Demographic Patterns in Ghana

Evidence from the Ghana Fertility Survey 1979–80

Editors
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Preface

It is well known that the World Fertility Survey achieved remarkable success in promoting analysis and utilization of the data from the national fertility surveys carried out under the programme. Apart from developing a series of technical bulletins, illustrative analyses, scientific reports and other technical documentation and computer software to support analysis, a number of workshops were organized in which scholars from developing countries undertook intensive practical research with the guidance and collaboration of WFS professional staff.

The workshop on the Ghana Fertility Survey (1979–80) was the last of this series of analysis workshops. The initiative in organizing the workshop was taken by the Central Bureau of Statistics (CBS), Ghana, who requested the International Statistical Institute to seek funds for it. With financial support of the United States Agency for International Development, the workshop was conducted at the WFS offices in London during the two months August–September 1984. The Ghanaian participants, selected through the CBS, were Mr George Adansi-Pipim of the Births and Deaths Registry Department, Accra; Dr Fred Aryee of the Regional Institute of Population Studies, Legon; and Ms Rebecca Appiah and Mr John Y. Owusu of the CBS. Mr Owusu was also the survey director and Ms Appiah a key member of the directorate of the Ghana Fertility Survey.

The Ghana workshop differed from most previous analysis workshops in certain respects. It involved a single country, rather than a group of countries as was the case on previous occasions. On the other hand, the workshop covered five subprojects, each dealing with a different topic. Generally, earlier workshops had each dealt with one specific topic and were therefore able to include a considerable amount of formal instruction as a part of the training process. In the present workshop, the approach used was one of more informal, individual discussions and interaction between the visiting researchers and the headquarters staff. Dr Iqbal Shah and Dr Susheela Singh guided the project and helped in its design, in carrying out the required computer work and in editing drafts.

With the coming end of the WFS programme, the analysis initiated during the Ghana workshop could not be completed within the available time and resources. The International Statistical Institute through its Research Centre (ISIRC) therefore took the initiative to secure additional funds from the United Kingdom Overseas Development Administration, and engaged the three editors of this volume to complete and edit the analyses during October–December 1984. The ISIRC is also happy to have taken the responsibility for technical editing, publication and distribution of this valuable report.

VIJAY K. VERMA
Director of the ISIRC

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Several individuals contributed to making the workshop and the publication possible. The late Director of Administration of the WFS, Mr V.C. Chidambaram, played an important role in organizing the funding of the workshop. The help of Mr Halvor Gille, Project Director of the WFS and the International Statistical Institute, in carrying out the workshop is also greatly appreciated. Special thanks go to Mr John Cleland for his encouragement and assistance throughout the project. The efforts of all of these individuals are doubly appreciated because they were made during the very difficult phase of the concluding months of the World Fertility Survey. We thank the International Statistical Institute Research Centre for assisting in finalizing this work and its publication. We greatly appreciate the speed with which the Overseas Development Administration (ODA) of the United Kingdom responded to the request for special funds to meet the publication costs; special thanks are due in this connection to Dr Sheila Macrae and Mr Chris Allison of the ODA.

The resilience, hard work and good humour of the workshop participants in these difficult circumstances were admirable. We thank them for their co-operation and promptness in completing the drafts.

We were fortunate to have the assistance of Elizabeth Baker and Marie-Thérèse Braunstein in typing the manuscript: we thank them for their patience, willingness and hard work. We are grateful also to Michael Munns for his assistance in preparing the manuscript for the printer.

THE EDITORS

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1 Introduction

John Y. Owusu and Susheela Singh

The republic of Ghana, with a land area of 238 537 square kilometers, attained political independence from the British on 6th March 1957. It has a population of 12.2 million,[1] and with an estimated crude birth rate of about 49 per thousand and a crude death rate of about 18 per thousand, the population is believed to be growing at an estimated rate of about 3 per cent per annum.

Since achieving political independence in 1957 the preoccupation of successive governments in Ghana has been to achieve rapid social and economic development for the country. The concept of the population as both the instrument of development and the beneficiary of development efforts has been uppermost in government planning in Ghana. Consequently due cognizance has been taken of the size, composition, distribution and changes in these aspects of the human stock, and the implications of these for the realization of the development objectives.

Knowledge of the changing characteristics of the population has been facilitated by the cumulating data from the decennial population censuses, which date back to the year 1891 when the first census was taken in the country, and *ad hoc* and post-census demographic sample surveys. Although the censuses conducted during the colonial era had deficiencies, as judged by modern population census and statistical standards, they nevertheless provided useful rough indications of the size, composition and distribution of the population.

[1] According to preliminary counts from the population census, March 1984.

1.1 TRENDS IN DEMOGRAPHIC CHARACTERISTICS

The last census in Ghana before the country's attainment of independence was taken in 1948, when the total population was estimated to be 4.1 million. Since that time, censuses were carried out in 1960 and 1970, and the most recent in 1984. The population had increased to almost three times its 1948 size by 1984, numbering 6.7 million in 1960, 8.6 million in 1970 and 12.2 million in March 1984 (preliminary count of the census). These results show a variable average annual growth rate over the intercensal periods, of about 4.7 per cent for 1948–60, 2.7 per cent for 1960–70, and about 3 per cent for 1970–84. The rate for 1948–60 is implausibly high, suggesting that either the 1948 census may have under-estimated or the 1960 census over-estimated the population, or both. However, these results do confirm that the rate of growth has been quite high throughout the last 30 years. The recent rise in the growth rate from the 1960s to the 1970s is also reasonable, considering the downward trend in the crude death rate (CDR), even if the crude birth rate (CBR) did not increase.

Collection of data on the vital rates through the registration system is limited in coverage. Even in the designated registration areas, which are mainly urban, vital registration is incomplete. Since these data are judged to be inadequate and defective, estimates have been made from the available survey and census data by making use of generally accepted mortality and fertility patterns. A set of such estimates, mainly from the UN, are shown in table 1.1 They show a gradual but steady decline in the CDR (per 1000), from 28 years in the early 1950s to 17 years in the late 1970s, with a

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Table 1.1 Estimates of the size of the national population and vital rates, 1948–73

Year	Population	CBR	CDR	Annual growth rate	GFR[e]	Child/women ratio	e_0 averaged for M & F[f]
1948[b]	4 118	—	—	—	—	—	—
1953[a]	4 964	47.5	28.2	1.93	203	771	36
1958[a]	6 303	47.9	25.6	2.23	205	808	38
1960[b]	6 727	—	—	5.28[c]	171	831	—
1963[a]	7 422	49.7	23.3	2.64	216	825	41
1968[a]	8 240	50.0	21.5	2.85	220	818	43
1970[b]	8 559	—	—	2.72[d]	—	817	—
1973[a]	9 385	48.6	19.1	2.95	216	832	46
1978[a]	10 969	—	—	3.38	—	—	48
1979–80	—	38.8[g]	—	—	—	—	—

[a]UN estimates, prepared by the Population Division, covering five-year periods, with the indicated year being in the middle, eg 1953 = estimate for 1950–5. *Demographic Yearbook*, 1979: Historical Supplement, N.Y.
[b]These counts are from censuses.
[c]Over the period 1948–60, using census totals.
[d]Over the period 1960–70, using census totals.
[e]General fertility rate.
[f]Average for males' and females' life expectancy.
[g]Based on the GFS, averaging births over the three years before the survey.

corresponding rise in average life-expectancy, from 36 to 48 years, over the same period.

Estimates of the CBR (per 1000 population) can be made from the 1979–80 Ghana Fertility Survey, relating births in a recent period to the total household population. The estimates of the CBR derived from the GFS are:

1 CBR of 43.1 if age-specific fertility rates for the five-year period of 1975–9 are applied to the household population;
2 CBR of 40.5 if age-specific fertility rates for the year prior to survey are used; and
3 CBR of 39.0 using the average number of births per year, over the three years before the survey.

The estimate for 1975–9 is somewhat higher than the other two because it is based on a longer period (five years) during which some decline occurred. However all three of these estimates are substantially less than the other current estimates of the CBR, which are usually in the range of 48–50. Even if the survey suffered from some under-counting of infants, this is unlikely to account for the total difference which is at least about 14 per cent (a decline from the usual estimate of 48–50 to 43). Thus, it would seem that a small decline in the CBR occurred during the 1970s. This may be due to a true decline in fertility or, instead, to changes in the population's age structure, eg by selective emigration of adults in the reproductive ages. The chapter on fertility will look into this question.

With a historically high and possibly rising rate of population growth based on high fertility, the proportion of the population aged less than 16 years has been rising over time, from about 45 per cent prior to 1960 to about 50 per cent around 1970 (see table 1.2). The proportion at older ages declined slightly and then rose again when the GFS results were taken into account. The net result of these two changes is that the dependency burden on the economically-productive age groups has increased over time. The detailed age distribution indicates that the more conventional measure of dependency (less than 15 and over 65 years of age) also increased, mainly from 1960–70 (from 47.7 to 50.4 per cent), and remained more or less constant during the 1970s (50.4 to 51.4 per cent) (see table 1.3).

Some changes have also occurred from 1960–80 in the marital status composition of the population (table 1.4). The percentage of women who are single increased substantially during this period, both at ages 15–19 and 20–24 (table 1.4), largely due, presumably, to rising school attendance. The proportion who are divorced or separated increased slightly at younger ages, while widowhood fell slightly at older ages, up to 1970. The GFS used a somewhat wider definition of

Table 1.2 Percentage distribution of the population, by broad age groups

	1921[a]	1948[a]	1960[a]	1968[b]	1970 Census	1979–80 GFS
Under 16	44.1	43.0	46.3	50.9	49.1	49.7
16–45	42.3	43.2	42.1	37.3	39.3	36.7
46+	13.6	13.8	11.8	11.8	11.6	13.6

[a]Caldwell (1967).
[b]Gaisie *et al* (1970).

Table 1.3 Age structure (percentage distribution), by five-year groups 1960–79

Age	Total				Males				Females			
	1960	1968	1970	1979	1960	1968	1970	1979	1960	1968	1970	1979
0–4	19.2	18.9	18.3	17.8	18.8	19.5	18.3	18.3	19.6	18.4	18.2	17.2
5–9	15.2	17.3	17.0	16.3	15.1	17.7	17.1	16.9	15.2	16.9	16.7	15.8
10–14	10.1	12.7	11.7	13.5	10.5	13.3	12.1	14.2	9.8	12.0	11.3	12.9
15–19	8.0	9.0	9.1	9.6	8.1	9.1	9.4	9.7	7.9	8.8	8.9	9.6
20–24	8.7	7.3	8.0	7.3	7.9	6.2	7.2	6.2	9.6	8.5	8.7	8.4
25–29	8.8	7.2	7.4	6.6	8.3	6.1	6.8	6.3	9.2	8.1	7.9	6.9
30–34	7.3	5.6	6.6	5.5	7.1	5.3	6.2	5.3	7.4	5.9	6.9	5.7
35–39	5.5	5.2	5.1	4.5	5.8	5.1	5.2	4.1	5.3	5.4	5.0	4.8
40–44	4.6	3.9	4.1	4.0	4.9	3.9	4.1	3.9	4.4	3.9	4.1	4.1
45–49	3.3	3.5	3.2	3.6	3.6	3.5	3.4	3.8	2.9	3.4	3.0	3.3
50–54	2.7	3.0	2.7	3.6	2.9	3.0	2.8	2.9	2.5	3.0	2.7	4.2
55–59	1.6	1.7	1.7	2.1	1.8	1.9	1.8	2.1	1.5	1.6	1.5	2.0
60–64	1.8	1.7	1.7	1.9	1.9	1.9	1.8	2.0	1.7	1.6	1.7	1.9
65+	3.2	3.0	3.4	3.8	3.3	3.4	3.8	4.3	3.0	2.5	3.4	3.1

Sources: 1960: Ghana Census (1960), vol 3; 1968: Gaisie (1976), 34; 1970: Ghana Census (1970), vol 3.

Table 1.4 Percentage distribution of women, by marital status for each five-year age group, 1960–79/80

Marital status	Year	15–19	20–24	25–29	30–34	35–39	40–44	45–49
Never married	1960	46	9	2	1	1	0	1
	1968	59	9		1		1	
	1970	68	16	4	1	1	1	1
	1979–80	69	15	3	1	1	1	0
Married	1960	52	86	92	91	88	82	72
	1968	38	83		87		78	
	1970	30	76	88	87	86	80	72
	1979–80	27	76	91	92	90	86	83
Divorced/ separated	1960	2	5	5	6	7	10	12
	1968	4	7		9		11	
	1970	2	7	8	9	9	12	14
	1979–80	4	8	6	7	7	9	11
Widowed	1960	0	1	1	2	4	8	15
	1968	0	1		3		10	
	1970	0	1	1	2	4	7	14
	1979–80	0	1	0	1	2	5	7

'marriage', classifying couples who were living together as married. This probably accounts for the apparent rise in proportions currently married, between 1970 and 1979–80, paralleled by declines in divorce, separation and widowhood over this same period.

1.2 CHANGES IN SOCIO-ECONOMIC COMPOSITION OF THE POPULATION

During the last two to three decades substantial changes have occurred in most aspects of Ghanaian life, many of which cannot, or have not, been measured or recorded in the usual sources. We briefly review the few changes for which numerical measures are available, mainly in urbanization, educational attainment, occupational composition and a few indices of economic change.

The proportion of the population which is urban (in towns of 5000 or more people) has been steadily increasing over time, from an estimated 13 per cent in 1948 to about one third of the national population around 1980 (see table 1.5). This is a significant social transformation, since many of the physical and economic conditions of life change with movement from rural to urban areas, changes that increase the likelihood of voluntary fertility restriction. This trend towards residence in towns and cities has affected all age groups of women in the childbearing ages, 15–44, with less of a change among the oldest age groups, 45–49 year olds (see table 1.6). We may expect this type of change to affect not only fertility, but also mortality, since provision of medical care is usually more adequate in urban centres and the supply of water, sewage and other public health-related services, is also better.

Even larger changes have occurred in educational attainment of the population, affecting the younger age groups much more than the older ones. From 1960–70, the proportion who have ever attended school has risen from 44 to 63 per cent among 6–14 year olds, and from 36 to 59 per cent among 15–24 year olds. In both cases the change among females is greater than that for males. For example, the proportion who had ever attended school, among 15–24 year-old girls, more than doubled between 1960–70, while attendance of boys increased by about 40 per cent (see table 1.7).

Ever-attendance is a gross measure of change, and tables 1.8 and 1.9 show greater details of the level of educational attainment for 15–24 year-old women, over the 1960–80 period. It is interesting

Table 1.5 Percentage urban and rural of the national population from censuses and surveys, 1948–79/80

	1948C	1960C	1968S	1970C	1979–80S
Urban	13	23	30	29	34
Rural	87	77	70	71	66

C = Census; S = Survey.

Table 1.6 Percentage urban among women, by five-year age groups, 1960, 1970, 1979–80

Age group	1960	1970	1979–80
15–19		33.9	35.0
	27.4		
20–24		32.7	36.4
25–29		30.8	37.9
	23.1		
30–34		27.8	33.3
35–39		27.1	33.3
	20.8		
40–44		24.9	29.0
45–49		23.9	23.7
	20.7		
50–54			

Table 1.7 Proportion who have ever been to school, by three large age groups, for males, females and the total population, 1960, 1970 and 1979–80

Age	Sex	Proportion who had been to school		
		1960	1970	1979–80
6–14	Total	43.7	62.5	NA
	Males	53.3	66.5	NA
	Females	33.4	58.4	NA
15–24	Total	35.9	59.3	NA
	Males	52.0	74.1	NA
	Females	21.1	45.5	69.1
25+	Total	13.7	22.2	NA
	Males	21.2	33.0	NA
	Females	5.8	11.7	32.3

to note that increases have mainly occurred in the proportion who have reached the level of middle school (7–10 years of schooling, since primary provides 6 years of schooling). In other words, the rise in attendance is not limited to the attainment of primary school education; instead, girls typically proceed to middle school level also. Among 20–24 year olds the proportion who have attained secondary or higher-level training (11 or more years in school) has also risen, from slightly under 2 per cent in 1960 to about 6 per cent in 1979–80.

Given the increase in urban proportion, we may expect that the occupational composition of the population would also have changed. Some small changes have occurred from 1960–80 (see table 1.10). The proportion employed in agricultural jobs declined from 61 to 51 per cent among men, and from 59 to 47 per cent among women. Correspondingly, for males, small increases occurred in employment in professional/technical/administrative, clerical and service jobs. Although women also had small increases in these categories over this 20-year period, their greatest shift was into production jobs, from 1960–70, and the proportion in production decreased while the proportion in sales increased during the 1970s.

Improvements in medical services from 1960–81 were substantial. The number of individuals in the population per medical doctor was 21 600 in 1960 and it had fallen to 7630 by 1981. A larger relative decline occurred in the population per nurse, from 5430 to 780 (World Bank 1984). Improvements have also occurred in the basic infrastructure (water, electricity, roads and other means of communication), certainly from 1950–70, although such improvements were much slower or non-existent during the past 10 years or so. Table 1.11 shows a few indications of

Table 1.8 Level of educational attainment for 15–24 year-old women, 1960, 1970, 1979–80

Level of education	1960	1970	1979–80
Never attended	76.2	54.5	30.1
Primary	8.0	11.5	11.8
Middle	14.0[a]	29.2	53.6
Secondary, or any other specialized training	1.8	4.9	4.6

[a]Includes commercial training, which is combined with secondary+, in 1970 and 1979–80.

Table 1.9 Level of educational attainment for 15–19 and 20–24 year olds, 1970 census and 1979–80 survey

Age group	Year	Never attended	Primary	Middle	Secondary+
15–19	1970	42.2	13.9	38.8	5.1
	1979–80	26.7	11.3	58.7	3.3
20–24	1970	66.8	9.1	19.4	4.7
	1979–80	33.9	12.3	47.9	6.0

Table 1.10 Occupational distribution (in percentage) of males and females, 1970 census and 1979–80 survey

	Males		Females	
	1970	1979–80[a]	1970	1979–80[b]
Professional and technical	5.3	9.6	2.0	3.5
Administrative and management	0.6		0.1	
Clerical	4.2	5.9	0.9	1.8
Sales	2.9	6.1	25.7	34.5
Service	4.0	4.8	1.5	2.2
Agricultural	59.8	50.8	54.5	47.3
Production	23.1	22.8	15.4	10.7
Total	99.9	100.0	100.1	100.0

[a]Most recent occupation of husbands of ever-married women (current husband, or last husband if not currently married).
[b]Occupation of women who were working at the time of the survey, both ever- and never-married.

Table 1.11 Indicators of economic change in Ghana, 1960–82

Indicator	1960–70	1970–82
Per capita income: annual growth rate (%)	−1.3 (1960–82)[a]	
Inflation: annual growth rate (%)	7.5	39.5
GDP: annual growth rate (%)	2.2	−0.5
Exports: annual growth rate (%)	0.1	−4.7
Imports: annual growth rate (%)	−1.5	−4.8
Fertilizer use: (grams per hectare)	900 (1970)	11 200 (1981)
Commercial energy used: annual growth rate	12.3 (1960–74)	−0.1 (1974–81)
Index of food production: 1969–71 = 100	–	72 (1980–2)

[a]This average contains a period of increase in per capita income, in the 1960s, and a period of declining income in the 1970s.
Source: World Bank (1984).

economic change during the 1960–82 period. These measures show that, while some growth occurred during 1960–70, this was reversed during the 1970s when GDP declined and inflation rose steeply. Despite the apparently higher use of fertilizer, food production declined greatly between 1970–82.

The overall picture is a mixed one. Economic improvements and increased modernization occurred in most spheres, prior to 1970. However after 1970, although the trend towards increased modernization continued (in education and urbanization), the country as a whole suffered from economic stagnation and even decline in some areas.

1.3 POPULATION POLICY AND NATIONAL DEVELOPMENT PLANNING

Successive governments in Ghana, particularly after attainment of political independence, have not failed to take cognizance of the country's high fertility rate and its relation to the economic development of the country. Each government has consequently taken the population levels and trends as one of the basic factors in the development process. The history of population policies in Ghana therefore reflects the tenets of social and economic development policies and programmes of successive governments.

Population policy prior to 1966

Demographic data available to the first post-independence government, headed by the late Dr Kwame Nkrumah, were obtained mainly from the decennial population censuses conducted during the colonial era. The last of the censuses, which were started in 1891, was conducted in 1948. Deficiencies in the census methodologies and procedures and the limited scope of data collected in the census, however, made the statistical information at the disposal of the government inadequate for comprehensive assessment of the demographic situation. Nevertheless the plan contained references to the population resource, although most of the statements were non-quantitative and where statistics were given these were in error in most cases. The references largely emphasized the favourable relationship between natural resources, which the country was seen to have in abundance, and population, which was seen to have great potential for technological development. The government saw the country as largely under-populated and therefore as having inadequate human resources to meet the needs of its anticipated future development.

Preparation of the Seven-Year Development Plan, on the other hand, benefited immensely from the results of the 1960 census which was acclaimed, in terms of modern population census standards, to have been very successful and very excellently executed. In this plan the government acknowledged the adverse implications of the young and growing population (of Ghana) for individual and national saving and for levels of per capita income. It also recognized the inability of the economy to absorb 'the growing ranks of young unemployed persons', and also the fact that the high growth rate of the country's population had contributed to some of the problems facing the country.

However, in the view of the government, a growing population presents an opportunity as well as a problem; 'as there are more mouths to

feed, so also are there more hands for work'. The population growth had presented problems because the economic system and production of the country had not been efficiently organized to meet the needs of a fast-growing population. The insufficient food supply, for instance, was attributed not to population increase but to the inefficient agricultural system characterized by traditional technology and its attendant low productivity; and the problems associated with a growing labour force was to be solved not by any adjustments in the demographic trends, but by technological and organizational changes as contemplated in the seven-year plan, and by differential adjustment of wages to create employment opportunities and to redistribute labour among the sectors. The strategy of industrialization chosen for the country's development was seen to hold the solution to the problem of a growing labour force. As the plan stated, 'the choice of strategy is based on our demographic circumstances, on our position in Africa, and on the need to invest our money in those lines of production for which the markets are most profitable and secure'.

The foregoing views and statements of this early government show that its economic development policies were essentially 'population-responsive', in that they essentially involved policies and development strategies that were to utilize, to greater advantage, opportunities which an increasing population could provide for economic development.

The economic development policy of the government was one that related to optimum population theory; that is, optimum relation of population to other factors of production. Output of labour depends on the available techniques of production and the skills the population possesses. A population of a given size may therefore be in a stage of diminishing returns while it is largely illiterate and unskilled, whereas, after a generation of education and training in production skills, a population of the same size might be of optimum or even suboptimum size. Therefore, to turn the problems of increasing population into an opportunity for economic development, the government embarked on programmes for the expansion and development of the economic and social infrastructure and for restructuring of the economy. These included the development of hydroelectric power on the Volta river, construction of the new port of Tema, and expansion of health services and of basic educational and training programmes to raise the quality of the labour force. There were attempts at mechanization and structural reorganization of the agricultural and industrial sectors of the economy, while changes were also attempted in the economic institutions to ensure increased governmental intervention in industrial, commercial and agricultural enterprises. Extension of free education was also embarked upon to reduce the burden of childbearing on parents.

From 1960 onwards, however, the country experienced increasing economic difficulties as earnings from its main export commodity, cocoa, fell progressively with the fall in the external price of cocoa. Consequently much of the development expenditure was met by deficit financing, loans and credits. The rapid expansion of the fee-free education also resulted in a high turn out of school leavers who drifted from the rural to the urban areas in search of white-collar jobs and employment in the industrial sectors. In spite of the rapid pace of the attempts at industrialization, industrial employment increased rather slowly – as it usually does – with the result that the absolute number of workers which the industrial sector could absorb lagged behind the growth of the labour force; and attempts to solve the unemployment problem by the establishment of state farms and workers brigades only succeeded in concealing the level of unemployment as per capita output of the workers in these establishments was far lower than even the cost of their employment.

Population policies since 1966

The military administration – the National Liberation Council – that succeeded the first civilian government in February 1966 inherited a deteriorating economy with high foreign indebtedness, a stagnant rural sector, and a high level of urban unemployment. In its attempt to improve upon the economic situation the new military government adopted a development strategy which was different in its orientation and area of emphasis from that pursued by the first civilian government. To unmask the high level of unemployment which had been largely concealed by over-employment in state establishments, many of the state enterprises were consequently sold to the private sector to be operated as profitable economic concerns. The rural–urban migration and the resultant high urban unemployment, which was seen to be the result of a stagnant rural sector, was also to be solved by a programme

of rural development, and the rapid industrialization of the country initiated by the previous government was consequently de-emphasized. Concurrent with the pursuit of a programme of general economic and social development, and for the success of the latter, the government also saw the need for a reduction of the country's high birth rate and rate of population growth. Consequently, in March 1969 the government published a national population policy statement — 'Population Planning for National Progress and Prosperity: Ghana Population Policy' — which emphasized the deleterious effects of rapid population growth and the need for population-influencing policies and programmes to be instituted as integral parts of a programme of national development.

In August 1969 the military government handed over the administration to the civilian government of the late Dr K.A. Busia after general elections. The new civilian administration adopted the development strategy of the previous (military) government and endorsed the population policy statement published in March 1969.

This policy statement identified the high fertility rate in the country and the consequent high rate of population growth as one of the nation's main population problems, if not the main one, and its deleterious effect on national development efforts was stressed. Available statistics and estimates based on the 1960 census data showed that Ghana's population was increasing at a rate of about 3 per cent per annum. This had been occasioned largely by the high fertility rate and a declining mortality rate. Consequently about 45 per cent of the population were aged under 15. As observed in the population policy statement, a high proportion of young dependent population — and therefore of non-producing consumers — had placed a heavy burden on the relatively small working population who produced the goods and services for the total population. This was seen to be thwarting efforts at accumulation of both private and public sector savings and investment which were needed for the country's social and economic development. Therefore if progress was to be made in the national development effort then the high rate of population growth should be curbed. While acknowledging that under improved social and economic conditions fertility could change whether there is any planned effort or not, the government, in the policy statement, pointed out that in the case of Ghana where the population growth rate was already high and was frustrating the development efforts, a rise in educational and income levels was not likely to be rapid enough or distributed widely enough to have much influence on fertility. A development strategy integrating population issues, which would involve the institution of a national programme for fertility limitation, was therefore to be pursued.

Policy measures proposed in the statement involved several distinct activities and approaches to influence fertility levels, besides changes that would result from the general programme of social and econonic development. These included:

1 Establishment of a national family planning programme to provide information, advice and assistance to couples wishing to space or limit their reproduction. In this approach the government would encourage and itself undertake programmes to provide information, advice and assistance to couples wishing to space or limit their reproduction; and these programmes would be educational and persuasive, and not coercive.
2 Promotion of opportunities for females: ways would also be sought to encourage and promote wider productive and gainful employment for women, to increase the proportion of girls entering and completing schooling, and to develop a wider range of non-domestic roles for women.
3 Modification of social institutions: the desirability of legal prescriptions relating to marriage and other social institutions and practices relevant to fertility would be examined.
4 Negative incentives: the structure of government employee benefits would also be examined and if necessary changed in such ways as to minimize their pro-natalist influences and maximize their anti-natalist effects. In this regard maternity leave and child benefits were to be modified.

In a plan of action, the population programmes would be developed and pursued as an integral part of the national development strategy, and towards these ends specific and quantitative demographic targets would be established.

The government, however, realized the limitation of existing demographic data for a more precise description of the structure and charac-

teristics of the population and the measurement of its trends. Steps were therefore to be taken to strengthen the statistical and research facilities and capability of the country to enable more reliable demographic data to be obtained. Towards this end the government in 1977 decided to participate in the World Fertility Survey programme. Although somewhat limited in its scope in these regards, the Ghana Fertility Survey provides, up to this time, the most comprehensive data on fertility in Ghana and its relationship with (selected) socio-economic background characteristics of Ghanaian women. Its results, further analysed and presented in this volume, consequently have tremendous implications for a re-appraisal of the national population policy and programmes.

1.4 THE GHANA FERTILITY SURVEY (GFS)

The survey was conducted in 1979–80, and funding for the project was provided by the United States Agency for International Development through the International Statistical Institute under whose sponsorship the World Fertility Survey was undertaken. Within the broad purposes of the World Fertility Survey programme, the objectives of the Ghana Fertility Survey, as given in volume I of the First Country Report (Central Bureau of Statistics 1983), may be stated as follows:

1 to obtain internationally standardized data on fertility levels and fertility behaviour which will aid the development of population programmes and the execution of population-related programmes and projects in Ghana;
2 to establish in Ghana a scientifically designed machinery for the conduct of surveys of human fertility levels and behaviour, and through this, to increase the nation's capability for fertility and other demographic survey research; and
3 to further international co-operation in statistical research.

The questionnaire for the survey consisted of two major parts: a household schedule which was used for listing household members together with basic demographic data about members including sex and age, and an individual questionnaire used for detailed interview of females aged 15–49 years who had been identified in the household schedule, irrespective of their marital status. The individual questionnaire contained sections on the following topics:

1 respondent's demographic and social background;
2 maternity history;
3 marriage history;
4 contraceptive knowledge and use;
5 birth intervals and fertility preferences;[2]
6 work history; and
7 current (or last) husband's background.

The survey which covered all the nine[3] regions of the country used a two-stage self-weighting sample design involving the selection of 300 primary sampling units (PSUs) with the objective of yielding a sample of 7500 households and an equal number of respondents for the individual interview. While the census enumeration areas were used as a sampling frame, selection of the sample entailed a field mapping and household listing operation. Regardless of marital status, all women aged 15–49 who slept in sampled households on the previous night were eligible for the individual survey. The survey fieldwork was started in February 1979 and completed in March 1980.

1.5 ANALYSIS OF THE GHANA FERTILITY SURVEY 1979–80

A general descriptive report, which covers the main findings of the survey, was published in 1983. Subsequently, a detailed analysis of the data from the module on factors other than contraception affecting fertility (FOTCAF) was carried out within one of the World Fertility Survey workshops (Gaisie 1984). Work on these factors was developed further in later publication (Gaisie forthcoming). In addition, an evaluation of the quality of the survey's data was also undertaken as part of a WFS workshop (Owusu 1984). Finally, one graduate thesis has used GFS data (Adansi-Pipim 1982), and other projects are in progress.

[2] This section included questions from the Module on Factors Other than Contraception Affecting Fertility (FOTCAF).

[3] One of the regions – Upper Region – has since been subdivided into two regions (Upper East and Upper West), giving a total of 10 regions for Ghana.

This book is the outcome of a workshop specifically devoted to the analysis of GFS data. The aim was to carry out in-depth analyses of five topics – nuptiality, fertility, infant and child mortality, contraception and policy-related issues (using data on fertility preferences and on knowledge and use of family planning sources). These analyses of individual topics had the advantage of being able to examine issues of interest to the country, employing all relevant socio-economic characteristics which had been measured in the GFS. In addition, they go beyond cross-tabular analyses, employing multivariate techniques, in order to be able to examine several factors simultaneously, and to estimate the net effect of each particular factor. An important advantage of bringing together the papers in one volume is that the policy implications of all the papers could be drawn out and related to each other.

1.6 SOCIO-ECONOMIC FACTORS OBTAINED IN THE GFS

The Ghana Fertility Survey collected most of the significant characteristics that could be reliably obtained in a single-round retrospective survey. All women were included in the individual survey, and the analyses can therefore benefit from the availability of data on the background characteristics of single women. Ever-married women also supplied some information about their husband (the current one, or if not currently married, their last husband).

Information was obtained about the following characteristics of women: region, current type of place of residence, childhood type of place of residence, literacy, years of schooling, religion, ethnicity, occupation, years worked and work status of employment before the first marriage and occupation, years worked, and work status and place of work for employment after the first marriage. In the case of the current or last husband, his childhood, type of place of residence, literacy, years of schooling, religion, ethnicity, occupation and work status were obtained.

Out of these two sets of factors, some were selected, partly to avoid duplication, and partly because they were of greater relevance for policy makers. These were region, current place of residence, level of education and occupation. Some analyses also used religion, ethnicity and place of work, but these factors were not emphasized as heavily as the four main ones. Factors such as work status were rejected on the grounds that they have relatively low variation, while others, such as number of years worked and childhood place of residence, were believed to have relatively low accuracy. The literacy variables were rejected in favour of the more detailed level of education variable. The percentage distribution of each of these factors according to the existing categories is shown in table 1.12.

Given the small size of the overall sample and more importantly, the small size of certain categories of variable, the workshop group agreed to reduce the total number of categories by collapsing the smaller ones with similar subgroups. This was also necessary to facilitate the multivariate analyses. Regions were regrouped for some analyses as follows: Western/Central combined, Ashanti/Brong Ahafo combined and Northern/Upper combined. These combinations were made on the basis of overall similarity between the regions which were grouped together. Similarly, in the case of ethnicity, Fante, Twi and other Akan were put together to form a total Akan subgroup, and the small group of Guan was combined with others to form one group. Among religion subgroups, all Christians were considered as one subgroup and the Traditional group was combined with those who reported themselves as having no religion. Among women, professional and clerical occupations were grouped together, self-employed and employed agricultural workers were put into one group, sales and services were also put into one group, and skilled and unskilled manual workers were combined. The same regroupings were used among husbands, except that professionals were considered on their own, and three groups, clerical, sales and services, were combined together. While sales jobs are relatively low status among women, it was felt that for men these would be jobs of an intermediate status, as are clerical and service jobs. Regrouping of educational categories was partly done on the basis of sample size distribution, and partly to maintain substantively meaningful subgroups. For women and men, the No Schooling and Secondary or Higher categories were in common. Regrouping of intermediate levels varied, however, because of the different sample size distributions: among women, primary (1–6 years), incomplete middle level (7–9 years) and complete middle level (10 years) were used, while for men, primary and incomplete

Table 1.12 Distribution of sample by categories of the main background factors[a]

Region	%	*Ethnicity*	%	*Religion*	%
Western	7.5	Fante	9.5	Christian (Cath.)	18.7
Central	7.6	Twi	41.1	Christian (others)	46.5
Greater Accra	11.9	Other Akan	3.4	Muslim	10.8
Eastern	16.5	Mole-Dagbani	13.1	Traditional	15.9
Volta	9.8	Ewe	12.2	No religion	8.0
Ashanti	24.0	Guan	3.0	Others	0.1
Brong Ahafo	7.9	Others, not stated	10.1	Not stated	0.0
Northern	5.7				
Upper	9.1				
Place of residence	%	*Respondent's education*	%	*Husband's education*	%
Rural	66.1	No schooling	51.8	No schooling	44.3
Other Urban	16.6	Primary 1–3	3.2	Primary 1–3	1.3
Major Urban	17.3	4–6	7.4	4–6	4.9
		Inc. Middle	12.9	Inc. Middle	5.9
		Compl. Middle	20.5	Compl. Middle	29.3
		Secondary+	4.3	Secondary+	13.0
		Not stated	0.3	Not stated	1.3
Respondent's[b] *occupation*	%	*Respondent's place of work*	%	*Husband's*[b] *occupation*	%
Prof/T/M	2.8	Family farm	18.8	Prof/T/M	9.4
Clerical	1.5	Other farm	16.7	Clerical	5.8
Sales	28.2	At home	13.8	Sales	6.0
S.E. Agric.	19.2	Away from home	30.4	S.E. Agric.	42.9
Agric. employees	17.5	No work	20.4	Agric. employees	7.1
Private HH	0.3			Private HH	0.2
Other service	1.6			Other service	4.5
Skilled prod.	8.1			Skilled prod.	19.9
Unskilled prod.	0.3			Unskilled prod.	2.5
Not working	20.4			No work	0.4
Not stated	0.1			Not stated	1.2

[a]All distributions are based on the total sample (6125 women) except for husband's education and occupation, which is based on the 4943 ever-married women.
[b]Occupation since marriage, for ever-married women, and most recent job for never-marrieds or for husbands. Prof/T/M = professional, technical, managerial; S.E. Agric = self employed agricultural; private HH = private household workers.

middle were combined, because of the small number of husbands in each group.

Even among the selected factors, all of which are important in their own right, there is a high degree of inter-relationship. For example, Mole-Dagbani are predominant in Northern/Upper regions, whereas Ewe predominate in the Volta region. Likewise, while over 90 per cent of women in Northern/Upper regions were illiterate, only 29 per cent of women in Greater Accra were illiterate. This is unavoidable, but it makes use of multivariate analysis even more important than it would otherwise be. Cross-tabulations of the most highly inter-related variables are shown in tables 1.13–1.18. Women tend to marry husbands of a similar socio-economic background with the result that respondent's and husband's education and their occupation are highly correlated (tables 1.13 and 1.14). However, even so, among any given category, usually more than 50 per cent of women are not in the parallel category of husbands' characteristics. There is a tighter relationship between region and ethnic composition, however, with all regions except Greater Accra having 70 per cent or more of its population from one ethnic group (table 1.15). Region and religion are

Table 1.13 Percentage distribution of respondent's education, by husband's education (based on ever-married women)

Respondent's education	Husband's education					
	No schooling	Primary	Incomplete Middle	Complete Middle	Secondary or higher	Number of women
No schooling	66.4	6.5	5.9	18.3	2.9	2955
Primary	29.4	9.7	8.9	43.8	8.2	527
Incomplete Middle	19.8	6.0	9.3	51.6	13.3	450
Complete Middle	11.5	3.7	3.7	49.0	32.1	843
Secondary+	10.1	3.6	0.0	19.6	66.7	168
Total	46.9	6.2	5.9	29.3	11.6	99.9
Number of women	(2320)	(307)	(294)	(1449)	(573)	(4943)

Table 1.14 Percentage distribution of respondent's occupation, by husband's occupation (based on ever-married women)

Responent's occupation	Husband's occupation					
	Professional/ technical/ management	Clerical and sales	Manual skilled and unskilled	Agricultural	Not stated	Number of women
Professional/Clerical	41.9	16.7	29.0	10.0	2.4	210
Sales Services	9.9	33.8	25.1	30.3	1.0	1656
Manual	13.4	30.3	23.1	31.4	1.8	455
Agricultural	5.0	11.7	6.6	76.0	0.8	2116
Never worked	9.7	25.1	19.2	39.2	6.7	505
Total	9.4	22.4	16.5	50.0	1.6	99.9
Number of women	(467)	(1107)	(818)	(2472)	(79)	(4943)

Table 1.15 Percentage distribution of regional populations, by ethnicity (based on all women)

Region	Akan	Mole-Dagbani	Ewe	Ga-Adangbe	Others	N
Western/Central	79.9	3.5	3.3	1.5	11.8	921
Greater Accra	34.0	3.2	17.0	31.8	14.0	729
Eastern	63.8	1.5	11.3	18.9	4.5	1011
Volta	2.7	0.7	73.1	0.2	23.4	599
Ashanti/Brong Ahafo	83.6	6.0	1.9	1.1	7.4	1959
Northern/Upper	3.4	67.7	0.2	0.0	28.7	906
Total	54.1	13.1	12.2	7.5	13.1	100.0
Number of women	(3314)	(804)	(745)	(460)	(802)	(6125)

Table 1.16 Percentage distribution of regional populations, by religion (based on all women)

Region	Christian	Muslim	Traditional	Number of women
Western/Central	77.8	9.0	13.2	920
Greater Accra	76.5	13.7	9.7	729
Eastern	73.7	3.0	23.3	1011
Volta	67.3	9.2	23.5	599
Ashanti/Brong Ahafo	75.1	11.4	13.5	1959
Northern/Upper	10.9	18.5	70.5	906
Total	65.2	10.8	24.0	100.0
Number of women	(3992)	(660)	(1472)	(6124)

Table 1.17 Percentage distribution of regional populations, by type of place of residence

Region	Rural	Other Urban	Major Urban	Number of women
Western	69.8	16.2	14.0	457
Central	56.0	31.5	12.5	464
Greater Accra	11.7	14.8	73.5	729
Eastern	71.7	24.7	3.6	1011
Volta	88.0	9.0	3.0	599
Ashanti	66.6	15.5	17.9	1473
Brong Ahafo	76.7	19.8	3.5	486
Northern	76.5	7.2	16.3	349
Upper	91.4	6.8	1.8	557
Total	66.1	16.6	17.3	100.0
Number of women	(4046)	(1019)	(1060)	(6125)

Table 1.18 Percentage distribution of education subgroups, by type of place of residence

Respondent's education	Rural	Other Urban	Major Urban	Number of women
No schooling	76.1	13.2	10.8	3152
Primary	67.3	17.0	15.7	648
Incomplete Middle	61.8	19.1	19.1	790
Complete Middle	51.7	23.3	25.0	1256
Secondary+	26.9	17.9	55.2	279
Total	66.1	16.6	17.3	100.0
Number of women	(4046)	(1019)	(1060)	(6125)

Table 1.19 Percentage distribution of all women according to education and occupation, by five-year age groups

Respondent's characteristics	15–19	20–24	25–29	30–34	35–39	40–44	45–49	Number of women
Education								
No schooling	11	13	15	17	17	15	12	3152
Primary	24	23	17	14	11	8	3	648
Incomplete Middle	49	23	14	7	4	2	1	790
Complete Middle	33	32	19	8	4	2	2	1256
Secondary+	18	28	31	12	4	5	2	279
Occupation								
Professional/Clerical	7	34	31	13	5	6	5	261
Sales and services	13	21	18	16	15	11	7	1844
Manual	10	26	22	17	12	7	7	519
Agricultural	10	18	17	15	14	14	11	2247
Never worked	66	17	8	3	3	1	2	1251
Total	22	20	17	13	12	9	7	100.0
Number of women	(1371)	(1220)	(1011)	(802)	(703)	(579)	(439)	(6125)

not so strongly related, however, with all regions except Northern/Upper having similar distributions. Northern/Upper deviates from this pattern since 70 per cent of its population believes in Traditional religions, compared to 10–23 per cent in other regions. Region and type of place of residence are somewhat related, mainly because 74 per cent of Greater Accra region is classified as Major Urban (table 1.17). On the other hand, Greater Accra constitutes only 50 per cent of the Major Urban population, and all regions make some contribution to the Major Urban group, as they also do to the Other Urban subgroup. Level of education is moderately related to type of place of residence, as expected (table 1.18). This is mainly due to the concentration of secondary or higher educated women in Major Urban areas.

We present the distribution of women according to education and occupation subgroups by age groups (table 1.19) because of the strong relationships that exist between the two. Educated women tend to be younger, eg only 11 per cent of these with secondary or higher education are above age 35, and only 7 and 10 per cent, respectively, of the incomplete and complete middle-level groups are above 35, compared to 28 per cent of the total population. In addition, most professional/clerical workers are under age 30 and most women who have never worked are under age 20. These relationships should be borne in mind in the detailed analyses that follow.

1.7 ORGANIZATION OF THE CHAPTERS

In addition to this chapter there are five main chapters in this book, four of which deal individually with one major topic – nuptiality, fertility, contraception, mortality – and the fifth covering two main topics, fertility perferences and knowledge and use of sources of family planning supplies. Two of the chapters, that on contraception and that on preferences and supply sources, have some areas in common, since both call upon the data on contraception, preferences and sources of family planning, but they marshal the data towards different issues. The final chapter draws out the main policy implications of all the five preceding chapters, and serves as a summary chapter. Each paper covers a rather broad topic, and aims to touch on all important issues concerning that topic. The chapters typically use cross-tabular analysis in the early sections, to describe basic trends and differentials, then move on to multivariate analysis and/or other analytic techniques in later sections, to analyse the relationships between explanatory and dependent variables.

Among all chapters, there is a strong focus on a few of the explanatory variables, region, place of residence and respondent's and husband's education, which are considered to be the variables of greatest policy relevance. A second, equally

important emphasis is on identifying and quantifying, where they exist, trends in each main dependent variable (eg age at marriage, level of fertility and mortality, level of use of contraception and fertility preferences). Differences across age groups, for example, can give some estimate of change. The description of differentials among the socio-economic subgroups is also a focus of all papers. The study of differentials is particularly interesting in Ghana where great variations can be observed in all aspects of society, and where, in addition, social change is proceeding at a steady pace.

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2 Nuptiality Patterns in Ghana

Fred Aryee

2.1 INTRODUCTION

Marriage has been defined as an arrangement that establishes a more or less enduring legally or socially sanctioned relationship between a man and a woman. It is also the institution which provides unequivocal social sanctions for fruitful sexual relations (Trussell *et al* 1981: 7). When marriage is defined or perceived in this way, its importance as a demographic variable becomes self-evident since the level of fertility within the population will be related to, or determined to a large extent by, the levels and patterns of marriage within that population.

However, usage of this concept of marriage, together with other related concepts such as divorce, separation and widowhood, in African censuses and surveys is beset with some conceptual and definitional problems which in some cases seriously limit the value of the information collected. The problem basically stems from the fact that, whereas in contemporary Western society marriage is a clearly defined legal state with socially recognized corresponding rights, obligations and duties, marriage in Ghana, and indeed in many African societies, is a developmental process and not a single definitive act (Radcliffe-Brown and Forde 1950). This means that it is not always clear at what particular stage of the process, which may take months or years in certain cases, a marriage can be said to have been finalized or legalized.

For the purposes of this analysis there are two particular features of Ghanaian marriage which need to be mentioned. First, it is important to realize that there are some important regional and ethnic variations with respect to certain marriage practices which have an important effect on nuptiality patterns among different subgroups of the population. For example, sanctions against pre-marital sex among the traditional Adangbe were so strong that such offenders were even banished from the state. In many other areas of Ghana, however, the emphasis on procreation as the goal of marriage, or indeed of life, was sufficiently strong to over-ride any such considerations in similar situations. Marriage was therefore not necessarily a pre-condition for childbearing; rather childbearing, or at least some evidence of fecundity, was in many cases a precondition for the finalization of the marriage contract. Again, practices such as child betrothal among the Konkomba no doubt led to wide differences in age between spouses and therefore to a relatively high rate of widowhood and of widow remarriage. Additionally, the cost of marriage varied widely from group to group and area to area, which meant that though early marriage was the ideal among all groups, in practice differences occurred depending on the ease with which the material pre-requisites of marriage could be acquired.

The second major feature of Ghanaian marriage worth noting is that the form of marriage has, particularly in the urban setting, been gradually changing its character. Not only have new forms of marriage such as civil or consensual unions emerged, but there has also been a decline in the role of kin, while some of the procedures or customs have been modified or eliminated. Under such conditions of change, questions on marriage in a survey need to be tackled with considerable perspicacity.

In view of the conceptual difficulties discussed above, the WFS approach was to use a 'loose' definition of marriage which would or could cover a wide variety of marital conditions, and which would ensure that marital fertility was not underestimated. Although marriage was formally defined in the survey as 'a union between a man

Susheela Singh, John Y. Owusu and Iqbal H. Shah, eds (1985). *Demographic Patterns in Ghana: Evidence from the Ghana Fertility Survey 1979–80*: 17–48. Voorburg, Netherlands: International Statistical Institute.

and a woman for which customarily or legally recognized rites or ceremonies have been performed', this was qualified to include any relationship with a woman which involved cohabitation.

Selected background variables

In order to study the contemporary patterns of marriage, it is important to find out what changes, if any, have occurred and if these changes are confined to or predominate in any particular subgroups of the population, and whether there are any particular features of these subgroups which tend to promote or facilitate these changes. For the purposes of this study seven particular background variables have been selected for critical examination. These are region of residence, urban–rural locality of residence, religion, ethnicity, education, occupation and place of work.

Region of residence

As the largest political or administrative unit in the country, the region constitutes a basic unit for the analysis of any social or economic trends. The number of regions has increased over the years with the periodic sub-division of larger units into smaller ones. The rationale for the choice of administrative boundaries, even in colonial times, was based to some extent on the grounds of ecological and ethnic homogeneity. The passage of time has reduced but not eliminated these similarities, and the regions still constitute a major source of differentiation for many characteristics of the population, such as level of urbanization, ethnic predominance, economic resource potential and ecological structure. It is therefore important to examine if there are any regional variations in nuptiality patterns.

Type of place of residence

Another basic unit of differentiation is the locality of residence. The modern town or urban area is in many ways very different from the pre-colonial town and its population tends to be more heterogeneous with respect to characteristics such as ethnicity, education, occupation, etc. This heterogeneity also results in, or is sometimes accompanied by, the acquisition of beliefs, attitudes and behaviour patterns which in some respects differ fundamentally from those of the rural dwellers. The extent of these differences may depend on a number of factors, such as the recency of urbanization, the degree of rural isolation or interaction with the urban community, the pace of modernization, etc. In general, therefore, analysis by locality of residence is extremely useful in measuring or indicating the degree of change from traditional or 'rural' behaviour to a modern or urban behaviour. In Ghana censuses and surveys, localities with a population of 5000 and over are classified as urban while those with a population under 5000 are considered rural.

Ethnicity

Ethnicity is a very important variable for demographic analysis. A person's beliefs, attitudes and behaviour patterns are acquired through socialization, which in the initial stages is achieved principally through the medium of one's ethnic group, identified and differentiated from other groups by a common language, habitat, social system and cultural practices. As far as the institution of marriage in traditional Ghanaian society is concerned, however, it is perhaps true to say that the similarities among various groups, such as universality of marriage, early marriage, polygamy, kin involvement, emphasis on procreation, etc, were as important, if not more important than the differences.

In the modern era however, the various ethnic groups, for reasons of habitat or historical association with colonizing or missionary agents, have had different degrees of exposure to 'modernizing' influences, and one would therefore expect this to manifest itself in different degrees of attachment to these traditional norms and practices. It would be difficult to predict the pattern of change in any clear consistent way, but in general one would expect minimum change among the ethnic groups located in the northernmost parts of the country, while the maximum change should be expected among those in the southernmost parts of the country. Such changes are not necessarily progressive or linear in any sense from one part of the country to the other, since within each area, several other factors such as the receptivity of the particular culture, location away from the centre of modernizing influences, etc, will affect the degree of change. Because of the continuing existence of social and cultural differences between ethnic groups, it is still

important to consider ethnic differentials in nuptiality, even though ethnicity is strongly associated with region of residence.

Religion

Marriage and childbearing practices can be directly influenced by religious beliefs and practices, and in this sense, religion can be one of the most important background variables. The extent to which religion can exert this influence on demographic behaviour, however, depends on how deeply these beliefs are held or practised. In the Ghanaian context, these are particularly crucial issues, for the clash between cultures – of various kinds – sometimes leads to the uneasy accomodation or acceptance by one system, of patterns of behaviour or beliefs which are basically inconsistent with the tenets of that culture. A good example of this is polygamy or the use of contraception which a practising Catholic would find unacceptable but which many Ghanaian Catholics can live with, without any qualms. Whatever the reasons for this, its ultimate effect is that though in principle one would expect a greater degree of change with respect to various nuptiality indices amongst those with 'new' religions – as opposed to the traditional ones – this may not always be the case, particularly as the religious influences are also interlinked with other variables such as education, or locality of residence.

As has already been explained elsewhere, the religious groups have high regional concentrations and ethnic group affiliation. This is partly related to the way in which the two principal religions, Christianity and Islam, were introduced into the country. Islam was the first religion to be introduced into the country at the beginning of the 15th century but entered the present territory of Ghana from the northern end where it still has a wide following. Christianity, on the other hand, made its first serious penetration into the country from the coastal belt in the 19th century, but both religions have, over the years, had to contend or compete with the Traditional religions of the people with different degrees of success in the areas where they now predominate. The fact that Christianity was associated with colonization, which also ushered in modern trade, education and urbanization, makes it realistic to assume that, as far as changes in nuptiality patterns are concerned, respondents who profess to be Christians will exhibit a greater degree of change than the Muslims and Traditional adherents.

Education

Studies in several developing countries have shown that education is probably the most important socio-economic variable associated with nuptiality and fertility changes. The reasons for this are related not only to the number of years spent in schooling and therefore away from reproduction, but also in the combination of values, beliefs and attitudes towards these events which education engenders. Education is also associated with greater occupational differentiation and social mobility, both of which can affect nuptiality and reproductive behaviour in various ways. It can therefore be hypothesized that education will be associated with a greater degree of change away from traditional behaviour with respect to the basic nuptiality indices examined here.

Outline of the chapter

As the above discussion shows, one focus of this chapter will be on differentials among the socio-economic subgroups. While the modernization type of characteristics (place of residence, education and occupation) are important in identifying trends in nuptiality, other ascribed characteristics (ethnicity, region, religion and type of union) are equally important in the study of marriage, but for different reasons. The collection of a complete history of marriages, and the inclusion of never-married women in the sample, provide a rich dataset for the analysis of nuptiality. As mentioned above, the GFS included consensual relationships as marriages, using a broad definition of 'living together' in the actual questions.

In this chapter we will also address several aspects of nuptiality. Proportions ever married and the mean age of marriage will be looked at from several perspectives, starting from the simple and moving on to the application of life-table analysis and use of the Coale indices. Differentials in the age at marriage are summarized by multiple classification analysis, to take account of the overlap between the background variables. Dissolution of marriages and the rate of remarriage are also analysed here. Finally a brief analysis of the homogeneity of married couples and of the characteristics of the two types of unions (polygamy and monogamy) is presented.

2.2 PROPORTIONS EVER MARRIED

Marriage in traditional African society had two major distinguishing features – universality or near universality, and early marriage. These two major characteristics stemmed directly from the influence, role and interest of the extended kinship group in the marriage process. Data on the proportions ever married in a census or survey are therefore very useful in indicating whether any significant changes have occurred in the universality of marriage within the society.

As table 2.1 shows, marriage in Ghana can still be described as universal or near universal. Among women aged 45–49, only 2 out of 1000 women are unmarried. As expected, the proportion ever married rises steadily from 30.9 per cent for the 15–19 age group to 99.8 per cent for the 45–49 age group. A significant feature is the fact that by age 30, almost all the women (over 99 per cent) are already married.

While the picture for the total country indicates very little change, it is fair to hypothesize that in view of the very rapid social and economic changes taking place in the country, some subgroups or sections within the population may already be exhibiting patterns of marriage which deviate in some essentials from the general pattern. It is therefore important to examine the data on proportions ever married by selected background variables.

Regional variations

Two regions, not surprisingly located at opposite ends of the country, exhibit some contrasting features which are strikingly different from the other regions. In the Greater Accra region, as many as 3.3 per cent of women aged 45–49 are still never married, whereas for all other regions, all the women are married by the time they reach age 45–49.

The proportion married is also significantly lower at each age group for Greater Accra than for most other regions, although there are some notable exceptions. For example, for the age group 15–19, Volta has the lowest proportion of ever married, 21.4 per cent compared to 21.7 per cent for Greater Accra and 21.9 per cent for Eastern region, but for ages 20–29 the proportion married is lower in Greater Accra than for all other regions. At the opposite end of the spectrum are Northern/Upper regions, where for the age group 15–19, the proportion married is 64.3 per cent, which on the average is more than twice the proportion married for all other regions, with the slight exception of Western/Central region. Thus in Northern/Upper region, marriage is not only universal, but appears to occur at very early ages.

Urban–rural variations

Urban–rural differentials in proportions married follow the expected pattern, though the differences are not very pronounced. By age 45–49, all the women in the rural areas have been married while 1 per cent of the females in urban areas are still not married. With the exception of just one age group, 30–34, the proportions married are higher in rural areas than in urban areas, and for the youngest age group, 15–19, about 34.2 per cent of the females in rural areas are married compared to only 24.8 per cent in urban areas, indicating a comparatively earlier age at marriage for rural women.

In spite of these urban–rural differences, however, it is interesting to note that even in the rural areas, there are some females still unmarried by age 40–44, and such unmarried females can in fact be found in all age groups below 45–49. Though these proportions are relatively insignificant, and may possibly reflect sampling errors, they may also, on the other hand, be clear pointers to the incipient changes in marital behaviour in the rural sector of Ghanaian society.

Educational variations

The importance of education as an agent of change or modernization in African societies is very widely recognized. As Duza and Baldwin state: 'even on the basis of partial evidence, one can argue that the transition from massive illiteracy to even elementary literacy represents a much more vital change than is normally recognized. It may well symbolize and activate a whole chain of modernization effects, including non-trivial consequences for female marital postponement' (Duza and Baldwin 1977: 10).

One would therefore expect significant variations in proportions married between the non-educated and the educated. In some respects, the data on proportions married confirms the pattern observed elsewhere, but in view of the small size of the highly educated group in the sample, the significance of the differentials should be treated with some caution.

For all educational categories – including those

Table 2.1 Proportions of women ever married and singulate mean age at marriage (SMAM), by age and background characteristics

Background characteristic	Age							SMAM		Difference in SMAM over last 5 years
	15–19	20–24	25–29	30–34	35–39	40–44	45–49	Current	5 years ago	
All women	.309	.846	.970	.991	.995	.998	.998	19.3	19.0	+0.3
Region										
Greater Accra	.217	.716	.940	1.000	.986	1.000	.967	19.8	19.5	+0.4
Eastern	.219	.777	.957	.982	.991	.981	1.000	20.4	19.9	+0.5
Western/Central	.390	.876	.965	.974	.982	1.000	1.000	19.1	19.2	−0.2
Volta	.214	.912	.979	1.000	1.000	1.000	1.000	19.4	18.8	+0.6
Ashanti/Brong Ahafo	.305	.880	.983	1.000	1.000	1.000	1.000	19.0	18.7	+0.3
Northern/Upper	.643	.890	.998	.987	.984	.990	1.000	17.5	17.7	−0.2
Place of residence										
Urban	.248	.761	.953	.993	.991	.994	.990	20.0	19.6	+0.4
Rural	.342	.894	.981	.991	.991	.995	1.000	18.9	18.6	+0.3
Education										
No schooling	.564	.936	.987	.994	.996	.994	1.000	17.5	17.9	−0.4
1–6 years	.361	.907	.982	.978	.958	1.000	.952	17.6	17.5	+0.1
7–9 years	.186	.872	1.000	1.000	.970	1.000	1.000	19.8	18.8	+1.0
10 years	.221	.798	.975	1.000	1.000	1.000	1.000	20.0	19.8	+0.2
11+ years	.068	.425	.815	.935	1.000	1.000	1.000	23.8	23.0	+0.8
Religion										
Christian	.254	.812	.957	.989	.987	.997	.996	19.9	19.5	+0.4
Muslim	.512	.941	.991	1.000	1.000	1.000	1.000	17.7	17.9	−0.3
Traditional	.487	.904	1.000	.991	.995	.990	1.000	18.0	18.0	0.0
Ethnicity										
Akan	.275	.838	.967	.990	.994	.997	.996	19.5	19.2	+0.3
Mole-Dagbani	.569	.890	.986	.984	.982	.989	1.000	17.8	17.9	−0.1
Ewe	.208	.848	.959	1.000	1.000	1.000	1.000	19.9	19.5	+0.4
Ga-Adangbe	.230	.759	.943	1.000	.967	.973	1.000	20.6	20.1	+0.5
Guan and others	.446	.883	.993	.992	1.000	1.000	1.000	18.4	18.2	+0.2
Occupation										
Professional/clerical	.020	.431	.824	.957	.923	1.000	1.000	24.2	23.3	+0.9
Sales/service	.337	.790	.989	.995	.985	.992	1.000	19.5	19.2	+0.4
Agricultural	.320	.784	.932	.970	.991	.989	1.000	20.0	19.5	+0.5
Production	.220	.772	.911	1.000	.981	1.000	.958	19.4	18.9	+0.5
Not working	.309	.916	.990	.996	.997	.997	1.000	18.9	18.6	+0.3
Place of work										
Family farm	.321	.807	.973	.986	.985	1.000	1.000	19.5	19.1	+0.3
Other farm	.314	.702	.825	.913	1.000	.963	1.000	21.4	20.6	+0.8
At home	.292	.790	.984	1.000	.966	1.000	1.000	19.7	19.2	+0.6
Away from home	.310	.723	.938	.989	.986	.992	.988	20.0	19.8	+0.2
No work	.309	.916	.990	.996	.997	.997	1.000	18.9	18.6	+0.3

with no schooling – no woman is unmarried by age 45–49, except for females with 1–6 years of schooling. For this group, a significant 4.8 per cent are still unmarried by age 45–49, whereas for the higher educational categories, all women are married by ages 45–49. This is obviously a surprising finding, since one would expect a higher proportion of never married to be correlated with a higher level of education. But in other respects, the differences by education follow the expected pattern very closely. For women at ages 15–24 particularly, there is a near perfect inverse relationship between education and proportion married, and the higher the level of education, the lower the proportion ever married. For women aged 15–19, the proportions ever married range from 56.4 per cent for women with no education to only 6.8 per cent for women with 11 or more years of schooling. For women aged 20–24, the proportions range from 93.6 per cent for those with no schooling to 42.5 per cent for those with 11 or more years of education.

Again, it is worth noting that even for those with little or no schooling, some women are reported as having never married by age 35–39, although again these proportions are relatively minimal, the highest being 4.2 per cent for women with 1–6 years of education aged 35–39.

Religion

Though there are some noticeable differences in proportions married between all religious groups, the differences are more pronounced between the Christians on the one hand and the Muslims and Traditionalists on the other. In the former group, a small proportion (0.4 per cent) are still never married by age 45–49 whereas for both Muslims and Traditionalists, no woman is reported as being never married by that age.

Again, for all age groups among Christians, there are significant proportions of women who have never married, while this is the exception rather than the rule for the Muslims and Traditionalists. It is also evident that, particularly for the younger women, aged 15–24, a far higher proportion of Muslims and Traditionalists marry than Christians. For the age group 15–19, the proportion ever married among both the Muslims and the Traditionalists is about twice that of the Christians. Though the difference is not so marked in the 20–24 age group, the proportion among the Christians is again significantly lower than for both Muslims and Traditionalists.

These differences should not however obscure the differentials between Muslims and Traditionalists. In general, proportions ever married are higher at most ages among the Muslims than among those of the Traditionalist faith.

Ethnicity

With the exception of the Akan, all women aged 45–49 among the other ethnic groups are ever married; but even for the Akan, the proportion never married is relatively small (0.3 per cent). A second striking feature of the table is the high proportion ever married among the 15–19 year old Mole-Dagbani (who inhabit the Northern/Upper regions), and to a lesser extent, the Guans, a dispersed group, some of whom also live in the Northern region. The proportions ever married for these two groups (56.9 and 44.6 per cent respectively) contrast sharply with the 20.8, 23.8 and 27.5 per cent ever married for the Ewe, Ga-Adangbe and Akan, respectively, who live in the coastal and middle belt. In fact by age 20–24, 89 per cent of the Mole-Dagbani women have ever married, which is higher than for any other group.

Occupation

Like education, occupation is one of the most important indices of change or modernization in contemporary African society. Among women, however, the significance is not always clear or marked because a considerable proportion of women are still engaged in traditional occupations or petty trading. However, the data on proportions married by occupational categories can still be useful in indicating possible future trends. It may be noted that occupation refers to the occupation before first marriage for ever-married women and the current occupation for never-married women.

It is significant that the proportion married is very different for the professional/clerical group compared to other groups. In the 15–19 age group, only 2 per cent of the professional/clerical women are ever married compared to a range of 22–34 per cent for other occupational groups. For the 20–24 age group less than half (43.1 per cent) of the professional/clerical females are ever married compared to over 75 per cent for all other occupational groups.

Respondent's place of work

The variation in proportion married by respondent's place of work is less marked than for occupation. Only women who work away from home have a small percentage never married by

age 45–49. Women who do not work have higher proportions of ever married at most age groups compared to other categories.

2.3 AGE AT MARRIAGE

The second major feature of African marriage is early marriage, which for females usually occurs soon after puberty. Current variations in the age at marriage are therefore important indicators of the extent to which various subgroups within the population have been differentially affected by modernization.

A simple way of measuring the age of marriage is the use of Hajnal's singulate mean age at marriage (SMAM) which measures the mean number of years spent in the single state among women ultimately marrying. It is calculated using current proportions ever married in each age cohort, and changes can be quantified by using the individual interviews to find the proportions of women single and ever married 5 years prior to the survey, to obtain an estimate of recent trends in the age at marriage.

As the results in table 2.1 show, the SMAM for the total sample is 19.3 years. Compared to 16.3 years for Bangladesh and 17.1 for Pakistan, this seems fairly high (Smith 1980: 2), but comparable to the level in many developing countries. It seems also that the SMAM has been slowly rising, and there is a gain of 0.3 years over the past 5 years. It will therefore be useful to examine differences in SMAM by selected socio-economic variables in order to describe differentials in levels and trends.

As table 2.1 shows, only the Eastern region has a SMAM of over 20 years (20.4), while only the Northern/Upper region has a SMAM of under 18 (17.5 years). The Greater Accra region with a SMAM of 19.8 years follows closely that of the Eastern region, while the Ashanti/Brong Ahafo region conversely has the lowest SMAM next to the Northern/Upper region. Thus, in a very generalized way, the north–south dichotomy which was evident earlier seems to be replicated here. In all regions, the SMAM has increased over the last 5 years, with the exception of the Western/Central and Northern/Upper regions, where there is a small decline of 0.2 years over the last 5 years.

The SMAM of 20.0 years in urban areas is greater than that of rural areas by 1.1 years, a fairly significant difference which confirms the earlier hypothesis of urban areas as the focus of change or modernization. In both urban and rural areas, however, the SMAM has been rising, with the rate of increase in the last 5 years only marginally higher in urban areas than in rural areas.

The importance of education as an instrument of social change is again demonstrated by the data. There is a clear positive relationship between educational attainment and the age at marriage, such that the higher the level of education, the higher the age at marriage. The SMAM ranges from a high of 23.8 years for females with 11 or more years of education to 17.5 years for those with no schooling. There does not seem to be any significant difference between those with 1–6 years of schooling and those with no schooling. Both have significantly low levels of 17.5 and 17.6 years which contrast very sharply with the 19.8, 20.0 and 23.8 years for the higher categories of educational attainment. The change in the SMAM is particularly dramatic for those with 7–9 years and 11 or more years of schooling. The increase in the SMAM is as much as 1.0 and 0.8 years, respectively, for these categories. There is a decline of 0.4 years in the SMAM of those with no schooling (17.9–17.5 years); it is not clear, however, whether this reflects a real decline or whether it is the result of some error in the data.

The SMAM for Christians is markedly higher – by about 1.9 years – than those of both Muslims and Traditional adherents, between whom there is very little difference. Though this could conceivably be partly the effect of education, there is no doubt that the pronounced difference mainly reflects the differential impact of urbanization and modernization on the different religious groups. There does not seem to have been any change in the SMAM over the last 5 years for those of the Traditional faith; there is a slight decline of 0.3 years for the Muslims, while for the Christians there is an increase of 0.4 years.

Variation in the SMAM according to ethnic group ranges from a high of 20.6 years for the Ga-Adangbe to 17.8 years for the Mole-Dagbani, with the Akans and the Ewes forming a middle-level group with SMAMs of 19.9 and 19.5 years respectively. Again, as was seen in the previous section, the level for the Guans (18.4 years) is closer to that of the Mole-Dagbani than to any other group. Moderate increases in the level of the SMAM for the past 5 years are shown for all ethnic groups except the Mole-Dagbani, for whom there is a small decline. The levels and changes for

Table 2.2 Ages by which 10, 25, 50 and 75 per cent of women marry, by current age, all women

Percentage married	Current age						
	15–19	20–24	25–29	30–34	35–39	40–44	45–49
10	15.5	15.1	14.9	14.4	14.5	14.9	15.1
25	16.9	16.4	16.3	16.1	15.9	16.2	16.3
50	18.6	18.2	18.3	18.0	17.9	18.2	18.3
75	–	20.3	20.7	20.6	20.4	20.9	20.5

the various ethnic groups are consistent with our generalized broad typology of a southern–northern dichotomy but with blurred edges, particularly in the middle zone. A rise in SMAM of half a year is noticed over the last 5 years among Ewe and Ga-Adangbe.

Occupational differences are very pronounced at the two ends of the occupational hierarchy, ranging as expected, from a very high level of 24.2 years for the professional/clerical group to 18.9 for those who are not working. Between these two extremes, however, there are no marked differences between those in sales/services, agriculture and production. The comparatively older age at marriage for women engaged in agriculture is rather surprising and difficult to explain if one assumes that this group is expected to contain a disproportionately large number of rural, illiterate and self-employed farm workers. All occupational categories appear to have attained moderate increases in SMAM over the last 5 years, with the highest increase (of 11 months) being reported for the professional/clerical group, and the lowest increase (of 4 months) for those not working.

2.4 LIFE-TABLE ANALYSIS OF AGE AT MARRIAGE

The analysis so far has been based upon the data on proportions ever married and estimates of SMAM using Hajnal's technique. A basic assumption underlying Hajnal's technique is that the age at marriage has been stable over the recent period. This assumption seems to hold in general. However, the available information permits one to investigate age at marriage for different birth cohorts of women as defined by their ages at the time of the survey. The life-table technique is particularly useful when observations are censored by a cross-sectional survey. This analysis looks at how women of a cohort marry from the earliest age to the age at the time of the survey. Thus the period of exposure of all women, including women never married at the time of the survey, is taken into account.

The life tables are constructed from data on the current age and age at marriage of all ever-married women and current ages of women still single.[1] Five-year age groups are used for the overall sample, whereas tables for subgroups are calculated for 10-year cohorts because of sample-size considerations. For the sake of brevity the results are shown on ages at which 10, 25, 50 and 75 per cent of women of a cohort marry. The age by which 50 per cent of a group have married is the median age at marriage of a cohort of women.

Focusing first upon the cohort changes in marriage patterns, one finds a fairly stable pattern across different cohorts of women (table 2.2). Median age at marriage seems to have changed very little, except among women aged 15–19 at survey (figure 2.1). Likewise, no change in the pace of marriage seems to have occurred as the dispersion of ages is similar from one age cohort to another.

Younger women (aged 20–29) both in urban and rural areas marry, on average, later than their

[1] The life-table methodology is described by Smith (1980). The marriage probability or the proportion married for the youngest age (say age 10), ${}_{10}q_0$, is found as the proportion marrying up to exact age 10.0 among all women 10 and over at interview. For the next interval – marriage from age 10.0 to age 11.0 – women married by age 10 are excluded, together with any women less than 11 at interview. The marriage rate between age 10 and 11, ${}_{1}q_{10}$, is then found as the proportion marrying in this interval among women aged 11 and over who had not married before exact age 10.0. The cumulative proportion married by age 11.0 will be ${}_{10}q_0 + (1 - {}_{10}q_0) \cdot {}_{1}q_{10}$, which is the sum of the chances of marrying by age 10.0, plus the chances of marrying between 10.0 and 11.0 for women not married by age 10. Rates for later ages are found in the same way and the expression for the cumulative proportion can be described as

$$1 - (1 - {}_{10}q_0) \prod_{i=10}^{x-1} (1 - {}_{1}q_i) \qquad \text{(Smith, 1980)}$$

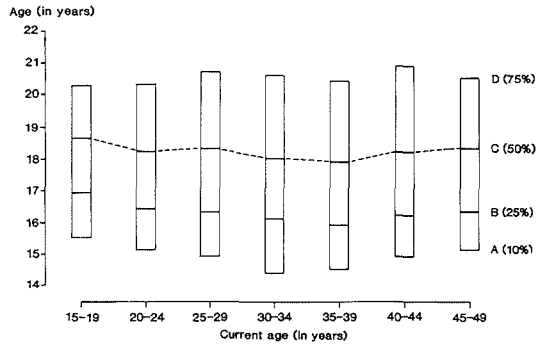

Figure 2.1 Ages by which 10, 25, 50 and 75 per cent of women marry, by current age, all women

predecessor cohort of women aged 30–39 at survey. Interestingly this cohort, aged 30–39, married earlier than women aged 40–49 (figure 2.2, I). This U-shaped pattern of a decline from the oldest age group, then a rise from the 30–39 to the youngest age groups, has been found in many countries, and is probably an indicator of problems with the quality of dates reported by the oldest age group (Goldman *et al* 1985). Typically, the 40+ age group reports too high an age at first marriage, either because of rounding to an age which is the norm, or because of omission of any periods spent living together before the marriage was recognized by customary or legal rites.

The average age at marriage among highly educated women with 10 or more years of schooling has been declining from the older to the younger cohort (figure 2.2, II). The same also applies to women with no schooling. The cohort differences in other subgroups are trivial. Women aged 20–29 of Ga-Adangbe origin and the same age group of women whose occupation was in production are two exceptions (table 2.3). The median age at marriage among Ga-Adangbe women aged 20–29 was a year later than women aged 30–39 in the same ethnic group. Likewise, women who worked in production and were aged 20–29 married 1.1 year later than women aged 30–39 in the same group. In most of the other subgroups no substantial change in age at marriage is noticed among the age cohorts.

The socio-economic differentials in age at marriage noted earlier are maintained in this analysis, using the life table approach. However, in addition to replication of the overall subgroup differences observed in SMAMs, it was found that the same subgroup differences also existed within the 10-year age groups. For example, women in urban areas marry a year later, approximately, irrespective of the age group, though the

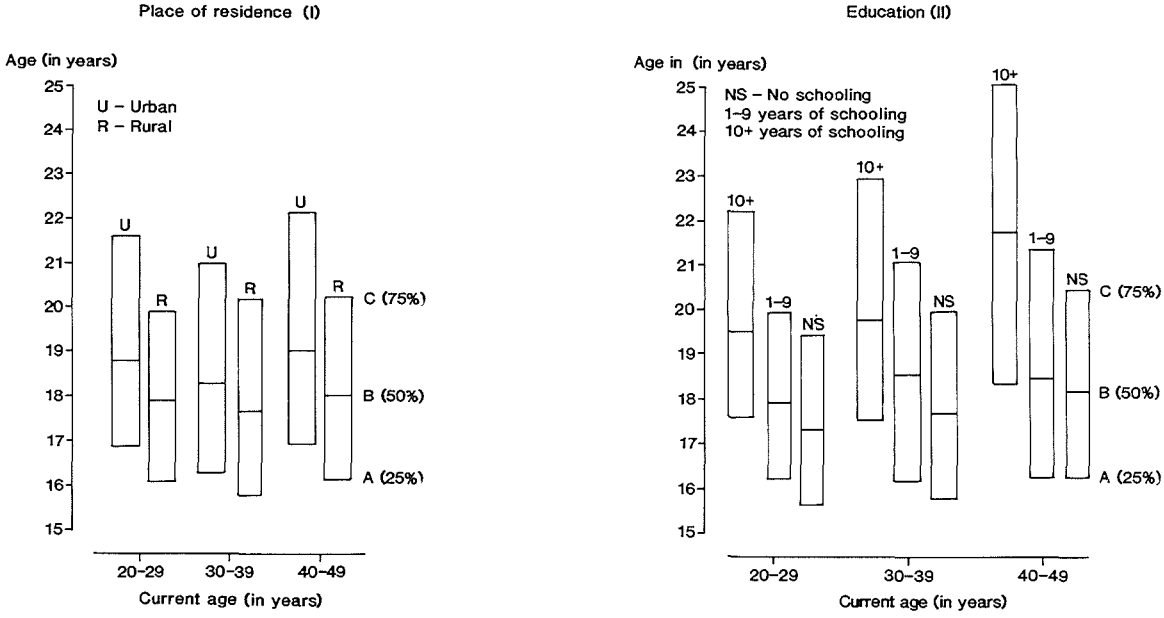

Figure 2.2 Ages by which 25, 50 and 75 per cent of women marry, by current age and place of residence (I) and education (II), all women

Table 2.3 Ages by which 25, 50 and 75 per cent of women marry, by current age and background characteristics, all women

Background characteristics	All ages (15–49)			20–29			30–39			40–49		
	25%	50%	75%	25%	50%	75%	25%	50%	75%	25%	50%	75%
Region												
Western/Central	16.2	18.1	20.7	16.1	17.9	20.2	16.0	17.9	21.0	16.2	18.3	21.0
Greater Accra	17.2	19.3	22.4	17.5	19.5	22.3	16.5	18.6	22.2	17.5	20.0	22.8
Eastern	16.8	18.9	21.4	16.9	19.0	21.8	16.3	18.4	20.9	16.3	18.6	20.7
Volta	16.6	18.5	20.7	16.6	18.3	20.1	16.2	18.1	20.5	16.4	18.5	21.6
Ashanti/Brong Ahafo	16.2	18.1	20.4	16.3	18.0	20.1	15.8	18.0	20.4	16.2	17.9	20.4
Northern/Upper	15.7	17.3	19.1	15.5	17.1	19.0	15.6	17.3	18.8	16.1	17.7	19.6
Place of residence												
Urban	16.8	18.8	21.6	16.9	18.8	21.6	16.3	18.3	21.0	16.9	19.0	22.1
Rural	16.2	17.9	20.1	16.1	17.9	19.9	15.8	17.7	20.2	16.1	18.0	20.2
Education												
No schooling	15.9	17.6	19.8	15.6	17.3	19.4	15.7	17.6	19.9	16.2	18.1	20.4
1–9 years	16.4	18.2	20.4	16.2	17.9	19.9	16.1	18.5	21.0	16.2	18.4	21.3
10 + years	17.7	19.7	22.7	17.6	19.5	22.2	17.5	19.7	22.9	18.3	21.7	25.0
Religion												
Christian	16.6	18.6	21.1	16.7	18.6	21.1	16.0	18.3	20.9	16.3	18.5	20.9
Muslim	16.1	17.7	19.8	15.8	17.6	19.6	16.1	17.6	19.7	16.5	18.4	21.2
Traditional and others	15.9	17.7	19.7	15.8	17.6	19.3	15.9	17.6	19.9	16.2	17.8	20.1
Ethnicity												
Akan	16.4	18.3	20.8	16.4	18.3	20.7	15.8	18.1	20.7	16.2	18.0	20.4
Mole-Dagbani	15.9	17.4	19.2	15.7	17.2	19.0	15.7	17.3	18.8	16.1	17.8	20.3
Ewe	17.0	18.9	21.4	17.0	18.8	21.1	16.5	18.5	21.1	16.7	19.0	22.2
Ga-Adangbe	16.8	18.9	21.8	17.2	19.3	22.0	16.2	18.3	21.4	17.0	18.9	21.6
Guan and others	16.1	17.9	20.1	16.0	17.7	19.8	16.1	17.9	20.4	16.4	18.3	20.5
Occupation												
No work	16.2	17.9	19.9	16.1	17.8	19.7	15.8	17.7	19.9	16.2	18.0	20.2
Agricultural	16.4	18.3	20.9	16.5	18.5	20.8	16.0	18.0	20.6	16.3	18.1	20.8
Sales/services	16.5	18.5	21.2	16.7	18.5	21.0	16.2	18.3	21.0	16.3	18.4	21.3
Production	16.8	19.2	21.3	17.5	19.6	21.7	16.2	18.5	21.1	16.4	18.6	20.6
Professional	20.0	23.1	26.5	20.1	22.9	26.1	19.5	22.8	26.5	20.3	24.0	27.8

difference is slightly less (7 months) among women aged 30–39.

2.5 COALE'S INDEX OF MARRIAGE PATTERN

The measures discussed so far are based on the direct proportions married or are summary indices of the schedule of percentages single or ever married. Another set of nuptiality indices, developed by Coale, and using the percentages and absolute number of currently married women, are also very useful. Coale's index (Coale 1969) of the pattern of marriage (I_m) is defined as

$$I_m = \frac{\Sigma_i m_i F_i}{\Sigma_i w_i F_i}$$

where w_i and m_i are numbers of women and numbers of currently married women, respectively, in 5-year age groups, i, from 15–19 to 45–49, and where the F_i are a standard set of natural marital fertility rates. The I_m index can, theoretically, range from zero (no one is currently

Table 2.4 Summary of I_{em} and I_m indices for Ghana, by background variables

Background variables	I_{em} (1)	I_m (2)	Absolute difference (1)–(2) (3)	Relative difference (1)–(2)/(2) (4)
All women	.873	.791	.082	.104
Region				
Greater Accra	.825	.773	.052	.067
Eastern	.841	.768	.073	.095
Western/Central	.884	.750	.134	.179
Volta	.881	.797	.084	.105
Ashanti/Brong Ahafo	.886	.782	.104	.133
Northern/Upper	.925	.905	.020	.022
Place of residence				
Urban	.843	.762	.081	.106
Rural	.890	.807	.083	.103
Education				
No schooling	.927	.860	.067	.078
1–6 years	.887	.772	.115	.149
7–9 years	.869	.762	.107	.140
10 years	.856	.749	.107	.143
11+ years	.703	.678	.025	.037
Religion				
Christian	.855	.755	.100	.132
Muslim	.926	.882	.044	.050
Traditional	.914	.856	.058	.068
Tribe				
Akan	.867	.756	.111	.147
Mole-Dagbani	.915	.898	.017	.019
Ewe	.862	.804	.058	.072
Ga-Adangbe	.834	.751	.083	.111
Guan and others	.904	.843	.061	.072
Occupation				
Not working	.895	.804	.091	.113
Professional/clerical	.708	.674	.034	.050
Sales/service	.867	.794	.073	.092
Agricultural	.849	.768	.081	.105
Production	.833	.770	.063	.082
Place of work				
Family farm	.865	.812	.053	.065
Other farm	.797	.685	.112	.164
At home	.860	.803	.057	.071
Away from home	.838	.784	.054	.069
No work	.895	.804	.091	.113

married at 15—49) to one (everyone is currently married). This nuptiality index has the advantage, unlike SMAM, of reflecting the fertility impact of loss of marital exposure, since exposure in the most fertile ages is more heavily weighted. For example an I_{em} index of .800 can be interpreted to be a reduction of 20 percentage points in the possible maximal levels of fertility.

Another variant or more refined measure (I_{em}) has been introduced by Smith (1978), based on the proportion of women ever married (rather than currently married). The difference between I_{em} and I_m thus indicates the effect of marital dissolution on fertility. As in the case of SMAM, the proportions currently married (or ever married) for computing the I_m and I_{em} are derived from the cross-sectional data of a census or survey, and are thus assumed to represent a synthetic cohort.

Table 2.4 shows the I_{em} and I_m indices, as well as the differences between them, by various background variables. At the national level, the I_{em} index of .873 indicates a reduction from the maximal effect of marriage on fertility, of 13 per cent, and a further reduction of 8 percentage points is due to dissolution of marriages as the index of currently married women (I_m) is .791. Therefore, because of loss of exposure between the ages of 15—49, fertility is about 80 per cent of what it could have been.

Subgroups vary in the relative effect of non-marriage and dissolution on fertility. As may be expected, the pattern of differentials in the I_{em} among subgroups follows the pattern of differences in age at marriage described earlier. Greater Accra and Eastern regions have the largest effect of non-marriage (I_{em} indices of .825 and .841) while Northern/Upper region has the smallest effect (I_{em} of .925). Groups with the largest effects of delayed marriage are women with 11 or more years schooling and those who work in professional or clerical jobs, in both cases with I_{em} indices of about .700. Groups with the earliest ages at marriage (Northern/Upper, No Schooling, Muslim and Traditional and the Mole-Dagbani) typically have the highest indices (about .9 or slightly higher). However, there is not a one-to-one correspondence between these two measures because of the additional weighting factor.

The additional effect of marriage dissolution, reflected in the difference between the I_{em} and I_m (column 3 of table 2.4), does not always follow the pattern of differentials in I_{em}. For example, some groups which show a strong effect of delayed marriage have low dissolution effects (Greater Accra, women with 11+ years schooling and professional/clerical workers), but in a few cases the two factors reinforce each other, eg Northern/Upper region, women with no schooling, Muslim and Traditional believers, and the Mole-Dagbani have low effect of both delayed marriage and dissolution, which is reflected in their I_m indices of .86—.90. By comparison, the national I_m index is .79, and most other subgroups have I_m indices of less than .80.

2.6 MULTIPLE CLASSIFICATION ANALYSIS (MCA) OF AGE AT MARRIAGE

The analysis in sections 2.2—2.5 showed that there are major differences between certain subgroups of the population with respect to the age at marriage, but a bivariate analysis does not determine the extent to which these differences are directly related or associated with the particular variables concerned, and the extent to which they are the effects of other intervening variables. For example, if there is a predominance of the young population in the urban areas and the old in the rural areas, differences in age at marriage between urban and rural populations could simply be the effect of differences in the age structure of the two populations.

A useful technique for testing for such effects is the use of Multiple Classification Analysis (MCA) which makes it possible to estimate the net effect of each variable when variations in the other selected factors are controlled for.

Table 2.5 shows the results of both the gross and net effects of various selected variables on the age at marriage, of ever-married females. The coefficients in column 1 are expressed as deviations from the overall mean age at marriage (17.7 years) for all ever-married females while the coefficients in columns 2—5 represent the effect of being in that particular category net of all the other selected variables. The beta coefficients given in parentheses in columns 2—5 are equivalent to standardized partial regression coefficients, whereas the eta coefficients in column 1 are equivalent to a simple beta from the bivariate linear regression of the dependent variable on the factors. The last row represents the proportional increment in the explained variation as each

Table 2.5 Multiple Classification Analysis (MCA) of the age at marriage: deviations from the overall mean of 17.7 years

Variable and category	N	Unadjusted deviation (1)	Adjusted deviations from overall mean (2)	(3)	(4)	(5)
Ethnicity						
Akan	2571	.02	.03	−.07	−.23	−.21
Mole-Dagbani	726	−.76	−.77	−.23	.02	.04
Ewe	582	.67	.63	.55	.69	.63
Ga-Adangbe	353	.71	.69	.09	.05	−.04
Guan and others	693	−.21	−.17	−.01	.22	.22
		(.13)	(.12)	(.06)	(.09)	(.08)
Region						
Western/Central	767	.09		.10	.32	.25
Greater Accra	547	.94		.90	.30	.16
Eastern	760	.41		.33	.41	.44
Volta	478	.25		−.17	−.33	−.32
Ashanti/Brong Ahafo	1536	−.19		−.08	−.04	.01
Northern/Upper	837	−.86		−.73	−.59	−.57
		(.16)		(.14)	(.10)	(.10)
Education						
No schooling	2950	−.26			−.43	−.39
1–6 years	527	−.16			−.11	−.11
7–9 years	449	−.43			−.07	−.03
10 years	842	.60			.96	.91
11+ years	157	3.52			3.51	2.98
		(.22)			(.24)	(.22)
Occupation						
No work	2946	−.30				−.21
Professional/clerical	125	3.76				1.66
Sales and services	928	.25				.25
Agricultural	648	.08				.14
Production	278	.49				.29
		(.20)				(.10)
R^2			.050	.061	.111	.120
Partial R^2 (due to variable added in the model)			—	.012	.053	.010

N = Number of women.
Figures in parentheses are eta (col 1) or beta coefficients (cols 2–5).

variable is added in the model, expressed as a proportion of the variation unexplained by the preceding model.

As can be seen from the R^2 figures in table 2.5, the age of women and ethnicity explain 5 per cent of the variance. This increases by a statistically significant amount for each of the other selected variables, namely region of residence, education and occupation, to a statistically significant R^2 of 12.0 per cent in the last column.

Table 2.5 shows quite clearly the very strong influence of education as an explanatory variable. The beta coefficient of (.22), observed after all other factors are controlled, is the highest. To a great extent, educational subgroups have much the same age at marriage before adjustment and

after adjustment for all other factors, which argues that the effect of education is largely independent of ethnicity, region of residence, occupation and age. Moreover, the proportionate reduction in the unexplained variance attributed to education (5.3 per cent) is the greatest. The systematically increasing effect of education on age at marriage is also shown by the range in the coefficients of deviation in column 5; women with 11 or more years of education marry 3.4 years later than women with no schooling. The biggest increase is at the highest levels of education, where women with 11 or more years of schooling marry 2 years later than women with 10 years of schooling, controlling for the variables included in the model.

Occupational differences are also particularly substantial for certain categories. Women whose occupation before marriage was classified as 'professional' or 'clerical' marry latest while those 'not working' marry earliest. Although occupation differentials are substantially reduced when all other factors are controlled (seen in the drop in eta coefficient from .20 to .10), the professional/clerical group continued to have a mean age 1.7 years above the average.

Differentials according to region of residence are also affected by the adjustment for other factors, especially in the cases of Greater Accra and Northern/Upper where it seems that the age at marriage of women in these regions is more directly attributable to their educational level, ethnicity or occupational status before marriage than to the region of residence *per se*. However, after controlling for ethnicity, education and occupation, women in Northern/Upper region still marry earliest, although it is the Eastern region that has the highest age at marriage, overtaking Greater Accra, as the coefficients in the last column show.

Because of the confounding effects between region and ethnicity – in view of the fact that some major ethnic groups are predominant in particular regions – the strength of the relationship between ethnicity and age at marriage is reduced from .12 to .06. When the adjusted differences are examined, the Ewe seem to marry more than half a year later, on average, irrespective of their region of residence or other background characteristics, such as education or occupation before marriage. As the data show, the coefficients of the Ewe remain almost constant, implying that for this group only the pronounced effect of ethnicity is independent of other characteristics.

On the other hand, early age at marriage among Mole-Dagbani and a late age among Ga-Adangbe are largely due to the intervening effects of their other background characteristics. In column 1 the difference in age at marriage between these two groups is of the order of 1.5 years. However, this reduces to only a month when adjusted for the effects of other background variables.

This analysis for age at marriage was repeated, including the period of marriage as a fifth background characteristic (table 2.6). It was thought necessary to separate out period differences because of the possible effects that changes in certain background variables over the years (such as increasing education, or changing occupational composition), could have on the age at marriage. For example, with the rapid expansion in educational facilities over the past 20 years or so, it is conceivable that the effects of education *per se* on the age at marriage would have changed over time.

The results of the MCA using the period approach (table 2.6) show that the final R^2 (.101) is slightly less than the final R^2 in table 2.5, and this is because table 2.5 included the main determinant, current age, whereas table 2.6 included only the background variables together with the period of marriage.

Education is still the strongest factor influencing age at marriage; the partial R^2 due to education (.035) is the highest compared to other variables. It is interesting to note, however, that the adjustment of the period effects substantially changes the age at marriage pattern by education. Women with 1–6 and 7–9 years of schooling marry earlier than women with no education. One possible explanation for this may be pregnancy leading both to earlier marriage and discontinuation of schooling in more recent periods. Those with 11 or more years of education still marry the latest.

The significance of the period effects can also be seen in the steady increase in the mean age at marriage from 16.8 years for women married before 1960 to 18.33 years for women married after 1975, a pattern of differences that remains virtually unchanged after adjustment for all other factors. The net effect of the period of marriage remains fairly significant throughout, as the beta

Table 2.6 MCA for age at marriage using period of marriage and other variables: deviations from the overall mean of 17.7 years

Variable and category	N	Unadjusted deviation from overall mean (1)	Adjusted deviations from overall mean (2)	(3)	(4)	(5)
Period of first marriage						
Before 1960	1241	−.90	−.90	−.87	−.86	−.89
1960–64	720	−.09	−.05	−.06	−.06	−.07
1965–69	842	.19	.19	.19	.19	.18
1970–74	1098	.34	.32	.32	.32	.34
1975+	1024	.63	.62	.61	.58	.61
		(.17)	(.17)	(.16)	(.16)	(.17)
Ethnicity						
Akan	2571	.02	.02	−.04	−.08	−.06
Mole-Dagbani	726	−.76	−.71	−.30	−.27	−.22
Ewe	582	.67	.68	.57	.66	.59
Ga-Adangbe	353	.71	.70	.17	.16	.04
Guan and others	693	−.21	−.24	−.12	−.06	−.07
		(.13)	(.12)	(.07)	(.08)	(.07)
Region						
Western/Central	767	.69		.13	.22	.13
Greater Accra	547	.94		.73	.37	.20
Eastern	760	.41		.38	.49	.54
Volta	478	.25		−.10	−.08	−.08
Ashanti/Brong Ahafo	1536	−.19		−.18	−.13	−.06
Northern/Upper	837	−.86		−.55	−.60	−.58
		(.16)		(.12)	(.11)	(.10)
Education						
No schooling	2950	−.26			−.01	.04
1–6 years	527	−.16			−.43	−.43
7–9 years	449	−.43			−.84	−.77
10 years	842	.60			.17	.10
11+ years	157	3.52			3.05	2.33
		(.22)			(.19)	(.15)
Occupation						
No work	2946	−.30				−.27
Professional/clerical	125	3.76				2.19
Sales and services	928	.25				.26
Agricultural	648	.08				.19
Production	278	.49				.51
		(.20)				(.13)
Multiple R^2			.044	.053	.086	.101
Partial R^2 (due to variable added in the model)			.015	.009	.035	.016

N = Number of women.

Figures in parentheses are eta (column 1) or beta coefficients (columns 2–5).

coefficients remain almost constant. Education remains the most important factor, after period of marriage.

The adjustment by period effects does not significantly affect the patterns already discussed in table 2.5 with respect to the other background characteristics, namely ethnicity, region of residence and occupation, although a few minor changes are evident.

The MCA was also run using religion, husband's education, polygamy and urban–rural residence as alternative background variables, but these did not appear to be significant once the period of marriage is controlled for.

In summary, this multiple classification analysis enables us to evaluate the independent effect of background factors. It shows that much of the effect of ethnicity, region and occupation is due to compositional differences either in these factors themselves, or in educational attainment. In contrast the two determinants with the largest independent effects are education and period of the marriage. Interestingly, the effect of education interacts with period of marriage, so that educational differentials are somewhat reduced once period is taken into account.

2.7 MARITAL DISSOLUTION AND REMARRIAGE

In addition to the effect of age at marriage on fertility, patterns of dissolution and remarriage can further influence the level of fertility through its effect on sexual exposure. This is true even where some childbearing occurs outside of marriage, because this is usually only a fraction of total fertility. Moreover, in the case of the Ghana survey, where consensual ('living together') unions were recognized and recorded, fertility outside of union would be quite low, and measurement of dissolution and remarriage is even more relevant.

This section will address several interesting questions. The extent of marital dissolution in Ghana will be described. The patterns in the level of dissolutions by the age at marriage, and by the length of the period since first marriage, will also be examined. An important question, in regard to the effect on fertility, is whether dissolution is greater early in marriage (during the peak reproductive years), rather than at later durations. This point will also be examined in terms of the average amount of time spent in different marital states, at different ages. The data will also be analysed with the aim of extracting any results on trends in dissolution and remarriage. All of these issues will be analysed for the main socio-economic subgroups, since differentials in levels and trends are especially important.

Current marital status

The distribution of women by marital status at the time of the survey gives a brief overview of the level of dissolution in Ghana. Two other West African countries, Ivory Coast and Senegal, have about the same proportion of first marriages among ever-married women aged 15–49 dissolved as in Ghana, 25–30 per cent, while others have a somewhat lower level of 15–20 per cent dissolutions (Benin, Cameroon and Nigeria) (table 2.7).

A more detailed view of current marital status

Table 2.7 Proportion of first marriages undissolved at time of survey in Ghana and selected African countries

Country	Year of survey	Percentage of first marriages	
		Undissolved at survey	Dissolved
Ghana	1979–80	72	28
Benin	1981–82	80	20
Cameroon	1978	80	20
Ivory Coast	1980–81	74	26
Morocco	1980	77	23
Tunisia	1978	93	7
Kenya	1977–78	84	16
Lesotho	1977	85	15
Senegal	1978	71	29
Nigeria	1981–82	85	15

is shown in table 2.8 for the whole country and for the main subgroups, averaged across all women aged 15–49. Differences in the percentage single across subgroups reflects the same patterns discussed earlier in this chapter with regard to the age at marriage and proportions ever married. The last two columns show the percentage of first unions which are still continuing, and conversely, the percentage of first unions dissolved.

Regional, religious and ethnic differentials are

Table 2.8 Percentage distribution of women aged 15–49, by current marital status, and by dissolution status of first marriages, by background characteristics (based on all women, except where otherwise indicated)

Subgroup	Total all statuses	Current marital status						
		Single	In first union	In later union	Separated or divorced	Widowed	First marriages	
							Undissolved	Dissolved
All women	100.0	19.3	58.3	14.1	6.8	1.5	72.2	27.8
Region								
Western/Central	100.0	15.9	49.9	20.6	11.2	2.4	59.3	40.7
Ashanti/Brong Ahafo	100.0	21.4	58.2	10.3	8.7	1.4	74.0	26.0
Eastern	100.0	24.7	53.0	15.1	5.5	1.6	70.4	29.6
Greater Accra	100.0	24.7	54.7	15.1	4.5	1.0	72.6	27.4
Volta	100.0	20.2	51.3	20.2	6.8	1.5	64.3	35.7
Northern/Upper	100.0	7.3	80.7	9.6	1.1	1.3	87.1	12.9
Place of residence								
Rural	100.0	17.1	60.1	14.3	6.9	1.6	72.5	27.5
Urban	100.0	23.6	54.8	13.7	6.5	1.4	71.7	28.3
Education								
No schooling	100.0	6.3	68.8	16.5	6.4	2.2	73.4	26.6
1–9 years	100.0	32.1	44.3	14.5	8.0	1.1	65.2	34.8
10+ years	100.0	34.1	50.3	8.7	6.3	0.6	76.3	23.7
Ethnicity								
Akan	100.0	22.1	52.1	15.0	9.3	1.6	66.8	33.2
Mole-Dagbani	100.0	9.5	79.5	9.2	0.7	1.1	87.8	12.2
Ewe	100.0	21.9	55.2	17.0	4.7	1.2	70.7	29.3
Ga-Adangbe	100.0	23.0	50.9	18.0	6.3	1.7	66.1	33.9
Guan and others	100.0	13.5	70.0	10.3	4.5	1.7	80.9	19.1
Religion								
Christian	100.0	24.7	51.0	14.8	8.1	1.4	67.7	32.3
Muslim	100.0	10.5	74.2	10.8	3.3	1.2	82.9	17.1
Traditional	100.0	8.7	71.1	13.6	4.5	2.0	77.9	22.1
Occupation[a]								
Not Working	100.0	0.0	75.6	13.7	8.8	2.0	75.6	24.4
Agricultural	100.0	0.0	66.3	23.0	8.9	1.8	66.3	33.7
Professional/skilled	100.0	0.0	71.9	20.2	6.2	1.7	71.9	28.1
Sales and services	100.0	0.0	66.4	24.4	7.4	1.7	66.4	33.6
Type of marriage[b]								
Monogamous	100.0	0.0	83.3	16.7	0.0	0.0	83.3	16.7
Polygamous	100.0	0.0	75.2	24.8	0.0	0.0	75.2	24.8

[a]Based on ever-married women only, since occupation before the first marriage is used.
[b]Based on currently married women only.

quite large, following the expected pattern of lower dissolution among the Northern/Upper region, the Muslim and Traditional subgroups and the Mole-Dagbani. Differentials exist for other socio-economic subgroups (education, place of residence and occupation) but these are comparatively less substantial. It would be interesting to see whether these overall subgroup differences in dissolution are reinforced by further differences in the patterns of dissolution and remarriage.

The probability of voluntary marital dissolution

Life-table techniques can be usefully applied to the study of nuptiality (as shown in section 2.4). In the case of marital dissolution also, this technique will yield incremental and cumulative probabilities for the various durations since the start of marriage (Smith 1980), and in the case of remarriage, incremental and cumulative remarriage rates for duration since first dissolution can be found. Rates are calculated by using denominators that consist of women exposed to the risk in question for the whole of the interval, and numerators that consist of the number experiencing the event in question.

Life-table dissolution rates by marriage duration for the first and second quinquennia ($_5q_0$ and $_5q_5$) and the second decade ($_{10}q_{10}$) of marriage are shown in table 2.9. The dissolution rates shown are for marriages dissolved by separation and divorce only (voluntary dissolutions), and exclude those dissolved through widowhood (involuntary).

For the total country, the probability of dissolution within the first 5 years of marriage is higher than in subsequent periods, particularly in the second quinquennium. With few exceptions, this is the pattern exhibited by various subgroups, an indication that for most Ghanaians, the risk of marital disruption is highest during the first 5 years of marriage as against all subsequent periods. The probability of voluntary dissolution during the first quinquennium ranges from a low of only 4 per cent in the Northern/Upper region to a high of 19 and 20 per cent in the Western/Central and Volta regions, following the well-established north–south dichotomous nuptiality pattern. Greater Accra and Ashanti/Brong Ahafo have only moderately high rates, while the rate for the Eastern region (17 per cent) is fairly close to that of the Western/Central region.

Between time periods, only the Northern/Upper region shows a slight increase from the first to the second quinquennium; the probability of dissolution remains constant throughout all duration periods in Greater Accra, while it declines in all other regions. It again increases sharply from the second quinquennium to the second decade of marriage for all regions except Northern/Upper region where it declines sharply to only 2 per cent, and the Eastern region where it declines to 8 per cent. In the Western/Central region, the probability of disruption in the second decade is even higher than it was in the first quinquennium.

Urban–rural rates across periods of marriage follow the same U-shaped pattern, with the probability of dissolution declining after the first quinquennium, and then rising again during the second decade. In urban areas, the rise up to the second decade brings the probability to a level even higher than in the first quinquennium. During the first quinquennium, the probability of dissolution is about the same in both the urban and rural areas (13 and 14 per cent respectively). The differential however widens during subsequent periods, when the risk becomes much higher in the urban area. Though the differences are not pronounced, they are perhaps to be expected due partly to the lack of the moderating influence of kinsmen in the urban area, and the greater pressures of urban living. Over time periods, educational differences follow the same U-shaped pattern noted earlier. This applies to all educational categories. In the case of women with some education, however, the increase in dissolutions during the second decade is fairly small.

Among the educational subgroups, women with 1–9 years of schooling have the highest rate of marital dissolution. It is almost twice as high as the rate for those with no education, and for the second quinquennium, the probability is more than twice as high (.17 as against .07). The fact that all those with schooling have relatively high rates of marital dissolution indicates that education is associated with marital instability in some way, although the precise mechanism of this linkage is not at all clear.

As before, the Mole-Dagbani group stands out with exceptionally low probabilities of dissolution throughout all time periods, followed as usual by the Guans. These low rates of marital dissolution contrast sharply with that of the Ga-Adangbe with a high rate of 18 per cent during the first quinquennium. During the same time period, the Akan and the Ewe also have similarly high rates. There is some decline in the risk of dissolution for

Table 2.9 Probability of dissolution of first union, by separation or divorce within 5 years, between 5 and 10 years and between 10 and 20 years, by background characteristics (based on ever-married women except where otherwise indicated)

Background characteristics	Probability of dissolution by separation/divorce		
	Within 5 years $_5q_0$	Between 5 and 10 years $_5q_5$	Between 10 and 20 years $_{10}q_{10}$
All women	.14	.09	.12
Region			
Western/Central	.19	.13	.21
Ashanti/Brong Ahafo	.14	.09	.13
Eastern	.17	.11	.08
Greater Accra	.13	.13	.13
Volta	.20	.11	.16
Northern/Upper	.04	.05	.02
Place of residence			
Rural	.14	.08	.11
Urban	.13	.12	.14
Education			
No schooling	.11	.07	.10
1–9 years	.21	.17	.18
10 + years	.17	.13	.14
Ethnicity			
Akan	.17	.12	.16
Mole-Dagbani	.04	.05	.03
Ewe	.16	.10	.12
Ga-Adangbe	.18	.12	.09
Guan and others	.09	.05	.08
Religion			
Christian	.18	.12	.15
Muslim	.07	.07	.02
Traditional and others	.08	.06	.08
Occupation before marriage			
Did not work	.13	.08	.10
Agricultural	.16	.10	.15
Professional/skilled	.14	.10	.11
Sales and services	.15	.13	.14
Type of marriage[a]			
Monogamous	.11	.06	.04
Polygamous	.11	.08	.11

[a]Based on currently married women.

all these ethnic groups during the second quinquennium, but the differences become sharper during the second decade.

Compared to the previous decade, the probability of dissolution is much lower among the Ga-Adangbe. It is only half of what it was before; for the Akans however, there is a sharp increase during the second decade to 16 per cent, the highest by far for any ethnic group during this decade. Being a matrilineal society, these high

rates of dissolution seem to support the hypothesis that marriage is inherently more unstable in matrilineal societies than in patrilineal ones.

Differentials in the risk of dissolution by education seemed to indicate that modernism was in some way associated with high risk of marital dissolution. Further proof for this assertion can be seen from the differentials by religion. Within the first quinquennium, the probability of dissolution among the Christians (18 per cent) is more than twice as high as those of both Muslims (7 per cent), and Traditional adherents (8 per cent). Though there is a decrease in the risk of dissolution during the second quinquennium for Christians, the rate is still comparatively high, and it even increases again during the second decade. The risk of marital disruption is particularly low among Muslims, and by the second decade it is only 2 per cent.

To investigate if a woman's occupation before first marriage had any bearing upon the risk of marital dissolution, probabilities of dissolutions were computed for three major subgroups along with women who did not work. Probabilities of dissolutions for occupational subgroups fit the usual U-shaped pattern, across duration periods. However, with only small differences across subgroups, it appears that occupation has only a weak relationship with the risk of marital dissolution. Women who have never worked and those in professional/skilled occupations have the lowest risk of dissolution, presumably for different reasons. Never-workers are concentrated in Muslim regions, while it has been observed in other countries that women who marry at late ages (which is true of the professional/skilled group) tend to have lower risks of dissolution. This is partly supported by the results for education subgroups, which show that women with 10 or more years education have lower risks than those with 1—9 years, although the no-schooling group has substantially lower risks than both of these educated groups.

During the first quinquennium, the risk of marital dissolution seems to be the same for women currently in monogamous or polygamous unions. By the second quinquennium, however, the risk becomes higher for women in polygamous unions and widens even further during the second decade, by which time it is almost three times as high as in monogamous unions. It must be noted that the type of union refers only to the current union and therefore applies only to currently married women. Although the probability of dissolution refers to the first marriage, it is possible that some women currently in a particular type might have belonged to another type in the first union. As the type of union was ascertained only for the current union, the analysis excludes women who were not currently married but who might have been married in the past.

The findings seem to uphold the view that polygamous unions are generally more unstable. However, a precise statement about the relationship between type of union and dissolution cannot be made in the present work.

Marital dissolution by age at marriage

The risk of marital dissolution is in some ways directly related to the age at marriage. The main reason for this is that a certain level of mental, physical and emotional development is necessary to cope with the strains and responsibilities of married life, and since this maturation process is associated with age, some age categories are more prone to the risk of marital dissolution than others. Thus a woman who first marries at the age of 25, for example, has a greater chance of maintaining her marriage than a 16 year old girl who may be physically developed but mentally and emotionally may be unprepared for marriage. This is why teenage marriages are notorious for their instability.

Of course this does not necessarily mean that the higher one's age, the higher the level of maturity and therefore the greater the chances of marital stability. There is a point beyond which other countervailing factors may have a more decisive effect on the survival of the marriage. For example, the woman who marries at the age of 35 may be more mature but less fecund than a 25 year old woman, and in societies where fecundity is a crucial factor in marital stability, the risk of dissolution for such a woman is obviously greater in spite of her maturity. For these reasons, it is useful to examine the rate of dissolutions by the age at marriage in order to determine if it affects the risk of dissolution in any significant way. Table 2.10 shows marriage dissolution rates within 20 years of first marriage broken down by marriage quartiles[2] for the various subgroups of

[2] Marriage quartiles refer to the ages by which less than 25 per cent (first quartile), 25—50 per cent (second quartile), 50—75 per cent (third quartile) and more than 75 per cent (fourth quartile) of women belonging to the subgroup in question marry. These ages are indicated in section 2.4 on age at marriage.

Table 2.10 Percentage of marriages dissolved due to separation or divorce within 20 years since first marriage among women aged 15–49 at survey, by age at marriage and background characteristics (based on ever-married women except where otherwise indicated)

Background characteristics	All	Age at first marriage			
		1st quartile	2nd quartile	3rd quartile	4th quartile
All women	31.0	34.5	29.9	31.6	25.5
Region					
Western/Central	44.6	55.3	37.4	42.2	33.8
Ashanti/Brong Ahafo	31.3	33.1	35.1	28.8	25.7
Eastern	32.0	36.2	27.8	33.0	24.2
Greater Accra	33.8	44.0	37.8	23.8	13.6
Volta	40.0	38.6	38.9	37.8	29.3
Northern/Upper	10.9	14.6	8.2	11.1	8.0
Place of residence					
Rural	29.6	32.9	26.6	31.3	25.7
Urban	34.4	40.0	35.3	32.8	21.3
Education					
No schooling	25.7	29.1	22.5	27.2	23.4
1–9 years	46.2	51.5	42.7	37.3	34.4
10+ years	37.9	43.6	33.3	26.0	14.9
Ethnicity					
Akan	38.4	42.6	37.4	38.0	32.3
Mole-Dagbani	11.3	16.9	8.5	8.2	10.5
Ewe	33.4	33.5	39.4	29.5	17.1
Ga-Adangbe	35.0	45.2	36.4	19.1	20.4
Guan and others	20.7	22.1	19.7	23.9	11.8
Religion					
Christian	38.4	41.2	41.3	35.7	31.3
Muslim	19.7	22.4	17.2	15.6	20.5
Traditional and others	20.9	27.7	15.1	24.9	15.4
Occupation					
Not working	28.0	31.0	28.0	28.7	21.5
Agricultural	35.7	37.4	31.4	38.4	31.8
Professional/skilled	30.8	35.8	20.9	14.0	—
Sales and services	36.7	43.7	31.8	38.8	21.6
Type of marriage[a]					
Monogamous	20.5	23.7	21.0	21.3	13.4
Polygamous	27.2	30.4	24.8	28.4	22.1

[a]Based on currently married women.

the population. In the case of one subgroup (professional/skilled workers), the final quartile is incomplete because only a small proportion of women married at ages which are above the age at which 75 per cent of women had married by the time of the survey.

For the total country, the data shows that 31 per cent of all marriages are dissolved through separation or divorce within 20 years of marriage among women aged 15–49. Young marriages are the most vulnerable to the risk of disruption, while those who marry at the highest ages have the lowest risk of disruption. For most background variables, the pattern is similar with the highest

risk occurring at the youngest ages, but with small variations, especially between the third and fourth quartiles.

Remarriage

In societies where childbearing occurs largely within marriage, marital disruption can depress the level of fertility. Conversely, remarriage, particularly if it occurs during the childbearing years, can have a positive effect on the level of fertility. In a society like Ghana where marriage is almost universal, one would expect a high degree of remarriage, and the data on remarriage in table 2.11 confirms this. Over 93 per cent of women whose marriages have been dissolved for one reason or another remarry within 15 years of dissolution, yielding an estimate of the rate of eventual remarriage. All subgroups have quite high remarriage rates, with a range from .89 to 1.0. With differences within some sets of subgroups being very small (1–3 per cent) it is unlikely that this factor can have contributed to existing fertility differentials for these sets of subgroups – residence, education and occupation. Where differences are somewhat larger, as for region, ethnicity and religion (6–8 per cent), they have greater potential to affect fertility.

Table 2.11 Proportion of women remarrying within 15 years of first dissolution

Background characteristic	Proportion remarrying within 15 years of dissolution
All women	.931
Region	
Western/Central	.954
Ashanti/Brong Ahafo	.894
Eastern	.937
Greater Accra	.958
Volta	.901
Northern/Upper	.940
Place of residence	
Rural	.935
Urban	.925
Education	
No schooling	.924
1–9 years	.953
10 + years	.946
Ethnicity	
Akan	.943
Mole-Dagbani	.969
Ewe	.893
Ga-Adangbe	.889
Guan and others	.895
Religion	
Christian	.930
Muslim	1.000
Traditional and others	.920
Occupation	
Not working	.949
Agricultural	.925
Professional/skilled	.929
Sales and services	.909

In general the rate of remarriage is very high among the regions, and with the marginal exception of the Ashanti/Brong Ahafo region, over 90 per cent of women whose marriages have been dissolved remarry within 15 years of dissolution. The rates of remarriage are highest in Greater Accra and Western/Central regions, and lowest in the Ashanti/Brong Ahafo and Volta regions.

In the case of ethnic differentials the distinctive 'northern' pattern is again evident here. The Mole-Dagbani have the highest rate of remarriage (about 97 per cent), followed by the Akan with 94.3 per cent. What is even more significant is the 8 percentage point difference in remarriage rate between the Mole-Dagbani and the Ga-Adangbe, who have the lowest remarriage rate. In contrast with other aspects of marriage, the sharp distinction between the Christians on the one hand, and the Muslims and Traditional adherents on the other, is not evident here. Among Muslims, remarriage is complete, whereas Traditional adherents have the lowest remarriage rate (92 per cent). It is only marginally higher (93 per cent) among Christians.

The tempo of remarriage

The effect which remarriage has on fertility is directly related to the rapidity of remarriage, and the ages at which people remarry. For this reason, it is important to study the extent of remarriage according to how quickly it occurs after the dissolution. Table 2.12 shows the proportion of first unions dissolved within 5 years of marriage, and the proportion of women who remarry within 5 years of dissolution, separately for dissolutions which occurred 5 years after first marriage, and for those which occurred more than 5 years after the first union (limited to a 15-year period). For the selected socio-economic subgroups, the pattern of

Table 2.12 Proportion of first unions dissolved within 5 years, and proportion of women remarried within 5 years of dissolution, for dissolutions in first 5 years and subsequently by background characteristics

Background characteristics	Proportion of first unions dissolved within 5 years	Proportion of women marrying within 5 years		
		Early dissolutions (<5 years)	Later dissolutions (5+ years)	Total
All women	.15	.85	.74	.80
Region				
Western/Central	.22	.88	.81	.84
Ashanti/Brong Ahafo	.14	.91	.74	.82
Eastern	.18	.84	.71	.79
Greater Accra	.15	.80	.67	.73
Volta	.22	.81	.74	.78
Northern/Upper	.06	.80	.73	.77
Place of residence				
Rural	.16	.86	.75	.81
Urban	.15	.82	.73	.77
Education				
No schooling	.12	.86	.75	.80
1–9 years	.23	.83	.77	.81
10+ years	.18	.85	.65	.78
Ethnicity				
Akan	.19	.88	.74	.81
Mole-Dagbani	.06	.85	.79	.82
Ewe	.17	.79	.54	.77
Ga-Adangbe	.20	.81	.50	.75
Guan and others	.10	.82	.74	.78
Religion				
Christian	.19	.85	.72	.79
Muslim	.08	.79	.91	.85
Traditional and others	.10	.85	.75	.79
Occupation				
Not Working	.14	.82	.70	.77
Agricultural	.17	.90	.80	.85
Professional/skilled	.14	.84	.79	.82
Sales and services	.18	.87	.76	.81
Type of marriage[a]				
Monogamous	.12	.94	.88	.92
Polygamous	.12	.86	.93	.89

[a]Based on currently married women.

dissolutions within the first 5 years of marriage does not differ in any significant way from the pattern already shown in table 2.9. The rates of dissolution here are obviously higher, however, because dissolutions through widowhood have been included. The emphasis in this section will therefore be on subgroup differentials of remarriages between early and later periods of remarriages within a 15-year period. For the total population, as for many other subgroups within the population, the probability of marrying within 5 years of dissolution is higher

for those whose marriages are dissolved within the first 5 years of marriage than for those whose marriages are dissolved later. Two major reasons may account for this. First, women involved in marriages terminated within the first 5 years are likely to be relatively younger in age and therefore more disposed to give marriage another trial; secondly, being relatively young, they may not have attained their desired family sizes, and in a fertility-conscious society, the pressures on such people to remarry can be considerable.

For all regions, remarriage is higher for marriages dissolved within the first 5 years than for those dissolved in later periods. Both Ashanti/Brong Ahafo and Western/Central regions have very high rates of remarriage, with the Ashanti/Brong Ahafo being the highest during earlier dissolutions, while the Western/Central region has the highest rate of remarriage for later dissolutions. The Greater Accra region has the lowest proportion remarrying.

For both rural and urban residents, remarriage is again higher for dissolutions within the first 5 years than for later periods. Overall, remarriage is more frequent in the rural areas than in the urban areas, but the differences are not substantial. For early dissolutions, the probability of remarriage is about the same for all educational groups, with the non-educated having a slight edge. All categories show a decline in the remarriage rate for later dissolutions but the decline is sharper for those with 10 or more years of education than for other educational groups.

Among ethnic groups, the proportions remarrying range from a low of 79 per cent among the Ewe to a high of 88 per cent among the Akan for early dissolutions. For later dissolutions, the range widens from a high of 79 per cent for the Mole-Dagbani to a low of 50 per cent for the Ga-Adangbe. The 50 and 54 per cent remarriage rates for the Ga-Adangbe and Ewe, respectively, are the lowest rates of remarriage for any subgroup within the sample, possibly an indication of the strong effect which socio-cultural factors have on nuptiality. Among all ethnic groups, remarriage is again higher for marriages dissolved within the first 5 years than for later dissolutions. Remarriage amongst Muslims shows a very unusual pattern. Unlike the rates for other subgroups considered so far, the proportion remarrying for later dissolutions is significantly higher than for early dissolutions (91 as against 79 per cent). The two other religious groups follow the usual pattern, and overall the differences between them are not very pronounced. For all occupational categories, remarriage is again higher for early dissolutions than for later dissolutions. For both early and later dissolutions, the highest rate of remarriage is among agricultural workers, and the lowest among those who are not working. For both early and late dissolutions, the proportion remarrying ranges from a high of 85 per cent among agricultural workers to 77 per cent among those who are not working.

Remarriages by type of marriage follow a very unusual pattern. For early dissolutions, the proportion remarrying among monogamous women is significantly higher than for those in polygamous unions. For later dissolutions, however, the situation is reversed, and remarriage is higher amongst polygamous women. Overall, however, the proportion of women remarrying is higher amongst monogamous women, although this 3 percentage point differential can be considered as insignificant.

Time spent in unions

The amount of time which a woman actually spends during her active reproductive years in a union has very important implications for her fertility performance. The greater the amount of time spent in unions, the higher the exposure to the risk of childbearing. On the other hand, where relatively long periods of time are spent in separation, divorce or widowhood during the reproductive years, there is a corresponding reduction in the exposure to the risk of childbearing, and it is therefore important to examine this aspect of marital behaviour.

Table 2.13 shows the average number of years spent in various marital states (single, first and later unions, separation, divorce and widowhood) within two broad age groups (15–24, 25–39) of the most active reproductive years, 15–39. Since it is clear from the data we have examined so far that marriage is near universal in Ghana, it can be inferred that the number of years, on average, spent in the single state is simply a reflection of the effect of the age at marriage. The relatively negligible amount of time spent in the single state for those aged 25–39 (generally less than half a year) confirms this conclusion. Except for the effect of age at marriage, therefore, single status or spinsterhood has very little, if any, influence on the level of fertility in Ghana. The data show that for the total country, a woman between the ages of 15–24 spends more than half the period (5.5

Table 2.13 Average number of years spent single, in first and later marriages, and separated, divorced or widowed from age 15–24 and from age 25–39, by selected background characteristics

Background characteristics	Average number of years spent in marital status							
	15–24				25–39			
	Single	1st Union	2nd+ Unions	S.D.W.[a]	Single	1st Union	2nd+ Unions	S.D.W.[a]
All Women	3.8	5.5	0.4	0.3	0.3	11.0	2.7	1.0
Region								
Western/Central	3.8	5.2	0.6	0.4	0.4	9.7	3.5	1.4
Ashanti/Brong Ahafo	3.6	5.8	0.4	0.2	0.1	11.8	2.3	0.8
Eastern	4.2	5.0	0.4	0.4	0.4	10.6	3.0	1.0
Greater Accra	4.8	4.5	0.3	0.4	0.4	9.8	3.3	1.5
Volta	3.9	5.2	0.5	0.4	0.3	10.5	2.7	1.5
Northern/Upper	2.8	6.7	0.2	0.2	0.2	12.5	1.8	0.5
Place of residence								
Rural	3.5	5.8	0.4	0.3	0.2	11.3	2.6	0.9
Urban	4.3	5.0	0.4	0.3	0.4	10.5	2.8	1.3
Education								
No schooling	3.2	6.1	0.4	0.3	0.2	11.3	2.5	1.0
1–9 years	3.7	5.3	0.5	0.5	0.4	9.8	3.4	1.4
10+ years	5.3	4.1	0.3	0.3	0.5	10.8	2.6	1.1
Ethnicity								
Akan	3.9	5.3	0.5	0.3	0.3	10.5	3.1	1.1
Mole-Dagbani	2.9	6.7	0.2	0.2	0.3	12.6	1.6	0.5
Ewe	4.4	4.9	0.4	0.3	0.3	11.0	2.4	1.3
Ga-Adangbe	4.5	4.6	0.4	0.5	0.6	10.2	3.1	1.1
Guan and others	3.5	6.0	0.3	0.2	0.2	12.0	2.0	0.8
Religion								
Christian	4.1	5.1	0.4	0.4	0.4	10.4	3.0	1.2
Muslim	3.3	6.3	0.2	0.2	0.2	12.2	2.1	0.5
Traditional	3.2	6.2	0.3	0.3	0.2	11.7	2.2	0.9
Occupation								
Not working	3.2	6.1	0.4	0.3	0.2	11.7	2.2	0.9
Agriculture	3.5	5.7	0.5	0.3	0.2	10.4	3.1	1.3
Professional/skilled	6.4	3.2	0.2	0.2	1.3	10.4	2.5	0.8
Sales and services	3.7	5.4	0.5	0.4	0.2	10.0	3.4	1.4
Type of marriage[b]								
Monogamous	3.6	5.7	0.4	0.3	0.2	11.9	2.4	0.5
Polygamous	3.2	6.1	0.4	0.3	0.2	11.3	2.8	0.7

[a]Separated, divorced or widowed.
[b]Based on currently married women.

years) in a first union. Therefore, apart from the single state, which can be viewed as the period before marriage (3.8 years on average), only a relatively small proportion of time is spent in second unions (0.4 years) and in dissolution (0.3 years) among 15–24 year olds. Among the regions, the average number of years spent in the single state varies from a low of 2.8 years in the Northern/Upper region, to a high of 4.8 years in the Greater Accra region. It is therefore not surprising that the positions are reversed with respect to the amount of time spent in first unions, with the average woman from the Northern/Upper region spending almost 7 years in a first union, compared to only 4.5 years for a woman from the Greater Accra region.

The proportion of time spent in second unions and in dissolutions is fairly negligible for all regions, though there are some significant differences. The time spent in dissolutions in the Northern/Upper and Western/Central regions, for example, is only half that of other regions. Similarly, for second unions, the average number of years spent by the women of the Northern/Upper region is about one-third that of women from the Western/Central region, where a relatively high level of marital instability has already been noted.

The higher age at marriage in the urban areas is reflected in the greater number of years, on average, being spent in the single state. This also means that rural women spend a greater proportion of time in first unions (5.8 as against 5 years). The proportion of time spent in second unions and in dissolution is, however, the same for both urban and rural women.

The importance of education as a key variable which is closely associated with nuptiality is again shown here for women aged 15–24. The level of education is positively related to the amount of time spent in the single state, and inversely related to the time spent in first unions. In other words, the higher the level of education, the greater is the proportion of time spent in the single state, and the smaller is the amount of time spent in a first union. For all groups, the proportion of time spent in second unions and in dissolutions is fairly small. For women aged 25–39, the pattern is generally the same except that the differentials between educational categories have been narrowed, and even reversed in the case of those with 1–9 years and 10 or more years of education, with respect to the amount of time spent in unions and in dissolutions. For both age groups, the north–south dichotomy manifests itself clearly here with ethnic differentials. The Mole-Dagbani, followed by the Guans, spend a relatively small amount of time in the single state, and a correspondingly greater amount of time in first unions. The Ga-Adangbe, and to a lesser extent, the Ewe, exhibit the opposite pattern. The amount of time spent in separation, divorce and widowhood is similarly lower among the Mole-Dagbani and the Guan than among the other tribes. The similarity between the Muslim and Traditional adherents with respect to many aspects of nuptiality is again illustrated by the data in this table. For both age groups, the average number of years spent in the various marital states are remarkably close for the two religious groups. A little over 6 years and about 12 years, respectively, for the two age groups, are spent in first unions by these two religious subgroups. The proportion of time spent in second unions and in dissolutions is relatively low for both categories.

Christian women, on the other hand, spend a relatively longer period in the single state, and a correspondingly shorter period in first unions at age 15–24. For the 25–39 age range, the average number of years spent unexposed by Christians is twice as high as for Muslims and 1.5 times as high as for Traditional adherents (1.6 years versus 0.7 years for Muslims and 1.1 years for Traditional adherents).

For the 15–24 age range, occupational differentials in years spent in the various marital states follow a well-defined pattern. The extremes of the occupational spectrum show sharply contrasting levels. The non-working woman, for example, spends an average of 3.2 years in the single state which is only half the time spent single by the professional/skilled woman.

For first unions the positions are reversed, with the professional/skilled woman spending only 3.2 years compared to 6.1 years for the non-working woman. The proportion of time spent in second unions and in dissolutions is generally low for both of these occupational categories, although again, they are much lower for the professional/skilled women. There is not much difference between the sales and agricultural workers whose patterns fall in between the two extremes. Over the 25–39 age range, the differentials are much narrower, and disappear altogether in some cases.

Differences according to the type of current union (polygamous or monogamous) are very

small, usually less than 0.5 years for all marital statuses, for both age ranges, suggesting that the two groups have, on average, much the same marital exposure.

2.8 SOME SOCIO-DEMOGRAPHIC CHARACTERISTICS OF CURRENTLY MARRIED WOMEN

This section briefly examines two separate aspects of the characteristics of married women. First, we describe the extent of homogeneity of married couples – ie to what extent do women marry men with the same education or of the same ethnic origin. Secondly, we present a socio-economic profile of women currently in monogamous or polygamous unions to see whether strong compositional differences exist between these two types of union.

Homogeneity of married couples

It is evident from table 2.14 that marriage is still largely intra-tribal, and that very few women find partners from outside their major tribe. Ethnic inter-marriage is highest among the Ga-Adangbe (almost 20 per cent), and lowest among the Akan (7.6 per cent) and Mole-Dagbani (7.9 per cent). The extent of ethnic inter-marriage is also fairly high amongst Guan women (16.1 per cent), but this can be explained by the fact that the Guans are a dispersed group, whose subgroups, in many cases, are located nearer to other major ethnic groups than to other Guan subgroups.

For various historical and cultural reasons, men have always received better education in Ghana than women. Both in terms of numbers and level of educational attainment, men have always had a distinct superiority. One result of this educational imbalance is that men are more likely to marry women with lower educational attainment than themselves (table 2.15); nevertheless, the educational qualification of a person is undoubtedly an important consideration in the choice of a marriage partner. As the data in table 2.15 show, it seems that highly educated women and non-educated women are particularly conscious of the educational qualifications of their partners. Of the women with 11 or more years of education, over three-quarters are married to husbands with similarly higher educational qualifications. Similarly, of the currently married women with no schooling, 65.3 per cent are married to non-educated husbands while the rest are married to men with higher educational qualifications.

The tendency of women to marry into higher

Table 2.14 Percentage distribution of currently married women, by their ethnicity and their husband's ethnicity

Ethnic group of wife	Ethnic group of husband						
	Akan	Mole-Dagbani	Ewe	Ga-Adangbe	Guan and others	Total	
						Percent[a]	N
Akan	92.4	0.6	1.6	1.7	3.7	100.0	2224
Mole-Dagbani	0.7	92.1	0.0	0.0	7.2	100.0	713
Ewe	4.1	0.4	89.8	1.5	4.3	100.1	538
Ga-Adangbe	11.0	0.0	4.7	80.8	3.5	100.0	317
Guan and others	6.7	7.0	1.2	1.2	83.9	100.0	644

[a]Figures may not add up to 100 due to rounding.
N = Number of women.

Table 2.15 Currently married women, by their educational status and educational status of husbands

Educational status of women	Educational status of husbands				
	No schooling	1–9 years	10 years	11+ years	All[a]
No schooling	65.3	12.5	17.8	3.1	98.7
1–9 years	21.4	17.7	48.1	12.4	99.6
10 years	6.1	7.7	49.3	36.3	99.4
11+ years	1.3	2.0	19.7	75.7	98.7

[a]Figures do not add up to 100 because of 'not stated'.

educational groups is clearly shown for those with 1–9 years of education. Over 60 per cent of this group are married to men with higher educational levels. It is not as marked in the case of those with 10 years of education, but even here the corresponding figure of 36.3 per cent is quite high.

The data also show that women do marry men with lower educational levels. Of the currently married women with 1–9 years of education, over one-fifth (21.4 per cent) are married to men with no schooling, while a similar proportion of those with 11 or more years of schooling are married to men with only 10 years of education.

Profile of polygamous and monogamous wives

Among societies where polygamy is practised, its extent is limited by several factors, the most important being the national demographic balance between the sexes. There are other important social, economic and cultural considerations such as one's social status, age, offices held, financial status, etc. It is assumed, however, that under conditions of modernization, polygamy tends to decline rapidly in importance, though the actual pattern or stages of this decline are not at all clear (Clignet and Sween 1969; Aryee 1978).

The data from table 2.16 shows that polygamy is still widely practised in Ghana: of all currently married women in the sample, about one in three (34.6 per cent) are involved in polygamous unions. Polygamy is still widely practised in the Northern/Upper region with about half the women in polygamous unions. Polygamy is also fairly high in the Volta region (about 43 per cent), only moderately practised in Western/Central and Ashanti/Brong Ahafo regions (about one in three women), and lowest in the Accra and Eastern regions (about 27 per cent). The Northern–Southern dichotomy is again evident here, though it is not as clearly delineated as in the case of other nuptiality indices. It is also not clear why the extent of polygamy in the Volta region differs significantly from those of the other 'Southern' regions.

Since modernization originates from and occurs mainly in the urban area, one would therefore expect polygamy to be less prevalent in the urban area. This indeed appears to be the case, but the most striking feature about the data is the rather small differential between the urban and rural rates, with only a 4 percentage point difference between the two.

The importance of education as a key modernizing variable is again shown here. There is an almost perfect inverse relationship between education and polygamy such that the higher the level of education, the lower the extent of polygamy. Participation in polygamous unions range from a low of 15.2 per cent for women with 11 or more years of schooling to about 40 per cent for those with no schooling.

Ethnic variations range from a high of about 49 per cent in polygamous unions among the more tradition-oriented Mole-Dagbani to a low of 28.5 per cent among the Akan, with the Ewe and Ga-Adangbe occupying a middle position between the two extremes. As usual, the Guan, some of whom share boundaries with the Mole-Dagbani, also have a high level of polygamy, with about 40 per cent of their women in polygamous unions.

Affiliation to the Christian church obviously has a very important influence on the practice of polygamy. Only about 29 per cent of Christian wives are in polygamous unions, compared to almost half for Muslims, and about 40 per cent for Traditional adherents. However, interestingly, the practice of polygamy is by no means remarkably less substantial among Christians.

Women in professional/clerical occupations stand out with a relatively low level of participation in polygamous unions. The rate of about 23 per cent is noticeably lower than the rate of about one in three for most other occupations. The relatively high rates of polygamy for women in production, sales and service is striking and may be related to the fact that economic or financial considerations are still important factors in the practice of polygamy. Place of work does not seem to be associated with polygamy in any significant way. The differences between the various categories are too small to merit any firm conclusions.

As with wife's education, polygamy is also closely associated with the husband's education. The relationship is again an inverse one, with participation in polygamous unions being lowest among husbands with 11 or more years of schooling (22.5 per cent), and highest among men with no schooling (44.2 per cent). The fact that polygamy is twice as prevalent among the latter group points clearly to the importance of education in social change.

Age at marriage does not have a strong relationship with polygamy. Participation in polygamous unions is about the same for age at marriage groups 15–19, 20–24 and 25+. However polygamy participation rates are noticeably higher

Table 2.16 Percentage distribution of currently married women, by type of union and selected background characteristics

Background characteristics	Percentage of women in			
	Polygamous unions	Monogamous unions	All	
			Percent	N
All	34.6	65.4	100.0	4428
Region				
Western/Central	32.1	67.9	100.0	648
Greater Accra	27.0	73.0	100.0	507
Eastern	27.8	72.2	100.0	688
Volta	43.4	56.6	100.0	426
Ashanti/Brong Ahafo	30.0	70.0	100.0	1342
Northern/Upper	50.1	49.9	100.0	817
Place of residence				
Urban	31.8	68.2	100.0	1420
Rural	35.9	64.1	100.0	3008
Education				
No schooling	39.6	60.4	100.0	2681
1–6 years	28.7	71.3	100.0	456
7–9 years	28.9	71.1	100.0	388
10 years	27.5	72.5	100.0	743
11+ years	15.2	84.8	100.0	151
Ethnicity				
Akan	28.5	71.5	100.0	2223
Mole-Dagbani	48.8	51.2	100.0	713
Ewe	35.8	64.2	100.0	533
Ga-Adangbe	32.0	68.0	100.0	316
Guan and others	40.3	59.7	100.0	643
Religion				
Christian	28.8	71.2	100.0	2622
Muslim	47.2	52.8	100.0	561
Traditional and others	41.3	58.7	100.0	1245
Occupation				
Not working	34.2	65.8	100.0	2631
Professional/clerical	23.1	76.9	100.0	117
Sales and service	37.2	62.8	100.0	841
Agricultural	32.3	67.7	100.0	579
Production	40.4	59.6	100.0	255
Husband's education				
No schooling	44.2	55.8	100.0	1987
1–9 years	28.8	71.2	100.0	549
10 years	27.4	72.6	100.0	1276
11+ years	22.5	77.5	100.0	569
Age at marriage				
<15	41.2	58.8	100.0	524
15–19	34.1	65.9	100.0	2856
20–24	32.5	67.5	100.0	872
25+	33.5	66.5	100.0	176
Place of work				
Family farm	32.6	67.4	100.0	389
Other farm	31.8	68.2	100.0	157
At home	39.6	60.4	100.0	328
Away from home	35.3	64.7	100.0	921
No work	34.2	65.8	100.0	2631

N = Number of women.

for those who married below the age of 15. It is very likely that women who married at such young ages come from the most tradition-oriented segments of the society, for whom polygamy is the norm rather than the exception.

The effect which polygamy has on the level of fertility has been commented on extensively in the sociological literature. It has been hypothesized that polygamy has a depressing effect on fertility due to a number of factors, and monogamous women therefore tend to be more fertile than polygamous wives (Goode 1970: 182; Dorjahn 1959). Of course such a question cannot be fully answered without strictly controlling for several variables such as age at marriage, age of respondents, etc; nevertheless it is still useful to examine the fertility differentials by type of union as revealed by the survey data.

As table 2.17 shows, not only do polygamous wives have more children than monogamous wives, but they also desire more children. For the total sample, polygamous wives have an average of 4.1 children ever born each, compared to 3.5 for a monogamous wife. Up to age 30, the number of children ever born is higher among polygamous wives, but the pattern reverses after this age. Thus women in polygamous unions seem to be relatively more productive during the earlier years of marriage. For the number of children desired however, wives in polygamous unions express a desire for more children than wives in monogamous unions at almost all age groups.

It is evident from table 2.18 that knowledge about contraception throughout Ghana is very widespread indeed. About 72 per cent of wives in monogamous unions and 66 per cent of those in polygamous unions know about some method of contraception. The marginal difference between monogamous and polygamous wives is most likely the effect of an advantage in education for monogamous women. It is also significant that knowledge about contraception is spread almost evenly throughout all age groups, including even the oldest women. But there is no necessary correlation between knowledge and usage. Wives in monogamous unions still have an edge over wives in polygamous unions, with 43 per cent of them having ever used some contraceptive method, as against 38 per cent of those in polygamous unions. Except for the youngest age group (15–19), usage seems to be fairly widely distributed among all age groups. It is rather irregular among polygamous wives, but those in the youngest ages (15–24) have the lowest record of usage.

As far as current usage is concerned, wives in both types of union report very low usage, although again, those in monogamous unions report higher usage (13.5 against 10.1 per cent). The lowest usage is in the younger ages (15–24), while the highest usage is by monogamous wives in the 25–34 age group and polygamous wives in the 35–44 age group.

About the same proportions of never users say that they intend to use in the future (about 18 and 16 per cent respectively for monogamous and polygamous wives). However, for both types of union groups it is generally those in the younger ages who report a greater inclination to use contraceptive methods in the future, presumably on the attainment of their desired family sizes.

2.9 SUMMARY

From data obtained in earlier censuses and surveys Ghana has been shown to have a young age at

Table 2.17 Currently married women aged 15+, by type of union and average number of children ever born and desired

Type of union	Current age (years)							
	Total	15–19	20–24	25–29	30–34	35–39	40–44	45+
A Children ever born								
Monogamous	3.5	0.7	1.5	2.7	4.2	5.5	6.2	7.1
Polygamous	4.1	0.7	1.8	2.9	3.9	5.4	6.0	6.7
B Children desired								
Monogamous	5.9	5.1	5.0	5.4	6.2	6.7	7.3	7.4
Polygamous	6.5	5.9	5.7	5.8	6.5	7.1	7.1	7.2

Table 2.18 Currently married women, by age, type of union, and knowledge of contraceptive method, whether ever used or using, and intention to use

Type of union	Age							
	Total	15–19	20–24	25–29	30–34	35–39	40–44	45–49
A Knows any kind of method								
Monogamous	71.8	62.4	74.2	75.9	72.7	65.3	73.2	70.4
Polygamous	65.6	56.5	62.0	69.8	64.5	66.8	67.1	64.2
B Ever used any method								
Monogamous	42.8	30.1	41.7	47.5	45.0	43.1	42.9	45.4
Polygamous	38.0	23.9	34.1	40.8	35.1	41.4	44.8	34.6
C Currently using any method								
Monogamous	13.5	7.1	10.7	16.5	18.8	13.5	12.1	12.0
Polygamous	10.1	4.4	8.7	10.6	9.4	12.7	13.3	7.4
D Intends to use in future								
Monogamous	17.9	22.6	24.2	17.1	13.3	15.0	15.7	8.3
Polygamous	15.5	21.7	19.7	15.9	16.7	14.6	9.8	8.6

marriage and nearly universal marriage. The results of the GFS show that this largely remains true. The average age at marriage (SMAM) was 19.3 years in 1979–80, and this was only a small increase on the mean of 19.0 years, five years before the survey. The universality of marriage is reflected by the fact that about 99 per cent had married among all age groups above 30. Use of the Coale indices, which incorporate weighting for the level of fertility, summarizes the effect of non-marriage (on a scale of 0 to 1). The national-level I_{em} index is .873, indicating a reduction in fertility due to delays in the age at marriage of about 13 per cent; the I_m index, which includes the effect of dissolution after first marriage, shows a further fertility reduction of about 8 per cent. Although the level of dissolution of first marriage is moderately high (28 per cent overall, at the time of survey) remarriage is also high (93 per cent) and most remarriages occur within 5 years of a dissolution, with the result that the proportion of exposure time which is lost because of dissolution is quite low (0.3 years out of the 10 years at age 15–24 and 1.0 year out of the 15 at age 25–39). There are insufficient data in the GFS to investigate the effect of polygamy on fertility, but from what data are available, it is clear that polygamy may be an important factor in future fertility trends, if not in determining current levels: about 35 per cent of currently married women are in polygamous unions and polygamous women tend to be more traditional in background, have somewhat higher fertility preferences and use less contraception.

Although there has been relatively little change in nuptiality in Ghana, differentials among the socio-economic subgroups are substantial. On regional and ethnic lines, the country more or less falls into a north–south pattern. Greater Accra and Eastern regions have the highest ages at marriage (19.5 and 19.9), the lowest proportion of 15–19 year olds being married (22 per cent), and the lowest I_{em} index (.825–.841), while Northern/Upper region has a mean age at marriage of 17.7, the highest percentage of 15–19 year olds being married (64 per cent) and the highest I_{em} index, .925. Ethnic and religious groups divide in a similar way, with the Mole-Dagbani and the Muslim groups having the highest marital exposure, as opposed to the Akan or Ga-Adangbe on the one hand, and the Christians on the other. In nuptiality measures, groups in the middle belt of the country are generally intermediate between the two extremes. This pattern is reinforced by the lower levels of dissolution and higher remarriage rates of the Northern/Upper region, the Mole-Dagbani ethnic group and the Muslim group, compared to other subgroups.

Differentials among residence and education subgroups were in the expected direction, with urban and better educated subgroups having higher ages at marriage and higher loss of exposure due to dissolution. The rise in the mean age at marriage from the no schooling group, 17.9 years, to about 20 years for women with middle-level schooling, and to almost 24 years for women with secondary or higher education, is one of the strongest set of differentials to be found.

Multivariate analysis of the age at marriage, including the five most important background variables (period in which the marriage occurred, region, ethnicity, respondent's education and occupation), showed that while all have substantial effects on age at marriage, before adjustment, it is period and education which continue to have the largest effects, after all other variables have been controlled. Region and ethnicity are especially strongly related to each other, as is seen in the large reduction in their effects on age at marriage, once the other is controlled.

The lack of much change at the national level, in either proportions marrying or the mean age at marriage, suggest that any expectations of future changes should be tempered. On the other hand, the existence of substantial differentials among educational and residence subgroups implies that the possibility of national-level change still exists, as the general level of education and the proportion of the population living in urban areas continues to rise.

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3 Levels, Trends and Differentials in Fertility

Iqbal H. Shah and Susheela Singh

3.1 INTRODUCTION

Both the First Country Report (Central Bureau of Statistics 1983) and the evaluation report (Owusu 1984) have found that the national total fertility rate declined by about half a child from the early to the later 1970s. If this decline is the result of real change in fertility behaviour, rather than being due to temporary fluctuations in demographic conditions, then it is a very important change. It would be the first fertility decline among African populations in the sub-Saharan region, and the implication is that once initiated, this downward trend in fertility would continue, although the rate of any future change cannot be predicted. One of the aims of this paper is to thoroughly examine recent trends in fertility, as measured by the Ghana Fertility Survey (GFS), partly to describe the form that any fertility change has taken, but more importantly, to attempt to establish whether the trend marks the onset of transition from high to low levels or whether it is simply a short-run fluctuation. Fertility differentials among regional and socio-economic subgroups will be one important means of answering this question and an in-depth analysis of recent trends at the national level will also be carried out.

It is well documented that the national level of fertility in Ghana was quite high in the recent period for which estimates have been made, about seven children per woman (Lesthaeghe 1984). This level of fertility was not the highest in sub-Saharan Africa, but it was much higher than several other African countries. The reason for the relative difference was probably not a shorter post-partum non-susceptible period,[1] but a lower incidence of sterility. Furthermore, reviewing trends over the 1960–79 period, Lesthaeghe found evidence of fertility increase in Northern, Upper and Volta regions, but in dismissing any change of less than half a child, he concluded that the national level has been high and stable. One of the purposes of this analysis will be to evaluate trends from the retrospective birth histories at the national and subgroup level, to determine whether these internal estimates agree with trends based on the external sources for the last 20 years or so.

This report will not directly address the question of the proximate determinants of fertility, since it has been covered elsewhere (Gaisie 1984, forthcoming; Lesthaeghe 1984; Casterline *et al* 1984). Nevertheless, we recognize the crucial role of changes in these variables in explaining fertility differentials and differentials in trends among the population subgroups.

We first look at trends in fertility in detail with the aim of isolating the effects of age, period and marriage duration. We will also examine different measures of fertility (birth interval length and parity progression ratios) to better describe the form in which the fertility decline has taken place. In addition we analyse fertility differentials and differentials in trends, according to the main socio-economic factors. Finally, we use multivariate analysis to measure the effect of each factor on fertility independent of other selected factors.

3.2 THE DATA AND THEIR QUALITY

A complete maternity history was used in the GFS, obtaining chronologically, for all children, the date of birth, sex, whether the child was alive, and if not, the date of death. In addition, each birth interval was probed for pregnancies which ended as miscarriages, abortions or stillbirths. This maternity history was preceded by a series of

[1] The period following birth, during which a woman is unable to conceive due to absence of ovulation.

Susheela Singh, John Y. Owusu and Iqbal H. Shah, eds (1985). *Demographic Patterns in Ghana: Evidence from the Ghana Fertility Survey 1979–80*: 49–95. Voorburg, Netherlands: International Statistical Institute.

questions on the number of sons and daughters living with, living away and those who had died. A similar set of questions to those used in censuses was used here to ascertain whether miscarriages were in fact induced abortions, but under-reporting was so great that these data are not useful for substantive analysis. This complete history of births enables us to calculate fertility rates for the past 25 years or so, and therefore analysis of fertility trends is possible. Since the GFS included all women (ever married and never married) in the survey of individual women, this analysis does not suffer from the problem of combining proportions ever married from a household survey with data from the individual survey, which typically lowers the quality of overall fertility estimates.

The completeness of reporting dates was reasonably good, probably because of the relatively high level of education in the country. Calendar year was supplied for 84 per cent of live births, and 79 per cent of women gave their own calendar year of birth. The reporting of the year of first marriage was equally good, with 76 per cent of women giving a calendar year. This last item, in combination with the dates of all other marriages and dissolutions, is needed for the estimation of marital fertility rates.

The evidence for a systematic shifting of dates of children's birth to months ending by a particular digit (for example, five or six) and to particular periods before the survey (eg 5–9 or 10–14 years) was investigated by evaluating the distribution of births by single months of birth (figure 3.1). No systematic heapings at months which are multiples of five or six are noticed. In addition, no evidence of systematic shifting of birth dates to a particular period was found. Births in period 5–9 years before the survey are fewer, on average, than births in period 0–4, but the pattern does not suggest that births have been moved into the 5–9 or 10–14 years out of earlier periods (ie 15 or earlier years before the survey) or from the most recent five-year period of 0–4 years before the survey.

A detailed evaluation of the quality of the data (Owusu 1984) found no evidence of omission of births, using both internal consistency checks (eg analysis of P/F ratios, the sex ratio at birth and sex differentials in infant mortality) and a comparison with the most recent external source (mean number of children ever born, with the 1971 Supplementary Enquiry). Since the vital statistics are incomplete, no comparison with data from this source could be made.

Because one important problem with single-round retrospective surveys is sensitivity of rates to misdating of births or of the women's date of birth itself, the evaluation report examined the data for evidence of misdating of these kinds. Analysis of the detailed fertility rates and of the P/F ratios, an index of fertility change/errors in the data, showed some problems with the 35–39 age group. Fertility of the 35–39 age group was

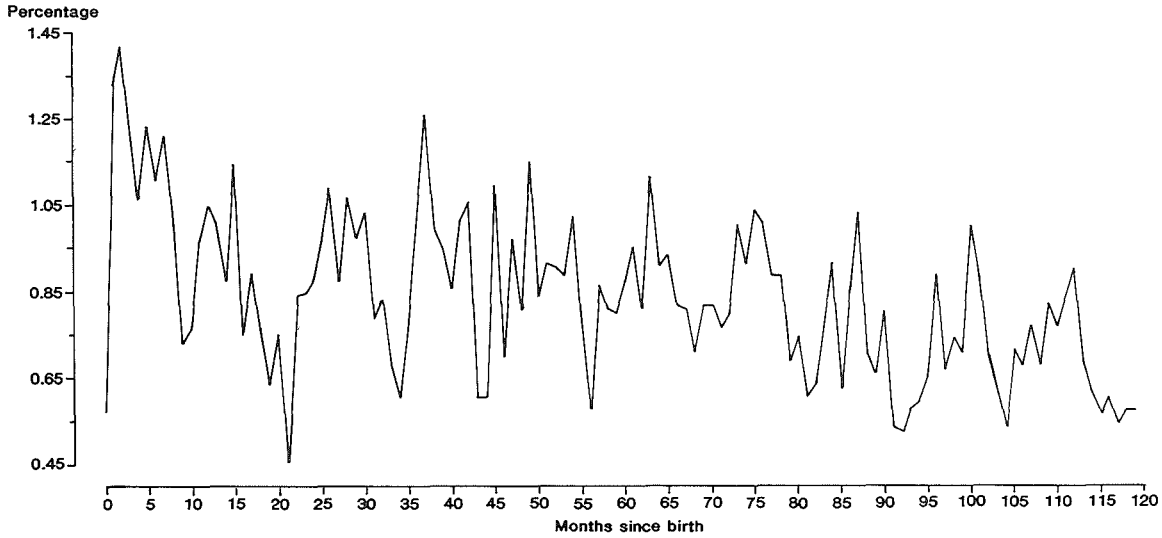

Figure 3.1 Percentage distributions of births, by period since birth

too high, possibly because 30–34 year-old women who had high fertility for their age group were shifted into the next older group. The data, however, suggest that a small fertility decline has occurred from the early 1970s to the late 1970s. This decline was most noticeable among the very young, 15–19, and the oldest age cohorts over age 35, and was strongest among urban women, and among those who had some schooling (Owusu 1984, table 19). The plausibility of these patterns support the reliability of the observed trend. On the other hand, rural women and uneducated women showed very little fertility decline in the recent 10-year period, and small rises before that. These rises in fertility could indicate misreporting errors (eg omission or displacement of dates of children's births) or it could be partly a real rise, since the regions suspected of having a fertility increase (Lesthaeghe 1984) are the more rural and uneducated ones. Therefore, in broad terms, the data are of reasonably good quality, and can be subjected to more detailed analysis for substantive results.

3.3 METHODOLOGICAL ISSUES

Use of the retrospective birth history from a single-round survey for estimation of fertility levels and trends is a complicated methodological issue, which has now received much attention as a result of the WFS surveys (Brass 1978; Verma 1980; Ryder 1982; Little 1982; Alam and Cleland 1981). This concerted effort was needed because the methodological and other problems (eg especially of data quality) associated with the calculation, evaluation and interpretation of fertility rates from a retrospective birth history were, to a great extent, unexplored. Approaches for the analysis of birth histories are described in detail in Verma (1980) and Ryder (1982), and a special package program (Fertrate) was written for the calculation of fertility rates for surveys of the WFS type. The three main types of fertility rates produced by this program are: age–period, cohort–period and cohort–age rates. In addition, rates may be calculated for periods of duration since the first marriage (duration–period or duration–cohort). In appendix B of this chapter we quote from Alam and Cleland (1981) a description of how these rates are calculated. These fertility rates are only one possible type of analysis, however, and many other approaches can be adopted (eg birth interval analysis and parity progression ratios).

Apart from non-sampling errors affecting the quality of the data, there are other important limitations caused by the type of sample used for these surveys: the relatively small size of the samples leads to appreciable sampling variability of estimates, and the restriction of the sample to women aged under 50 causes a cumulating truncation effect as one moves further back in the past. This truncation effect is unavoidable, and its reduction of coverage of past trends (loss of a 5-year age group with each 5-year period gained in the past) cannot be helped. Selectivity is also a problem. Women interviewed in 1979–80 are a subsample of women surviving by this time among all who were born. Going back in time, we successively lose information to a greater extent. In addition, when analysing marital fertility levels in the past, the analysis is largely based upon women marrying at relatively younger ages.

Sampling variability can be dealt with, however, by restricting analysis to groups of some minimum size. Little (1982) estimated the following relative errors for fertility rates, based on an average of five countries (Sri Lanka, Pakistan, Nepal, Colombia and Kenya):

Age group	Reference period (in years)				
	1	2	3	4	5
A Age-specific fertility rates: average of five countries					
15–19	11.37	7.89	6.84	6.01	5.22
20–24	8.05	4.94	4.12	3.66	3.48
25–29	7.82	5.48	4.60	4.10	3.66
30–34	10.36	7.53	6.84	6.17	5.39
35–39	14.40	11.12	9.89	9.06	8.47
40–44	24.95	16.75	16.02	15.19	15.22
B Total fertility rate: Kenya					
Urban	8.10	5.60	5.10	5.00	4.90
Rural	2.60	1.90	1.70	1.50	1.50
Total	2.50	1.80	1.60	1.50	1.50

Relative errors are the standard errors expressed as a percentage of the relevant fertility rate. Thus a 95 per cent confidence interval for the TFR of Kenya, for a 5-year rate, is ±3.0 per cent. This confidence interval increases for subgroups of the

population according to the size of the subgroup, eg rural is about the same as the total population, if the proportion rural is substantial (as in Kenya). In contrast, the corresponding range is ± 9.8 per cent for urban women in Kenya. As the base population (number of woman-years of exposure) increases, when a longer period is covered, there is a sharp drop in the sampling error from a 1-year rate to a 3-year rate, but a smaller drop to a 5-year rate. In additon, older age groups, which have fewer births, have the largest sampling errors.

Because of these limitations, the analysis mainly uses 5-year rates; the one table which shows single-year rates is smoothed for 3-year periods, and the rates therefore have a 3-year base. In addition, because of the likelihood of substantial sampling fluctuation of rates for each 5-year age group, we will concentrate on interpretation of patterns in the rates, and ignore sporadic variations. Nevertheless, it should be borne in mind that by aggregating over 5-year periods, we are attenuating the trends in fertility, especially if these are rapid.

3.4 RECENT FERTILITY TRENDS AT THE NATIONAL LEVEL

When the completed fertility of women aged 45–49 in 1979–80 is compared with women of the same age group in 1971 (Supplementary Enquiry, adjusted figures), no decline in fertility is found. The mean number of children per woman at both points in time is about seven (Country Report, vol 1 and Tawiah 1984). Having dismissed changes of less than 0.5 child, Lesthaeghe (1984) also concluded that fertility in Ghana was high and stable at about seven children per woman. Lesthaeghe further concluded that fertility rises of over 0.5 child had occurred in Northern, Upper and Volta regions. However, although comparison of the mean number of children ever born from the 1971 Supplementary Enquiry and the GFS do not show any substantial change at the national level, analysis of period fertility measures shows a decline of slightly under 0.5 child within the decade before the survey.

In this section we take a detailed look at trends in fertility using different measures, a 3-year moving average of single-year rates, and rates for 5-year periods. These are fertility rates for all women, which are generalizable to the whole population. The 3-year average is used to smooth out fluctuations which result from small sample size, when single-year rates for specific age groups are calculated. We also look at marital fertility rates in this section, relating all births within marriage to years spent married, shown here for 5-year periods. We also discuss cohort–period rates, in regard to both all-women and married-women bases.

This is a necessary alternative perspective, because the synthetic cohort experience may vary from the experience of real cohorts, if change has been very recent. In addition, it is interesting to look not only at period measures, which are generally used for estimation of growth rates and projections, but also at the experience of real cohorts, over the last 30 years or so. All of these rates were done for calendar years, rather than for years before the survey.

The 3-year moving average rates are presented in table 3.1. Even after smoothing, the rates (births per 1000 woman-years of exposure) still show substantial fluctuations from year to year, of 10–20 points in the rates. These fluctuations show no relationship with rounded years (eg those ending in 0 or 5) nor do all age groups show the same pattern of fluctuations, suggesting that they are probably random. Indeed, fluctuations of this size lie within the sample errors for these rates. Despite this element of random variation, we nevertheless find that from the earlier period to the more recent years, several age groups had small downward trends. The 40–44 age group declined from a rate of approximately 150 in the early 1970s to one of about 130, while the 35–39 group declined from about 230 in the late 1960s to about 175, and the 30–34 age group from about 270 (prior to the 1970s) to about 240. The 15–19 age group oscillated from rates in the mid-140s to about 130 during the 1960s and again during the 1970s, making it difficult to quantify any overall trend. The 20–24 group was roughly stable, while the 25–29 group had a relatively small decline from a rate of over 280 in most years before 1973 to about 250 in 1978.

Figure 3.2 shows the rough shape of the schedule of fertility rates for four years, 1977, 1972, 1967 and 1962, spread out over the last 20 years. This figure emphasizes that most of the fertility change occurred at older ages, that is, above age 30, and also suggests that, at least at these older ages, some small declines had occurred even before the early 1970s.

Table 3.1 Single-year age-specific fertility rates (three-year moving average for all years except 1978)

Age group	1978	1977	1976	1975	1974	1973	1972	1971	1970	1969	1968	1967	1966
15–19	129	130	133	143	144	145	139	137	133	127	130	129	138
20–24	273	256	248	264	268	273	267	259	268	270	269	264	258
25–29	252	266	273	283	285	287	279	282	289	289	283	282	296
30–34	224	236	248	252	262	264	264	266	271	277	267	259	249
35–39	150	175	192	208	207	216	195	212	215	232	229	235	260
40–44	122	133	133	138	143	151	150	155					
45–49	48	59	75										

Age group	1965	1964	1963	1962	1961	1960	1959	1958	1957	1956	1955	1954
15–19	145	149	147	140	143	157	164	167	152	134	126	121
20–24	271	266	275	262	263	263	264	255	239	230	243	272
25–29	295	289	279	273	294	286	307	281	288	253		
30–34	272	285	292	279	260							

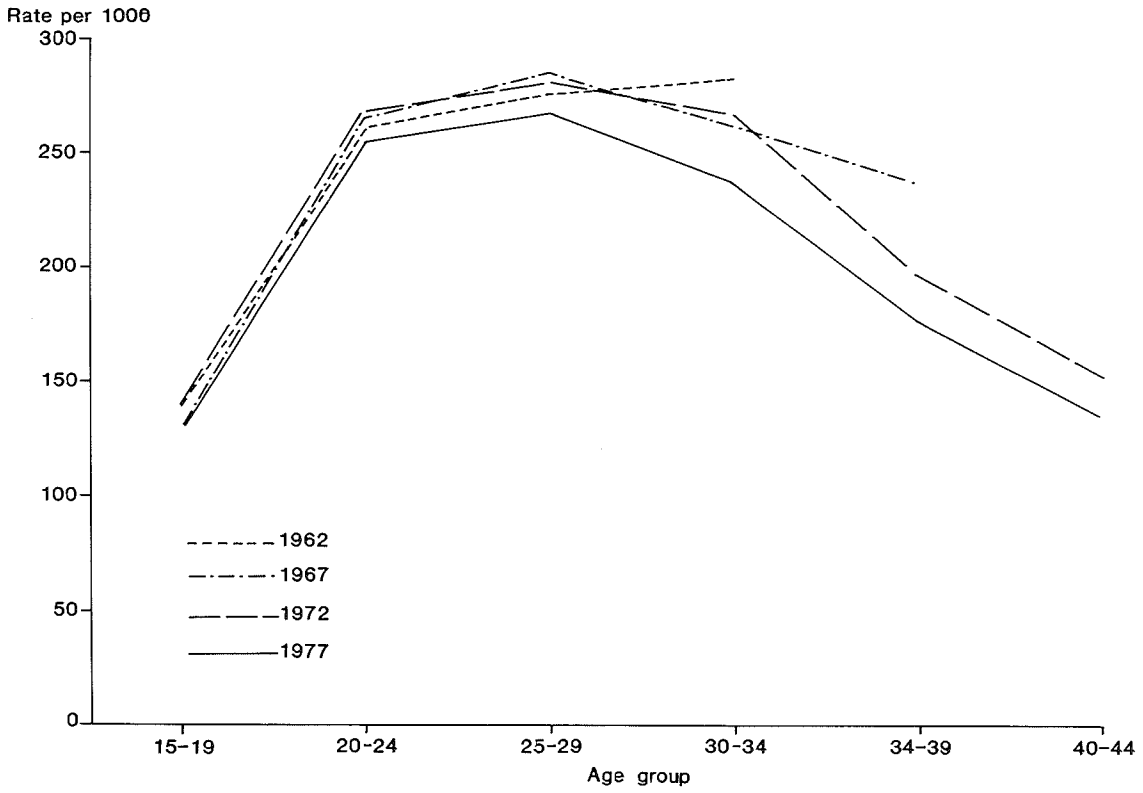

Figure 3.2 Age-specific fertility rates centred on four calendar years over the last 20 years (1962, 1967, 1972, 1977) (*Source*: table 3.1)

Rates for 5-year periods show the broader trends, and are in some ways preferable, because they further reduce the effect of sampling variations. As seen in table 3.2, irregular fluctuations are fewer, and they occur mainly at ages 15–19 and 20–24. These rates confirm that most of the fertility change occurred at ages 30–44, a decline of about 14 per cent for ages 35–44, in the last 10 years, and about 6 per cent at ages 30–34. In addition, small declines occurred at ages 35–39, in the late 1960s, and at ages 30–34, in the early 1960s. Analysis of trends is sharply curtailed by censoring of the sample, however, with the loss of a 5-year age group for each 5-year period gained in the past. Total fertility rates (TFR) were calculated for the last four 5-year periods, assuming that the missing rate for a given age–period group was the same as that of the adjacent age–period group. Under these assumptions, the average family size declined from 7.2 children in 1960–4 to 6.5 children in 1975–9. This is a total decline of 0.7 child or about 10 per cent over the whole period, but most of this change occurred between 1970–4 and 1975–9 (0.45 child, or 6.5 per cent).

Cohort–period rates (table 3.3) for all women show a similar trend, with about the same amount of change in the last 10 years, but a somewhat smaller decline over the 20-year period. Again, most of the decline occurred above age 30, and at ages 15–19. There is no strong systematic displacement of births that fits the 'Potter' pattern, suggesting that the observed decline is not entirely spurious.

Marriage and fertility

Fertility decline within marriage is much smaller (table 3.4). A decline of 0.3 child, or 3.4 per cent in the total marital fertility rate (TMFR) occurred

Table 3.2 Age-specific fertility rates and total fertility rates (TFR) for five-year calendar periods

Age group	Period					Percentage change		
	1975–9	1970–4	1965–9	1960–4	1955–9	1970/4–1975/9	1965/9–1970/4	1960/4–1965/9
15–19	137	141	131	148	151	−2.8	+7.6	−11.5
20–24	258	267	265	270	244	−3.8	+0.8	−1.9
25–29	275	286	291	286	275	−3.8	−1.7	+1.7
30–34	249	265	266	281		−6.0	0.0	−5.3
35–39	184	213	237			−13.6	−10.1	
40–44	133	155				−14.2		
45–49	61							
TFR[a]	6.49	6.94	7.03	7.19	7.02	−6.5	−1.3	−2.2

[a]Children per woman.

Table 3.3 Cohort-period age-specific fertility rates for five-year periods

Age group	Central age	Period					Percentage change		
		1975–9	1970–4	1965–9	1960–4	1955–9	1970/4–1975/9	1965/9–1970/4	1960/4–1965/9
15–19	15	51	71	63	74	86	−28.2	+12.7	−14.9
20–24	20	222	224	216	228	207	−0.9	+3.7	−5.3
25–29	25	272	276	279	275	262	−1.4	−1.1	+1.5
30–34	30	263	280	289	289		−6.1	−3.1	0.0
35–39	35	214	243	246			−11.9	−1.2	
40–44	40	164	179				−8.4		
45–49	45	92							
TFR[a]		6.39	6.83	6.82	6.92		−6.4	0.0	−1.4

[a]Children per woman.

Table 3.4 Marital age-specific fertility rates (within marriage) and total marital fertility rates (TMFR) for five-year periods

Age group	Period					Percentage change		
	1975–9	1970–4	1965–9	1960–4	1955–9	1970/4–1975/9	1965/9–1970/4	1960/4–1965/9
15–19	349	327	307	304	311	+ 6.7	+ 6.5	+ 1.0
20–24	311	316	317	311	295	− 1.6	0.0	+ 2.0
25–29	294	306	306	303	293	− 3.9	0.0	+ 1.0
30–34	267	278	277	289		− 4.0	0.0	− 4.2
35–39	199	227	251			− 12.3	− 9.6	
40–44	146	169				− 13.6		
45–49	74							
TMFR[a]	8.20	8.49	8.51	8.51	8.41	− 3.4	0.0	0.0

[a]Children per woman married continuously between ages 15–49.

Table 3.5 Cohort-period marital age-specific fertility rates and total marital fertility rates (TMFR) for five-year periods

Age group	Central age	Period					Percentage change		
		1975–9	1970–4	1965–9	1960–4	1955–9	1970/4–1975/9	1965/9–1970/4	1960/4–1965/9
15–19	15	346	322	304	311	314	+ 7.5	+ 5.9	− 2.3
20–24	20	329	325	315	305	306	+ 1.2	+ 3.2	+ 3.3
25–29	25	304	303	306	301	288	+ 0.3	− 1.0	+ 1.7
30–34	30	279	295	300	301		− 5.4	− 1.7	− 0.3
35–39	35	231	257	258			− 10.1	− 0.4	
40–44	40	178	194				− 8.2		
45–49	45	105							
TMFR[a]		8.86	9.01	8.91	8.88		− 1.7	+ 1.1	+ 6.3

[a]Children per woman married continuously between ages 15–49.

within the most recent 10-year period, the 1970s. Again, this small decline was concentrated at ages over 35, but a small increase occurred within marriage, at ages 15–19. Clearly, these results suggest that the fertility decline at ages 15–19 resulted from a rise in the age at marriage, and not from a decline within marriage. Cohort–period fertility rates within marriage (table 3.5) show almost no fertility decline, even in the recent 10-year period, when the TMFR is considered. This is so, despite small declines above age 30, mainly because marital fertility at older ages has proportionally less weight than general fertility in a summary fertility measure (such as the TMFR and the TFR).

A decomposition of the change in the TFR from 1970–4 to 1975–9 into three components, that due to change in marital exposure, that due to change in marital fertility rates and an interaction term (Kitagawa 1964), confirmed that most of the fertility decline was due to declines in marital exposure, especially at ages 15–19. Our measure of marital exposure is not simply proportions ever married, but years spent married, related to the total number of years lived during the period concerned. It therefore incorporates not only age at marriage but also dissolution.

Although the analysis of nuptiality (chapter 2) shows little change in the overall index, the singulate mean age at marriage (SMAM), it is nevertheless found that the ages by which 10, 25 and 50 per cent of women had married had increased somewhat, over time from the cohort aged 35–39 to that aged 15–19 at survey:

Per cent married	Age–cohort				
	15–19	20–24	25–29	30–34	35–39
10	15.5	15.1	14.9	14.4	14.5
25	16.9	16.4	16.3	16.1	15.9
50	18.6	18.2	18.3	18.0	17.9

Source: chapter 2, table 2.2

In addition, the proportion of time since first marriage lost because of dissolution of marriages has increased over time especially at ages 20–24 and 30–34. The proportion of women who were ever married, but are not currently married, was estimated from the marriages history for the mid-points of the two recent 5-year periods:

Period	At age					
	15–19	20–24	25–29	30–34	35–39	40–44
1972 June	1.6	3.9	7.8	4.8	9.9	10.1
1977 June	2.1	6.7	7.1	7.1	8.7	11.6

These small increases in the proportion with dissolved unions which occured between 1972 and 1977 could have also contributed to the decline in the total fertility rate.

Apart from period marital fertility rates, it is also important to look at fertility rates for duration groups, both at the national level and according to age at first marriage. Marital duration is defined as the number of years which have elapsed since the year of the first marriage. In this analysis we group duration into 5-year categories (0–4, 5–9, . . . , 30–34 years since the first marriage). Duration–specific rates are presented in tables 3.6 and 3.7. At the national level we observe that the highest rate of childbearing occurs during the first 10 years of marriage, with a gradual decline from this peak, to older marital durations, but even at durations 25–29 and 30–34, the rate of childbearing is not insignificant (table 3.6). The rate of childbearing during the first 10 years of marriage has remained more or less stable from the 1960s to the date of the survey, 1979–80. During the 1970s a small decline occurred at duration 10–14 years (6.8 per cent), however, and progressively larger declines occurred above that duration. In addition, from the late 1960s to the early 1970s some decline occurred at the oldest duration group represented (20–24). When cumulative fertility, eg up to duration 15, 20, 25 and 30 years, is considered, we find negligible change up to duration 15, but an increasing percentage change at longer durations, which is also reflected in a larger absolute decline. Cumulative fertility up to marital duration 25 (ie nearly completed fertility) declined in the

Table 3.6 Duration-specific marital fertility rates for durations 0–34, over the period 1960–79

Duration groups	1975–9	1970–4	1965–9	1960–4	Percentage change	
					1970/4–1975/9	1965/9–1970/4
0–4	317	315	310	309	+ 0.1	+ 1.6
5–9	294	292	293	301	+ 0.1	0.0
10–14	259	278	286	268	− 6.8	− 2.8
15–19	197	235	244	285	− 16.2	− 3.7
20–24	156	192	245		− 18.8	− 21.6
25–29	89	132			− 32.6	
30–34	49					
$\sum_{0}^{15}$	4.35	4.43	4.45	4.39	− 1.8	0.0
$\sum_{0}^{20}$	5.34	5.60	5.67	5.82	− 4.6	− 1.2
$\sum_{0}^{25}$	6.12	6.56	6.90		− 6.7	− 4.9
$\sum_{0}^{30}$	6.57	7.22			− 9.0	

Table 3.7 Duration-specific marital fertility rates, by age at first marriage

Duration of marriage	Period					Percentage change	
	1975–9	1970–4	1965–9	1960–4	1955–9	1970/4–1975/9	1965/9–1970/4
A Age at marriage < 16 years				$N^a = 1235$			
0–4	321	305	301	309	318	+ 5.2	+ 1.3
5–9	276	307	293	306	266	− 10.1	+ 4.8
10–14	279	281	286	250	260	− 0.7	− 1.7
15–19	209	250	235	268		− 16.4	+ 6.4
20–24	178	189	216			− 5.8	− 12.5
25–29	105	104				+ 1.0	
30–34	65						
$\sum_0^{15}$	4.38	4.47	4.40	4.33	4.22	− 2.0	+ 1.6
$\sum_0^{20}$	5.43	5.72	5.58	5.67		− 5.1	+ 2.5
B Age at marriage 16–18 years				$N^a = 2084$			
0–4	317	325	299	302	306	− 2.5	+ 8.7
5–9	298	281	300	302	293	+ 6.0	− 6.3
10–14	262	286	313	278		− 8.4	− 8.6
15–19	214	249	256			− 14.1	− 2.7
20–24	162	198				− 18.2	
25–29	79						
$\sum_0^{15}$	4.39	4.46	4.56	4.41		− 1.5	− 2.2
$\sum_0^{20}$	5.46	5.71	5.84			− 4.4	− 2.2
C Age at marriage 19–20 years				$N^a = 811$			
0–4	332	319	344	308	282	+ 4.1	− 7.3
5–9	299	310	273	298	281	− 3.5	+ 13.6
10–14	232	283	232	281		− 18.0	+ 22.0
15–19	178	211	230			− 15.6	− 8.3
20–24	123	175				− 29.7	
25–29	87						
$\sum_0^{15}$	4.32	4.56	4.25	4.44		− 5.3	+ 7.3
$\sum_0^{20}$	5.21	5.62	5.40			− 7.3	+ 4.1

[*Table continues*]

Table 3.7 (*cont*)

Duration of marriage	Period					Percentage change	
	1975–9	1970–4	1965–9	1960–4	1955–9	1970/4–1975/9	1965/9–1970/4
D Age at marriage 20+ years				$N^a = 813$			
0–4	299	305	320	327	332	−2.2	−4.7
5–9	303	280	300	286		+8.2	−6.7
10–14	245	250	259			−2.0	−3.5
15–19	156	180				−13.3	
20–24	115						
$\sum_{0}^{15}$	4.24	4.18	4.40			+1.4	−5.0
$\sum_{0}^{20}$	5.02	5.08				−1.2	

[a]Number of women in the group.

1970s by 0.44 child (−6.7 per cent) while cumulation to duration 30 showed an absolute decline of 0.65 child (−9.0 per cent). These estimates of recent fertility decline contain some of the effect of any change in age at marriage, because women at given durations will, on average, be somewhat older if age at marriage is higher. However, even so, they indicate that more change occurred within marriage than did marital fertility rates. The analysis of cohort–duration rates modifies the above conclusions. The 30–34 duration cohort has unexpectedly low fertility at duration 5–14 and then quite high fertility above duration 15, thereby showing large 'declines' above duration 14, in the period duration rates (table 3.6). However, when cohort–duration rates are cumulated, this removes the probably spurious calendar-year period pattern, showing a smaller amount of decline, and this decline is restricted to change from duration cohort 25–29 to 20–24:

Cumulated fertility to duration	Duration cohort			Percentage change	
	20–24 (1)	25–29 (2)	30–34 (3)	(3) to (2)	(2) to (1)
20	5.45	5.76	5.42	+6.3	−5.4
25	6.19	6.65	6.55	+1.5	−6.9
30		7.09	7.10	0.0	

Duration-specific rates for age at first marriage subgroups show mixed results. Fertility is negatively related with age at first marriage, but it is only marriage at age 19 or older that makes any difference to fertility. Even this differential is relatively small, however, suggesting that age at marriage is not an important determinant of the overall level of marital fertility. However, the percentage decline in estimates of completed fertility after first marriage (up to duration 20 years) is intermediate between that of the TFR and the TMFR, suggesting that fertility decline according to marriage duration is somewhat more important than that estimated by the period measure of marital fertility.

Somewhat unexpectedly, the oldest age at marriage group (20+) has the smallest fertility decline in the last decade, although it still has the lowest level of fertility. This may be due to the fact that its fertility is already on the low side, and also to the occurrence of some decline over the 1965–9 to 1970–4 period, when the other groups had either fertility increases or much smaller declines. All age-at-marriage groups have about the same level of fertility in the first decade of marriage, however. But it is also noticeable that the oldest age-at-marriage subgroup had some decline early in marriage, at duration 0–4 years, from the late 1960s up to the year of the survey, suggesting that spacing of births may be increasing in frequency for this age-at-marriage group.

Summary

In summary, a small fertility decline was observed in the recent decade, about 0.5 child in the TFR, with a smaller decline of about 0.2 child in the decade before the last. Some of this change was due to rising age at marriage, affecting fertility under age 20, but the rest of it occurred above age 30, mainly within marriage. Despite the recency and small size of this fertility decline, cohort–period rates show about the same change as age–period rates. This is less true of marital fertility, however, because although fewer 15–19 year olds marry at young ages, their fertility rate had increased over time. Nevertheless, the plausibility of the age pattern of the fertility decline and the steadiness of the declines in the age-specific rates for single calendar years, for ages above 30, increase the reliability of the observed trend.

3.5 RECENT FERTILITY TRENDS AMONG SOCIO-ECONOMIC SUBGROUPS[2]

Region

Differences across regions in the level of fertility during the 1975–9 period are relatively small, with only one exception (table 3.8). Greater Accra has a substantially smaller average family size, about 5 children per woman, compared to 7.1 children in Western/Central region, and 6.5–6.7 children in all regions. Recent trends do vary more, however. Unexpectedly, Greater Accra had only a small decline in the last decade, 3.4 per cent. Its already low level in 1970–4 (a TFR of 5.2 children) may account for this rather small change. Most other regions have small declines as well, ranging from 2.6 to 5.2 per cent, with the exception of Northern/Upper region, where the decline is unexpectedly large −16 per cent.

However this latter region also had a quite large rise in fertility from the 1965–9 to 1970–4 period, 11 per cent. In contrast, other regions either did not change much or had small declines (Western/Central, Eastern and Ashanti/Brong Ahafo). The combined effect of changes from the late 1960s to the late 1970s is that Greater Accra and Volta remained about the same, Northern/Upper had a decline of 0.4 child, and other regions had declines of 0.5–0.7 child.

However analysis of the complete set of fertility rates suggests that some regions may have suffered from misreporting errors, affecting any conclusions about trends. One of the more commonly observed types of error is misreporting of dates of birth of children. Usually births are shifted from younger ages to somewhat older ages, resulting in too low fertility rates at young ages (15–19, 20–24) and too high rates at older ages (25+) relative to what they would have been. Because this shifting of births occurs mainly among older women (40+, usually, but occasionally 35–39 also), it produces spurious levels of fertility in some periods before the survey. The typical result is heaping in one or both of two periods, 5–9 and 10–14 years before survey. This heaping may also coincide with movement of births backwards, from 0–4 to 5–9 years before the survey. This type of error is known as the 'Potter' type of misreporting (Potter 1977). An alternative explanation for the resulting fertility trend (rising fertility from 15 or more years before survey to the 5–14 years period, then declining fertility up to 0–4 years before the survey) can be a real rise in fertility, combined with a real decline in the most recent period. This is an unusual combination, however, and each population has to be individually examined for the applicability of these two hypotheses.

The case of Northern/Upper region is especially striking: age groups over 30 have quite low fertility at young ages (15–24) compared to women under age 30, and then have substantially higher fertility at older ages. Displacement of births, as described above, could account for the fertility trend observed for this subgroup – a rise from 6.8 to 7.7 children (TFRs), from 1960–4 to 1970–4, then a decline to 6.5 children in 1975–9. This 'Potter' pattern apparently exists in Volta and Ashanti/Brong Ahafo regions, but is much weaker or practically non-existent in Western/Central, Greater Accra, and Eastern regions. In these last three regions, however, there are some erratic fluctuations, probably due to the relatively small sample sizes of regions.

It is also possible that a partial explanation of this pattern of misreporting can occur as a result of two different real changes: for example, a real rise in fecundity (eg from improved health of mothers, or from a breakdown in traditional

[2] Fertility rates for labour-force-related subgroups (woman's place of work, her occupation, and husband's occupation) are presented in appendix 2 of this chapter, for interested readers, but these are not discussed in this section.

Table 3.8 Age-specific fertility rates and total fertility rates (TFR) for six major regions

Region/ age group	Period				Percentage change	
	1975–9	1970–4	1965–9	1960–4	1970/4–1975/9	1965/9–1970/4
Western/Central		N[a] = 921				
15–19	172	170	154	169	+ 1.2	+ 10.4
20–24	277	276	269	247	+ 0.4	+ 2.6
25–29	279	288	321	287	− 3.1	− 10.3
30–34	291	319	280	308	− 8.8	+ 13.9
35–39	227	195	277		+ 16.4	− 29.6
40–44	139	176			− 21.0	
45–49	40					
TFR	7.13	7.32	7.59	7.52	− 2.6	− 3.6
Greater Accra		N[a] = 729				
15–19	83	110	87	128	− 24.5	+ 26.4
20–24	206	199	252	233	+ 3.5	− 21.0
25–29	248	244	274	277	+ 1.6	− 10.9
30–34	229	233	230	279	− 1.7	+ 1.3
35–39	172	184	121		− 6.5	+ 52.1
40–44	69	73			− 5.5	
45–49	0					
TFR	5.04	5.22	5.19	5.56	− 3.4	+ 0.6
Eastern		N[a] = 1011				
15–19	131	140	137	148	− 6.4	+ 2.2
20–24	244	266	276	328	− 8.3	− 3.6
25–29	301	291	297	265	+ 3.4	− 2.0
30–34	245	256	296	233	− 4.3	− 13.5
35–39	174	204	229		− 14.7	+ 10.9
40–44	149	151			− 1.3	
45–49	97					
TFR	6.71	7.03	7.42	7.26	− 4.6	− 5.3
Volta		N[a] = 599				
15–19	137	124	154	147	+ 10.5	− 19.5
20–24	304	290	254	309	+ 4.8	+ 14.2
25–29	301	268	289	310	+ 12.3	− 7.3
30–34	235	283	263	360	− 17.0	+ 7.6
35–39	177	200	185		− 11.5	+ 8.1
40–44	111	153			− 27.5	
45–49	60					
TFR	6.63	6.89	6.79	7.62	− 3.8	+ 1.5
Ashanti/Brong Ahafo		N[a] = 1959				
15–19	145	131	135	165	+ 10.7	− 3.0
20–24	269	282	277	291	+ 4.6	+ 1.8
25–29	287	295	304	313	− 2.7	− 3.0
30–34	251	258	260	276	− 2.7	− 0.8
35–39	170	215	260		− 20.9	− 17.3
40–44	123	135			− 8.9	
45–49	57					
TFR	6.51	6.87	7.14	7.49	− 5.2	− 3.8

[*Table continues*]

Table 3.8 (*cont*)

Region/ age group	Period				Percentage change	
	1975–9	1970–4	1965–9	1960–4	1970/4–1975/9	1965/9–1970/4
Northern/Upper		N[a] = 906				
15–19	144	170	125	118	−15.3	+36.0
20–24	252	276	250	193	−8.7	+10.4
25–29	240	312	242	254	−23.1	+28.9
30–34	238	242	250	270	−1.6	−3.2
35–39	186	254	233		−26.8	+9.0
40–44	163	212			−23.1	
45–49	80					
TFR	6.52	7.73	6.96	6.80	−15.7	+11.1

[a]Number of women.

fertility-restraining practices such as post-partum abstinence or prolonged breastfeeding) may occur and be combined with real fertility decline (eg from increased use of contraception). Based on broad trends of improvements in social, medical and public health spheres, and in the likely, though undocumented, trend of reductions in the duration of post-partum abstinence and breast-feeding, a rise in fertility seems plausible. This would apply especially to rural areas, which were more disadvantaged. However, depending on the region, the plausibility of a recent decline in fertility is more questionable. Three regions, Greater Accra, Eastern and Volta, have significant levels of current use (20, 16 and 15 per cent of currently married women, respectively). However, all other regions have very low levels of contraceptive use. While the small recent fertility declines in these three regions and the comparatively low level of Greater Accra can be explained by their level of contraceptive use, this would not apply to other regions which had recent declines, especially Northern/Upper (−15.7 per cent) and Ashanti/Brong Ahafo (−5.2 per cent), where use was 1.2 and 7.6 per cent, respectively.

Another possible factor which could have caused recent fertility decline is heavy out-migration of males, either to other regions or to other countries. The sex ratios of males to females, over the age range 15–49, was obtained from the household population of the GFS. These indicate that Ashanti/Brong Ahafo region had a particularly high deficit of males, and this could be an important reason for their decline (the ratio was 730 men per 1000 women). No other region had as low a ratio. Northern/Upper's ratio was 933 per 1000 women, and other regions had ratios of about 900 per 1000. In any case, these overall ratios do not reflect the more crucial variable, duration of continuous absence of men from the particular region: clearly absences will only have a noticeable effect on fertility if the absence is quite long.

Comparison of regional TFRs at different points in time supports some of our conclusions above concerning both national and regional trends. Estimated (1960 Census and 1968 rates, based on the 1970 Census) or reported (GFS, for 1975–9) total fertility rates are shown in table 3.9. At the national level this 'external' comparison shows a small fertility rise in the 1960s and a small decline in the 1970s, around 0.5 child in the latter case. Internal estimates (table 3.2) agree with the small decline in the 1970s, but would place the TFR for the early 1960s at a higher level, about 7 children, and therefore would suggest that a more or less constant level of fertility existed between 1960–70. A fairly large decline is found in Ashanti/Brong Ahafo region, from both internal and external trends. Trends from the two sources disagree, however, in regard to the Volta region. The external trend shows a rise in fertility, followed by a small recent decline, while internal trends alone show decline throughout the period. However, since some displacement of births apparently occurred in the GFS data for this region, the internal trends are probably showing an exaggerated amount of decline. The two trends also agree quite well for

Table 3.9 Regional trends in total fertility rates from 1960–79/80, based on censuses and surveys

Region	1960 Census[a]	1968 based on 1970 Census[b]	1975–9 GFS
Total population	6.6	6.7–7.2	6.5
Western/ Central	6.6	6.6–7.0	7.1
Greater Accra	6.6	6.0–6.4	5.0
Eastern	7.2	6.8–7.4	6.7
Volta	6.1	6.6–7.0	6.6
Ashanti/ Brong Ahafo	7.3–7.5	7.8–9.0	6.5
Northern/ Upper	5.5	5.1–7.2	6.5

[a]From Page and Coale (1972).
[b]From Gaisie (1976).

Eastern region, showing a small decline of about 0.5 child.

Fertility trends in Northern/Upper region are more difficult to ascertain than those of other regions. The degree of uncertainty about fertility in this region is seen in the wide range given by Gaisie for 1968 (5.1–7.2 children). If the mid-point of this range is taken (about 6 children) then both external sources and the GFS agree in showing a fertility increase prior to 1970. However, the rise shown in the GFS is larger than that from external sources. Some real increase in fertility is plausible, given the possibility of improvements in fecundity, and reduction in the fertility-restraining effect of cultural factors (eg prolonged breastfeeding, abstention and polygamy). However an additional factor that supports the alternative hypothesis of mis-reporting is the occurrence of a substantial decline in fertility from 1970–4 to 1975–9 (from 7.73 to 6.52 children, table 3.8). Such a decline is hard to explain, given the low level of contraceptive use. This combination of the rise up to 5–9 years before the survey with a decline from this period to 0–4 years before survey fits the Potter hypothesis of date misreporting quite well. On balance, therefore, we conclude that some mis-reporting of dates did occur in Northern/Upper region, affecting fertility trends over the last 20 years. A small rise is nevertheless plausible, but it was probably much less than that shown in GFS data (0.9 child). A rough estimate of the recent level of fertility can be obtained by averaging TFRs over the last four 5-year periods, the estimate being 7 children per woman.

Disagreements between the trends observed in table 3.8 and those in table 3.9 occur for Western/ Central and Greater Accra regions. The 1960 census estimate is lower than the GFS estimate for 1960–4, for Western/Central region, but it is higher for Greater Accra. Since the 'Potter' type of error probably did not occur in Western/Central region, it cannot explain the difference. In the case of Greater Accra, the external trend (a decline from 6.6 in 1960 to 6.0 in 1968 and 5.0 in 1975–9), disagrees with GFS results, since the latter show stability at a level of about 5.0 children, from the 1960s to the late 1970s. The estimate of 6.6 children from the 1960 census seems implausibly high. Two factors which could help to explain the GFS trend for Greater Accra are:

1 rural migrants from the 1960s onwards have raised the level of fertility, more or less cancelling out any true decline of life-time urban residents, in the aggregate; and
2 the GFS sample for this region may not be representative of its population at earlier points in time, if migration flows were substantial and moved in both directions.

Summary

A comparison of the GFS data with data from external sources has been an integral part of data quality evaluation in the WFS. However, when estimates vary, especially in the way these do for Greater Accra, it is very difficult to decide betwen the estimates of two sources. The quality of the 1960 and the 1970 censuses has been found to be low (Ewbank 1981), but these sources show a trend for Greater Accra which is at least intuitively more plausible than the trend shown by the GFS. Furthermore, estimates from the external sources have generally been derived by using indirect estimation techniques, which are themselves based upon certain assumptions about fertility schedules and the pattern of omissions in censuses or surveys. It is possible for the indirect procedures to provide a reasonable estimate for one region and not for the other. The absence of any trend and very low levels of fertility in the GFS for Greater Accra could imply omissions in this region over all periods as a possible explanation, when one compares GFS results with the results of the external sources. This also seems

implausible. As mentioned above, an alternative explanation is that incoming rural migrants depressed the magnitude of any fertility decline, and raised the level of fertility in Greater Accra to a degree that absorbed changes in fertility.

To sum up the regional trends, we suggest a decline well established for Eastern region, a modest decline for Greater Accra, almost constant fertility for Western/Central region, and considerable uncertainty about fertility trends in Volta, Ashanti/Brong Ahafo and Northern/Upper regions.

Place of residence

The interest in analysing fertility according to current place of residence is mainly based on the expectation that urban, as opposed to rural residence, places constraints on childbearing. Housing is more expensive and less spacious, and the direct and indirect costs of raising children are greater in urban areas. Child-care and schooling costs more, and the opportunity cost of women working is also greater in urban areas, while in contrast, in rural areas, children become economically productive at an earlier age. Apart from expected differences in the level of fertility at any one point in time, we would also expect that any declines in fertility would begin first and be larger in urban areas, where the trend towards increasing modernization and westernization is likely to be earlier and more rapid. We examine the fertility rates by different places of current residence with two aims: first, to see whether the Ghanaian pattern conforms with the commonly observed relationships, and secondly, to describe these differentials and trends for Ghana itself.

The urban–rural comparisons based upon the current place of residence assume that fertility behaviour of a woman is affected primarily by her current place of residence and not by the type of place she might have lived in previously, if that was different from her current type of place of residence. The rural–urban comparisons would be affected by the proportion of rural women who were migrants from urban areas, and the proportion of urban women who were migrants from rural areas, and the extent to which the migrant group manifests the characteristics of their place of origin more than their current place of residence. Since women from rural areas migrate to urban areas in a greater number and fertility in rural areas is generally higher, the urban–rural differentials based upon current place of residence are attenuated.

We present the total fertility rates for 5-year periods over the last 20 years in table 3.10 for urban and rural areas. More detailed age-specific rates are shown in table 3.11. Urban areas may be divided into two categories: 'Major Urban', towns with more than 10 000 population and all regional capitals; and 'Other Urban', towns with 5000–10 000 people. In addition, we also include rates for the Greater Accra region, and for the total urban population, to facilitate comparisons. It is important to remember that only 73 per cent of Greater Accra region is classified as Major Urban, while about 15 per cent is considered to be Other Urban and 12 per cent is rural. Among all women, two-thirds live in rural areas, and about 17 per cent live in each of the two urban types of place of residence.

The results for Ghana largely fit the expected patterns. At all periods of time urban areas have a lower level of fertility than rural areas, and typically Major Urban residents have lower fertility than Other Urban residents. In addition, Major Urban areas have had the largest fertility decline, about 1.6 children, from the early 1960s to the late 1970s, and they are followed by the Other Urban and rural areas, with a decline of

Table 3.10 Total fertility rates, for the period 1960–79, for place of residence subgroups

Subgroup	Period				Number of women
	1975–9	1970–4	1965–9	1960–4	
All urban	5.78	6.37	6.45	6.73	2079
Major urban	5.23	6.15	6.06	6.81	1060
Other urban	6.37	6.65	6.81	6.70	1019
Rural	6.85	7.20	7.26	7.34	4046
Greater Accra	5.03	5.21	5.19	5.56	729

Table 3.11 Age-specific fertility rates and total fertility rates (TFR), by type of residence

Residence/ age groups	Period				Percentage change	
	1975–9	1970–4	1965–9	1960–4	1970/4–1975/9	1965/9–1970/4
Urban						
15–19	104	125	111	148	−16.8	+12.6
20–24	228	244	268	258	−6.6	−9.0
25–29	258	270	286	294	−4.4	−5.6
30–34	230	257	245	267	−10.5	+4.9
35–39	161	184	186		−12.5	−1.1
40–44	117	135			−13.3	
45–49	58					
TFR	5.78	6.37	6.45	6.73	−9.3	−1.2
Rural						
15–19	157	150	143	148	+4.7	+4.9
20–24	275	279	264	275	−1.4	+5.7
25–29	284	294	293	282	−3.4	+0.0
30–34	258	269	274	285	−4.1	−1.8
35–39	194	224	253		−13.4	−11.5
40–44	139	162			−14.2	
45–49	62					
TFR	6.85	7.20	7.26	7.34	−4.9	−0.8

about 0.3–0.5 child. Apparently residence in smaller towns has relatively much less impact on the conditions influencing childbearing, but residence in larger towns, cities and regional capitals has a much greater effect on these conditions. This is a plausible finding, which was also reached in regard to other developing countries (Casterline *et al* 1984; United Nations 1983). When all urban areas are grouped together, the trends are averaged, and urban areas overall show a decline of about one child, in contrast with half that decline in rural areas.

While about half of the fertility decline of Major Urban areas occurred during the 1960s (which is weakly reflected in the trend for Greater Accra region), neither Other Urban nor rural women showed any decline in this early period. The latter two categories experienced the greater part of their small decline during the 1970s. However Major Urban residents also had a substantial decline in the recent decade, about 0.9 child. Interestingly, Greater Accra region did not match this recent decline; this may be due to an interplay of the trends for the different residence subgroups within it, although its already low level may also account for its relative stability.

In general, the residence differentials and the different trends among the residence subgroups are quite plausible, and they greatly increase the reliability of the national trend, which shows the average of these three residence groups, a small decline of about 0.7 child in the last 20 years, most of it occurring in the last decade.

Education

As with the type of place of residence, educational differentials are expected to approximate a commonly found pattern. Typically, fertility declines as education rises, and in addition, more educated groups, being the more modern and more likely to change behaviour, usually are the first to experience any downward trend in fertility. It is relevant to look at differentials for both husbands' and women's education, although the former, by definition, can only be estimated for fertility within marriage, and the latter may be done both for ever-married women and for all women, single and married. For purposes of comparability, we present in table 3.13 cumulative fertility to age 35, for the last 20 years for all three types of rates, the age of 35 being chosen because of small numbers of older educated women. Age-specific rates are also presented in table 3.12 for women,

Table 3.12 Age-specific fertility rates and total fertility rates (TFR), by level of respondent's education and calendar period

Respondent's education/ age group	Period				Percentage change	
	1975–9	1970–4	1965–9	1960–4	1970/4–1975/9	1965/9–1970/4
No schooling		N[a] = 3152				
15–19	175	174	161	156	+ 0.6	+ 8.1
20–24	276	289	275	270	− 4.5	+ 5.1
25–29	280	296	292	285	− 5.4	+ 1.4
30–34	255	271	272	272	− 5.9	− 0.4
35–39	190	220	240		− 13.6	− 8.3
40–44	137	162			− 15.4	
45–49	63					
TFR	6.88	7.38	7.33	7.24	− 6.8	+ 0.7
Primary		N[a] = 648				
15–19	182	165	127	153	+ 12.1	+ 29.9
20–24	282	242	261	314	+ 16.5	− 7.3
25–29	284	295	308	309	− 3.7	− 4.2
30–34	257	265	245	281	− 3.0	+ 8.2
35–39	163	204	237		− 20.1	− 13.9
40–44	153	155			− 1.3	
45–49	61					
TFR	6.91	6.94	6.97	—	− 0.4	− 0.3
Incomplete middle		N[a] = 790				
15–19	139	167	118	196	− 16.8	+ 41.5
20–24	266	250	249	323	+ 6.4	+ 0.4
25–29	251	274	304	286	− 8.4	− 9.9
30–34	209	218	266	281	− 4.1	− 18.0
35–39	136	213	237		− 36.2	− 10.1
40–44	133	155			− 14.2	
45–49	61					
TFR	5.98	6.69	6.95	—	− 10.6	− 3.7
Complete middle + secondary and higher			N[a] = 790			
15–19	94	88	74	86	+ 6.8	+ 18.9
20–24	225	235	225	181	− 4.3	+ 4.4
25–29	268	239	247	283	+ 12.1	− 3.2
30–34	226	228	221	281	− 0.9	+ 3.2
35–39	170	131	27		+ 29.8	− 44.7
40–44	83	155			− 46.5	
45–49	61					
TFR	5.64	5.69	6.10	—	− 0.9	− 6.7

[a]Number of women.

and in table 3.14 according to husband's education.

The expected pattern of a monotonic decline in fertility as education rises is not always found (table 3.13). Instead, in several instances, a curvilinear pattern is found, with rising fertility up to the primary level (1–6 years schooling), and occasionally even up to Middle-level schooling (Incomplete Middle level is equivalent to 7–9 years schooling, while Complete Middle or higher is about 10 or more years schooling), followed by a decline in fertility above that level. This curvilinear pattern is stronger, and persists up to the most recent period, when total marital fertility for husbands' education is considered. It is weaker for marital rates by women's education, and is non-existent for all-women fertility.

This curvilinear pattern has been found in many other populations (Cochrane 1979; Mosley *et al* 1982; Singh and Casterline 1985). If improvements in fecundity have been observed, due to improvements in health and medical services, the more educated are likely to benefit more from such changes, partly because they live in urban areas, and partly because they are more open to accepting modern/western changes. In the opposite direction the breakdown of traditional practices, such as post-partum abstinence and prolonged breastfeeding, begins among more educated women, and leads to shortening of the average birth interval, and an increase in fertility. Although use of contraception may also start among these groups, and the age at marriage may rise, there is frequently a time lag between these two changes. The decline in fertility above the Middle level of education shows that for the two best educated groups, the balance of these factors was re-adjusted relatively quickly. This explanation fits the case of Ghana, as found by Gaisie (1984).

Apart from the curvilinearity of the overall pattern, the size of the decline in fertility as education increases is of great interest. In the case of marital fertility between 1970–4, there is no decline until the highest level of education is reached, and this is about 0.2 child (table 3.13). However this pattern had changed by the late 1970s, to show a fertility decline from Primary to Middle level, and a further decline to the highest educated group.

Cumulative fertility among all women shows a decline even from the 'No Schooling' group, to the Primary level, for the period 1965–74, although this differential no longer existed during the recent 5-year period (table 3.13). In contrast, while little or no difference existed between the

Table 3.13 Cumulative fertility to age 35, for the period 1960–79, by education subgroups

Subgroup	Period			
	1975–9	1970–4	1965–9	1960–4
A Husband's education: marital fertility				
No schooling	5.85	6.04	5.76	5.70
Primary/Incomplete Middle	6.53	6.58	6.43	6.15
Complete Middle	6.41	6.17	6.40	6.54
Secondary+	5.74	5.71	6.23	6.23
B Women's education: marital fertility				
No schooling	5.95	6.10	6.02	5.86
Primary	6.39	6.15	6.12	6.61
Incomplete Middle	6.01	6.13	5.99	6.51
Complete Middle+	6.14	5.93	5.88	5.62
C Women's education: all-women fertility				
No schooling	4.93	5.15	5.00	4.92
Primary	5.03	4.84	4.71	5.11
Incomplete Middle	4.33	4.55	4.45	5.21
Complete Middle+	4.07	3.95	3.84	3.86

Table 3.14 Marital age-specific fertility rates and total marital fertility rates (TMFR), by husband's education and calendar period

Husband's education/ age group	Period				Percentage change	
	1975–9	1970–4	1965–9	1960–4	1970/4–1975/9	1965/9–1970/4
No schooling		N[a] = 2185				
15–19	323	302	279	268	−7.0	+8.2
20–24	297	307	299	291	−3.3	+2.7
25–29	285	316	298	301	−9.8	+6.0
30–34	265	283	275	279	−6.4	+2.9
35–39	198	230	244		−13.9	−5.7
40–44	152	175			−13.1	
45–49	81					
TMFR	8.01	8.47	8.26	8.20	−5.4	+2.5
Primary and incomplete middle			N[a] = 601			
15–19	375	380	322	365	−1.3	+18.0
20–24	354	324	347	324	+9.3	−6.6
25–29	309	314	298	291	−1.6	+5.4
30–34	268	298	318	249	−10.1	−6.3
35–39	213	238	241		−10.5	−1.2
40–44	173	114			+51.8	
45–49	(24)					
TMFR	8.58	8.46	8.32	8.04	+1.4	+1.7
Complete middle		N[a] = 1449				
15–19	361	332	357	345	+8.7	−7.0
20–24	327	331	329	352	−1.2	+0.6
25–29	304	303	327	311	+0.3	−7.3
30–34	289	267	266	300	+8.2	+0.4
35–39	198	214	277		−7.5	−22.7
40–44	113	191			−40.8	
45–49	(23)[b]					
TMFR	8.08	8.31	8.86	9.00	−2.8	−6.2
Secondary or higher		N[a] = 646				
15–19	353	340	312	329	+3.8	+9.0
20–24	282	301	345	341	−6.3	−12.8
25–29	277	261	332	319	+6.1	+8.7
30–34	236	239	257	(257)[b]	−1.3	−7.0
35–39	177	216	(263)		−18.1	−17.8
40–44	102	(130)			−21.5	
45–49	(22)					
TMFR	7.25	7.55	8.31	8.31	−4.0	−9.1

[a]Number of women.
[b]Estimated rates, in the case of 'Complete Middle' group, taken from the adjacent education groups, and in the case of 'Secondary or Higher' group, conservatively estimated to be the same as the rate for 1965–9, for the same age group.
( ) indicate fewer than 100 woman-years of exposure during the 5-year period.

Primary and Incomplete Middle levels, in earlier periods, by the late 1970s this differential was substantial, almost one child.

These changes in the differential across education groups resulted from different trends within each subgroup. Looking at all-women fertility only, we find that the No Schooling group had a small increase over time, followed by a recent decline of about 0.5 child (table 3.13). Analysis of the full array of age-specific fertility rates did not suggest that the rise was due to date misreporting. In contrast, no other education group had a fertility increase. Other better educated groups did not have much fertility decline, either, as seen both from cumulative and age-specific rates.

In general, the pattern of differentials is plausible. A curvilinear relationship between education and fertility has been found in other modernizing societies, and can be explained by the combination of changes in social, economic and cultural factors. As expected, highly educated women and women married to highly educated men, do have increasingly lower fertility than less educated groups.

The occurrence of a small decline over time in the No Schooling group, while none was found among Primary-educated women, is unexpected. Contraceptive use of efficient methods is practically non-existent among the No Schooling group (2 per cent), and is quite low among Primary-educated women (7 per cent), so that this could not be the relevant factor. On the other hand, greater internal and external migration, discussed above in regard to regional differentials, could have occurred among the No Schooling group, and could account for some of this difference in trends. The trend of small or no declines among women with primary or higher education is probably due to the balancing of the opposing factors discussed above, improved fecundity and increasing contraceptive use, combined with rising age at marriage. In the case of the best educated group of women, their lack of any noticeable decline may also be partly due to their already relatively low level of fertility.

These results suggest that fertility decline within education subgroups which is rather small, did not contribute much to national-level fertility decline. However the changing educational composition in Ghana (increasing proportions with higher education attainment) was probably a contributory cause of the small recent fertility decline at the national level.

Religion and ethnicity

Fertility differentials or differences in trends for religious or ethnic subgroups may exist if religious beliefs or cultural norms associated with these subgroups affect any of the factors associated with childbearing. In using GFS data to analyse the fertility of these subgroups, we could not analyse groups in the full detail that would have been desirable, because of sample size. The subgroups chosen were: Christian, Muslim and Traditional and No Religion. Ethnicity was classified into the following subgroups: all Akan groups, Ga-Adangbe, Ewe, Mole-Dagbani and Others (including Guans). It was felt that those who were reported as 'no religion' most likely had links with one of the various traditional religions, and it was also felt that the three Akan groups were sufficiently similar to be grouped together.

The GFS results show that the three main religious subgroups had quite similar levels of fertility in the early 1960s, but their fertility trends since then have been quite different (table 3.15). The large Christian population had a steady fertility decline throughout the 20-year period, of about 0.9 child or 13 per cent. In contrast, both of the other two groups apparently had increases in fertility from the early 1960s up to the early 1970s, followed by a decline of about 0.5 child during the last 10 years. Analysis of the detailed age-specific rates suggests that some displacement of births among older women may have occurred, causing heaping of births in the period 5–9 years ago, and producing the appearance of substantial decline from this period to the 0–4 years period before the survey. If we accept the level of fertility reported for the 1975–9 period (ie assuming that no births were shifted from this period into an earlier period, and that omission was negligible), and averaged the TFRs for the previous three 5-year periods, the amount of decline would be only about 0.3 child (about 4 per cent), for the Muslim and Traditional groups. In contrast, the Christian group's decline occurred steadily over the 20-year period, and is larger (about 0.9 child or 13 per cent, from 1960–4 to 1975–9).

These results do not agree with those from the 1971 Supplementary Enquiry (Tawiah 1984). Tawiah found that among older rural women, Muslims had about 0.8 child less than Christian women (average parity for those aged 35–49, of 5.95 and 6.77, respectively), and among urban women, a weaker differential in the same direction

Table 3.15 Age-specific fertility rates and total fertility rates (TFR), by religion subgroups and calendar period

Religion/ age group	Period				Percentage change	
	1975–9	1970–4	1965–9	1960–4	1970/4–1975/9	1965/9–1970/4
Christian		N[a] = 3992				
15–19	127	130	122	155	− 2.3	+ 6.6
20–24	247	261	267	278	− 5.4	− 2.2
25–29	271	274	298	290	− 1.1	− 8.1
30–34	253	260	271	284	− 2.7	− 4.1
35–39	170	200	233		− 15.0	− 14.2
40–44	132	147			− 10.2	
45–49	53					
TFR	6.27	6.63	6.96	7.20	− 5.4	− 4.7
Muslim		N[a] = 660				
15–19	158	153	140	154	+ 3.3	+ 9.3
20–24	286	273	256	289	+ 4.8	+ 6.6
25–29	283	303	280	270	− 6.6	+ 8.2
30–34	248	300	242	(260)	− 17.3	+ 24.0
35–39	186	261	(336)		− 28.7	
40–44	159	(183)			− 13.1	
45–49	(42)					
TFR	6.81	7.46	6.90	7.09	− 8.7	+ 8.1
Traditional		N[a] = 1472				
15–19	165	169	151	130	− 2.4	+ 11.9
20–24	278	277	265	249	+ 0.3	+ 4.5
25–29	281	304	283	283	− 7.6	− 1.9
30–34	241	259	264	278	− 6.9	− 3.1
35–39	205	222	229		− 7.7	− 3.1
40–44	129	166			− 22.3	
45–49	76					
TMFR	6.88	7.37	7.17	7.06	− 6.6	+ 2.8

[a]Number of women.
( ) indicate fewer than 100 woman years of exposure during the 5-year period.

was also found (5.60 and 6.05 children, respectively). The equivalent age group of urban Traditional and No Religion women was intermediate between Christians and Muslims, while among the rural population, this group was more similar to the Muslim group. It is possible that greater omission of births by Muslim and Traditional and No Religion groups than by Christians occurred in the 1971 Supplementary Enquiry, and if so, this would explain the difference between the two sources. Reasons for expecting a lower quality of data from the Muslim and Traditional groups are that they are more rural and less educated than the Christian population.

Findings for ethnic subgroups in some ways parallel those for religious subgroups (table 3.16). The Mole-Dagbani subgroup, which is mainly Muslim and Traditional in religion, also exhibits similar fertility trends to these subgroups, of a rise then a recent decline. Two other ethnic groups, the Akan and the Ga-Adangbe, show steady and substantial fertility decline during the 20 years before the survey, of about 0.9 child. The Ewe ethnic group shows some evidence of displacement of dates of births by the oldest age group, 45–49 year olds, but this is not very severe, and their level of fertility has been nearly constant during the last 15 years, at about 6.7–6.8 children. The miscellaneous group of 'Others' has a very erratic

Table 3.16 Age-specific fertility and total fertility rates (TFR), by major ethnic groups and calendar period

Ethnic/ age group	Period				Percentage change	
	1975–9	1970–4	1965–9	1960–4	1970/4–1975/9	1965/9–1970/4
Akan		N[a] = 3314				
15–19	137	143	139	171	−4.2	+2.9
20–24	260	266	283	278	−2.3	−6.0
25–29	284	290	308	293	−2.1	−5.8
30–34	258	268	276	288	−3.7	−2.9
35–39	180	198	247		−9.1	−19.8
40–44	119	143			−16.8	
45–49	49					
TFR	6.44	6.79	7.23	7.35	−5.2	−6.1
Mole-Dagbani		N[a] = 804				
15–19	151	168	128	121	−10.1	+31.3
20–24	259	275	252	207	−5.8	+9.1
25–29	241	310	257	277	−22.3	+20.6
30–34	210	240	269	253	−12.5	−10.8
35–39	191	272	266		−29.8	+2.3
40–44	184	177			+4.0	
45–49	48					
TFR	6.42	7.45	6.99	6.75	−13.8	+6.6
Ewe		N[a] = 745				
15–19	131	108	124	142	+21.3	−12.9
20–24	258	272	266	312	−5.1	+2.3
25–29	274	264	303	293	+3.8	−12.9
30–34	239	274	280	291	−12.8	−2.1
35–39	214	209	166		+2.4	+25.9
40–44	147	133			+10.5	
45–49	(77)					
TMFR	6.70	6.69	6.75	7.07	0.0	−0.9
Ga-Adangbe		N[a] = 460				
15–19	110	116	118	120	−5.2	−1.7
20–24	225	234	240	296	−3.8	−2.5
25–29	258	233	273	310	+10.7	−14.7
30–34	241	246	284	(248)	−2.0	−13.4
35–39	205	205	(227)		0.0	−9.7
40–44	139	(162)			−14.2	
45–49	(121)					
TMFR	6.50	6.59	7.13	7.42	−1.4	−7.6
Guan and others		N[a] = 802				
15–19	144	150	120	120	−4.0	+25.0
20–24	271	273	233	252	−0.7	+17.2
25–29	290	305	259	247	−4.9	+17.8
30–34	277	286	200	289	−3.1	+43.0
35–39	148	210	224		−29.5	−6.3
40–44	115	224			−48.7	
45–49	(86)					
TMFR	6.66	7.67	6.73	7.21	−13.2	+14.0

[a]Number of women.
( ) indicate fewer than 100 woman-years of exposure during the 5-year period.

trend, by comparison, dropping from 7.2 to 6.7 then rising to 7.7 and further declining to 6.7 children, over the last 20 years. This may be due to a combination of reporting errors and sampling fluctuations.

3.6 ANALYSIS OF BIRTH INTERVALS

The foregoing analysis has been quite useful in bringing out the overall trends and differentials in fertility levels. Further insights can be gained by studying birth intervals. The detailed maternity histories collected in the GFS provide the opportunity for a deeper analysis of family formation than what has been possible by evaluating age-period fertility rates. The reproduction process of a woman consists of a number of stages through which she passes during her reproductive span. In this context, there are two aspects of interest:

1 whether a woman moves from one stage to the next (for example, from marriage to first parity or from first parity to second parity); and
2 how long does it take for her to make the transition.

The first is regarded as 'quantum', or the quantity aspect of fertility, and the second is called 'tempo', or the timing aspect of fertility (Ryder 1980). The analysis of birth intervals enables one to examine these two aspects separately. By studying the parity-specific behaviour, one is able to investigate if fertility reduction has been achieved by control at higher order births or if the decline has been diffused at births of all orders. In addition, one can distinguish fertility patterns of different subgroups of a population. These objectives are pursued in this section. The analysis will complement the findings noted earlier in addition to providing new insights both in regard to the change in fertility and the process of family building in Ghana.

The time between first marriage and the first birth is called the first birth interval and the interval between one live birth and the next is called an inter-birth interval. These are generally designated according to the order of the birth which terminates the interval. Data from a cross-sectional survey provide incomplete maternity histories for women who had not completed child-bearing by the time of the survey. Therefore, any analysis on trends across different time periods or cohorts of women (based on data from a cross-sectional survey) without taking into account the length of exposure would yield estimates distorted due to truncation and selectivity. Rodríguez and Hobcraft (1980) illustrate these biases in the birth interval analysis by drawing examples from the WFS data for Colombia. (See also Bumpass *et al* (1982) for further details.)

Though the biases are not eliminated completely, the use of life-table methodology greatly reduces the magnitude of these biases. Parity-specific life tables yield estimates of the probabilities (and of the other related measures) of having an $(i + 1)$-th birth at each specified interval after entry into ith parity cohort. This approach thus combines data on order-specific closed and open birth intervals and defines the exposure with reference to the date of the 'event origin': that is, the date of marriage for the first birth interval and the date of the preceding birth for all the higher order births. Although life tables for younger cohorts of women would be incomplete in the sense that more women will attain the given birth order, at a later time, the comparisons of the probabilities or the cumulative proportions giving next birth at successive durations of exposure would be valid across different cohorts. Selectivity bias is handled by constructing separate life tables according to the subgroups of age at marriage (for the first birth interval) and the age at the start of the interval (for intervals of second or higher order births).

The methodology for constructing life tables from WFS data is described by Smith (1980) and it has been elaborated for the birth interval analysis by Rodríguez and Hobcraft (1980). The analysis is restricted to intervals initiated in the decade ending two years before the survey date.

The choice of the period 2–12 years before the survey was primarily motivated by the consideration of representing the experience of women included in the GFS, for a period least affected both by reporting errors and by biases of selectivity. When experience in more distant periods is analysed, recall errors become increasingly pronounced. In addition, bias towards a younger age at the ending of an interval increases. For example, any intervals initiated or closed at early ages, such as 15 or 16, would be included for calendar years 1946–79, whereas intervals initiated at age 40 can only be included

in the analysis for period 1970–9. For the period stretching up to 12 years before the survey the selectivity biases are minimal since the coverage of the experience is relatively more complete. The lower bound of two years is needed so that the intervals initiated in the most recent period can be observed after these have been subjected to a reasonable period of exposure. An inter-birth interval of at least 14 months is expected: a few months elapse, during which women are exposed to the risk of conception but have not yet conceived (generally termed as 'period of ovulatory exposure' and estimated to be 5 months, corresponding to a fecundability level of 0.2) and 9 months which are taken on average, from conception to a live birth. Thus a period of two years seems appropriate as the lowest bound of the period taken here. Finally, as the investigation of recent changes are central to this study, reliance upon the period 2–12 years before the survey provides an appropriate universe for the birth interval analysis. (Further discussion on the choice of period 2–12 years before the survey can be found in Bumpass *et al* (1982) and Rindfuss *et al* (1982).)

Because many women give birth to more than one child, they contribute more than one birth interval to the analysis. Birth intervals have been estimated for subgroups of women contributing the intervals, using the life table procedure. Intervals between two live births are considered, and not the inter-pregnancy interval (ie, between two pregnancies). The latter seem more appropriate. However, the GFS data on such intervals, especially on pregnancy wastage, are of poor quality. Furthermore, the analysis does not take into consideration any periods of non-exposure due to women being sexually inactive or not menstruating during the interval between two live births. (Data on such matters are available at most for the two most recent births.) Non-exposure due to marital dissolution is negligible (see chapter 2). The practice of indexing birth intervals by the order terminating the interval is followed. The first birth interval is the lowest and the seventh birth interval is the highest examined here. These intervals cover over 90 per cent of the intervals initiated during the period. In case of twin births only one of the twins is considered and therefore intervals of zero length are excluded. From a mass of detailed tables and summary measures, the proportion closing intervals by 60 months since the preceding birth (or marriage in case of first birth interval) and the mean length of interval for women who close the interval by 60 months are shown. The former is a measure of quantity and is referred to as the 'quintum', indicating the proportion who reach next parity by five years since the previous parity. It is a natural analogue to the 'parity progression ratio' which one is unable to derive from incomplete maternity histories. The mean of intervals closed by 60 months is a conditional mean as it refers only to women who continue reproduction. This shows the 'tempo' of fertility. All tables have been obtained by using the software program BIRTHS developed by Germán Rodríguez and Jane Menken (1982).

Results

There is a relatively small overall variation in the mean intervals between successive births (table 3.17), suggesting that variations in fecundability and non-susceptible period depend little on age, parity or duration of marriage. The GFS data show that the use of contraception was not related to the number of living children (see chapter 4). The average length of intervals has increased in the period 3–7 years before the survey as compared to 8–12 years before the survey. Small differences in the quantum are known to have a substantial overall fertility impact. Differences in excess of 10 per cent in the percentage reaching next parity by 60 months are of significant demographic importance (Rodríguez *et al* 1984). Even differences of 5 per cent produce a non-negligible impact on the overall fertility.

The proportions reaching the fifth, sixth and seventh parity have declined in the recent period by six, five and seven percentage points, respectively. This indicates a moderate decline in fertility, primarily concentrated at higher parities. The increase in the length of interval is modest, the highest being 3 months in the seventh interval. Thus the tempo of fertility seems almost constant, whereas moderate change in the level of fertility is indicated for the overall sample.

The mean of birth intervals of order i is a weighted average of intervals of women with different final family size. For example, all women with 2 or more births contribute to the estimation of second to third interval. Some may have only 2 births by the time of the survey (and hence their intervals were censored), whereas the others may have 4, 5 or even 10 children by the time of the

Table 3.17 Mean interval (in months) and percentage reaching parity by 60 months since previous parity (quintum), by order of interval and period of birth

Period (years before the survey)	Interval													
	First		Second		Third		Fourth		Fifth		Sixth		Seventh	
	X	Quintum	X	Quintum	X	Quintum	X	Quintum	X	Quintum	X	Quintum	X	Quintum
All years[a]	20.9	88.4	32.2	86.4	32.3	84.5	32.6	83.5	31.9	83.2	31.9	80.5	32.2	79.3
	(3978)		(4299)		(3460)		(2700)		(2071)		(1525)		(1094)	
3–7	20.5	93.5	33.9	83.7	33.5	82.5	34.1	80.1	32.1	76.4	32.9	75.4	34.5	74.3
	(970)		(1087)		(952)		(781)		(620)		(492)		(395)	
8–12	20.2	91.3	32.2	86.8	32.7	84.3	32.7	82.5	32.4	82.2	32.0	80.2	31.5	80.8
	(831)		(893)		(709)		(633)		(538)		(424)		(359)	

Figures in parentheses are number of women at the start of the interval.
[a]Covers the period from one month before the survey to the earliest month before the survey.

survey. In general, women with higher parities are selected both in terms of their higher fecundability, lower or no use of contraceptives and lower education or rural residence. For example, among all women of ages 20–24 at survey, women who have had 2 births, and thus are included in the estimation of second to third interval, are likely to have married younger and had 2 children at a relatively quicker pace than the women of this group on average. Age at the start of the interval (ie 'relative age') is generally used to control for selectivity (Rodríguez and Hobcraft 1980).

Parity–cohort birth interval life tables were calculated for four relative age categories. The boundaries of the age categories were chosen so as to yield four groups of approximately equal size, and thus correspond roughly to the quartiles of the distribution of ages at the start of the interval. Quartiles Q_1, Q_2 and Q_3 are defined as the lowest exact age in years for which the cumulative frequency of age at the start of the interval in the whole sample exceeded the 25th, 50th, and 75th percentile respectively. The relative age categories[3] used in the analysis were: $<Q_1$, Q_1-Q_2, Q_2-Q_3, and $>Q_3$.

In general, the period 3–7 years before the survey is marked by a decline in proportions reaching next parity and an increase in the average length of the interval for all of the four relative age categories (table 3.18). The difference in the proportions reaching next parity in period 3–7 from proportions in period 8–12 are represented in figure 3.3. Increases over 5 percentage points are noted for the first interval among women marrying relatively younger (ie by age 15 and 16–17 years). In most of the other intervals, the proportions reaching next parity have declined among women of all relative age categories. With a few exceptions, the average length of interval has also increased in the most recent period among

[3] The quartile ages by event are as follows:

Quartile ages (in years)	At event			
	Marriage	1st birth	2nd birth	3rd birth
Q_1	<16	<17	<20	<22
Q_2	16–17	17–18	20–21	22–24
Q_3	18–19	19–20	22–24	25–27

Quartile ages (in years)	4th birth	5th birth	6th birth
Q_1	<25	<27	<29
Q_2	25–27	27–29	29–31
Q_3	28–30	30–32	32–34

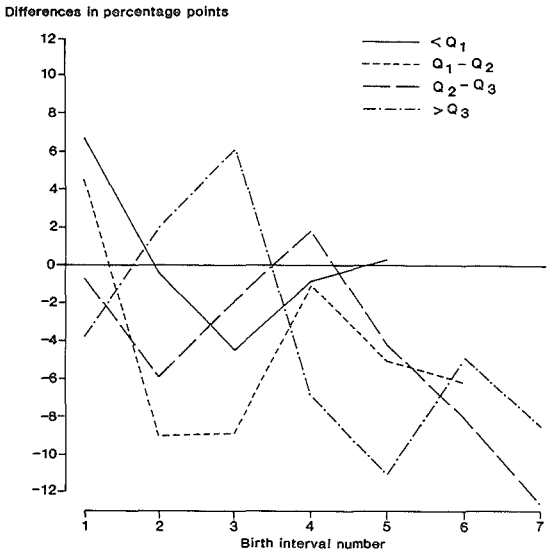

Figure 3.3 Percentage points differences in the proportions reaching next parity by 60 months since the preceding parity in period 3–7 years before the survey from period 8–12 years before the survey (set at zero), by quartiles ($<Q_1$, Q_1-Q_2, Q_2-Q_3, and $>Q_3$) of relative ages and birth interval. (See footnote 3 and text for the details of quartile ages.) *Source*: table 3.18.

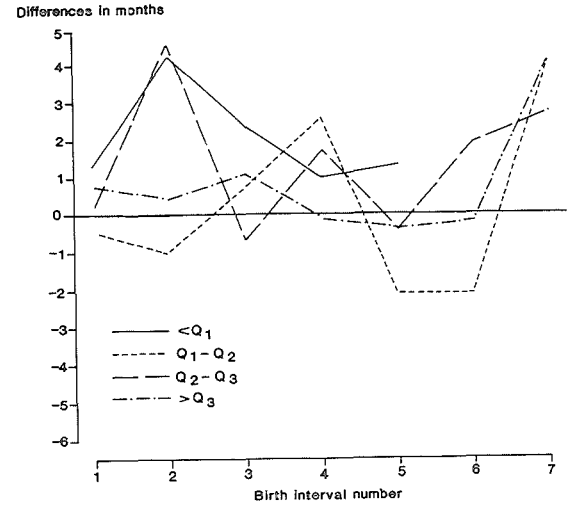

Figure 3.4 Differences in the mean length of interval in period 3–7 years before the survey from the mean interval in period 8–12 years before the survey, by quartiles of relative ages and birth interval. (See footnote 3 and text for details on quartiles of relative ages.) *Source*: table 3.18.

Table 3.18 Mean length of interval and percentage reaching next parity by 60 months since the preceding parity (quintum), by relative age and period

Interval	Relative ages[a]							
	$<Q_1$		Q_1-Q_2		Q_2-Q_3		$>Q_3$	
	3–7 years	8–12 years	3–7 years	8–12 years	3–7 years	8–12 years	3–7 years	8–12 years
First								
Mean (in months)	22.8	21.5	19.3	19.7	19.6	19.3	20.8	20.1
Quintum (%)	96.6	89.8	96.2	91.6	93.1	93.7	86.6	90.4
Number of intervals	196	220	291	216	238	202	245	194
Second								
Mean (in months)	35.6	31.4	32.9	33.9	35.4	30.8	32.7	32.3
Quintum (%)	83.8	84.2	78.0	87.0	82.3	88.2	89.1	87.1
Number of intervals	157	163	314	230	260	205	356	296
Third								
Mean (in months)	33.5	31.1	32.9	32.3	33.3	34.0	34.2	33.1
Quintum (%)	83.9	88.4	80.6	89.5	81.4	83.2	85.0	78.8
Number of intervals	213	154	215	154	290	180	234	221
Fourth								
Mean (in months)	32.9	31.9	34.8	32.1	34.4	32.7	33.7	33.8
Quintum (%)	86.2	87.1	82.9	83.9	85.3	83.4	70.5	77.3
Number of intervals	123	133	219	174	208	133	233	193
Fifth								
Mean (in months)	32.3	30.9	30.7	32.9	32.6	33.0	32.5	33.0
Quintum (%)	87.1	86.8	78.9	84.0	80.0	84.2	63.2	73.7
Number of intervals	130	135	149	151	146	119	195	133
Sixth								
Mean (in months)	32.1	—[b]	33.4	31.2	32.7	30.8	33.6	—[b]
Quintum (%)	87.9	—	80.2	86.4	70.1	78.1	68.0	—
Number of intervals	110	—	107	131	118	110	157	—
Seventh								
Mean (in months)	—[b]	—[b]	—[b]	32.0	—[b]	—[b]	36.3	32.2
Quintum (%)	—	—	—	84.9	—	—	63.4	71.8
Number of intervals	—	—	—	113	—	—	130	100

[a]See footnote 3 and text for details on quartile ages.
[b]Figures for intervals fewer than 100 are not shown.

women of all except the oldest relative ages, for intervals from the first to the seventh (figure 3.4). Women experiencing the previous event latest ($>Q_3$) show a fairly stable pattern of spacing for all except the seventh interval.

For the sake of brevity, tables by relative age and period are not presented for the subgroups. In order to point out the trends in means and proportions, differences in period 3–7 from period 8–12 are shown. A positive figure for the mean and a negative value of proportion (in rows of differences) suggest a decline in the tempo and the quintum of fertility in the recent period as compared to the period 8–12 years before the survey. For example, the values of 2.3 and 2.1 for the second interval in urban subgroups imply that the mean second interval in period 3–7 was 2.3 months longer on average and the proportion reaching second parity was 2.1 percentage points lower than what had been observed for the same birth interval in the period 8–12 years before the survey. Differences amounting to 3 months in means and 2–3 percentage points in proportions are of minor significance.

Women in urban areas manifest greater decline in fertility, especially in births of orders five and above (table 3.19). For example, the proportions reaching fifth and sixth parities were lower by 11 and 10 percentage points respectively in period 3–7 as compared to 8–12 years before the survey. Decline in rural fertility has been of modest dimensions in all except the fifth and the seventh parity measures.

Irrespective of their years of schooling, fewer educated women go on to higher parities as compared to women with no formal schooling (table 3.20). However, for parities with comparable sample sizes, a reduction (of 4 percentage points) in proportions reaching third parity was noticed among women with 1–9 years of schooling and of 5 percentage points in reaching second parity among women with 10+ years of schooling. A reduction in proportions reaching next parity is noticed even among women with no schooling. Proportions reaching fifth, sixth and the seventh parity have declined by 7, 4 and 6 percentage points respectively in the recent period of 3–7 years before the survey (table 3.20).

Regional trends are hard to ascertain due to reduced sample sizes at higher parities (table 3.21). Only two main regions, Ashanti/Brong Ahafo and Northern/Upper, preserve intervals of sizes (at fourth or higher parities) required for meaningful comparisons. Both regions manifest fairly substantial decline in the quintums of fertility. However, both regions were also identified as representing the sort of reporting errors which are linked with spurious decline in fertility (section 3.5). Among the other regions not affected by reporting errors, Western/Central region shows a fairly stable pattern. The proportion reaching third parity has declined by 3 percentage points in Eastern region. There is mixed evidence for Greater Accra. Figures for Volta are not shown as these were based upon fewer than 100 intervals in all parities from one to seven.

Decline in fertility of higher order births is more pronounced among the Akans and among Mole-Dagbani women (table 3.22). Women of Guan ethnic group show an increase (of 8 percentage points) in the proportion attaining first parity and a decline of 5 percentage points in the proportion reaching third parity. Comparisons for Ewe and Ga-Adangbe are difficult to make due to their small sample sizes (ie below 100 intervals for parity in either or both of the two periods).

Supporting the findings of a decline in fertility rates of Christian women, birth interval analysis reveals that Christian women reach sixth and seventh parity in the period 3–7 years before the survey at numbers 9 and 11 percentage points lower than in period 8–12 years before the survey (table 3.23). Proportions reaching second and fourth parity among Muslims have also greatly reduced (6 and 10 percentage points, respectively) in the recent period. On the other hand, mixed results are noted for women of Traditional religion. For example, proportions decline for the third and fifth parities, but remain fairly constant for the sixth and seventh parities. An increase of 6 percentage points is also noted for this subgroup in terms of proportion reaching first parity.

Both Muslim and Traditional subgroups were identified (in section 3.5) as exhibiting reporting errors of misplacement of dates of birth. As periods considered for the birth interval analysis do not correspond exactly to the periods used for evaluating fertility rates, the finding of reporting errors in the period 5–9 years before the survey cannot be substantiated from the birth interval analysis. It is, however, quite clear that the tendency to shift birth dates into the 8–12 years before the survey did not operate uniformly for births of all orders. For example, proportions reaching fifth parity among the Traditional subgroup show a remarkable decline, whereas proportions for the fourth, sixth and seventh parities remain almost constant. Likewise, except for the second and the seventh intervals, mean length of intervals among Traditional subgroups shows a fairly constant pattern over 3–7 and 8–12 years before the survey. The comparisons across different parities for Muslims are limited by the small sample sizes for parities five and above. Therefore, it is hard to discern a trend either in reporting errors or in the spacing patterns for this subgroup. Overall, one can conclude that a decline occurred among Christians, especially in fertility of higher order births, but no consistent pattern was found among Muslims and Traditional subgroups.

Women currently in monogamous or polygamous unions show a decline in the proportions attaining next parity (table 3.24). The decline is, however, generally greater among women in monogamous unions than among women in polygamous unions, especially for the sixth and seventh parities. For the fourth and fifth parities,

Table 3.19 Mean interval (in months) and percentage reaching parity by 60 months since previous parity (quintum), by order of interval, period of birth, and women's place of residence

Urban–rural subgroup and period (years before the survey)	Interval													
	First		Second		Third		Fourth		Fifth		Sixth		Seventh	
	X[b]	Quintum	X	Quintum	X	Quintum	X	Quintum	X	Quintum	X	Quintum	X	Quintum
Urban														
All periods[a]	20.7	90.3	32.9	84.6	32.7	82.7	32.5	82.3	32.4	80.0	31.2	77.2	32.0	80.2
(1) 3–7	21.0	90.2	35.0	83.2	33.9	79.4	33.9	77.5	30.0	69.2	31.7	69.1	34.1	75.6
(2) 8–12	20.3	90.1	32.7	85.3	33.6	82.6	33.5	80.0	33.4	80.4	31.0	79.3	31.7	82.2
Difference: (1) − (2)	+ 0.7	+ 0.1	+ 2.3	− 2.1	+ 0.3	− 3.2	+ 0.4	− 2.5	− 3.4	−11.2	+ 0.7	− 10.2	+ 2.4	− 6.6
Rural														
All periods[a]	21.0	87.5	31.9	87.2	32.2	85.2	32.6	84.0	31.6	84.5	32.1	81.7	32.2	78.9
(1) 3–7	20.3	94.8	33.3	83.9	33.3	84.0	34.1	81.4	32.7	78.4	33.4	77.9	34.7	73.7
(2) 8–12	20.1	92.0	32.0	87.6	32.2	85.1	32.4	83.5	31.2	82.9	32.4	80.6	31.4	80.3
Difference: (1) − (2)	+ 0.2	+ 2.8	+ 1.3	− 3.7	+ 1.1	− 1.1	+ 1.7	− 2.1	+ 1.5	− 4.5	+ 1.0	− 2.7	+ 3.3	− 6.6

[a] Covers the period from one month before the survey to the earliest month before the survey.
[b] X = mean.

Table 3.20 Mean interval (in months) and percentage reaching parity by 60 months since previous parity (quintum), by order of interval, period of birth, and women's years of schooling

Education subgroups and period (years before the survey)	Interval													
	First		Second		Third		Fourth		Fifth		Sixth		Seventh	
	X[b]	Quintum	X	Quintum	X	Quintum	X	Quintum	X	Quintum	X	Quintum	X	Quintum
No schooling														
All periods[a]	21.9	85.5	32.0	88.0	32.1	85.0	32.6	85.0	31.7	84.0	31.8	81.8	32.0	80.6
(1) 3–7	21.8	92.0	34.7	88.2	33.3	82.4	34.7	82.1	31.9	76.5	32.7	77.0	34.1	76.5
(2) 8–12	21.5	90.8	31.8	89.7	32.2	84.2	32.3	85.5	32.2	83.6	31.9	81.4	31.4	82.0
Difference: (1) − (2)	+ 0.3	+ 1.2	+ 2.9	− 1.5	+ 1.1	− 1.8	+ 2.4	− 3.4	− 0.3	− 7.1	+ 0.8	− 4.4	+ 2.7	− 5.5
1–9 years of schooling														
All periods[a]	19.5	94.2	31.9	85.5	32.6	84.1	31.6	78.9	31.4	85.7	32.8	77.5	33.4	72.9
(1) 3–7	18.7	95.2	33.0	81.8	32.9	82.2	32.4	76.4	31.0	75.6	—[c]		—[c]	
(2) 8–12	19.4	93.7	31.9	82.5	34.5	85.9	—[c]		—[c]		—[c]		—[c]	
Difference: (1) − (2)	− 0.7	+ 1.5	+ 1.1	− 0.7	− 1.6	− 3.7	—		—		—		—	
10+ years of schooling														
All periods[a]	19.4	92.2	33.0	80.8	33.3	81.8	33.4	77.5	34.5	69.7	—[c]		—[c]	
(1) 3–7	20.5	93.8	33.5	78.9	34.5	83.3	33.4	76.2	—[c]		—[c]		—[c]	
(2) 8–12	18.2	90.8	33.7	84.3	32.9	82.8	—[c]		—[c]		—[c]		—[c]	
Difference: (1) − (2)	+ 2.3	+ 3.0	− 0.2	− 5.4	+ 1.6	+ 0.5	− 0.7	+ 6.7	—		—		—	

[a] Covers the period from one month before the survey to the earliest month before the survey.
[b] X = mean.
[c] Number of women contributing to the interval are fewer than 100.

Table 3.21 Mean interval (in months) and percentage reaching parity by 60 months since previous parity (quintum), by order of interval, period of birth, and women's region of residence

Regional subgroups and period (years before the survey)	Interval													
	First		Second		Third		Fourth		Fifth		Sixth		Seventh	
	X[b]	Quintum	X	Quintum	X	Quintum	X	Quintum	X	Quintum	X	Quintum	X	Quintum
Western/Central														
All periods[a]	19.2	88.8	30.5	88.2	30.4	83.8	31.8	85.6	31.3	83.4	29.8	84.4	29.7	83.1
(1) 3–7	18.6	92.7	29.5	86.4	30.1	83.9	32.7	84.6	31.1	75.6	—[c]		—[c]	
(2) 8–12	19.5	92.7	30.9	88.4	32.1	81.3	31.5	83.5	—[c]		—[c]		—[c]	
Difference: (1) − (2)	− 0.9	0.0	− 1.4	− 2.0	− 2.0	+ 2.6	+ 1.2	+ 1.1	—		—		—	
Greater Accra														
All periods[a]	20.9	90.5	33.4	81.6	32.0	77.9	31.2	76.2	32.4	77.7	31.2	70.4	—[c]	
(1) 3–7	20.7	88.9	34.2	81.3	34.0	74.2	—[c]		—[c]		—[c]		—[c]	
(2) 8–12	20.6	87.2	34.1	81.4	—[c]		—[c]		—[c]		—[c]		—[c]	
Difference: (1) − (2)	+ 0.1	+ 1.7	+ 0.1	− 0.1	—		—		—		—		—	
Eastern														
All periods[a]	20.5	92.0	31.3	84.3	31.5	83.8	32.1	84.0	30.5	84.8	31.0	82.9	31.5	79.3
(1) 3–7	21.0	93.9	34.0	85.1	31.9	83.1	33.9	83.4	—[c]		—[c]		—[c]	
(2) 8–12	20.9	94.8	31.3	82.5	33.3	86.2	—[c]		—[c]		—[c]		—[c]	
Difference: (1) − (2)	+ 0.1	− 0.9	+ 2.7	+ 2.6	− 1.4	− 3.1	—		—		—		—	
Volta[d]														
All periods[a]	17.9	93.4	31.5	83.6	32.4	85.2	32.6	85.4	32.6	85.7	33.7	89.1	33.8	79.9

[*Table continues*]

Table 3.21 (*cont*)

Regional subgroups and period (years before the survey)	Interval													
	First		Second		Third		Fourth		Fifth		Sixth		Seventh	
	X[b]	Quintum	X	Quintum	X	Quintum	X	Quintum	X	Quintum	X	Quintum	X	Quintum
Ashanti/Brong Ahafo														
All periods[a]	20.6	93.1	32.3	89.2	32.5	88.1	32.5	84.9	31.9	84.0	32.1	77.8	32.6	77.5
(1) 3–7	20.5	94.3	34.5	83.6	35.0	87.0	32.8	78.0	33.3	78.5	33.0	68.3	34.3	64.9
(2) 8–12	19.3	94.2	32.3	88.2	32.4	88.2	33.3	84.2	32.6	83.1	32.2	74.6	32.3	80.8
Difference: (1) − (2)	+ 1.2	− 0.1	+ 2.2	− 4.6	+ 2.6	− 1.2	− 0.5	− 6.2	+ 0.7	− 4.6	+ 0.8	− 6.3	+ 2.0	− 15.9
Northern/Upper														
All periods[a]	26.0	71.8	34.0	86.5	34.8	82.8	34.5	80.9	33.1	81.0	34.0	78.3	33.6	77.1
(1) 3–7	23.5	91.3	36.4	86.9	35.9	78.0	36.3	82.7	32.5	71.6	—[c]		—[c]	
(2) 8–12	24.7	83.3	32.4	90.8	32.4	83.4	33.2	80.9	32.7	85.3	—[c]		—[c]	
Difference: (1) − (2)	− 1.2	+ 8.0	+ 4.0	− 3.9	+ 3.5	− 5.4	+ 3.1	+ 1.8	− 0.2	− 13.7	—		—	

[a]Covers the period from one month before the survey to the earliest month before the survey.
[b]X = mean.
[c]Number of women contributing to the interval are fewer than 100.
[d]Women contributing to intervals in periods 3–7 and 8–12 years before the survey were fewer than 100 in all intervals of order one to seven. Therefore, figures for periods are not shown for Volta.

Table 3.22 Mean interval (in months) and percentage reaching parity by 60 months since previous parity (quintum), by order of interval, period of birth, and women's ethnicity

Ethnic subgroups and period (years before the survey)	Interval													
	First		Second		Third		Fourth		Fifth		Sixth		Seventh	
	X[b]	Quintum	X	Quintum	X	Quintum	X	Quintum	X	Quintum	X	Quintum	X	Quintum
Akan														
All periods[a]	20.0	92.2	31.4	87.6	31.5	84.9	32.2	84.9	31.2	83.4	31.1	81.0	31.3	79.2
(1) 3–7	20.3	93.4	33.0	82.0	32.6	83.9	32.6	80.2	31.9	78.3	31.2	73.0	34.2	73.2
(2) 8–12	19.2	94.1	31.6	86.3	32.3	82.3	32.4	83.5	31.1	80.9	31.0	79.2	30.6	81.0
Difference: (1) – (2)	+ 1.1	– 0.7	+ 1.4	– 4.3	+ 0.3	+ 1.6	+ 0.2	– 3.3	+ 0.8	– 2.6	+ 0.2	– 6.2	+ 3.6	– 7.8
Mole-Dagbani														
All periods[a]	24.8	75.9	34.7	87.4	35.7	84.9	35.3	81.5	33.8	79.4	34.6	78.2	35.2	80.3
(1) 3–7	21.9	91.6	36.3	87.2	37.3	81.1	36.4	75.8	34.4	67.3		–[c]		–[c]
(2) 8–12	23.2	88.2	33.3	92.2	33.5	84.2	34.3	82.8	33.1	84.4		–[c]		–[c]
Difference: (1) – (2)	– 1.3	+ 3.4	+ 3.0	– 5.0	+ 3.8	– 3.1	+ 2.1	– 7.0	+ 1.3	– 17.1		–		–
Ewe														
All periods[a]	18.8	91.8	32.9	84.5	32.4	84.1	33.2	81.7	32.7	85.6	33.4	86.6	32.8	78.6
(1) 3–7		–[c]	33.8	82.8	32.3	79.7		–[c]		–[c]		–[c]		–[c]
(2) 8–12		–[c]	33.9	85.9		–[c]		–[c]		–[c]		–[c]		–[c]
Difference: (1) – (2)		–	– 0.1	– 3.1		–		–		–		–		–
Ga-Adangbe[d]														
All periods[a]	20.4	91.4	32.4	79.3	30.4	83.4	31.4	80.5	30.9	83.9	33.0	77.1		–[c]
Guan and others														
All periods[a]	22.9	83.6	31.8	85.9	32.4	83.2	31.2	83.3	32.2	84.7	30.6	77.8	31.7	79.0
(1) 3–7	22.4	94.0	34.2	86.6	33.9	81.7	34.4	84.5		–[c]		–[c]		–[c]
(2) 8–12	21.5	86.1	31.3	88.5	32.3	87.7	31.5	86.3		–[c]		–[c]		–[c]
Difference: (1) – (2)	+ 0.9	+ 7.9	+ 2.9	– 1.9	+ 1.6	– 6.0	+ 2.9	– 1.8		–		–		–

[a]Covers the period from one month before the survey to the earliest month before the survey.
[b]X = mean.
[c]Number of women contributing to the interval are fewer than 100.
[d]Women contributing to intervals in periods 3–7 and 8–12 years before the survey were fewer than 100. Figures are not shown for Ga-Adangbe.

Table 3.23 Mean interval (in months) and percentage reaching parity by 60 months since previous parity (quintum), by order of interval, period of birth, and women's religion

Religion subgroups and period (years before the survey)	Interval													
	First		Second		Third		Fourth		Fifth		Sixth		Seventh	
	X[b]	Quintum	X	Quintum	X	Quintum	X	Quintum	X	Quintum	X	Quintum	X	Quintum
Christian														
All periods[a]	19.8	91.8	31.8	85.5	31.8	84.5	32.0	83.4	31.9	83.4	31.6	80.6	32.2	77.5
(1) 3–7	20.2	93.5	32.8	80.8	32.6	83.5	33.7	79.6	32.3	77.2	33.2	73.4	34.5	69.7
(2) 8–12	19.2	93.0	32.4	84.3	32.8	83.9	32.2	80.4	32.8	79.9	31.2	82.3	32.1	80.8
Difference: (1) − (2)	+ 1.0	+ 0.5	+ 0.4	− 3.5	− 0.2	− 0.4	+ 1.5	− 0.8	− 0.5	− 2.7	+ 2.0	− 8.9	+ 2.4	− 11.1
Muslim														
All periods[a]	22.0	86.2	32.4	88.0	34.0	88.2	33.7	86.0	32.5	85.3	32.0	79.5	33.8	83.0
(1) 3–7	20.6	93.2	34.8	85.7	36.3	86.8	35.7	79.1	—[c]		—[c]		—[c]	
(2) 8–12	21.9	90.0	32.7	91.5	34.0	87.6	34.3	89.4	—[c]		—[c]		—[c]	
Difference: (1) − (2)	− 1.3	+ 3.2	+ 2.1	− 5.8	+ 2.3	− 0.8	+ 1.4	− 10.3	—		—		—	
Traditional/others														
All periods[a]	22.9	82.0	32.8	87.6	32.7	83.0	33.1	82.8	31.5	82.3	32.3	80.8	31.7	81.7
(1) 3–7	21.7	93.1	36.1	90.9	33.9	77.2	34.2	81.5	31.3	74.8	31.6	76.8	34.0	79.4
(2) 8–12	21.9	87.4	31.5	90.6	32.1	83.9	32.6	82.9	31.6	83.2	33.8	76.1	29.7	79.3
Difference: (1) − (2)	− 0.2	+ 5.7	+ 4.6	+ 0.3	+ 1.8	− 6.7	+ 1.6	− 1.4	− 0.3	− 8.4	− 2.2	+ 0.7	+ 4.3	+ 0.1

[a]Covers the period from one month before the survey to the earliest month before the survey.
[b]X = mean.
[c]Number of women contributing to the interval are fewer than 100.

Table 3.24 Mean interval (in months) and percentage reaching parity by 60 months since previous parity (quintum), by order of interval, period of birth, and women's type of current union

Union subgroups and period	Interval													
	First		Second		Third		Fourth		Fifth		Sixth		Seventh	
(years before the survey)	X[b]	Quintum	X	Quintum	X	Quintum	X	Quintum	X	Quintum	X	Quintum	X	Quintum
Monogamous														
All periods[a]	20.8	90.3	32.2	87.2	32.0	84.9	32.3	84.5	31.8	83.5	31.9	83.4	31.7	82.7
(1) 3–7	20.7	94.2	33.7	85.7	33.3	83.1	34.0	84.4	31.4	78.4	33.0	79.2	34.6	78.4
(2) 8–12	19.9	92.5	32.2	87.5	32.4	85.2	32.3	82.4	32.0	81.1	33.1	84.0	30.2	86.2
Difference: (1) − (2)	+ 0.8	+ 1.7	+ 1.5	− 1.8	+ 0.9	− 2.1	+ 1.7	+ 2.0	− 0.6	− 2.7	− 0.1	− 4.8	+ 4.4	− 7.8
Polygamous														
All periods[a]	21.8	84.1	32.1	86.2	32.8	84.4	32.8	83.8	32.3	86.1	32.5	79.0	33.4	75.7
(1) 3–7	20.6	92.3	33.7	83.8	33.9	84.6	34.2	79.0	33.1	75.9	33.1	76.1	34.9	72.3
(2) 8–12	21.1	88.4	32.4	86.6	32.9	82.8	33.2	84.0	33.1	88.8	31.2	77.8	33.3	75.1
Difference: (1) − (2)	− 0.5	+ 3.9	+ 1.3	− 2.8	+ 1.0	+ 1.8	+ 1.0	− 5.0	0.0	− 12.9	− 0.1	− 1.7	+ 1.6	− 2.8

[a]Covers the period from one month before the survey to the earliest month before the survey.
[b]X = mean.

Table 3.25 Mean interval (in months) and percentage reaching parity by 60 months since previous parity (quintum), by order of interval, period of birth, and women's place of work since marriage

Place of work subgroups and period (years before the survey)	Interval													
	First		Second		Third		Fourth		Fifth		Sixth		Seventh	
	X[b]	Quintum	X	Quintum	X	Quintum	X	Quintum	X	Quintum	X	Quintum	X	Quintum
Farm														
All periods[a]	20.5	89.2	31.4	89.0	31.8	85.8	32.3	86.2	31.4	84.8	31.6	82.3	31.2	80.6
(1) 3–7	19.9	93.9	33.1	86.0	33.4	82.9	33.4	86.4	32.8	79.5	32.3	75.0	32.3	71.1
(2) 8–12	20.1	93.4	32.0	89.4	32.1	86.5	32.0	84.0	31.2	83.2	31.9	81.9	31.2	81.6
Difference: (1) − (2)	− 0.2	+ 0.5	+ 1.1	− 3.4	+ 1.3	− 3.6	+ 1.4	+ 2.4	+ 1.6	− 3.7	+ 0.4	− 6.9	+ 1.1	− 10.5
Home														
All periods[a]	21.0	87.6	32.2	84.6	33.8	87.2	32.5	81.7	32.2	87.2	32.0	82.7	34.0	85.4
(1) 3–7	19.6	93.4	33.5	87.0	33.2	82.9	34.5	72.1	31.0	84.1	33.4	73.9	—[c]	
(2) 8–12	19.9	88.3	31.3	85.4	33.5	88.8	32.5	83.0	33.4	83.5	—[c]		—[c]	
Difference: (1) − (2)	− 0.3	+ 5.1	+ 2.2	+ 1.6	− 0.3	− 5.9	+ 2.0	− 10.9	− 2.4	+ 0.6	—		—	
Away from home														
All periods[a]	20.9	89.1	32.9	84.3	32.0	81.4	32.7	79.9	32.5	77.9	32.4	76.7	32.8	73.8
(1) 3–7	21.0	91.8	34.5	81.7	33.2	82.3	34.7	77.7	31.5	63.8	33.3	74.7	36.0	73.3
(2) 8–12	20.2	91.7	33.1	84.7	33.0	79.3	33.5	78.8	33.9	79.9	33.2	74.7	—[c]	
Difference: (1) − (2)	+ 0.8	+ 0.1	+ 1.4	− 3.0	+ 0.2	+ 3.0	+ 1.2	− 1.1	− 2.4	− 16.1	+ 0.1	0.0	—	
Didn't work[d]														
All periods[a]	22.2	83.0	33.8	83.7	33.8	81.4	34.6	82.8	—[c]		—[c]		—[c]	

[a]Covers the period from one month before the survey to the earliest month before the survey.
[b]X = mean.
[c]Number of women contributing to the interval are fewer than 100.
[d]Fewer than 100 women contributed to intervals in period 3–7 and 8–12 years before the survey. Figures are therefore not shown for this subgroup.

women in polygamous unions represent greater decline in terms of quintums.

Interestingly, women whose place of work since marriage was at a farm or at home reach next parities in declining numbers in the recent period as compared to 8–12 years before the survey (table 3.25). The proportions reaching next parity have also declined among women who worked away from home. However, it is substantial only among women reaching fifth parity.

Overall, one finds a decline in fertility among women of almost all subgroups, though in a varying degree. It seems, therefore, that the norms of lower family size may have diffused from the most modern subgroups to the others in the society. As is the case in the early stage of fertility transition, the reduction in fertility has been primarily concentrated at births of higher orders (ie 5 or higher). Comments on the socio-economic differentials have not been made as they are consistent with those noted earlier in the discussion on fertility rates by age, period and subgroup. More specifically, women belonging to relatively more traditional subgroups, such as rural and no schooling, manifest a faster pace of fertility as well as a greater proportion reaching next parity in comparison to women in more modern subgroups of urban or 1–9 and 10+ years of schooling. There is, however, no uniform pattern covering all periods, all intervals (from first to the seventh) and both summary measures of mean and quintum.

3.7 FERTILITY TRENDS AND SOCIO-ECONOMIC DIFFERENTIALS: A MULTIVARIATE ANALYSIS

Having found a decline in fertility in the recent period and important socio-economic differentials in fertility, it is useful to examine if such findings are statistically significant. Furthermore, as background characteristics are often inter-related, one finds it hard to draw any conclusions about the relationship between a particular background characteristic and fertility unless adjustment of other characteristics is made. For these reasons, recourse to a statistical model often proves helpful.

In order to assess the relative magnitudes of any effects, a model-based approach is utilized. In particular, a 'rate model' is used to examine the effects of selected variables on fertility rates. Multiplicative or log-linear models are fitted to the counts of events (births), using the amount of exposure as one of the multiplicative factors in the model. Thus, the model is effectively a log-linear model for the rates, but a 'Poisson' error structure is assumed for the counts, with the inclusion of the exposure, treated as a known constant, as a preliminary adjustment factor in the model (see Little 1978 for a discussion of these models).

All models were fitted using the Glim (General Linear Interactive Modelling, see Baker and Nelder 1978) software package with a Poisson error structure and a logarithmic link function, taking the exposure as an offset and fitting models by iterative weighted least squares to the counts of births.

Data were organized in a cross-tabular form. As the evaluation of the trend was one of the objectives, period of birth was constructed as a variable with codes:

1 if a birth occurred during 5–9 years before the survey; and
2 if a birth occurred during 0–4 years before the survey.

Corresponding to each of these two periods, woman-years of exposure since first marriage were computed for the estimation of marital fertility, and the full 5-year exposure was assigned for the overall fertility. Since age of a woman is an important determinant of fertility, age at survey was used for the period 0–4 and the current age backdated by 5 years for the period 5–9 years before the survey. Women over 45 at survey were excluded from the analysis altogether. Their contribution to fertility in 0–4 years before the survey was minimal. In the period 5–9 years before the survey, the age over 45 is unavailable due to the upper age limit of 49 for women interviewed in the GFS. Background variables, such as religion, education, region and ethnicity were included in the analysis. The categories of all these variables were classified against each other. Any cell with zero woman-years of exposure was excluded from the analysis.

The results of fitting a model of this type are parameter estimates which are expressed as ratios of the rate in a particular category to the rate in the base or reference category of the variable. The first category of each of the variables included in the model is usually taken as the reference category for that variable and the parameter for the 'Grand Mean' or the overall reference category

(abbreviated as % GM) represents the coefficients for the combination of reference category (which is in the present context: period, 5–9; age, <25; religion, Christian; region, Western/Central; ethnicity group, Akan; and education, no schooling). By exponentiating the parameter estimates one obtains the level relative to the reference category. For example, a coefficient of −0.07093 for period 0–4 (table A.4) implies that the level of marital fertility in period 0–4 was 93 per cent ($e^{-0.07093}$ equals 0.932) of that in period 5–9 (set at 100 in percentage or 1.0 in proportion). This is an adjusted level since it has been derived from the coefficient adjusted for the other variables included in the model.

Table 3.26 shows that the marital fertility level by age 45 in the recent period was 7 percentage points lower than the level in period 5–9 years before the survey. The observed increase in the magnitude of the decline (from what has been noted in section 3.4) is partly due to the upper age limit of 45 and partly due to the adjustment of the confounding effects of other variables. In addition, marital fertility has been considered here by taking into account births and woman-years of exposure since first marriage, rather than the 'within marriage' births and exposures. The order of magnitude of decline over the 10 years before the survey increases for the measures of marital fertility based upon 'since marriage' as compared to measures based upon 'within marriage'. Measures of the overall fertility, however, show greater decline than any of the two measures of marital fertility, The decline in 0–4 years before the survey as compared to 5–9 years before the survey appears the lowest when comparing 'within marriage' measures, intermediate when comparing 'since marriage', and the greatest when comparing 'overall fertility' measures. (Note that the level of 'within marriage' fertility up to age 45 in period 1975–9 shown in table 3.5 was 96 per cent of the level over the same age range in 1970–4.) The period effects are statistically significant at the 0.001 level and this supports the results reported in earlier sections which showed some fertility decline in Ghana.

The interpretation of age effects is straightforward as decline in fertility with increasing age is a most common demographic fact. Women aged 35 and over have a level of marital fertility half of that for women below age 25. Age was found to be the strongest variable among all the variables included in the model.

Table 3.26 Relative levels of marital fertility, by period and background characteristics

Variable and category	Fertility levels (adjusted)
Period	
5–9 years before the survey	1.00
0–4 years before the survey	0.93
Age	
< 25 years	1.00
25–29 years	0.81
30–34 years	0.75
35–44 years	0.56
Region	
Western/Central	1.00
Greater Accra	0.82
Eastern	0.95
Volta	0.93
Ashanti/Brong Ahafo	0.92
Northern/Upper	0.88
Ethnicity	
Akan	1.00
Mole-Dagbani	0.97
Ewe	1.04
Ga-Adangbe	1.02
Guan and others	0.98
Religion	
Christian	1.00
Muslim	1.06
Traditional and others	1.02
Education	
No schooling	1.00
1–9 years	0.98
10+ years	1.00

Period, age, and region are significant at 0.001 level, whereas religion, ethnicity, and education are not statistically significant at 0.05 level.
Source: Table A.4

It was noted in section 3.5 that Western/Central region had the highest level of overall fertility and Greater Accra the lowest among the six regions classified in this study. The present analysis substantiates this finding. Both retain their extreme levels, even after the adjustments of the confounding effects. The level of marital fertility in Northern/Upper region is higher than that for Greater Accra but lower than levels for the other regions, after adjusting for other variables.

Ethnic differentials are not very large. Except for Ewe women, marital fertility levels of other ethnic subgroups are similar to the Akan. Although the level of overall fertility for Muslim women was found to be lower during 1975–9 (section 3.5) than for women of Traditional religions, fertility among Muslims was higher than among Traditionals if one examines the level since 1970 (table 3.15). The level of marital fertility among Muslims appears 6 percentage points higher than the level of Christians over the last 10 years and after the adjustment of the variables included in the model. Muslims have higher marital fertility than women of Traditional religions.

Finally, marital fertility by education does not show much variation. Three broad categories of education are used for the log-linear analysis due to sample size considerations. Previous work (section 3.5) utilized a larger number of categories and therefore the results obtained from the present analysis cannot be directly compared with that undertaken in section 3.5. Nevertheless the earlier analysis of marital fertility rates for education subgroups largely agrees with these findings. Marital fertility among women with 1–9 years of education is lower by 2 percentage points than among women with no schooling. Women with 10+ years of schooling have a level of marital fertility similar to that for women with no schooling. The results for the overall fertility (not shown here) indicate a greater variation in fertility by education. The pattern conforms to the expected level of higher fertility among women with low or no education. Thus the educational differentials are primarily due to age at marriage. This finding is substantiated by results for age-specific fertility reported in section 3.5.

Among the four background variables (region, ethnicity, religion and education), only region is a statistically significant variable. This is not surprising because regional subgroups vary to a greater extent (in terms of fertility levels) than any other subgroups of a background variable.

Results for the overall fertility levels were broadly similar to those noted above. For the sake of brevity, these are not shown here. To sum up, one may state that the evidence of fertility decline is substantiated by the multivariate analysis based upon marital fertility rates for the two most recent 5-year periods before the survey. The differentials in fertility by socio-economic background variables noted in section 3.5 are largely upheld by the multivariate analysis.

3.8 DISCUSSION

The evidence of a recent decline in fertility which appeared slight at the outset, was none the less a consistent finding of this study. The observed decline was supported by the analysis of age-specific and marital fertility rates, by parity–specific birth interval analysis, and by the multivariate analysis. Although some reporting errors of the type conducive to a spurious decline in fertility (Potter 1977) were found, these were limited to a few regional and socio-economic subgroups. Several other subgroups, such as educated women, women in urban areas, those in regions other than Northern/Upper, Volta and Ashanti/Brong Ahafo, and women who had experience of working away from home, manifest a decline in overall fertility and, to a lesser extent, in marital fertility.

The future course of fertility in Ghana depends on how one views the recent trends. On one hand, one may suggest that the decline was a short-term response to the large-scale out-migration of Ghanaians or to the economic crisis of the late 1970s. Therefore, with any future improvement in economic conditions, the level of fertility could show a fairly constant or even an increasing pattern due to reductions in the length of breastfeeding accompanied with no great rise in the use of contraception. On the other hand, one can argue that once the fertility transition sets in, the process of decline will continue and may even become faster with the speed of decline becoming even more rapid.

With the information available, one cannot forecast the future trends in fertility in a straightforward manner. It is, however, fairly clear that the recent decline in fertility was not a short-term fluctuation in response to difficult economic conditions. Short-term fluctuations produce a pattern of decline or rise across the board. If the 'short-term' hypothesis was true, one would have found a decline in fertility during the recent period across all parities. On the other hand, a pattern of fertility transition from high to low, in general, follows a path that shows gradual decline in fertility concentrated initially at high parities and among the more modern subgroups. The trends in Ghana follow this pattern. Parity-specific birth interval analysis shows that proportions reaching higher order births (for example, 5 or higher) were reduced substantially in the recent period. For lower order births, the

proportions remain almost constant and even increased for the first order births. Likewise, subgroups characterized with more modern attributes show greater decline than those with less modern features. One can view the pattern as diffusing from high to low parities and from more modern subgroups to less modern subgroups. Overall, a trend of declining fertility is suggested.

Socio-economic differentials fit the usual pattern of high fertility among the subgroups lower on the socio-economic scale and traditional on the ethnic, religious, or regional scale. Among the five background variables considered in the multivariate analysis, region is the only statistically significant variable differentiating marital fertility.

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APPENDIX A

Table A.1 Age-specific fertility rates and total fertility rates (TFR), by women's most recent place of work and calendar period

Place of work/age groups	Period				Percentage change	
	1975–9	1970–4	1965–9	1960–4	1970/4–1975/9	1965/9–1970/4
Farm		N[a] = 2170				
15–19	224	171	159	166	+ 31.0	+ 7.5
20–24	278	286	279	287	− 2.8	+ 2.5
25–29	291	300	309	288	− 3.0	− 2.9
30–34	258	283	277	293	− 8.8	+ 2.2
35–39	193	211	257		− 8.5	− 17.9
40–44	132	153			− 13.7	
45–49	49					
TFR	7.13	7.27	7.42	7.47	− 1.9	− 2.0
At home		N[a] = 844				
15–19	161	134	120	141	+ 20.1	+ 11.7
20–24	280	269	276	252	+ 4.1	− 2.5
25–29	291	304	294	275	− 4.3	+ 3.4
30–34	236	280	280	256	− 15.7	0.0
35–39	199	231	189		− 13.9	+ 22.2
40–44	146	158			− 7.6	
45–49	80					
TFR	6.97	7.28	6.99	6.76	− 4.3	+ 4.1
Away from home		N[a] = 1860				
15–19	144	130	117	136	+ 10.8	+ 11.1
20–24	241	248	248	255	− 2.8	0.0
25–29	256	261	271	293	− 1.9	− 3.7
30–34	244	242	244	264	+ 0.8	− 0.8
35–39	163	203	235		− 19.7	− 13.6
40–44	124	156			− 20.5	
45–49	82					
TFR	6.27	6.61	6.77	7.11	− 5.1	− 2.4

[a]Number of women.

Table A.2 Age-specific fertility rates and total fertility rates (TFR), by women's most recent occupation and calendar period

Occupation/ age groups	Period				Percentage change	
	1975–9	1970–4	1965–9	1960–4	1970/4–1975/9	1965/9–1970/4
Not working		N[a] = 1251				
15–19	67	102	86	89	− 34.3	+ 18.6
20–24	234	260	213	248	− 10.0	+ 22.1
25–29	253	255	219	254	− 0.8	+ 16.4
30–34	258	184	215	283	+ 40.2	− 14.4
35–39	161	224	159		− 28.1	+ 40.9

[*Table continues*]

Table A.2 (*cont*)

Occupation/ age groups	Period				Percentage change	
	1975–9	1970–4	1965–9	1960–4	1970/4–1975/9	1965/9–1970/4
40–44	163	177			− 7.9	
45–49	45					
TFR	5.91	6.24	5.57	6.28	− 5.3	+ 12.0
Sales and services		N[a] = 1844				
15–19	160	143	124	152	+ 11.9	+ 15.3
20–24	270	276	265	259	− 2.2	+ 4.2
25–29	279	286	277	294	− 2.4	+ 3.2
30–34	247	262	259	245	− 5.7	+ 1.2
35–39	178	217	217		− 18.0	0.0
40–44	142	155			− 8.4	
45–49	94					
TFR	6.85	7.17	6.71	7.08	− 4.5	+ 6.9
Agricultural		N[a] = 2247				
15–19	211	172	159	167	+ 28.5	+ 8.2
20–24	277	281	277	289	− 1.4	+ 1.4
25–29	289	302	306	288	− 4.3	− 1.3
30–34	258	279	273	294	− 7.5	+ 2.2
35–39	190	210	256		− 9.5	− 18.0
40–44	129	156			− 17.3	
45–49	51					
TFR	7.08	7.26	7.39	7.51	− 2.5	− 1.8
Manual workers		N[a] = 519				
15–19	146	128	120	120	+ 14.1	+ 6.7
20–24	263	251	268	256	+ 4.8	− 6.3
25–29	243	276	330	250	− 12.0	− 16.4
30–34	228	272	291	220	− 16.2	− 6.5
35–39	202	234	207		− 13.7	+ 13.0
40–44	130	142			− 8.5	
45–49	52					
TFR	6.32	6.78	7.05	6.24	− 6.8	− 3.8
Professional and clerical		N[a] = 261				
15–19	71	71	62	49	0.0	+ 14.5
20–24	158	157	189	115	+ 0.6	− 16.9
25–29	235	182	191	(305)	+ 29.1	− 4.7
30–34	219	178	(215)	281[b]	+ 23.0	− 17.2
35–39	115	(125)	237[b]		− 8.0	(− 47.3)
40–44	(65)	155[b]			(− 58.1)	
45–49	61[b]					
TFR	4.62	4.65	5.55	6.02	− 0.6	− 16.2

[a]Number of women.
[b]These are estimated rates, taken from the total population (see table 3.2) because the number of older women in professional occupation was too few to allow direct calculation of the rates.
( ) indicates fewer than 100 woman-years of exposure during the 5-year period.

Table A.3 Marital age-specific fertility rates and total marital fertility rates (TMFR), by husband's occupation and calendar period

Husband's occupation/ age group	Period				Percentage change	
	1975–9	1970–4	1965–9	1960–4	1970/4–1975/9	1965/9–1970/4
Agricultural		N[a] = 2472				
15–19	351	318	307	274	+ 10.4	+ 3.6
20–24	309	312	306	301	− 1.0	+ 2.0
25–29	298	323	301	297	− 7.7	+ 7.3
30–34	275	284	284	301	− 3.2	0.0
35–39	198	235	251		− 15.7	− 6.4
40–44	152	169			− 10.1	
45–49	79					
TFR	8.31	8.60	8.49	8.36	− 3.4	+ 1.3
Manual		N[a] = 1107				
15–19	357	327	320	350	+ 9.2	+ 2.2
20–24	325	312	323	304	+ 4.2	− 3.4
25–29	293	309	314	307	− 5.2	− 1.6
30–34	262	274	282	249	− 4.4	− 2.8
35–39	218	239	285		− 8.8	− 16.1
40–44	143	215			− 33.5	
45–49	(97)					
TFR	8.48	8.87	9.18	9.04	− 4.4	− 3.4
Sales, clerical, services		N[a] = 809				
15–19	325	344	295	323	− 5.5	+ 16.6
20–24	312	342	342	357	− 8.8	0.0
25–29	282	269	308	324	+ 4.8	− 12.7
30–34	252	276	224	(246)	− 8.7	+ 23.2
35–39	199	184	(209)		+ 8.2	− 12.0
40–44	148	(178)			− 16.9	
45–49	(59)					
TFR	7.89	8.26	8.08	8.48	− 4.5	+ 2.2
Professional		N[a] = 467				
15–19	374	338	329	341	+ 10.7	+ 2.7
20–24	284	310	322	322	− 8.4	− 3.7
25–29	301	268	336	377	+ 12.3	− 20.2
30–34	279	243	295	(333)	+ 14.8	− 17.6
35–39	151	192	(249)		− 21.4	− 22.9
40–44	92	(97)			− 5.2	
45–49	(0)					
TFR	7.41	7.24	8.14	8.60	+ 2.3	− 11.1

[a]Number of women.
( ) indicates fewer than 100 women years of exposure during the 5-year period.

Table A.4 Parameter estimates and their standard errors (SE) from the log-linear model of marital (since marriage) fertility rates

Estimate	SE	Parameter
−.8873	.03426	%GM
−.2096	.02756	AGE (2)
−.2881	.02940	AGE (3)
−.5787	.02888	AGE (4)
−.07093	.02044	PER (2)
.06006	.03788	REL (2)
.02130	.02886	REL (3)
−.1939	.04490	REG (2)
−.04882	.03713	REG (3)
−.08041	.05107	REG (4)
−.08778	.03112	REG (5)
−.1314	.04824	REG (6)
−.02791	.04721	ETH (2)
.04336	.04405	ETH (3)
.02385	.04535	ETH (4)
−.02142	.03891	ETH (5)
−.01560	.02897	ED (2)
.003628	.03153	ED (3)

The first category (%GM) is to be interpreted as the 'Grand Mean', the general reference category which represents the combination of all the individual reference categories. The details of the parameters are as follows:

I. *AGE (age at end of period)*
(1) < 25 (reference category)
(2) 25–29
(3) 30–34
(4) 35–44

II. *PER (Period)*
(1) 5–9 (reference category)
(2) 0–4

III. *REL (Religion)*
(1) Christian (reference category)
(2) Muslim
(3) Traditional and others

IV. *REG (Region)*
(1) Western/Central (reference category)
(2) Greater Accra
(3) Eastern
(4) Volta
(5) Ashanti/Brong Ahafo
(6) Northern/Upper

V. *ETH (Ethnicity)*
(1) Akan (reference category)
(2) Mole-Dagbani
(3) Ewe
(4) Ga-Adangbe
(5) Guan and others

VI. *ED (Education)*
(1) No schooling (reference category)
(2) 1–9 years
(3) 10+ years

APPENDIX B

Fertility rates from birth histories. (Extracted from 'Illustrative Analysis: Recent Fertility Trends in Sri Lanka', *WFS Scientific Reports* no 25, chapter 3, by Iqbal Alam and John Cleland.)

3.1 Age-period-specific fertility rates (ASFR)

The ASFR is the ratio of (a) births to an age group in a specified interval of time, generally a 12-month period, to (b) the total number of woman-years spent in that age group in that interval of time. That is, the births in the numerator are classified according to the age of the mother at the time of childbirth,[4] and the woman-years of exposure, the denominator, do not depend on the woman's marital status. It is conventional to multiply these ratios by 1000. The sum of these ratios across ages is the Total Fertility Rate (TFR), which may be interpreted as the mean number of births that a woman would have if she survived the entire reproduction span and experienced the fertility schedule prevailing in a given period.

In WFS surveys generally, two sets of data have been collected, one relating to ever-married individual respondents and the other to all household members. The calculation of ASFRs requires information from both data sets – the numerator (number of births) from the individual data and the denominator (number of women) from the household data. The approach adopted here is to use as the denominator for age-specific fertility rates the number of ever-married women from the individual survey divided by the proportion ever married for each age at the time of the survey (from the household survey), thus adjusting for women who were not married at the time of the survey. For example, if in the household survey 75 per cent of the women aged 20 are ever married, then on the inflation factor for this age is $1/.75 = 1.33$. The adjustment factors are calculated by single years of age and often exhibit considerable fluctuations. The merits of smoothing proportions to remove irregularities due to sampling error are debatable but, in the case of Sri Lanka, experimental work indicated that smoothing made little difference to the rates.

It should be recognized that the computation of ASFRs in this way assumes that single women

[4] When month of mother's birth and of the child's birth coincide, it is assumed in Fertrate that the former precedes the latter.

have no births, an assumption that is reasonable in the case of Sri Lanka in view of the very low reported level of premarital births. It should also be noted that these all-women rates can only be calculated for subpopulations that can be identified in the household survey data. In the case of the SLFS, this consideration limits analysis to type of place of residence and region of residence. Period can be measured either in calendar years or in intervals of time receding from the survey in 12-month blocks. In the latter case, events in the month of interview itself and exposure in that month are omitted to avoid the problem of the extra half month of exposure. We have preferred to use the period-before-interview approach to avoid the slight inherent disadvantage of the calendar approach, stemming from the incomplete experience in the calendar year of interview, namely 1975. In the presentation of results, however, we have retained a calendar year label to denote period, in order to sharpen the historical perspective. Thus rates for the period 0–4 years preceding the survey are labelled 1970–75, rates for 5–9 years prior are labelled 1965–70 and so forth.

3.2 Age-period-specific marital fertility rates (ASMFR)

The ASMFR is similar to the ASFR except that the denominator consists of exposure either (1) since first marriage, or (2) within marriage. In the first case, all births following date of first marriage are included in the numerator, while in the second case, births occurring in periods of separation, divorce or widowhood are excluded. The sum of these rates is the total marital fertility rate (TMFR). In societies where women marry late and age at marriage is increasing, as in Sri Lanka, changes in this measure are difficult to interpret and often misleading, as the rates for younger age groups are based on a highly selective minority of early marrying women. For this reason we have avoided cumulating age-specific marital rates in the presentation of the substantive results.

The computation of ASMFRs is similar to that of ASFRs, except that the denominators as well as the numerators are calculated from the individual data, because single women do not contribute exposure. In general, the ASMFRs will be calculated on the within-marriage basis. The reason for this decision is to control for possible differences in exposure following first marriage between subgroups, though in Sri Lanka where marital stability is high and fertility outside marriage is negligible, these two different ways of calculating marital fertility rates yield similar results. In surveys where less confidence can be placed on the accuracy of reported dates of births, marital dissolutions and remarriages than in the SLFS, it would be preferable to use exposure since first marriage.

3.3 Duration-period-specific marital fertility rates (DSMFR)

The main reasons for analysing marital fertility by age, rather than duration since first marriage, are (1) comparability with other sources; (2) the recognition that biological fecundability varies by age; and (3) lack of data on duration since first marriage. The last mentioned reason does not apply in this case and there is a great advantage for subgroup comparisons in relating fertility to time since first marriage, the starting point of real exposure, rather than to age.

In our analysis, we will calculate DSMFRs for various subgroups of the population. The computational procedures are the same as for marital fertility except that instead of age, the rates are cross-classified by duration since first marriage. As summary measures, we shall cumulate DSMFRs to durations 15 and 20. These synthetic cohort measures are analogous to the TFR and represent the average number of children born in the first 15 or 20 years of marriage to a hypothetical woman experiencing the fertility rates of a specified period. The reason for presenting both summations is that the former will tend to give conservative estimates of changes in marital fertility, while the latter may yield slightly inflated estimates because of truncation. The main limitation of both these summary indices concerns the comparison of subpopulations where age at first marriage is very different. For a late marrying group, births in the first 20 years of marriage are close to completed fertility, but this is not true for an early marrying group. As earlier marriage is usually associated with higher marital fertility, the net effect will be to understate differentials between subgroups. This limitation should be borne in mind in the discussion of findings.

As intimated earlier, truncation, due to the fact that women over the age of 49 were not included in the individual survey of the SLFS, affects DSMFRs by progressively restricting rates to younger marrying women as the period before survey lengthens. For instance in the period

10–14 years before the survey (1960–5), fertility rates at duration 15–19 are totally confined to women marrying before the age of 25 and under-represent women marrying between 15 and 25. The corresponding rates for the most recent period, 0–4 years before the survey, are merely restricted to women marrying before age 35 and under-represent women marrying between the age of 25 and 35. As duration-specific marital fertility is likely to be related to age at marriage, it is clear that a straightforward comparison of DSMFRs on a 15-year period runs the risk of biased estimates of fertility decline, probably in the direction of overestimating the decline.

In a very large sample, this problem could be minimized by introducing age at marriage controls, but this is impractical in the present study, except at the national level, because it leads to excessively unstable estimates based on small numbers of woman. Another approach is to eliminate the truncation effect by restricting the analysis at each duration to women marrying before a certain age. Thus the investigation of changes in fertility over the past 15 years at durations 15–19 can be restricted to women marrying before age 15; similarly at duration 10–14, attention can be confined to women marrying before age 20 and so on. This approach was tried both at the national level (see table 12 in the next chapter) and for the two extreme educational categories whose average age at marriage is very different. These results are shown in appendix table B3. As expected the differences between the truncated and untruncated rates are greater for the later marrying, better educated group than for less educated couples, and wider at longer durations. Differences in the cumulated rates, however, are not excessive. For the better educated, the estimated declines between the period 1960–5 and 1970–5 in the number of children born in the first 15 years of marriage were 23 and 20 per cent for truncated and untruncated rates, respectively. In terms of children born in the first 20 years of marriage, the figures were 28 and 22 per cent. For the less educated, the corresponding figures were 16 and 14 per cent for 15 years, and 18 and 14 per cent for 20 years.

This empirical exercise led us to conclude that a straightforward interpretation of duration-specific rates over a 15-year period without an age at marriage restriction would not yield seriously distorted estimates of change, even at the sub-national level and in our main analysis we have proceeded on this assumption. The decision was strengthened by the realization that the elimination of the age at marriage truncation bias introduced a selection bias of possibly equal seriousness. This latter bias arises from the fact that Sri Lanka has experienced substantial increases in age at marriage over the past 20 years. Thus, young marrying members of more recent marriage cohorts are an increasingly atypical and selected minority whose reproductive behaviour cannot be easily compared to early marrying members of older cohorts.

4 Knowledge and Use of Contraception

Rebecca Appiah

4.1 INTRODUCTION

Ghana, with an estimated annual birth rate of 50 per 1000 persons and a growth rate of about 3 per cent per annum, is one of the fastest growing countries in the world. Large families are generally favoured. This high fertility was mainly a function of the high infant mortality. However, even with a drastic reduction in infant mortality and a resultant increase in the expectation of life at birth, there has not been any appreciable decline in fertility levels. Since as late as in 1966, only about 14 per cent males and 11 per cent females knew of contraceptives and only 12 per cent males and 8 per cent females had ever used contraceptive methods (Pool 1970); the level of modern contraceptive knowledge and use before the 1950s must be much lower. However, spacing of births for child-health reasons was widely known and practised. Abstaining from sexual relations while lactating was the method largely practised in the past, though the period of post-partum abstention has shortened in recent times. Abstention was facilitated by the high incidence of polygyny.

The first post-independence government recognized in its 7-year Development Plan the fact that the population was growing at a rapid rate due to declining death rates and continuing high fertility rates. However, the government at that time looked upon the growing population as an opportunity which required 'a sustained stream of productive investments at an adequate rate to turn this opportunity into a reality'. During 1956–66 there was no publicity or distribution of contraceptives. It was mainly due to the pronatalist attitude of the administration that efforts to set up family planning programmes by private organizations did not succeed. In 1956 an initiative by Miss Edith Gales of the Pathfinder Fund led to the formation of a family planning committee but no concrete action followed. In 1961 the Christian Council of Ghana established a committee on Christian marriage and family life in Accra. This committee gave contraceptive advice and supplies in addition to general counselling on marriage. The coverage was, however, limited to a small section of the general public. A branch of the International Planned Parenthood Federation (IPPF), known as the Planned Parenthood Association of Ghana, was established as a result of a visit by Mrs Betty Hill, and started offering family planning services from 1965 onwards.

A change in government in 1966 eventually led to a change in the official attitude towards family planning programmes. In 1966 the then newly created Manpower Board advised on the need to reduce the rate of population growth, and in 1969 the government adopted a population policy which aimed at reducing the rate of population growth to 2 per cent per annum by the year 2000. The Ghana National Family Planning Programme was also set up at the same time to offer family planning services to couples who wanted to limit or space childbearing. There are now 336 hospitals or clinics which provide family planning services. Most of these 336 family planning clinics are controlled by the government:

Region	Total	Government hospitals and health centres[a]	PPAG[b]	Christian Council	Other private mission clinics
Total country	336	230	41	12	53
Western	31	20	7	–	4
Central	19	13	4	–	2
Greater Accra	57	21	12	4	20
Eastern	53	39	6	1	7
Volta	44	39	–	4	1
Ashanti	55	34	7	1	13
Brong Ahafo	24	20	–	1	3
Northern	28	21	4	–	3
Upper	25	23	1	1	–

[a]Ministry of Health.
[b]Planned Parenthood Association of Ghana.

Susheela Singh, John Y. Owusu and Iqbal H. Shah, eds (1985). *Demographic Patterns in Ghana: Evidence from the Ghana Fertility Survey 1979–80*: 97–142. Voorburg, Netherlands: International Statistical Institute.

All family planning services are offered in these hospitals and clinics, whether government or private, but sterilization is carried out only in the big hospitals. There is no emphasis on the provision of any specific method. Acceptors are offered services which they ask for but they are also advised about other methods when they want to change methods. Even though it is generally believed that the rate of abortion is high, abortion still remains a criminal act and is allowed only when the mother's life is in danger. Apart from modern contraceptives, it is generally accepted that some women also use local herbs as contraceptives. However, most of the herbs supposedly used for preventing conception are usually pessaries for abortion (Bleek 1976). This fact was also confirmed by the data from the Ghana Fertility Survey where all the local contraceptive herbs mentioned were later found to be abortifacients.

The Ghana Fertility Survey, which was conducted in 1979–80, collected data on fertility, marriage, contraception and fertility preferences of about 6125 women aged 15–49. Some background data on the socio-economic characteristics of respondents and respondents' husbands were also obtained. In addition, data on knowledge and use of both modern and traditional contraceptives were also collected. One of the important features of this survey was that the sample was large enough to allow for analysis of regional differentials.

However, it is pertinent that we point out some of the limitations of the data we are going to use. First, the data cannot describe trends in contraceptive use. Secondly, the data do not differentiate between continuous and sporadic use of contraceptives, because the only available data on timing of use is use in the open interval. Data on current use of more than one method were also not collected.

In editing the original questionnaires it was found that in most cases where young unmarried respondents were staying with their parents, respondents almost invariably reported no knowledge and use of contraceptives. We suspect that there was gross under-reporting of knowledge of contraceptives in such cases and this may be due to the presence of one or both of the parents. We also suspect under-reporting of contraceptive use among respondents who are using contraceptives without the knowledge of their husbands.

One obvious inconsistency in the data was the fact that about 80 per cent of respondents who reported themselves as currently abstaining also reported that they were having sexual relations 'these days'. This inconsistency may be due to the fact that the respondents might not have fully understood the question on abstinence, eg it could have been interpreted to mean rhythm, and the time reference of the phrase 'these days' is very vague.

The first part of this study is a descriptive analysis of the levels of knowledge and use of contraception for the national population and for selected socio-economic subgroups. Following that, we consider the relationship between fertility preferences and contraceptive use. We then briefly look at knowledge of family planning sources and recent attendance at such sources according to knowledge and use of specific contraceptive methods. Finally, we use multivariate analysis to estimate the independent effect of background variables on the level of contraceptive knowledge and use.

4.2 KNOWLEDGE, EVER-USE AND CURRENT USE OF CONTRACEPTION

In the GFS, as in most other WFS surveys, data on contraception was obtained by a detailed battery of questions. Spontaneous knowledge of methods was ascertained first with the following question: 'Now I want to talk about a somewhat different topic. As you may know, there are various methods that women or men can use to delay or avoid pregnancy. Do you know of, or have heard of, any of these ways or methods?' If the answer was yes, women were then asked which methods they knew of. Methods which were not volunteered by the respondent were probed individually, with a sentence describing the method. At the same time women were asked, for each method they reported knowing, whether they had ever used that method. Current use of contraception was ascertained separately in a later section of the questionnaire, from currently married women who had resumed sexual relations after the last birth, and who were not currently pregnant, using a single direct question, 'Are you or your husband currently using a method to keep you from getting pregnant?', and if so, the method was asked. Data on abstinence was obtained in several ways in different parts of the questionnaire, as described below in the section on abstinence.

Although all women, including never-married women, were asked about the knowledge and ever-

use of contraceptive methods, much of the analysis is restricted only to currently married women. Among 6125 women, 4943 were ever married and 4436 were currently married. However, we do address knowledge and ever-use of contraception by the 1182 never-married women. Since they were not asked about current use, this aspect is not covered here.

Knowledge and use of any method of contraception

The GFS data shows that knowledge of contraceptive methods is fairly widespread among currently married women. Sixty-nine per cent of all currently married women knew about one or more methods. Variations in the level of knowledge by age group are minimal except among women with no schooling or only primary education (table 4.1). Overall, the level of knowledge rises from a low of 61 per cent at age group 15–19 to a high of about 73 per cent at age group 20–29; thereafter the proportions decline gradually to 67 per cent and 66 per cent at 30–39 and 40–49, respectively, Regional differences, however, are rather large with the lowest level of knowledge in Northern/Upper region (22 per cent), and highest surprisingly in Volta (96 per cent), with Greater Accra following closely with 93 per cent.

Differentials in the level of knowledge among rural and urban residents, and the other socio-economic groups, are in the expected direction. Level of knowledge among urban residents is higher (80 per cent) than among rural residents (63 per cent). Variations in knowledge are rather

Table 4.1 Percentage of currently married women knowing one or more contraceptive methods, by current age and background characteristics[a]

Subgroup	All ages	Current age				
		15–19	20–29	30–39	40–49	Number of women
All women	68.6	61.1	72.6	67.0	65.6	4436
Region						
Western/Central	79.9	82.5	82.9	79.1	74.7	650
Greater Accra	93.1	(80.0)	94.1	93.5	94.6	509
Eastern	87.1	(87.2)	88.9	87.0	83.9	689
Volta	96.3	(92.3)	97.7	97.3	92.3	428
Ashanti/Brong Ahafo	63.9	57.7	70.7	58.6	58.8	1342
Northern/Upper	22.0	35.0	22.5	20.8	26.3	818
Place of residence						
Rural	63.2	57.9	65.8	63.0	60.7	3012
Urban	80.1	69.6	85.4	75.0	80.0	1424
Level of education						
No schooling	56.8	43.0	54.1	58.4	61.2	2686
Primary	80.0	62.5	79.8	84.7	84.5	456
Incomplete Middle	87.2	87.5	86.0	89.6	–	390
Complete Middle	88.7	84.4	88.5	90.1	(95.0)	743
Secondary +	96.7	–	97.9	97.5	–	152
Occupation						
Never worked	52.6	58.6	60.1	35.4	(20.0)	455
Agricultural	61.7	51.6	63.2	60.3	63.9	1884
Sales and service	76.8	76.7	80.3	75.0	72.6	1485
Manual	75.4	–	81.7	71.4	67.2	415
Professional and clerical	97.1	–	95.1	(100.0)	(91.7)	196

[a]Figures for cells with less than 20 women are not shown, while the values for cells with 20–49 cases are given in parentheses. Subgroups may not add up to 4436 because of missing data.

large for the educational and occupational subgroups. As the educational level rises the level of knowledge increases. Whereas only 57 per cent of women with no formal education know a method, knowledge is almost universal for women with secondary and higher education. With regard to respondent's occupation, among women who have never worked, 53 per cent know a method; however, 62 per cent of agricultural workers, 80 per cent of sales and service workers, 82 per cent of manual workers and 95 per cent of professional and clerical workers know at least one method. This pattern of differentials approximates the expected positive relationship with status of occupation.

In addition to fairly widespread knowledge of at least one method of contraception, we find that knowledge of more than one method is also common. More than a third of all currently married women know four or more methods, and only about 12 per cent of women who know any method know of only one method (table 4.2). This observation applies to most subgroups of the population. However, among the regions there is considerable variation. In Northern/Upper region, where the level of knowledge is very low, a large majority of those knowing any method know only one method and only about 3 per cent know four or more methods. But Volta region, in spite of its high overall level of knowledge, also has a relatively large proportion knowing only one method (23 per cent). In Greater Accra, 76 per

Table 4.2 Percentage distribution of currently married women, by number of methods known and selected background variables[a]

Subgroup	Number of methods known					
	0	1	2	3	4+	Number of women
All women	1389	527	477	433	1600	4426
Percentage	31.4	11.9	10.8	9.8	36.2	100.0
Age group						
15–29	29.2	10.0	11.2	10.0	39.6	2203
30–49	33.5	13.8	10.4	9.6	32.7	2223
Number of living children						
0–1	32.4	10.3	10.5	8.7	34.9	1278
2–3	32.4	11.8	9.9	9.3	36.7	1435
4–5	31.9	13.4	11.2	10.8	32.9	955
6+	27.0	12.9	12.4	11.3	36.2	758
Region of residence						
Western/Central	20.1	10.7	10.1	8.8	50.3	646
Greater Accra	6.9	4.9	5.3	7.3	75.6	506
Eastern	12.9	13.2	13.1	11.9	48.8	686
Volta	3.7	23.4	16.6	11.9	44.4	428
Ashanti/Brong Ahafo	36.1	10.6	14.6	13.5	25.3	1339
Northern/Upper	77.9	12.3	3.4	3.1	3.1	815
Type of place of residence						
Rural	36.8	13.0	11.7	9.5	29.1	3006
Urban	19.9	9.5	8.9	10.4	51.2	1420
Level of education						
No schooling	43.2	14.7	10.1	8.9	23.2	2686
Primary	20.0	11.8	13.6	12.3	42.4	456
Incomplete Middle	12.8	9.2	12.8	14.6	50.4	390
Complete Middle	11.3	5.2	12.0	10.4	61.0	743
Secondary+	2.6	1.3	3.3	3.3	89.5	151

[a]Percentages may not add to 100 due to rounding. Subgroups may not add up to 4426 because of missing data.

cent know of four or more methods, and Western/Central region, even with its relatively low overall level of knowledge, has 50 per cent, compared to 48.8 per cent in Eastern and 44 per cent in Volta, knowing four or more methods. Urban residents are more likely to know of more methods than rural residents.

The data also show that education has the greatest impact on the number of methods likely to be known. The more educated a woman is, the higher the likelihood that she knows a large number of methods. While almost 90 per cent of women with secondary and higher education know of four or more methods, only 23 per cent of those with no formal education are in that category.

Even though knowledge of contraceptive methods is quite high, the level of ever-use is fairly low (table 4.3). Only 40 per cent of currently married women had ever used a method. But the pattern of ever-use by age of a woman and her socio-economic group is similar to that of level of knowledge.

Variations among age groups are slight while that by region is quite large. As expected Northern/Upper region has the lowest proportions, while Volta has the highest level of ever-users (93 per cent). As expected, the level of ever-use increases as the level of education increases, with 30 per cent of women with no schooling compared to about 75 per cent of women with secondary and higher education reporting ever using any method. Among the occupational groups a similar direction can be observed, but the difference in levels of ever-use among the professional and clerical workers as compared to women in all the other occupational groups is substantial.

Even though most women who know at least

Table 4.3 Percentage of currently married women who ever used any method of contraception, by current age and selected background variables[a]

Subgroup	Current age					
	All ages	15–19	20–29	30–39	40–49	Number of women
All women	40.0	27.5	42.6	41.4	37.6	4436
Region						
Western/Central	20.7	17.5	27.4	19.4	12.7	650
Greater Accra	49.1	(20.0)	48.5	54.2	51.4	509
Eastern	69.2	(59.6)	67.0	75.0	68.4	689
Volta	92.5	(88.5)	96.6	92.7	84.6	428
Ashanti/Brong Ahafo	32.7	22.6	37.4	31.0	29.4	1342
Northern/Upper	9.7	4.2	7.8	9.4	15.3	818
Place of residence						
Rural	38.2	30.5	39.9	39.5	36.4	3012
Urban	43.6	19.6	47.8	45.5	41.0	1424
Level of education						
No schooling	9.8	18.3	25.4	32.9	33.4	2686
Primary	47.6	(22.6)	44.1	56.9	(58.6)	456
Incomplete Middle	53.1	41.1	51.5	56.9	(59.1)	390
Complete Middle	57.6	42.9	59.0	63.4	(52.5)	743
Secondary+	79.6	–	77.9	(82.5)	–	152
Occupation						
Never worked	23.7	21.2	28.2	23.1	(10.1)	455
Agriculture	35.3	23.2	35.7	35.9	37.5	1884
Sales and service	44.0	38.9	45.7	46.1	37.8	1485
Manual	48.3	–	53.0	46.4	39.1	415
Professional and clerical	76.0	–	74.6	(77.3)	(79.1)	196

[a]Figures for cells with less than 20 women are not shown, while the value for cells with 20–49 cases are given in parentheses. Subgroups may not add up to 4436 because of missing data.

one method know four or more methods, more than 50 per cent of all those who have ever used contraception have used only one method and only a very small proportion (2.6 per cent) has used four or more methods (table 4.4). This contrast is even stronger in cases where the overall level of ever-use is low. Thus in Northern/Upper where only about 10 per cent have ever used contraception, 85 per cent of women who have ever used any method had used only one method and among those with no education about 72 per cent of ever-users had used only one method. However the proportions using two methods in Volta and Eastern are reasonably high. And among those with secondary and higher education about equal proportions have used one, two or three methods (20 per cent each).

In addition to ever-use being substantially less than knowledge of contraception, current use is also much lower than ever-use (see figure 4.1). Only about 10 per cent of all currently married women are using a method. Current use is lowest among women aged 15–19 and highest (12 per cent) at age group 30–39. Those aged 40–49 also show low levels of current use. The comparatively low levels of current use at the younger and the older age groups may indicate for the younger group the eagerness to have children as they are newly married, and for the older group, the belief that they are no longer capable of bearing children and therefore have no need for continued use (if they had ever used at all). The regional variations are much wider with Greater Accra having the highest proportion currently using (20 per cent) and

Table 4.4 Percentage distribution of currently married woman, by number of methods ever used and selected background variables[a]

Subgroup	Number of methods ever used					
	0	1	2	3	4+	Number of women
All women	2652	992	458	208	116	4426
Percentage	59.9	22.4	10.3	4.7	2.6	100.0
Age group						
15–29	59.8	20.9	10.6	5.6	3.1	2203
30–49	60.0	23.9	10.1	3.8	2.2	2223
Number of living children						
0–1	64.8	18.6	9.4	4.6	2.5	1278
2–3	60.0	21.9	10.4	4.8	3.0	1435
4–5	57.6	24.4	10.4	4.9	2.7	955
6+	54.5	27.3	11.9	4.4	2.0	758
Region of residence						
Western/Central	79.3	14.2	3.4	2.3	0.8	646
Greater Accra	50.9	23.0	14.9	7.1	4.1	506
Eastern	30.8	30.8	20.8	9.7	8.0	686
Volta	7.5	53.0	25.0	11.0	3.5	428
Ashanti/Brong Ahafo	67.3	20.7	7.7	3.0	1.3	1339
Northern/Upper	90.3	8.2	0.9	0.4	0.2	815
Place of residence						
Rural	61.8	22.6	9.4	4.0	2.2	3006
Urban	55.9	22.0	12.3	6.3	3.5	1420
Level of education						
No schooling	70.2	20.9	5.9	2.0	1.0	2686
Primary	52.4	26.1	13.4	4.8	3.3	456
Incomplete Middle	46.9	26.4	17.4	5.9	3.3	390
Complete Middle	42.3	23.4	18.8	9.8	5.6	743
Secondary+	19.9	23.4	20.5	23.2	12.2	151

[a]Percentages may not add up to 100 due to rounding. Subgroups may not add up to 4426 because of missing data.

Table 4.5 Percentage distribution of currently married women, by number of efficient methods known and selected background variables[a]

Subgroup	Number of efficient methods known					
	0	1	2	3	4+	Number of women
All women	1796	533	516	458	1123	4426
Percentage	40.6	12.0	11.7	10.3	25.4	100.0
Age group						
15–29	36.3	11.0	12.7	11.4	28.6	2203
30–49	44.8	13.1	10.6	9.3	22.1	2223
Number of living children						
0–1	39.7	10.5	12.1	10.0	27.6	1278
2–3	41.0	11.5	10.9	11.0	25.9	1435
4–5	42.7	12.8	12.0	8.6	23.8	955
6+	38.7	14.8	11.7	11.9	22.9	758
Region of residence						
Western/Central	24.5	13.5	12.1	12.1	38.0	646
Greater Accra	8.4	8.1	8.1	14.5	60.9	506
Eastern	26.1	17.7	13.8	12.5	29.8	686
Volta	38.1	14.0	9.8	7.9	30.1	428
Ashanti/Brong Ahafo	40.6	13.2	17.3	12.6	16.2	1339
Northern/Upper	86.9	5.6	3.4	2.1	2.0	815
Type of place of residence						
Rural	48.4	12.5	11.1	9.0	18.5	3006
Urban	24.1	11.1	12.7	13.2	38.9	1420
Level of education						
No schooling	55.5	12.6	9.5	8.3	14.2	2686
Primary	26.5	17.3	16.0	11.0	29.2	456
Incomplete Middle	18.2	13.3	15.9	15.4	37.0	390
Complete Middle	14.8	8.2	15.6	14.7	46.6	743
Secondary+	2.6	2.0	6.6	9.9	78.8	151

[a]Percentages may not add to 100 due to rounding. Subgroups may not add up to 4426 because of missing data.

Northern/Upper the lowest proportion (about 1 per cent). The level of current use is also moderately high in Eastern and Volta regions. The comparatively high level of current use in Greater Accra is not surprising as it also has the highest proportion of educated women. Forty-four per cent of currently married women in Accra have more than 9 years of schooling as compared to 4 per cent in Northern/Upper region.

Although, generally, the youngest age group has the lowest level of current use, in Greater Accra that group has the highest proportion of current users (33 per cent). This may indicate use for postponing or spacing childbearing. A sizeable proportion of current users at age group 30–39 and 40–49 in most of the regions may, on the other hand, indicate use for stopping childbearing. Current use rises with level of education. However, among women with middle and secondary and higher education, use is highly concentrated among ages 20–29 and 30–34, an indication of use for spacing. On the other hand, use among women with primary education is spread more evenly over age groups 20–29, 30–39 and 40–49 with the highest proportion in the oldest age group, a greater indication of use for stopping childbearing. The direction of current use among the occupational groups shows that women in the professional and clerical groups have the highest proportion and women who have never worked the lowest. However, current use is highest among those aged 30–39 in all groups, except manual,

where the highest use is observed for age group 20–29.

Table 4.6 indicates that generally the more methods known, the larger the proportion who are currently using contraception. Thus, while 11 per cent of women who know of only one method are currently using a method, 37 per cent of women who know of nine methods are using contraception. While no such pattern emerges when one looks at the number of living children, the regions show the general pattern up to the level of four known methods. Thereafter the proportion either stabilizes or fluctuates. Among the educational groups too, the general pattern is clearly discernible.

Data on current use by number of methods ever used (table 4.7) show a similar pattern, but the proportion using stabilizes at the level of ever-use of two methods. However, in Greater Accra, Volta and Ashanti/Brong Ahafo regions and among women with secondary and higher education the proportion using contraception stabilizes after knowledge of three methods.

From the foregoing we can say that there are fairly wide variations in levels of knowledge, ever-use and current use of contraceptive methods among the various socio-economic groups. In addition, there are wide gaps between the levels of knowledge and ever-use and the levels of ever-use and current use. These gaps are clearly illustrated in figures 4.1 and 4.2.

Knowledge, ever-use and current use of specific methods

One useful classification of methods is that of efficient, relative to the less efficient (called

Table 4.6 Among women who know at least one method, the percentage distribution of women currently using a method, by number of methods known, for selected background variables[a]

Subgroup	Number of methods known										
	1	2	3	4	5	6	7	8	9	10	11
All women	402	374	318	285	234	243	198	124	101	53	(41)
Percentage	11.2	12.3	15.1	15.8	24.0	18.9	20.2	24.2	36.6	28.3	(36.6)
Age group											
15–29	7.9	7.5	16.4	15.2	22.7	16.4	22.6	25.0	31.6	(21.9)	(25.0)
30–49	13.8	17.7	13.7	16.7	25.5	22.0	17.4	23.2	(43.2)	(38.1)	(47.6)
Number of living children											
0–1	7.0	5.9	16.4	10.1	31.3	16.4	14.0	(15.2)	(21.2)	(26.1)	–
2–3	8.8	13.6	15.9	19.1	23.2	16.9	26.4	(34.7)	(43.6)	–	(25.0)
4–5	15.3	13.6	11.1	20.0	(19.2)	18.3	(22.2)	(25.0)	–	–	–
6+	16.2	18.2	17.5	(14.6)	(19.5)	(28.2)	(15.0)	–	–	–	–
Region of residence											
Western/Central	3.8	(4.6)	(0.0)	(2.6)	(7.9)	11.8	(18.3)	(15.2)	(10.0)	(28.3)	–
Greater Accra	5.6	(4.6)	(11.1)	(20.4)	26.4	22.2	(28.9)	(40.6)	(56.7)	–	(30.4)
Eastern	2.9	29.0	31.2	10.0	(27.1)	19.4	(17.0)	(20.0)	–	–	–
Volta	13.3	17.0	16.2	(20.0)	(18.5)	(22.2)	(13.0)	–	–	–	–
Ashanti/Brong Ahafo	7.4	8.4	13.4	21.0	30.8	13.9	(21.2)	–	–	–	–
Northern/Upper	5.0	(0.0)	–	–	–	–	–	–	–	–	–
Level of education											
No schooling	11.8	16.3	10.8	9.9	16.7	12.5	14.9	(12.5)	(28.6)	–	–
Primary	12.5	6.0	(5.0)	(21.9)	(19.2)	(22.9)	(14.3)	–	–	–	–
Incomplete Middle	(7.7)	10.2	(10.3)	17.7	(22.6)	(21.2)	(9.1)	–	–	–	–
Complete Middle	(6.5)	6.0	21.8	20.8	32.1	23.7	24.2	(23.9)	28.9	–	–
Secondary+	–	–	–	–	–	–	–	–	–	–	–

[a]Figures for cells less than 20 women are not shown, while the values for cells with 20–49 cases are in parentheses.

Table 4.7 Percentage of women currently using a method, by number of methods ever used and selected background variables[a]

Subgroup	Number of methods ever used			
	1	2	3	4+
Number of women	772	373	163	75
Percentage	23.8	38.6	36.2	36.0
Age group				
15–29	19.1	40.7	36.1	(35.7)
30–49	28.2	36.3	36.4	(36.4)
Number of living children				
0–1	21.0	36.5	(30.2)	–
2–3	23.5	45.4	45.6	33.3
4–5	25.0	32.5	(36.8)	–
6+	26.4	35.8	(24.0)	–
Region of residence				
Western/Central	27.9	–	–	–
Greater Accra	48.2	55.2	(62.1)	–
Eastern	29.0	36.4	17.7	(25.0)
Volta	13.6	22.1	(30.0)	–
Ashanti/Brong Ahafo	20.2	42.0	(47.1)	–
Northern/Upper	11.8	–	–	–
Level of education				
No schooling	22.6	23.1	(28.9)	–
Primary	26.1	(32.7)	–	–
Incomplete Middle	18.1	38.5	–	–
Complete Middle	25.4	41.9	30.0	36.0
Secondary+	(48.0)	60.7	(62.1)	–

[a]Figures for cells with less than 20 women are not shown, while the values for cells with 20–49 cases are given in parentheses. This table is based on exposed women.

inefficient here). Efficient methods are the pill, IUD, sterilization, injection and the condom. All others are considered inefficient. In this section we look at levels of knowledge and use of these two main categories of methods, but we also consider specific individual methods.

Table 4.8 shows that there is generally a high level of knowledge of efficient methods and this holds for all the socio-economic subgroups. Slightly more younger women than older women know about efficient methods while more older women know about inefficient methods. Among the regions a higher proportion know at least one efficient method at all the age groups than know of only inefficient methods (except in Northern/Upper region where, at age groups 30–49, as many married women know of some efficient methods as inefficient methods). Knowledge of one or more efficient methods is almost universal in Greater Accra and is lowest in Northern/Upper region where the level of knowledge is low in any case. Women with no schooling are less likely to know about efficient methods than those with some education, and among those with some education the proportion knowing efficient methods rises with education.

Even though knowledge of only inefficient methods is comparatively low in most subgroups, it is disproportionately high in Volta, and this indicates that the very high level of knowledge observed earlier is mainly that of inefficient methods.

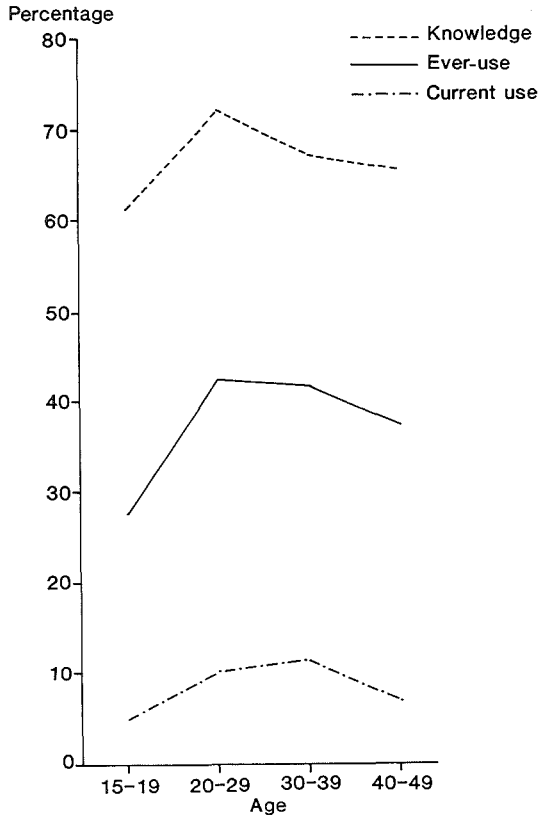

Figure 4.1 Knowledge, ever-use and current use of contraceptive methods, by age

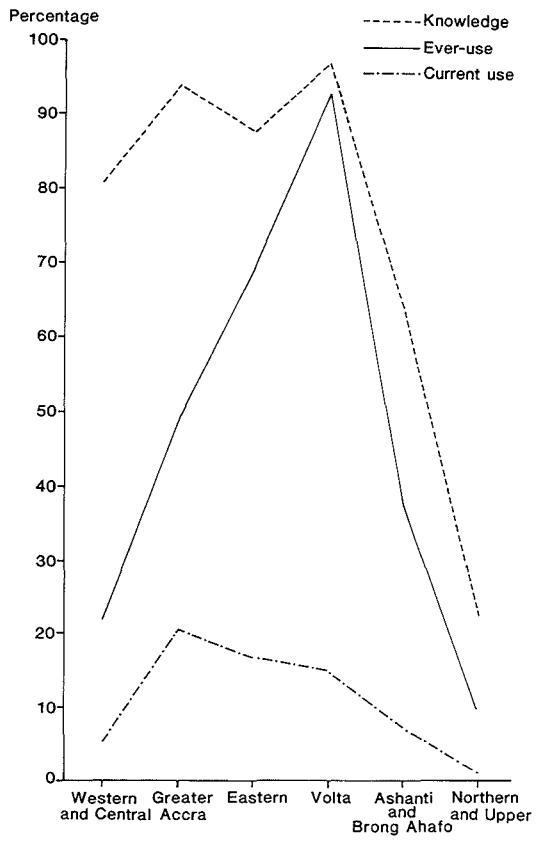

Figure 4.2 Knowledge, ever-use and current use of contraceptive methods, by region

Table 4.9 shows that, generally, the high level of knowledge of efficient methods is not limited to only one method. Many women know about four or more efficient methods (25 per cent). In addition younger women (15–29) and women with fewer children are more likely to know about more efficient methods than older women (30–49) and those with more children. Although many married women know of four or more efficient methods, the majority of those in Northern/Upper region who know of efficient methods, know of only one method. While almost two-thirds of women in Greater Accra know of four or more methods, the proportion is about one-third or less for the other regions. Furthermore, women with less education are more likely to know of fewer efficient methods than those with more education. About 80 per cent of those with secondary and higher education compared to about 14 per cent of those with no formal education know of four or more methods.

The pill and abstention are the most widely known methods. It is interesting to note that the pill was more likely than any other method to be spontaneously reported (table 4.10). Other well-known methods are IUD, female sterilization, condom, other female scientific methods, injection and rhythm, in that order. Methods which are least known are douche and male sterilization. In all regions, except Volta, Eastern and Northern/Upper, the pill is more widely known than abstention. In Volta almost every currently married women knew about abstention while the pill is known only to about half as many. While the proportion knowing the pill increases with educational level, interestingly enough the proportion knowing abstention also generally increases. However, it can be observed that level of knowledge of every method is much higher among women with a high level of education.

Table 4.11 shows that, though a higher proportion know about efficient methods, more

Table 4.8 Percentage of currently married women who know specific methods, by age and selected background variables

Subgroup	Inefficient only	Efficient	Pill	IUD	OFS[a]	Douche	Condom	Rhythm	Withdrawal	Abstention	Female sterilization	Male sterilization	Injection
All women	9.2	59.4	47.5	35.0	24.4	8.0	29.1	20.8	18.7	48.6	30.5	4.1	22.6
Age group													
15–29	7.0	63.7	51.1	36.7	30.5	8.3	35.2	22.0	20.9	47.1	31.3	5.1	23.1
30–49	11.3	55.1	43.9	33.3	18.4	7.6	23.1	19.6	16.5	50.0	29.7	3.1	22.0
Region of residence													
Western/Central													
15–29	3.2	79.6	65.7	44.7	32.7	18.1	53.1	21.7	35.3	54.1	36.9	9.7	38.5
30–49	5.3	71.8	58.1	48.1	23.2	12.9	38.1	15.8	33.1	53.4	34.9	6.2	38.7
Greater Accra													
15–29	0.4	92.1	76.8	66.7	55.1	13.9	76.4	45.3	28.1	62.9	63.7	7.9	41.2
30–49	2.9	90.9	76.5	71.1	49.6	14.5	64.9	51.7	26.9	73.6	68.2	9.9	49.6
Eastern													
15–29	8.9	79.8	49.7	30.1	42.3	12.6	48.5	37.7	32.5	68.4	55.2	5.2	23.0
30–49	17.1	68.6	45.5	27.3	27.8	13.5	29.5	31.4	23.1	73.8	48.5	1.1	21.5
Volta													
15–29	30.0	67.0	47.0	41.5	31.5	10.0	34.0	41.0	41.0	95.0	49.5	8.5	25.5
30–49	38.2	57.5	40.8	34.7	18.0	6.5	26.8	37.3	28.9	93.8	44.3	6.6	18.9
Ashanti/Brong Ahafo													
15–29	4.2	64.0	56.7	41.0	29.2	2.6	23.2	11.0	10.6	34.8	5.6	3.2	19.2
30–49	4.7	53.9	47.6	34.6	9.8	3.4	8.2	7.4	5.2	33.3	14.5	0.7	15.9
Northern/Upper													
15–29	6.3	14.6	13.5	4.0	3.2	3.0	3.4	3.7	3.4	10.0	3.7	1.3	4.2
30–49	11.1	11.8	10.2	3.4	1.8	1.1	1.6	3.0	1.6	15.4	2.3	0.5	4.6
Place of residence													
Rural													
15–29	8.7	55.6	43.1	29.8	24.2	7.3	27.6	18.3	18.9	44.2	26.3	4.5	19.4
30–49	14.2	47.8	36.8	25.7	13.0	6.3	15.4	15.6	14.5	52.6	25.2	2.2	17.2
Urban													
15–29	3.7	79.5	66.7	50.2	42.8	10.4	50.0	29.2	24.8	52.6	41.1	6.3	30.4
30–49	4.7	71.8	60.1	50.7	30.7	10.5	40.5	28.7	21.3	54.7	40.0	5.3	33.1
Level of education													
No schooling													
15–29	10.4	41.7	31.6	19.7	12.1	5.0	17.3	10.0	11.4	36.6	19.5	2.4	12.7
30–49	13.4	46.2	35.1	25.4	11.7	5.7	15.2	13.5	12.2	45.2	23.2	1.4	16.5
Primary													
15–29	5.7	70.9	51.7	32.6	25.7	8.8	37.2	28.0	21.5	50.2	37.9	5.0	23.8
30–49	7.7	76.9	61.5	45.1	22.6	9.2	34.4	30.8	20.0	65.6	44.6	4.1	32.8
Incomplete Middle													
15–29	4.8	81.4	63.2	48.5	42.6	10.7	46.4	25.8	23.7	54.6	39.9	6.2	30.2
30–49	7.1	82.4	67.7	56.5	29.3	11.1	37.4	33.3	24.2	63.6	43.4	1.0	22.2
Complete Middle													
15–29	4.2	83.7	71.3	53.9	50.7	11.0	51.2	31.6	29.6	57.7	39.3	6.6	32.5
30–49	1.2	90.1	80.7	70.2	51.5	15.2	59.7	44.4	34.5	66.1	54.4	10.5	50.3
Secondary+													
15–29	–	97.9	91.6	85.3	77.9	19.0	86.3	63.2	57.9	66.1	61.1	21.1	51.6
30–49	–	94.7	93.0	77.2	84.2	35.1	84.2	64.9	64.9	79.0	71.9	31.6	64.9

[a]OFS = Other scientific methods (ie diaphragm, tampon, sponge, foam tablets, jelly or cream).

Table 4.9 Percentage distribution of currently married women, by number of efficient methods known and selected background variables[a]

Subgroup	Number of efficient methods known					
	0	1	2	3	4+	Number of women
All women	1796	533	516	458	1123	4426
Percentage	40.6	12.0	11.7	10.3	25.4	100.0
Age group						
15–29	36.3	11.0	12.7	11.4	28.6	2203
30–49	44.8	13.1	10.6	9.3	22.1	2223
Number of living children						
0–1	39.7	10.5	12.1	10.0	27.6	1278
2–3	41.0	11.5	10.9	11.0	25.9	1435
4–5	42.7	12.8	12.0	8.6	23.8	955
6+	38.7	14.8	11.7	11.9	22.9	758
Region of residence						
Western/Central	24.5	13.5	12.1	12.1	38.0	646
Greater Accra	8.4	8.1	8.1	14.5	60.9	506
Eastern	26.1	17.7	13.8	12.5	29.8	686
Volta	38.1	14.0	9.8	7.9	30.1	428
Ashanti/Brong Ahafo	40.6	13.2	17.3	12.6	16.2	1339
Northern/Upper	86.9	5.6	3.4	2.1	2.0	815
Type of place of residence						
Rural	48.4	12.5	11.1	9.0	18.5	3006
Urban	24.1	11.1	12.7	13.2	38.9	1420
Level of education						
No schooling	55.5	12.6	9.5	8.3	14.2	2686
Primary	26.5	17.3	16.0	11.0	29.2	456
Incomplete Middle	18.2	13.3	15.9	15.4	37.0	390
Complete Middle	14.8	8.2	15.6	14.7	46.6	743
Secondary+	2.6	2.0	6.6	9.9	78.8	151

[a]Percentages may not add up to 100 due to rounding. Subgroups may not add up to 4426 because of missing data.

currently married women have ever used inefficient than efficient methods. However, a closer examination of the regional data show that only three of the regions (Volta, Eastern and Northern/Upper) follow that pattern. In the other regions a higher proportion have used more efficient than inefficient methods. Level of education shows that a higher proportion of those with no schooling are predisposed to use inefficient rather than efficient methods. But those with primary and incomplete middle have equal proportions who have used efficient and inefficient methods. However, among the completed middle and secondary and higher groups higher proportions have used efficient than inefficient methods.

Although a relatively large proportion of women know of four or more efficient methods, the majority have ever used only one efficient method; thus, while about 12 per cent have used only one method, only a negligible proportion (0.1 per cent) have ever used four or more methods (table 4.12). But in Greater Accra and Eastern regions about 12–14 per cent of currently married women have ever used two or more efficient methods. A relatively large proportion,

Table 4.10 Percentage distribution of knowledge (probed or spontaneous) of specific methods of currently and never-married women

Method	Currently married		Never married	
	Probed	Spontaneous	Probed	Spontaneous
Number of Women	4436		1182	
Pill	21.1	26.4	20.1	19.6
IUD	23.9	11.0	19.7	5.2
OFS[a]	17.5	6.9	21.0	10.3
Douche	7.4	0.6	5.1	0.9
Condom	24.6	4.4	29.8	5.2
Rhythm	19.6	1.2	18.2	1.1
Withdrawal	18.0	0.7	15.0	1.3
Abstention	45.6	2.9	29.3	4.0
Female sterilization	28.9	1.6	23.4	14.4
Male sterilization	3.9	0.2	2.8	0.1
Injection	17.6	5.0	13.1	4.1

[a]OFS = other female scientific methods (ie diaphragm, tampon, sponge, foam tablets, jelly or cream).

about 36 per cent, of those with secondary and higher education have used two or more efficient methods.

With regard to use of specific methods, abstention has been more widely used than the pill (the second most used method). All regions, except for Western/Central region, have ever used abstention much more than the pill. In fact in Volta, where abstinence has been used by almost all women, less than 10 per cent have ever used the pill. With the exception of those with secondary and higher education, all the other educational groups have used abstention more than the pill. Apart from these two methods, rhythm and other female scientific methods have also been widely used, with the level of use varying among the regions and also rising with level of education (see table 4.11).

Data on current use of specific methods show that even though the proportion currently using contraceptive methods is very low, slightly more women are currently using efficient than inefficient methods and with the exception of Volta and Eastern, a higher proportion use efficient than inefficient methods in all the regions (see table 4.13). Variations in current use of efficient methods within the socio-economic groups are quite substantial with educational subgroups having the greatest range. While those with no schooling have less than 2 per cent currently using efficient methods, about 30 per cent of those with secondary education are currently using efficient methods.

Among the specific methods abstention is slightly more currently used than the pill but the regional data show that this pattern is true only in Volta and Eastern regions. In all the other regions the pill is more currently used than abstention. Among the educational groups those with no schooling are more likely to use abstention than the pill and it is only at the secondary and higher level that the proportion using the pill is substantially higher than that of abstention. The use of other female scientific methods and condom also rises with level of education. Female sterilization, one of the least used methods, is used mainly by women with secondary and higher education.

Table 4.14 emphasizes that abstention (including post-partum abstinence) is not only the most well-known method, but it is also the most used method. Usually more than 50 per cent of all those who know of it have used it before. Older women (30–49) and those with many children are more likely to have used abstention than younger women and those with fewer children. Almost all women in Volta who know of abstention have used it before. Use is also high in Eastern region. A larger proportion of rural residents and those with less education who know of abstention have used it compared to urban residents and those with higher education. The proportion who have used

Table 4.11 Percentage of currently married women ever using specific methods, by age and selected background variables

Subgroup	Inefficient only	Efficient	Pill	IUD	OFS[a]	Douche	Condom	Rhythm	Withdrawal	Abstention	Female sterilization	Male sterilization	Injection
All women	21.8	18.2	11.7	1.3	7.5	1.2	4.1	9.2	4.4	28.0	.5	.0	.5
Current age													
15–29	19.8	20.3	11.6	.8	10.4	1.3	5.9	9.9	5.4	26.2	.1	.0	.4
30–49	23.9	16.1	11.8	1.8	4.5	1.1	2.3	8.6	3.3	29.6	.9	.0	.5
Region of residence													
Western/Central													
15–29	10.0	15.5	9.4	1.0	5.2	1.9	3.6	5.8	4.2	10.0	.0	.0	.3
30–49	4.4	12.0	10.0	.6	2.1	.3	1.5	1.8	1.2	4.1	.3	.0	.3
Greater Accra													
15–29	13.5	31.8	13.1	1.1	18.0	1.9	16.1	14.6	9.0	18.7	.0	.0	.0
30–49	17.4	36.0	21.1	9.1	9.1	1.2	7.4	10.7	6.6	23.6	2.9	.0	.4
Eastern													
15–29	34.4	31.6	18.1	.3	19.1	4.0	10.7	22.4	10.1	48.8	.0	.0	1.2
30–49	43.5	28.7	21.2	2.2	13.0	4.1	3.6	22.3	6.1	60.9	1.4	.0	.8
Volta													
15–29	75.5	20.0	11.0	1.5	10.2	1.5	4.5	28.5	15.5	91.0	.0	.0	.5
30–49	78.5	11.4	7.5	.4	3.5	.9	2.2	25.4	10.1	87.7	.9	.0	.0
Ashanti/Brong Ahafo													
15–29	12.6	22.1	13.8	.7	11.0	.0	4.0	4.0	2.3	19.3	.1	.0	.4
30–49	15.0	15.4	12.8	1.1	2.8	.5	1.5	3.1	1.3	20.0	.8	.0	.8
Northern/Upper													
15–29	4.2	2.9	2.6	.5	.8	.5	1.1	.8	.3	4.5	.0	.0	.0
30–49	10.2	1.6	1.3	.2	.0	.2	.2	.2	.2	10.0	.0	.0	.2
Place of residence													
Rural													
15–29	22.4	15.8	9.3	.6	7.9	1.2	4.3	9.7	5.0	27.4	.1	.0	.3
30–49	26.3	11.9	9.0	1.0	3.8	1.6	1.2	7.8	3.0	31.1	.9	.0	.5
Urban													
15–29	14.9	29.0	16.1	1.1	15.3	1.1	9.1	10.3	6.2	24.0	.0	.0	.7
30–49	18.3	25.7	18.2	3.7	6.2	1.2	4.9	10.5	4.0	26.1	.8	.0	.6
Level of education													
No schooling													
15–29	19.3	4.8	3.7	.4	1.7	.8	.7	4.2	1.8	20.3	.1	.0	.1
30–49	23.6	9.5	7.2	.7	2.8	.6	.8	6.2	1.9	27.0	.5	.0	.2
Primary													
15–29	19.9	20.3	11.5	.8	8.1	1.5	5.0	9.2	5.8	26.4	.0	.0	.4
30–49	31.3	26.2	19.5	2.1	5.6	1.5	3.1	14.9	5.6	42.6	2.1	.0	.5
Incomplete Middle													
15–29	22.7	26.8	15.1	.7	14.1	1.7	5.8	11.3	6.5	30.9	.4	.0	.3
30–49	33.3	30.3	23.2	4.0	4.0	4.0	4.0	18.2	8.1	43.4	1.0	.0	1.3
Complete Middle													
15–29	20.8	36.0	19.7	1.6	18.9	1.9	12.2	16.6	8.4	34.1	.0	.0	.5
30–49	17.0	43.9	29.8	8.8	11.7	3.5	9.4	12.3	8.8	31.6	.6	.0	1.2
Secondary +													
15–29	10.5	67.4	34.7	.0	45.3	1.1	25.3	27.4	20.0	26.3	.0	.0	3.2
30–49	10.5	71.9	50.9	10.5	31.6	1.8	19.3	29.8	14.0	31.6	9.7	.0	5.3

[a]OFS = other female scientific methods (ie diaphragm, tampon, sponge, foam tablets, jelly or cream).

Table 4.12 Percentage distribution of currently married women, by number of efficient methods ever used and selected background variables[a]

Subgroup	Number of efficient methods ever used					
	0	1	2	3	4+	Number of women
All women	81.8	11.9	5.5	.8	.1	4426
Age group						
15–29	79.7	12.3	7.1	.8	.0	2203
30–49	83.9	11.4	3.9	.8	.1	2223
Number of living children						
0–1	81.8	11.0	6.5	.7	.1	1278
2–3	81.2	11.9	5.9	1.0	.0	1435
4–5	82.6	11.2	5.1	.9	.1	955
6+	81.8	14.1	3.4	.5	.1	758
Region of residence						
Western/Central	86.2	10.7	2.9	.2	.0	646
Greater Accra	66.2	20.6	11.4	1.4	.4	509
Eastern	70.0	16.4	11.9	1.6	.1	689
Volta	84.6	10.7	4.0	.7	.0	428
Ashanti/Brong Ahafo	81.0	13.6	4.6	.9	.0	1339
Northern/Upper	97.8	1.2	.7	.2	.0	815
Type of place of residence						
Rural	86.2	9.1	4.0	.7	.0	3006
Urban	72.5	17.7	8.6	1.1	.1	1420
Level of education						
No schooling	92.2	5.6	2.0	.2	.0	2686
Primary	77.2	17.1	5.3	.4	.0	456
Incomplete Middle	72.3	19.2	8.2	.3	.0	390
Complete Middle	62.2	23.0	12.5	2.3	.0	743
Secondary+	30.5	33.8	27.2	6.6	2.0	151
Number of women	3619	525	243	36	3	4426

[a]Percentages may not add up to 100 due to rounding.

rhythm before is also high in Volta and Eastern, but is about the same for all the other subgroups.

Though the number of women who know of other female scientific methods (diaphragm, tampon, sponge, foam tablets, jelly or cream) is about half of the number who know the pill, a larger proportion, about 31 per cent, have used other female scientific methods while only about 25 per cent have used the pill before. And while a larger proportion of younger women and those with fewer children have ever used other female scientific methods, a larger proportion of older women and those with more children have ever used the pill. In addition a larger proportion of those with higher education have used both methods. And among the regions, the proportion who have ever used the pill is highest in Eastern region.

Abstinence as a contraceptive method

Data on knowledge of specific methods shows that abstinence is one of the most well-known methods, and among the inefficient methods it is the most widely ever-used method. Data on current use (table 4.15) show that its use is highest in Eastern and Volta regions and among those with no schooling and primary education.

When post-partum abstinence is included in current use as a method of contraception, the level of use rises sharply, being highly concentrated in Northern/Upper and Volta regions where,

Table 4.13 Percentage distribution of currently married women currently using specific methods, by selected background variables[b]

Subgroup	Only inefficient methods	One or more efficient methods	Pill	IUD	OFS[a]	Douche	Condom	Rhythm	Withdrawal	Abstention	Female sterilization	Injection	Number of women
All women	4.0	5.5	2.4	.3	1.6	.0	.6	.7	.2	3.1	.5	.1	4436
Region													
Western/Central	1.4	3.8	2.3	.3	.9	.0	.2	.8	.2	.5	.2	.0	650
Greater Accra	5.5	14.5	5.3	1.4	3.3	.2	3.1	1.4	.4	3.5	1.4	.0	509
Eastern	11.6	4.8	1.6	.3	1.2	.0	.9	1.5	.4	9.7	.7	.1	689
Volta	9.8	4.7	1.9	.2	1.9	.0	.2	1.6	.7	7.5	.5	.0	428
Ashanti/Brong Ahafo	1.2	6.4	3.1	.1	2.5	.0	.1	.1	.1	1.0	.4	.1	1342
Northern/Upper	.4	.9	.5	.1	.0	.0	.2	.0	.0	.4	.0	.0	818
Place of residence													
Rural	4.0	3.7	1.7	.2	1.1	.0	.2	.5	.2	3.3	.5	.7	3012
Urban	4.1	9.1	3.9	.6	2.9	.1	1.5	1.1	.3	2.7	.5	.1	1424
Level of education													
No schooling	3.9	1.9	1.0	.1	.3	.0	.2	.3	.1	3.5	.3	.0	2686
Primary	4.6	6.6	2.6	.2	2.0	.2	.7	1.3	.4	2.6	1.1	.0	456
Incomplete Middle	4.4	7.2	3.6	.8	1.8	.0	.8	1.5	.3	2.6	.3	.0	390
Complete Middle	3.4	12.0	4.6	.8	4.7	.0	1.7	.7	.1	2.6	.1	.0	743
Secondary+	5.9	30.3	13.2	.7	9.2	.0	2.6	2.6	1.3	3.3	3.3	1.3	152

[a]OFS = other female scientific methods (ie diaphragm, tampon, sponge, foam tablets, jelly or cream).
[b]Subgroups may not add up to 4436 because of missing data.

Table 4.14 Proportion of currently married women who have ever used specific methods, among those who knew of each method

Subgroup	Pill	IUD	OFS[a]	Douche	Condom	Rhythm	Withdrawal	Abstention	Female sterilization	Male sterilization	Injection
Total population											
Number knowing method	2101	1549	1082	352	1289	923	828	2151	1349	182	1000
Number ever using method	519	58	331	53	182	410	193	1237	21	0	20
Percentage	24.7	3.7	30.6	15.1	14.1	44.4	23.3	57.5	1.6	.0	2.0
Age group											
15–29	22.8	2.1	34.1	15.8	16.9	45.0	25.8	55.8	.1	.0	1.8
30–49	27.0	5.5	24.8	14.3	10.0	43.8	20.2	59.1	3.0	.0	2.2
Number of living children											
0–1	18.6	1.8	34.3	15.9	17.4	40.0	22.6	48.9	.5	.0	2.2
2–3	26.3	2.7	32.5	13.3	14.6	44.0	23.4	58.4	.9	.0	1.6
4–5	26.8	6.7	25.0	15.7	12.3	44.0	28.7	63.7	3.2	.0	3.1
6+	29.3	5.3	23.9	16.1	6.7	53.5	18.8	60.4	2.3	.0	1.1
Region of residence											
Western/Central	15.8	1.7	12.9	6.0	5.4	19.8	7.7	13.0	.4	.0	.8
Greater Accra	22.1	7.1	26.2	11.1	16.9	26.4	28.6	30.9	2.1	.0	.4
Eastern	41.6	4.6	45.6	31.1	18.1	65.0	29.0	77.4	1.4	.0	4.6
Volta	20.9	2.5	27.9	14.3	10.9	68.9	36.5	94.6	1.0	.0	1.1
Ashanti/Brong Ahafo	25.5	2.4	35.5	7.5	17.4	38.4	22.9	57.3	3.0	.0	3.4
Northern/Upper	16.7	1.0	15.0	18.8	25.0	14.8	10.0	57.6	0.0	.0	2.8
Type of place of residence											
Rural	23.0	3.0	31.6	16.3	12.6	51.3	24.0	63.4	1.8	.0	2.0
Urban	26.9	4.6	30.0	13.4	15.6	35.9	22.3	46.7	1.2	.0	2.0
Level of education											
No schooling	17.4	2.6	20.4	12.7	4.9	44.8	15.6	58.4	1.5	.0	1.2
Primary	26.4	3.4	28.8	17.1	11.6	39.9	27.4	60.1	2.7	.0	1.6
Incomplete Middle	26.7	3.1	29.4	21.4	12.2	47.2	29.0	59.9	.6	.0	1.8
Complete Middle	30.0	5.6	33.9	19.1	21.8	45.1	27.6	56.2	.3	.0	1.8
Secondary+	44.3	4.8	50.0	5.3	26.9	44.3	29.4	41.8	5.1	.0	7.0

[a]OFS = other female scientific methods (ie diaphragm, tampon, sponge, foam tablets, jelly or cream).

Table 4.15 Percentage distribution of currently married women, by knowledge, ever-use, and current use of abstention (including and excluding post-partum)

	Total	Western/ Central	Greater Accra	Eastern	Volta	Ashanti/ Brong Ahafo	Northern/ Upper	No schooling	Primary	Incomplete Middle	Complete Middle	Secondary+
Knowledge	48.6	53.7	68.0	71.3	94.4	34.1	13.0	42.1	55.5	57.0	59.6	67.8
Ever-use	27.9	6.9	21.0	55.2	89.3	19.6	7.5	24.6	33.3	34.1	33.5	28.3
Current use excluding post-partum	3.1	0.5	3.5	9.7	7.5	1.0	0.4	3.5	2.6	2.6	2.6	3.3
Current use including post-partum	26.8	16.3	16.0	30.7	44.1	17.2	45.1	30.0	20.4	24.4	23.1	15.8

incidentally, the proportion in polygamous unions is also high (chapter 2). When the length of post-partum abstinence exceeds the length of post-partum amenorrhoea the intervening period of abstention can be described as 'contraceptive' in the sense that it increases the non-susceptible post-partum period. Gaisie (1984) notes that 'although the average duration of abstinence is shorter than the average duration of amenorrhoea (about 11 months, compared to 14 months for amenorrhoea), abstinence exceeds amenorrhoea in the case of a significant number of individual women, thereby lengthening the mean duration of the non-susceptible period (16 months)'.

The high prevalence of reported knowledge and use of abstention as a contraceptive method may stem from the traditional practices of prolonged post-partum abstinence and of terminal abstinence among older women. The practice of post-partum abstinence originates from the belief that having sexual relations too soon after birth may stop the flow of breastmilk, thus endangering the health of the baby. The long period of abstinence in the past was facilitated by the high incidence of polygamy. In addition to post-partum abstinence, older women in polygamous unions also practised terminal abstinence. However, it is likely that increasing modernization is reducing the prevalence of polygamy, and shortening the period of post-partum abstinence.

However, even though abstinence when practised effectively can provide the same protection as any efficient contraception, it is usually subject to a high degree of lapses. Cleland and Kalule-Sabiti (1984), using GFS data, also find a high degree of inconsistency between the reporting of current use of abstinence for contraceptive purposes and reporting of sexual relations 'these days', ie in the recent period. Among those reported as currently abstaining, 84 per cent are also reported as having sexual relations these days. Even among women who say they are currently post-partum abstainers, 18 per cent also report that they are having sexual relations 'these days'. Part of the problem may lie in the interpretation of the meaning of the phrase 'these days', but it is also possible that the concept of abstinence is also misunderstood. For example, use of rhythm (ie periodic abstinence) could have been reported as abstinence, and this would be consistent with the respondent also saying that she had sexual relations 'these days'.

These various considerations mean that reporting of the use of abstention as a contraceptive method must be carefully evaluated before any conclusions can be reached. These results also suggest that any future surveys would have to revise questions on abstinence.

Summary

From the foregoing it can be seen that more currently married women know about efficient than inefficient methods but ever-use of inefficient methods is slightly higher than efficient methods. The implication is that the relatively low ever-use of efficient methods is due to preference for inefficient methods, since both are known by quite high proportions of women. Nevertheless, inefficient methods are used more extensively in Eastern and Volta than in any other region. Furthermore, a large proportion of current use of inefficient methods can be attributed to the use of abstinence. However, variations in knowledge, ever-use and current use among the educational groups are in the expected direction. Better educated women are more likely to know of, have ever used and be currently using efficient rather than inefficient methods, compared to less educated women.

An index of knowledge of contraceptive methods[1] which reflects not only the number of women who know of contraceptive methods but also the types of methods known (weighting methods by their degree of effectiveness) places the levels of knowledge among the various subgroups in their proper perspective. Thus, while there is not much variation in the mean index for the various age and parity subgroups, a different picture emerges for the regions. Volta and Eastern regions which have hitherto had the highest levels of knowledge now rank third and fourth, respectively, while Western/Central ranks second with Greater Accra having the highest index (see table 4.16). This situation is accounted for primarily by the relatively large proportions in Volta and Eastern knowing inefficient methods only while large proportions in Western/Central and Greater Accra know one or more efficient methods. The same can be said for the difference in the indices for urban and rural residents. The index of knowledge for those with secondary and higher education is much higher than for the other

[1] This index weights methods as follows: pill, IUD, male or female contraception and injection = 6; condom = 5; douche = 4; rhythm = 3; withdrawal and abstention = 2.

Table 4.16 Mean index[a] of knowledge and ever-use of contraceptive methods of currently married women, by background variables

Subgroup	Index of knowledge	Index of ever-use
All women	13.3	2.4
Age group		
15–29	14.5	2.6
30–49	12.2	2.2
Number of living children		
0–1	13.8	2.3
2–3	13.4	2.4
4–5	12.7	2.4
6+	13.2	2.5
Region of residence		
Western/Central	18.0	1.3
Greater Accra	26.0	3.7
Eastern	16.4	4.6
Volta	16.3	4.0
Ashanti/Brong Ahafo	10.6	2.0
Northern/Upper	2.2	0.4
Type of place of residence		
Rural	10.9	2.0
Urban	18.5	3.1
Level of education		
No schooling	8.8	1.4
Primary	15.8	2.8
Incomplete Middle	18.4	3.3
Complete Middle	21.6	4.4
Secondary+	33.3	8.1

[a]The index is a weighted mean of methods, using the following weights: pill IUD, male and female sterilization and injection = 6; condom = 5; douche = 4; rhythm = 3; withdrawal and sbstinence = 2.

groups, a reflection of the fact that larger proportions know any method and an even larger proportion know one or more efficent methods.

A similar index of the level of ever-use reflects not only a much lower of level of ever-use but also lower ever-use of efficient methods by currently married women, as observed earlier. The mean index of ever-use does not change much, according to age and number of living children. Differences in the index of ever-use among the three regions with high level of ever-use (Volta, Eastern and Greater Accra) are small, and the very low index for Northern/Upper is not unexpected, in view of its generally low level of ever-use and an even lower level of ever-use of efficient methods. The impact of education on level of ever-use and ever-use of efficient methods can be observed here too. The data show that those with secondary and higher education are about seven times as likely as those with no education not only to have used a method but also to have used effective methods.

Knowledge and ever-use of contraception among never-married women

Among never-married women contraceptive knowledge is about as widespread as among currently married women: 64 per cent of all never-married women knew one or more methods (table 4.17). Given that some under-reporting may have occurred, when parents were present at the interview, this would be a slight underestimate of the true level of knowledge. Regional variations follow a pattern similar to that of currently married

Table 4.17 Percentage of never-married women who know of and who have ever used any method of contraception, by age and selected background variables[a]

Subgroup	Knowledge			Ever-use			Number of women
	Total	15–19	20–29	Total	15–19	20–29	
All women	63.7	59.8	81.2	30.4	27.0	45.9	1182
Region of residence							
Western/Central	71.2	68.4	(88.9)	21.2	20.2	(29.6)	146
Greater Accra	80.6	73.2	96.4	24.4	10.6	56.4	180
Eastern	78.8	76.5	(87.9)	51.6	48.5	(63.3)	250
Volta	82.6	80.9	—	77.7	76.4	—	121
Ashanti/Brong Ahafo	43.0	39.6	65.5	13.4	10.7	30.9	419
Northern/Upper	40.9	(37.5)	(47.6)	7.6	(5.0)	(14.3)	66
Place of residence							
Rural	59.4	57.8	70.2	29.6	28.5	38.3	692
Urban	70.0	63.1	90.0	31.4	24.7	51.6	490
Level of education							
No schooling	45.7	42.0	(59.4)	16.8	15.9	(18.8)	197
Primary	52.9	53.5	—	16.5	18.2	—	121
Incomplete Middle	56.5	54.4	(87.0)	24.4	23.7	34.8	340
Complete Middle	93.3	71.7	84.1	39.0	36.0	50.0	413
Secondary+	—	(91.1)	96.5	56.7	(44.4)	70.0	104

[a]Figures for cells less than 20 women are not shown, while values for cells with 20–49 cases are in parentheses.

Table 4.18 Percentage of never-married women who know efficient or inefficient methods, by age and selected background variables

Subgroup	Total		15–19		20–29	
	Inefficient only	Efficient	Inefficient only	Efficient	Inefficient only	Efficient
Region						
Western/Central	4.1	67.1	4.4	64.0	3.7	85.2
Greater Accra	.8	80.0	.0	72.4	.0	96.4
Eastern	10.2	68.4	11.7	64.8	4.1	83.7
Volta	38.8	43.8	40.0	40.9	27.7	72.7
Ashanti/Brong Ahafo	.7	42.2	.5	39.0	1.8	63.8
Northern/Upper	3.0	37.9	5.0	32.5	.0	47.6
Place of residence						
Rural	10.0	49.4	10.7	47.0	5.3	64.9
Urban	3.3	66.5	3.9	59.2	1.6	87.0
Level of education						
No schooling	13.7	32.0	14.6	27.4	9.4	50.0
Primary	9.1	43.8	11.1	42.4	.0	43.8
Incomplete Middle	5.6	50.9	6.0	48.4	.0	87.0
Complete Middle	6.3	68.0	6.8	64.9	4.5	79.5
Secondary+	1.0	92.3	2.2	88.9	.0	96.5

Table 4.19 Percentage of never-married women ever using efficient or inefficient contraceptive methods

Subgroup	Total		15–19		20–29	
	Inefficient only	Efficient	Inefficient only	Efficient	Inefficient only	Efficient
Region						
Western/Central	5.5	15.8	4.4	15.8	11.1	18.5
Greater Accra	7.8	16.7	4.1	6.5	16.4	40.0
Eastern	24.4	27.2	26.0	22.4	18.4	44.9
Volta	67.8	9.9	68.2	8.2	63.6	27.3
Ashanti/Brong Ahafo	1.7	11.7	1.6	9.1	1.8	29.1
Northern/Upper	1.5	6.1	.0	5.0	4.8	9.5
Place of residence						
Rural	16.9	12.7	17.4	11.1	14.9	23.4
Urban	11.4	20.0	17.4	13.6	12.9	38.7
Level of education						
No schooling	13.2	3.6	14.6	1.3	6.3	12.5
Primary	14.9	1.7	16.2	.2	12.2	.0
Incomplete Middle	13.5	10.9	13.6	10.1	13.0	21.7
Complete Middle	16.5	22.5	16.3	19.7	17.0	33.0
Secondary+	13.5	45.2	13.3	31.1	14.0	56.1

women. Volta has the highest proportion knowing a method (83 per cent) and Northern/Upper the lowest (41 per cent). However, somewhat unexpectedly, the level of knowledge in the latter region is much higher among never-married than among the currently married (22 per cent). Among the socio-economic groups, differentials in levels of knowledge follow the expected pattern observed for currently married women. Rural residents have a much lower level of knowledge than urban residents. Furthermore, the level of knowledge increases with rising education.

Among never-married women, the overall proportion of ever-users is 30 per cent, which is only slightly lower than that of currently married women. Also, the pattern of the regional, urban–rural and educational differentials are similar to those of the currently married; thus Volta has the highest level of ever-use, about 78.2 per cent, and Northern/Upper the lowest, about 8 per cent.

Never-married women are more likely to know of at least one efficient method than to know of only inefficient methods, whichever background variable one looks at (see table 4.18). Greater Accra has the highest level of knowledge of efficient methods while Northern/Upper region has the lowest. However, the proportion knowing efficient methods in Northern/Upper is much higher among never-married women than among currently married women. The proportion knowing efficient methods also increases with rise in educational level but, as for currently married women, most of the methods known, except pill, were not reported spontaneously.

Ever-use of efficient methods is highest in Eastern and lowest in Northern/Upper, and generally increases with rise in level of education (see table 4.19). Volta in this case too has a disproportionately high level of ever-use of inefficient methods, about 68 per cent. But levels of ever-use of inefficient methods among the various educational groups are about the same. However, the level of ever-use of inefficient methods among never-married women is consistently lower than that of currently married women. This indicates that never-married women are more likely to use efficient methods and therefore are more highly motivated to prevent pregnancy.

4.3 RELATIONSHIP BETWEEN FERTILITY PREFERENCES AND CONTRACEPTIVE USE

Introduction

In this section we will examine the extent to which the expressed desire to delay or stop childbearing affects the pattern of contraceptive use. We will be dealing with answers to the following question: 'Do you want to have another child at

any time in the future?' Those who answered 'no' to the above question were classified as not wanting to have any more children while those who answered 'yes' were asked the following question: 'Would you rather have a baby in the next year or so or would you prefer to wait for several years?' Respondents who answered 'next year or so' were classified as wanting to have a child soon and those who said they wanted to 'wait for several years' were classified as wanting to delay having the next child. We hypothesize that those who want to stop or to delay childbearing will be more likely to use contraception than those who want children soon. Furthermore, we also expect those who want to stop or delay childbearing to use efficient rather than inefficient methods if they are serious about their expressed preference. In addition, we will look at the characteristics of those who have never used any method, and those who have used before but who have stopped using, and the relationship between their fertility preferences and the decision to stop or not use contraception. Finally, we will examine the fertility preferences of those who have never used contraception before but who intend to do so in the future.

Fertility preference and contraceptive use

A question well worth examining is the extent to which the decision to stop or delay childbearing is implemented by the use of contraceptives. We expect that those who want to delay or stop childbearing will be consistent and support their expressed preferences with the use of contraceptives. We also expect those who want the next child soon to be consistent and not use any contraceptive methods if they are to achieve their expressed preference. However, table 4.20 shows that exposed[2] currently married women are more likely to behave inconsistently with their expressed preference (52.4 per cent of all exposed women behave inconsistently with their expressed fertility preferences). The consistent group is composed mainly of women who want more children and are therefore not using any method. Only a small proportion of all exposed women are consistent in using contraception to delay (6.4 per cent), or to stop childbearing (2.6 per cent). Among the 52 per cent of all exposed women considered to be inconsistent in their behaviour, 40 per cent want to delay having the next child and yet are not using any method. In addition, 9 per cent want to stop childbearing and are also not using any method. Only a small minority (3.4 per cent) of the inconsistent group are in the category of those who want children soon but are using contraceptives. While the level of consistency and inconsistency varies among the age groups and other socio-economic subgroups, a pattern similar to that described above can be observed in all the groups.

The older age groups are more consistent than the younger age groups. The consistent groups who are using contraception in age groups 15–19, 20–29 and 30–39 are using it more for spacing (that is using and wanting to delay the next child) while the oldest age group is more likely to be using for stopping childbearing (wanting no more children and using). This confirms our earlier observations. However, a relatively large proportion of those aged 40–49 are inconsistent in wanting to stop childbearing and not using any method. It is likely that they are not using because they believe they are incapable of having any more children.

Among the regions, Greater Accra and Northern/Upper regions have slightly higher proportions in the consistent group than the other regions. But while almost all those in the consistent group in Northern/Upper are in the group who want soon and are not using any method, about 20 per cent of those in Greater Accra are using a method for either spacing or stopping childbearing. Urban residents are more predisposed to be consistent than rural residents but in both groups contraceptive use is directed more at spacing than stopping, though proportions using are higher among urban residents.

As expected, a high proportion of those with secondary and higher education behave consistently with their fertility preferences. But quite a high proportion of those with no formal education is also in the consistent group. However, as observed earlier for Greater Accra and Northern/Upper regions, these two educational groups are consistent in different directions. About 44 per cent of those with no formal education are in the category of the 'want more soon and not using' group, while only about half as much in the secondary and higher education group are in this category. Another noteworthy fact is that a relatively large proportion of those with secondary and higher education are using contraception to space childbearing. In addition,

[2] Women who are currently married, not currently pregnant, have resumed sexual relations and also report that they are fecund.

Table 4.20 Fertility preferences and contraceptive use of currently married exposed women, by selected background variables — percentages[a]

Subgroup	Consistent			Inconsistent			
	Wants no more and using	Wants to delay and using	Wants more soon and not using	Wants soon and using	Wants to delay and not using	Wants no more and not using	Number of women
All women	2.6	6.4	37.9	3.4	40.0	9.0	3414
Current age							
15–19	0.0	5.5	34.9	1.1	57.5	0.4	275
20–29	0.5	8.3	35.6	3.5	49.1	2.6	1506
30–39	4.1	6.4	40.7	3.7	33.3	10.8	1102
40–49	7.2	1.7	40.0	2.8	18.8	27.7	531
Region							
Western/Central	2.1	4.0	43.9	1.1	39.3	8.8	476
Greater Accra	7.0	13.3	31.8	5.3	27.6	14.0	399
Eastern	4.0	10.5	27.9	6.1	42.9	8.3	545
Volta	3.3	9.5	27.4	6.0	40.7	12.1	332
Ashanti/Brong Ahafo	1.9	5.3	34.4	2.9	45.2	10.0	1015
Northern/Upper	0.0	0.9	56.4	0.6	36.9	3.4	647
Type of place of residence							
Rural	2.2	5.0	37.9	2.7	42.9	8.0	2315
Urban	3.6	9.5	38.2	4.5	33.8	10.9	1099
Education							
No schooling	2.3	3.1	43.5	2.3	37.8	9.9	2039
Primary	3.1	7.7	32.8	3.4	42.5	9.7	351
Incomplete Middle	2.0	7.9	32.0	5.0	46.5	6.3	303
Complete Middle	2.2	12.7	27.8	4.4	45.9	7.1	593
Secondary +	10.7	24.6	23.8	9.8	23.8	6.6	122

[a]Subgroups may not add up to 3414 because of missing data.

they have, among the inconsistent group, the largest proportion using a method even though they want children soon.

Fertility preferences and pattern of contraceptive use

Apart from variation in use or non-use among the different preference groups, it is also useful to look at variations in their use of efficient methods, since the type of method gives some indication of the degree of motivation to control fertility. Efficient methods are considered to be the pill, IUD, sterilization, injection and condom. Abstinence, as one of the most difficult to measure 'inefficient' methods, is separated out from the inefficient category. For this particular analysis, we define abstinence to include current, post-partum and terminal abstinence. Current abstinence is that reported in answer to the question on current use of contraception, while post-partum abstinence is obtained separately, as the non-resumption of sexual relations since the last birth. Women who are not having sexual relations 'these days', and who also say that they do not intend to resume relations, are classified as being in terminal abstinence.

Among currently married fecund women about 65 per cent are not using any method at all (table 4.21), and of those using a method a large majority (25 per cent) are using abstinence. Of the remaining 10 per cent, 6 per cent are using efficient methods and 4 per cent inefficient methods. However, this pattern of use changes when fertility preferences are taken into account. Of the group who want children soon 86 per cent are not using any method, which seems logical. And of the 14 per cent in this group who are using any method 8 per cent are abstaining and about 6 per cent are using efficient or inefficient methods. These differences are highly significant, using the Z statistic, at the level of .001 probability (Z: $P<.001$). Among the other preference groups relatively lower proportions are not using any method but, of those using a method, a large proportion are just abstaining. The relatively high level of use of abstinence only among those who want to space and those who want to stop childbearing (41 and 23 per cent out of a total level of use of 54 and 38 per cent respectively) indicates a

Table 4.21 Fertility preferences and current contraceptive use of currently married fecund women, by age — percentages

Age and preference group	Not using at all	Abstinence only	Inefficient methods	Efficient methods	Number of women
Total population					
All women	64.7	25.3	4.4	5.6	4027
Wants soon	85.8	8.4	2.8	3.0	1535
Uncertain	62.3	32.2	4.1	1.4	435
Wants delay	45.6	40.5	5.9	8.0	1584
Wants no more	62.2	23.3	4.9	9.7	473
<30					
All women	63.8	27.0	3.2	6.1	2189
Wants soon	87.3	7.2	1.5	3.9	940
Uncertain	55.3	40.4	2.1	2.1	141
Wants delay	43.5	43.0	4.8	8.7	1037
Wants no more	64.8	26.8	2.8	5.6	71
30+					
All women	65.8	23.4	5.9	4.9	1838
Wants soon	83.4	10.3	4.9	1.5	595
Uncertain	65.6	28.2	5.1	1.0	294
Wants delay	49.7	35.6	8.0	6.6	547
Wants no more	61.5	22.6	5.2	10.4	402

much higher level of inconsistency than observed in the previous section, since a substantial proportion of reported abstinence in the Ghanaian context can aptly be relegated to non-use (Cleland and Kalule-Sabiti 1984). Nevertheless, those in the other preference groups, except the uncertain group, who use methods other than abstinence are more predisposed to use efficient than inefficient methods which shows that at least this small group supports their expressed preference, either to space or to stop childbearing, with more positive action. There is more use of inefficient than efficient methods among the uncertain group, unlike other preference groups.

Among the age groups the pattern is similar to the one above in many respects. However, among younger women (under 30), a higher proportion of all the preference groups who are using a method (excluding abstinence) use efficient rather than inefficient methods, with the highest proportions among those wanting to delay childbearing. This serves to emphasize that use of contraceptives by younger women is mainly for spacing. Among older women, use of inefficient methods is slightly higher than efficient methods. But twice as many older women who want no more children use efficient (10 per cent) as opposed to inefficient methods (5 per cent).

In the various regions the pattern is similar even though each region has its own peculiarities. In Western/Central region, all those who want no more children and are not using abstinence, are using efficient methods, which is quite surprising for regions where the level of both knowledge and ever-use is very low (see table 4.22). In Greater Accra a relatively large proportion of the 'uncertain' and 'wants to delay' groups (not using abstinence) are using inefficient methods. This is quite understandable in the former preference group but highly inconsistent in the latter group, more especially when that group is in Greater Accra region, where use of efficient methods is highest. However, the rather high proportion of those using efficient methods to stop childbearing (three times as much as inefficient, 17 versus 5 per cent) seems to indicate that most of those using efficient methods really want to stop childbearing. Among all the preference groups in both Eastern and Volta, a much larger proportion of those using contraceptive methods other than abstinence are using inefficient methods, and this substantiates the rather high level of knowledge and ever-use of inefficient methods in these two regions. On the other hand, in Ashanti/Brong Ahafo, where the level of use is generally low, women in all the preference groups are more predisposed to use efficient rather than inefficient methods. But in Northern/Upper all those who do not want any more children and who are using a method use only abstinence. This is not surprising in view of the fact that it is in these regions that terminal abstinence is practised. The educational groups exhibit similar patterns and as expected, the more educated are more likely to use efficient methods, while the less educated in all preference groups tend to use more inefficient methods (table 4.23).

The observations outlined above show that currently married exposed women who want to either space or stop childbearing often do not use any method at all and when they do use contraception, the majority use abstinence only. But in view of our earlier observation that abstinence is a highly ineffective contraception we can conclude that these women are even more inconsistent in their behaviour than observed earlier on. However, it is heartening to note that though level of use of other methods is low, those who want to space or stop childbearing are more likely to use efficient than inefficient methods. However, the large numbers of those who want to either stop or delay childbearing and who are either not using or using abstinence only, form a potential source of users. If these women were to use contraception the current low level of use would be raised to more than 50 per cent.

Profile of past users and never users

In section 4.2 above we observed that only 40 per cent of currently married women have ever used any method before. This means that about 60 per cent have never used any method before. In addition, with only 9.5 per cent currently using any method, there is a very high proportion of women who have stopped using. We will now examine the characteristics of these two groups and also see to what extent their expressed fertility preferences have influenced their decision to stop using or not to use. Furthermore, we will also examine the relationship between the intention to use in the future (by never users) and expressed fertility preferences.

Table 4.24 shows that, of the 41 per cent of currently married women who have used contraceptives before, about 75 per cent have stopped using any method. The data also show that those who have stopped using are usually

Table 4.22 Fertility preferences and current contraceptive use of currently married fecund women, by region — percentages

Region and preference group	Not using at all	Abstinence only	Inefficient methods	Efficient methods	Number of women
Western/Central					
All women	77.6	16.6	1.6	4.2	566
Wants soon	91.5	6.8	0.9	0.9	235
Uncertain	81.0	17.2	0.0	1.7	58
Wants delay	62.6	28.2	3.4	5.8	206
Wants no more	71.6	14.9	0.0	13.4	67
Greater Accra					
All women	65.9	14.6	5.7	13.8	487
Wants soon	88.4	3.2	2.6	5.8	189
Uncertain	74.4	12.8	10.3	2.6	39
Wants delay	45.4	22.1	8.6	23.9	163
Wants no more	53.1	25.0	5.2	19.7	91
Eastern					
All women	59.6	23.2	12.8	4.5	626
Wants soon	84.6	2.7	10.1	2.7	188
Uncertain	69.9	16.4	12.3	1.4	73
Wants delay	41.2	39.2	14.4	5.2	291
Wants no more	58.1	18.9	13.5	9.5	74
Volta					
All women	44.8	39.3	11.1	4.8	377
Wants soon	75.8	10.0	10.8	3.3	120
Uncertain	56.7	33.3	10.0	0.0	30
Wants delay	21.1	60.2	12.7	6.0	166
Wants no more	42.6	42.6	8.2	6.6	61
Ashanti/Brong Ahafo					
All women	74.9	17.3	1.3	6.6	1217
Wants soon	88.6	6.4	0.6	4.4	499
Uncertain	76.8	16.4	3.6	3.6	56
Wants delay	60.8	28.7	1.6	9.0	513
Wants no more	76.5	14.8	2.0	6.7	149
Northern/Upper					
All women	52.0	46.7	0.4	0.9	754
Wants soon	79.9	19.1	0.3	0.7	304
Uncertain	46.9	52.5	0.0	0.6	179
Wants delay	21.6	75.9	0.8	1.6	245
Wants no more	46.2	53.8	0.0	0.0	26

younger, less educated and more likely to be rural than urban residents. They are mainly found in Northern/Upper region, and in Volta where there is a high level of ever-use (94 per cent). The fact that a large proportion of ever-users used abstinence partly accounts for the very high proportion who have stopped. Never users have similar characteristics but they are more concentrated in Northern/Upper and are much less likely to be in Volta region. Furthermore, a large proportion of never users do not intend to use any contraceptives in future and this group is also highly concentrated in Northern/Upper and Western/Central regions. They are also to be found

Table 4.23 Fertility preferences and current contraceptive use of currently married fecund women, by education – percentages[a]

Education and preference group	Not using at all	Abstinence only	Inefficient methods	Efficient methods	Number of women
< 7 years of schooling					
All women	65.7	27.2	4.6	2.4	2779
Wants soon	85.6	9.9	3.3	1.3	1040
Uncertain	61.4	35.2	3.1	0.3	383
Wants delay	47.4	43.6	6.1	2.9	1009
Wants no more	64.6	22.8	5.5	7.2	347
7 + years of schooling					
All women	62.3	21.0	4.1	12.6	1240
Wants soon	86.2	5.3	1.8	6.7	492
Uncertain	69.2	9.6	11.5	9.6	52
Wants delay	42.7	34.7	5.6	17.0	571
Wants no more	55.2	24.8	3.2	16.8	125

[a]Subgroups may not add up to 4027 because of missing data.

Table 4.24 Percentage distribution of currently married fecund women, by pattern of contraceptive use; never used, by future use[a]

Subgroup	Ever used			Never used			Number of women
	Total	Currently using	Stopped using	Total	Intends future use	Does not intend future use	
All women	40.8	10.5	30.3	59.2	18.0	41.2	4027
Region							
Western/Central	21.4	6.0	15.4	78.6	15.6	63.1	566
Greater Accra	49.5	20.9	28.5	50.5	16.2	34.3	487
Eastern	69.7	18.1	51.6	30.4	10.1	20.3	626
Volta	94.2	16.5	77.7	5.8	0.8	5.0	377
Ashanti/Brong Ahafo	34.4	8.4	26.0	65.7	38.1	27.5	1217
Northern/Upper	9.7	1.3	8.4	90.3	3.7	86.6	754
Age group							
15–19	27.5	4.9	22.6	72.6	25.5	47.0	368
20–29	42.6	10.2	32.4	57.4	20.2	37.2	1821
30–39	41.5	12.4	29.1	58.5	15.6	43.0	1266
40–49	42.3	10.8	31.5	57.7	11.7	46.0	572
Education							
No schooling	30.3	6.7	23.6	69.7	14.7	55.0	2356
Primary	47.0	12.1	35.0	53.0	25.8	27.2	423
Incomplete Middle	52.3	12.0	40.3	47.7	24.3	23.5	375
Complete Middle	57.9	15.9	42.1	42.1	22.0	20.1	718
Secondary+	79.6	37.4	42.2	20.4	12.9	7.5	148

[a]Subgroups may not add up to 4027 because of missing data.

among those aged 15–19 and 40–49 and are most likely to have had no formal education.

Data on those who have stopped using and never users and their fertility preferences gives an insight into some of the reasons for stopping or never using contraception. Table 4.25 shows that a large proportion of never users (54 per cent) and of those who have stopped using (43 per cent) want children soon, and only 9 and 15 per cent, respectively, do not want any more children. However, a reasonable proportion of never users (36 per cent) and of stoppers (41 per cent) also want to delay having the next child. But their inconsistent behaviour suggests that there may be other reasons especially for stopping, or never using contraception. Regional and educational variations follow the expected direction with Northern/Upper region and those with secondary and higher education being consistent in having only a very small proportion of never users in the want no more group.

Never-use, future use and fertility preferences

Only about 30 per cent of currently married fecund women who have never used contraception before intend to do so in the future (table 4.26) and a large proportion of those intending future use want to either space their children or stop childbearing altogether. In addition, a reasonable proportion of those who want children soon intend to use contraception in the future. Most younger women intending future use want to space childbearing while most of those in the middle age groups want to stop childbearing, probably because they have achieved their desired family size. Ashanti/Brong Ahafo have the highest proportion intending future use (table 4.24), and a majority of these women want to either space or stop childbearing altogether (see table 4.26). The proportion of never users intending future use increases, as expected, with level of education.

Summary

It is clear from the results of this analysis that the expressed desire to delay or stop having children is most unlikely to be accompanied by use of contraceptives. This fact, coupled with the large proportion who use abstinence when using a method to stop or delay childbearing, makes women's behaviour appear even more inconsistent. However, the few who use contraception tend to use more efficient than inefficient methods and this is even more significant for those with secondary and higher level of education. It is also clear that a large proportion of those women who have stopped using, or who have never used contraception, did so because they want more children soon. But other factors may also be responsible for their decision to stop or not to use at all, as a large proportion also want to stop or delay childbearing.

Table 4.25 Percentage distribution of currently married fecund women, by pattern of contraceptive use and fertility preferences

Subgroup/preference group	Current users	Past users	Never users
Total			
Wants no more	19	15	9
Wants delay	52	41	36
Wants soon	28	43	54
Number of women	(423)	(1221)	(2383)
Western/Central			
Wants no more	27	22	9
Wants delay	56	26	36
Wants soon	17	53	55
Number of women	(34)	(87)	(445)
Greater Accra			
Wants no more	24	21	18
Wants delay	52	28	28
Wants soon	23	49	54
Number of women	(102)	(139)	(246)

[*Table continues*]

Table 4.25 (*cont*)

Subgroup/preference group	Current users	Past users	Never users
Eastern			
Wants no more	18	13	6
Wants delay	51	48	39
Wants soon	31	38	53
Number of women	(113)	(323)	(190)
Volta			
Wants no more	14	17	7
Wants delay	51	44	30
Wants soon	35	37	59
Number of women	(62)	(293)	(22)
Ashanti/Brong Ahafo			
Wants no more	18	14	10
Wants delay	53	39	42
Wants soon	29	45	47
Number of women	(102)	(316)	(799)
Northern/Upper			
Wants no more	0	10	0
Wants delay	60	46	30
Wants soon	39	42	70
Number of women	(10)	(63)	681
No schooling			
Wants no more	23	15	10
Wants delay	41	39	33
Wants soon	34	44	55
Number of women	(158)	(556)	(1642)
Primary			
Wants no more	19	16	9
Wants delay	53	38	42
Wants soon	27	43	48
Number of women	(51)	(148)	(224)
Incomplete Middle			
Wants no more	10	11	9
Wants delay	52	44	42
Wants soon	37	44	50
Number of women	(45)	(151)	(179)
Complete Middle			
Wants no more	9	11	7
Wants delay	65	47	42
Wants soon	26	41	50
Number of women	(114)	(302)	(302)
Secondary+			
Wants no more	17	20	2
Wants delay	57	23	36
Wants soon	26	57	54
Number of women	(55)	(62)	(30)

Table 4.26 Percentage of currently married fecund women who have never used who intend to use in future, by fertility preferences and selected background variables

Subgroup	Percentage who intend to use in future among never users				
	Total	Wants soon	Uncertain	Wants to delay	Wants no more
Percentage	30.4	26.1	7.4	39.1	51.6
Number of women	(2383)	(1039)	(297)	(863)	(184)
Current age					
15–19	35.2	34.2	–	40.6	–
20–29	35.1	30.5	7.1	44.5	(68.0)
30–39	26.6	21.8	6.4	31.0	67.1
40–49	20.3	8.5	11.5	30.7	34.8
Region of residence					
Western/Central	19.8	13.9	(12.8)	23.8	(40.0)
Greater Accra	32.1	26.8	(17.4)	35.7	(48.8)
Eastern	33.2	31.3	(12.0)	44.2	–
Volta	(13.6)	–	–	–	–
Ashanti/Brong Ahafo	58.1	49.6	(25.0)	66.1	75.0
Northern/Upper	4.1	3.5	0.6	7.7	5.3
Education					
No schooling	21.1	16.8	5.8	26.7	48.2
Primary	48.7	37.3	–	60.2	–
Incomplete Middle	50.8	45.6	–	61.6	–
Complete Middle	52.3	47.2	–	–	–
Secondary+	63.3	61.5	–	–	–

Note: '–' = fewer than 20 cases. Percentages enclosed in parentheses indicate that the number of cases is 20–49.

4.4 KNOWLEDGE OF SOURCES FOR FAMILY PLANNING SUPPLIES AND CONTRACEPTIVE USE

Introduction

By definition, a fairly strong relationship between knowledge of family planning sources and contraceptive use is to be expected. Women who have ever used or who are currently using supply methods are more likely to know of sources, because they needed to use them. Current users of supply methods are also more likely to have made a recent visit to a family planning source. We will examine these relationships for specific methods because type of method will determine the need for supplies. However, apart from the expected relationships, this analysis is perhaps more useful in providing estimates of knowledge of sources and even attendance at sources, among never users, past users or users of inefficient methods. Variation in all of these relationships among socio-economic subgroups is also a focus of the analysis in this section. We expect that in those regions and among those groups where the level of knowledge of methods is high, the level of knowledge of sources will also be high. We also expect that those using efficient methods will have a higher level of knowledge of sources, especially according to the specific methods being used. In addition, we expect a high proportion of current users of efficient methods to have paid a recent visit.

Data on family planning sources is derived from responses to three questions. The respondent was first asked for the types of outlet where the methods known to her could be obtained and which outlet she preferred to use if she wanted supplies. If the respondent herself had gone to any of the outlets she was further asked if she had paid a visit recently (preceding 12 months), and which outlet she visited.

Knowledge of sources for family planning supplies

In this section we will look at the level of knowledge of family planning sources for each of the six main supply methods among those who know each particular method, and how this differs among the various socio-economic subgroups. In one sense this analysis evaluates the substantive meaning of the reported knowledge of contraception, since knowledge of a method is less meaningful if no source for it is known.

Table 4.27 shows that about two-thirds of all currently married women who know of contraceptive methods know sources for those methods, and even when background variables are taken into account the proportion does not fall below 50 per cent, except in one case. Variations in level of knowledge of sources are minor among the age groups (even though those aged 20–29 are more likely to know of method sources than those aged 40–49), but variations among the regions and educational groups are substantial. The proportions knowing a source range from about 26 per cent in Northern/Upper region to 85 per cent in Ashanti/Brong Ahafo. The low level of knowledge of method sources in Northern/Upper is expected since that region also has the lowest proportion knowing a method, but the high proportion in Ashanti/Brong Ahafo is rather unexpected as it has the second lowest level of knowledge. But strangely enough, Volta region with over 90 per cent of women knowing of contraception has only about 50 per cent of these women knowing of a source. This rather low level of knowledge of sources in Volta can be attributed to the large proportion of women who know only inefficient methods. As expected, the proportion knowing sources increases with increases in the level of education. While less than 50 per cent of

Table 4.27 Percentage who know of a supply source for specific methods, among currently married women who know the method itself, by selected background variables

Subgroup	All methods	Pill	IUD	OFS[a]	Condom	Female sterilization	Injection
Number who know method	3043	2106	1552	1083	1290	1351	1001
Percentage all women	63.2	74.2	67.4	73.0	62.6	57.4	61.7
Current age							
15–19	60.4	66.7	58.5	63.6	57.6	48.2	60.0
20–29	67.7	75.3	69.6	76.1	63.9	57.2	65.5
30–39	61.5	75.9	70.5	73.2	64.4	60.5	60.8
40–49	56.2	71.2	58.7	65.0	56.8	55.9	54.6
Region							
Western/Central	50.3	55.1	52.0	51.7	53.0	36.1	52.2
Greater Accra	60.3	64.6	58.3	70.0	60.0	45.7	59.6
Eastern	65.8	80.4	58.4	77.0	61.9	67.4	58.2
Volta	50.5	72.2	70.4	70.2	58.1	73.0	60.6
Ashanti/Brong Ahafo	84.7	92.6	86.3	89.7	85.4	68.0	81.9
Northern/Upper	25.6	39.6	50.0	40.0	50.0	58.3	27.8
Type of place of residence							
Rural	59.3	73.7	66.4	71.9	61.7	59.0	59.3
Urban	69.7	74.8	68.5	74.1	63.5	55.1	64.8
Respondent's education							
No schooling	48.6	64.0	59.0	58.8	52.8	48.6	53.0
Primary	66.3	73.3	60.7	67.6	50.6	62.9	54.8
Incomplete Middle	74.4	78.9	71.6	73.9	62.2	60.4	70.9
Complete Middle	82.6	84.3	74.5	80.7	70.4	62.9	66.9
Secondary+	94.6	94.3	88.0	89.3	86.9	76.7	84.9

[a]OFS = other female scientific methods (ie diaphragm, tampon, sponge, foam tablets, jelly or cream).

women with no formal education know of method sources, almost every woman with secondary and higher education knows of a source.

Data on levels of knowledge of specific method sources show that more women know about sources for the pill and other female scientific methods than the other methods, though proportions knowing sources for the other methods do not fall below 50 per cent. Women aged 20–29 and 30–39 are more likely to know of sources for each of the specific methods than women aged 15–19 and 40–49. This reflects the level of use among these age groups. Among the regions, Ashanti/Brong Ahafo has the highest proportion of women knowing a source for each of the methods, except female sterilization. Northern/Upper also has the lowest proportions for all methods except female sterilization. Among educational groups proportions of women who know of supply-method sources for each method generally increase with rise in the level of education.

Knowledge of method sources and pattern of contraceptive use

The data (table 4.28) show, as may be expected, that women who have never used contraception are much less likely to know of method sources than those who have used contraceptives before. Among women who have never used contraception, 25 per cent know of method sources compared to a range of about 50–95 per cent for women who have used contraceptives before.

Table 4.28 Percentage of currently married exposed women who know any source, by pattern of contraceptive use and selected background variables

Subgroup	Never users	Past users	Current users	
			Inefficient methods	Efficient methods
Number of exposed women	2009	982	178	245
Number who know a source	511	667	88	234
Percentage all women	25.4	67.9	49.4	95.5
Current age				
15–19	21.5	77.4	10.0	87.5
20–29	28.6	72.2	64.4	96.1
30–39	23.0	63.2	47.4	95.1
40–49	23.9	61.0	39.4	96.6
Number of living children				
0–1	28.3	70.4	53.1	95.2
2–3	24.5	69.2	56.9	93.7
4–5	22.1	65.4	41.5	96.3
6+	26.7	65.3	42.5	100.0
Region				
Western/Central	30.7	79.7	44.4	92.0
Greater Accra	33.5	80.4	67.9	87.8
Eastern	33.1	75.1	38.8	100.0
Volta	25.0	46.4	45.2	100.0
Ashanti/Brong Ahafo	37.6	84.1	87.5	100.0
Northern/Upper	3.4	17.6	33.3	100.0
Respondent's education				
No schooling	17.1	51.0	34.9	92.3
Primary	34.8	70.7	52.4	96.7
Incomplete Middle	41.5	86.2	58.8	96.4
Complete Middle	51.6	86.0	84.0	96.6
Secondary+	87.0	95.5	100.0	95.7

However, among the latter group, current users of inefficient methods have a much lower proportion who know of sources than past users, while current users of efficient methods have a very large proportion who know of sources. The comparatively large proportion who know of method sources may be due to past use of efficient methods while the low level among current users of inefficient methods may indicate a very low level of ever-use of efficient methods.

Among the age groups the level of knowledge of sources among each pattern of use group, except current users of inefficient methods, shows little variation. Current users of inefficient methods aged 15–19 have only 10 per cent who know of sources, compared to 64 per cent of those aged 20–29. This large difference in levels may indicate higher ever-use of efficient contraception by the latter group and a relatively lower use of efficient methods by the former. Even though the regional data show a pattern similar to the general one outlined in the first paragraph, there is considerable variation in levels of knowledge of sources for past users and current users of inefficient methods. Ashanti/Brong Ahafo region has the highest level in all use groups while Northern/Upper has the lowest in all use groups. However, the level of knowledge of method sources among past users and current users of inefficient methods in Volta region is about the same, a further indication of a high level of use of inefficient methods for both groups. Northern/Upper also shows a higher level of knowledge of sources for current users of inefficient methods than for the past users, and this may be due to a much lower level of use of efficient methods by past users.

Data for the educational groups show the expected pattern. In addition, the data show a relatively high level of knowledge of sources for women with secondary and higher education who have never used any method. The level is also quite high for women with no schooling who are also current users of efficient methods.

Table 4.29, which shows the proportion of currently married women who know of sources for specific methods by exposure status, shows that there is virtually no difference in level of knowledge of sources between all women and those who are exposed to the risk of pregnancy. It also emphasizes that sources for the pill are consistently better known than sources for the other methods, and those for injection the least well known. Within the exposed group the pattern in the levels of knowledge of sources for each method fits the expected pattern. A high proportion of women who reported current use of the method knew sources where that method could be obtained. The only exception to this is the condom. And this is not very strange as male partners are more likely to procure these.

In addition, women who use efficient methods other than the method in question are less likely to know of sources for those methods. The exception to this is the pill for which the proportion knowing sources is still quite high. This indicates that the pill might have been used before by more women. Furthermore, those using inefficient methods are even less likely to know sources for specific methods. Those not using and

Table 4.29 Percentage of currently married women below age 45 knowing a source for pill, IUD, other female scientific methods, condom, female sterilization and injection, by exposure status and current use of contraception[a]

Exposure/use status	Pill	IUD	OFS[b]	Condom	Female sterilization	Injection
All women	36	24	19	19	18	14
Exposed	36	24	19	20	18	15
Using supply methods	97	–	96	64	–	–
Using other efficient methods	74	59	47	56	36	34
Using inefficient methods	36	25	23	22	32	15
Not using	32	21	15	16	16	13
Not exposed	37	24	18	17	15	12

[a] '–' indicates less than 20 cases in the base.
[b] OFS = other female scientific methods (ie diaphragm, tampon, sponge, foam tablets, jelly or cream).
Source: Jones (1984).

those not exposed are also less likely to know of method sources but their levels are about the same.

Recent visit to a supply source and pattern of use

As expected, recent attendance is concentrated among users of efficient methods (table 4.30). Never the less, the proportion using efficient methods who have not visited an outlet (40 per cent) is quite large. However, this may be due to the fact that the methods being used can be procured by their male partners. Women using efficient methods and residing in Western/Central and Ashanti/Brong Ahafo regions and those with secondary and higher education are more likely to have visited an outlet recently than women in the other regions and in the other educational groups.

The most visited outlet is the government hospital or clinic and over 50 per cent of all women in every subgroup who visited an outlet recently went to a government hospital or clinic. This is expected as it is not only the most known but also the most preferred outlet. The planned Parenthood Association of Ghana and Christian Council clinic is the second most visited outlet. The least used outlet is the family planning mobile clinic. Even though the majority of women in all the regions visited the government hospital or clinic, women in each region also patronized specific outlets. The Planned Parenthood Association of Ghana (PPAG) and Christian Council clinic was also visited recently by a relatively large proportion of women in Ashanti/ Brong Ahafo and Greater Accra; 28 and 19 per cent of those who visited a source in these regions went to this clinic. In Western/Central, Northern/ Upper and Eastern regions a relatively large proportion of women who made a recent visit went to family planning fieldworkers. This may be a reflection of the availability of those outlets in these regions. It should however be pointed out that the low patronage of private clinics and pharmacies at shops in Greater Accra and Ashanti/ Brong Ahafo may be due to the relatively high cost of contraceptive methods in these outlets. A relatively large proportion of women with secondary and higher education (27 per cent) and those with complete middle education (26 per cent) who have recently visited an outlet visited the PPAG and Christian Council clinic. Those with primary education (24 per cent) are also more likely than all other educational groups to have used the source of a family planning fieldworker.

From the preceding, the relatively low level of knowledge of sources in the regions with a high level of knowledge of contraceptive methods may be mainly due to a relatively high use of inefficient methods especially in Volta and Eastern. However in Greater Accra it may be due to the fact that male partners may be procuring the supplies needed. It also follows that even though use of contraception in Ashanti/Brong Ahafo and Western/Central is relatively low, most of those using contraception use efficient methods and that may explain the relatively high level of knowledge of sources in these regions.

4.5 CORRELATES OF CONTRACEPTIVE KNOWLEDGE AND USE

The analyses in the previous sections indicate that contraceptive knowledge and use are related to respondent's region of residence, level of education, preference for children and her current age. However, since all these variables are closely inter-related, we will examine the independent effects of each of these variables on the levels of knowledge, ever-use and current use, by controlling for the other variables. The set of variables selected for use in this analysis are region of residence, respondent's education, husband's education, preference for children and travel time to source of contraceptive supply. We added the last variable to the set selected because there is a strong indication from the previous section that those who know of contraceptive methods and have also used them before are more likely to know of method sources and are also more likely to travel there to get supplies. Respondent's current age and number of living children are also used. We will limit our discussion to knowledge, ever-use and current use of any contraceptive method. We will also briefly discuss current use of efficient methods because of its relevance to policy matters.

Multiple classification analysis (MCA) is used. The results are, however, shown in terms of unadjusted and adjusted proportions. The adjusted proportion refers to the proportion of women likely to show the score of the dependent variable (for example, proportion knowing a method or

Table 4.30 Percentage distribution of currently married exposed women, by recent visit to a family planning outlet, pattern of contraceptive use and selected background variables

Subgroup	No visit	Government hospital and clinic	PPAG/ Christian Council clinic	Private doctor/ clinic	Pharmacy/ shop	Family planning field-worker	Mobile family planning clinic	Not stated	Number of women
Number of women	3214	84	40	15	26	22	10	3	3414
All women	94.1	2.5	1.2	.4	.8	.6	.3	.1	3414
Not using	98.3	.5	.3	.1	.4	.2	.1	.0	2991
Using inefficient	97.8	1.1	.6	.0	.6	.0	.0	.0	178
Using efficient	41.2	26.9	11.8	4.5	5.3	6.9	2.4	.8	245
Region									
Western/Central	94.1	2.5	.4	.6	.6	.8	.8	.0	476
Not using	98.0	.9	.0	.0	.5	.0	.7	.0	442
Using inefficient	100.0	.0	.0	.0	.0	.0	.0	.0	9
Using efficient	24.0	32.0	8.0	12.0	4.0	16.0	4.0	.0	25
Greater Accra	89.2	5.8	2.8	.5	1.0	.5	.3	.0	399
Not using	96.6	1.0	1.3	.0	1.0	.0	.0	.0	297
Using inefficient	92.9	.0	3.6	.0	3.6	.0	.0	.0	28
Using efficient	58.1	27.0	8.1	2.7	.0	2.7	1.4	.0	74
Eastern	95.6	1.7	.4	.4	.7	1.1	.2	.0	545
Not using	98.6	.2	.0	.2	.5	.5	.0	.0	432
Using inefficient	98.8	1.3	.0	.0	.0	.0	.0	.0	80
Using efficient	48.5	21.2	6.1	3.2	6.1	12.1	3.0	.0	33
Volta	95.2	3.6	1.2	.0	.0	.0	.0	.0	332
Not using	97.4	1.5	1.1	.0	.0	.0	.0	.0	270
Using inefficient	100.0	.0	.0	.0	.0	.0	.0	.0	42
Using efficient	55.0	40.0	5.0	.0	.0	.0	.0	.0	20
Ashanti/Brong Ahafo	91.7	2.6	2.1	.8	1.5	.8	.4	.2	1015
Not using	98.0	.3	.3	.3	.5	.2	.1	.0	913
Using inefficient	93.8	6.3	.0	.0	.0	.0	.0	.0	16
Using efficient	24.4	25.6	20.9	5.8	11.6	3.5	1.2	.0	86
Northern/Upper	99.2	.3	.0	.0	.0	.3	.0	.2	647
Not using	99.7	.2	.0	.0	.0	.2	.0	.0	637
Using inefficient	100.0	.0	.0	.0	.0	.0	.0	.0	3
Using efficient	57.1	14.3	.0	.0	.0	14.3	.0	14.3	7
Respondent's education									
No schooling	97.8	1.1	.2	.2	.1	.3	.1	.0	2039
Not using	99.3	.3	.0	.1	.1	.2	.1	.0	1881
Using inefficient	99.1	.9	.0	.0	.0	.0	.0	.0	106
Using efficient	40.4	32.7	7.7	7.7	1.9	7.7	1.9	.0	52
Primary	93.4	2.6	1.1	.6	.9	1.1	.0	.3	351
Not using	98.3	1.0	.3	.0	.3	.0	.0	.0	300
Using inefficient	95.2	.0	4.8	.0	.0	.0	.0	.0	21
Using efficient	43.3	20.0	6.7	6.7	6.7	13.3	.0	3.3	30
Incomplete Middle	93.4	4.0	.7	.0	1.0	.7	.3	.0	303
Not using	98.1	.8	.0	.0	.8	.4	.0	.0	258
Using efficient	100.0	.0	.0	.0	.0	.0	.0	.0	17
Using inefficient	46.4	35.7	7.1	.0	3.6	3.6	3.6	.0	28
Complete Middle	87.7	4.7	3.0	.7	1.9	1.0	.7	.3	593
Not using	95.6	.8	1.0	.2	1.5	.4	.2	.2	479
Using inefficient	96.0	4.0	.0	.0	.0	.0	.0	.0	25
Using efficient	42.7	25.8	14.6	3.4	.7	2.2	1.1	1.1	89
Secondary+	68.0	9.8	9.8	3.3	4.9	2.5	1.6	.0	122
Not using	88.1	3.0	6.0	3.0	.0	.0	.0	.0	67
Using inefficient	88.9	.0	.0	.0	11.1	.0	.0	.0	9
Using efficient	34.8	21.7	17.4	4.3	10.9	6.5	4.3	.0	46

proportion ever using, etc), had the effects due to the other variables been removed.

The analysis is restricted to currently married and fecund women. Women with missing codes on any one or more of the variables in the model examined were excluded in the analysis. Thus the number of women may vary from one analysis to another.

Knowledge of contraception

Table 4.31 shows that the unadjusted level of contraceptive knowledge for Northern/Upper region is the lowest among the regions (22 per cent). But this proportion increases to 31 per cent when adjusted for both respondent's and husband's education. The level for Greater Accra

Table 4.31 Knowledge of any contraceptive method: differentials after adjustment[a] for region, education, fertility preferences and accessibility of a supply source.

Subgroup	Number of women	Unadjusted percentages (know any method)	Percentages adjusted for		
			Region, Respondent's and husband's education	Prior factors + preference for children + travel time	All factors + age and number of living children
Region					
Western/Central	561	81	81	82	82
Greater Accra	470	93	86	88	88
Eastern	613	88	86	81	80
Volta	372	97	96	94	94
Ashanti/Brong Ahafo	1212	65	63	59	59
Northern/Upper	747	22	31	41	42
			(.46)	(.39)	(.38)
Respondent's education					
No schooling	2322	57	65	68	68
Primary	423	80	70	69	69
Incomplete Middle	371	87	75	70	71
Complete Middle	714	89	77	71	71
Secondary +	145	97	82	67	68
			(.12)	(.02)	(.03)
Husband's education					
No schooling	1737	50	63	67	67
Primary/Incomplete Middle	507	81	73	74	74
Complete Middle	1189	82	73	69	69
Secondary+	542	91	76	69	69
			(.12)	(.04)	(.05)
Preference for children					
Wants soon	1519	65	66	67	68
Uncertain	429	54	67	67	66
Wants delay	1561	72	69	70	70
Wants no more	466	85	78	72	70
			(.08)	(.04)	(.03)
Travel time					
Does not know any source	2249	45	50	50	50
< 15 minutes	795	100	91	91	91
15–29 minutes	284	100	97	97	97
30–59 minutes	264	100	96	96	96
Over 1 hour	383	100	95	94	94
			(.47)	(.47)	(.47)

[a]Multiple classification analysis has been used.
NOTE: A summary coefficient, the standardized partial beta coefficient, is given in parentheses.

falls from 93 to 86 per cent. The other regions show only very slight changes, and Western/Central shows no change at all. This means that part of the low level of knowledge in Northern/Upper region can be explained by its very low levels of both respondent's and husband's education, while the reverse is true for Greater Accra. When preference for children and travel time are controlled, the level for Northern/Upper rises again to 41 per cent and there are corresponding falls in Eastern, Volta, and Ashanti/Brong Ahafo, and slight increases in Greater Accra and Western/Central. The level further rises, though only slightly for Northern/Upper, when number of living children and respondent's current age are controlled. The level for Eastern also falls slightly. This shows that preference for more children partly explains the low level of knowledge in Northern/Upper. However, the demographic variables, current age and number of living children, have either no effect or a minimal effect on level of knowledge in all the regions.

The level of contraceptive knowledge among the educational groups is highly associated with husband's education and region of residence. The unadjusted level for women with no schooling rises from 57 to 65 per cent when region of residence is controlled and correspondingly decreases for the other groups, with the highest decrease for those with secondary and higher education (from 97 to 82 per cent). When preference for children and travel time are controlled, the proportion for those with no schooling further increases to 68 per cent while that for those with secondary and higher education decreases further to 67 per cent, cancelling out the original unadjusted differentials. Current age of respondent and number of living children have very little further effect on the level of contraceptive knowledge, for all the groups. These results imply that husband's education and region of residence and preference for children account for a large part of the observed differences in the levels of contraceptive knowledge among the various educational groups. The effect of husband's education is not unexpected as highly educated women tend to marry highly educated men. About 75 per cent of women with secondary and higher education are married to men with a similar level of education. A similar relationship is indicated for levels of knowledge by husband's education.

Differences in levels of knowledge among the various preference groups are also almost evened out when region of residence, respondent's and husband's education, travel time, age and number of living children are controlled. Levels among the various travel-time groups are least affected by all the variables, with a large difference remaining between those who know a source, regardless of the travel time to that source, and those who do not know a source (over 90 per cent compared to 50 per cent). A summary index of the effect of each independent factor on the dependent variable (level of knowledge), the standardized partial eta coefficients, shows that region of residence and travel time to a method source have the largest influence on contraceptive knowledge. Respondent's and husband's education also exert moderate but about equal strength on contraceptive knowledge. The influence of preference for children on knowledge is the least among all the variables.

Ever-use of contraception

The unadjusted data for levels of ever-use show that the level is lowest in Northern/Upper region and highest in Volta (table 4.32). But the level rises from 10 to 19 per cent for Northern/Upper when respondent's and husband's education are controlled. The level for Greater Accra, however, falls from 50 to 41 per cent, and there are only minimal changes in all other regions. When preference for children and travel time are controlled, the level for Northern/Upper further rises to 28 per cent and slight falls occur in Eastern, Volta and Ashanti/Brong Ahafo. Age and number of living children have little effect on the levels of ever-use among the regions. While part of the low levels of ever-use in Northern/Upper can be attributed to the effect of respondent's and husband's education and preference for children, a large part is due to the regions themselves, as seen in the large regional differences that remain even after all variables are controlled (table 4.32). Unadjusted data on levels of ever-use among the educational groups show that the level of ever-use increases as education rises, but when these data are controlled for region of residence and husband's education, ever-use among those with secondary and higher education falls from 80 to 72 per cent and that of those with no schooling increases from 30 to 37 per cent. Decreases are also indicated for those with primary and

Table 4.32 Ever-use of any contraceptive method: differentials after adjustment[a] for region, education, fertility preferences and accessibility of a supply source.

Subgroup	Number of women	Unadjusted percentages (ever-use of any method)	Percentages adjusted for		
			Region, Respondent's and husband's education	Prior factors + preference for children +travel time	All factors + age and number of living children
Region					
Western/Central	561	22	23	23	23
Greater Accra	470	50	41	41	41
Eastern	613	70	69	64	63
Volta	372	94	94	92	92
Ashanti/Brong Ahafo	1212	35	33	30	30
Northern/Upper	747	10	19	28	29
			(.47)	(.42)	(.42)
Respondent's education					
No schooling	2322	30	37	40	39
Primary	423	47	40	40	40
Incomplete Middle	371	53	43	40	42
Complete Middle	714	48	48	43	44
Secondary+	145	80	72	61	62
			(.15)	(.08)	(.09)
Husband's education					
No schooling	1737	25	45	38	38
Primary/Incomplete Middle	507	48	41	42	42
Complete Middle	1189	51	45	42	43
Secondary+	542	65	52	46	47
			(.13)	(.06)	(.07)
Preference for children					
Wants soon	1519	33	45	36	35
Uncertain – more	429	31	41	40	39
Wants delay	1561	46	42	43	43
Wants no more	466	62	57	53	49
			(.14)	(.11)	(.09)
Travel time					
Does not know any source	2249	21	26	26	27
<15 minutes	795	67	61	60	60
15–29 minutes	284	66	62	61	61
30–59 minutes	264	63	60	59	59
Over 1 hour	384	69	60	59	58
			(.35)	(.34)	(.33)

[a]Multiple classification analysis has been used.
NOTE: A summary coefficient, the standardized partial beta coefficient, is given in parentheses.

incomplete education, while the level for complete middle remains the same. When preference for children and travel time are further controlled, the levels for women with secondary and higher education decreases to 61 per cent and that of those with no schooling increases to 40 per cent. The levels for those with incomplete and complete middle education also fall. Finally, when age and number of living children are controlled, there are only minimal changes on levels. After all these adjustments the level of ever-use is still positively related to education, but the main remaining difference is that for women with secondary and higher education. Husband's education shows the same relationship but the range in percentage ever used among the education groups is narrower, for unadjusted differences and especially after adjustment for other factors.

The level of ever-use is highest among women who want no more children (62 per cent) and lowest for those who are uncertain about their fertility preferences (31 per cent), as indicated by the unadjusted data in table 4.32. But the level for those who want no more decreases to 57 per cent, and those for the 'wants soon' and uncertain groups increases to 45 and 41 per cent respectively, when education of both respondent and husband and region of residence are controlled. When travel time is further controlled, in addition to the other variables, the level drops for all the groups except the uncertain group which rises slightly. But the largest decrease is for those who want children soon, mainly because this group is less likely to know a source. Current age and number of living children affects the level for those who want no more children more than the other groups. The level for this group (wants no more) falls to 49 per cent. After controlling for all factors, level of ever-use is still higher for those women who want no more children and lowest for those who want their next children soon, but the differentials are much smaller.

Women who do not know any source of contraceptive supplies are still much less likely to use any method even after all factors have been controlled. And the likelihood of ever-use shows a small decrease as travel time to a supply source increases, after all variables have been controlled. Our summary index, the standardized partial beta coefficient for ever-use, further emphasizes the strong effects of region of residence and travel time to a source, over all other variables. However, respondent's and husband's education and preference for children also exert considerable influence on the level of ever-use even though their effects are not as strong as the former variables.

Current use of contraception

After controlling for respondent's and husband's education the level of current use in Greater Accra declines from 21 to 16 per cent while that of Northern/Upper increases from 1 to 4 per cent (table 4.33). Levels of current use for Western/Central, Eastern and Volta remain unchanged and that of Ashanti/Brong Ahafo registers only a slight change. The effect of controlling for preference for children and travel time increases the level for Northern/Upper to 7 per cent while the level remains unchanged in Greater Accra. Increases or decreases in the other regions are minimal. Age of respondent and number of living children have no effect on the level of current use in all the regions, except in Northern/Upper, and even here the effect is minimal. But after all the variables have been controlled, the level of current use is much higher in Northern/Upper region than Western/Central and Ashanti/Brong Ahafo. The low level of current use in Northern/Upper is, therefore, highly associated with the comparatively low level of education (respondent's and husband's), preference for more children and the high proportion of women not knowing any source of supply, but factors other than those we are studying may also be contributing to the low level of current use. This appears to be so because, after controlling for all the factors, current use in these regions is still about 50 per cent less than the level in Greater Accra and Eastern regions. While part of the high level of current use in Accra can be accounted for by its relatively high level of education, the other factors have no effect on its level of current use. Also, only part of the high level of current use among those with secondary and higher education can be attributed to the effects of region of residence, husband's education, preference for less children and travel time, since these results show that a high level of education continues to be strongly associated with current use, even after other factors are controlled. The data further indicate that the effect of education below the secondary level on current use is minimal. Husband's education shows a similar relationship, though its effect is not as strong as that of respondent's own education. Similarly, though education, region of residence, age and number of living children account for some of the high level of current use of those who want no more children, the expressed desire to stop or to

Table 4.33 Current use of any method: differentials after adjustment[a] for region, education, fertility preferences and accessibility of a supply source.

Subgroup	Number of women	Unadjusted percentages (current use of any method)	Percentages adjusted for		
			Region, Respondent's and husband's education	Prior factors + preference for children + travel time	All factors + age and number of living children
Region					
Western/Central	561	6	6	7	7
Greater Accra	470	21	16	16	16
Eastern	613	16	17	16	15
Volta	372	16	16	15	15
Ashanti/Brong Ahafo	1212	8	7	6	6
Northern/Upper	747	1	4	7	8
			(.17)	(.14)	(.14)
Respondent's education					
No schooling	2322	6	9	9	9
Primary	423	12	10	10	10
Incomplete Middle	371	12	9	8	9
Complete Middle	714	15	11	10	11
Secondary+	145	37	28	25	25
			(.12)	(.09)	(.10)
Husband's education					
No schooling	1737	4	8	9	8
Primary/Incomplete Middle	507	10	9	9	9
Complete Middle	1189	12	11	10	10
Secondary+	542	23	17	15	15
			(.10)	(.07)	(.08)
Preference for children					
Wants soon	1519	5	6	6	6
Uncertain – more	429	5	8	8	7
Wants delay	1561	13	13	13	13
Wants no more	466	19	17	16	14
			(.14)	(.13)	(.12)
Travel time					
Does not know any source	2249	4	6	6	6
<15 minutes	795	17	14	14	14
15–29 minutes	284	25	22	22	22
30–59 minutes	264	15	15	14	14
Over 1 hour	383	16	15	15	14
			(.18)	(.17)	(.16)

[a]Multiple classification analysis has been used.
NOTE: A summary coefficient, the standardized partial beta coefficient, is given in parentheses.

delay constitutes a strong motive for current use.

Table 4.34 shows an unexpected pattern in the relationship between travel time to a source and current use of contraception. Although use is negatively related to travel time, from the 15–29 minutes category to the longest travel time categories, this does not hold for the shortest travel time group, those who would go to a source less than 15 minutes away. This pattern remains even after controlling all other factors.

One possibility is that the less than 15 minutes group combines two quite different groups, those who reported no travel time at all (ie women whose source is the fieldworker or the mobile clinic) and those who are actually physically close to a different type of source, which they would travel to. Arguably, women who have the source brought to them would be less likely to be using (because their motivation is not at all related to finding the source) than those who know a source which is very close. When this category is split into two, 0 minutes and 1–14 minutes travel time, the relationship begins to fit the expected pattern much better: the '0' category has a quite low level of use, but from the '1–14' minutes group upwards, a negative relationship is found (see table 4.34). This relationship has a plateau at 1–29 minutes, ie short travel time of less than half an hour is associated with about the same level of use (25 per cent) but above that there is a sharp drop to about 15 per cent use, which remains the same, regardless of whether the travel time is 30–59 minutes or over an hour. This basic pattern remains even after controlling all other factors, although the difference between travel time groups narrows substantially. A similar pattern is found for current use of efficient contraceptive methods (see table 4.34).

The summary index of the relationship between the independent factors and current contraceptive use, the standardized partial beta coefficient, indicates that travel time and region are still the more important factors affecting level of current use. But their influence is not as dominant as observed before, for knowledge and ever-use of any method of contraception. Furthermore, the influence of preference for children on current use is considerable, while it was negligible before, for knowledge and ever-use. The effect of education, respondent's and husband's, is not

Table 4.34 Travel time to a source of family planning supplies: effect on current use of any method and on current use of efficient methods

Travel time	Number of women	Percentage (current use of any method)	Percentages adjusted for		
			Region, Respondent's and husband's education	All independent factors	All independent factors + age and number of living children
A Current use of any method					
Travel time					
Does not know any source	2249	4	6	6	6
0 minutes	522	13	11	11	11
< 15 minutes	273	26	20	20	19
15–29 minutes	284	25	23	22	22
30–59 minutes	264	15	14	14	14
Over 1 hour	383	16	15	14	14
B Current use of efficient methods					
Travel time					
Does not know any source	2249	0	2	2	2
0 minutes	522	9	8	8	8
< 15 minutes	273	19	13	13	13
15–29 minutes	284	20	17	16	16
30–59 minutes	264	13	12	12	12
Over 1 hour	383	11	11	11	11

Table 4.35 Current use of efficient methods: differentials after adjustment[a] for region, education, fertility preferences and accessibility of a supply source

Subgroup	Number of women	Unadjusted percentages (current use of efficient methods)	Percentages adjusted for		
			Region, Respondent's and husband's education	Prior factors + preference for children + travel time	All factors + age and number of living children
Region					
Western/Central	561	4	5	6	6
Greater Accra	470	15	10	10	10
Eastern	613	5	5	4	4
Volta	372	5	5	4	4
Ashanti/Brong Ahafo	1212	7	6	5	5
Northern/Upper	747	1	5	8	8
			(.07)	(.08)	(.08)
Respondent's education					
No schooling	2322	2	4	5	5
Primary	423	7	7	6	7
Incomplete Middle	371	7	6	5	5
Complete Middle	714	12	9	8	8
Secondary+	145	31	23	19	19
			(.06)	(.12)	(.12)
Husband's education					
No schooling	1737	1	4	5	4
Primary/Incomplete Middle	507	2	3	3	3
Complete Middle	1189	8	7	7	7
Secondary +	542	19	14	12	12
			(.15)	(.11)	(.11)
Preference for children					
Wants soon	1519	3	3	3	3
Uncertain – more	429	1	4	4	4
Wants delay	1561	8	8	8	8
Wants no more	466	14	14	12	12
			(.15)	(.13)	(.13)
Travel time					
Does not know any source	2249	0	2	2	2
< 15 minutes	795	13	10	10	10
15–29 minutes	284	20	17	16	16
30–59 minutes	264	13	12	12	12
Over 1 hour	383	11	12	11	11
			(.22)	(.21)	(.20)

[a]Multiple classification analysis has been used.

NOTE: A summary coefficient, the standardized partial beta coefficient, is given in parentheses.

insignificant, but smaller than that of the other factors.

Current use of efficient methods

The relatively low use of efficient contraceptive methods in Northern/Upper can be attributed to low levels of education (respondent's and husband's) and preference for more children. When these variables are controlled the level of use of efficient methods is raised from 1 to 8 per cent, the second highest level of use of efficient methods. And apart from Greater Accra, where a third of its level of current use of efficient methods can be explained by the effects of education, the changes in levels in the other regions are minimal after adjusting for all the variables. Respondent's and husband's education and preference for children are still, by themselves, strongly related to current use of efficient methods.

From the preceding discussion we may conclude that the data strongly suggest that region of residence has more influence on level of knowledge than respondent's or husband's education and preference for children. Thus, while those in Northern/Upper are less likely to know of contraceptive methods irrespective of level of education or expressed preference for children, those in the other regions are more likely to know of contraception especially when those women reside in Greater Accra and Volta regions. However, though the region of residence determines to some extent the level of ever-use, level of education (respondent's and husband's) and preference for children also exert considerable influence on the level of ever-use.

Level of current use is affected mainly by education, especially that of the respondent. But it is only after the secondary and higher level that its effect is strongly seen. The expressed desire to stop or delay having children is also positively related to level of current use. More than twice as many women who want to stop childbearing are likely to be using contraceptives as those who want children soon. This positive relationship between current use and education and preference for children is also indicated in the use of efficient methods. In table 4.35, the beta coefficients show that current use of efficient methods is highly affected by travel time to a method source. Education (respondent's and husband's) and preference for children exert considerable influence on current use. The effect of region of residence is much less on current use than on knowledge and ever-use.

Summary

We present the proportion of variance explained at each level by the variables, as a summary of the overall effect of the different background explanatory factors (table 4.36). This table shows the relative importance of travel time on knowledge and use of contraceptives, but also shows the relative unimportance of current age and number of living children on contraceptive knowledge and use. We consider this an important finding emerging from this study. Data for most WFS countries reveal that the use of contraception, unlike the Ghanaian case, is a response to high parity. Women generally start using contraception only after having several births. These results, showing almost no relationship between use of contraception and age or number of living children, suggest that high fertility does not necessarily lead Ghanaian women to start use of contraception. Instead, the even distribution of

Table 4.36 Proportion of variance explained (R^2) after introduction of background and demographic variables

Dependent variable	After introduction of			
	Region, Respondent's and husband's education	+ Preference for children	+ Travel time to a supply source	All independent and covariates (age, living children)
Knowledge of any method	33.4	33.9	49.7	49.8
Ever-use of any method	31.6	33.5	41.7	42.0
Current use of any method	8.0	9.8	11.8	12.1
Current use of efficient methods	8.7	10.9	14.0	14.1

use across age or parity groups suggests that the motivation to use contraception is as much for spacing children as it is for stopping childbearing. However, though the influence of preference for children is minimal on knowledge and ever-use, it is of considerable importance on level of current use of efficient methods, an increase of about 2 per cent in variance explained, even after the three background variables, region, wife's education and husband's education, have been controlled.

These results support the expected relationships for education and region. The consistency in the relationship of contraceptive knowledge and use with expressed preference to stop or delay childbearing also increases our confidence in the reliability of the data on this difficult topic of attitudes and preference concerning childbearing in the future. The relationship between travel time and current use of contraception is a particularly interesting one, with important policy implications.

4.6 CONCLUSIONS

From the preceding it is quite obvious that, though the level of knowledge of contraceptive methods is quite high among both married and unmarried women, the level of both ever-use and current use are quite low. In addition, a significant proportion of women have only used or are only using inefficient methods. As this cannot be attributed to lack of knowledge of efficient methods (level of knowledge of efficient methods far exceeds that of inefficient methods) we can only conclude that the women prefer to use inefficient methods. However, there is a high concentration of educated women, especially those with secondary and higher education, among those who use efficient methods. A large proportion of women residing in Greater Accra region also use efficient rather than inefficient methods but this may be due to the fact that about 80 per cent of women with secondary and higher education reside in the Greater Accra region. The data also revealed that the most favoured efficient method is the pill. The conclusion was also reached that, even when women express the desire to space or stop childbearing, most of them do not use any contraceptives to achieve their expressed desire, and of those who use a method most of them use abstinence. There is, however, a relatively high level of use of efficient methods among more educated women and those residing in Greater Accra region, who want to either space or limit childbearing.

In an earlier section, it was observed that only 40 per cent of currently married women have ever used any contraceptive methods before. However, only about 10 per cent were using any contraceptive at the time of the survey. This means that 75 per cent have stopped using contraceptives. From the expressed fertility preferences we can infer that about 43 per cent stopped using because they wanted children soon. But it seems other reasons might have contributed to their stopping, since an equally high proportion (41 per cent) of stoppers also want to space or limit childbearing. Furthermore, only 30 per cent of the 60 per cent who have never used contraceptives intend to use contraceptives in the future.

The section on correlates of contraceptive knowledge and use mainly confirms the conclusions reached in the preceding sections. Though region of residence is revealed as having a much stronger effect than education on the level of contraceptive knowledge, education comes out as the most important determinant of both ever-use and current use of contraceptives. However, the effect of education is much more important at the secondary and higher level of education. In addition, women are more predisposed to use contraceptives when travel time to supply sources is less than 30 minutes. However, number of living children and respondent's current age have minimal effects on contraceptive use.

The findings revealed in this study highlight the fact that 10 years of active involvement of the government has had substantial impact on contraceptive knowledge but comparatively less effect on the level of current use of efficient methods.

The results of this study also point out areas where efforts of the family planning agencies — both government and non-governmental — should be rechannelled. In this connection note should be taken of the fact that most women use only inefficient methods even when they wish to space or stop childbearing. In addition, the importance of travel time to supply sources on current use should also be taken into account. Finally, it is important to note that if all the women who want to either space or stop childbearing, and who are either using abstinence or not using any method, were to use contraception, the level of contraceptive use would rise to about 50 per cent of all currently married women.

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5 Fertility Preferences and Utilization of Family Planning Services

John Y. Owusu

5.1 INTRODUCTION

In its population policy statement published in March 1969 the Government of Ghana expressed concern about the deleterious effects of the country's high rate of population growth on national efforts to achieve rapid social and economic development. Population programmes were therefore to be instituted to provide information, advice and assistance for couples wishing to space or limit their reproduction. While emphasizing the voluntary and educational nature of the programmes, policy measures were also to be taken to influence the large family norm of the population.

Periodic population censuses and earlier demographic surveys have provided statistics on the size, composition and other data for estimating levels of fertility, mortality and rate of population growth. The GFS, however, enquired about not only the levels but also conditions and determinants of fertility (including fertility preferences which enable us to identify population subgroups with different degrees of motivation and unmet need for limitation of family size). Questions were also asked to obtain information about respondents' perceived availability of, and accessibility to, family planning service outlets.

In this study we briefly comment, in section 5.2, on the limitations of fertility-preference questions asked in the WFS surveys, as discussed by earlier writers. We undertake analysis of data on preference for additional children in section 5.3 followed by analysis of stated desired family size in section 5.4. In section 5.5 we present a multivariate analysis of determinants of fertility preferences, and in section 5.6 we examine data on knowledge, preference and use of family planning outlets, followed in section 5.7 by a multivariate analysis of determinants of knowledge and use of outlets.

5.2 CHARACTERISTICS AND LIMITATIONS OF DATA ON FERTILITY PREFERENCES

Questions asked in the GFS were intended to enable us to obtain three measures of fertility preferences:

1 desire for additional children;
2 desired family size; and
3 number of additional children wanted.

Regarding desire for additional children, each woman who was currently married and fecund and had had at least one live birth was asked:

> 'Do you want to have another child at anytime in the future?'

and if she was pregnant the question asked was:

> 'Do you want to have another child at anytime in the future in addition to the one you are expecting?'

For currently married and fecund[1] women who had not had any live birth and were not pregnant the question asked was:

> 'Do you want to have any children?'

For women who were not pregnant and who had answered 'yes' to the principal question, follow-up questions were asked about spacing and sex preference of the future birth.

To obtain a measure of wanted family size, women who had had a live birth or were pregnant were also asked follow-up questions on additional number of children wanted. This means that

[1] Fecund women are those who answered 'yes' to the question: 'As far as you know, is it physically possible for you and your husband to have a child, supposing you wanted one?'. Only currently married, unsterilized, non-pregnant women were asked this question.

Susheela Singh, John Y. Owusu and Iqbal H. Shah, eds (1985). *Demographic Patterns in Ghana: Evidence from the Ghana Fertility Survey 1979–80:* 143–192. Voorburg, Netherlands: International Statistical Institute.

women who had had no live birth were not asked any question relating to number of children wanted.

The question on preferred family size which was asked of all women in the sample regardless of their current marital, fecundity or fertility status was:

> 'If you could choose exactly the number of children to have in your whole life, how many children would that be?'

Several criticisms have been made by earlier writers regarding the reliability of fertility-preference questions asked in demographic enquiries, particularly in less developed countries (Hauser 1967; Knodel and Prachuabmoh 1973). As reported by Lightbourne and MacDonald, the view has been expressed that the concept of family size preferences is a meaningless notion in these societies where the population are largely non-numerate and fatalistic in their views about reproduction and therefore are unable to give meaningful quantitative answers regarding how many children they want (Lightbourne and MacDonald 1982).

While recent fertility surveys have shown that appreciable proportions of respondents in less developed countries do give numeric answers regarding desired family size, the studies have none the less shown a high positive correlation between desired family size and number of living children. Many writers (Knodel and Prachuabmoh 1973; Pullum 1980; Lightbourne and MacDonald 1982) have observed, however, that this trend not only reflects rationalization of past fertility but may also be due to the following factors. Women, while in low parity status, may understate the number of children they want but with increased experience in childbearing and as a result of changes in their demographic and socio-economic circumstances their desired family size may be revised upwards. Also, in countries undergoing a process of modernization and subsequent declining fertility the younger cohorts of women would tend to desire lower family size than the older cohorts.

Whatever the explanations that may be offered to explain the pattern of responses to questions about fertility preferences in less developed countries, it may be noted that respondents' responses regarding their desired family size are largely attitudinal and conditional in the sense that they relate to future action or expectations, the realization of which may be affected by changes in the respondent's socio-economic circumstances or demographic characteristics. In traditional societies, children are valued by parents as sources of labour for the production of goods and services for the household; they are potential sources of maintenance for parents in the latter's old age, and in conditions of high child mortality, large family size serves to ensure or guarantee a desirable number of living children. These factors, together with the importance attached to the perpetuation of one's lineage, largely determine the cultural

Table 5.1 Percentage of married and fecund women, by preference for additional children and number of living children

Number of living children	Preference for additional children						
	Wants no more	Wants more			Undecided	Not stated	Number of women
		Total	Wants soon	Wants delay			
Total	11.7	77.4	38.1	39.3	10.1	0.7	4027
0	0.9	96.7	87.9	8.9	1.6	0.7	429
1	1.7	93.1	44.8	48.2	4.8	0.5	821
2	3.0	87.9	38.9	49.0	8.4	0.6	771
3	7.4	81.6	33.3	48.3	10.7	0.3	598
4	15.3	70.8	30.0	40.8	13.1	0.8	510
5	20.7	59.6	20.4	39.2	19.1	0.6	329
6	35.4	47.9	16.7	31.1	15.6	1.2	257
7	41.3	32.0	11.3	20.7	24.7	2.0	150
8	55.6	29.3	8.1	21.2	13.1	2.0	99
9+	54.0	27.0	4.8	22.2	19.0	0.0	63

norms in traditional societies which partly influence individual decisions about ideal or desired family size.

Personal circumstances which may also influence individual decisions include achieved family size, sex composition of living children, opportunity cost of having children, experiences of child deaths or difficult labour during delivery. Changes in the societal factors or in the personal circumstances of the individual may therefore lead to revisions of desired family size. Therefore, as Pullum has observed (Pullum 1980), personal ideal or desired family size that may be set around the time of marriage may not be expected to persist thereafter. In the following sections we shall examine the data on fertility preferences, and evaluate the response patterns in terms of the observations of earlier writers, mentioned above.

As stated earlier in this section, questions relating to preferred family size were asked of all women in the sample irrespective of their marital and fecundity status. Questions relating to desire for additional children were, however, asked only of women who were currently married and fecund. For purposes of comparability among the fertility-preference variables, therefore, we shall restrict much of the analysis in this chapter to women who were currently married and fecund. More importantly, since marriage has been a social institution within which most births occur in Ghana, the target population of any family planning programme should primarily be the currently married and the fecund who are exposed to childbearing.

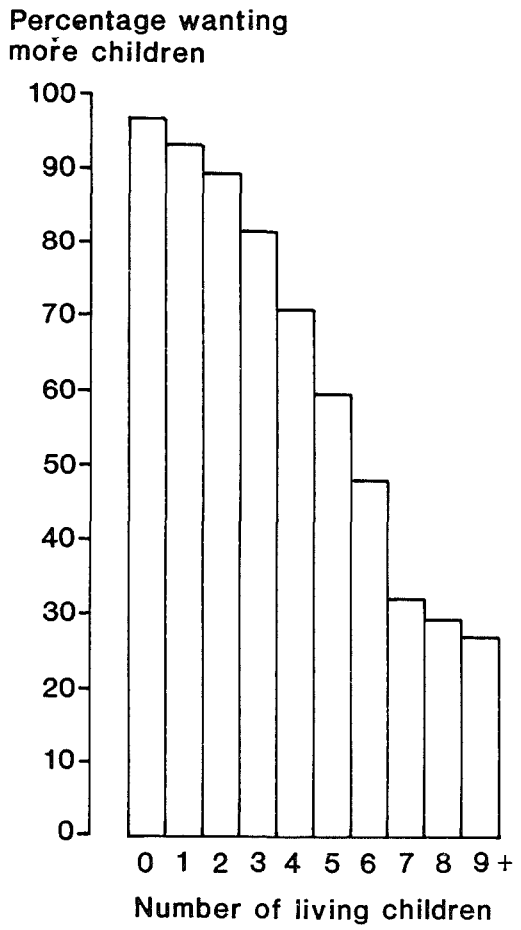

Figure 5.1 Proportion of currently married and fecund women wanting more children, by number of living children

5.3 DESIRE FOR ADDITIONAL CHILDREN

As shown in table 5.1, 77.4 per cent of currently married and fecund women wanted to have more children, as against 11.7 per cent who did not want to have any more and 10.1 per cent who were uncertain (undecided) about having more or no more children. The 77.4 per cent who wanted more children were almost equally divided between women who wanted an additional child soon (38.1 per cent) and who wanted to delay (39.3 per cent). As shown in figure 5.1, however, the proportion of women who wanted more children decreased progressively from 96.7 to 27.0 per cent as the number of living children increased, while the proportion who wanted no more children also increased systematically from about 1 to 54 per cent with increase in number of living children. The distributions by age of women also show similar decreasing and increasing levels in proportions wanting more and wanting no more children, respectively (table 5.2 and figure 5.2). The association with age is, however, not as great as with number of living children. The proportion of women who were undecided (10.1 per cent) about having more or no more children was significant as this group almost equalled the group who wanted no more children.

The distribution of proportions wanting no more children by region of residence, given in table 5.3, shows Greater Accra as having the highest proportion (19.7 per cent) followed by Volta (16.2 per cent) and Ashanti/Brong Ahafo

Table 5.2 Percentage of married and fecund women, by preference for additional children and age of woman

Current age of woman	Preference for additional children						
	Wants no more	Wants more			Undecided	Not stated	Number of women
		Total	Wants soon	Wants delay			
Total	11.7	77.4	38.1	39.3	10.1	0.7	4027
15–19	0.3	96.2	49.2	47.0	2.7	0.8	368
20–24	2.5	91.8	43.3	45.5	5.3	0.3	919
25–29	5.2	86.3	40.0	46.3	8.0	0.4	902
30–34	11.0	76.2	36.6	39.6	12.1	0.7	710
35–39	21.9	59.7	31.5	28.2	17.6	0.7	556
40–44	33.9	48.0	28.0	20.0	17.1	1.1	375
45–49	38.1	45.2	27.9	17.3	14.2	2.5	197

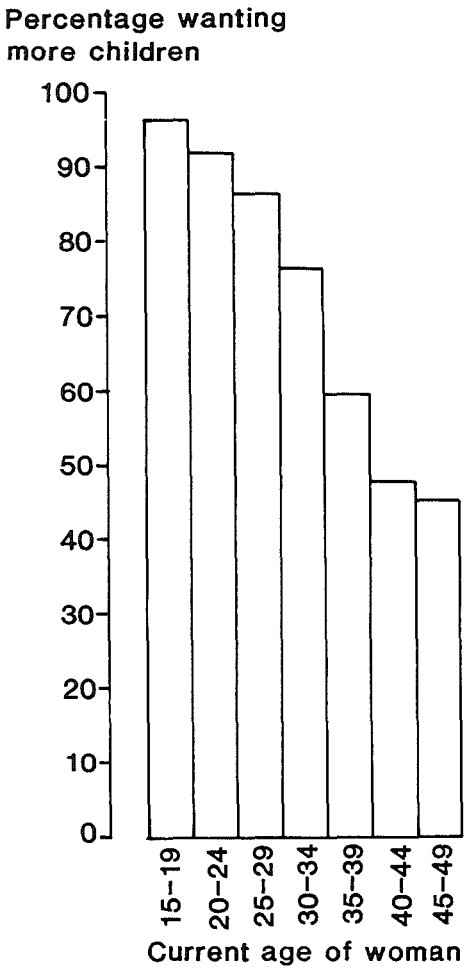

Figure 5.2 Proportion of currently married and fecund women wanting more children, by current age

(12.2 per cent). Northern/Upper with only 3.4 per cent had the lowest proportion wanting no more children. On the other hand, Northern/Upper had the second lowest proportion of women wanting more children (72.8 per cent) but this is explained by the very high proportion (22.3 per cent) of women in these regions who were undecided about having more or no more children. Distribution by ethnic group also shows the Ga-Adangbe (19.3 per cent), who are mostly in the Greater Accra region, as having the highest proportion of women wanting no more children, followed by the Ewe (13.6 per cent) who are mostly in the Volta region, and the Akan (13.2 per cent) who are found mostly in the Ashanti, Brong Ahafo, Western, Central and Eastern regions. The Mole-Dagbani, who are mostly in the Northern/Upper region, had the lowest proportion of women wanting no more children (3.8 per cent). The differentials by ethnic origin in all the preference variables reflect very closely the corresponding proportions in the regions where the ethnic groups are respectively concentrated (table 5.3).

The data do not show any strong linear relationship between preference for additional children and level of education (table 5.3). The proportion wanting no more children was 12.3 per cent for women with no schooling, 13.5 per cent for the primary category and 15 per cent for women with secondary education and above, but was 9.6 and 9.3 per cent, respectively, for women with uncompleted and completed middle-school education. The latter two categories consequently had the highest proportions wanting more children (87.2 and 86.5 per cent, respectively). The relationships with type of place

Table 5.3 Percentage of married and fecund women, by preference for additional children and selected socio-economic background variables

Background variable	Preference for additional children						
	Wants no more	Wants more			Undecided	Not stated	Number of women
		Total	Wants soon	Wants delay			
Total	11.7	77.4	38.1	39.3	10.1	0.7	4027
Region of residence							
Western/Central	11.8	77.9	41.5	36.4	10.2	0.0	566
Greater Accra	19.7	72.3	38.8	33.5	7.4	0.6	487
Eastern	11.8	76.5	30.0	46.5	11.3	0.3	626
Volta	16.2	75.9	31.8	44.0	5.8	2.1	377
Ashanti/Brong Ahafo	12.2	83.2	41.0	42.2	4.3	0.3	1217
Northern/Upper	3.4	72.8	40.3	32.5	22.3	1.5	754
Ethnic origin							
Akan	13.2	80.1	38.5	41.6	6.4	0.3	1984
Mole-Dagbani	3.8	73.3	38.6	34.7	21.7	1.2	665
Ewe	13.6	76.3	32;6	43.7	8.6	1.5	487
Ga-Adangbe	19.3	69.5	35.3	34.2	10.8	0.4	295
Guan and others	10.6	77.8	42.1	35.7	10.4	1.2	596
Type of place of residence							
Rural	10.5	77.7	36.8	40.9	10.9	0.9	2711
Urban	14.3	77.0	40.9	36.1	8.4	0.3	1316
Level of education							
No schooling	12.3	72.5	37.1	35.4	14.3	0.9	2356
Primary	13.5	80.6	39.0	41.6	5.2	0.7	423
Incomplete Middle	9.6	87.2	43.2	44.0	2.9	0.3	375
Complete Middle	9.3	86.5	38.2	48.3	4.0	0.1	718
Secondary+	15.0	78.2	38.1	40.1	6.1	0.7	147

of residence were distinct but the differences were not great. The rural, as expected, had a lower proportion than urban wanting no more children (10.5 as against 14.3 per cent), a higher proportion wanting more (77.7 as against 77.0 per cent) and a higher proportion being undecided (10.9 as against 8.4 per cent).

5.4 DESIRED FAMILY SIZE

Analysis in the preceding section related to desire for additional children without any specification of the additional number wanted. In this section, therefore, we examine the number of children 'preferred' and 'wanted'. The former, which in this analysis is designated as 'preferred family size', is obtained from the direct question about the number of children the respondent would like to have in her whole life if she could choose, while the latter, referred to as 'wanted family size', is obtained by adding the stated additional number of children wanted to number of children living.

Proportion giving numeric answer

As observed by earlier writers, data on desired family size could be biased if large proportions of respondents gave non-numeric answers and the family size preferences of respondents giving such answers were different from that of those giving numeric answers. In the GFS, however, 88.3 per cent of the respondents gave numeric answers to the question about preferred family size while 80.5 per cent gave such answers to the question about additional number of children wanted. Variations by demographic and socio-economic factors were, for most of these, not great. As shown in table 5.4, proportions giving numeric answers varied narrowly by number of living children, between 87 and 89 per cent for the

Table 5.4 Percentage of married and fecund women who gave numeric answers for preferred family size and additional children wanted, by selected demographic and socio-economic background variables

Variable	Number of women	Percentage giving numeric answer for	
		Preferred family size	Additional children wanted
Total	4027	88	81
Age of woman			
15–19	367	88	85
20–29	1815	89	85
30–39	1265	87	76
40–49	572	87	76
Number of living children			
<2	1250	88	84
2–3	1369	89	82
4–5	839	88	76
6+	569	87	76
Region of residence			
Western/Central	563	89	81
Greater Accra	487	93	89
Eastern	626	96	87
Volta	377	91	84
Ashanti/Brong Ahafo	1214	98	95
Northern/Upper	752	59	47
Ethnic origin			
Akan	1984	97	91
Mole-Dagbani	665	64	52
Ewe	487	95	84
Ga-Adangbe	295	93	86
Others	596	80	73
Type of place of residence			
Rural	2711	87	79
Urban	1316	91	85
Level of education			
No schooling	2356	82	72
Primary	423	95	90
Incomplete Middle	375	98	95
Complete Middle	718	99	94
Secondary+	147	99	93

question about preferred family size, and between 76 and 85 per cent for the question about additional number of children wanted, and did not show any linear relationship with number of living children. In all the categories of age of woman, type of place of residence, and level of education, the proportions were generally above 80 per cent. In the regional categories, however, Northern/Upper had only 59 and 47 per cent of respondents giving numeric answers for preferred family size and additional children wanted, respectively, while for the other regions the proportions were above 80 per cent. The Mole-Dagbani ethnic group, who are found mostly in the Northern/Upper region, also had only 64 and 52 per cent giving numeric answers for preferred family size and additional children wanted, respectively, while the proportions for the other ethnic groups were again above 80 per cent. As analysis of desired family size is necessarily restricted to respondents who

gave numeric answers, findings relating to the Northern/Upper region and Mole-Dagbani ethnic group may consequently be biased in view of the low proportion of respondents who gave numeric answers. It is likely that the bias will be in the direction of underestimation, since non-numeric answers are usually linked to women with no education or rural residence who also, in general, desire a greater number of children.

Preferred family size

Although the question on preferred family size was somewhat hypothetical, it nevertheless did not relate to a generalized ideal family-size concept as the question related to the respondent's own preference or personal desire. It asked about the number of children the respondent would like to have in the absence of any constraining factors including unfavourable demographic or child-bearing experiences or socio-economic conditions or circumstances. Data on preferred family size obtained from GFS therefore have relevance for policy formulation and programme implementation.

For currently married and fecund women the mean preferred family size was 6 children. Preferred family size increases systematically as number of children ever born increases from 5 for women with parity zero and one, to 9.4 for women with parity nine and above (table 5.5). Distribution by age of woman and years since first marriage – both of which are positively related to parity – also showed that mean preferred family size increased with age and duration of marriage.

Data in table 5.6 also show that less than 1 per cent (0.6 per cent) of the respondents who wanted more children gave a preferred family size which is less than or equal to the number of children they had, while 62 per cent of those who wanted no more children gave a preferred size which is less than or equal to the number of living children they had. Women whose actual family size exceeded preferred family size also had the highest mean number of living children (6.6), followed by women whose actual family size equalled preferred size with a mean of 5.5, while those whose preferred family size exceeded actual size had the lowest mean number of living children of 2.6. In each category of the comparison, the mean for those who wanted more children was lower than the mean for those who wanted no more or who were undecided.

The proportion of women who gave preferred family size less than or equal to number of living children increased and the proportion who gave preferred size greater than number of living children decreased as number of living children, age of woman and duration of marriage increased (table 5.7). Of the total married and fecund women (in table 5.6), however, only 9.4 per cent gave preferred family size which is less than or equal to number of living children. Seventy-nine per cent gave preferred size which is greater than number of living children, and 11.6 per cent did not give a numeric answer regarding preferred family size. Consequently, although in the comparative distribution of mean number of living children and mean preferred family size the differences between the two variables narrow somewhat with increasing parity, age of woman, and duration of marriage, at no point in the aggregate distributions (table 5.5) did the mean number of living children equal or exceed the mean preferred family size.

Wanted family size

As mentioned earlier in this section, the wanted family size variable was constructed by adding number of additional children wanted to number of living children. Respondents who did not want any more children were assigned 'zero' additional child wanted. Compared with preferred family size, the wanted family size variable is less hypothetical, and reflects much more respondent's effective desire, having regard to all her constraining circumstances. A major limitation of the variable, however, is that it does not provide a true measure of wanted family size. For those wanting no more children it cannot be ascertained whether the respondent wanted exactly the number she had or whether she had exceeded the number wanted. Thus, in this regard, the constructed variable could be an over-estimate of the true wanted family size. However, since respondents who did not want to have any more children constituted only 11.7 per cent, the proportion of those who would have exceeded their wanted family size would be too small to significantly affect the true levels of wanted family size.

For total married and fecund women the mean wanted family size was 5.5, compared with the mean of 6.0 obtained for preferred family size. Like the distributions for the latter, the mean wanted family size also increased from 4.6 for women with one or no living child to 9.8 for women with nine or more living children (table 5.8). The means by age of woman also

Table 5.5 Mean number of living children and mean preferred family size, by age of woman, years since first marriage, and number of children ever born, based on women who gave numeric answers to preference questions

Variable	Mean number of children			
	Living[a]	Preferred	Difference: living − preferred	Number of women
Total	2.9	6.0	−3.1	3556
Age of woman				
15–19	0.6	5.2	−4.6	324
20–24	1.4	5.2	−3.8	817
25–29	2.4	5.5	−3.1	815
30–34	3.6	6.3	−2.7	621
35–39	4.7	7.0	−2.3	479
40–44	5.2	7.4	−2.2	331
45–49	5.5	7.3	−1.8	169
Years since first marriage				
<5	0.9	5.0	−4.1	899
5–9	2.1	5.5	−3.4	870
10–14	3.3	6.1	−2.8	643
15–19	4.4	6.7	−2.3	523
20–24	5.1	7.5	−2.4	386
25–29	6.0	7.8	−1.8	188
30+	5.6	7.5	−1.9	47
Children ever born				
0	0.0	5.0	−5.0	372
1	0.9	5.0	−4.1	728
2	1.8	5.2	−3.4	694
3	2.7	5.6	−2.9	526
4	3.6	6.0	−2.4	446
5	4.4	6.8	−2.4	294
6	5.2	7.2	−2.0	215
7	5.9	7.9	−2.0	134
8	6.7	8.6	−1.9	90
9+	7.9	9.4	−1.5	57

[a]Living-children figures are based on all married and fecund women who had given numeric answers on the preference question. Means based on all married and fecund women are almost exactly the same as these.

increased from 4.8 for age group 15–19 to 6.7 for age group 45–49, while the means by marriage duration increased from 4.7 for under five years of marriage to 6.5 for thirty or more years marriage duration (table 5.9). The mean wanted family size was therefore lower than the mean preferred size at all parities, for all age groups, and for all marriage durations. The differences however varied narrowly between zero to 0.6 of a child for parity, 0.3–0.8 of a child for age of woman, and 0.3 to one child for marriage duration.

Socio-economic differentials

We next examine the levels (of desired family size) in terms of selected socio-economic background factors: region of residence, ethnic origin, type of place of residence, level of education and occupation of respondent. Analysis of regional differentials is intended principally to reflect geographical differences in fertility preferences. Ethnic differentials are intended to show variation in cultural values and attitudes regarding

Table 5.6 Comparison of preferred family size with number of living children according to preference for additional children

Preference for additional children	Preferred < living			Preferred = living			Preferred > living			Other answers			Number of women
	N	Mean living children	Percentage	N	Mean living children	Percentage	N	Mean living children	Percentage	N	Mean living children	Percentage	
Total	38	6.6	1.0	334	5.5	8.4	3160	2.6	79.1	462	3.0	11.6	3994
Wants more	8	5.8	0.3	10	4.9	0.3	2795	2.4	89.6	302	2.4	9.7	3115
Wants no more	27	6.8	5.7	267	5.6	56.4	152	5.1	32.1	27	5.1	5.7	473
Undecided	3	7.7	0.7	57	5.5	14.0	213	3.8	52.3	133	3.8	32.7	406

Table 5.7 Comparison of preferred family size with number of living children, by number of living children, age of woman and duration of marriage – currently married and fecund women

Variable	Mean preferred family size	Proportion of women for whom			Number of women
		Preferred < living	Preferred = living	Preferred > living	
Total	6.0	1.1	9.4	89.5	3556
Number of living children					
0	5.1	–	.3	99.7	372
1	5.1	.0	.7	99.3	728
2	5.3	.0	1.0	99.0	694
3	5.8	.2	6.8	93.0	526
4	6.4	.2	16.1	83.6	446
5	7.0	3.1	15.0	82.0	294
6	7.7	2.3	33.0	64.7	215
7	8.2	9.7	29.1	61.2	134
8	8.9	6.7	37.8	55.6	90
9+	9.8	7.0	45.6	47.4	57
Age of woman					
15–19	5.2	.0	.3	99.7	324
20–24	5.2	.0	1.6	98.4	817
25–29	5.5	.5	4.3	95.2	815
30–34	6.3	1.0	11.1	87.9	621
35–39	7.0	2.7	19.8	77.5	479
40–44	7.4	3.3	23.3	73.4	331
45–49	7.3	3.0	26.6	70.4	169
Years since first marriage					
<5	5.0	.0	.7	99.3	899
5–9	5.5	.1	2.9	97.0	870
10–14	6.1	.9	9.6	89.4	643
15–19	6.7	2.3	19.3	78.4	523
20–24	7.5	3.1	20.7	76.2	386
25–29	7.8	3.7	26.6	69.7	188
30+	7.5	2.1	23.4	74.5	47

Table 5.8 Mean wanted and preferred family size, by number of living children – married and fecund women

Mean family size	Number of living children										Total
	0	1	2	3	4	5	6	7	8	9+	
Wanted	4.6	4.6	4.9	5.4	5.9	6.5	7.1	7.8	8.4	9.8	5.5
Preferred	5.1	5.1	5.3	5.8	6.4	7.0	7.7	8.2	8.9	9.8	6.0
Difference: (wanted – preferred)	– 0.5	– 0.5	– 0.4	– 0.4	– 0.5	– 0.5	– 0.6	– 0.4	– 0.5	0.0	– 0.5

Table 5.9 Mean number of living children and mean wanted family size, by age of woman and years since first marriage

Variable	Mean number of children		
	Living	Wanted	Difference: living – wanted
Total	2.8	5.5	– 2.7
Age of woman			
15–19	0.6	4.8	– 4.2
20–24	1.4	4.9	– 3.5
25–29	2.4	5.1	– 2.7
30–34	3.5	5.8	– 2.3
35–39	4.7	6.5	– 1.8
40–44	5.1	6.6	– 1.5
45–49	5.6	6.7	– 1.1
Years since first marriage			
< 5	0.9	4.7	– 3.8
5–9	2.1	5.1	– 3.0
10–14	3.3	5.5	– 2.2
15–19	4.3	6.2	– 1.9
20–24	5.2	6.8	– 1.6
25–29	6.1	7.0	– 0.9
30+	5.6	6.5	– 0.9

reproduction, while type of place of residence differentials are meant to show the relative influences of more or less modern environments on fertility preferences. Education affords the individual greater access to knowledge and information, and more greatly exposes the individual to modern values and ideas – influences which could affect one's traditional values and attitudes regarding reproduction and fertility preferences. The differential compatibility (or incompatibility) of types of occupation with childbearing also makes occupation a relevant predictor variable in analysis of desired family size.

As presented in tables 5.10 and 5.11, the levels of desired family size – preferred and wanted – did not vary much among most of the regions. Greater Accra region with 4.9 and 4.6, respectively, had the lowest mean preferred and wanted family size, followed by Volta with 5.8 and 5.3 mean preferred and wanted family size, respectively. The mean preferred size, and wanted size (in brackets), for the other regions were: Eastern 5.9 (5.5), Western/Central 5.9 (5.6), Ashanti/Brong Ahafo 6.0 (5.4), with Northern/Upper having the highest levels of 7.7 (7.0). For all the regions the means increased systematically as number of living children increased. The levels of preferred size for Greater Accra (which had the lowest) ranged from 4.1 for women with less than two living children to 7.6 for women with nine or more living children, with levels of wanted size also ranging from 3.8 to 7.1, respectively, while for Northern/Upper (which had the highest levels) the corresponding ranges of mean preferred and wanted size were, respectively, 7.1–9.7 and 6.4–8.6.

Besides the Mole-Dagbani who had the highest

Table 5.10 Mean preferred family size, by number of living children and selected socio-economic background variables – currently married and fecund women

Variable	Number of living children				
	Total	< 2	2–3	4–5	6+
Total	6.0	5.1	5.5	6.7	8.3
Region of residence					
Western/Central	5.9	4.7	5.5	6.6	8.3
Greater Accra	4.9	4.1	4.7	5.5	7.6
Eastern	5.9	4.8	5.2	6.2	8.3
Volta	5.8	4.9	5.2	6.5	7.8
Ashanti/Brong Ahafo	6.0	5.1	5.4	6.6	8.4
Northern/Upper	7.7	7.1	7.4	8.6	9.7
Ethnic origin					
Akan	5.8	4.7	5.2	6.4	8.3
Mole-Dagbani	7.4	6.8	6.9	8.3	9.6
Ewe	5.6	4.5	4.9	6.4	7.9
Ga-Adangbe	5.6	4.4	5.1	5.8	8.5
Others	6.4	6.0	6.1	6.8	8.2
Place of residence					
Rural	6.3	5.3	5.7	7.0	8.4
Urban	5.5	4.7	5.2	6.0	8.2
Level of education					
No schooling	6.8	5.9	6.1	7.1	8.4
Primary	5.7	5.0	5.2	6.1	8.3
Incomplete Middle	5.2	4.7	5.1	6.4	7.4
Complete Middle	4.9	4.5	4.8	5.7	7.8
Secondary+	4.4	4.2	4.3	5.0	6.0
Occupation					
Never worked	5.6	5.1	5.6	7.0	9.7
Agricultural	6.5	5.5	5.9	6.9	8.4
Sales/service	5.9	5.0	5.5	6.4	8.2
Manual – skilled/ unskilled	5.6	4.6	5.3	6.8	7.9
Professional/clerical	4.4	4.2	4.2	5.5	5.0

Table 5.11 Mean wanted family size, by number of living children and selected socio-economic background variables — currently married and fecund women

Variable	Number of living children				
	Total	<2	2–3	4–5	6+
Total	5.5	4.6	5.1	6.2	7.8
Region of residence					
Western/Central	5.6	4.5	5.2	6.4	8.3
Greater Accra	4.6	3.8	4.4	5.1	7.1
Eastern	5.5	4.5	4.8	5.9	8.0
Volta	5.3	4.5	4.7	5.9	7.5
Ashanti/Brong Ahafo	5.4	4.6	4.9	6.1	7.8
Northern/Upper	7.0	6.4	6.7	8.0	8.6
Ethnic origin					
Akan	5.3	4.3	4.9	6.0	7.9
Mole-Dagbani	6.6	6.3	6.0	7.4	8.5
Ewe	5.2	4.2	4.6	6.0	7.5
Ga-Adangbe	5.1	4.0	4.5	5.6	7.8
Others	6.0	5.4	5.8	6.4	7.7
Place of residence					
Rural	5.7	4.8	5.2	6.3	7.9
Urban	5.1	4.3	4.8	5.7	7.6
Level of education					
No schooling	6.2	5.3	5.6	6.4	7.9
Primary	5.3	4.6	4.8	5.8	8.0
Incomplete Middle	4.8	4.1	4.8	6.0	6.9
Complete Middle	4.6	4.1	4.5	5.5	7.7
Secondary+	4.0	3.8	4.0	4.6	7.0
Occupation					
Never worked	5.1	4.7	5.2	6.4	8.8
Agricultural	6.0	5.0	5.4	6.3	7.9
Sales/service	5.4	4.5	5.0	6.0	7.7
Manual – skilled/ unskilled	5.2	4.2	4.8	6.3	7.7
Professional/clerical	4.2	3.9	4.0	5.2	6.7

levels of 7.4 and 6.6 mean preferred and wanted family size, respectively, the differences among the other ethnic groups were also not great. The preferred, and wanted (in brackets), size were: Akan 5.8 (5.3), Ewe 5.6 (5.2) and Ga-Adangbe 5.6 (5.1). The means for rural residents were 6.3 and 5.7, respectively, as against 5.5 and 5.1, respectively, for urban. Although the rural means were higher than the means for the urban for all the parity categories, the differences between the two were not great as these ranged from 0.2 of a child to 1 child for preferred family size and from 0.3 to 0.6 of a child for wanted family size. Level of education, on the other hand, showed a fairly strong positive relationship with desired family size. Preferred size decreased systematically from 6.8 for women with no schooling to 4.4 for women with post-middle education (ie secondary and above), and wanted size also decreased from 6.2 for women with no schooling to 4.0 for those with post-middle education. This relationship obtains also within the first two parity categories (ie < 2 and 2–3 living children) but the relationship is indeterminate within the last two higher parity categories.

Regarding occupational differentials, women in agricultural occupations had the highest preferred and wanted family size (6.5 and 6.0, respectively) while women in professional/clerical occupations had the lowest preferred and wanted size (4.4 and 4.2, respectively). The corresponding means for other occupation categories were: sales/service 5.9 and 5.4, manual (skilled and unskilled) 5.6 and 5.4, manual (skilled and unskilled) 5.6 and 5.4, and never worked 5.6 and 5.1.

As observed for the other variables, the mean desired family size – both preferred and wanted – for occupation categories increased as number of living children increased, with variable categories generally maintaining their relative positions in the levels, particularly in the two lowest parity categories.

5.5 DETERMINANTS OF FERTILITY PREFERENCES: A MULTIVARIATE ANALYSIS

In the preceding sections we have presented data on preferences for additional children and on levels of desired family size separately, in most cases by selected demographic and socio-economic background variables, namely, age of woman, parity or number of living children, duration of marriage, region of residence, ethnic origin, type of place of residence, level of education and occupation of respondent.

These variables have been included in the analysis because of their theoretical significance and their relevance for policy formulation and programme implementation. As stated in the preceding section, ethnic differentials reflect the levels of, and variations in, traditional norms and cultural values regarding reproduction and fertility preferences. Regional as well as rural–urban

variations also show geographical differences in fertility preferences and therefore have implications for programme planning and implementation, while educational and occupational differentials relate to variables which are susceptible to policy intervention. While the demographic variables included also have relevance for policy formulation and programme implementation, their inclusion in this analysis is also to evaluate hypotheses postulated in section 5.2 regarding the observed positive correlation between desired family size and number of living children.

The variables selected for use in the analysis are inter-related. Age of woman and duration of marriage, for instance, are inter-related and both are also positively correlated with parity. Regions have some concentration of specific ethnic groups and vary also in the degree of urbanization and level of education. To evaluate the net effects of the variables we apply the method of multiple classification analysis (MCA) which enables us to study the effects of each variable after holding other variables constant. This method is similar to the method of direct standardization but has the added efficiency of providing summary measures of the relative strength of associations between the independent and dependent variables.

We present in tables 5.12, 5.13 and 5.14 the results for preference for additional children, preferred family size and wanted family size. Figures in column (3) are the unadjusted deviations from the overall measure (mean or proportion) while figures in column (4) are deviations from the overall measure after adjustments have been made for the effects of all other factors (in column (1)). In column (5) are the resultant deviations from the overall measure after adjustments have been made for the effects of all other factors and controls (or covariates). Bracketted figures in column (3) are the eta coefficients which show the strength of associations between each factor and the dependent variable, without controlling for the effects of other factors. The eta is thus equivalent to a simple correlation coefficient, but always takes a positive value between 0 and 1.0. Bracketted figures in columns (4) and (5) are beta coefficients, which also show the strength of the associations between each factor and the dependent variable but after adjusting for the effects of the other factors and of covariates. This measure is also analagous to a partial-correlation coefficient, with the differences between eta and beta largely indicating the effect of adjustment. Multiple R^2 shows the combined percentage of the total variance explained by all the factors and covariates, and is equivalent to the square of the multiple correlation coefficient.

In the MCA, variables used as independent factors are region of residence, ethnic origin, type of place of residence, education and occupation of respondent, while age, number of living children, number of child deaths and duration of marriage are entered as demographic controls (or covariates).

Desire to stop childbearing

The results of the MCA for desire to stop childbearing, given in table 5.12, show that region of residence with eta correlation of 0.15 is the factor which has relatively the greatest association with desire to stop childbearing. After controlling for the effects of the other factors and the controls (covariates) the eta correlation was reduced slightly to beta 0.11. The effect of the adjustments were, however, relatively greater in Eastern and Northern/Upper, with the proportion in Eastern who wanted no more children decreasing from 12 to 9 per cent and the proportion in Northern/Upper increasing from 4 to 8 per cent.

Ethnic origin also had high gross association with desire to stop childbearing, but after adjusting for the effects of region and other factors and variables the strength of the association weakens, with the correlation decreasing from eta 0.13 to beta 0.06. The effect of the adjustments was greatest on the Mole-Dagbani, the Ewe and the Ga-Adangbe. The proportion of the Mole-Dagbani who wanted no more children increased from 4 to 9 per cent; the corresponding proportion of the Ewe decreased from 10 to 8 per cent, and that of the Ga-Adangbe also decreased from 20 to 15 per cent. The gross and net levels of the desire to stop childbearing were practically the same for the Mole-Dagbani as for the Northern/Upper region.

The association of type of place of residence with desire to stop childbearing was rather weak, both in gross and net levels. The eta and beta correlations were 0.06 and 0.03, respectively. The gross proportions of women in rural and urban areas who wanted no more children were 11 and 15 per cent, respectively, while the proportions after the adjustments were, respectively, 11 and 13 per cent. The adjustments had no effect on the proportion for rural areas.

Table 5.12 Multiple classification analysis of preference for additional children – currently married and fecund women

Factor + category	Percentage wanting no more children Overall proportion = 0.12			
	N[a]	Unadjusted deviation	Adjusted (for factors) deviation	Adjusted (for factors + covariates)[b] deviation
(1)	(2)	(3)	(4)	(5)
Region of residence				
Western/Central	563	−.00	−.02	−.01
Greater Accra	487	.08	.07	.07
Eastern	626	.00	−.01	−.03
Volta	377	.04	.08	.05
Ashanti/Brong Ahafo	1214	.01	−.00	.00
Northern/Upper	751	−.08	−.06	−.04
		(.15)[c]	(.14)[d]	(.11)[d]
Ethnic origin				
Akan	1977	.01	.03	.01
Mole-Dagbani	663	−.08	−.06	−.03
Ewe	487	.02	−.03	−.02
Ga-Adangbe	295	.08	.04	.03
Others	596	−.01	−.02	.00
		(.13)[c]	(.11)[d]	(.06)[d]
Place of residence				
Rural	2705	−.01	−.01	−.01
Urban	1313	.03	.02	.01
		(.06)[c]	(.04)[d]	(.03)[d]
Level of education				
No schooling	2356	.01	.03	−.02
Primary	423	.02	−.01	.02
Incomplete Middle	375	−.02	−.05	.02
Complete Middle	718	−.02	−.05	.03
Secondary+	146	.03	−.05	.02
		(.05)[c]	(.11)[d]	(.06)[d]
Occupation				
Never worked	437	−.07	−.04	.03
Agricultural	1648	.00	.01	−.01
Sales/service	1353	.02	.01	.00
Manual – skilled/unskilled	392	−.02	−.02	−.03
Professional/clerical	188	.02	.02	.02
		(.08)[c]	(.06)[d]	(.05)[d]
Multiple R^2			.039	.219

[a]N = number of women.
[b]The covariates are age, parity, marital duration and number of children who have died.
[c]Eta coefficient.
[d]Beta coefficient.

Table 5.13 Multiple classification analysis of preferred family size – currently married and fecund women

Factor + category	Preferred family size Overall mean = 6.02			
	N[a]	Unadjusted deviation	Adjusted (for factors) deviation	Adjusted (for factors + covariates)[b] deviation
(1)	(2)	(3)	(4)	(5)
Region of residence				
Western/Central	504	−.12	−.24	−.20
Greater Accra	452	−1.11	−.68	−.66
Eastern	602	−.14	−.16	−.25
Volta	346	−.24	−.01	−.30
Ashanti/Brong Ahafo	1197	−.04	.02	.06
Northern/Upper	447	1.74	1.12	1.29
		(.34)[c]	(.22)[d]	(.25)[d]
Ethnic origin				
Akan	1909	−.24	−.05	−.14
Mole-Dagbani	426	1.40	.35	.45
Ewe	460	−.46	−.27	−.11
Ga-Adangbe	275	−.41	.20	.10
Others	478	.41	.04	.21
		(.26)[c]	(.08)[d]	(.09)[d]
Place of residence				
Rural	2359	.27	−.01	−.01
Urban	1189	−.53	.02	.02
		(.17)[c]	(.01)[d]	(.01)[d]
Level of education				
No schooling	1926	.75	.53	.24
Primary	402	−.27	−.12	−.06
Incomplete Middle	368	−.81	−.62	−.25
Complete Middle	708	−1.13	−.85	−.41
Secondary+	144	−1.67	−.97	−.41
		(.39)[c]	(.28)[d]	(.13)[d]
Occupation				
Never worked	383	−.41	−.60	−.13
Agricultural	1427	.52	.30	.18
Sales/service	1206	−.13	−.06	−.08
Manual – skilled/unskilled	346	−.37	−.13	−.13
Professional/clerical	186	−1.57	−.45	−.38
		(.24)[c]	(.13)[d]	(.07)[d]
Multiple R^2			.223	.429

[a]N = number of women.
[b]The covariates are age, parity, marital duration and number of children who have died.
[c]Eta coefficient.
[d]Beta coefficient.

Table 5.14 Multiple classification analysis of wanted family size – currently married and fecund women

Factor + category	Wanted family size Overall mean = 5.51			
	N[a]	Unadjusted deviation	Adjusted (for factors) deviation	Adjusted (for factors + covariates)[b] deviation
(1)	(2)	(3)	(4)	(5)
Region of residence				
Western/Central	453	.13	.00	.18
Greater Accra	430	−.93	−.55	−.58
Eastern	541	−.02	−.02	−.16
Volta	315	−.16	−.03	−.24
Ashanti/Brong Ahafo	1147	−.10	−.06	−.08
Northern/Upper	350	1.47	.93	1.21
		(.29)[c]	(.18)[d]	(.22)[d]
Ethnic origin				
Akan	1793	−.19	−.06	−.13
Mole-Dagbani	342	1.09	.28	.44
Ewe	410	−.34	−.18	−.09
Ga-Adangbe	254	−.38	.08	−.00
Others	437	.45	.13	.27
		(.21)[c]	(.06)[d]	(.10)[d]
Place of residence				
Rural	2124	.23	−.01	.00
Urban	1112	−.43	.02	−.01
		(.15)[c]	(.01)[d]	(.00)[d]
Level of education				
No schooling	1684	.68	.49	.26
Primary	382	−.17	−.07	−.06
Incomplete Middle	356	−.73	−.58	−.27
Complete Middle	678	−.93	−.70	−.38
Secondary+	136	−1.46	−.85	−.41
		(.36)[c]	(.26)[d]	(.14)[d]
Occupation				
Never worked	355	−.38	−.51	−.07
Agricultural	1268	.46	.29	.17
Sales/service	1123	−.10	−.07	−.09
Manual – skilled/unskilled	311	−.34	−.13	−.09
Professional/clerical	179	−1.33	−.36	−.29
		(.22)[c]	(.13)[d]	(.07)[d]
Multiple R^2			.179	.413

[a]N = number of women.
[b]The covariates are age, parity, marital duration and number of children who have died.
[c]Eta coefficient.
[d]Beta coefficient.

The association with education was also not very strong. The adjusted proportion of women who wanted no more children did not vary much among the categories with some education. While for women with no education the proportion was reduced from 13 to 10 per cent after the adjustments, the corresponding changes in proportions for the categories with some education were, from 10 to 14 per cent for incomplete middle, from 10 to 15 per cent for completed middle and from 15 to 14 per cent for secondary and above. There was no change in the proportion for primary (14 per cent) after the final adjustment for the covariates. With these differential effects by level of education the resultant eta and final beta correlations were 0.05 and 0.06, respectively.

The association with occupation is also not very high although, as in the case of education, the differential effects on the levels of proportions who wanted no more children are noteworthy. Women who had never worked had the lowest unadjusted proportion of 5 per cent who wanted no more children, but after the final adjustment for the covariates the proportion increased to 16 per cent. Manual workers had the lowest adjusted proportion of 9 per cent, after a slight decrease from a gross proportion of 10 per cent. Agricultural workers also had a minor reduction in the proportion who wanted no more children, from 12 to 11 per cent, while sales/service workers also had a minor reduction in their proportion after the adjustments, from 14 to 10 per cent. The professional/clerical category with a proportion of 14 per cent wanting no more children had no changes after adjustment for other factors and for the covariates. With these differential effects by type of occupation, the strength of the association between occupation and desire for additional children was reduced from eta 0.08 to beta 0.05.

Preferred family size

Region, as shown in table 5.13, again had relatively the greatest gross and net association with preferred family size, with eta correlation of 0.34 and beta correlation of 0.25. All the regions except Northern/Upper had unadjusted mean preferred family size less than the grand mean of 6.0, with Greater Accra having the lowest (4.9) followed by Volta (5.8). After adjusting for the effects of other factors and variables, the mean preferred family size for Western/Central, Greater Accra, Eastern and Volta were again less than the grand mean, but the mean for Greater Accra increased (to 5.4) as well as that for Ashanti/Brong Ahafo (from 6.0 to 6.1), while the means for the other regions further decreased. The mean for Northern/Upper decreased from 7.8 to 7.3.

For ethnic origin the Ewe, followed by the Ga-Adangbe, had the lowest unadjusted mean preferred family size, 5.6 for both groups. After adjustment, however, the Akan and the Ewe had the lowest mean preferred size (5.9), followed by the Ga-Adangbe (6.1). The Mole-Dagbani had the highest unadjusted and adjusted mean, with significant reduction, however, after the adjustment, from 7.4 to 6.5, while the levels for the other ethnic groups increased after controlling for other factors and the covariates. The eta correlation was high, 0.26, but the strength of the association was reduced to beta 0.09 after the adjustments.

The unadjusted rural–urban differential in preferred family size was high, with rural having a mean of 6.3 as against 5.5 for urban. After adjustment for the effects of the other socio-economic factors, however, the differences vaporized, with both rural and urban areas having a mean preferred family size of 6.0. This resulted in a coefficient of 0.17 for eta and 0.01 for beta. Adjustment for the covariates did not make any further change in either the rural or urban means, or in the beta coefficients.

Education had the highest association with preferred family size, with the latter varying inversely with level of education both in the unadjusted and adjusted levels. The eta coefficient was 0.39, the highest among the factors. Adjustment for the effects of the other factors made some significant reduction in the strength of the relationship between education and preferred family size (beta = 0.28), and further adjustment for the covariates made further significant reduction in the strength of the relationship, bringing the beta coefficient further down to 0.13.

With regard to type of occupation, the professional/clerical category and the never worked had the lowest unadjusted and adjusted mean preferred family size, followed by manual workers, with agricultural workers having the highest levels, both unadjusted and adjusted. In the adjustment processes, however, the effects of occupation were dissimilar to that of education. While the adjustments for other factors and covariates progressively reduced the levels of preferred family size for the educational categories, the never-worked had a decrease in level of preferred size after adjustment for other

factors but the level increased again after adjustment for the covariates. The reverse was the case for the sales/service category – an increase in the mean after adjustment for the factors and a (slight) decrease after adjustment for the covariates. Agricultural workers had progressive decreases in the adjustments while the professional/clerical category had progressive increases; and adjustment for the covariates did not make any further change in the level of preferred family size for manual workers after an increase in the level as a result of the adjustment for other factors. The eta coefficient of 0.24 for type of occupation was high but the beta coefficients of 0.13 and 0.07 showed significant reduction in the strength of the relationship between occupation and preferred family size with the successive adjustments for other factors and covariates.

Wanted family size

The relative levels of wanted family size (number of living children plus number of additional children desired) and patterns or direction of change in the levels and coefficients after adjustments for the confounding effects of other factors and covariates (shown in table 5.14), reflect very closely the findings for preferred family size (in table 5.13), although the absolute levels of the values and the coefficients were generally lower for the wanted family size variable. Region, again, showed the strongest relationship with wanted family size, with Greater Accra and Volta regions having the lowest adjusted and unadjusted means while Northern/Upper had the highest adjusted and unadjusted means. Mole-Dagbani ethnic group also had the highest adjusted and unadjusted means, and the large gross differential between rural and urban diminished after adjustment for the effects of the other factors and covariates. Level of wanted family size was again inversely related to level of education, both before and after the adjustments, while the irregular direction of change among the occupational categories in the adjustment processes were also generally noticeable in the results for wanted family size.

In the multiple classification analysis (MCA) of the three fertility preference variables, namely, desire to stop childbearing and preferred and wanted family size, we have attempted to assess the importance of each factor partly by the absolute range of its category values and partly by the magnitude of the eta and beta coefficients. The desire to stop childbearing does not have direct comparative relationship with preferred or wanted family size as the desired family sizes at which the population subgroups decide not to have additional children may vary. The results of the analysis nevertheless showed close correspondence between the levels of the measures for the three preference variables.

In summary, region had the highest association with each of the preference variables, and remained the most important of the factors even after the effects of the other factors and covariates had been controlled. The dominant effect of region is, however, largely due to the effect of the very extreme values which the Northern/Upper region had. The initial effect of ethnic origin on the variables, particularly on preferred and wanted family size, was high due to the extreme values for the Mole-Dagbani, but after adjusting for region and other factors and for covariates, the importance of ethnic origin diminished considerably. Similarly, the initial importance of type of place of residence (for preferred and wanted family size) evaporated with adjustment for the confounding effects of other factors and variables. Education, on the other hand, had an inverse relationship with preferred and wanted family size although its relationship with the desire to stop childbearing was negligible. For type of occupation the professional/clerical category had the lowest preferred and wanted family size both before and after the adjustments, while the agricultural category had the highest mean preferred and wanted family size before and after the adjustments, with the other categories experiencing different effects from the adjustment processes.

While the combined effects of all the factors explained 4 per cent of the total variance in the desire to stop childbearing, together with the covariates they explained 22 per cent of the total variance; and while the combined effects of the factors also explained 22 per cent of the total variance in preferred family size and 18 per cent in wanted family size, together with the covariates they explained 43 per cent of the total variance in preferred family size and 41 per cent of the variance in wanted family size. Clearly, fertility preference is more dependent on the demographic characteristics of women (their age, parity and marriage duration) than on the socio-economic characteristics.

Relative effects of demographic variables

In the preceding discussion we have examined the degree of association between the preference variables and each socio-economic background variable while the individual effects of the demographic variables used as controls or covariates were not ascertained. As mentioned in section 5.2, the demographic variables included in the analysis have both theoretical significance and policy and programme relevance. It has been postulated that the observed positive correlation between desired family size and number of living children may be due partly to the tendency of women with lower parities or shorter marriage durations to understate the number of children they would ultimately want, partly to the differential effects of modernization and a regime of declining fertility on age cohorts, with younger women tending to desire smaller family size than older women, and partly to rationalization effects. We, therefore, present in table 5.15 and figures 5.3–5.5 the unadjusted and adjusted levels of preferred and wanted family size by age of woman, duration of marriage and number of living children. To obtain these results, each of these

Table 5.15 Mean preferred and wanted family size, by age or woman, years since first marriage and number of living children – currently married and fecund women

Variable	Preferred family size		Wanted family size	
	Unadjusted	Adjusted	Unadjusted	Adjusted
Age of woman				
15–19	5.2	6.2	4.8	5.6
20–24	5.2	6.1	4.9	5.6
25–29	5.5	5.9	5.1	5.4
30–34	6.3	6.0	5.9	5.5
35–39	7.0	6.1	6.5	5.5
40–44	7.4	6.2	6.5	5.5
45–49	7.3	5.8	6.6	5.5
	(0.38)[a]	(0.05)[b]	(0.33)[a]	(0.03)[b]
Years since first marriage				
<5	5.0	6.4	4.7	5.9
5–9	5.5	6.0	5.1	5.5
10–14	6.1	5.8	5.6	5.3
15–19	6.7	5.8	6.2	5.3
20–24	7.5	6.0	6.8	5.4
25–29	7.8	5.8	7.0	5.2
30+	7.5	5.3	6.4	4.9
	(0.42)[a]	(0.11)[b]	(0.36)[a]	(0.12)[b]
Number of living children				
0	5.1	5.1	4.6	4.3
1	5.1	5.0	4.6	4.5
2	5.3	5.3	4.9	4.8
3	5.8	5.8	5.4	5.4
4	6.4	6.4	5.9	6.1
5	7.0	7.0	6.5	6.7
6	7.7	7.9	7.1	7.5
7	8.2	8.4	7.8	8.2
8	8.9	9.1	8.4	9.0
9+	9.8	10.2	9.8	10.3
	(0.51)[a]	(0.54)[b]	(0.54)[a]	(0.64)[b]

[a]Eta coefficient.
[b]Beta coefficient.

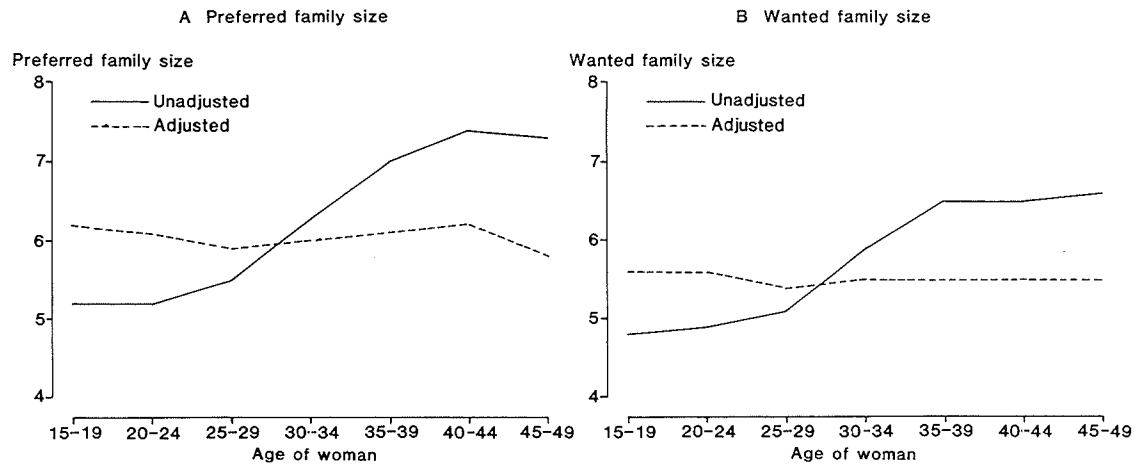

Figure 5.3 Mean preferred (A) and wanted (B) family size, by age of woman

three variables had been used, one at a time, as a background factor among five factors in MCA with an appropriate set of demographic controls (or covariates). The other four background factors in the models are region, ethnic origin, type of place of residence and education. The demographic variables from which an appropriate set of three are selected as controls in each model are age of woman, number of living children, number of child deaths and years since first marriage.

The unadjusted levels of preferred and wanted family size varied directly, although to different degrees, with age of woman, marriage duration and number of living children, as discussed in section 5.4. The mean preferred family size by age of woman increases from 5.2 for age group 15—19 to 7.4 for age group 40—44 and then drops to 7.3 for the 45—49 age group, giving a range difference of 2.2 children between the minimum and maximum values. The adjusted means, however, vary from 5.8 to 6.2 giving a range difference of only 0.4 of a child and with no discernible relationship with age. The unadjusted mean for wanted family size also increases from 4.8 for the age group 15—19 to 6.6 for the 45—49 age group with a range difference of 1.8 children, whereas the adjusted means were 5.5 each for the four oldest age groups, with age group 25—29 having a mean of

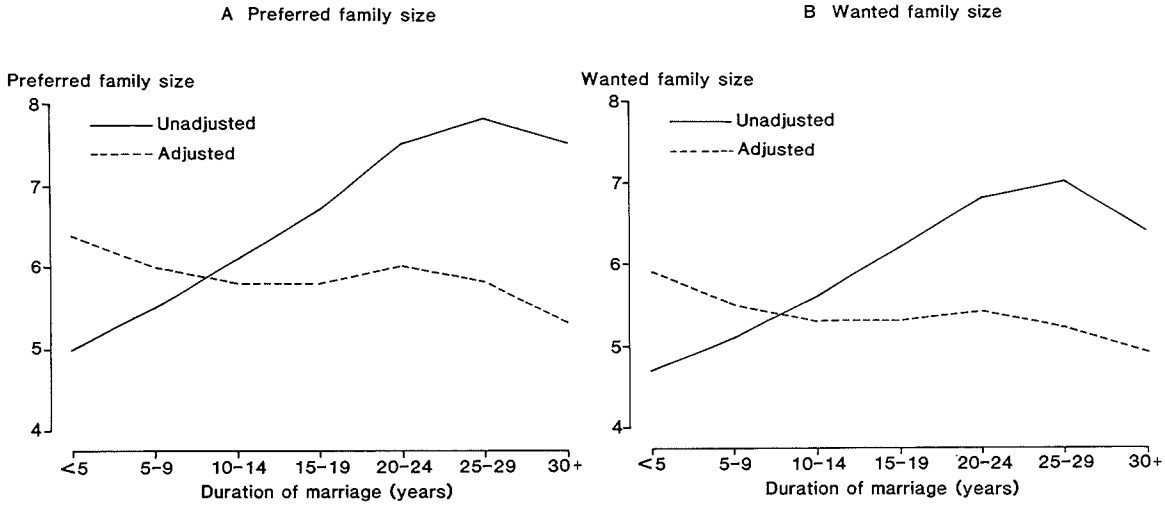

Figure 5.4 Mean preferred (A) and wanted (B) family size, by duration of marriage

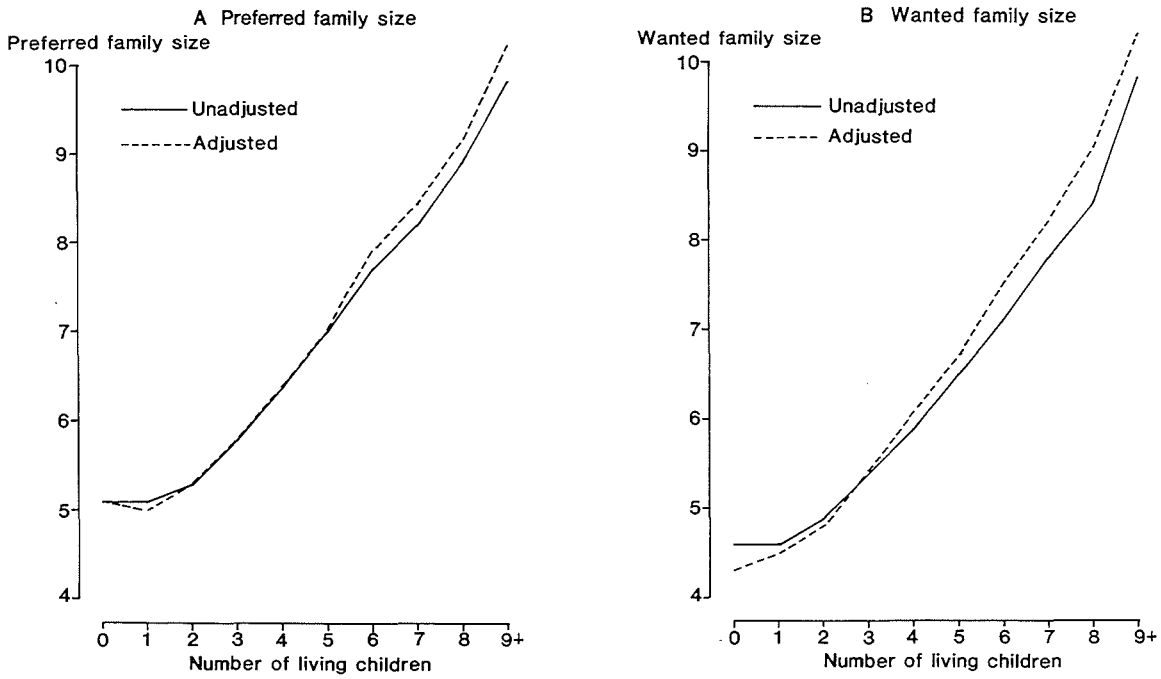

Figure 5.5 Mean preferred (A) and wanted (B) family size, by number of living children

5.4 and the two youngest age groups having a mean of 5.6 each. Consequently, the eta coefficient was reduced from a high level of 0.38 to a low beta of 0.05, indicating that age of woman *per se* has practically no association with desired family size. Figures 5.3(A) and 5.3(B) vividly show the relationship. Similarly, while the unadjusted means by duration of marriage increased from 5.0 for under five years duration to 7.8 for 25–29 years duration (a range difference of 2.8 children) and then decreased to 7.5 for a marriage duration of 30 years or more, the adjusted means varied between 5.3 and 6.4 (a range difference of 1.1 children) and did not show any systematic relationship with marriage duration. The pattern for the wanted family size variable was similar, with the unadjusted means showing a range difference of 2.3 children as against a range difference of 1 child for the adjusted means. The net effects of marriage duration on both preferred and wanted family size was therefore not very high, as indicated by the eta and beta coefficients and shown graphically in figures 5.4(A) and 5.4(B). Number of living children, on the other hand, showed a very high correlation with desired family size, both before and after adjusting for possible confounding effects of the other factors and the other demographic controls or variables. The unadjusted mean preferred family size increased progressively from 5.1 for women with one or no living child to 9.8 for women with nine or more living children, giving a range difference of 4.7 children, while the adjusted mean also increased from 5.0 for women with one living child to 10.2 for women with nine or more living children, giving a range difference of 5.2 children. The corresponding unadjusted and adjusted range differences for wanted family size were, respectively, 5.2 and 7.0 children.

The data from the GFS therefore show that the evidence of positive effects of marriage duration on desired family size is very weak, and the hypothesis of positive effects of age cohorts is also unsubstantiated. Number of living children appears to be the demographic variable — among the others studied — which has the strongest positive relationship with desired family size, as indicated by the high eta (0.51, 0.54) and beta (0.54, 0.64) coefficients, and graphically illustrated in figures 5.5(A) and 5.5(B). However, if the positive correlation between desired family size and number of living children was due wholly to 'rationalization' effects, one would expect to

find the levels of the preference variables coinciding with the diagonal line of full rationalization. As the preference levels lie above this line the phenomenon can be ascribed partly or largely to upward revision of desired family size, with increasing experience of childbearing.

5.6 KNOWLEDGE, PREFERENCE AND USE OF FAMILY PLANNING OUTLETS

Analysis of data on fertility preferences sought to measure the levels and variations of fertility norms and attitudes among the various subgroups of the Ghanaian population, to identify factors which determine these norms and attitudes, and through these to identify target population subgroups for specific national population programmes such as the national family planning programme. However, while the identification of population subgroups with unmet need for family planning and the creation of motivation for family planning may constitute essential activities of a national family planning programme, the success of the programme also depends on the degree to which it makes contraceptive services and supplies easily accessible to programme acceptors and potential adopters of family planning.

Availability and accessibility of family planning services can be measured directly where questions are asked about the presence of family planning clinics in the community or the distance from the community to the nearest clinic. A complementary approach is to also ask respondents about their (subjective) impressions of accessibility of sources, ie their awareness of the existence of such sources, their particular preferences and their own travel time to the sources. In the case of Ghana only the second approach was used.

Questions asked in the GFS were knowledge of family planning outlets for specific methods, and preferences for types of outlets, travelling time, and cost of services or supplies at the outlets. Questions were also asked on recent visits to a family planning outlet and quality of service received, as indicated by waiting time at outlet, and whether or not the respondent was satisfied with the service given.

The questions asked in the GFS do not relate directly to the true geographical distribution of family planning facilities. They none the less provide a measure of the success of the efforts of the family planning programme in bringing awareness of the availability of its services to the population and also of its success in achieving the acceptance and utilization of the services by the population.

Knowledge of family planning outlets

Awareness of the existence of family planning outlets is determined by both objective and subjective factors. The former relate largely to the extent of the provision of clinics or other sources of supply, and the effectiveness of the information and public education activities of the programme. The latter (as used here) include the individual's need or motivation for family planning services. The actual availability of sources may therefore not coincide with the degree of awareness of the existence of the outlets as reported by respondents. Knowledge of the extent of the incongruity between true availability and awareness is, however, very important for programme planning and evaluation.

In this analysis, however, we are handicapped by the lack of adequate statistics relating to programme activities, particularly statistics of not only the number and geographical distribution of family planning outlets and their classification by agency but more importantly the volume of activities and geographical coverage of the mobile outlets, particularly the family planning fieldworkers and the mobile family planning clinics. Such statistics would have provided the basis for evaluating the performance of the programme in creating awareness of the availability of its service outlets in the various regions of the country. With this limitation we proceed to discuss, in this section, simply the extent of knowledge of family planning outlets, as subjectively reported by respondents.

For all women in the sample the proportion who knew any family planning outlet was 42.8 per cent. In most regions and in the total sample, young women (15—19 year olds) had substantially less knowledge of sources than the age group 20—29. In general, women aged 30 and over had slightly lower proportions knowing a source than the peak ages 20—29.

The proportion who knew a source was only slightly higher for the currently married (43.3 per cent) than for the never married (38.8 per cent) (table 5.16). The latter constituted 19.3 per cent of the total sample. 47.7 per cent of the divorced, separated and widowed knew a source. This subpopulation, however, constituted

Table 5.16 Percentage of women who knew a family planning source, by age, region of residence and marital status – all women

Region of residence/ Marital status	Total	Age group 15–19	20–29	30–39	40–49	N[b]
All women	42.8	35.3	51.0	41.9	36.4	6125
Region						
Western	32.6	15.4	39.2	38.6	30.2	457
Central	46.1	51.0	53.2	43.8	33.0	464
Greater Accra	53.2	30.6	58.5	61.5	58.5	729
Eastern	54.5	45.4	65.0	56.1	44.7	1011
Volta	45.4	37.1	52.8	45.2	42.6	599
Ashanti	53.8	39.9	67.2	52.2	46.6	1473
Brong Ahafo	41.4	33.9	48.1	41.1	40.9	486
Northern	10.3	4.8	10.1	8.5	16.7	349
Upper	3.4	5.7	5.8	1.2	0.9	557
Currently married						
Total	43.3	37.0	49.2	41.2	36.9	4436
Western	34.4	16.1	40.3	36.0	29.3	340
Central	46.5	57.7	51.7	46.2	34.7	310
Greater Accra	56.2	23.3	55.7	61.9	58.1	509
Eastern	57.3	59.6	64.2	55.8	46.5	689
Volta	48.6	53.9	51.7	45.3	46.2	428
Ashanti	58.4	53.7	66.5	52.2	48.7	988
Brong Ahafo	42.1	31.0	48.5	38.7	41.4	354
Northern	9.8	3.1	9.2	8.5	16.2	326
Upper	2.9	5.1	4.8	1.3	0.9	492
Divorced, separated, widowed						
Total	47.7	46.4	59.1	50.8	33.1	507
Western	38.3	28.6	27.8	63.6	36.4	47
Central	35.9	33.3	44.0	36.8	28.0	78
Greater Accra	62.5	75.0	68.4	50.0	57.1	40
Eastern	48.6	25.0	65.2	63.2	27.3	72
Volta	48.0	75.0	71.4	43.8	25.0	50
Ashanti	57.5	57.9	76.4	52.5	39.1	160
Brong Ahafo	50.0	50.0	50.0	83.3	38.9	38
Northern[a]	12.5	–	–	–	–	8
Upper[a]	0.0	–	–	–	–	14
Never married[a]						
Total	38.8	34.0	59.6	–	–	1182
Western	20.0	13.2	42.9	–	–	70
Central	55.3	50.8	84.6	–	–	76
Greater Accra	42.8	30.9	67.3	–	–	180
Eastern	48.4	42.9	69.4	–	–	250
Volta	33.1	31.8	45.5	–	–	121
Ashanti	37.9	33.9	62.2	–	–	325
Brong Ahafo	35.1	34.5	40.0	–	–	94
Northern	20.0	11.1	40.0	–	–	15
Upper	9.8	6.5	18.8	–	–	51

[a] '–' indicates too few cases to show percentages.
[b] N = number of women.

only 8.3 per cent of the total. On account of population size, therefore, and for other reasons given in section 5.2 of this chapter, much of the analysis in this section is limited to currently married women.

The proportions of currently married women who knew a family planning source by age and number of living children, by selected background variables, namely region, type of place of residence and respondent's level of education, are presented in tables 5.17 and 5.18. Apart from Northern/Upper region where the proportion who knew a source was 5.6 per cent, the proportions in the other regions were high and ranged between 40.2 and 57.3 per cent, with the Eastern region recording the highest proportion (57.3 per cent), followed by Greater Accra (56.2 per cent). Variation among the southern regions was therefore not very great.

Distribution of the proportions by broad age groups (table 5.17) also did not show great variation among the regions, the proportions varying (for all the regions) from 36.9 per cent for age group 40–49 to 49.2 per cent for age group 20–29. Knowledge of a family planning source did not have a strong association with number of living children (table 5.18). For the total sample, the proportion who knew a source varied between 41.7 per cent (for women with 4–5 living children) to 44.4 per cent (for women with 6 or more living children). In two cases low parity women, who would have less immediate need of contraception, had much lower knowledge of sources than other parity groups (Volta region and women with no education).

Knowledge of a source, however, appeared to be positively associated with level of education. The distribution for the total sample ranged from 27.6 per cent for women who had had no schooling to 91.5 per cent for those with secondary education and above, and the positive association can be seen in all the age groups and for all parities. Knowledge of a source was also moderately higher among the urban women than the rural.

Besides the socio-economic background characteristics we may also examine the relationship between desire for additional children (used here as a proxy for motivation) and knowledge of a family planning source (table 5.19). For the total currently married women, knowledge of a source was higher among women who did not want to have any more children (59.4 per cent) than among women who wanted to have more children

Table 5.17 Percentage of currently married women who knew any family planning source, by age and region, type of place of residence and level of education

Background variable	Total	Age group			
		15–19	20–29	30–39	40–49
Total	43.3	37.0	49.2	41.2	36.9
Region					
Western/Central	40.2	35.1	45.6	40.8	32.0
Greater Accra	56.2	23.3	55.7	61.9	58.1
Eastern	57.3	59.6	64.2	55.8	46.5
Volta	48.6	53.9	51.7	45.3	46.2
Ashanti/Brong Ahafo	54.1	46.7	62.4	48.4	46.5
Northern/Upper	5.6	4.2	6.5	4.2	6.9
Type of place of residence					
Rural	37.4	36.8	42.8	34.6	31.7
Urban	55.8	37.3	61.1	54.5	51.8
Level of education					
No schooling	27.6	18.3	24.9	29.4	30.5
Primary	53.1	27.1	51.6	58.4	67.2
Incomplete Middle	64.9	67.9	62.1	75.3	50.0
Complete Middle	73.2	66.2	72.9	76.3	80.0
Secondary+	91.5	—[a]	92.6	90.0	88.2

[a]Base population for the cell is less than 10.

Table 5.18 Percentage of currently married women who knew any family planning source, by number of living children and region, type of place of residence and level of education

Background variable	Number of living children				
	Total	<2	2–3	4–5	6+
Total	43.3	44.3	43.0	41.7	44.4
Region					
Western/Central	40.2	41.0	40.0	44.9	34.6
Greater Accra	56.2	53.9	62.0	54.4	47.5
Eastern	57.3	66.8	59.0	51.2	50.6
Volta	48.6	38.9	52.5	53.9	48.9
Ashanti/Brong Ahafo	54.1	56.0	54.8	50.9	53.6
Northern/Upper	5.6	3.9	5.4	7.1	8.3
Type of place of residence					
Rural	37.4	37.2	36.2	36.6	41.0
Urban	55.8	57.2	57.1	53.5	53.3
Level of education					
No schooling	27.6	19.0	23.3	30.2	38.6
Primary	53.1	46.9	50.0	54.6	68.4
Incomplete Middle	64.9	59.4	68.4	70.5	67.7
Complete Middle	73.2	71.2	74.1	77.3	72.7
Secondary+	91.5	92.3	91.2	92.6	—[a]

[a]Base population for the cell is less than 10.

Table 5.19 Percentage of currently married women who knew any family planning source, by age, number of living children and desire for future birth

Age and number of living children	Desire for future birth			
	Total	Want more	Want no more	Undecided
Total	44.1	43.7	59.4	30.0
Age group				
15–19	37.0	37.3	—[a]	20.0
20–29	49.3	50.5	68.6	22.3
30–39	40.4	37.2	62.0	33.2
40–49	40.2	32.0	53.5	34.8
Number of living children				
<2	45.0	45.6	61.1	21.7
2–3	44.1	45.0	73.1	21.7
4–5	42.1	40.4	58.2	32.3
6+	45.2	34.1	56.2	41.2

[a]The base population for the cell is 1.

(43.7 per cent). The differences between the two groups were, however, not very great. For women who were undecided about their desire for additional children, the proportion who knew a source was only 30.0 per cent.

Knowledge of specific sources for specific methods

Knowledge of any source for each specific method, and of each specific source for any method, is shown for all currently married women (table 5.20). Since multiple reporting of sources is possible (for the different methods), the total proportion who know a source for any subgroup is less than the sum of the percentages across a row. The method for which the largest proportion of the women knew a source is the pill (35.2 per cent) followed by the IUD (23.6 per cent), condom (18.2 per cent) and female sterilization (17.5 per cent). The proportion who knew a source for injection was 13.9 per cent.

Again, except for the Northern/Upper region which showed very low levels of knowledge of sources for the specific methods (less than 2 per cent knew a source for each of five methods and 4.7 per cent knew a source for the sixth method – the pill), variation in the knowledge of sources for specific methods, particularly for pill and injection, was not great among the other regions. The proportion for the pill ranged between 31.5 per cent (Volta) and 49.5 per cent (Greater Accra), and the range for injection was 12.9 per cent (Eastern) to 26.9 per cent (Greater Accra). Knowledge of a source for IUD, however, was relatively very high in Greater Accra and Ashanti/Brong Ahafo regions and moderately high in Volta and Western/Central regions, while for 'other female scientific methods'[2] knowledge of a source was relatively high in only Greater Accra and Eastern regions. For female sterilization the levels of knowledge of a source were also higher in Eastern, Volta and Greater Accra regions and for condom, knowledge of a source was relatively very high in Greater Accra region with Western/Central and Eastern regions occupying intermediate positions. The distribution shows that in most of the regions consistent rank order levels of proportions knowing a source are not maintained for the various specific methods. Apart from the Northern/Upper region which occupied the sixth (bottom) position in knowledge of sources for all the specific methods, and Greater Accra region which occupied the first position in knowledge of sources for five of the six specific methods, the other regions occupied different rank order positions in the knowledge of sources for the six specific methods.

Type of place of residence and level of education of respondent, on the other hand, were positively related to knowledge of sources for each of the six specific methods, with the urban and more educated groups having higher knowledge.

In all subgroups the government hospital/clinic was generally dominant as the reported source for family planning methods (table 5.20B). However, in Western/Central and Eastern regions, the family planning fieldworker was reported by quite a large proportion of women, and the mobile clinic was also well known in Western/Central region, relative to the government hospital/clinic. In the total population, 31 per cent reported knowing the government hospital/clinic as a supply source, compared to less than 12 per cent for each of the other main supply sources.

The data show substantially higher overall knowledge of sources in urban areas than in rural areas for the most well-known source, government hospital/clinic (table 5.20). Somewhat higher knowledge of the PPAG/Christian Council and of pharmacies/shops as sources is also found in urban areas. The latter is to be expected because urban areas have a relatively high density of pharmacies and shops in any case. The slightly higher reported knowledge of the fieldworker and mobile clinic as sources, in rural areas, is perhaps to be expected, since these supply sources are more available in rural areas.

For all methods of contraception every type of source is reported by increasing proportions of women, as education increases. However, while this increase is steep for four sources (government hospital/clinic, PPAG/Christian Council, private doctors and pharmacies/shops), it is much less for the other two sources, fieldworkers and mobile clinics. This could be due to two reasons. These sources which go to potential users may be concentrating on less educated subgroups, or, alternatively, more educated women may be more likely to know alternative sources which they would prefer to report. The higher overall knowledge of sources by more educated women ties in with their higher levels of use of contraception (see chapter 4). In the case of

[2] These comprise the diaphragm, tampon, sponge, foam tablets, jelly or cream.

Table 5.20 Percentage of currently married women who (A) knew any source for specific methods and (B) knew a specific source for any method, by region, type of place of residence and level of education

A *Knowledge of any source for specific methods*

Background variable	Type of method							
	Total	Pill	Injection	IUD	Other female scientific[a]	Female sterilization	Condom	Number of women
Total	43.3	35.2	13.9	23.6	17.8	17.5	18.2	4436
Region								
Western/Central	40.2	34.0	20.2	24.2	14.3	12.9	24.2	650
Greater Accra	56.2	49.5	26.9	40.1	36.7	30.1	42.2	509
Eastern	57.3	38.2	12.9	16.7	26.7	34.8	23.8	689
Volta	48.6	31.5	13.3	26.6	17.1	34.1	17.5	428
Ashanti/Brong Ahafo	54.1	48.7	14.5	32.9	18.3	10.3	13.9	1342
Northern/Upper	5.6	4.7	1.2	1.8	1.0	1.7	1.2	818
Type of place of residence								
Rural	37.4	29.4	10.8	18.4	13.3	15.2	13.2	3012
Urban	55.8	47.5	20.5	34.6	27.5	22.3	28.9	1424
Level of education								
No schooling	27.6	21.7	8.0	13.7	7.0	10.6	8.4	2686
Primary	53.1	41.0	15.1	23.0	16.5	25.7	18.2	456
Incomplete Middle	64.9	50.8	20.0	36.2	29.0	24.6	27.4	390
Complete Middle	73.2	61.9	24.5	42.9	41.1	26.9	37.4	743
Secondary+	91.5	86.8	48.0	72.4	71.7	50.0	74.3	152

[*Table continues*]

Table 5.20 (*cont*)

B *Knowledge of specific sources for any method*

Background variable	Total	Government hospital/ clinic	PPAG/ Christian Council	Private doctor/ clinic	Pharmacy/ shop	Family planning fieldworker	Mobile family planning clinic	Number of women
Total	43.3	31.0	6.4	4.1	6.8	11.0	6.0	4436
Region								
Western/Central	40.2	19.4	2.8	1.4	2.2	12.5	15.7	650
Greater Accra	56.2	47.5	8.6	6.3	17.7	8.5	7.3	509
Eastern	57.3	45.1	2.9	2.9	7.1	30.0	5.1	689
Volta	48.6	43.5	7.0	0.7	8.2	5.8	2.6	428
Ashanti/Brong Ahafo	54.1	35.3	12.3	8.5	8.0	8.3	5.7	1342
Northern/Upper	5.6	4.4	0.6	0.4	0.6	2.3	0.5	818
Type of place of residence								
Rural	37.4	25.9	4.5	3.6	4.2	9.9	4.7	3012
Urban	55.8	41.6	10.3	5.1	12.2	13.2	8.9	1424
Level of education								
No schooling	27.6	19.4	2.6	2.1	2.0	6.9	4.0	2686
Primary	53.1	38.2	8.6	4.6	7.0	10.8	7.5	456
Incomplete Middle	64.9	51.3	7.7	5.9	7.2	17.2	8.5	390
Complete Middle	73.2	49.8	14.4	7.4	17.5	20.1	9.7	743
Secondary+	91.5	71.7	23.7	16.5	36.8	22.4	13.8	152

[a]These methods comprise the diaphragm, tampon, sponge, foam tablets, jelly or cream.

overall reporting of the government hospital/clinic, Greater Accra had the highest proportion, 47.5 per cent, followed by Eastern (45.1 per cent) and Volta (43.5 per cent). Ashanti/Brong Ahafo had the highest proportion (12.3 per cent) mentioning PPAG/Christian Council, followed by Greater Accra (8.6 per cent) and Volta (7.0 per cent). Ashanti/Brong Ahafo again had the highest proportion (8.5 per cent) reporting private doctor/clinic, followed by Greater Accra (6.3 per cent). Regions having highest proportions mentioning the other outlets as sources for family planning services and supplies were: Greater Accra – 17.7 per cent for pharmacy/shop, followed by Volta (8.2 per cent); Eastern – 30 per cent for family planning fieldworker, followed by Western/Central (12.5 per cent); Western/Central – 15.7 per cent for mobile family planning clinic, followed by Greater Accra (7.3 per cent).

We next look at knowledge of specific sources for specific methods for subgroups of the population (tables 5.21–5.23). The base population here is all women who knew a source (1922 women). Because of this, the percentage distributions in tables 5.21–5.23 do not sum up to 100 per cent, since eg only 1560 women knew a source for the pill, not all 1922 women. Regarding knowledge of specific sources for specific methods, Greater Accra region (60.1 per cent) and Northern/Upper region (52.2 per cent) had the highest proportions reporting government hospital/clinic as source for the pill. Ashanti/Brong Ahafo region had the highest proportions reporting PPAG/Christian Council (16 per cent) and private doctor/clinic (11.6 per cent) as sources for the pill. Greater Accra again (19.2 per cent) had the highest proportion reporting a pharmacy/shop as source for the pill while Northern/Upper (34.8 per cent) and Eastern (32.2 per cent) had the highest proportions reporting family planning fieldworkers as source for the pill. Western/Central region with 32.6 per cent had a relatively very high proportion reporting mobile family planning clinic as source for the pill, followed by Greater Accra with 11.2 per cent.

In all the regions government hospital/clinic was generally dominant as the reported source for each family planning method, except the mobile family planning clinic which was reported as being the most prevalent source for methods in the Western/Central region (mainly in the Central region when the two regions are considered separately) – particularly for the pill (32.6 per cent), injection (26.2 per cent) and IUD (29.1 per cent). The fieldworker is reported as a source for the pill by quite high proportions of women in Eastern and Northern/Upper regions, higher than all sources except the government hospital/clinic. Compared to other regions, the PPAG/Christian Council clinics are most well known in Ashanti/Brong Ahafo region, for almost all methods.

For all methods, the clinics (government or PPAG) are better known in urban than in rural areas (table 5.22). The private doctor is less well known, in general, and the differential by place of residence is relatively small. As may be expected, pharmacies and shops are mainly reported for the pill, OFS methods and the condom, and in all cases, they are more well known as sources in urban areas. There is much less of a difference between urban and rural areas in regard to the fieldworker and mobile clinic, and for some methods, rural areas have higher proportions reporting these sources than urban areas.

Interestingly, more educated women are more likely to report the government hospital/clinic and the PPAG clinics, for almost all methods, compared to less educated women (table 5.23). This generalization does not apply to sterilization, however, where all education subgroups are highly likely to report the government sources. The increase in reporting knowing a source as education rises is also much weaker for the fieldworker and mobile clinic sources, where reported knowledge is more or less even across education subgroups.

These results suggest that some concentration of availability of particular types of sources in particular regions occurs: the pharmacy/shop in the Greater Accra region, the family planning fieldworker in Eastern region and the mobile clinic in Western/Central (mainly Central) region. This may be inferred from the especially high proportions reporting knowledge of these sources in these regions.

The relatively very low knowledge of PPAG/Christian Council as source for family planning services is unexpected as the family planning programmes of these private agencies (particularly the PPAG) appear to have been well established in the country, particularly in family planning fieldworker and mobile clinic services. The possibility of respondents regarding the outlets of these agencies as government sources is high, and the fact that in the interview knowledge of government hospital/clinic was asked first could contribute to this possibility. There is a generally recognized tendency for respondent and

Table 5.21 Of all currently married women who knew a source for any method (1922 women), percentage who knew specific sources for specific methods, by type of source and region of residence

Method and region of residence	Government hospital/ clinic	PPAG/ Christian Council	Private doctor/ clinic	Pharmacy shop	Family planning fieldworker	Mobile family planning clinic
Pill						
Total	42.6	10.7	6.4	7.1	14.7	10.8
Western/Central	30.7	5.4	2.7	2.7	12.3	32.6
Greater Accra	60.1	12.2	7.3	19.2	8.4	11.2
Eastern	25.6	3.0	2.0	4.1	32.2	5.8
Volta	44.2	11.1	1.0	7.2	4.8	4.8
Ashanti/Brong Ahafo	48.1	16.0	11.6	5.5	10.1	7.6
Northern/Upper	52.2	10.9	2.2	6.5	34.8	6.5
Injection						
Total	21.4	4.6	2.8	0.4	1.2	4.1
Western/Central	20.7	1.2	1.2	0.0	1.5	26.1
Greater Accra	40.2	7.7	3.5	1.8	1.4	2.1
Eastern	18.7	0.3	2.0	0.5	1.0	0.0
Volta	26.0	1.9	0.0	0.5	0.0	0.5
Ashanti/Brong Ahafo	14.9	8.0	4.4	0.0	1.1	0.6
Northern/Upper	15.2	0.0	0.0	0.0	6.5	0.0
IUD						
Total	38.2	7.6	3.8	0.4	3.3	5.0
Western/Central	19.2	3.1	0.4	0.0	8.4	29.1
Greater Accra	60.8	8.4	6.3	1.1	1.8	2.5
Eastern	26.8	1.5	0.5	0.0	0.3	0.3
Volta	50.0	4.8	0.0	1.1	1.0	0.5
Ashanti/Brong Ahafo	39.3	13.5	7.0	0.3	4.6	1.4
Northern/Upper	32.6	0.0	0.0	0.0	0.0	2.2
Other female scientific[a]						
Total	15.4	5.9	2.3	8.5	11.7	5.5
Western/Central	14.2	2.3	0.8	2.3	6.5	10.0
Greater Accra	40.6	9.1	4.9	22.0	9.1	7.3
Eastern	7.1	1.0	1.0	4.8	33.2	4.3
Volta	15.4	6.7	0.5	11.5	3.9	2.9
Ashanti/Brong Ahafo	10.7	8.5	3.2	6.6	5.5	4.7
Northern/Upper	8.7	2.2	2.2	6.5	6.5	2.2
Female sterilization						
Total	37.3	1.8	1.8	0.3	0.5	0.2
Western/Central	28.4	1.5	0.4	0.4	0.8	0.8
Greater Accra	52.8	0.4	3.5	0.7	0.4	0.4
Eastern	56.5	1.8	2.3	0.0	0.8	0.0
Volta	69.2	1.4	0.0	0.0	0.5	0.5
Ashanti/Brong Ahafo	15.3	2.6	1.9	0.3	0.1	0.0
Northern/Upper	30.4	0.0	2.2	0.0	2.2	0.0

[*Table continues*]

Table 5.21 (*cont*)

Method and region of residence	Government hospital/ clinic	PPAG/ Christian Council	Private doctor/ clinic	Pharmacy/ shop	Family planning fieldworker	Mobile family planning clinic
Condom						
Total	15.5	4.2	2.0	8.3	13.4	5.8
Western/Central	17.2	2.3	0.4	1.5	21.5	18.0
Greater Accra	44.4	8.4	4.9	23.8	12.2	10.1
Eastern	4.8	0.5	0.8	5.8	29.4	3.3
Volta	16.8	6.7	0.0	6.7	8.7	2.4
Ashanti/Brong Ahafo	9.5	4.6	2.6	6.6	3.7	2.3
Northern/Upper	6.5	2.2	2.2	6.5	13.0	2.2

[a]These methods comprise the diaphragm, tampon, sponge, foam tablets, jelly or cream.

Table 5.22 Of all currently married women who knew a source, proportion who knew specific sources for specific methods, by type of source and type of place of residence

Method and type of place of residence	Government hospital/ clinic	PPAG/ Christian Council	Private doctor clinic	Pharmacy/ shop	Family planning fieldworker	Mobile family planning clinic
Pill						
Total	42.6	10.7	6.4	7.1	14.7	10.8
Rural	39.0	8.2	6.8	4.4	15.9	10.6
Urban	47.7	14.2	5.8	10.8	13.0	11.2
Injection						
Total	21.4	4.6	2.8	0.4	1.2	4.1
Rural	19.0	2.8	2.6	0.2	1.2	4.5
Urban	24.9	7.2	3.0	0.8	1.1	3.5
IUD						
Total	38.2	7.6	3.8	0.4	3.3	5.0
Rural	32.7	6.3	3.8	0.3	3.5	5.3
Urban	45.9	9.4	3.7	0.5	3.0	4.5
Other female scientific[a]						
Total	15.4	5.9	2.3	8.5	11.7	5.5
Rural	11.3	3.8	2.0	5.7	11.9	4.8
Urban	21.1	8.8	2.9	12.5	11.5	6.4
Female sterilization						
Total	37.3	1.8	1.8	0.3	0.5	0.2
Rural	38.2	1.1	1.4	0.1	0.5	0.1
Urban	36.0	2.8	2.4	0.5	0.4	0.4
Condom						
Total	15.5	4.2	2.0	8.3	13.4	5.8
Rural	10.8	2.8	1.2	4.6	13.7	5.2
Urban	22.1	6.2	3.0	13.6	13.1	6.8

[a]These methods comprise the diaphragm, tampon, sponge, foam tablets, jelly or cream.

Table 5.23 Of all currently married women who knew a source, percentage who knew specific sources for specific methods, by type of source and level of education

Method and level of education	Government hospital/ clinic	PPAG/ Christian Council	Private doctor/ clinic	Pharmacy/ shop	Family planning fieldworker	Mobile family planning clinic
Pill						
Total	42.6	10.7	6.4	7.1	14.7	10.8
No schooling	41.7	7.0	5.8	3.4	14.9	12.2
Primary	36.0	13.6	5.0	6.2	12.4	11.2
Incomplete Middle	47.0	6.7	5.5	3.2	14.6	11.5
Complete Middle	41.9	14.2	7.0	10.1	16.0	8.8
Secondary+	53.2	18.7	11.5	23.0	12.2	10.1
Injection						
Total	21.4	4.6	2.8	0.4	1.2	4.1
No schooling	17.8	2.7	2.0	0.0	1.1	6.6
Primary	17.4	6.2	2.5	0.8	0.4	2.9
Incomplete Middle	24.9	2.4	2.0	0.0	1.2	1.2
Complete Middle	22.1	5.2	3.5	0.7	1.7	3.1
Secondary+	39.6	13.7	5.8	1.4	0.7	2.2
IUD						
Total	38.2	7.6	3.8	0.4	3.3	5.0
No schooling	32.7	5.5	3.1	0.3	3.2	7.2
Primary	29.8	7.4	2.9	0.4	0.8	4.1
Incomplete Middle	45.1	5.1	3.6	0.0	3.2	2.0
Complete Middle	40.1	9.6	4.0	0.6	3.9	5.0
Secondary+	62.6	15.8	7.9	0.7	5.0	0.7
Other female scientific						
Total	15.4	5.9	2.3	8.5	11.7	5.5
No schooling	9.6	2.4	0.5	3.1	8.4	3.6
Primary	9.5	2.1	1.2	5.8	9.1	6.2
Incomplete Middle	17.0	5.5	1.6	8.7	13.8	5.1
Complete Middle	19.7	9.0	3.9	12.3	16.7	6.8
Secondary+	36.0	19.4	9.4	26.6	10.8	9.4
Female sterilization						
Total	37.3	1.8	1.8	0.3	0.5	0.2
No schooling	35.6	1.5	1.6	0.0	0.3	0.3
Primary	44.6	2.1	1.2	0.8	0.8	0.0
Incomplete Middle	34.8	1.2	1.6	0.4	0.8	0.0
Complete Middle	34.0	2.0	1.7	0.4	0.6	0.4
Secondary+	51.1	2.9	5.0	0.0	0.0	0.0
Condom						
Total	15.5	4.2	2.0	8.3	13.4	5.8
No schooling	9.5	2.0	0.4	2.4	13.1	5.0
Primary	10.7	2.9	0.4	5.4	9.9	8.3
Incomplete Middle	17.4	2.8	2.4	6.3	13.8	5.1
Complete Middle	18.8	6.1	2.9	13.1	14.7	5.3
Secondary+	39.6	13.0	8.6	30.2	15.8	9.4

interviewer fatigue to set in, when questions are repeated, as in this case, for several methods and sources. The sponsoring agencies for the family planning fieldworkers and mobile clinics were, however, not specified to enable us to know the relative predominance of PPAG and the Christian Council in the provision of fieldworkers and mobile services.

Preference for specific sources of family planning methods

So far we have discussed the reported knowledge of sources. In this section the information obtained on *preferred* sources, for particular methods, is analysed. We will examine the proportions of currently married women who preferred specific sources for specific methods, based only on women who knew outlets for the specific methods. Thus, we will be showing percentage distributions of women who knew an outlet according to the preferred outlet.

As shown in the second row of table 5.24, government hospital/clinic remained the most preferred source for all the six specific methods. Among women who knew a source for each particular method, the percentage preferring this outlet ranged from 32.7 per cent for the condom to 86.6 per cent for female sterilization. By comparison, typically only about 10 per cent or less, and occasionally 10–25 per cent, of women who knew a source expressed a preference for any of the other sources, for each particular method. Even for supplies which could be purchased over the counter, such as condom and other female scientific methods, the most preferred outlet was government hospital/clinic. The family planning fieldworker ranked second to government hospital/clinic as a preferred source for the pill, other female scientific methods and condom, while PPAG/Christian Council, private doctor/clinic, and mobile family planning clinic ranked after government hospital/clinic as preferred sources for methods that require clinic attendance (ie injection, IUD and female sterilization).

There were, however, greater regional variations in preferences for specific methods. As shown in table 5.25, government hospital/clinic was the most preferred source for injection in all regions, and for the other methods in most of the regions; the family planning fieldworker was the most preferred source for the pill in Eastern (42.6 per cent), for other female scientific methods in Eastern (62.5 per cent), and for condom in Western/Central (35.0 per cent) and Eastern (66.5 per cent), while the mobile family planning clinic was the most preferred source for the pill (38.0 per cent), injection (51.9 per cent), and IUD (48.4 per cent) in Western/Central. Although PPAG/Christian Council and private doctor/clinic did not rank first as a source in any region, the two sources were highly (and the next most) preferred sources in Ashanti/Brong Ahafo for the pill, injection and IUD. Pharmacy/shop which did not rank first in any region was also the next most preferred source for other female scientific methods in Volta (30.1 per cent) and Ashanti/Brong Ahafo (27.3 per cent).

With regard to differences in preferences according to type of place of residence (table 5.26), the relative proportions that preferred government hospital/clinic as source for the specific methods were lower in the rural than in the urban areas while the converse was the case for preferences for family planning fieldworker and mobile family planning clinic. This may simply be a reflection of the relative availability of these sources in urban and rural areas, rather than any true difference in preferences.

Questions were asked in the GFS regarding time to preferred sources and these were intended primarily to ascertain the accessibility of sources. These data show that variations in travel time across regions were substantial, as were variations between types of sources for specific methods (table 5.27). Greater Accra and Northern/Upper regions had the shortest travel time to specific sources for specific methods, with a range of 10–30 minutes, while the other regions reported relatively longer travel time, of up to 110 minutes, to sources. Travel time to sources for female sterilization, injection, IUD, and pill (methods that require clinic attendance or prescription) was generally longer than the travel time to sources for condom and other female scientific methods. Travel time to pharmacy/shop and private doctor/clinic was generally shorter than travel time to government hospital/clinic or PPAG/Christian Council outlets.

Type of transport was also obtained, for each specific contraceptive method needing supplies. The type of transport is definitely related to length of travel time, as may be expected (tables 5.28–5.30). It is noticeable that the mean travel time for female sterilization is longer than that for other methods, in several regions and for all types of transport except the taxi. This generalization holds among urban and rural areas, although the

Table 5.24 Of all currently married women who knew any source, percentage who knew specific outlets as sources for specific methods compared with percentage distribution of those who preferred specific sources for specific methods, by type of source preferred for specific method

Method and knowledge/ preference	Government hospital/ clinic	PPAG/ Christian Council	Private doctor/ clinic	Pharmacy/ shop	Family planning fieldworker	Mobile family planning clinic	Not stated	Number of women
Pill								
Know	42.6	10.7	6.4	7.1	14.7	10.8	—	1922
Prefer	48.3	10.2	8.8	6.1	13.6	11.2	1.8	1562
Injection								
Know	21.4	4.6	2.8	0.4	1.2	4.1	—	1922
Prefer	61.0	11.0	10.8	1.3	2.9	12.5	0.5	618
IUD								
Know	38.2	7.6	3.8	0.4	3.3	5.0	—	1922
Prefer	64.9	12.0	8.6	1.0	4.7	8.7	0.2	1046
Other female scientific								
Know	15.4	5.9	2.3	8.5	11.7	5.5	—	1922
Prefer	32.7	10.8	6.1	15.1	22.3	10.5	2.7	790
Female sterilization								
Know	37.3	1.8	1.8	0.3	0.5	0.2	—	1922
Prefer	86.6	3.6	7.5	0.5	0.8	0.4	0.6	775
Condom								
Know	15.5	4.2	2.0	8.3	13.4	5.8	—	1922
Prefer	32.7	6.4	4.6	15.3	26.7	11.9	2.4	808

Table 5.25 Of all currently married women who knew sources for specific methods, percentage who preferred specific sources for specific methods, by region of residence

Method and region of residence	Government hospital/ clinic	PPAG/ Christian Council	Private doctor/ clinic	Pharmacy/ shop	Family planning fieldworker	Mobile family planning clinic	Not stated	Number of women
Pill								
Western/Central	35.3	5.0	2.3	4.5	14.5	38.0	0.5	221
Greater Accra	62.3	9.9	4.0	8.3	3.6	9.5	2.4	252
Eastern	38.8	3.0	1.9	5.3	42.6	3.8	4.6	263
Volta	62.2	11.1	6.7	8.1	2.7	8.1	0.0	135
Ashanti/Brong Ahafo	47.6	14.9	16.4	6.0	7.2	6.7	1.2	653
Northern/Upper	57.9	7.9	2.6	2.6	21.1	5.3	2.6	38
Injection								
Western/Central	39.7	2.3	2.3	0.8	3.1	51.9	0.0	131
Greater Accra	78.1	12.4	2.2	2.2	0.7	2.9	1.5	137
Eastern	77.5	4.5	9.0	3.4	4.5	0.0	1.1	89
Volta	86.0	7.0	3.5	1.8	0.0	1.8	0.0	57
Ashanti/Brong Ahafo	47.9	20.6	26.3	0.0	3.1	2.1	0.0	194
Northern/Upper	70.0	0.0	0.0	0.0	30.0	0.0	0.0	10
IUD								
Western/Central	31.2	5.1	1.3	0.0	14.0	48.4	0.0	157
Greater Accra	81.4	10.3	2.9	2.0	0.5	2.5	0.5	204
Eastern	88.7	6.1	2.6	0.9	0.9	0.9	0.0	115
Volta	81.6	7.9	5.3	2.6	1.8	0.9	0.0	114
Ashanti/Brong Ahafo	57.6	18.1	16.6	0.5	5.2	1.8	0.2	441
Northern/Upper	100.0	0.0	0.0	0.0	0.0	0.0	0.0	15
Other female scientific								
Western/Central	37.6	6.5	3.2	6.5	18.3	28.0	0.0	93
Greater Accra	56.1	9.6	1.6	13.4	5.3	10.2	3.7	187
Eastern	13.0	1.6	2.2	10.9	62.5	3.3	6.5	184
Volta	38.4	9.6	5.5	30.1	6.8	8.2	1.4	73
Ashanti/Brong Ahafo	25.3	20.8	13.9	18.0	11.0	10.6	0.4	245
Northern/Upper	50.0	0.0	0.0	25.0	25.0	0.0	0.0	8

[*Table continues*]

Table 5.25 (*cont*)

Method and region of residence	Government hospital/ clinic	PPAG/ Christian Council	Private doctor/ clinic	Pharmacy/ shop	Family planning fieldworker	Mobile family planning clinic	Not stated	Number of women
Female sterilization								
Western/Central	84.5	6.0	3.6	1.2	2.4	2.4	0.0	84
Greater Accra	95.4	0.0	2.0	1.3	0.0	0.0	1.3	153
Eastern	87.1	2.9	7.1	0.4	1.3	0.0	1.3	240
Volta	87.7	4.1	7.5	0.0	0.0	0.7	0.0	146
Ashanti/Brong Ahafo	74.6	7.2	17.4	0.0	0.7	0.0	0.0	138
Northern/Upper	100.0	0.0	0.0	0.0	0.0	0.0	0.0	14
Condom								
Western/Central	28.8	3.2	1.3	1.9	35.0	29.9	0.6	157
Greater Accra	51.6	7.9	3.3	15.3	6.5	11.2	4.2	215
Eastern	9.8	1.2	1.8	13.4	66.5	3.7	3.7	164
Volta	41.3	9.3	2.7	17.3	21.3	6.7	1.3	75
Ashanti/Brong Ahafo	31.6	11.2	12.3	27.3	9.1	7.5	1.1	187
Northern/Upper	30.0	0.0	0.0	20.0	50.0	0.0	0.0	10

Table 5.26 Of currently married women who knew sources for specific methods, percentage who preferred specific sources for specific methods, by type of place of residence

Method and type of place of residence	Government hospital/ clinic	PPAG/ Christian Council	Private doctor/ clinic	Pharmacy/ shop	Family planning fieldworker	Mobile family planning clinic	Not stated	Number of women
Pill								
Rural	46.2	8.0	10.5	5.3	16.7	12.3	0.9	885
Urban	51.0	13.0	6.5	7.2	9.6	9.7	3.0	677
Injection								
Rural	58.9	8.3	12.6	0.9	3.7	15.3	0.3	326
Urban	63.4	14.0	8.9	1.7	2.1	9.2	0.7	292
IUD								
Rural	61.0	10.6	11.4	1.1	5.4	10.3	0.2	554
Urban	69.3	13.4	5.5	0.8	3.9	6.9	0.2	496
Other female scientific								
Rural	27.3	7.3	8.3	15.3	28.3	11.5	2.0	399
Urban	38.1	14.3	3.8	14.8	16.1	9.5	3.3	391
Female sterilization								
Rural	87.1	3.5	7.4	0.2	1.1	0.2	0.4	457
Urban	85.8	3.8	7.5	0.9	0.3	0.6	0.9	318
Condom								
Rural	28.2	4.5	4.5	13.4	35.0	13.4	1.0	397
Urban	37.0	8.3	4.6	17.3	18.7	10.5	3.6	411

Table 5.27 Mean travel time (in minutes) to preferred source[a] for specific methods, by type of source and region of residence — currently married women

Method and region of residence	Government hospital/clinic	PPAG/ Christian Council	Private doctor/clinic	Pharmacy/ shop
Pill				
Total	47.6	55.5	40.2	51.1
Western/Central	62.1	47.3	22.0	47.4
Greater Accra	19.1	13.5	19.0	24.9
Eastern	54.9	52.3	93.0	41.5
Volta	70.6	32.9	44.3	53.7
Ashanti/Brong Ahafo	51.6	72.1	40.4	69.6
Northern/Upper	24.8	21.7	15.0	30.0
Injection				
Total	54.5	53.1	31.9	35.3
Western/Central	80.2	46.7	33.3	105.0
Greater Accra	19.8	16.4	16.7	15.7
Eastern	78.6	77.5	33.8	31.7
Volta	69.5	52.5	50.0	—
Ashanti/Brong Ahafo	57.7	66.9	31.7	—
Northern/Upper	27.1	—	—	—
IUD				
Total	50.7	63.7	36.9	29.1
Western/Central	64.7	40.0	20.0	—
Greater Accra	19.0	14.0	14.2	11.8
Eastern	68.3	63.3	90.0	10.0
Volta	68.6	55.6	44.2	27.5
Ashanti/Brong Ahafo	57.6	79.7	36.5	75.0
Northern/Upper	14.3	—	—	—
Other female scientific				
Total	41.7	49.3	30.4	40.3
Western/Central	56.3	55.0	15.0	20.0
Greater Accra	17.5	14.8	11.7	13.3
Eastern	65.4	16.0	17.5	41.6
Volta	64.5	23.1	23.8	38.3
Ashanti/Brong Ahafo	56.7	66.4	35.9	60.6
Northern/Upper	18.8	—	—	10.0
Female sterilization				
Total	76.5	73.1	67.7	41.8
Western/Central	99.1	40.0	53.3	15.0
Greater Accra	29.6	—	11.7	16.0
Eastern	102.7	97.6	87.6	120.0
Volta	74.0	77.5	77.7	—
Ashanti/Brong Ahafo	87.2	70.0	57.7	—
Northern/Upper	16.2	—	—	—
Condom				
Total	39.7	39.0	22.9	38.8
Western/Central	57.2	40.0	20.0	21.7
Greater Accra	16.2	15.1	10.3	11.2
Eastern	57.5	110.0	10.0	35.2
Volta	62.1	12.3	6.0	35.0
Ashanti/Brong Ahafo	56.1	60.2	29.6	60.3
Northern/Upper	11.7	—	—	17.5

[a]Family planning fieldworker and mobile clinics are not shown here, since they are considered to require no travel time on the part of the user.

Table 5.28 Mean travel time (in minutes) to preferred source for specific methods, by mode of travel and region of residence — currently married women

Type of transport and region of residence	Type of method					
	Pill	Injection	IUD	Other female scientific	Female sterilization	Condom
Bus						
Total	64.2	63.6	60.5	42.9	76.5	52.5
Western/Central	66.4	106.7	52.4	34.0	70.0	48.3
Greater Accra	31.1	22.0	23.7	21.1	35.5	20.3
Eastern	69.2	57.9	80.4	47.5	99.0	56.8
Volta	81.0	76.6	69.5	57.0	72.2	70.4
Ashanti/Brong Ahafo	62.2	54.1	62.0	45.6	103.7	56.0
Northern/Upper	16.7	15.0	21.7	20.0	31.5	10.0
Walk						
Total	22.5	26.1	25.0	22.1	41.2	19.4
Western/Central	44.1	63.8	69.1	56.6	56.8	57.7
Greater Accra	11.9	14.3	12.4	12.3	14.8	11.4
Eastern	30.6	33.1	46.7	20.0	48.2	16.5
Volta	27.2	33.2	30.8	31.8	64.5	20.1
Ashanti/Brong Ahafo	21.2	21.9	22.6	20.6	18.6	14.1
Northern/Upper	27.9	40.0	17.5	13.8	17.5	16.7
Taxi						
Total	25.0	19.8	19.6	23.8	22.3	21.7
Western/Central	25.0	33.1	32.5	27.5	30.7	33.7
Greater Accra	18.3	17.5	17.4	17.9	24.2	20.1
Eastern	20.5	12.5	16.4	15.8	16.0	13.0
Volta	48.3	22.5	30.0	67.5	15.0	55.0
Ashanti/Brong Ahafo	34.6	21.8	23.3	34.1	24.2	13.1
Northern/Upper	8.3	10.0	7.1	—	7.1	—
Private car						
Total	40.0	68.6	41.0	35.2	90.4	23.8
Western/Central	57.5	45.0	45.0	90.0	135.0	45.0
Greater Accra	14.5	14.8	14.1	16.0	19.6	14.6
Eastern	67.1	149.0	67.6	57.0	129.0	45.7
Volta	66.7	77.5	67.8	60.0	96.4	36.7
Ashanti/Brong Ahafo	49.7	29.5	42.8	65.0	66.5	10.0
Northern	—	—	—	—	—	—
Other						
Total	78.3	83.4	81.4	89.2	120.2	85.3
Western/Central	91.1	90.0	91.4	75.0	180.8	71.3
Greater Accra	108.3	202.5	185.0	82.5	82.1	15.0
Eastern	81.1	68.2	89.7	117.8	114.3	117.0
Volta	115.0	10.0	143.3	95.0	110.0	—
Ashanti/Brong Ahafo	75.8	85.3	76.9	87.5	112.1	85.6
Northern/Upper	—	30.0	—	—	—	—

Table 5.29 Mean travel time (in minutes) to preferred source[a] for specific methods, by type of source and type of place of residence – currently married women

Method and place of residence	Government hospital/ clinic	PPAG/ Christian Council	Private doctor/ clinic	Pharmacy/ shop
Pill				
Total	47.6	55.5	40.2	51.1
Rural	66.5	86.9	50.8	83.2
Urban	25.7	30.1	18.0	20.4
Injection				
Total	54.5	53.1	31.9	35.3
Rural	81.1	97.4	41.3	42.5
Urban	27.6	24.0	17.1	32.4
IUD				
Total	54.5	63.1	36.9	29.1
Rural	75.5	104.2	42.8	43.0
Urban	26.4	26.9	23.4	11.8
Other female scientific				
Total	41.7	49.3	30.4	40.3
Rural	67.5	92.1	37.8	63.7
Urban	23.1	27.1	14.7	16.9
Female sterilization				
Total	76.5	73.1	67.7	41.8
Rural	104.6	104.7	103.7	120.0
Urban	36.7	31.1	16.6	15.7
Condom				
Total	39.7	39.7	22.9	38.8
Rural	63.7	73.9	33.2	67.3
Urban	22.2	20.5	12.7	16.5

[a]Family planning fieldworker and mobile clinics are not shown here, since they are considered to require no travel time on the part of the user.

increase in time for female sterilization is greater in rural areas. As may be expected, for all supply sources and for all methods, women in rural areas report a much longer mean travel time than urban women (table 5.29). This reflects both the relatively more dispersed distribution of the outlets in the rural areas as well as the relative availability of transportation in the rural compared with urban areas. Travel time by bus took between 50 and 90 minutes in the rural areas to reach a source for a method compared with 30–48 minutes in the urban areas; and a client in the rural areas would walk for between 36 and 79 minutes to reach a source while one would walk for less than 25 minutes in the urban areas.

Use of family planning outlets

Among currently married women only 12.8 per cent had ever visited any family planning outlet, compared with a proportion of 40 per cent who had ever used a contraceptive method. Among currently married and exposed[3] women the same differential is found: the proportion who had visited an outlet was 13.2 per cent, compared with 41 per cent who had ever used a contraceptive method. About 31 per cent of married and

[3] 'Exposed women' are those who are currently married, report themselves as fecund and are not currently pregnant.

Table 5.30 Mean travel time (in minutes) to preferred source for specific methods, by mode of travel and type of place of residence – currently married women

Type of transport and place of residence	Type of method					
	Pill	Injection	IUD	Other female scientific	Female sterilization	Condom
Bus						
Total	64.2	63.6	60.5	42.9	76.5	52.5
Rural	74.1	76.4	71.5	50.6	88.6	67.5
Urban	43.1	41.4	40.6	32.0	47.5	30.1
Walk						
Total	22.5	26.1	25.0	22.1	41.2	19.4
Rural	36.0	46.0	53.7	39.2	78.7	34.3
Urban	16.1	16.6	14.6	15.7	21.4	14.6
Taxi						
Total	25.0	19.8	19.6	23.8	22.3	21.7
Rural	69.7	19.0	60.0	81.0	42.0	39.0
Urban	19.1	19.9	17.2	19.7	21.2	20.3
Private car						
Total	40.0	68.6	41.0	35.2	90.4	23.8
Rural	44.6	89.9	54.9	39.8	107.8	28.6
Urban	32.6	29.9	20.5	29.8	45.3	19.2
Other						
Total	78.3	83.4	81.4	89.2	120.2	85.3
Rural	81.8	89.2	86.8	94.5	134.4	91.1
Urban	57.4	58.3	60.5	58.0	65.0	50.5

exposed women had never visited an outlet but knew of at least one, while the remaining 56 per cent who had never visited an outlet did not know any. With regard to recent visit to an outlet, only 5.8 per cent of currently married and exposed women had visited any source within the last twelve months. Three per cent had not visited any source but were using a contraceptive method.

Although the general levels of use of outlets were very low, there were notable regional differentials. As shown in table 5.31, the lowest proportions who had ever visited a source, and also who had visited a source in the last twelve months, were in Northern/Upper region (1.7 and 0.6 per cent, respectively). Volta with 9.9 and 4.8 per cent had, respectively, the second lowest proportion ever using and the third lowest recently using a source. Greater Accra had the highest proportions who had ever used an outlet (20.3 per cent) and who had recently visited an outlet (10.8 per cent). The urban subgroup, as expected, had higher proportions of respondents who had ever used an outlet and who had recently used one. The proportions in both categories of use, as expected, also increased with level of education, with respondents who had had education beyond middle school having relatively very high proportions.

For all regions, except Northern/Upper, and for all the educational categories and the rural–urban subgroups, a substantial proportion of respondents (about 50 per cent on the average) who had never visited a source knew a source, and 3 per cent (on the average) who had not used an outlet within the last twelve months were currently using a contraceptive method that required some type of supply. Since 'supply' methods include the IUD and female sterilization, which were currently used by 0.8 per cent of currently married women, and since husbands may obtain supplies of some other methods (especially the condom), this is not such an unexpected finding. It is interesting to note,

Table 5.31 Percentage of currently married and exposed women ever using and recently using family planning outlets (during last 12 months), by selected background variables

Background variable	A Ever used outlet			B Recently used outlet[a]				Number of women
	Yes	No, but knows a source	No, and does not know a source	Yes		No		
				Using a supply method	Not using a supply method	Using a supply method	Not using a supply method	
Region								
Western/Central	10.3	30.5	59.2	4.0	1.9	1.3	92.9	476
Greater Accra	20.3	37.1	42.6	7.8	3.0	10.8	78.4	399
Eastern	17.2	41.5	41.3	3.1	1.3	2.9	92.7	545
Volta	9.9	38.3	51.8	2.7	2.1	3.3	91.9	332
Ashanti/Brong Ahafo	17.8	37.3	44.8	6.3	1.8	2.2	89.7	1015
Northern/Upper	1.7	4.0	94.3	0.3	0.3	0.8	98.6	647
Type of place of residence								
Rural	10.5	28.0	61.5	2.9	1.1	1.9	94.1	2315
Urban	18.8	36.6	44.6	6.9	2.6	5.4	85.1	1099
Level of education								
No schooling	6.0	21.7	72.2	1.5	0.7	1.0	96.8	2039
Primary	16.5	36.8	46.7	4.6	1.7	4.0	89.7	351
Incomplete Middle	18.2	46.5	35.3	5.0	1.7	4.3	89.1	303
Complete Middle	26.0	47.2	26.8	8.4	3.5	6.6	81.5	593
Secondary+	48.4	45.9	5.7	24.6	7.4	13.1	54.9	122
Total	13.2	30.8	56.1	4.2	1.6	3.0	91.2	3414

[a]Supply methods are those about which detailed information was obtained, the pill, IUD, injection, other female scientific methods, condom and female sterilization.

however, that 1.6 per cent of all exposed women had visited a source recently, but were not using a supply method at the time of interview.

The relatively very low levels of use (and knowledge also) of outlets compared with levels of use (and knowledge) of contraceptive methods is mainly due to the fact that the questions about knowledge and use of family planning outlets, by definition, had to be related to outlets for contraceptive methods that need supplies. The inefficient methods, particularly abstention, which a large proportion of respondents had ever used (22.6 per cent as against 18.5 per cent for all efficient methods), were not included. The regional differentials in the levels of knowledge and use of efficient and inefficient contraceptive methods, therefore, largely account for the regional differentials in knowledge and use of outlets, which in many cases are in great contrast with the overall levels of knowledge and use of any contraceptive method and fertility preferences. The Volta region, for instance, had the second highest proportion desiring to stop childbearing, the second lowest desired family size, and the highest proportions knowing and ever using contraceptive methods, but as the region had the highest proportions of ever users of inefficient methods only, it ranked second lowest in ever-use of outlets and third lowest in knowledge of outlets (table 5.32). Another limitation of the data on use of outlets is that the levels of the latter may not adequately reflect the levels of knowledge and use of contraceptive methods, since some respondents may receive supplies from husbands, or services through means other than the sources specified in the questionnaire.

Table 5.32 Percentage of currently married women knowing and using family planning outlets, by selected background variables

Background variables	Of all married women, proportion knowing				Of all married and exposed women							
					Proportion ever using				Proportion currently/recently using			
	Method			Supply Source	Method			Supply Source	Method			Supply Source
	Total	Inefficient only	Efficient		Total	Inefficient only	Efficient		Total	Inefficient only	Efficient	
Total	68.6	9.2	59.4	43.3	41.1	22.6	18.5	13.2	12.4	5.2	7.2	5.8
Region												
Western/Central	79.8	4.3	75.5	40.2	20.6	8.4	12.2	10.3	7.1	1.9	5.2	5.9
Greater Accra	93.1	1.6	91.5	56.2	49.9	14.8	35.1	20.3	25.5	7.0	18.5	10.8
Eastern	87.1	13.2	73.9	57.3	70.1	39.1	31.0	17.2	20.7	14.7	6.0	4.4
Volta	96.2	34.3	61.9	48.6	94.0	78.0	16.0	9.9	18.7	12.7	6.0	4.8
Ashanti/Brong Ahafo	63.9	4.5	59.4	54.1	34.8	15.3	19.5	17.8	10.1	1.6	8.5	8.1
Northern/Upper	22.0	8.9	13.1	5.6	9.5	7.3	2.2	1.7	1.6	0.5	1.1	0.6
Place of residence												
Rural	63.1	11.5	51.6	37.4	39.8	25.3	14.5	10.5	9.9	5.1	4.8	4.0
Urban	80.0	4.2	75.8	55.8	43.9	16.9	27.0	18.8	17.7	5.4	12.3	9.6
Level of education												
No schooling	56.8	12.3	44.5	27.6	30.7	23.0	7.7	6.0	7.7	5.2	2.5	2.2
Primary	80.1	6.6	73.5	53.1	47.6	24.8	22.8	16.5	14.5	6.0	8.5	6.3
Incomplete Middle	87.2	5.4	81.8	64.9	53.1	26.4	26.7	18.2	14.8	5.6	9.2	6.6
Complete Middle	88.7	3.5	85.2	73.2	58.8	20.2	38.6	26.0	19.2	4.2	15.0	12.0
Secondary+	96.7	–	96.7	91.5	81.1	12.3	68.8	48.4	45.1	7.4	37.7	32.0

5.7 DETERMINANTS OF KNOWLEDGE AND USE OF FAMILY PLANNING SERVICES: A MULTIVARIATE ANALYSIS

Levels of knowledge and utilization of family planning services have been shown in the preceding paragraphs to be generally not very high among married women. As the data show, however, there are remarkable differences in the levels among population subgroups. To assess the net individual effects and the relative importance of the socio-economic subgroups, therefore, we again apply the method of multiple classification analysis (MCA). The background characteristics considered and used as explanatory factors are again region of residence, type of place of residence, respondent's and husband's education, and respondent's occupation, with age of respondent and number of living children as controls (or covariates).

In the analysis of desired family size which principally involved an assessment of the personal desires and attitudes of the respondent, only background factors relating to the respondent were considered. Knowledge and utilization of family planning services, particularly the latter, are, however, behaviour or action variables involving in most cases the joint decision of the married couple. Husband's education can reasonably measure the extent of spousal communication on issues of fertility control. For this reason the most relevant background variable of husband, namely, education, is included in the multiple classification analysis of knowledge and utilization of family planning services. The inclusion of husband's background characteristics has, however, increased the proportion of cases with missing information, and since such cases are normally excluded from MCA, there are slight changes in the levels of knowledge and use of sources presented in the MCA results, compared with corresponding proportions in the preceding section.

Knowledge of outlets

The results of the analysis presented in table 5.33 show three of the factors, region of residence, and respondent's and husband's education, to be more strongly associated with level of knowledge of sources of family planning services. The three factors had comparable degrees of association with the dependent variable, knowledge of sources. The eta (unadjusted) coefficients of association for the factors were: region and respondent's education, 0.38 each; and husband's education, 0.40. After adjusting for the confounding effects of other factors, the coefficients of association for region, respondent's education and husband's education were 0.23, 0.20 and 0.19, respectively. Controlling further for age of woman and number of living children did not make any further substantial changes in the adjusted coefficients of association as the beta coefficients were reduced only to 0.21 for region and increased only to 0.23 and 0.20 for respondent's and husband's education, respectively. For type of place of residence the eta coefficient of association was only 0.14 which was reduced to 0.05 after all adjustments, and for type of occupation the coefficient of association was also reduced from 0.13 (unadjusted) to 0.07 and 0.05, respectively, after adjusting for other factors and also for covariates.

In the present analysis Eastern region had the highest unadjusted proportion knowing a source (57 per cent), followed by Ashanti/Brong Ahafo (52 per cent), with Greater Accra (49 per cent) and Volta (48 per cent) taking the third and fourth highest positions. Northern/Upper with only 5 per cent had the lowest proportion knowing a source. After adjusting for the confounding effects of the other factors, however, Greater Accra's proportion of women who knew a source was reduced to a low 34 per cent, second lowest after Northern/Upper. The proportion for Volta dropped only slightly to 45 per cent after adjusting for the other factors, while Eastern with 54 per cent maintained its top position. Adjusting further for the covariates did not make any additional significant changes in the adjusted levels. Greater Accra's very high decline in the proportion knowing a source, after the adjustments, is mainly due to the elimination of the confounding effects of the education variables which have been shown to be factors most strongly associated with knowledge of family planning outlets. Greater Accra region has the highest proportion of the population who had attended school. The converse effect of controlling for education can also be seen in the increase in the proportion for Northern/Upper after the adjustments (from 5 to 23 per cent) as this region (Northern/Upper) is the most disadvantaged with regard to level of education. The very low proportion for Volta region, which had the highest proportion knowing a contraceptive method and the highest proportion ever using a method, on the

Table 5.33 Multiple classification analysis for knowledge of any family planning sources – currently married and exposed women[a]

Factor plus category	A Of currently married women, percentage who know any source				B Of currently married and exposed women, percentage ever attended a source				C Of currently married and exposed women, percentage recently attended a source			
	Overall mean = 0.41				*Overall mean = 0.12*				*Overall mean = 0.05*			
	N	Unadjusted deviation (1)	Adjusted (for factors) deviation (2)	Adjusted (for factors + covariates) deviation (3)	N	Unadjusted deviation (1)	Adjusted (for factors) deviation (2)	Adjusted (for factors + covariates) deviation (3)	N	Unadjusted deviation (1)	Adjusted (for factors) deviation (2)	Adjusted (for factors + covariates) deviation (3)
Region												
Western/Central	624	−.02	−.01	−.01	460	−.03	−.03	−.02	460	.00	.00	.01
Greater Accra	421	.08	−.07	−.07	326	.06	−.02	−.02	326	.04	−.00	−.00
Eastern	659	.16	.13	.12	518	.05	.04	.03	518	−.01	−.02	−.02
Volta	413	.07	.04	.03	320	−.02	−.04	−.04	320	−.01	−.01	−.01
Ashanti/Brong Ahafo	1268	.11	.08	.07	954	.04	.03	.03	954	.02	.01	.01
Northern/Upper	800	−.36 (.38)[b]	−.20 (.23)[c]	−.18 (.21)[c]	631	−.10 (.19)[b]	−.03 (.09)[c]	−.02 (.08)[c]	631	−.04 (.12)[b]	−.00 (.05)[c]	−.00 (.05)[c]
Type of place of residence												
Rural	2919	−.05	−.12	−.02	2240	−.02	−.00	−.00	2240	−.01	−.00	−.00
Urban	1266	.11 (.14)[b]	.04 (.05)[c]	.04 (.05)[c]	969	.04 (.09)[b]	.01 (.02)[c]	.01 (.02)[c]	969	.03 (.08)[b]	.01 (.02)[c]	.01 (.02)[c]
Respondent's education												
No schooling	2647	−.14	−.07	−.08	2009	−.05	−.03	−.03	2009	−.02	−.01	−.01
Primary	455	.12	.04	.05	350	.05	.02	.03	350	.02	.01	.01
Incomplete Middle	383	.23	.13	.15	297	.07	.03	.05	297	.02	.01	.01
Complete Middle	652	.30	.16	.18	518	.12	.05	.07	518	.06	.02	.03
Secondary+	48	.46 (.38)[b]	.31 (.20)[c]	.33 (.23)[c]	35	.34 (.24)[b]	.24 (.13)[c]	.26 (.15)[c]	35	.27 (.20)[b]	.20 (.12)[c]	.27 (.13)[c]
Husband's education												
No schooling	1978	−.19	−.09	−.09	1500	−.07	−.04	−.05	1500	−.03	−.02	−.02
Primary and Incomplete Middle	540	.04	.00	.00	435	−.03	−.03	−.03	435	−.02	−.02	−.02
Complete Middle	1222	.19	.09	.10	940	.07	.05	.05	940	.03	.02	.02
Secondary+	445	.31 (.40)[b]	.14 (.19)[c]	.15 (.20)[c]	334	.17 (.27)[b]	.10 (.17)[c]	.11 (.17)[c]	334	.10 (.21)[b]	.07 (.14)[c]	.07 (.14)[c]
Respondent's occupation												
Never worked	450	−.10	−.09	−.07	334	−.08	−.09	−.07	334	−.03	−.03	−.03
Agricultural	1874	−.04	.00	−.00	1428	−.02	.00	.00	1428	−.01	.00	.00
Sales/Service	1454	.06	.02	.02	1125	.03	.01	.01	1125	.02	.00	.00
Manual – skilled and unskilled	407	.08 (.13)[b]	.01 (.07)[c]	.02 (.05)[c]	322	.08 (.13)[b]	.05 (.10)[c]	.05 (.09)[c]	322	.03 (.09)[b]	.01 (.05)[c]	.01 (.05)[c]
Multiple R^2			.245	.252			.101	.109			.060	.063

N = number of women.
[a]Covariates are age of respondent and number of living children.
[b]Eta coefficients.
[c]Beta coefficients.

other hand, arises, as discussed in the preceding section, from the fact that greater proportions of the respondents in this region knew, and had ever used, only inefficient methods, for which the questions about sources of supply or services were not applicable. Level of knowledge of family planning outlets, however, increases progressively with increasing level of education, both in the unadjusted and adjusted levels. The unadjusted levels for respondent's education ranged from 27 per cent for women with no education to 87 per cent for women with education beyond middle school. The levels of knowledge by level of husband's education also ranged from 22 per cent for women whose husbands had never attended school to 72 per cent for women whose husbands had had education beyond middle school. After controlling for the effects of the other factors, the levels of knowledge by respondent's education ranged from 34 per cent for women with no education to 72 per cent for those with education beyond middle school; after controlling also for age of woman and number of living children the levels ranged from 33 to 74 per cent. The corresponding range of the levels by husband's education, after adjusting for the other factors, was from 32 per cent for women whose husbands had had no education to 55 per cent for those whose husband's had had education beyond middle school, and, after also adjusting for the covariates, the corresponding range was 32—56 per cent. Apparently, wife's education had greater influence on knowledge of family planning outlets than did her husband's education.

Ever-use and current use of outlets

The association between levels of use of family planning outlets and the socio-economic background characteristics of the population subgroups is, however, generally weak. The coefficient of association between level of ever-use and region of residence came to 0.19 (unadjusted) and declined to 0.09 after adjusting for the other factors, and finally to 0.08 after adjusting in addition for the covariates. Corresponding coefficients for current use were 0.12 (unadjusted) and 0.05 after each of the two stages of the adjustments. The eta and beta coefficients for type of place of residence for ever-use were 0.09 (unadjusted) and 0.02 after each round of the adjustments, while the corresponding coefficients for current use were 0.08 (unadjusted) and 0.02 after each of the adjustments. For respondent's occupation the eta coefficient of association for ever-use was 0.13 but this dropped to beta 0.10 and 0.09, respectively, after the adjustments, while the corresponding coefficients for current use were 0.09 (unadjusted) and 0.05 after each stage of the adjustments. Education of respondent and husband, however, remained relatively more strongly associated with levels of ever-use and current use of family planning outlets. The eta and beta coefficients of association of ever-use with respondent's education were 0.24 (unadjusted), 0.13 after adjusting for the effects of the other factors, and 0.15 after also adjusting for the effects of the covariates, while the corresponding coefficients for current use were 0.20, 0.12 and 0.13, respectively. The respective coefficients of association for husband's education for ever-use were 0.27 (unadjusted) and 0.17 after each of the adjustments, while for current use the corresponding coefficients were 0.21 (unadjusted) and 0.14 after each of the adjustments.

The diminished strength of the association between the background variables and levels of use of family planning outlets, particularly after adjusting for the confounding effects of the other factors and variables, had the effect of narrowing the range of the levels of use across the categories of each factor and reducing the absolute levels of the proportions for the categories, except for the education variables which continued to show great differentials among the categories. For ever-use, the unadjusted regional differentials varied between 2 per cent (for Northern/Upper) and 18 per cent (for Greater Accra) while the adjusted differentials (after the second adjustment) varied between 8 per cent (for Volta) and 15 per cent (for Ashanti/Brong Ahafo and Eastern), compared with the overall proportion of 12 per cent. For current use the range of the unadjusted differentials was from 1 per cent (for Northern/Upper) to 9 per cent (for Greater Accra) as against the range of 3 per cent (for Eastern) to 6 per cent (Western/Central and Ashanti/Brong Ahafo) after the adjustments, compared with the overall proportion of 5 per cent. For respondent's education the range between the unadjusted proportions for women with no education and those with education beyond middle school was, for ever-use, 7—46 per cent as against 9—38 per cent after the adjustments. For current use the corresponding range of the unadjusted proportions was 3—32 per cent as against the range of 4—26 per cent after the adjustments. Levels of use also showed positive relationship with husband's

education although the range of differences (among the categories), as shown in the MCA results, was smaller than the differences by wife's education.

5.8 SUMMARY AND CONCLUSIONS

In the analysis of the GFS data on fertility preferences we have attempted to examine the patterns of responses in the survey with the view to finding any evidence of the deficiencies and biases which are commonly believed to exist in survey data on fertility preferences from developing countries. The deficiencies and biases relate to the extent of non-numeric answers to questions about desired or wanted family size, and the positive correlation invariably observed between desired family size and number of living children. Earlier writers have attributed the latter to a number of situations, namely, rationalization of achieved family size, upward revision of desired family size with increasing experience of childbearing, and differential age–cohort responses to processes of modernization in a regime of declining fertility.

Of the total respondents who were asked the questions about desired family size, 88 per cent gave numeric answers regarding preferred family size and 81 per cent gave such answers to the question about additional number of children wanted. The overall socio-economic differentials in the proportions giving numeric answers were not great except for the Northern/Upper region and for the Mole-Dagbani ethnic group, who had about half of the respondents giving non-numeric answers.

Among all married and fecund women only about 12 per cent expressed the desire to stop childbearing. As expected, however, the proportion wanting no more children increased and the proportion wanting more decreased, as number of living children increased – with the two distribution lines intersecting where number of living children is between 6 and 7. Consequently, the level of desired family size – 6.0 for preferred size and 5.5 for wanted size – was quite high and reflected the high completed family size of 6.5 children estimated for the country. There were, however, significant differentials in the three fertility preference variables among the various population subgroups. The greatest differentials for all the three measures were found between Northern/Upper region, which had the lowest proportion desiring to stop childbearing and the highest desired family size, and the rest of the regions; between the Mole-Dagbani ethnic group, which also had the lowest proportion desiring to stop childbearing and the highest desired family size, and the rest of the ethnic groups; and among the educational (respondent's) categories. Greater Accra and Volta regions had the highest proportions desiring to stop childbearing and the lowest preferred and wanted family size. The differentials by type of place of residence were distinct but not very great, with urban having a slightly higher proportion desiring to stop childbearing and lower preferred and wanted family size. As expected, the relationship between level of education and proportion desiring to stop childbearing was positive, while the relationship between education and preferred and wanted family size was negative.

Multiple classification analysis showed that a great deal of the differentials among subgroups, particularly for preferred and wanted family size, was due to the confounding effects of the other factors. After controlling for the effects of the other variables, the gross or initial significance of ethnic origin and rural–urban residence, for instance, evaporated, leaving region and respondent's education as the two most significant explanatory factors, besides number of living children, for preferred and wanted family size. It is also observed that the high significance of region is due largely to the extreme values which Northern/Upper had, as the differentials among the other regions were not very great. The application of the MCA has also shown that it is number of living children which is positively related to level of desired family size. Age of woman and duration of marriage by themselves have not been shown to have any significant relationship with desired family size. However, it could not be determined from the data whether the positive relationship between number of living children and desired family size is due more to rationalization effects or reflects much more a genuine upward revision of desired family size as a result of increasing experience of childbearing.

Regarding knowledge of family planning outlets, the proportion of married women who knew a source or outlet was 43 per cent. As in the case of fertility preferences, however, there were significant differentials in knowledge of a source among the regions, among the educational categories and between the rural–urban subgroups. Level of education, as expected, was

positively related to knowledge of a source, and women desiring to stop childbearing also had a higher proportion knowing family planning outlets, compared to other preference groups. This category of women naturally had greater motivation to seek to know outlets for family planning services.

The methods for which the largest proportion of respondents knew sources was the pill, followed by IUD; and the most widely known and most preferred outlet for all the methods was government hospital/clinic which in any case had the widest distribution in the country. Family planning fieldworker was the next most preferred source for the pill, other female scientific methods, and condom, while the other family planning clinics, namely PPAG/Christian Council, private doctor/clinic and mobile family planning clinic, were the next most preferred outlets for methods that require clinic attendance (ie injection, IUD and female sterilization). There were, however, great regional variations in knowledge of and preference for specific sources or outlets. Western/Central (but mainly Central), for instance, had the highest proportions preferring family planning fieldworker and mobile family planning clinic as outlets for almost all the methods. Travel time was also found to be related to type of method: it was longer to outlets for methods that require clinic attendances. Greater Accra and Northern/Upper regions also showed the shortest travel time to sources of methods.

Analysis relating to utilization of family planning outlets has also shown the levels of ever-use and current use of the outlets to be rather low. The overall proportion of married and exposed women who had ever used any outlet for family planning was 13 per cent and the proportion currently using any outlet was only 6 per cent. The corresponding proportions of married and exposed women who had ever used a contraceptive method and who were currently using a method were 41 and 12 per cent, respectively. However, levels of knowledge and

Table 5.34 Relative strength of association between fertility preference variables and selected background variables — currently married women

Dependent variable and factor	Unadjusted eta	Adjusted for factors[a] beta	Adjusted for factors plus covariates[b] beta
A Desire to stop childbearing			
Region	.15	.14	.11
Ethnic origin	.13	.11	.06
Rural/urban residence	.06	.04	.03
Education	.05	.11	.06
Occupation	.08	.06	.05
B Preferred family size			
Region	.34	.22	.25
Ethnic origin	.26	.08	.09
Rural/urban residence	.17	.01	.01
Education	.39	.28	.13
Occupation	.24	.13	.07
C Wanted family size			
Region	.29	.18	.22
Ethnic origin	.21	.06	.10
Rural/urban residence	.15	.01	.00
Education	.36	.26	.14
Occupation	.22	.13	.07

[a]Factors are region, ethnicity, place of residence, education and occupation of the respondent.
[b]Covariates are age, number of living children and marital duration of respondent.

Table 5.35 Relative strength of association between knowledge and use of family planning outlets and selected background variables – currently married women

Dependent variable and factor	Unadjusted eta	Adjusted for factors[a] beta	Adjusted for factors plus covariates[b] beta
A Knowledge of outlets			
Region	.38	.23	.21
Rural/urban residence	.14	.05	.05
Respondent's education	.38	.20	.23
Husband's education	.40	.19	.20
Respondent's occupation	.13	.07	.05
B Ever-use of outlets			
Region	.19	.09	.08
Rural/urban residence	.09	.02	.02
Respondent's education	.24	.13	.15
Husband's education	.27	.17	.17
Respondent's occupation	.13	.10	.09
C Recent use of outlets			
Region	.12	.05	.05
Rural/urban residence	.08	.02	.02
Respondent's education	.20	.12	.13
Husband's education	.21	.14	.14
Respondent's occupation	.09	.05	.05

[a]Factors are the five main variables – region, place of residence, respondent's education, husband's education, respondent's occupation.
[b]Covariates are age and number of living children.

Table 5.36 Proportion (percentage) of total variance in fertility preferences and knowledge and use of family planning outlets, explained by all selected factors and covariates combined

Dependent variables	Factors only[a]	Factors and covariates[b]
A Fertility preferences		
Desire to stop childbearing	3.9	21.9
Preferred family size	22.3	42.9
Wanted family size	17.9	41.3
B Knowledge and use of family planning services		
Knowledge of outlets	24.5	25.2
Ever-use of outlets	10.1	10.9
Recent use of outlets	6.0	6.3

[a]Factors are region, place of residence, respondent's education, husband's education and respondent's occupation.
[b]Covariates are age and number of living children.

use of outlets may also not adequately reflect the levels of contraceptive knowledge and use, as some respondents may receive supplies from husbands or services from sources or through agents other than the sources specified in the questionnaire.

The relative, if not the absolute, levels of knowledge and use of outlets among the regions and other population subgroups, as also shown for fertility preferences, are useful findings for policy formulation and programme planning and implementation. In this regard, and by way of a summary, we present in tables 5.34–5.36 the relative strengths of the relationships between levels of desire to stop childbearing, desired family size and knowledge and use of family planning services, and the socio-economic background variables considered in the analysis. These results show that for all measures of fertility preference, and for knowledge of family planning sources, region and education are the factors with the strongest independent effect. In the case of attendance at family planning sources, it is education (both respondent's and husband's) that has the strongest impact, independently of all other factors. Finally, an important conclusion that emerged was that, unlike its unimportant relationship with contraception, one demographic correlate, number of living children, proved to be highly related to fertility preferences. In contrast, none of the three demographic characteristics, age, parity or marital duration of the respondent, had much effect on knowledge of or attendance at family planning sources.

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6 Levels, Trends and Determinants of Infant and Child Mortality

George Adansi-Pipim

6.1 INTRODUCTION

Information on mortality in Ghana is very patchy. Consequently, the estimation of mortality levels, trends and differentials remains the weakest area in Ghanaian demography. At the national level, very little is known about the various dimensions of infant, childhood and adult mortality and the issues related with them. Even in the registration areas, where registration of births and deaths has been made compulsory since the beginning of the century, the mortality picture is still not clear. Indeed, as has been observed by Kpedekpo *et al* (1970), the data gathered by the civil registration system contain errors of considerable magnitude due, primarily, to serious under-reporting of births and deaths. In the absence of reliable vital statistics, data from population censuses and demographic sample surveys have provided the basic material for the estimation of vital rates for Ghana. It must be noted, however, that the primary data from these sources may also suffer from several errors and deficiencies which are normally characteristic of retrospective enquiries relating to fertility and mortality. Therefore, various estimation techniques have been applied to derive what are believed to be more plausible measures of vital rates.

An overview of previous estimates of mortality

Gaisie (1969a) utilized life-table techniques and computed age-specific mortality rates of 0.029 and 0.004 for age groups 1–4 and 5–14 from information on reported number of children dead in the last 12 months which was obtained through the 1960 Post Enumeration Survey. But as he observed, comparison of the actual life-table mortality rates with rates derived from a model life table for Ghana (based on Brass' two parameter system and Coale–Demeny North level 9 model life table) showed that the former rates were too low to be plausible estimates. His estimated lx function from the life table constructed by Brass' technique (using the same data set) indicated much higher mortality rates: of all children born alive, about 80 per cent survived to their second birthday, 75 per cent to their fifth birthday, 70 per cent to their tenth birthday and 60 per cent to their fifteenth birthday. In a subsequent work, Gaisie (1976) constructed a life table for Ghana from the data of 1968–9 National Demographic Sample Survey (NDSS). Two systems of data collection were employed in this survey. These were the single-round retrospective enquiry and the continuous registration system. The second system was maintained for twelve months in the sample areas. By adapting a model life table which was based on the estimated value of $_2q_0$ (the probability of dying before the second birthday), he arrived at mortality rates of 133 infant deaths per 1000 live births and 95 child deaths per 1000 live births for children under twelve months old and those between 1 and 4 years old, respectively. More recently, Gaisie (1979) produced estimates of child mortality rates, $_4q_1$, for Ghana from the 1960 and 1971 Post-Census Surveys based on estimated lx and the North model life table. The child mortality rates were .110 and .086 from the 1960 and 1971 post-censal surveys, respectively.

Schedules of child survivorship have been derived directly from the data of 1960 and 1971 post-censal surveys by the Central Bureau of Statistics (1983) utilizing information on children ever born, children born in the past twelve months and the number of children dead (table 6.1).

Using Brass and Trussell mortality estimation techniques, the Central Bureau of Statistics (1983) estimated an infant mortality rate of 150 per thousand and 121 per thousand from the 1960

Susheela Singh, John Y. Owusu and Iqbal H. Shah, eds (1985). *Demographic Patterns in Ghana: Evidence from the Ghana Fertility Survey 1979–80:* 193–226. Voorburg, Netherlands: International Statistical Institute.

Table 6.1 Average number of children ever born and average number of surviving children, by age of woman: 1960 and 1971

Age of woman	Average number of children ever born		Average number of children surviving		Proportion of deceased children	
	1960	1971	1960	1971	1960	1971
15–24	1.174	0.882	0.951	0.754	0.190	0.144
25–34	3.583	3.762	2.718	3.009	0.241	0.200
35–44	5.396	5.900	3.797	4.459	0.296	0.244
45–49	5.921	6.420	3.875	4.566	0.345	0.289

Source: Central Bureau of Statistics (1983), p. 9

and 1971 post-census surveys, respectively, compared with direct estimates of 126 per thousand and 87 per thousand, also from the same data sets. Estimated child mortality (ie at 1–4 years) by the Bureau was 65 child deaths per 1000 live births from the 1971 supplementary enquiry. Life expectancy at birth (e_0) was estimated by the Bureau to be 46.6 years for both sexes in 1971. Male and female expectations of life at birth were estimated at 45.3 years and 48.3 years respectively, for 1971, while male and female expectations of life at birth were 39 years and 41.7 years in 1960. This implied an average annual increase in life expectancy of 0.5 to 0.6 year during the period 1960 to 1971 (table 6.2).

Adansi-Pipim (1982) re-estimated the probabilities of dying before age five, $_5q_0$, from the survivorship data obtained through the 1948 census, 1960 and 1971 post-census surveys, the 1968–9 National Demographic Sample Survey and the 1979–80 Ghana Fertility Survey, utilizing Brass' indirect estimation technique. Application of Brass' method (1982) of estimating time location also made it possible to estimate time trends in child mortality from these data sets. Results from the two techniques quite clearly reveal that mortality of children under the age of five has declined substantially between 1930 and 1976 (table 6.3).

The above review of mortality estimates from other sources shows that different investigators obtained different estimates from the same data sets when different estimation techniques were utilized. None the less, they consistently indicate substantial reductions in infant and child mortality, with consequent increase in life expectancy at birth from 1930 up to 1976.

Table 6.2 Infant and child mortality rates and life expectancies, by sex: 1971

		Male	Female
1	Infant mortality ($_1q_0$):		
	(a) Rate per thousand	130	111
	(b) Life expectancy	45.3	48.3
2	Child mortality ($_4q_1$):		
	(a) Rate per thousand	65	58
	(b) Life expectancy	51.4	53.3

Source: Central Bureau of Statistics (1983), p. 9

The data and their quality

The heart of the Ghana Fertility Survey, like all the other WFS surveys, was a complete, retrospective birth history for all women in the reproductive age range (15–49 years of age, irrespective of marital status in the case of Ghana). For each birth, information was obtained on date of birth, sex of child and the survival status of each live birth, and age at death was determined where relevant. Below we give the exact questions asked about each live birth:

225 Live births (total number)
227 What was the name of your (first, second, . . .) child?
228 Was the child a boy or a girl?
229 In what year was . . . (name of child) born?

Table 6.3 Estimated mean child mortality in Ghana: 1930–76 (indirect estimates)

Period	$_5q_0$
1930–44	.320
1943–56	.254
1955–68	.205
1963–76	.131

Source: Adansi-Pipim (1982)

230 How many years ago was . . . (name of child) born?
231 In what month was that child born?
232 How long after . . . (name of previous birth) did you have this child?
233 Is he/she still living?
234 How many years and months old was the child when he/she died?

These data enabled us to estimate infant and child mortality directly. Undoubtedly, the usefulness and reliability of demographic parameters derived from surveys, censuses or registration data depend on the quality of the data collected. It is therefore important that inherent errors and biases within the data must be explored and their magnitude and effect on estimated parameters ascertained and measured. Consequently, we examine in the rest of this section the mortality data from the GFS with the aim of identifying the types and sources of errors and biases, if any, that may affect the reliability of the levels, trends and patterns of infant and child mortality.

As in most retrospective enquiries, the mortality estimates from the GFS may be affected by various types of errors. Such errors may be the result of omission of births and deaths of infants or misplacement of their birth or death dates. The errors may also be due to sampling variations as well as misstatement of age of mother. Omission of births and deaths is perhaps the most serious error generally present in maternity history data.[1] The error is believed to occur more commonly for children who were not living with their mothers at time of the survey, those children who died when they were young, especially in their first year of life, and also those children whose death occurred several years before the survey. Deaths that occurred to older women are more likely to be omitted or their birth and death dates misplaced, than those that occurred to younger women partly because the experience of older women goes back farther in the past than those of younger women, and partly because older women are less educated than younger women.

There are basically two different ways of looking at the quality of data. One is to compare estimates from the data under evaluation with estimates obtained from external sources covering similar periods. The other is to critically analyse the data for evidence of internal consistency. Comparison of mortality estimates from the 1971 Supplementary Enquiry (SE) derived indirectly with direct estimates from the 1979–80 GFS show that the SE estimates are much higher than the GFS retrospective estimates for the period around 1968. The ${}_1q_0$ and the ${}_5q_0$ from the SE were 0.121 and 0.211 respectively, compared with 0.074 and 0.130 from the GFS. The observed divergence between the two sets of estimates is very puzzling.[2] One possible explanation is that omission of deaths occurred in the GFS. However, comparison of direct estimates from the birth history with indirect estimates, which make an adjustment for omission (both from the GFS), showed a reasonable degree of agreement. For instance, the estimated ${}_5q_0$ of 126 from Brass' indirect method, approximately for the year 1972, agreed very well with the direct estimate of 124 child deaths per 1000 live births for the period 5–9 years before the survey. This finding is reassuring indeed and increases our confidence in the quality of the GFS data.

We next examine the data for evidence of internal consistency with regard to trends and patterns of differentials. The figures in table 6.4 for infant and child mortality by 5-year periods prior to the survey show a systematic decline over

[1] *Editors' Note:* Omission may be a more serious error when mortality rates based on proportions of children who have died is being considered. However, when rates for specific periods of time are being calculated, it is more likely that misdating of births or deaths will cause the greater problem: misdating will spuriously inflate and deflate mortality rates of the affected periods. A review of WFS data quality in 41 countries found that omission of births and deaths was relatively less important than incorrect reporting of dates of the events, in terms of its effect on both fertility and mortality rates (Goldman *et al* 1985).

[2] *Editors' Note:* A partial explanation for this large discrepancy between the two sources is age misreporting in the 1971 enquiry. Brass' indirect estimation technique may use the average number of children ever born to the 15–19 and 20–24 age groups (P1/P2) or the 20–24 and 25–29 age groups (P2/P3) to obtain adjustment factors for estimating the level of the best-fitting model life table, from which estimates of infant and child mortality rates are taken. The P2/P3 ratio is more strongly recommended because of the greater selectivity of young mothers, which makes them less representative of the population as a whole. If women aged 30–34 have misreported their ages as 25–29, then their higher parity will inflate the parity of 25–29 year olds and will produce a spuriously low P2/P3 ratio. The result is that too low a level of model life table will be estimated, and the estimates of infant and other mortality rates will be too high. Age misreporting of the kind described above probably did occur in Ghana (Ewbank 1981) and therefore the estimated ${}_1q_0$ of 121 and ${}_5q_0$ of 211 for 1971 are very likely to be over-estimates.

Table 6.4 Probabilities of infant and child death for periods prior to the survey

Period prior to survey (years)	Probabilities of death			
	$_1q_0$	$_1q_1$	$_3q_2$	$_5q_0$
20–24	.113	.040	.062	.185
15–19	.086	.025	.050	.153
10–14	.088	.032	.048	.156
5–9	.074	.024	.039	.124
0–4	.072	.034	.034	—

[a]The rates are synthetic cohort measures taken from Rutstein (1984).

the entire period. For instance, infant mortality dropped from 0.113 for the period 20–24 years before the survey to 0.072 for 0–4 years before the survey. Both early and late childhood mortality show a declining pattern, but more substantial and consistent declines are observed for later childhood mortality ($_3q_2$). These results conform with the expectation of a declining trend in the mortality level. There is therefore not much evidence of differential levels of omission of infant and child deaths, over time.

Discussion of the demographic and socio-economic differentials below also show that age of mother at birth, as well as differentials in sex of child and rural–urban residence, are consistent with expected patterns, supporting the quality of the mortality data.

The above analysis shows that there is great internal consistency within the GFS data. This is borne out by the fact that the differentials in infant and child mortality by sex, rural–urban residence and age of mother at birth broadly conform to expected patterns. Furthermore, the overall levels also conform to the expected pattern of declining trends. There is therefore no strong evidence of selective omissions of deaths. Comparison of direct estimates from the GFS with indirect estimates from external sources, however, showed that the level of mortality estimated directly from the GFS data generally appeared to be low. But as we have demonstrated above, comparison of direct and indirect estimates from the GFS agreed reasonably well, a finding which has increased our confidence in the quality of the GFS data.

Objectives and methods

We propose to undertake an in-depth analysis of the mortality data of the Ghana Fertility Survey, with the aim of obtaining substantive results with regard to overall levels and trends in infant and child mortality. We will also examine the biological correlates of infant and child mortality, the effect of birth spacing on infant mortality, and the socio-economic correlates of mortality. The analysis is based on a children's file created from the birth histories which were collected from a self-weighted sample of 6125 females aged 15–49, including both ever-married and never-married women. For some parts of the analysis we focus on the recent period, considering only the 15 692 births which occurred between the first and eleventh year prior to the survey. Analysis by 5-year periods reveals that infant and child mortality did not change significantly during this period (see discussions of levels and trends below). Moreover, the evaluation of the quality of the data failed to reveal any serious omission of births (Owusu 1984).

The life-table measures of mortality used in this study are derived from the groupings of months adopted at the coding stage:

Coding of age at death	Descriptive term	Life-table notation
0 month	Neo-natal mortality rate	—
1–11 months	Post-neonatal mortality rate	—
0–11 months	Infant mortality rate	$_1q_0$
1 year (12–23 months)	Early childhood mortality (toddler)	$_1q_1$
2–4 years (24–59 months)	Later childhood mortality	$_3q_2$
0 month to 5 exact years	Probability of dying by age 5	$_5q_0$

The analysis covers recorded mortality up to age five, of birth cohorts, that is to say, children born in specific periods. In order to achieve this objective, a policy was adopted whereby cases of incomplete exposure to risks were discarded. For instance, we discarded births in the 12 months before the survey, in the computation of infant mortality, and births less than 60 months before the survey in the case of child mortality. We could have only discarded cases less than 24 months in the case of early childhood mortality ($_1q_1$) but initial exploratory analysis revealed no significant difference at all in the rates based on more than 24 months exposure and rates based on more than 60

months exposure. Consequently, estimates of neo-natal, post-neonatal and infant mortality are based on 9566 births of 1—11 years before the survey, while child mortality estimates are based on 6126 births of 5—12 years before the survey. The trends in mortality are, however, examined for births which occurred during the last 25 years.

6.2 LEVELS AND TRENDS OF INFANT AND CHILD MORTALITY RATES, BASED ON GFS DATA

Table 6.5 presents observed and adjusted infant mortality rates for 5-year periods prior to the survey for the entire country. Moving backwards in time, from a recent to an earlier 5-year period, we lose information on the oldest 5-year cohort of women, with each 5-year reversal. The GFS was restricted to women aged 15—49 at survey. The information over this age range is complete only for the period 0—4 years before the survey. For the period 5—9 years ago, no information is available for women aged 45 and over. This truncation of the information can be adjusted for by replacing the missing information with that available for the adjacent period. Indeed, the truncation effect is hardly noticeable. The figures show a remarkable fall in infant mortality over the last 24 years. There was a reduction of 35 per cent in infant mortality over this period. The reduction was, however, more drastic in the earlier 10 years than the more recent 10 years before the survey. In absolute terms, 60 per cent of the reduction occurred in the earlier 10 years while the latter 10 years enjoyed only 40 per cent reduction in infant mortality.

Changes in post-neonatal mortality were less drastic than those in neo-natal mortality (table 6.6). Neo-natal mortality declined in 0—4 years before the survey from that in 20—24 years by about 23 neo-natal deaths per 1000 live births compared with 15 per thousand reduction in post-neonatal deaths over the same period. Further examination of the nature of the trends shows that the greatest reduction in neo-natal as well as post-neonatal mortality occurred in the earliest period between 10—14 and 20—24 years before the survey. Neo-natal mortality declined by about 18

Table 6.5 Infant mortality rates for periods prior to the survey (observed and adjusted)

		Period (years) prior to survey				
		0—4	5—9	10—14	15—19	20—24
A	Observed	72	74	87	86	108
B	Adjusted for truncation	72	75	93	89	110

The method of adjustment is based on maternal age. It is as follows:

$$\text{Adjusted rate} = \frac{\text{observed rate 15—49 in 0—4}}{\text{observed rate 15 — x in 0—4}} \times \text{observed rate 15 — x in period P}$$

where x is successively 44, 39, 34 and 29 for periods (P) 5—9, 10—14, 15—19 and 20—24, respectively. The assumption underlying this procedure is that for periods with truncated information, the mortality experience of the truncated cohort was similar to that for period 0—4 for which complete information is available . More specifically, the relationship of mortality experience of women aged 15 to x in period 0—4 to the mortality experience of women aged 15—49 in period 0—4 holds for the periods where no information above x is available. Thus, the adjustment factor varies by x and the period. For example, for period 5—9 no information is available after age 44 and, therefore, the adjusted rate for this period equals the observed rate for period 5—9 multiplied by the ratio of the rate of 15—49 in period 0—4 to the rate for 15—44 in period 0—4.

Table 6.6 Neo-natal and post-neonatal mortality rates for periods prior to the survey, adjusted for truncation

Mortality measure	Period (years) prior to survey				
	0—4	5—9	10—14	15—19	20—24
Neo-natal	38	40	50	47	61
Post-neonatal	34	35	43	42	49
Ratio of neo-natal to post-neonatal	1.12	1.14	1.16	1.12	1.24

per cent between the periods 10–14 and 5–9. Since then the decline has almost levelled off. Post-neonatal mortality also levelled off over the 10-year period immediately preceding the survey. It is evident from the foregoing that a considerably larger part of the reduction in infant mortality in the country was attributable to the reduction in neo-natal mortality and concentration of infant deaths between 1 and 11 months.

We now turn to consider the levels and trends in mortality between the ages 1 and 5. The figures again depict a substantial reduction in ${}_1q_1$, ${}_3q_2$, and ${}_5q_0$ (ie the probability of dying between 12 and 23 months, 24 and 59 months and the probability of dying by age 5, respectively) from the period 20–24 years before the survey to the period 0–4 years before the survey. The reduction in child mortality was substantial between periods 20–24 and 15–19, and 10–14 and 5–9 (table 6.7). Mortality of children under five years, for instance, dropped by 32 per thousand between periods 20–24 years and 15–19 years before the survey. The same rate of decline was achieved between periods 10–14 and 5–9. The early child mortality, ${}_1q_1$, shows a decline from 40 in period 20–24 to 25 in period 0–4. More substantial declines in mortality are observed at ages 2–5. There was apparently no change in child mortality between the 15–19 and 10–14 year periods before the survey. Generally, however, there has been a substantial decline in child mortality from the earliest period to the most recent period before the survey.

Table 6.8 presents neo-natal, post-neonatal and infant mortality rates for urban and rural areas for periods prior to the survey. The figures show a substantial reduction in infant mortality in urban and rural areas from the earliest period to the most recent period before the survey. There is, however, a slight rise in infant mortality in urban areas in the 0–4 year period before the survey. Both urban and rural areas had the same absolute reduction in infant mortality (41 infant deaths per 1000 live births) over the entire 25 years under review. The greatest reduction in infant deaths occurred in the earliest period, however. Post-neonatal mortality appeared unchanging in both urban and rural areas in the 0–14 years before the survey, while neo-natal mortality showed a rising trend in the most recent period in urban areas.

Causes of trends in infant and child mortality in Ghana

The data show substantial reduction in infant and child mortality in the country over the last 24 years before the survey. We also observed that

Table 6.7 Probabilities of child death per 1000 live births for periods prior to the survey

Mortality measure	Period (years) prior to survey				
	0–4	5–9	10–14	15–19	20–24
${}_1q_1$	25[a]	24	32	25	40
${}_3q_2$	34[a]	39	48	50	62
${}_5q_0$	–	124	156	153	185

[a]These estimates are synthetic cohort measures, taken from Rutstein (1984).

Table 6.8 Neo-natal, post-neonatal and infant mortality rates for periods prior to the survey, by urban and rural areas

Place of residence	Mortality measure	Period (years) prior to survey				
		0–4	5–9	10–14	15–19	20–24
Urban	Neo-natal	32	28	44	34	54
	Post-neonatal	27	27	26	35	46
	IMR (${}_1q_0$)	59	55	70	69	100
Rural	Neo-natal	40	45	50	52	70
	Post-neonatal	37	37	46	41	48
	IMR (${}_1q_0$)	77	82	96	93	118

infant and child mortality declined very rapidly and significantly from the period 20–24 years before the survey to the period 5–9 years before the survey. However, there was little or no change in mortality in the 10 years prior to the survey. It is perhaps worth reviewing some of the factors that have contributed to the decline in infant and child mortality from the middle 1950s up to the late 1960s, and which may account for the stabilization of this downward trend in the very recent period.

The decline in mortality, from the mid-1950s to the late 1960s, coincided with a period of rapid economic, social, medical and health advancement in the country. The country had a relatively strong and buoyant economy during this period. The output of export commodities like cocoa, gold, diamonds, timber and manganese was also high. The result was that the country had enough foreign exchange to undertake developmental projects which affected the standard of living of the people. In the agricultural sector, the increase in the country's annual output of food production was much higher than the rate of population growth. Consequently, there was increased per capita consumption of food. The availability of food coupled with better nourishment led to reduction in infant and child mortality. The period of massive decline in infant and child mortality also coincided with an unprecedented expansion in education in the country. With the introduction of free education, many primary, secondary and teacher training schools and colleges were opened. The University of Ghana (formerly Gold Coast) was expanded and two other universities were established during this period. Erosion of traditional attitudes towards women's education led to expansion in women's enrolment in schools and colleges, one result being the improvement in child-care practices. The education acquired by women also led to better use of available resources for children and less fatalism with regard to child health.

Remarkable progress was also made in the medical and public health systems of the country during this period. Many hospitals and health centres were opened and health posts were established in several rural areas. There was improvement also in maternal and child-health services.

The period also witnessed significant improvements in environmental and public health. Sanitation in public places improved tremendously and there was wider provision of piped-water supplies during this time.

Immunization against communicable and infectious diseases was vigorously pursued. This led to reduction in infant and child death due to causes such as measles, small pox, whooping cough, tuberculosis and tetanus. Improvement in personal hygiene, particularly among school children, led to total eradication of yaws. The control or eradication of these communicable diseases meant that morbidity declined and the general standard of health in the population improved.

That infant and child mortality levelled off during the last 10 years before the survey is not surprising. Indeed, the momentum and the tempo of change in socio-economic development which started just before Independence in 1957 and which was sustained by the government came to a halt in the early 1970s. The economy suffered reverses during this period, as described in the introductory chapter. For the first time in the history of Ghana, the country recorded a deficit in food production in the early 1970s. The effect was that there was increased malnutrition among infants and children. In sum, there was widespread deterioration in the provision of public services in many aspects of life in the country and this led to levelling off of the trend in infant and child mortality during this recent period.

6.3 BIOLOGICAL CORRELATES OF INFANT AND CHILD MORTALITY

Evidence from several studies has established a very strong link between mortality early in life (neo-natal, post-neonatal, infant and child mortality) and sex of child, maternal age and birth order. Excess male mortality has, for instance, been established for most human populations (Page 1971; Puffer and Serrano 1973; Anker and Knowles 1977; United Nations 1979). In a summary of results of 29 national fertility surveys which were carried out within the World Fertility Survey programme, Rutstein (1983) noted that for the four African countries which were included in the analysis (Senegal, Lesotho, Kenya and Sudan) about 14 per cent more males than females died before reaching age 1 while 22 per cent more males died between ages 1 and 2. Between ages 2 and 5, he observed that 3 per cent less males than females had died. Generally, the African pattern of male to female mortality ratio did not differ significantly from that of the Asian and Latin American countries.

It has also been established that late age as well as very early age of motherhood represent a grave risk factor for the newborn child (Omran 1976, 1981; Federici and Terrenato 1980; Rutstein 1983). Also strongly correlated with mortality at young ages is the parity of the mother. Available evidence indicates that the minimum risk corresponds to second births and the maximum risk to both first and higher order births. Indeed, high parity risk is exacerbated if the births are spaced closely together (even a relatively low parity, say a third child, runs a high risk of dying if it occurs soon after the second birth). The World Health Organization report on 'Social and Biological Effects on Pre-natal Mortality' reached similar results when the factors were examined for individual causes of death in early life (WHO 1978).

We therefore examine, in this section, the relationship between infant and child mortality and the above-mentioned biological attributes of mother and child. It is perhaps worth noting that a study of this nature usually suffers from the problem of isolating the influence of each single factor on early-life mortality, while these factors are directly or indirectly correlated with one another and also with other social and economic variables. However, we overcome this problem in two ways. First, by presenting, where possible, cross-classifications indicating the inter-relationships between the various factors and, secondly, by the use of multivariate analysis to capture the independent effect of each factor.

Sex differentials in infant and child mortality

The most outstanding difference in the biological factors is that which characterizes the mortality of the two sexes. Neo-natal mortality for males has consistently exceeded that for females. During the remainder of the first year of life, mortality has also been higher for males, although exceptions with higher mortality for females have been observed (Chen *et al* 1981; Chen *et al* 1980). A WHO investigation has also shown that the unfavourable position of the male sex is evident for almost all the causes of death if 'congenital malformation of the central nervous system and the eye' (which result in a female excess mortality in all countries with the exception of Japan), and in some cases 'the condition of the umbilical cord', are excepted (WHO 1978). It is now well established that physiological differences in the capability of male and female infants to survive early infancy largely account for this differential. Males have a higher risk of birth injury, breathing difficulties and jaundice.

Table 6.9 clearly shows that reported infant and child mortality for males is higher than that for females. Male neo-natal mortality is, for instance, 24 per cent higher than that of females. In the case of post-neonatal mortality, males are 19 per cent more at risk of dying than females. Throughout infancy, 20 per cent more males die than females. Indeed, the excess male mortality in infancy is maintained into childhood but with significantly reduced male to female ratios.

We further demonstrate the relationship between sex of child and mortality by rural–urban place of residence in table 6.10. The figures reveal that the male and female mortality differential is maintained for rural as well as urban place of residence. However, the ratio of male to female neo-natal mortality is much higher in rural areas than urban areas.

Table 6.11 also indicates that the differences between male and female neo-natal, post-neonatal and infant mortality still persist regardless of maternal education. However, the ratios show that the male and female mortality differential becomes more pronounced with increasing number of years of schooling of mothers. This phenomenon possibly reflects better reporting by the well-educated mothers. Generally, however, the overall mortality rates show the exposed inverse association with maternal education.

Table 6.9 Sex-specific probabilities of death

Mortality measure	Male	Female	Ratio (male/female)
Neo-natal	36	29	1.24
Post-neonatal	38	32	1.19
$_1q_0$	72	60	1.20
$_1q_1$	25	24	1.04
$_3q_2$	33	31	1.06

Table 6.10 Rural-urban sex-specific probabilities of death

	Rural				Urban			
	Neo-natal	Post-neonatal	$_1q_0$	Number of births	Neonatal	Post-neonatal	$_1q_0$	Number of births
Male	39	41	78	3390	28	30	57	1446
Female	31	35	64	3244	24	26	49	1445
Ratio	1.26	1.17	1.22		1.17	1.15	1.16	

Table 6.11 Probabilities of death, by sex of child and maternal education

Maternal education and sex of child	Neo-natal	Post-neonatal	$_1q_0$	Number of births
No schooling				
Male	35	39	73	3207
Female	29	36	64	3015
Ratio (male/female)	1.20	1.08	1.14	
1–9 years				
Male	38	32	69	869
Female	28	30	57	898
Ratio (male/female)	1.36	1.07	1.21	
10+ years				
Male	36	36	71	833
Female	25	20	45	763
Ratio (male/female)	1.44	1.80	1.58	

Differentials by maternal age

The influence of maternal age on the survival of newborn babies is a very well known and analysed biological relationship (Hughes 1923; Morris and Heady 1955; Wray 1971). Several studies in recent times have addressed the issues of the effect of maternal age on infant and child mortality, utilizing WFS data for Nepal (Thapa and Retherford 1982), Colombia (Somoza 1980), Pakistan (Alam and Cleland 1984), and for a cross-national sample of countries (Rutstein 1983). With the exception of Pakistan, these studies uniformly suggest that there is an age band in the fertility span of a woman during which the reproductive risks are at a minimum. And on either side of this relatively safe age band, the risks progressively increase, describing a J-shaped or a U-shaped curve, in the majority of cases (Omran 1981). In general, the minimum mortality rates pertain to mothers in the 20–24 and 25–29 age groups with small differences between the two age groups. Rates at maternal ages below 20 are generally higher, as are rates at maternal ages 35 and over.

As revealed by the figures in table 6.12, the findings in this study conform to the expected pattern. We observe that children born to very

Table 6.12 Probabilities of death, by maternal age

Age at maternity	Neo-natal	Post-neonatal	$_1q_0$	$_1q_1$	$_3q_2$
<20	40	37	75	29	42
20–24	28	32	59	22	34
25–29	27	34	60	27	23
30–34	38	33	70	23	25
35–39	24	30	53	21	39
40–44	54	63	113	29	51
45–49	71	77	143	–	–

young (under 20) and older mothers (over 40) have an increased risk of dying before age 1. The infant mortality rate for mothers aged less than 20, for instance, is 75 per 1000 live births, while the rate ranges between 53 and 70 for mothers aged 20–39, rising steeply above age 40, to over 100. The rate of 70 for maternal age 30–34 appears unusual, considering the fact that both age groups on either side have much lower probabilities of dying. One possibility is that reporting of the age of women at the time of the survey, for ages 30–34 and 35–39, was incorrect, with shifting of older women (who would have had worse mortality) into the younger age group, 30–34. Since the period covered in this study is only the last 10 years, it is only these two current age groups who are contributing to the 30–34 age at motherhood rates. A similar pattern of mortality differentials with maternal age is also observed for the two components of infant mortality, namely, neo-natal and post-neonatal. However, the relationship is much stronger for neo-natal than post-neonatal rates. Again, we observe an unusual value of 38 for the neo-natal rate for 30–34 year-old mothers. Among the factors responsible for excess neo-natal mortality at younger and older ages at maternity are: prematurity, low birth weight, and complications of the delivery itself. However, the fact that post-neonatal mortality also shows higher death rates for older mothers (40–49) suggests that it is not only congenital or delivery-related factors that are at issue.

The childhood mortality rates also conform to the expected pattern. However, the association for the later childhood period is much stronger than that for the early childhood period.

Table 6.13 presents infant mortality rates by maternal age and rural–urban place of residence. We again observe the persistence of maternal age effect on mortality, when rural–urban place of residence is controlled. For rural mothers, the lowest mortality rates pertain to mothers in the 20–29 age group with higher rates for very young (<20) and older maternal ages (40–49). A similar pattern of higher mortality to very young and older mothers is also observed for urban mothers. In general, however, the urban infant death rates are substantially lower at all maternal age groups than rural rates. It follows, therefore, that both maternal age and rural–urban place of residence affect infant mortality independently.

Table 6.13 Infant mortality rates, by maternal age and rural–urban place of residence

Maternal age	Rural	Urban
<20	82 (1123)	60 (513)
20–29	64 (3222)	50 (1501)
30–39	69 (1956)	50 (779)
40–49	123 (333)	92 (98)

Number of births are given in parentheses.

Differentials by birth order

There is an abundance of evidence concerning the association between birth order and mortality of infants. In a study of rural India, Gordon and Wyon (1962) found that infant mortality tended to increase with birth order. Similar observations have also been made in several studies, for example, in England and Wales (Morris and Heady 1955), New York (Chase 1961), Hawaii (Yerushalmy *et al* 1956) and Ghana (Addo and Goody 1974). More recently, researchers have addressed similar issues using WFS data (Thapa and Retherford 1982; Somoza 1980; and Rutstein 1983).

The general pattern that has emerged from all the studies indicates that the risk of death is relatively high for first births, decreases for second and third births, rises sharply for fourth and fifth births and increases more sharply for higher order births. With only slight differences the relationship between neo-natal, post-neonatal and infant mortality and birth order shows a U-shaped or J-shaped pattern. Several reasons have been put forward to explain the observed association which include the following:

1 that first-born children are more likely to be born to relatively inexperienced, probably young, mothers who are biologically, mentally, socially and economically unprepared to bear and raise children;
2 that children of higher order births are more likely to be born to mothers who are older and therefore physically more worn out; and
3 that children of higher order births, by definition, are members of large families and are more likely to be affected by competition from older siblings in terms of food and other family resources.

Table 6.14 presents neo-natal, post-neonatal, infant and child mortality rates by birth order. As expected, the risk of death, particularly in the

Table 6.14 Probabilities of death, by birth order

Birth order	Mortality measure				
	Neo-natal	Post-neonatal	$_1q_0$	$_1q_1$	$_3q_2$
1	41	27	67	20	37
2	16	33	49	24	32
3	23	41	63	26	26
4	35	40	73	33	30
5+	39	37	74	25	32

first four weeks, is substantially higher for first order births. We observed the lowest neo-natal mortality rate for birth order 2, with a sharp rise for birth orders 4 and 5 plus. This relationship is less strong for post-neonatal mortality, and for the overall infant mortality rate, however. This suggests that unlike the relationship with age of the mother, this one is primarily due to congenital or genetic factors, associated with the birth itself. However, once maternal age is controlled (table 6.15), we observe somewhat larger differentials by birth order for post-neonatal mortality, at least for mothers aged under 20 and 20–29, but not for older mothers. In addition, we note that a very sharp rise occurs from order 2 to order 3 births (19–55 for neo-natal and 64–96 for infant mortality) for very young mothers (those under 20). This is doubtless a reflection of the effect of very close spacing of births (third birth before age 20) on the risk of infant death. We explain this relationship in more detail in section 6.5.

Regardless of place of residence, neo-natal mortality shows a U-shaped relationship with birth order (table 6.16). In rural as well as urban areas, the death rate of first order births is more than twice as much as that of second order births. This suggests that the birth order effect on mortality is independent of rural–urban place of residence.

Table 6.15 Probabilities of death, by birth order and maternal age[a]

Birth order	Maternal age	Mortality measure		
		Neo-natal	Post-neonatal	$_1q_0$
1	<20	45	32	76
	20–29	35	21	56
	30–39	24	–	24
	40–49	–	–	–
2	<20	19	45	64
	20–29	16	28	44
	30–39	9	36	45
	40–49	–	–	–
3	<20	55	43	96
	20–29	25	41	65
	30–39	8	36	43
	40–49	–	111	–
4	<20	–	–	–
	20–29	39	45	82
	30–39	29	28	56
	40–49	–	–	–
5+	<20	–	–	–
	20–29	29	–	61
	30–39	38	33	69
	40–49	60	64	121

[a]Estimates for a category with fewer than 50 births are not shown.

Table 6.16 Neo-natal mortality rates, by birth order and rural–urban place of residence (number of births in parentheses)

Birth order	Rural	Urban
1	48 (1412)	26 (703)
2	19 (1151)	11 (571)
3	21 (993)	27 (442)
4	34 (846)	36 (360)
5+	41 (2226)	33 (815)

None the less, the urban rates are substantially lower than rural rates for all birth orders.

6.4 SOCIO-ECONOMIC CORRELATES OF INFANT AND CHILD MORTALITY

Socio-economic conditions undoubtedly exert a powerful influence on the state of health of an individual and the whole set of events that finally end in a death. However, knowledge of the mechanisms that regulate the relationships is imperfect because of the complexity of the problem, the close inter-relationship that exists among the various phenomena and the inadequacy of statistical information.

Social theorists argue that within any society an unequal distribution of wealth will produce differences in the quality of life enjoyed by the various social groups. These differences extend to factors such as nutrition and health care, which have a direct influence on the occurrence of sickness and death. In the GFS, a few basic social indicators were measured. They included: type of place of residence, education of the respondent and her husband's education, and some information on occupation. This section will use the two most important of these indicators, place of residence and respondent's education, as an approximate index of socio-economic differences in the background of women. It is likely that urban–rural residence will be related to the availability and accessibility of health services, for example. Education is also related to mortality and morbidity risks because highly educated women know more about the nutritional value of different foods, are more likely to have pre-natal and post-natal care, and a hospital delivery, and on the whole would be more aware of existing medical services and more willing to use these services than less educated women.

In the early childhood period evidence has emerged that socio-economic factors play an important role in determining the level of infant and child mortality. In a famous study of social and biological factors in infant mortality in England and Wales, Morris and Heady (1955) observed a step-by-step increase in the still-birth rate and neo-natal and post-neonatal mortality rates from social class one to social class five, a classification which was based on occupation of the father. Researchers utilizing WFS data have also reported similar variations in infant and child mortality by certain defined socio-economic factors (Caldwell and McDonald 1981; Hobcraft *et al* 1984; Alam and Cleland 1984; Thapa and Retherford 1982). In most of the countries covered by the WFS, however, infant mortality was lowest in metropolitan areas, higher in urban areas and still higher in rural areas, and in virtually every country studied with the WFS data, both infant and child mortality decreased consistently with increasing education of parents, particularly that of the mother (Rutstein 1983).

Conversely, it has been recognized that the level of infant and child mortality is a very important indicator of the health status of children and of the overall level of social and economic development. Using macro-level data, Preston (1978), in a cross-national study of per capita income and infant mortality, also observed that countries with higher per capita income, except the oil rich Arab and African countries, enjoyed relatively lower infant mortality. Community characteristics and health facilities and their relationship with infant and child mortality have also been studied in Bangladesh (Al-Kabir 1984), Cameroon (Njeck 1984), Ecuador (Borja 1985), Egypt (Eid and Casterline 1985) and Ivory Coast (Tiapani 1984). These studies showed that the presence of health facilities in villages is associated with lowered mortality.

We, therefore, examine in this section socio-economic differentials in the risk of death early in life by determining how much of the infant and child mortality rates estimated for the 10-year period before the survey could be accounted for by variability in socio-economic conditions. The variables considered are: education of parents, type of place of current residence and region of residence. For each variable we control for the age of mother at birth and birth order. Later in the study we examine multivariate log-linear rate

models of the risk of death to children, to estimate the independent effect of socio-economic and biological factors on mortality.

Mortality differentials by education of mother

Several studies have shown that parental education, particularly that of the mother, powerfully differentiates among infant and child mortality levels. So far the results from these studies indicate that children born to educated mothers have better chances of survival than children born to mothers without any formal education (Gaisie 1969b; Behm 1979; Caldwell 1979; Farah and Preston 1981). These observations have been confirmed by studies utilizing WFS data, which show that in virtually every country surveyed, both infant and child mortality decrease consistently with increasing education. In Pakistan for instance, Alam and Cleland (1984) observed that children of educated women experience lower mortality at all ages than those of women with no schooling. The study also shows twice as high toddler (1–2 years of age) and child mortality rates for the uneducated group compared with the educated group. In a study of 28 WFS surveys, Hobcraft *et al* (1984) also observed a common pattern of steadily decreasing risk in neo-natal mortality for increasing levels of mother's education, except for a few minor anomalies. But even in countries with minor anomalies, seven or more years of mother's education leads to a mortality rate only half as much as that of children of mothers with no education.

The search for the cause of such differentials has indeed engaged the attention of demographers for some time now. Two schools of thought have emerged. One school supported by Behm (1979) treats mother's education as a proxy for socio-economic status. They argue that education is correlated with other indicators of the standard of living and educational differences reflect the uneven distribution of resources and services in the population which manifests itself in differential mortality. The other school led by Caldwell (1979) argues a cogent case for a more direct effect through improved child care and less fatalism with respect to health, which would result from improvement in mothers' education. Viewed from whichever standpoint, it is clear that children born to educated mothers experience better chances of survival.

We present three tables in this section to examine the relationship between maternal education and mortality. Tables 6.17, 6.18 and 6.19 present the various mortality rates by age at maternity, birth order and level of education of mother. We have identified three categories of mothers by level of education for the analysis. These are: mothers with no schooling, mothers

Table 6.17 Probabilities of death, by age at maternity and mother's education (number of births in parentheses)[a]

Mortality measure/ years of schooling	Age at maternity				
	< 20	20–29	30–39	40–49	All ages
A Infant mortality rates					
No schooling	67 (743)	64 (2876)	66 (2214)	121 (389)	68 (6222)
1–9 years	79 (504)	58 (911)	49 (326)	–	63 (1767)
10+ years	83 (384)	47 (920)	57 (194)	–	58 (1513)
B Neo-natal mortality rates					
No schooling	30 (743)	30 (2876)	33 (2214)	57 (389)	32 (6222)
1–9 years	44 (504)	29 (911)	28 (326)	–	33 (1767)
10+ years	52 (384)	18 (920)	41 (194)	–	30 (1513)
C Post-neonatal mortality rates					
No schooling	39 (721)	35 (2791)	35 (2142)	68 (367)	37 (6021)
1–9 years	37 (482)	31 (885)	22 (317)	–	31 (1709)
10+ years	33 (364)	29 (903)	16 (186)	–	28 (1467)

[a]Estimates for a category with fewer than 50 births are not shown.

Table 6.18 Child mortality rates, by age at maternity and education (number of births in parentheses)[a]

Mortality measure/ years of schooling	Age at maternity				
	< 20	20–29	30–39	40–49	All ages
A Toddler mortality rates ($_1q_1$)					
No schooling	28 (532)	29 (1955)	24 (1404)	33 (123)	27 (4014)
1–9 years	44 (273)	19 (486)	5 (189)	–	23 (957)
10+ years	5 (198)	10 (415)	32 (93)	–	11 (711)
B Child mortality rates ($_3q_2$)					
No schooling	37 (517)	37 (1898)	35 (1370)	59 (119)	37 (3904)
1–9 years	61 (261)	10 (477)	11 (188)	–	25 (935)
10+ years	30 (197)	15 (411)	0 (90)	–	17 (703)

[a]Estimates for a category with fewer than 50 births are not shown.

Table 6.19 Probabilities of death, by mother's education and parity (number of births in parentheses)

Mortality measure/years of schooling	Parity					
	1	2	3	4	5+	All parities
A Infant mortality rates						
No schooling	55 (951)	56 (953)	66 (927)	77 (870)	77 (2521)	68 (6222)
1–9 years	81 (558)	45 (378)	57 (263)	82 (195)	48 (373)	63 (1767)
10+ years	72 (600)	33 (391)	58 (240)	29 (139)	91 (143)	58 (1513)
B Neo-natal mortality rates						
No schooling	33 (951)	18 (953)	25 (927)	37 (870)	39 (2521)	32 (6222)
1–9 years	50 (558)	11 (378)	23 (263)	46 (195)	29 (373)	33 (1767)
10+ years	43 (600)	15 (391)	17 (240)	7 (139)	63 (143)	30 (1513)
C Post-neonatal mortality rates						
No schooling	23 (920)	38 (936)	42 (904)	42 (838)	39 (2423)	37 (6021)
1–9 years	32 (530)	35 (374)	35 (257)	38 (186)	19 (362)	31 (1709)
10+ years	30 (574)	18 (385)	42 (236)	22 (138)	30 (134)	28 (1467)

with 1–9 years of schooling and mothers with 10+ years of schooling. Age at maternity is presented in the order of: all ages at maternity, less than 20, 20–29 and 30–39; and, in the case of birth order, we have 1, 2, 3, 4 and 5 or more.

The most striking pattern in table 6.17 is the observed inverse relationship between infant mortality (and its components, neo-natal and post-neonatal mortality) and education. The infant mortality rate for mothers with no schooling, for instance, exceeds the rate for those with 1–9 years and 10+ years of schooling by 7 and 15 per cent, respectively, while post-neonatal mortality is in excess by 15 and 30 per cent, respectively. Further examination of the pattern of these mortality differentials shows rather puzzling results for infant and neo-natal deaths. For both measures, mortality rises very sharply for young mothers only (those aged less than 20), as education increases. This differential may be partly explained by more complete reporting by better educated young mothers. This pattern is, however, reversed for older mothers, although the rates are somewhat unstable at ages 30–39 and 40–49, where the number of births to educated older mothers is quite small.

Examination of the mortality pattern by age at

maternity for each level of education reveals a U-shaped pattern of very high mortality for very young mothers, relatively low rates for mothers aged 20–29 and high mortality for higher ages at maternity, for infant and post-neonatal deaths for all three level of education groups; but this pattern is found for neo-natal deaths only among mothers with 1–9 years and 10+ years of schooling.

For early and later childhood mortality (table 6.18), we observe the already-established pattern of an inverse relationship between level of education and mortality. Mortality in early childhood to mothers with no schooling is, for instance, 15 and 52 per cent more than mothers with 1–9 years and 10+ years of schooling, respectively. In the case of later childhood, the death rate for children whose mothers have no education is twice as high as that for mothers who have 1–9 years of schooling. For both early and later childhood mortality, we observe a monotonic decline in mortality for maternal age 20–29 with increasing number of years of schooling, but no discernible pattern for children born to young mothers aged less than 20.

Table 6.19 shows differentials in infant, neo-natal and post-neonatal mortality by level of education of mothers and birth order. As expected, we find the commonly observed pattern of higher mortality for birth order 1, low mortality for orders 2 and 3 and higher death rates for higher order births for all levels of education, for neo-natal deaths. Post-neonatal deaths, on the other hand, do not show any discernible association by birth order within levels of education, perhaps because such deaths are mainly caused by environmental rather than biological factors. Although declining neo-natal and post-neonatal mortality was generally found as education increased, within each birth order, an important exception occurred among first births, where a positive relationship was observed. This anomaly echoes that found by age of mother, ie young mothers (who will be the group having the majority of first births) also had a positive relationship between neo-natal mortality and education. We would conclude that similar reasons to those put forward above would account for this anomalous finding.

Differentials by region

Region in Ghana is a very important unit for demographic analysis for two reasons. First, the regions are the major administrative subdivisions of the country and therefore planners are better able to utilize results from studies based on the regions for policy formulation and implementation. Secondly, the regions show considerable variations in social and economic characteristics. Analysis of regional variations in infant and child mortality is therefore necessary as an important input into policy formulation in the areas of health and development.

There were nine regions in the country at the time of the Ghana Fertility Survey (the number has recently been increased to ten). For practical purposes of facilitating the analysis we have combined Western and Central regions, Northern and Upper regions, and Ashanti and Brong Ahafo regions. We therefore have six regions for the analysis. The combination of these regions was based on the similarity of their cultural and socio-economic characteristics.

Table 6.20 presents the probabilities of death by region and age at maternity for children under four weeks old, between one and eleven months old and under twelve months old. We observe substantial differences in neo-natal deaths between the regions for all ages at maternity. The lowest neo-natal death rate (20 per thousand) is found in Ashanti/Brong Ahafo. Western/Central region with a rate of 62 has the highest neo-natal death rate in the country. For the remaining regions the range in the neo-natal death rate is quite narrow, 24–37 deaths per 1000 births. The observed regional variations in neo-natal mortality probably reflect the uneven distribution of medical and health facilities, particularly those connected with maternal care and delivery systems. With the exception of Northern/Upper region, the neo-natal death rate is high for maternal age <20, relatively lower for 20–29 and higher again at 30–39, conforming to the expected pattern.

Greater Accra with 17 deaths per 1000 live births has the lowest post-neonatal death rate in the country. This is followed by Eastern region with a rate of 22. The highest post-neonatal mortality is found in Northern/Upper region which has a rate of 62. It is likely that these regional variations in post-neonatal mortality reflect variation in modernization and availability of health care in the country. Further examination of the pattern of regional variation in post-neonatal mortality reveals that four out of the six regions show the expected U-shaped pattern of variation in mortality with age at maternity.

Table 6.20 Probabilities of death, by age at maternity and region (number of births in parentheses)[a]

Mortality measure/ region	Age at maternity				
	All ages	< 20	20–29	30–39	40–49
A Neo-natal mortality rates					
Western/Central	62 (1596)	70 (298)	51 (703)	54 (503)	163 (92)
Greater Accra	24 (940)	26 (153)	24 (537)	26 (234)	–
Eastern	28 (1485)	36 (248)	28 (702)	26 (454)	12 (81)
Volta	37 (918)	74 (135)	23 (484)	48 (270)	–
Ashanti/Brong Ahafo	20 (2873)	31 (540)	12 (1449)	21 (768)	60 (116)
Northern/Upper	30 (1713)	15 (262)	38 (848)	30 (506)	10 (97)
B Post-neonatal mortality rates					
Western/Central	47 (1497)	65 (277)	43 (667)	36 (476)	78 (77)
Greater Accra	17 (917)	27 (149)	15 (524)	18 (228)	–
Eastern	22 (1443)	21 (239)	23 (682)	20 (442)	25 (80)
Volta	23 (884)	32 (125)	19 (473)	19 (257)	–
Ashanti/Brong Ahafo	28 (2816)	29 (523)	33 (1432)	17 (752)	46 (109)
Northern/Upper	62 (1661)	47 (258)	54 (816)	73 (491)	115 (96)
C Infant mortality rates					
Western/Central	106 (1596)	131 (298)	92 (703)	87 (503)	228 (92)
Greater Accra	41 (940)	52 (153)	39 (537)	43 (234)	–
Eastern	50 (1485)	56 (248)	51 (702)	46 (454)	37 (81)
Volta	59 (918)	104 (135)	41 (484)	67 (270)	–
Ashanti/Brong Ahafo	48 (2873)	59 (540)	44 (1449)	38 (768)	103 (116)
Northern/Upper	90 (1713)	61 (262)	90 (848)	101 (506)	124 (97)

[a]Estimates for a category with fewer than 50 births are not shown.

With an overall rate of 106 infant deaths per 1000 live births, Western/Central region has the highest infant mortality rate in the country. The death rate is almost twice as high as that of Greater Accra, Eastern, Volta and Ashanti/Brong Ahafo. The lowest infant mortality is in Greater Accra (41), followed by Ashanti/Brong Ahafo (48). We again observe that the U-shaped pattern of mortality differential by age at maternity is established for all the regions except Northern/ Upper region.

Disparities in the order of 12 per thousand exist in early childhood mortality between Ashanti/ Brong Ahafo and Eastern regions on the one hand and Volta, Greater Accra and Western/Central regions on the other (see table 6.21). Northern/ Upper region has the highest early childhood mortality of 44. This is quite a different pattern from that of infant mortality, where Western/ Central region had the highest level of infant mortality. This may be due to differences in prevalence of diseases and sickness in the early childhood period among the regions. Ashanti/ Brong Ahafo and Eastern regions again have the lowest later childhood mortality in the country with just about 22 child deaths per 1000 live births across all ages at maternity. The rates for Western/Central, Greater Accra and Volta regions are at almost the same level and moderately higher (32). Northern/Upper region has the highest later childhood mortality of 61. For both early and later childhood mortality, the lowest rates are identified with maternal age 20–29 with relatively higher rates for very young and old maternal ages, for all regions.

Using earlier survey and registration data, Gaisie (1976) arrived at similar inter-regional differences in infant and child mortality rates, crude death rates and expectation of life at birth. Notwithstanding the observed regional differentials in the country from both studies, it is important to emphasize that region of

Table 6.21 Child mortality rates, by age at maternity and region (number of births in parentheses)[a]

Mortality measure/ region	Age at maternity			
	All ages	<20	20–29	30–39
A Toddler mortality rates ($_1q_1$)				
Western/Central	29 (936)	40 (177)	24 (421)	29 (309)
Greater Accra	26 (543)	27 (111)	32 (310)	8 (118)
Eastern	15 (941)	20 (147)	18 (450)	9 (316)
Volta	28 (571)	71 (84)	16 (312)	30 (165)
Ashanti/Brong Ahafo	16 (1721)	23 (305)	15 (882)	12 (496)
Northern/Upper	44 (980)	16 (182)	49 (486)	49 (283)
B Child mortality rates ($_3q_2$)				
Western/Central	32 (909)	41 (170)	39 (411)	17 (300)
Greater Accra	32 (529)	65 (108)	30 (300)	9 (117)
Eastern	23 (927)	49 (144)	14 (442)	22 (313)
Volta	31 (555)	13 (78)	42 (307)	19 (160)
Ashanti/Brong Ahafo	22 (1694)	34 (298)	16 (869)	27 (490)
Northern/Upper	61 (937)	50 (179)	50 (462)	78 (269)

[a]No estimate is shown for age group 40–49 due to fewer than 50 births in each subgroup.

residence is not a determinant of mortality *per se*. Rather, it is acting as a proxy for other variables that are themselves determinants. On the basis of this analysis it is difficult to say what variables it is representing. The most logical factors, however, are distribution of medical and health facilities, prevalence of diseases and the general level of development.

Differentials by rural–urban place of residence

Several demographic studies in developing countries have focused on the risk of death associated with rural and urban places of residence (Behm 1979; Johnson 1964; Davis 1973). The results from these studies show that children born in rural areas have considerably lesser chances of survival than children born in urban areas. This pattern is, however, a reversal of the mid-nineteenth century European trend of higher urban than rural mortality which was attributable to congestion, pollution and unhealthy sanitary conditions in the large towns and cities which provided a favourable environment for the spread of epidemics and infectious diseases.

In most of the countries which participated in the WFS, infant mortality was lowest in metropolitan areas, higher in other urban areas and higher still in rural areas. In a few countries (notably Bangladesh, Egypt, Philippines, Sri Lanka and Thailand), infants in metropolitan centres have no large advantage in survival over those in other urban areas but the two urban areas still have a greater advantage over those living in rural areas. In seven other countries (Costa Rica, Dominican Republic, Jamaica, Paraguay, Republic of Korea, Mauritania and Tunisia), infants born in rural areas have about the same chances of survival as those born in small urban areas. In two other countries, Guyana and Haiti, infants born in the capital city are much less likely to survive than even those born in rural areas. For mortality between ages 1 and 4 years, however, death rates are almost always lowest in metropolitan areas, intermediate in other urban and highest in rural areas (Rutstein 1983).

We present the results of our study in tables 6.22 and 6.23 for neo-natal, post-neonatal, infant, early and later childhood mortality rates. We consider three major places of residence which are: large urban, other urban and rural.

The results indicate that in Ghana, for all ages at maternity, neo-natal mortality is about the same in smaller urban areas as it is in the rural areas, but there is a substantially reduced probability of death at 1–4 weeks in large urban areas. The neo-natal death rate in large urban areas is 42 per cent lower than that of smaller urban

Table 6.22 Probabilities of death, by age at maternity and place of residence (number of births in parentheses)[a]

Mortality measure/ place of residence	Age at maternity				
	All ages	< 20	20–29	30–39	40–49
A Neo-natal mortality rates					
Rural	35 (6634)	44 (1123)	30 (3222)	35 (1956)	54 (333)
Other urban	33 (1497)	32 (277)	30 (767)	35 (400)	75 (53)
Large urban	19 (1394)	30 (236)	14 (734)	18 (379)	–
B Post-neonatal mortality rates					
Rural	38 (6403)	40 (1074)	36 (3126)	35 (1888)	73 (315)
Other urban	32 (1447)	26 (268)	42 (744)	21 (386)	–
Large urban	23 (1368)	35 (229)	15 (724)	27 (372)	–
C Infant mortality rates					
Rural	71 (6634)	82 (1123)	64 (3222)	69 (1956)	123 (333)
Other urban	64 (1497)	58 (277)	70 (767)	55 (400)	75 (53)
Large urban	42 (1394)	64 (236)	29 (734)	45 (379)	–

[a]Estimates for a category with fewer than 50 births are not shown.

Table 6.23 Child mortality rates, by age at maternity and place of residence (number of births in parentheses)[a]

Mortality measure/ place of residence	Age at maternity				
	All ages	< 20	20–29	30–39	40–49
A Toddler mortality rates ($_1q_1$)					
Rural	25 (3987)	28 (685)	24 (1950)	24 (1240)	18 (112)
Other urban	24 (913)	28 (176)	27 (474)	12 (250)	–
Large urban	25 (829)	32 (155)	22 (448)	24 (211)	–
B Child mortality rates ($_3q_2$)					
Rural	34 (3889)	44 (666)	31 (1903)	33 (1210)	55 (110)
Other urban	17 (891)	23 (171)	17 (461)	12 (247)	–
Large urban	37 (808)	53 (150)	32 (438)	34 (206)	–

[a]No estimate is shown for a category with fewer than 50 births.

areas. However, the differences in neo-natal mortality between rural and smaller urban areas is very pronounced for maternal ages over 20, while the very large gap between smaller urban and large urban places is narrowed for these young mothers.

In the case of post-neonatal mortality we observe a more systematic decline, with increasing size of place of residence across all maternal ages: the lowest death rate is in large urban areas, with an intermediate rate in smaller urban areas and the highest rate in rural areas. However, this pattern of decreasing mortality with increasing urbanism is not maintained for every age group at maternity. For instance, at maternal ages under 20, the lowest mortality rate is found in smaller urban areas and for maternal age 20–29 the highest mortality rate is found in smaller urban areas. None the less we observe the expected U-shaped pattern of mortality with age at maternity for rural and large urban areas.

The typical pattern of decreasing mortality with increasing urbanism is observed across all ages at maternity for infant mortality. Infant mortality in rural areas is 10 per cent higher than smaller

urban areas and 41 per cent higher than larger urban areas. A similar pattern is observed for maternal ages 20–29 and 30–39. In the case of very young mothers (ie less than 20) and old mothers (40–49) the lowest infant death rate is observed in smaller urban areas, but the number of births on which the rate is based is quite small. Again, the U-shaped pattern of mortality with age at maternity is established in rural and large urban areas only, but not for smaller urban areas.

We observe that toddlers in urban and large urban areas have no advantage in survival over those in rural areas across all ages at maternity (table 6.23), a finding which is puzzling. We however observe enormous disparity in later childhood mortality between rural areas and smaller urban areas across all ages at maternity and also for the different groups of ages at maternity. Indeed, the later childhood mortality rate in rural areas is double that of urban areas across all ages at maternity and at maternal ages under 20 and 20–29. Normally, we would attribute these rural and smaller urban disparities in mortality to a combination of lower socio-economic level and relatively poorer access to medical and health services in the rural areas, but the fact that the later-childhood mortality in large urban areas is the highest across all ages at maternity as well as in the different age groups at maternity makes that argument untenable. A factor which probably accounts for the unexpectedly high child death rates for the large urban areas was the outbreak of cholera in the coastal areas of the country in 1972, as a result of which many children died in Accra and Sekondi-Takoradi, which make up two of the three large urban areas in Ghana[3].

[3] *Editors' Note:* In the absence of statistical data on the outbreak of cholera in 1972 and its effect on child mortality by type of area, one can offer this merely as one partial explanation among a number of possible explanations. Further exploration into child mortality rates by place of residence and period does not reveal a consistent pattern or support the proposition put forth above. For example, $_3q_2$ in 1965–9 – a period unaffected by the reported cholera outbreak – was 51 per 1000 in major urban as compared to 39 in other urban and 49 in rural areas. Furthermore, $_3q_2$ in 1970–4 (the period that covers the cholera epidemic) was 45 in rural areas as compared to 31 in major urban areas. The patterns change from one measure of child mortality to another and from one period to another over the 20-year period before the survey. Thus, figures from the GFS do not substantiate as fully as the statement implies, that the cholera outbreak in 1972 was the major factor leading to higher child mortality in major urban as compared to other urban or rural areas.

6.5 BIRTH SPACING EFFECTS ON INFANT AND CHILD MORTALITY

The link between short birth intervals and higher risk of infant and child mortality has been recognized since the early 1920s. Hughes (1923) in his study of 1135 births in Gary, Indiana (USA), found an infant mortality rate of 169 per 1000 births when the previous interval was less than 15 months, compared with 103 per thousand for intervals of 2 years or more. Yerushalmy (1945), using an indirect method of estimating the risk, reached similar conclusions with regard to still-birth rates among birth cohorts of 1937–41 in the United States. Similar findings have been observed by Morris and Heady (1955), Addo and Goody (1974), Wolfers and Scrimshaw (1975) and Omran (1976, 1981). Several literature reviews about the effects of birth order, child spacing, and birth intervals on child survival have been made in recent years by Wray (1971), Omran (1976, 1981), Gray (1981), Winikoff (1983), Hobcraft *et al* (1984) and Cleland and Sathar (1984).

The common finding from these studies is that short intervals between births is detrimental to the health of the mother and the health of the children born at both ends of the interval. One obvious mechanism causing poorer survival chances is the 'maternal depletion syndrome' (Jelliffe 1966). It has been found that a short interval does not give the mother sufficient time to recuperate from birth and to replenish her stores of nutrients used during pregnancy. Such mothers are more likely to have pregnancy losses and low birth-weight babies. Low birth weight decreases chances of immediate survival as a result of the infant's vulnerability to infection with consequent greater chance of death (Puffer and Serrano 1973, 1975; Ebrahim 1982). Another mechanism likely to cause poorer survival chances for children in closely-spaced families is often called the 'competition' thesis. In this case, having closely-spaced children to care for at the same time does not allow the mother to devote her full attention to either child. Children may also be at higher risk as a result of sharing meagre resources (Wray and Aguire 1969; Puffer and Serrano 1973; Omran 1981; Ebrahim 1982). The competition of a rapid subsequent pregnancy is another important aspect of this phenomenon even though studies in this direction are very sparse. The effect of such a pregnancy is often to induce too early weaning, with consequent deleterious effects on survival of the preceding child. For example, Swenson (1977), in a study of rural areas in Bangladesh,

compared the survivorship of the index child between age 1 and 3 by whether the next pregnancy occurred within 12 months or not, and found that children whose birth was followed by a subsequent pregnancy in less than 12 months have significantly lower survivorship than those whose birth was followed by longer intervals.

Evidence concerning the association between preceding and also succeeding interval length and mortality risk has been greatly augmented recently by findings of the World Fertility Survey project (Thapa and Retherford 1982; Edmonston 1983; Alam and Cleland 1984; Rutstein 1983). Analysis of WFS data based on 26 countries, for instance, shows that the occurrence of a birth less than two years after the previous birth increased the mortality rate in the first month of life by at least 50 per cent in 24 countries, and more than doubled it in 14 of them (Rutstein 1983). The effects of rapid childbearing were equally apparent in the second and twelfth month of life where the mortality risk was raised by at least 50 per cent in 22 countries and actually doubled in 12. Rutstein (1983) again observed that a closely-spaced subsequent birth also tended to adversely affect the survival chances of the older child. And Hobcraft *et al* (1983), in their comparative analysis of WFS data from 23 countries, showed that the birth of another child within 18 months raised early childhood mortality rates ($_1q_1$) by over 50 per cent in 16 of the 23 countries examined. They further observed that the effect of the succeeding interval length was quite independent of the effect of the preceding birth.

It follows from the above that both the displaced child and the displacing child are affected adversely by short birth intervals. Consequently, prevailing medical opinions favour spacing of pregnancies in order to allow recuperation of mothers, to safeguard the health of the offspring and to enable mothers to breast-feed their children without the added burden of a new offspring.

The focus of this analysis will first be on the mortality of the nth child in relation to the length of the preceding birth interval (ie the interval between the n − 1th birth and the nth birth). In this regard, first order births are totally excluded from the analysis as they have no preceding interval. The second goal of this analysis is to examine the effect of spacing on survivorship of the older of a sibling pair, ie the succeeding birth interval, with a control for length of preceding interval. We compare the survival chances of children who were born less than two years since previous birth with that of children born 24–48 months or more than 48 months since the last birth. Since women who had experienced the loss of a previous child are more likely to experience losses in future, we control for the survivorship status of the last child to examine the effect of spacing on the survival chances of the next child.

We consider in table 6.24 the effect of preceding interval length on mortality without any control for birth order and maternal age. The bottom panel shows the relationship between survivorship of the index child and preceding birth interval length, without controlling for the survivorship of the preceding child. As expected, we observe an extremely strong association at all age segments up to 5 years. Children born within two years of the preceding birth experience an infant mortality rate which is more than three times as high as those born after an interval of four or more years; their neo-natal mortality rate is more than four times as high and post-neonatal rate three times as high. For early and later childhood periods children born within two years of the preceding birth experience risk of death twice as high as those born after an interval of four or more years.

The top and middle panels of table 6.24 also examine mortality in situations where the preceding child survived more than two years and where the child died before the age of two years. As expected, mortality in infancy is much higher where the preceding child died in the first two years than when the child survived more than two years. Specifically, the neo-natal, post-neonatal and infant mortality rates are three times as high when the preceding child died as when he or she survived. This is a noteworthy finding indeed, and confirms for Ghana the common finding that deaths of successive children are correlated. After age 1, however, the mortality differences between surviving more than two years and dying before age 2 diminish greatly. This suggests that the causes underlying the correlation are largely endogenous.

One important result of the analysis in table 6.24 is the persistence of the strong association between mortality at all age segments and the preceding birth interval regardless of survival status of the preceding child. The implication of this is that the link between birth spacing and mortality cannot be attributed entirely to the competition between two closely-spaced infants for food and parental care.

Table 6.24 Probabilities of death, by length of preceding birth interval and survivorship of preceding child, birth order 2 or higher (number of births in parentheses)[a]

Interval length	Mortality measure				
	Neo-natal	Post-neonatal	$_1q_0$	$_1q_1$	$_3q_2$
A Preceding child survived 2+ years					
Interval length					
< 2 years	37 (1314)	62 (1265)	97 (1314)	33 (821)	31 (794)
2–4 years	22 (4045)	24 (3956)	45 (4045)	27 (2484)	32 (2417)
4+ years	13 (1190)	24 (1175)	36 (1190)	17 (712)	14 (700)
All	23 (6549)	31 (6396)	54 (6549)	26 (4017)	29 (3911)
B Preceding child died in first 2 years					
Interval length					
< 2 years	105 (286)	117 (256)	210 (286)	29 (139)	59 (135)
2–4 years	56 (319)	90 (301)	141 (319)	39 (178)	58 (171)
4+ years	15 (66)	31 (65)	45 (66)	–	–
All	73 (671)	95 (622)	161 (671)	31 (355)	55 (344)
C All preceding children					
Interval length					
< 2 years	49 (1600)	71 (1521)	117 (1600)	32 (960)	36 (929)
2–4 years	25 (4364)	28 (4257)	52 (4364)	29 (2662)	34 (2588)
4+ years	13 (1256)	24 (1240)	37 (1256)	16 (750)	15 (738)
All	28 (7220)	37 (7018)	64 (7220)	27 (4372)	31 (4255)

[a]Estimates for a category with fewer than 50 births are not shown.

In spite of the obvious differences in mortality according to the preceding interval length, it still remains possible that there is a confounding effect of maternal age, originating from the fact that short birth intervals may be more common at young maternal ages where mortality risks are high. Consequently we examine whether the association between preceding interval length and survivorship of the index child persists when both birth order and maternal age at birth of the the index child are controlled. Table 6.25 presents the data for cases where the preceding child survived for two or more years.

It is obvious from the figures that despite the problem caused by small sample sizes in some cases, the interval effects still persist. This is particularly noticeable at maternal ages 20–29 and 30–39 for neo-natal, post-neonatal and infant mortality where the sample sizes are relatively large enough to facilitate comparison. We again observe that the association between preceding interval length and neo-natal, post-neonatal and infant mortality is particularly strong for birth orders 2 and 3–5. In addition, we observe erratic fluctuations for early and later childhood mortality due, possibly, to the small sample sizes.

Lastly, in the present analysis we consider the effect of spacing on survivorship of the older of a sibling pair, ie the effects of the succeeding interval length on the index child. This approach follows that of Hobcraft *et al* (1983) and takes into account the problem of reverse causality (ie the effect of early death of the index child on succeeding interval length) and overcomes it by identifying the group of children who were alive at the early conception of the next sibling, and contrasting their subsequent survivorship with children who experienced a longer delay to the next conception. We restrict our analysis only to childhood mortality, as this distinction is not feasible for the first year of life. The upper panel of table 6.26 presents early childhood mortality, cross-classified by whether or not a succeeding child was born within 18 months (ie conceived

Table 6.25 Probabilities of death per 1000 births, by length of preceding interval, birth order and maternal age, confined to cases where the preceding child survived at least two years (number of births in parentheses)[a]

Birth order	Interval length	Maternal age (years)		
		< 20	20–29	30–39
A Neo-natal				
2	< 2 years	20 (100)	22 (184)	–
	2–4 years	21 (192)	11 (723)	–
	4+ years	–	9 (235)	–
3–5	< 2 years	–	36 (419)	20 (151)
	2–4 years	–	19 (1339)	30 (560)
	4+ years	–	23 (264)	10 (306)
6+	< 2 years	–	44 (68)	48 (292)
	2–4 years	–	26 (153)	25 (768)
	4+ years	–	–	14 (217)
B Post-neonatal				
2	< 2 years	82 (98)	44 (180)	–
	2–4 years	16 (188)	20 (715)	17 59)
	4+ years	–	13 (233)	–
3–5	< 2 years	37 (27)	59 (404)	68 (148)
	2–4 years	71 (28)	30 (1313)	22 (543)
	4+ years	–	27 (258)	7 (297)
6+	< 2 years	–	31 (65)	65 (278)
	2–4 years	–	20 (149)	19 (749)
	4+ years	–	–	19 (214)
C Infant mortality ($_1q_0$)				
2	< 2 years	100 (100)	65 (184)	–
	2–4 years	36 (192)	30 (723)	17 (59)
	4+ years	–	21 (235)	–
3–5	< 2 years	–	93 (419)	86 (151)
	2–4 years	–	49 (1339)	52 (560)
	4+ years	–	49 (264)	17 (300)
6+	< 2 years	–	73 (68)	110 (292)
	2–4 years	–	46 (153)	43 (768)
	4+ years	–	–	32 (217)
D Early childhood ($_1q_1$)				
2	< 2 years	15 (65)	43 (115)	–
	2–4 years	30 (132)	25 (432)	–
	4+ years	–	13 (150)	–

[*Table continues*]

Table 6.25 (*cont*)

Birth order	Interval length	Maternal age (years)		
		< 20	20–29	30–39
3–5	< 2 years	–	30 (263)	33 (90)
	2–4 years	–	33 (845)	16 (354)
	4+ years	–	6 (153)	15 (188)
6+	< 2 years	–	–	36 (192)
	2–4 years	–	40 (100)	25 (474)
	4+ years	–	–	14 (137)
E Later childhood ($_3q_2$)				
2	< 2 years	78 (64)	18 (110)	–
	2–4 years	31 (128)	28 (421)	–
	4+ years	–	13 (148)	–
3–5	< 2 years	–	27 (255)	11 (87)
	2–4 years	–	30 (817)	28 (348)
	4+ years	–	19 (152)	5 (185)
6+	< 2 years	–	–	32 (185)
	2–4 years	–	10 (96)	36 (462)
	4+ years	–	–	22 (135)

[a]Estimates for a category with fewer than 50 births are not shown.

Table 6.26 Probabilities of death per 1000 births in early and later childhood, by length of succeeding and preceding birth intervals, confined to cases where preceding child survived 2+ years (number of births in parentheses)[a]

Interval length	Early childhood ($_1q_1$) Succeeding interval length in months		
	< 18	18+	Open
Preceding interval length			
< 2 years	125 (40)	28 (702)	25 (79)
2–4 years	69 (102)	25 (2067)	25 (315)
4+ years	–	16 (489)	22 (184)
All[a]	66 (181)	25 (3258)	24 (578)

Interval length	Later childhood ($_3q_2$) Succeeding interval length in years				
	< 2	2–3	3–4	4+	Open
Preceding interval length					
< 2 years	20 (153)	39 (291)	39 (153)	42 (120)	–
2–4 years	39 (441)	37 (803)	25 (516)	34 (350)	20 (307)
4+ years	–	13 (159)	15 (131)	16 (129)	22 (180)
All[a]	29 (695)	34 (1253)	26 (800)	33 (599)	18 (564)

[a]Including index births without a preceding interval (ie first births).

within 9 months) of the birth of the child with a control for length of preceding interval. In the lower panel, later childhood mortality is cross-classified by whether or not a succeeding child was born within 2 years, 2–3 years, 3–4 years or 4+ years of the birth of the child with a control also for length of preceding interval.

We observe immediately that only a minority of children who themselves survived the first year of life experienced the birth of a younger sibling within 18 months, hence the small sample sizes. Nevertheless, the interval effects still persist. The early childhood mortality of this group is twice as high as that for children with a longer succeeding interval. Much higher differentials exist where the succeeding birth was born within 18 months, compared to longer succeeding intervals, when preceding interval length is controlled. We also observe a slight drop in mortality for children with no younger sibling (categorized as open) when the preceding interval length is controlled, though this result is not open to straightforward interpretation.

In the case of later childhood mortality, presented in the lower panel of table 6.26, we observe much reduced mortality as the preceding interval increases in length, when the succeeding interval length is controlled. However, comparison between the different preceding interval lengths reveals erratic fluctuations due to small sample sizes.

6.6 DETERMINANTS OF INFANT AND CHILD MORTALITY

In analysing the relationship between socio-economic and biological factors and infant or child mortality, concentration on mortality rates for any single factor can lead to misleading interpretations. When factors are associated, as in our analysis above, single-factor rates may not necessarily reflect the independent effect of each factor on the rate. One way of overcoming this problem is to assess the independent effect of one factor by studying multi-dimensioned cross-tabulation of rates. Unfortunately, a multi-dimensional cross-tabulation of rates by all the relevant factors usually yields cells with small numbers so that the cell-specific rates cannot be estimated accurately and the issue of statistical significance arises. To estimate the independent effect of each variable, with other variables controlled, we adopt a multivariate log-linear rate model approach. This procedure seems an appropriate model-based analysis of a table of rates because it allows:

1 assessment of the relative influence of each such variable on the rate, by estimating its effects adjusted for the effects of associated explanatory variables;
2 assessment of the statistical significance of the overall fit of the model and of a particular explanatory variable;
3 accounting of the exposure in each cell so that the analysis is not overly sensitive to deviant rates based on small exposures; and
4 production of a table of fitted or predicted rates which provides more precise estimates of the rates for small subgroups of the population.

The analysis of a cross-tabulation of rates by various factors requires for each cell-specific rate the count of events and the exposure upon which the rate is based. We use a log-linear model for the number of events (deaths), with the logarithm of the number of individuals at risk (exposure) being included as a known adjustment term in the linear predictive part of the model. This model assumes homogeneity within each cell and that the number of events (deaths) follows a Poisson distribution. Parameter estimates and their standard errors are found through maximum-likelihood estimation using the statistical package Glim (Baker and Nelder 1978).

As an example, suppose D_{ij} is the number of events (deaths) in the ijth cell of a two-dimensional table of rates and N_{ij} is the corresponding number of individuals at risk (exposure). Our additive log-linear model would then be $\ln(D_{ij}) = \ln(N_{ij}) + a + b_i + c_j$, where b_i and c_j are parameters corresponding to the presence of an individual in row i and column j, respectively, and a is a constant. The presence of a case in row i and column j is indicated in the manner of dummy variables which take the value of one if an individual belongs to the category and zero, otherwise. The expected probability of death from this model would be $\exp(a \times b_i \times c_j)$ for cell ij. By adopting a convention that $b_1 = c_1 = 0$, it is usual to term $\exp(b_i)$ as the relative risk of being in category i compared with the first or baseline or reference category. Note that the b_i and c_j parameters are interpreted using the epidemiological concept of relative risk which is defined as a ratio of rates for various subgroups or

subpopulations. For example, among the three education categories, if we set 'no schooling' as the reference category, the parameter for '1–9 years of education' when exponentiated would be the risk of dying for children to mothers of 1–9 years of schooling relative to children of mothers with 'no schooling'. We further note that any cell in the table can be specified as the baseline cell and the constant term represent the cell-specific rate in that baseline cell simply by setting the row and column parameters corresponding to that cell equal to unity. Note again that the parameter estimates of the log-linear rate model when exponentiated allow us to return to the multiplicative form of the rate model and we interpret the exponentiated parameter estimates as estimated relative rates. A fuller account of these models is given by Hobcraft *et al* (1984).

Our strategy has been to fit a model containing simple main effects of maternal age, length of previous birth interval, birth order, education, residence and region. In other words, we estimate a single parameter corresponding to each category for every variable included in our cross-tabular analysis, but with one category arbitrarily set to zero. In our analysis, however, we examine the relative risks or the exponentiated parameter estimates which show the ratio of mortality level of the group in question to that of the omitted or baseline group. We also obtained parameter estimates and their standard errors, and an overall goodness of fit called deviance (log-likelihood ratio statistic) and its degrees of freedom. The statistical significance of each factor was determined by successively introducing them into the model and then comparing the change in the deviance with a chi-squared distribution in the usual way.

Results

Tables 6.27 and 6.28 show exponentiated parameter estimates or relative risks that result from fitting the model to the data. This model includes main effects for each of the six variables named above. The baseline or reference categories for the factors are: maternal age: <20; length of previous birth interval: <2 years; birth order: 2; education: mother's with no schooling; place of residence: rural; and region: Western/Central. In addition, we also calculated the adjusted mortality rates corresponding to the relative risks of tables 6.27 and 6.28, and these are shown in table 6.29. We begin by examining patterns for each variable in turn across each measure of mortality.

The fitting of the log-linear model to the data shows that age of mother at birth of child does not have a statistically significant effect on any of the measures of infant and child mortality. Nevertheless, the relative risks conform to the cross-tabular pattern noted earlier and indicate that children born to mothers in the age range 20–29 are advantaged in the first month of life

Table 6.27 Relative risks of neo-natal, post-neonatal and infant mortality, by background characteristics (number of births in parentheses)

Subgroup	Mortality measure					
	Neo-natal		Post-neonatal		Infant mortality ($_1q_0$)	
	Unadjusted	Adjusted	Unadjusted	Adjusted	Unadjusted	Adjusted
Maternal age						
<20[a]	1.00	1.00	1.00	1.00	1.00	1.00
		(435)		(424)		(435)
20–29	0.90	0.79	0.71	0.83	0.78	0.81
		(3764)		(3678)		(3764)
30+	1.36	0.92	0.74	0.87	0.95	0.89
		(3047)		(2842)		(3047)
Significance		NS		NS		NS
Length of previous interval						
<2 years[a]	1.00	1.00	1.00	1.00	1.00	1.00
		(1605)		(1526)		(1605)
2–3 years	0.50	0.54	0.41	0.40	0.45	0.47
		(4379)		(4272)		(4379)

[*Table continues*]

Table 6.27 (*cont*)

Subgroup	Mortality measure					
	Neo-natal		Post-neonatal		Infant mortality ($_1q_0$)	
	Unadjusted	Adjusted	Unadjusted	Adjusted	Unadjusted	Adjusted
4+ years	0.26	.028	0.33	0.33	0.31	0.32
		(1262)		(1246)		(1262)
Significance		**		**		**
Birth order						
2[a]	1.00	1.00	1.00	1.00	1.00	1.00
		(1704)		(1678)		(1704)
3—4	1.65	1.72	1.18	1.25	1.32	1.38
		(2583)		(2518)		(2583)
5+	2.46	2.22	1.09	1.11	1.51	1.44
		(2959)		(2848)		(2959)
Significance		*		NS		+
Education of mother						
No schooling[a]	1.00	1.00	1.00	1.00	1.00	1.00
		(5166)		(5012)		(5166)
1—9 years	0.82	0.28	0.76	1.11	0.78	1.04
		(1190)		(1161)		(1190)
10+ years	0.72	0.99	0.69	1.07	0.71	1.02
		(890)		(871)		(890)
Significance		NS		NS		NS
Place of residence						
Rural[a]	1.00	1.00	1.00	1.00	1.00	1.00
		(5117)		(4969)		(5117)
Urban	0.88	0.81	0.72	0.89	0.79	0.86
		(2129)		(2075)		(2129)
Significance		NS		NS		NS
Region						
Western/Central[a]	1.00	1.00	1.00	1.00	1.00	1.00
		(1235)		(1168)		(1235)
Greater Accra	0.47	0.62	0.38	0.44	0.43	0.53
		(673)		(656)		(673)
Eastern	0.47	0.47	0.54	0.55	0.51	0.52
		(1146)		(1117)		(1146)
Volta	0.53	0.57	0.50	0.54	0.52	0.56
		(697)		(677)		(697)
Ashanti/Brong Ahafo	0.29	0.32	0.64	0.68	0.45	0.49
		(2156)		(2122)		(2156)
Norther/Upper	0.48	0.52	1.62	1.81	1.00	1.10
		(1339)		(1304)		(1339)
Significance		**		**		**

[a]Reference category.
NS = Not significant
+ = Significant at .05 level
* = Significant at .01 level
** = Significant at .001 level

Table 6.28 Unadjusted and adjusted relative risks of death at ages 1–2, 3–5 and 0–5, according to background characteristics (number of births in parentheses)

Subgroup	Early childhood ($_1q_1$)		Later childhood ($_3q_2$)		Childhood ($_5q_0$)	
	Unadjusted	Adjusted	Unadjusted	Adjusted	Unadjusted	Adjusted
Maternal age						
< 20[a]	1.00	1.00	1.00	1.00	1.00	1.00
		(298)		(291)		(321)
20–29	1.25	1.27	0.59	0.64	0.81	0.87
		(2287)		(2220)		(2426)
30+	1.02	1.01	0.63	0.60	0.88	0.88
		(1757)		(1715)		(1892)
Significance		NS		NS		NS
Length of previous interval						
< 2 years[a]	1.00	1.00	1.00	1.00	1.00	1.00
		(957)		(926)		(1077)
2–3 years	0.86	0.81	0.89	0.89	0.66	0.66
		(2642)		(2568)		(2799)
4+ years	0.46	0.42	0.41	0.41	0.32	0.32
		(743)		(732)		(763)
Significance		+		+		**
Birth order						
2[a]	1.00	1.00	1.00	1.00	1.00	1.00
		(1045)		(1020)		(1100)
3–4	1.23	1.21	0.88	0.91	1.13	1.13
		(1566)		(1520)		(1670)
5+	1.09	1.25	1.04	1.13	1.25	1.27
		(1731)		(1686)		(1869)
Significance		NS		NS		NS
Education of mother						
No schooling[a]	1.00	1.00	1.00	1.00	1.00	1.00
		(3299)		(3203)		(3546)
1–9 years	0.64	0.82	0.44	0.54	0.59	0.76
		(640)		(628)		(669)
10+ years	0.68	0.77	0.21	0.26	0.58	0.76
		(403)		(395)		(424)
Significance		NS		*		NS
Place of residence						
Rural[a]	1.00	1.00	1.00	1.00	1.00	1.00
		(3082)		(3003)		(3309)
Urban	1.15	1.22	0.68	0.83	0.83	0.91
		(1260)		(1223)		(1330)
Significance		NS		NS		NS
Region						
Western/Central[a]	1.00	1.00	1.00	1.00	1.00	1.00
		(723)		(702)		(796)
Greater Accra	1.12	1.11	0.79	1.11	0.70	0.87
		(369)		(357)		(388)

[*Table continues*]

Table 6.28 (*cont*)

	Early childhood ($_1q_1$)		Later childhood ($_3q_2$)		Childhood ($_5q_0$)	
	Unadjusted	Adjusted	Unadjusted	Adjusted	Unadjusted	Adjusted
Eastern	0.51	0.53	0.76	0.79	0.51	0.53
		(747)		(736)		(777)
Volta	0.78	0.86	0.98	1.05	0.73	0.79
		(439)		(429)		(466)
Ashanti/Brong Ahafo	0.60	0.63	0.76	0.78	0.56	0.60
		(1324)		(1301)		(1385)
Northern/Upper	1.81	1.92	2.25	2.65	1.44	1.48
		(740)		(701)		(827)
Significance		**		*		**

[a]Reference category.
NS = Not significant at .05 level.
\+ = Significant at .05 level.
* = Significant at .01 level.
** = Significant at .001 level.

compared to children born to mothers of ages below 20, and compared to the oldest age group 30+ of mothers, who have a similar relative risk to that of young mothers. Interestingly, however, the oldest group of mothers has a much smaller relative disadvantage (0.92 as compared to 1.0 for mothers below age 20) of a neo-natal loss after all variables are adjusted, compared to their unadjusted mortality risk (1.36 as compared to 1.0 for women below age 20). In the case of post-neonatal mortality, we observe clear-cut reductions in risks for children born to mothers aged 20–29 and 30+. Children born to mothers aged 20–29 are still slightly advantaged even though there is a slight rise in their relative risk compared to children in the neo-natal period. In the early childhood period, the data show no difference in mortality between very young and old mothers. Moving on to the later childhood period, we observe clear-cut reductions in relative risks for both maternal ages 20–29 and 30+, relative to young mothers (table 6.28).

For all of the mortality measures other than neo-natal, the relative position of age groups of mothers remains the same after adjustment for all variables, as it was before adjustment. The implication of this result is that the existing differentials, statistically insignificant though they may be, are nevertheless probably due to unmeasured variables, such as biological factors (connected with the physiological state of older mothers) or developmental factors (such as the immaturity of young mothers which means they they are not experienced in child care).

Tables 6.27–6.29 clearly indicate that the length of previous birth interval has a statistically significant effect at all levels of mortality, but as the child ages the strength of the effect declines. For neo-natal mortality, we observe substantial reductions in mortality as the length of previous birth interval increases. Indeed the relative risks decrease monotonically, being only half as much for intervals of 2–3 years and one-third as much for intervals of more than four years, compared to short intervals of less than two years. As we look into the post-neonatal period, the reduction in the relative risk becomes even more substantial for previous birth interval length 2–3 years, corresponding to a risk of 0.40 as compared to 1.0 for previous intervals of less than two years. We still observe that previous birth interval length of more than four years conveys an appreciable advantage, but not as much as was found for neo-natal mortality. Short intervals of less than two years are still a major disadvantage. Given these differentials, similar reductions in relative risks are observed for infant mortality, as birth interval length increases. Between ages 1 and 5, however, the strength of the effect of length of previous birth interval is relatively weak, being statistically significant at .05 level compared with .01 level in infancy. In early childhood, the relative risks decrease by about 20 per cent for children born 2–3 years after an earlier sibling and by more than

Table 6.29 Adjusted[a] infant and child mortality rates

Variable and category	Mortality measure				
	Neo-natal	Post-neonatal	Infant ($_1q_0$)	Early childhood ($_1q_1$)	Later childhood ($_3q_2$)
Maternal age					
< 20	26.2	34.7	63.1	26.6	38.4
20–29	20.9	28.6	51.3	33.9	24.4
30+	24.2	30.2	56.4	26.9	23.2
Length of birth interval					
< 2 years	40.5	62.6	104.5	29.7	30.9
2–3 years	22.1	25.3	48.9	24.1	27.5
4+ years	13.0	20.5	33.1	12.7	12.7
Birth order					
2	13.4	26.3	41.8	25.8	24.2
3–4 years	23.0	32.7	57.3	31.4	22.1
5+ years	29.7	29.1	59.9	32.3	27.4
Education of mother					
No schooling	22.3	29.1	53.6	31.9	30.1
1–9 years	21.9	32.2	55.6	26.3	16.4
10+ years	22.2	31.1	54.7	24.7	8.0
Place of residence					
Rural	24.0	30.6	56.6	34.9	26.0
Urban	19.3	27.4	48.5	28.6	21.7
Region					
Western/Central	44.4	37.5	81.5	35.3	24.3
Greater Accra	27.6	16.3	43.6	39.3	26.8
Eastern	20.9	20.7	42.1	18.8	19.2
Volta	25.2	20.2	45.6	30.5	25.5
Ashanti/Brong Ahafo	14.0	25.7	40.1	22.1	18.9
Northern/Upper	23.2	67.9	89.8	67.9	49.7

[a]The adjusted rates are based upon the log-linear model which includes: (1) mother's age at birth; (2) length of previous birth interval; (3) birth order; (4) education of mother; (5) rural–urban place of residence; and (6) region of residence. The parameter estimates were adjusted by multiplying these by the proportion of cases to which the estimates referred.

50 per cent for those born after a gap of more than four years. The reduction in relative risk in the later childhood period for children born 2–3 years after an earlier sibling is marginal, corresponding to a relative risk of 0.89 compared with children born after a long interval of more than four years whose relative risk is 0.41.

The stability of the pattern of differences according to interval length, from unadjusted to adjusted relative risks, demonstrates that the effects of birth interval length exist across all socio-economic and other subgroups measured here. As in the case of maternal age differentials, these differences are probably due to unmeasured factors. Two such variables have been identified by other researchers, although the relationship between birth spacing and mortality is still debated among professional demographers:

1 maternal depletion syndrome, because of frequent pregnancies; and
2 competition for food and parental care with the previous closely-spaced births.

Birth order has a statistically significant effect on neo-natal and infant mortality but not on post-neonatal mortality. We observe clear-cut excess neo-natal mortality for higher order births even after controlling for other factors in the regression models. The relative risks increase monotonically,

being more than two-thirds greater for birth orders 3–4 and more than twice as great for orders 5+. Higher order births continue to be disadvantaged in the remainder of infancy although the relative risks are substantially reduced. The relative risks in childhood reveal interesting patterns which are, however, not statistically significant. We observe the persistence of heightened risks of death for higher order births in childhood. In the early childhood period we observe an increase of 20 and 25 per cent in relative risks for birth orders 3–4 and 5+, respectively, than for birth order 2. In later childhood, births of order 3–4 seem slightly advantaged while births of order 5+ are marginally disadvantaged. As in the case of maternal age and birth interval length, the relationship between this variable and mortality is just as strong after adjustment as it is for unadjusted rates. Again, we suggest that these results imply that unmeasured (probably physiological) factors are responsible for the increased relative risk of high order births.

In our discussion of cross-tabular rates of socio-economic correlates of infant and child mortality in section 6.4, maternal education emerged as a very important determinant of mortality. In addition, we observed substantial differentials in mortality by rural–urban place of residence. The results in the multivariate context indicate that after other factors are controlled, education of mother has a substantial and significant effect (at the .01 level) only for later childhood mortality, with the children of educated mothers being more advantaged. The relative risks associated with uneducated mothers contrast greatly with mothers who have 1–9 years and 10+ years of schooling (1.0 compared to 0.54 and 0.26). These are large reductions indeed and confirm the general increasing importance of socio-economic variables with age of the child. By contrast, the substantial unadjusted infant mortality differences, according to mother's education, are completely eliminated once other biological and socio-economic factors are controlled.

Rural–urban place of residence, however, shows no significant influence on mortality when other factors are controlled. The fact that the unadjusted rural–urban differentials are reduced after the model fitting implies that the residence effect on mortality partly arises from rural–urbal differences in the selected variables. However, some differences remain even after all other factors are controlled, both in infant and childhood mortality, with rural areas being relatively disadvantaged.

Tables 6.27–6.29 also indicate that region has a significant effect on neo-natal, post-neonatal and infant mortality at the .001 level after all other factors are controlled. It is interesting to note that in the neo-natal period the relative risks of all the regions are well below that of the baseline category of Western/Central region. This implies then that Western/Central is the most disadvantaged region in regard to neo-natal mortality. Indeed Ashanti/Brong Ahafo emerges as the most advantaged region in the country, in the neo-natal period, with a decrease of about 70 per cent in risk when other factors are controlled. This finding confirms the advantaged position observed for this region in the cross-tabular analysis. For the other regions the picture changes after the model fitting even though the results still show reductions in risks for all of them. Eastern region, with a relative risk of 0.47, emerges as the second most advantaged region, a position which was occupied by Greater Accra before the model fitting. With a relative risk of 0.62, Greater Accra is in fact second to Western/Central region as the most disadvantaged region in the neo-natal period. The resulting changes in the pattern of relative risks after controlling for the five other factors indicate that the observed excess neo-natal mortality associated with some of the regions may be more the consequence of inter-relationships among other factors, probably spacing patterns and birth-order effects within the regions, than being a result of socio-economic factors. In the case of post-neonatal mortality, however, the relative risk is lower for Greater Accra than it is for Ashanti/Brong Ahafo as compared to neo-natal risks. The relative risks associated with Western/Central region (baseline category) contrasted with Northern/Upper region increases rather sharply to 1.81. In addition, the data suggest no difference in relative risks between Eastern and Volta regions. These findings probably reflect differences in the level of socio-economic development of the various regions. For infant mortality as a whole the results indicate no significant difference in relative risks between Greater Accra, Eastern, Volta and Ashanti/Brong Ahafo regions which are all about 50 per cent of the baseline category of Western/Central region. Northern/Upper region emerges as the most disadvantaged region, with a slightly higher risk than Western/Central. The pattern of relative risks in early and later childhood by region reveals interesting features,

which are somewhat different from that of infant mortality, and which are also statistically significant. Unlike the results for infant mortality, Greater Accra and Volta regions have relative risks which are higher than those for Eastern and Ashanti/Brong Ahafo regions. Moreover, although Northern/Upper still has one of the highest risks, for childhood mortality, Western/Central does not have one of the worst risks, as it did for infant mortality. On the contrary, it is slightly better off than Greater Accra region, after all variables have been adjusted.

6.7 SUMMARY AND CONCLUSIONS

The results of this analysis of the GFS data have provided some useful insights into mortality conditions in Ghana in the recent past. The study indicates a substantial reduction in infant and child mortality over the last 25 years. Indeed we observed 38 fewer infant deaths per 1000 children born in the most recent period than in the period 20–24 years ago. The decline in neo-natal deaths over this period was, on average, about 23 per thousand and for post-neonatal deaths, it was 15. Thus, it is clear from this analysis that the most pronounced declines in infant deaths have been among deaths in the first month of life.

Regarding childhood mortality we observed that deaths to children between 1 and 2 years and 2 and 4 years also declined over the last 24 years. For early childhood mortality we observed 15 fewer deaths per 1000 children born in the most recent period than in the period 20–24 years ago, while for later childhood mortality, there were 28 fewer deaths per 1000 children born in the 5–9 year period before the survey than in the period 20–24 years prior to the survey. Among the factors responsible for such dramatic declines in infant and child mortality were: advancement in socio-economic development, improvement in medical and public health and, above all, improvement in the standard of living.

However, notwithstanding the overall decline over the entire 25 years, the available evidence suggests that the level of infant and child mortality remained more or less stable in the 10 years immediately preceding the survey (ie 0–4 and 5–9 year periods) due to economic setbacks and consequent deterioration in all aspects of life.

Another important finding concerns the relationship between bio-demographic and socio-economic factors and infant and child mortality. Our cross-tabular analysis revealed striking differentials in recent infant and child mortality (10 years before the survey) between the sexes, the various age groups of motherhood and among the various birth orders. Female mortality was substantially higher than male, while children born to teenage mothers and older mothers experienced considerable excess mortality over the more favourable age groups, 20–24 and 25–29. For the socio-economic variables, we observed excess mortality for mothers with no schooling, Western/Central and Northern/Upper regions and rural place of residence.

Another important area investigated in this study is the relationship between birth spacing and infant and child mortality. We observed that children born after a space of two or less years have a higher probability of dying, at all ages, than those born after a previous interval length of four or more years. Similarly, children who were followed by subsequent births soon after, also suffer increased risk of death.

But once we control for other factors in the log-linear model, age of mother at birth as well as rural–urban place of residence cease to be significant determinants of mortality. In addition, the effects of maternal education weakened, only being statistically significant at .05 level for later childhood mortality. As for the rural–urban place of residence, the absence of any effect of this variable on mortality after fitting the model reflects differences in the selected variables in rural–urban place of residence. Among the significant determinants of infant and child mortality, the length of previous interval emerges as the most dominant factor. We observed an approximately linear decline in probabilities of death as preceding interval lengthens. This suggests that if all mothers in Ghana spaced their children, infant and child mortality would be reduced considerably.

This study also shows that birth order has a strong and significant effect on survival in the first year of life, but the effect disappears thereafter. Region of residence is also a highly significant source of variation in infant and child mortality. The analysis reveals that for neo-natal and infant mortality, Ashanti/Brong Ahafo is the most advantaged region while in the post-neonatal period, Greater Accra has the least risk. This situation changes somewhat for childhood mortality, when, after all other factors have been

controlled, Greater Accra and Volta are worse off compared to their position for infant mortality, and Western/Central is relatively better off.

In conclusion, it is worth noting that the present study has highlighted the nature of and changes that have occurred in infant and child mortality in Ghana. It has also highlighted the sources of mortality variation and their relative importance. The gross inequalities we observe in the chances of survival during the first few years of life are, however, sufficient to suggest that our analysis has captured important dimensions of the problems associated with survival in the country. The results of the analysis suggest that the Government of Ghana has not yet been able to make any significant headway in reducing the high infant and child mortality which has remained at the same level since the early 1970s. We believe, however, that the present policy of Primary Health Care (PHC) is a positive step in the right direction towards achieving further reduction in mortality.

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7 Overview of Findings

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This chapter touches on the main findings of the various papers. This is a selective summary, focussing on policy-relevant results only. Chapter 1 gives a historical review of population policies in Ghana, but we do not attempt here to relate specific elements of the current policy with the results of the GFS. Since no attempt is made to thoroughly cover any chapter, readers who are interested in the full results of the analysis of any of the five main areas (nuptiality, fertility, contraception, preferences and family planning, and infant and child mortality) are referred to the chapters themselves.

7.1 NUPTIALITY PATTERNS

Marriage is universal among Ghanaian women with 99.8 per cent married over age 45. Over 30 per cent of women aged 15–19 at the GFS had already been married and most (97 per cent) were married by age 25–29. The overall mean age at marriage (SMAM) among females was 19.3 years. There was almost no change in SMAM over the five years prior to the GFS.

Nuptiality patterns show marked differences by region of residence, ethnicity and educational attainment of women. For example, 64 per cent of women in the Northern/Upper region were married in age group 15–19 in contrast to about 21 per cent among women living in Greater Accra, Eastern, and Volta regions. Whereas 56 per cent of women with no schooling were married in age group 15–19, only about 7 per cent among women with 11 or more years of schooling were married in the same age group. Likewise, the mean age at marriage among women with no schooling was 18 years, as compared to 23 years among women with 11 or more years of education.

Changes in age at marriage when examined by different birth cohorts (as indicated by their ages at survey) show relatively modest changes from an older cohort to the younger cohort. Interestingly, age at marriage among highly educated women (ie 10+ years of schooling), as well as among women with no schooling, has been declining from the older to the younger cohort.

Among women who had ever married by the time of the survey, educational attainment was one of the strongest variables differentiating age at marriage. The period of marriage was also a significant factor influencing age at marriage of ever-married women.

Overall, nearly one-third of all first marriages are dissolved because of either separation or divorce. However, most women experiencing dissolution of the first marriage, remarry soon after the dissolution. Therefore, any time lost due to marriage dissolution or delay in remarrying over the reproduction span of women, is clearly negligible.

Polygamy is still common in Ghana. Thirty-five per cent of currently married women were in polygamous unions. The prevalence of polygamy is highest in Northern/Upper region, where 50 per cent of currently married women were in polygamous unions. Volta also had a high proportion (43 per cent) of women currently in polygamous unions. A non-negligible proportion (27.1 per cent) of polygamous unions was noticed even for Greater Accra region.

The salient features of the work undertaken in chapter 2 are:

1 marriage is nearly universal for females in Ghana;
2 women marry on average by age 19;
3 the impact of marital dissolution on fertility levels is negligible, mainly due to a rather small proportion of marriages being dissolved and a

Susheela Singh, John Y. Owusu and Iqbal H. Shah, eds (1985). *Demographic Patterns in Ghana: Evidence from the Ghana Fertility Survey 1979–80:* 227–233. Voorburg, Netherlands: International Statistical Institute.

high level of remarriages among women who experience dissolutions; and

4 relatively modest changes in marriage and remarriage patterns.

7.2 FERTILITY LEVELS AND TRENDS

Results of analysis presented in chapter 3 confirm that the level of fertility in Ghana is high. It was found that at the national level during the period 1975–9 each woman, on the average, bore 6.5 children in her reproductive life span, compared with about 7 children, estimated from other sources by other demographers for the same period. The analysis however shows that there has been some decline, at the national level, in the level of fertility – about 0.7 of a child (or 10 per cent) in the period 1960–4 to 1975–9, with most of the change (0.45 child or 6.5 per cent) occurring in the period 1970–4 to 1975–9. The rate and magnitude of the decline, however, are not large enough to match the fast-declining mortality and arrest the increasing rate of population growth.

Of greatest interest, none the less, are the patterns and components of the change and their implications. The analysis shows that the decline in fertility was much more noticeable for age group 15–19 and for those aged 30 or above. Also, while the overall variation in the mean intervals between successive births is relatively small, the decline has been relatively much more rapid for higher birth orders, and the average length of birth intervals has increased in the period 3–7 years before the survey, compared to 8–12 years before the survey.

Regional differences in the levels of fertility during the 1975–9 period have also been found to be relatively small, except that Greater Accra with 5.0 children had the lowest average total fertility, compared with 7.1 for Western/Central and 6.5–6.7 for the other regions. Greater Accra however had only 3.4 per cent fertility decline in the last decade. Most of the other regions had declines ranging from 2.6 to 5.2 per cent. Northern/Upper region's 16 per cent decline is unexpected and may be due to poor quality of the data particularly as the region also recorded an 11 per cent rise in fertility from the 1965–9 to 1970–4 period. The reliability of the levels of fertility for Ashanti/Brong Ahafo is also suspected. These qualifications make findings on regional differentials somewhat inconclusive.

The rural–urban levels of fertility showed the expected pattern of lower fertility in urban compared with rural, and a relatively greater rate of decline, although the differentials are not great. However, while about half of the fertility decline in Major Urban areas occurred in the 1960s with the decline continuing to the recent decade, the Other Urban and the rural areas experienced the greater part of their small decline during the 1970s.

Education has been regarded as the socio-economic variable that is expected to have the strongest negative association with fertility. This is because education is seen as an agent of change or modernization in traditional societies. It affords the individual greater access to knowledge and information, and greater exposure to foreign values, ideas and influences which could activate a whole chain of modernization effects, including late marriage. The better educated are therefore more likely to know about contraception and use it, and to have a smaller family size. Towards these ends the government proposed in the policy statement to increase the proportion of girls entering and completing school.

The GFS results largely confirm this expectation. The fertility measures presented in chapter 3 for all women show significant differentials between women who have not attended school and women who had schooling beyond middle level, with the former having consistently higher fertility levels than the latter. However, the expected pattern of a monotonic decline in fertility as education rises was not always found. In several instances, a curvilinear pattern was found, with rising fertility up to the primary level, and occasionally even up to middle level, followed by a decline in fertility above that level. This pattern has been attributed to improvements in health and medical services which have improved fecundity. The educated, by virtue of their urban residence and greater readiness to accept modern changes, have a greater chance of benefitting from these health-improving services. The breakdown among the educated of traditional practices such as post-partum abstinence and prolonged breastfeeding, which tend to prevent or inhibit early pregnancy after a birth, also leads to shortening of birth intervals and consequently an increase in fertility. In the opposite direction, as stated before, there is relatively greater knowledge

and use of contraception among the educated, and the higher fertility levels of women with primary and incomplete middle-level education indicates that, unlike women in the highest educational group, the effects of the fertility-inducing factors carry a heavier weight than the effects of contraceptive use. The GFS findings therefore show that for any policy measure (relating to the expansion of educational facilities for women) to have the desired demographic effect, education should extend beyond middle-school level.

The findings also show that the rate of fertility decline among the educational groups over time was not very great, and as concluded in chapter 3, the fertility decline observed at the national level is therefore partly attributable to compositional changes in the level of education.

The foregoing overview of findings relating to fertility levels, differentials and trends show that at the aggregate level the level of fertility is high, but there has been some decline in the fertility rate over the past decade. The fertility rate within marriage is particularly high, and shows a lower rate of decline. Much of the decline, for all women, is attributable to the rise in age at marriage.

Opinions may, however, be divided over the nature of the decline – whether it is a short-run fluctuation, or a genuine trend which is likely to continue, or a result of, or response to, the economic hardships in the past decade that had led to strained married life for many couples and strains in many family homes, with the expectation that the decline will be halted or reversed when the economic situation improves. As discussed in chapter 3, however, the Ghanaian pattern reflects the pattern of change in the early stage of fertility transition – with the reduction initially concentrated at births of higher orders and among women of higher socio-economic subgroups.

7.3 KNOWLEDGE AND USE OF CONTRACEPTION

GFS results show that knowledge of contraceptive methods is relatively high in Ghana. Nearly 70 per cent of currently married women and 64 per cent of never-married women knew at least one method. Substantial differences exist among subgroups, with Northern/Upper region having especially low knowledge (22 per cent) and Ashanti/Brong Ahafo region the next lowest level among the regions (64 per cent), compared to 80 per cent or more in all other regions. Only 57 per cent of women with no education knew of a method, compared to 80 per cent or more of other education subgroups. This overall high level of knowledge of methods is even more significant since about half of the women who knew at least one method knew four or more methods. In addition 63 per cent of the subgroup who knew some method also knew of a family planning source. The Northern/Upper region ranks low both on knowledge of multiple methods and on knowledge of family planning sources.

Ever-use of contraception is comparatively low, however – 40 per cent of currently married women had used a method at some time in the past. Differentials in ever use are stronger than those in knowledge: three regions had quite high levels of ever use (Greater Accra, Eastern and Volta) while the others are much lower (Ashanti/Brong Ahafo, 33 per cent; Western/Central, 21 per cent; and Northern/Upper, 10 per cent). The extremely high level of use of Volta (92 per cent) is a reflection of ever-use of abstinence in this region. Overall, abstinence was one of the two best known and used methods, the other being the pill. Ever-use of more than one method is quite low, however; only 18 per cent of currently married women had used two or more methods at some time in the past. Current use was much lower still – only 9.5 per cent were using a method at the time of the survey and nearly half of these were using inefficient methods, especially abstinence. This percentage does not include women who were practising post-partum abstinence, however. The relatively high level of use (ever and current) of inefficient methods, in view of the widespread knowledge of efficient methods, suggests that women prefer to use inefficient methods. One possible explanation is that women have misconceptions about the side effects and other problems associated with use of efficient methods. If so, it would appear that more effort should be devoted to dissemination of information on contraceptive methods, than is done at present. This issue needs further exploration by family planning bodies.

Although the level of ever-use is only moderate, there are indications that use may increase. Thirty per cent of the 60 per cent who have never used intend to use in future. In addition a high proportion of women who wish to delay the next birth or to stop childbearing are not using

contraception: these two groups of potential users constitute about 50 per cent of all exposed women, at the national level.

Multivariate analysis of the correlates of contraceptive knowledge and use confirmed that region of residence has a much stronger effect than education on the level of contraceptive knowledge, but education comes out as the most important determinant of both ever-use and current use of contraceptives. In addition women are more predisposed to use contraceptives when travel time to supply source is less than 30 minutes. However, number of living children and respondent's current age have very little effect on contraceptive use. This is an unusual finding, since in most countries, women are likely to begin using after they have had several children. Instead, the even distribution of use among age groups and parity groups suggests that use is determined as much by the need to space children, as by the need to stop childbearing.

These results demonstrate that 10 years of active involvement of the government has had substantial impact on contraceptive knowledge but comparatively less effect on the level of current use of efficient methods. The analysis also suggests areas where the efforts of family planning agencies — both government and non-governmental — should be rechannelled. Reasons for the very high use of only inefficient methods or of no use at all even when women wish to space or stop childbearing, need to be examined. In addition the importance of travel time to supply sources on current use should also be taken into account. Finally, it is important to note that substantial latent demand for family planning services exists — if all the women who want to either space or stop childbearing, and who are either using abstinence or not using any method were to use contraception, the level of contraceptive use would rise to about 50 per cent of all currently married women.

7.4 FERTILITY PREFERENCES

One of justifications for instituting the national family planning programme was the belief that there was a high motivation among Ghanaian women to reduce the level of childbearing, and this belief was based on the high evidence of induced abortions which was believed to be prevalent in the country. The GFS results showed that at the time of the survey only 11.7 per cent of currently married and fecund women wanted to stop childbearing, while 10.1 per cent were undecided about whether they wanted more children or not. However, of the remaining 77 per cent who wanted to have more children, about half wanted to delay the next child by a substantial period (39.3 per cent) and only half wanted the next child soon (38.1 per cent). This result is especially important, since it implies that although the population who want to stop childbearing is low, the desire to space children is high. Future demand for family planning may therefore depend more upon this need. As expected, the proportion wanting no more children increased and the proportion wanting more decreased as number of living children increased — with the two distribution lines intersecting where number of living children is between 6 and 7. Consequently, the level of desired family size — 6.0 for preferred size and 5.5 for wanted size — was quite high and reflected the high completed family size of 6.5 estimated for the country.

There were, however, significant differentials in fertility preferences among the various population subgroups — the greatest differentials in all the three being found between Northern/Upper region, which had the lowest proportion desiring to stop childbearing and the highest family size, and the rest of the southern regions; between the Mole-Dagbani ethnic group, which also had the lowest proportion desiring to stop childbearing and the highest desired family size, and the rest of the ethnic groups; and among the educational (respondent's) categories. Greater Accra and Volta regions had the highest proportions desiring to stop childbearing and the lowest preferred and wanted family size. The differentials by type of place of residence (ie rural–urban residence) were distinct but not very great, with urban having a slightly higher proportion desiring to stop childbearing, and lower preferred and wanted family size. The relationship between level of education and proportion desiring to stop childbearing was positive, as expected, and negative for preferred and wanted family size.

Multiple classification analysis showed that after controlling for the effects of the other variables the gross or initial significance of ethnic origin and rural–urban residence evaporated, leaving region and respondent's education as the two most significant explanatory factors — besides number of living children — for preferred and

wanted family size. It was also found that the high significance of region is due largely to the extreme values which Northern/Upper had, as the differentials among the other regions were not very great. The application of the MCA has also shown that among the demographic variables it is number of living children, not age or marriage duration, which is positively related to level of desired family size. One important reason for the positive relationship is rationalization by women — after they have had a number of children they report this number as what they desire. The data are insufficient to determine whether there is any true change in average desired family size. Even if the desired family size is high across all parity and age groups, however, this does not mean that there is no scope for fertility reduction. The question on desired family size is abstracted to some extent, and approximates 'ideal' family size, rather than the intended number of children in each woman's individual circumstances. The strong motivation to space children could in itself, if implemented, reduce the number of children actually born.

7.5 FAMILY PLANNING SOURCES

Forty-three per cent of currently married women knew an outlet for at least one of the six supply methods (pill, IUD, condom, other female scientific methods, injection and female sterilization). The method for which the largest proportion of respondents knew sources was the pill, followed by the IUD. The most widely known and most preferred source for all six methods was government hospital/clinic, which in any case had the widest distribution in the country. There were however great regional variations in knowledge of and preference for specific outlets, a reflection probably of regional variation in their availability. Utilization of family planning outlets (both ever-use and recent attendance) was, however, very low. The overall proportion of married and exposed women who had ever used an outlet for family planning was 13 per cent, and the proportion who had attended an outlet in the past 12 months was only 6 per cent. While these results may underestimate the true level of use of family planning sources (since some respondents may receive supplies from husbands or services from sources other than those mentioned in the GFS), it is nevertheless clear that the level of attendance in the past and in the recent one-year period is rather low.

Although the absolute levels of knowledge and use of sources for family planning may be somewhat under-reported, the relative differences among the regions and the other socio-economic and demographic subgroups are still useful for policy-makers. The multiple classification analysis identified education (respondent's and husband's) as the factor with the strongest independent impact on knowledge and use of sources. Region was a significant source of variation in knowledge of sources of family planning, but was less important for attendance at these sources. None of the demographic variables (age and parity) were strongly related to knowledge and use of supply sources, suggesting that reported levels of knowledge and use are not just a response to differences in need, which depend on demographic characteristics.

7.6 INFANT AND CHILD MORTALITY

Although investigation of the levels, trends, and differentials in fertility and its major components was central to the planning of the workship on further analysis of the GFS, it was recognized that a study of infant and child mortality was too important to have been overlooked. Chapter 6 was devoted to this subject and it covered most of the important issues with regard to levels, trends and differentials in infant and child mortality. The investigation of differentials was pursued beyond the level considered in other chapters. In addition to examination of the relationship between mortality and the demographic and socio-economic factors, the effect of birth spacing on the mortality risk of the subsequent child was also examined.

A general decline in infant and child mortality was noticed over a period of 25 years before the survey. The infant mortality rate, for example, during 0—4 years before the survey was 72 per 1000 children born as compared to 108 during 20—24 years before the survey. The pace of decline was faster in the period 10—24 years before the survey than in the period 0—9 years before the survey. The decline in neo-natal mortality was fairly substantial with a rate of 38 neo-natal deaths per 1000 live births in period 0—4 as compared to 61 in 20—24 years before the

survey. On the other hand, post-neonatal mortality in period 0—4 declined to 34 from 49 in 20—24 years before the survey.

Biological correlates of infant and child mortality in Ghana were similar to those found in most of the countries which participated in the World Fertility Survey. Children born to mothers who are very young (< 20 years of age) and very old (over 40) suffer higher mortality risks. Likewise, first order births and those of fifth or higher order suffer excessive mortality compared to children of second, third, or fourth order.

Socio-economic differentials suggest that infant mortality is higher in Western/Central region than in any other region, primarily due to a very high neo-natal mortality rate of 62 per 1000 which was nearly twice that of any other region. Northern/Upper region had the second highest rate of infant mortality (90 per 1000) primarily due to its high post-neonatal mortality rate of 62. The infant mortality rate (41) of Greater Accra was the lowest.

One major finding of chapter 6 was the strong association between birth spacing and the survival chances of the subsequent child. The infant mortality rate for children born less than 2 years since the previous birth was 117 as compared to 52 for children born 2—4 years and 37 for children born 4 or more years after the preceding birth. This relationship was unaffected by the adjustment of the confounding effects of other socio-economic variables examined in the multivariate context. Length of the previous interval was one of the two statistically significant variables among the six variables taken into account.

Region of mother's residence is the second most important variable explaining infant and child mortality in Ghana. Interestingly, the infant mortality rate in Northern/Upper region appears 10 percentage points higher than in Western/Central region when confounding effects of the selected variables are adjusted for.

7.7 POLICY IMPLICATIONS

One of the objectives of this chapter was to evaluate the current population policy in the light of findings from the GFS. However, for this task to be accomplished due consideration needs to be given to a number of factors other than what the findings may imply. Indeed, factors such as cultural norms and economic and political conditions carry great importance both in the formation and in the implementation of policy and especially policy which deals with the delicate subject of population control (or fertility control, at the individual level). It was, therefore, decided to present a summary of findings which can be helpful to those involved in formulating or implementing population policy.

The overview of population policy presented in chapter 1 indicates that the reduction in population growth through voluntary fertility control is the cornerstone of the present population policy in Ghana. To this end, one is enlightened by the findings of the various chapters included in this book.

First, a set of basic information with regard to key demographic indicators and their major socio-economic and regional differentials has been provided here. Secondly, one finds that Ghana is at the onset of fertility decline. It has not been possible for the investigators to pinpoint the factors influencing this decline. However, family planning activities seem to have made some headway. They have been quite successful in making the population aware of fertility control and contraceptive methods. This is indeed a pre-requisite for anyone to use contraception or to change from one method to another should it be necessary. There is, however, a substantial level of unmet need. Among 1584 women (or 30 per cent of currently married women) who expressed the desire to delay the birth of the next child, 46 per cent were using no method of contraception. Likewise, 62 per cent of 473 women who wanted no additional children were using no method of contraception as of the survey. These subgroups need to be given high priority. Furthermore, the use of contraception has not been even across regions. Northern/Upper region appears to have a low level of knowledge and consequently of ever-use and current use of contraceptive methods. It is possible that women in these regions were not interested in controlling fertility and there was no less effort on the part of the family planning programme to enlist support there. None the less, these regions must be considered for further family planning activities. It seems more important to make headway in areas with low use of contraceptives if the programme is to succeed in increasing the level of use in the country.

The support for family planning can also be emphasized from a less controversial maternal and child health perspective. The beneficial effect of

spacing on the survival of the subsequent child is very clear. For women resistant to the idea of fertility control, this argument can be justifiably put forth. Thus family planning activities can be promoted both from the national perspective of keeping population growth at the same pace as economic development and from the point of view of maternal and child health.

The potentials of nuptiality patterns for policy intervention are limited. The average age at marriage is reasonably high. Furthermore, the trend in the age at marriage was insignificant. Although modernization and social changes may influence the incidence of marital dissolution, no policy intervention is likely to affect this aspect on its own. It was also found that the overall impact of marital dissolution on fertility is negligible.

Finally, we reiterate that the set of papers included in this volume presents source material for policy-makers to explore. The primary objective of this chapter was to summarize the most important findings, which would be helpful for those involved in policy-making.