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# Community-Level Data in Fertility Surveys

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The World Fertility Survey is an international research programme whose purpose is to assess the current state of human fertility throughout the world. This is being done principally through promoting and supporting nationally representative, internationally comparable, and scientifically designed and conducted sample surveys of fertility behaviour in as many countries as possible.

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# Contents

# Community-Level Data in Fertility Surveys

**The Character and Purpose of Community-Level Data**

National sample surveys on fertility and family planning almost always abstract data for the individual couples from their immediate social contexts and group the couples for analysis according to their individual characteristics. However, many people have recognized that the neighborhood, community, or social milieu in which the couples live may affect their reproductive behavior in interaction with the individual characteristics usually considered. The term "ecological" is often used to designate supra-individual data about the social environment, delimited on an areal basis. Studies relating ecological-level variables to each other are fairly common,[1] and there is a considerable literature about both their value and the possible fallacies of assuming that they can substitute for studies of the relationships at the individual level.[2]

An ecological or community-level factor is defined here as any characteristic common to all the persons living in the community. Two types of ecological factors can be distinguished.[3] One set consists of characteristics for which a corresponding measurement cannot be made for individuals. For instance, the presence or absence of a hospital, a school or a market, or the distance from village to the nearest large city are attributes which apply to the whole community and do not have a corresponding differential measurement for each individual. These are sometimes called global variables. A second set of ecological measures is based on the aggregation of individual measures (e.g., the mean educational level or educational distribution of the population or the fertility rate or parity distribution of all women above a certain age). These supra-individual measures are sometimes called "contextual" variables, since they are attempts to describe aspects of the social context in which the individual lives. Whether based on the aggregation of data for individuals or not, the community or ecological-level measures may be treated as common to all members of the community. Each individual may be characterized as belonging to a collectivity that is well or poorly educated; rich or poor; with or without a market or school; close to or far from an urban center.

In a psychological sense there may be an individual analogue to what appear to be unique ecological facts. For example, the distance of the village to the nearest large city is an identical objective fact for all members of the village, but perceptions of that distance may be an important psychological fact varying among individuals. Almost every ecological fact has such a psychological perceptual analogue.

A hierarchy of social units can be characterized by ecological, supra-individual measures. These may be successively larger and more inclusive: the neighborhood, the village or town

or city, a district encompassing many local communities, and regions including many districts. Finally, in international comparisons, countries as a whole may be treated as the ecological supra-individual units.

There are relatively few instances in which measures of some aspect of the community or social milieu as ecological or collective properties have been related to measures of fertility and family planning for individuals. A few very common types of demographic tabulations do relate collective to individual characteristics. For example, data relating such individual characteristics as wife's education and the number of children she has born often are tabulated separately for rural and urban areas and for communities classified by size. In this way it is possible to see whether rural-urban differentials persist across educational categories; or, conversely, whether educational differentials persist across rural-urban categories; or whether the relation of education to fertility is different in rural and urban areas (i.e., is there an interaction?).

It is common also to tabulate fertility distributions separately by region, district or other geographical units. Insofar as comparisons are then made within and between regions as to levels and relations of individual fertility and education, for example, the geographical units are ecological classifications. This often involves treating regions as distinctive cultural entities. Sometimes, of course, such geographical units are rather arbitrarily demarcated and do not delimit real social units of interaction and interdependence. The analysis is likely to be most useful if the areal units correspond to units of social interaction and social and political organization. It is also likely to be more useful if these units can be ranked according to some meaningful principle (e.g., economic level). It is always possible, of course, that regional differentials can be explained by the individual characteristics of their population, once the regional population composition on these characteristics is considered.

Apart from such fairly obvious examples as rural-urban or geographical regional units, there are only a few studies in which ecological-level variables have been related to individual fertility variables. Studies by O. D. Duncan and by Lewis Rhodes[4] have demonstrated that in some American cities both the educational level of small areas within the city (census tracts) and the education of the individual couple are related to their individual fertility. K. Srikantan[5] analyzed how the characteristics of neighborhood units in a Taiwanese city affected some aspects of reproductive behavior in interaction with the characteristics of the individuals living in those neighborhoods. R. Anker[6] found that the modernization level of eleven villages was correlated for their individual residents positively to acceptance of family planning and negatively to the desired and actual number of children for one of the two major caste groups in a rural area of Gujarat, India, after taking into account individual educational and other characteristics.

There are many more examples of studies relating ecological to individual variables in other social science fields. For example, political behavior (e.g., whether and how individuals vote) has been shown to be dependent not only on individual status and demographic characteristics but also on the political climate or local political organization of the areas in which the

citizens live.[7] For example, in some studies it appears that individual political behavior is affected by the extent to which the election districts in which citizens live have been dominated historically by a single political party.

In the field of education, there is a considerable body of research and scientific controversy about whether the characteristic of the school as a unit affects the achievements of students in school or in later life, apart from the family background and personal qualities the individual student brings to the school.[8] For example, is the performance of the student in school or his occupational or educational aspirations affected by the proportion of students in the school who come from poor or middle class homes or by the resources available in the school?

Another example is drawn from research on the American soldier in World War II.[9] It was found that opinions about promotion opportunities of individual soldiers depended not only on their individual promotion records but also on the aggregate promotion level of their military units or of the age and educational stratum to which they belonged. His standing and progress in comparison with other members of his group was important in interaction with his own absolute status or rate of progress.

The concept of the "reference group" was used to interpret these findings. Broadly, this means that the individual's selfperception and behavior depends partly on how he compares his own status and behavior to standards he observes in groups or strata of people with which he identifies himself. For example, the theory is that the soldiers evaluated their personal promotion records by reference to the norms and experience of their platoons. This interpretation is only a plausible inference, since there were no data on the perceptions of the soldiers about promotion rates.

**Community-Level Variables for Fertility Research**

That the characteristics of the community may have an independent effect on the fertility and mortality has been sufficiently well accepted, so that several major fertility-family planning studies have administered "community-level" questionnaires in addition to the more usual individual fertility questionnaires. This has been done in studies in India, Iran, Korea, Nigeria, Pakistan, Tanzania, Thailand and Turkey.[10] Unfortunately, the joint relation between the community-level and individual explanatory variables and measures of individual reproductive behavior have not been presented in any published analyses from any of these studies as yet.[11] These studies have covered a wide range of community-level variables, as indicated in the specimen questionnaires to be published as Occasional Paper 8.

An important rationale for considering both individual and ecological variables is that it is believed that the reproductive behavior of couples is affected both by their personal characteristics and the social context in which they live and especially by some interaction or relation between the individual and the group characteristics. For example, many studies find that educational attainment is negatively correlated to fertility and positively related to fertility control practice at the individual level. We can then ask whether fertility is affected not only by individual education but also by the educational level of the community.

It is plausible that poorly educated women living in a well educated community may have lower fertility than the national average for their educational class, because in their local communities they find models for smaller families, legitimation for limiting fertility, and more readily available birth control services.

We have considered an ecological fact – the educational level of the community – which has an individual analogue. However, such a parallel is not essential. For example, perhaps the relation of education to fertility for individuals depends not so much on the educational level of the community per se, but more broadly on the extent to which the community is integrated and interdependent with the larger society, as indicated by community measures of access to transportation and communication flows and facilities; these environmental networks of interaction and influence may create interests transcending the familial and the local community influence.

It is desirable to specify, if possible, just how the ecological-level variable is believed to affect the individual's behavior and then to investigate the presumed intervening link. For example, if we compare poorly educated women in poorly and well educated communities, do the latter in fact distinctively perceive that their neighbors have relatively small families, believe that family planning is accepted as legitimate in their neighborhoods, and do they have superior access to birth control facilities and information? If the degree of access to outside influences affects the way in which education is related to fertility for individuals, can it be shown that the information and values of specific educational strata depend on the degree of access in such a way as to explain the varying relation of education to fertility? The investigation of such intervening links probably will require either additional questions on individual survey questionnaires or other supplementary studies. Even if such additional investigations are not immediately possible, it is desirable to specify what the linkage may be as a basis for justifying and selecting among the possible ecological variables to be investigated.

The nature of the community influence might be through indirect social-psychological effects. For example, where almost everyone is both poor and poorly educated, there may be little to stimulate aspirations for better education or living conditions. On the other hand, where there is a significant group in the population who are better educated and living in better circumstances, aspirations for the mobility of one's children may be aroused by perception of a new range of possibilities. Thus, the desire to limit family size may follow not simply from emulation of those with small families but because parents decide to have fewer children in order to do more for those already born when they believe that is possible.

We know that the fertility and fertility control practices of women at the same educational level vary greatly between countries and areas. For example, in one recent comparison the proportions of couples practicing contraception in *any* educational class in the Philippines was less than the proportions in *any* educational class in Taiwan.[12] The proportions of well educated women in the Philippines practicing contraception was less than among illiterate women in Taiwan. Within Taiwan the fertility of illiterate women, for example, varied considerably between local areas in some relation to general fertility and educational levels. It is

plausible that such relationships and contrasts might be sharper and more meaningful, if the relationships of ecological to individual data could be made with reference to the specific community in which the individuals live and have their most immediate social interaction. The ecological or community-level variable may be the fertility rate or an aggregate measure of family planning. We may ask, for example, whether the fertility or family planning practice of individuals varies from the average of the national subgroup to which they belong in relation to the values of the ecological values for their own local areas. This would not be the case if areal variation in fertility rates could be explained completely by variations in age-educational composition and not at all by age-education-specific fertility rates. If there is s community-level effect, then the kinds of explanations illustrated in the preceding paragrapha could be explored.

Interpreting the relationship of individual to ecological variables is considerably simpler in situations with little population mobility. If poorly educated women have distinctively low fertility in a predominantly well educated community, this may be a result of community influence, but it may also arise because the poorly educated women who already have or want to have low fertility are selectively attracted to such an area. Does the community select or produce the low fertility? Insofar as mobility is likely to be less in local communities of developing countries, the problems of sorting out this selective factor also may be less.

Where ethnic, religious or other cultural groupings have a known or potential relationship to reproduction, the composition of the community with respect to these groups may be very relevant in addition to the cultural identification of individuals. There is a considerable body of research about the hypothesis that being in a minority ethnic or religious group affects fertility.[13] A study in the Netherlands advanced the view that the relatively high fertility of the Netherlands (compared to the rest of Western Europe) resulted from the confrontation of opposing religious groups rather than from distinctive theological positions.[14] These ideas suggest that, if individuals are classified according to some ethnic, religious or other cultural principle, it should also be pertinent to identify them by the composition of their communities with respect to the same classification (e.g., do Roman Catholics in a Protestant environment have different reproductive patterns from those living in a predominantly Roman Catholic community?).

A plausible, widely cited hypothesis is that in developing countries where parents depend on their children in many ways (e.g., for security and care in old age), the high mortality of children is associated with the desire for many children, with high fertility and with little practice of birth control. Whether the individual couples have lost children through death is one relevant fact, but the general mortality experience of their own community may be at least as important. Not only the level of mortality in the communities but its variability may profoundly affect perceptions about the potential risks of losing the children parents consider essential. Therefore, aggregate measures for areas of the level and variability of mortality and, if possible, the community's perceptions of these facts may be valuable supplements to the reports of individuals about the mortality of their own children and their personal per-

ceptions of the risks of living and dying.
Only a few of the many plausible hypotheses involving ecological-level variables in relation to fertility have been discussed here to illustrate the concept and the range of possibilities. In a later section lists of possible variables are presented along with some rationale for believing that they may be related to fertility.

**Some Issues in Analysis and Interpretation**
When both individual and ecological-level data are available there are several possible types of analysis:

*a* Analysis may be completely at the ecological level – how do ecological measures for the units relate to aggregate measures of reproductive behavior? It is important not to draw inferences from such analyses at the aggregate level about the relationships at the individual behavioral level without great caution.

*b* Ecological-level explanatory variables may be related to measures of individual reproductive behavior. When we group couples together by such ecological variables as distance to the nearest large city or to a market or by the mean educational level of their communities, do we find significant differentials or correlations to fertility, use of contraception, ideal family size, etc.?

*c* The joint relation of ecological and individual-level explanatory variables to the reproductive behavior being explained is especially interesting. To what extent is there an interaction between the ecological and individual-level variables? If there is an interaction, can we specify its meaning? Can we specify plausible and testable links between the ecological or individual-level explanatory variables and the reproductive behavior being studied? Does the inclusion of ecological-level variables add something to the explanation by individual-level variables?

If the characteristic of the individual is an attribute, then the comparable community-level aggregate statistic will usually be a rate or a proportion (e.g., proportion Roman Catholic, proportion using contraception, births per 1000 last year). If the characteristic of the individual is a variable, then the community-level characteristic (e.g., education or income) may be one of a variety of measures used to characterize a distribution, e.g., a measure of the average, of dispersion, or of skewness. With sufficient data the community-level variable may be a measure of correlation (e.g., what is the correlation between education and fertility or the use of contraception or the desired number of children in each ecological unit?). Recent writing has advanced the hypothesis that desired family size and fertility levels may be affected by the distribution of income and welfare, apart from their average levels.[15] To investigate such ideas, distributions as well as averages are needed.

Regardless of whether a community-level questionnaire is used, it is very desirable that the data sets for fertility surveys should include an identification code for the specific community in which each respondent lives. Identification of higher level area units, e.g., districts or provinces or states or regions, should also be a part of the coding plan if identification of the specific community does not readily identify also the larger units of which it is a part.

By use of a "dummy" variable to represent communities, regions, districts, states, etc. in a regression equation or in an analysis of covariance, it is possible to estimate the maximum amount of variance that can be associated with the differentiation of units at the ecological level. The identification of the ecological unit itself permits an estimate of the maximum possible explanatory power of the ecological variables, whether measured or not. If specific ecological measures are available for these units, then the difference between what they can explain and the estimated maximum indicates potential gains of searching for additional ecological-level variables. If there are no measures at the ecological level, then this maximum estimate indicates what might be gained by going beyond the individual survey data to consider ecological or contextual data.

Quite apart from this usage, it is worthwhile to identify the individual ecological unit in the coding process, even if there is no community-level questionnaire or other data about the ecological unit when the survey is done. It is always possible that data for such units will be found later in existing statistical resources or that anthropologists, statisticians or others may be encouraged to collect pertinent data after the survey is done. Full identification of the communities in the individual-level questionnaires is an inexpensive and prudent step to keep open the potential for combining ecological with individual data and analysis in the future.

Expanatory measures at the ecological level will not be very useful unless they vary significantly between areas. For example, it may be important to know whether the community has electric power, a market or a school, but only if these are found in some communities and not in others. Similarly, if the percentage of workers in agriculture or with a radio do not vary significantly between communities, they are unlikely to explain variations in reproductive behavior. However, if there is a strong belief that such factors do explain reproductive patterns, it may be worthwhile to demonstrate that they do not. Negating a hypothesis that is held to be true and important by scientific workers or by government officials is sometimes as important as providing supporting evidence for a plausible explanatory hypothesis.

If the average level of the reproductive variable to be explained (e.g., fertility or the proportion using contraception) does not vary much between communities, it may mean that introducing the ecological-level measurement of any variables will not help to explain individual reproductive behavior. However, this is not always true. In the first place, communities may have similar rates or averages because of differences in population distributions by age ,marriage duration, education or some other pertinent characteristics which offset real differences in age-specific, marriage-duration-specific, or education-specific rates. Conversely, differences in rates between areas may reflect differences in distributions on related characteristics (e.g., age and education) rather than real differences in characteristic-specific rates. Secondly, it is

quite possible that the averages, e.g., in fertility rates, may be similar in different areas, although the relationship between fertility and some characteristic of interest (e.g., education) may be quite different in the areas. Areas with similar average fertilit6 levels may differ in having positive, negative or zero correlations between fertility and education. Presumably, the significance of having little or much education for the fertility of individuals will be quite different under these differing circumstances.

Adding community-level or ecological to individual data in fertility research may add to our understanding of fertility patterns either (a) because this introduces on an aggregate basis variables about individuals that are not otherwise available or (b) because it introduces supra-individual variables that are intrinsically collective in character. Given the elementary state of our knowledge about the dynamics of fertility, an ecological-level measure may provide useful information, even if it is not possible in a particular study to establish whether it truly represents a collective phenomenon or whether it may be shown eventually to be a statistical aggregation of basically individual phenomena. Whether the data are collected for or about individuals or for or about collective units does not necessarily correspond to an abstract distinction between a social or individual level of reality or between social and psychological facts. An individual's report on his occupation or his perception of his status reflects social as well as psychological determinants. On the other hand, a presumed social effect – the correlation of the educational levels of communities and the fertility of individuals – may have a social component, as previously suggested, but it also may simply represent with aggregate data a very similar relation of education and fertility for individuals in all communities, with the difference in fertility between communities arising out of community differences in the distributions of educational status. At this stage of fertility research it is desirable to have data at various levels of aggregation, even if the allocation of explanation to one or another level of reality or abstraction is not immediately possible.

**Collecting Community-Level Data in Developing Countries**

Community-level analyses probably are particularly appropriate for developing countries where different communities are likely to be at very different levels of change and development and where intra-country demographic differences by area are likely to be particularly large. However, such variations may also exist as a result of long-standing environmental and cultural differences that are not a product of any recent modernization effects.

Even within a single country it is difficult to devise community-level indicators that are applicable both to rural communities and to large towns and cities. The community-level questionnaires used in the fertility studies previously cited were restricted to that part of the sample which lived in rural areas or small towns. Since a very large part of the population of most developing countries lives in such places, this restriction, followed in this manual, still provides ample opportunity for significant analyses. It is still possible to show the fertility measures for the populations in the large places as a point of polar contrast to that of population classified by the characteristics of the rural communities.

It is proposed that, so far as possible, in WFS studies, data be obtained at the community level for each small community or village which contains one of the sampling units of the national fertility sample. While the criteria for the sizes of the communities to be included may vary by country, the WFS suggestion is for an upper limit of 10,000. Community-level data would be sought for each community of less than 10.000 population in which a sampling unit for the national sample survey happened to fall.

Ecological analyses for larger communities are feasible by designating neighborhoods, wards, districts, census tracts, census enumeration districts or other meaningful subdivisions of the cities as the effective community for respondents who reside within them. In large cities it is difficult to obtain systematic information about sub-areas by interviewing local officials or leaders, but it is possible that statistical data for sub-areas within the city may be available from censuses, registers or other sources. Since this will depend entirely on the statistical resources of each country, no specific recommendations are made here for this purpose.[16] This paper refers specifically to data for smaller communities.

The information for the community-level indicators can come from various sources, depending on the statistical resources of the country. It is possible that the information could be obtained from published or unpublished data or maps in central statistical offices, regional or district government offices, or in the records of other relevant government agencies (e.g., the ministries of agriculture, transportation, education or health). In some countries the relevant details will be found only in the district, state, or regional offices in which the communities lie rather than either the national offices or in the communities themselves.

It may be possible in some countries to obtain data about the communities falling into the sample through special tabulations of the schedules or cards from the last census. Sometimes such local communities are the units of aggregation in the census itself and data might be found in unpublished tables. Sometimes, the data are filed by local community.

Another important possible source of community-level data is the aggregation of individual responses from the survey for each community in the sample. This is feasible only if there are relatively large clusters of respondents in the communities. For example, the mean educational level of the community, the proportions using contraception, or the proportions of households with radios could be calculated for each community by aggregating responses of individuals. Since this way of generating ecological variables does not require any additional interviews, the aggregation can be to higher levels than the community (e.g., districts containing a number of the communities in the sample rather than the individual communities).

As compared with such aggregation of individual responses, the advantage of a separate community-level questionnaire directed to a presumably informed respondent is that (a) it avoids unnecessary repetition, e.g., in asking each respondent in the main questionnaire whether the community has electricity, and (b) on some questions, e.g., distance to the nearest hospital, a statement from an informed official is likely to be objectively more accurate than the report of the average survey respondent. Of course, if perception of the distance rather than the objective fact is desired, individuals in the main sample must be questioned.

The community-level questionnaire is intended for the situation in which more or less objective facts about the community as a whole cannot be obtained either from official sources or by aggregating individual responses from the main sample survey. In each country a decision must be made about the kinds of information which can be obtained with reasonable reliability from community-leader informants. For example, whether the community has any electricity supply, any mechanically-powered agricultural implements or a hospital probably can be learned with reasonable reliability from such interviews. The distance to the nearest hospital or school or improved road may be less reliably reported, but probably can be obtained with tolerable accuracy if broad groupings are satisfactory. The reliability of the report becomes more problematic when the informed respondent is asked for the distribution of phenomena, each of which is best measured by a census or survey, e.g., the proportion of cultivated land devoted to particular crops or the amount and value of different crops harvested.

Despite problems of reliability, it may be worthwhile asking community-level informants to give their best judgment about some facts believed to be important. If the community-level questionnaire is used anyway for items whose reliability is believed to be reasonably good, the marginal costs of adding a few judgmental items will not be great. For example, suppose that on the extent of radio-ownership in the communities, there are neither statistical data or the possibility of aggregating individual responses. The community-level respondent could be asked a question like this: "In what proportion of households in this community do you estimate that there is a radio?" Would you say,

| | |
|---|---|
| None | |
| Very few | (less than 10%) |
| Few | (10– 29%) |
| Many | (30– 79%) |
| Almost all | (80–100%) |

Such an estimation may not be highly reliable, but it makes it possible to classify the communities into broad categories on radion-ownership that may be sufficient if there are considerable variations between communities in radio-ownership.

Consider another example. It may not be too difficult to establish whether specific types of health personnel and facilities are in each community or at specific distances from it. However, it may be of greater interest to have some measure of the probability that those who are sick actually utilize such services. If the sample is not too small, aggregating individual responses to questions about this topic would be the best source. If this is not feasible, it may be worthwhile to try out a judgment by the community respondent in response to a question like this: "Suppose that the children of average people in this community are sick, what is the likelihood that the child would get qualified medical help during the first week of its illness?" Would you say:

Almost never
Rarely
Fairly often
Usually

The reliability of such ratings obviously is suspect and should be checked wherever feasible. It is proposed for trial because the topics covered may be very important and the cost of obtaining such judgments is not great, if the community-level interview is to be taken anyway for factual items about which there is less question. Where it is feasible, it may be worthwhile to test the reliability of reports from the community-level informants by asking them to report on items for which independent measures exist. Since the community theoretically is a major focus of development efforts in many countries, research on how to get community-level data may be of value beyond the study of fertility.

How far a particular country goes with attempts to get more than simple, fairly straightforward facts about the communities will depend on many local matters: the belief that such data are locally useful, the degree of confidence in the possibility of getting reasonable responses with sufficient effort, and the amount of effort and level of personnel that can be put into this aspect of the study. If the community-level questionnaire is to be handled in a quick interview by the survey supervisor, for example, it should be kept relatively simple. On the other hand, if either supervisors or others are to devote some time to the community-level questionnaire, perhaps, for example, interviewing several informants at some length and spending some time on making reasonable checks, then more can be attempted. Social anthropologists have been using local informants to obtain information about collective life in local areas for many decades. Such skilled observer-interviewers probably will not be available for a large sample of communities, but the intellectual input (e.g., through cooperation with appropriate universities or government departments) could be great enough to make the community-level investigation more rather than less sophisticated in some countries.

In some surveys several different kinds of local leaders or officia s have been interviewed about the local community or region. Almost inevitably, this means that there will be sets of differing responses about some factual questions. Where feasible, such multiple responses are desirable to indicate something of the unreliability of measures that otherwise might not be apparent. However, it also imposes the task of reconciling, pooling or choosing among varying responses.

It may also be useful to interview local leaders and officials about their own attitudes toward family size and fertility limitation. This was done in the Impact Survey, covering what are now Pakistan and Bangladesh.[17] The opinions or attitudes of local community leaders may themselves be regarded as social facts about the communities which may be treated as ecological-level variables, potentially pertinent to the attitudes and behavior of the members of the communities. Such data on samples of leaders from a range of communities and regions may also have independent value in indicating the distribution of opinions of the local

leadership toward matters that may have policy implications.

A recent survey in Tanzania illustrates one set of proposed solutions to some of the problems we have just raised. The principal purpose of the National Demographic Survey of Tanzania is estimating vital rates and other important socio-demographic characteristics for Tanzania as a whole and for significant parts of the population.[18] The questionnaire for each individual household has relatively few questions about social and economic characteristics. In eight of eighteen regions the sample includes about 800 households in each of four local clusters. This should make it possible to estimate many parameters by aggregating individual responses in each cluster and region. However, in addition for each cluster in each region, a questionnaire is used to interview several different kinds of officials about cluster-level facts, many of which have no analogue in the individual-level questionnaire. The officials are being asked some factual questions which are relatively easy to answer (e.g., presence or absence of a post office), but they are also asked for information about distributions of phenomena which involve judgment and estimation, e.g., percent of people who migrate away temporarily, most important diseases, customs about length of lactation period, percentage of households growing various crops and the average amount grown per household, and marriage customs. In the Tanzanian study information about clusters was obtained by discussions with regional officers responsible for Development, Planning, Education, Medical Care and Labour. In addition, at the district and cluster levels there were interviews with District Development Director, District Planning Officer, Divisional Secretary, and Ward Executive Officer. Since several different officials are being interviewed about each cluster, it will be both possible and necessary to study the variability of responses and ways of pooling or choosing among responses that differ.

Most national sample surveys on fertility are likely to have much smaller clusters in specific local areas than this Tanzanian study, making aggregation of responses more difficult. However, by aggregating responses to larger districts or regions, such an approach may be possible in other countries too. If there is an interest in insuring large clusters in local areas, then the sampling design for the survey must be appropriately designed for this purpose initially.

The community-level questionnaire must be designed for each country, since the specific characteristics of such matters as transportation facilities vary with terrain, climate, as well as the level of development. This is even more problematic when trying to develop measures of such matters as the level of agricultural development.

In the next section there are listed in outline form kinds of community-level variables plausibly related to fertility, with illustrations under each of the items which might be indicative of the general concept or variable. Some of these are likely to be available only if there are reliable official statistics on the subject (e.g., educational level, infant mortality, incidence of malaria). It should be possible to obtain most of the others by interviewing an informed leader if the item is relevant at all.

Following the suggested list of variables, there is a suggested "model" community question-

naire and O.P. No. 9 reprints several questionnaires that have actually been used in studies previously cited. Community-level questionnaires, including the "model" presented in this occasional paper usually include more than one question pertinent to particular topics. While these can be used as individual variables, presumably an effort would be made to combine the responses for groups of questions into scales of some type, e.g., involvement in modern agriculture, or access to urban facilities, etc. Paydarfar in a study of an Iranian province categorized each village as having or not having each of 42 facilities or types of personnel whose presence could be considered as an indication of modernization and of openness to outside influence.[19] Then he assigned a score to each village by weighting each factor according to its frequency (those types of facilities or personnel which were found least frequently had the highest weights with a high total score indicative of modernization). These scores were used to stratify the villages but have not yet been related to variations in fertility.
The list of variables and corresponding items in the questionnaire can be expanded to include many other aspects of community life that are relevant in some places but are not presently included in the selected list. For example, the following have been suggested as potentially important:

**1** The predominant form of agricultural activity: e.g., plantations, individual small owner-operated farms, larger owner-operated farm with employed labor, tenant-operated farms, sharecropper farms.

**2** Whether employment is predominantly in the community, in fields near the community or in other communities to which the residents commute.

**3** Indicators of nutrition: types of food eaten and amounts of major types available.

**4** Incidence of venereal disease and the prevalence of other diseases which may be relevant for fertility.

**5** Indicators of the position of women which may reflect the extent to which they have status and autonomy in the community apart from their roles as mothers and homemakers. Presumably, this might include such topics as: the extent and character of female labor force participation, particularly the extent to which they either work outside of the home and in non-family enterprises or the extent to which they contribute to and have some control over the money resources of the family; the extent to which women have independent property rights; the extent to which they engage in social activities outside of the familial context; the extent to which they select their own marriage partners, etc.

**6** Well-accepted practices of prolonged ritual abstinence or other well-recognized practices which might affect fertility, e.g., lactation practices.

7 Extent of migration into and out of the community.

8 Opinions and practices of community leaders with respect to fertility and family planning practices.

In view of the lack of experience with analysis of community-level data in relation to fertility, the "model" should be regarded as a set of illustrative suggestions for countries which wish to develop such questionnaires. It is probably worthwhile for quite a few countries to include community-level questionnaires in their fertility research programs; the tested experience with it is not great enough to make it a universal recommendation.

# Types of Community-Level Variables Suggested for Consideration

**1. Transportation and communication: measures of access to other centers and networks of interaction and influence.**

(The assumption is that greater access to and interaction with persons and institutions outside of the local community increases the probability of stimulation by new ideas and interests and also increases the chances of dependence on nonfamilial institutions, where the numbers of children will be less relevant)

A. Distance to and time required by average person to travel to:
   (1) Nearest town with at least 10,000 population
   (2) Nearest town with at least 100,000 population
   (3) Nearest market center where the produce of the local area can be sold regularly

B. Transportation facilities
   (1) Kinds of roads connecting community to other places
   (2) Distance from nearest motorable road (time required to be obtained also wherever distance is mentioned)
   (3) Distance to railroad, busline or other facility at which community residents can begin mechanical powered transport to other places
   (4) Usual and most advanced type of transport (usual is what most people use; advanced is what some may use)
      a. to travel to other towns (e.g. nearest town of 10,000 at which people from the village go with some regularity)
      b. to carry produce to market

C. Communication and information sources:
   (1) Whether telephone or telegraph is available in community and, if not, distance to nearest installation (if meaningful in country, get telephone calls per capita per year)
   (2) Mail and the post:
      a. Whether there is a post office, and if not, distance to nearest one
      b. Is there regular mail delivery and pickup?

*c. (If this is meaningful) letters posted and received per capita

*(3) Availability of radios per capita (if no data, get an informed judgement that there is regular access to radio for none, a few, many, almost everyone.)

(4) Newspapers

a. Is there regular delivery of any paper to the community?

b. If locally meaningful: newspaper circulation per capita. Or alternatively, if meaningful get judgemental rating: newspapers are received fairly regularly by no one, a very few, many, almost everyone.

(5) Movies

a. Are movies shown in the community at least once a week?
*If not*

b. What is the distance to the nearest place where movies are shown at least once a week?

**2. Health levels and facilities**

(Health levels and facilities may be related to fertility, especially insofar as they affect infant mortality. Child mortality may affect the number of children that must be born to have any desired number of children survive. Maternal and child health facilities may have special relations to fecundity and to fertility limitation)

A. Presence of each of the following or distance from village:

(1) Personnel: a qualified doctor
an indigenous doctor
a qualified midwife or nurse
any other health worker
health personnel known to give family planning information

(2) Facilities: hospital
clinic
dispensary
any facility which provides family planning services

B. Measures of availability of medical services
e.g. What is the likelihood in this village that a sick child will receive some qualified medical attention in the first week of an illness (an "informed" estimate e.g. none, some, many, almost all).

*C. The infant mortality rate and any other available mortality data.

*D. Rate of incidence of important diseases.

* Data that probably must come from statistical sources. If available only at level above the community (e.g. district or region) that may be satisfactory.

E. Access in the village to "treated" or "protected" water supply (by none, a few, many, most.)

F. Availability in part or all of the community of public drains, garbage disposal.

**3. Family planning: facilities and prevalence**

(This is potentially important but only in countries where there is some significant level of such services)

A. Family planning facilities
   (1) Availability in the community or distance to (or time required for travel to):
      a. A clinic, hospital or other facility which provides family planning services
      b. A doctor providing such services (apart from clinic or hospital)
      c. A family planning worker or other paramedical worker providing such services (including those who visit area)
      d. A pharmacy or other shop selling contraceptives.
   (2) Prevalence
      *a. Acceptors of family planning in official program (per 100 eligible women or per capita)
      b. Judgement of community leader as to whether there is use of family planning services or practice of family planning by – any, a few, many

**4. Education**

(Education is usually but not always shown to be negatively related to fertility and positively related to fertility control practices. It is generally recognized that education per se is not the causal factor. It may be relevant vecause it increases access specifically to fertility control models and ideas but more generally because it related the individual to a world of ideas and institutions transcending the local and familial)

*A. Measures of educational level if available: e.g. average educational attainment of adults (preferably distinguishing young and older adults); % literate, % with primary education completed, % with highschool education completed.

B. Distance from and time for average child to get to
   (1) a primary school
   (2) a secondary school

*C. Proportion of children of eligible ages attending
(1) a primary school
(2) a secondary school
If such data are not available on statistical basis, perhaps try to get an informed judgemental guess: none, a very few, few, many, most)

**5. Availability of electric power**

(This is important for many aspects of community life which may in turn affect fertility. It affects communications, kinds of consumer goods that can be used, power for agriculture and industry and transportation, family life in night-time hours, etc.)

A. Does the community have electric power at all?

*B. If yes: In what proportion of *homes* is it found?: (none, a few, many, almost all)

*C. Electric power consumption per capita

**6. Agricultural development level**

(Presumably the communities in which farmers use modern methods and are linked to a modern market system for supplies and sales of produce are more likely than others to have motivations and influences leading toward lower fertility. Agricultural prosperity, apart from modernization, may be less clearly related to fertility. In traditional societies it might be related to higher fertility with resources being used to achieve high fertility values)

A. Equipment: extent to which modern mechanical farm equipment is used in the community (e.g. used by none, a few, many, almost all farmers)

B. Extent of use of chemical commercial fertilizers

C. Extent of adoption of new types of crops and/or seeds in preceding 5 years

D. Regular contacts of community with agricultural extension agents or development workers

E. Extent to which production is for subsistence or market sale

*F. Value of agricultural production
   a. per farm
   b. per capita
   c. per agricultural worker

G. Major crops

*H. Population per acre of cultivable land

*I. Land tenure and average size of farm holding

J. Availability of modern irrigation facilities (if relevant for local agriculture)

**7. Industrial development**

(The less the rural community is dependent purely on local agricultural resources, presumably the greater the chance that individuals will be in touch with ideas and institutions that are less familial and traditional)

A. Does the community have any business using mechanical power and employing at least 10 people?

B. If it has none, what is the distance of the community from such an establishment?

*C. What proportion of the resident population of the community works in such an establishment either locally or elsewhere either regularly or on a seasonal basis? (Rough judgements may be adequate: none, a few, many)

*D. Proportion of the population of labor-force-age employed in
   (1) non-agricultural activity
   (2) industry

**8. Contact with governmental structure**

(Presumably local communities which are isolated from the larger governmental structure are more likely than others to maintain local and traditional patterns and less likely to be influenced by new developments which may be communicated through functionaries of the government. However, this influence is probably much affected by the character of the

governmental orientation of staff toward serving the population, and popular confidence in government officials. Therefore, whether contact with the governmental structure will have a "modernizing influence" which will extend to fertility is an open question)
For each of the following is there a representative in the community, or one who comes there regularly? If no, then how far is the nearest representative with whom people in the community have some contact?

police
office concerned with taxation
office concerned with land registration
a court with local jurisdiction
office for registration of births and deaths

**9. Ethnic/religious/language or other relevant cultural groupings**

If there are significant groups of any of these types in the country which are believed to be pertinent to fertility differentials and if the WFS individual questionnaire asks whether the respondents belong to one category of such groupings, the community level questionnaire should ask for an estimate of the distribution of the total population among such groupings (e.g. Protestant, Catholic, Other, or Malay, Chinese, Indian, Pakistani, Other, etc.).

# Community-Level Questionnaire

Name of community: .....
Identification: .....
(District, region, or other areal identification.)
Name and position of respondent: .....
Population of the Community .....

**1. Transportation and communication**

1.1

| Distances and time for travel to nearest | Estimated distance | Estimated time for average resident to travel there (If in this community enter: Here) |
|---|---|---|
| town with 10,000 people | | |
| town with 100,000 people | | |
| market center where local produce is sold | | |
| place where can begin travel to other places by rail, bus, or other powered transport facility for public use | | |
| road that is motorable most of year | | |

1.2 Road: community is

| | Check the most superior type in community | Distance in miles to road of types d-e |
|---|---|---|
| a. Not on any road | | |
| b. on unimproved road | | |
| c. on loose-surfaced road, low standard | | |
| d. on loose-surfaced road, high standard | | |
| e. on hard surfaced road | | |

1.3

| What is the mode of transport used for going to the nearest market center outside the community? | Check the type used by most | Check here the types used regularly by anyone in the community |
|---|---|---|
| a. walking | | |
| b. riding animal or in animal-drawn vehicle | | |
| c. bicycle | | |
| d. motorized vehicle | | |

1.4 Communication facilities

| | Check if available in community | If unavailable in community: distance in miles to nearest community that has one | If unavailable in community: estimated time for average resident to travel there |
|---|---|---|---|
| telephone | | | |
| telegraph | | | |
| post office | | | |
| mail delivery | | | |
| newspaper for sale or public reading | | | |
| movie (at least weekly) | | | |
| Coffee-house or restaurant | | | |

1.5 Ownership of radios
(If statistical data unavailable):
What is your estimate of the proportion of households in this community with a radio?

None .....
Very few (less than 10%) .....
Few (10–29%) .....
Many (30–79%) .....
Almost all (80–100%) .....

1.6 Statistical information on transportation and communication where available:

a. Letters sent (per 1.000 population) .....
b. Letters received (per 1,000 population) .....
c. Telephone calls (per 1,000 population) .....
d. Newspaper circulation (per 1,000 population) .....
e. % of households with radios .....

## 2. Health

2.1 Is each of the following in the community? If not, how far is the location of the nearest and how long does it take for average person in community to travel there?

| Type of facility or personnel | In community? | | If not in the community: | |
|---|---|---|---|---|
| | Yes | No | Distance in miles | Time required for average person to travel to place or personnel |
| Qualified doctor | | | | |
| Indigenous doctor | | | | |
| Qualified midwife or nurse | | | | |
| Other health worker (specify) | | | | |
| Hospital | | | | |
| Clinic | | | | |
| Dispensary Pharmacy or shop selling drugs | | | | |

2.2 Is there any provision in any part of the community through public authority of

| | Yes | No |
|---|---|---|
| Drains | | |
| Garbage removal | | |
| Treated or protected water | | |

2.3 What part of the population of the community has access to "treated" or "protected" water?

None .....
A very few (less than 10%) .....
Few (10–29%) .....
Many (30–79%) .....
Almost all (100%) .....

2.4 When children are sick in the community, what is the likelihood that they will receive some qualified medical care in the first week of their illness? The number who would get it would be

None .....
A very few (less than 10%) .....
Few (10–29%) .....
Many (30–79%) .....
Almost all (100%) .....

**3. Family Planning facilities and prevalence**

3.1 Which of the following are available in the community? If any are not available in community, what is the distance to and time required to travel to the nearest place which has the service or facility?

| | In community? | | If not in community | |
|---|---|---|---|---|
| Service or personnel or facility | Yes | No | Distance in miles | Time required for average person to travel to facility or personnel |
| Clinic, hospital, or other general or specialized service for family planning | | | | |
| Other doctor providing such service | | | | |

| | | | | |
|---|---|---|---|---|
| Family planning worker or other paramedical personnel who provide advice or service (include those who visit community | | | | |
| Pharmacy or other shop selling contraceptives | | | | |

3.2 (If there is an organized family planning programme which has the community in the service area for which it is responsible.)

3.2.1 Acceptors in the official family planning programme who live in this community (per 1,000 population) (if such data are available from official sources).

.....

3.2.2 What would be your best estimate of the proportion of married women of childbearing age (under 45) who have received family planning services from the organized family planning services?

None .....
Very few (less than 10%) .....
Few (10–29%) .....
Many (30–79%) .....
Almost all (80–100%) .....

3.2.3 What would be your best estimate of the proportion of married women of childbearing age (under 45 )who have ever used contraception or done something to limit the number of children they have?

None .....
Very few (under 10%) .....
Few (10–29%) .....
Many (30–79%) .....
Almost all (80–100%) .....

## 4. Education.

4.1 Are there any schools in the community? If not, what is the distance or time required for children to travel to the school?

| | Present in Community? | | If not in Community: | |
|---|---|---|---|---|
| Kind of school | Yes | No | Distance in miles | Time required for average child to travel to this school |
| Primary school | | | | |
| Secondary school | | | | |

4.2 From official statistics if available: Number of children of eligible age and proportion of children of eligible age who attend the school:

| | Number who attend | | | Proportion of those of eligible age who attend | | |
|---|---|---|---|---|---|---|
| | Boys | Girls | Total | Boys | Girls | Total |
| Primary | | | | | | |
| Secondary | | | | | | |

4.3 (If 4.2 cannot be answered from official sources); What is your best estimate of the proportion of children of the eligible age who attend the primary and secondary schools?

| | | Estimated % of those of eligible age who attend | | | | |
|---|---|---|---|---|---|---|
| | | None | Very few (less than 10%) | Few (10–29%) | Many (30–79%) | Almost all (80–100%) |
| *Primary* | Boys | | | | | |
| | Girls | | | | | |
| | Total | | | | | |
| *Secondary* | Boys | | | | | |
| | Girls | | | | | |
| | Total | | | | | |

4.4 Statistics on education from official sources if available:

4.4.1 Mean educational attainment for adults (over 20):

Males .....
Females .....
Total .....

4.4.2 % of adults who

| | Males | Females | Total |
|---|---|---|---|
| are literate | | | |
| have completed primary school | | | |
| have completed secondary school | | | |

## 5. Availability of Electric Power

5.1 (If available from official sources.)
Kilowatts of electricity per capita per annum .....
Proportion of households with electric power .....

5.2 (If such data not available from official sources.)
What is your best estimate of the proportion of households which have electric power:

None .....
Very few (less than 10%) .....
Few (10–29%) .....
Many (30–79%) .....
Almost all (80–100%) .....

## 6. Agriculture

6.1 Data from official sources, if available:

a. Value of agricultural production .....
total value .....
value per farm .....
value per capita .....

b. Average size of farm holding .....
Mean .....
Median .....

c. List of the major crops of the area with estimated % of total acreage given to each crop: .....

d. Measure of use of irrigation

e. Number of males of labour force age in agriculture

| | No. | % of male labour force |
|---|---|---|
| Total | | |
| as Owners | | |
| Tenants | | |
| Work on family farm | | |
| Farm labourers for others | | |

f. Proportions of farms with any kind of powered farm machinery:

.....

g. Proportion of farms which have tried new crops or new types of seeds in last five years:

.....

(The following questions are asked if data is not available from official sources)

6.2 What is your best estimate of the proportion of farms in the community which have some form of powered equipment for farming?

| | | |
|---|---|---|
| None | | ..... |
| Very few | (less than 10%) | ..... |
| Few | (10–29%) | ..... |
| Many | (30–79%) | ..... |
| Almost all | (80–100%) | ..... |

6.3 What proportion of the farms would you estimate make some use of chemical fertilizer which they buy?

| | | |
|---|---|---|
| None | | ..... |
| Very few | (less than 10%) | ..... |
| Few | (10–29%) | ..... |
| Many | (30–79%) | ..... |
| Almost all | (80–100%) | ..... |

6.4 What proportion of the farms would you estimate have tried new crops or seeds not grown in this community five years ago?

| | | |
|---|---|---|
| None | | ..... |
| Very few | (less than 10%) | ..... |
| Few | (10–29%) | ..... |
| Many | (30–79%) | ..... |
| Almost all | (80–100%) | ..... |

6.5

6.5.1 Are there any agricultural extension workers or agents or other development workers who provide advice or services to the farmers in this community?

| | |
|---|---|
| Never | ..... |
| Occasionally visit | ..... |
| Regularly visit | ..... |
| Resident in community | ..... |

6.5.2 (If any such service is available) What proportion of the farmers in the community would you estimate have ever received advice or other help from this service?

| | | |
|---|---|---|
| None | | ..... |
| Very few | (less than 10%) | ..... |
| Few | (10–29%) | ..... |
| Many | (30–79%) | ..... |
| Almost all | (80–100%) | ..... |

6.6 What proportion of the farms would you estimate make use of irrigation water from a public source (other than irrigation completely through their own efforts)?

| | | |
|---|---|---|
| None | | ..... |
| Very few | (less than 10%) | ..... |
| Few | (10–29%) | ..... |
| Many | (30–79%) | ..... |
| Almost all | (80–100%) | ..... |

**7. Non-agricultural Development.**

7.1 Is there a business in the community which uses mechanical power and employs at least 10 people?

| | |
|---|---|
| Yes | ..... |
| No | ..... |

7.2 If none in the community:
What is the distance in miles to the nearest place with such an establishment?

.....

How long would it take the average person to travel there?

.....

7.3 What proportion of the male labour force of the community would you estimate works in such an establishment?

| | | |
|---|---|---|
| None | | ..... |
| Very few | (less than 10%) | ..... |
| Few | (10–29%) | ..... |
| Many | (30–79%) | ..... |
| Almost all | (80–100%) | ..... |

## ACCESS TO GOVERNMENTAL AGENCIES

**8.** Indicate whether each of the following is present in the community and if not the distance to the nearest community where the facility or personnel are available.

| | In community? | | If not in the community | |
|---|---|---|---|---|
| | Yes | No | Distance in miles | Time required for average person to travel to place or personnel |
| Tax collection office | | | | |
| Policeman | | | | |
| Land registration office | | | | |
| Court with local jurisdiction | | | | |
| Office for registration of births and deaths | | | | |
| District or provincial capital | | | | |

## ETHNIC/RELIGIOUS/LANGUAGE/OR OTHER RELEVANT CULTURAL GROUPINGS

**9.** Approximately what proportion of the population of the community belongs to each of the following groups (to be specified for each country):

| | % in each group |
|---|---|
| Group A | ..... |
| B | ..... |
| C | ..... |
| Other | ..... |
| TOTAL | 100% |

# Footnotes

1 E.g., D. M. Heer and E. S. Turner, "Areal Differences in Latin American Fertility," *Population Studies*, Vol. 18, No. 3, March 1965, pp. 279–292; P. Mazur, "Birth Control and Regional Differentials in the Soviet Union," *Population Studies*, Vol. 22, No. 3, November 1968, pp. 319–333; T. P. Schultz, *A Family Planning Hypothesis: Some Empirical Evidence from Puerto Rico*, Memorandum RM-5405-RC/AID; Santa Monica, Rand Corporation, 1967; O. A. Collver, "Women's Work Participation and Fertility in Metropolitan Areas," *Demography*, Vol. 5, No. 1, 1968, pp. 55–60

2 E.g., see Mattei Dogan and Stein Rokkan, *Quantitative Ecological Analysis in the Social Sciences*, Cambridge, M.I.T. Press, 1969; W. S. Robinson, "Ecological Correlations and the Behavior of Individuals," *American Sociological Review*, Vol. 15, 1950, pp. 351–357; O. D. Duncan, Ray Cuzzart and Beverly Duncan, *Statistical Geography*, Glencoe, Free Press, 1961; R. Baudon, "Propriétés individuelles et propriétés collectives," *Revue française de sociologie*, Vol. 4, 1963, pp. 275–299; H. M. Blalock, *Causal Inferences in Non-Experimental Research*, Chapel Hill, University of North Carolina Press, 1964, pp. 97–114.

3 The wording in this paragraph is drawn in large part from K. S. Srikantan, *Effects of Neighborhood and Individual Factors on Family Planning in Taichung*, Doctoral Dissertation in Sociology, University of Michigan, 1967. For discussion of this and other issues, see P. Kendall and P. F. Lazarsfeld, "The Relation Between Individual and Group Characteristics" in *The American Soldier;* and P. F. Lazarsfeld and M. Rosenberg, Eds., *The Language of Social Research*, Glencoe, Free Press, 1955, pp. 290–296.

4 O. D. Duncan, "Residential Areas and Differential Fertility," *Eugenics Quarterly*, Vol. 11, No. 2 June 1964, pp. 82–89; L. Rhodes, "Socio-economic Correlates of Fertility in the Metropolis: Relationship of Individual and Areal Unit Characteristics," *Social Biology*, Vol. 18, No. 3, September 1971, pp. 296–304.

5 *Op. cit.*

6 R. B. Anker, *Socio-Economic Determinants of Reproductive Behavior in Households of Rural Gujarat, India*, Doctoral Dissertation in Economics, University of Michigan, 1973.

7 E.g., R. L. Merritt and S. Rokken, *Comparing Nations, The Use of Quantitative Data in Cross-National Research*, New Haven, Yale University Press, 1966; Henry Valien and Daniel Katz, *Political Parties in Norway: A Community Study*, Oslo, Universitetsforlaget, 1964.

8 Many studies have been done following the well-known investigation by J. Coleman, et al., *Equality of Educational Opportunity*, Washington, U.S. Office of Educational Opportunity, 1966. For an excellent discussion of many of the issues and an empirical test of some of them, see R. M. Hauser, *Socio-economic Background and Educational Performance*, The Arnold and Caroline Rose Monograph Series in Sociology, American Sociological Association, Washington, D.C., 1971. See also, C. Jencks, et al., *Inequality: A Reassessment of the Effect of Family and Schooling in America*, New York, Basic Books, 1972.

9 S. A. Stouffer, et al., *The American Soldier: Adjustment During Army Life*, Princeton, Princeton University Press, 1949, Vol. I, Chapter 6.

10 The Mysore India questionnaire and some discussion of it is in United Nations, Department of Economic and Social Affairs, Population Studies No. 34, *The Mysore Population Study*, New York, 1961. For the Korean questionnaire see, Bom Mo Chung, et al., *Psychological Perspectives: Family Planning in Korea*, Seoul, Korean Institute for Research in the Behavioral Sciences, 1972. The questionnaire for a 1963 study on Turkey is in *Selected Questionnaires on Knowledge, Attitudes, and Practice of Family Planning*, New York, Demographic Division of the Population Council, 1967. A community-level questionnaire was also used in a 1968 Turkish study. The questionnaires have not yet been published for the 1968 Pakistan Impact Study and for a study in the field now in Nigeria (International Research Project on Changing African Family Structure of the Department of Sociology, University of Ibadan, Nigeria). The Iran schedule is in A. A. Paydarfar, "Social Change in a Southern Province of Iran," mimeo, 1973, Carolina Population Center. The Tanzanian schedule is also available in mimeographed form. The community-level data for Thailand were collected in a series of "village profiles" for villages falling into the sample for a national longitudinal study on fertility and other social, economic, and demographic variables. (See *The Methodology of the Longitudinal Study of Social, Economic, and Demographic Change*. Research Report No. 6 of the Institute of Population Studies, Chulalongkorn University, Bangkok, 1971.) Some of these community-level schedules are reprinted in the Appendix.

11 In the Mysore study the community-level data were used to describe the rural sample, but there was no analysis of the relation of the community-level data to fertility. K. S. Srikantan aggregated to a regional level Turkish survey data for individuals on some aspects of fertility, family planning and modernization attitudes and then related these aggregate regional measures to the ranking of the regions based on data from other sources. However, community-level data as such were not involved in this analysis. See K. S. Srikantan, "Regional and Rural-Urban Socio-Demographic Differences in Turkey," *The Middle East Journal*, Summer, 1973, pp. 275–300.

12 These data were part of the tables assembled by the Subcommittee on Comparative Fertility Analysis of the International Union for the Scientific Study of Population for a seminar held in Brussels, May 1973.

13 E.g., C. Goldscheider and P. R. Uhlenberg, "Minority Group Status and Fertility," *The American Journal of Sociology*, Vol. 74, No. 4, January 1969, pp. 361–372.

14 F. Van Heek, "Roman Catholicism and Fertility in the Netherlands: Demographic Aspects of Minority Status," *Population Studies*, Vol. 10, No. 2, November 1956, pp. 125–138.

15 W. Rich, *Smaller Families Through Social and Economic Progress*, Washington, D.C., Oversea Development Council, January 1973; and J. E. Kocher, *Agricultural Development, Equity, and Fertility Decline: A Review of the Evidence*, New York, The population Council, 1973.

16 If the sample for particular cities is large enough, it is also feasible to aggregate individual survey responses for the local subareas and then utilize these aggregate measures in relation to individual responses. This was done in the study by Srikantan cited in footnote 3. David Goldberg has done similar unpublished analyses for a fertility survey in Ankara, Turkey.

17 In this 1968 study the main emphasis of the interviews with local leaders was on their own opinions and attitudes. The kinds of leaders interviewed included the village headman, the Imam (a Moslem religious leader), a leader on the government basic democracy program, a school teacher, a doctor, and a Hakim or Kaviraj (an indigenous doctor). The 1963 study in Turkey (see footnote 10) also had separate questions addressed to the local Muhtars and Imams.

18 The description of the Tanzania 1973 study is drawn from a letter from Dr. R. Henin, director of the study ,while the study was in progress.

19 A. A. Paydarfar, *Social Change in a Southern Province of Iran*, Chapel Hill, University of North Carolina Population Center, 1973 (mimeo). For an example of the use of component analysis to develop a typology of large towns based on 60 different variables, see C. A. Moser and W. Scott, *British Towns*, London, Oliver and Boyd, 1961.

WORLD FERTILITY SURVEY

# OCCASIONAL PAPERS

| | | |
|---|---|---|
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| 2. | The World Fertility Survey: Problems and Possibilities | J. C. Caldwell |
| | World Fertility Survey Inventory: Major Fertility and Related Surveys 1960–73 | |
| 3. | Asia | Samuel Baum *et al* |
| 4. | Africa | |
| 5. | Latin America | |
| 6. | Europe, North America and Australia | |
| 7. | The Study of Fertility and Fertility Change in Tropical Africa | John C. Caldwell |
| 8. | Community-Level Data in Fertility Surveys | Ronald Freedman |
| 9. | Examples of Community-Level Questionnaires | Ronald Freedman |
| 10. | A Selected Bibliography of Works on Fertility | György T. Acsádi |
| 11. | Economic Data for Fertility Analysis | Deborah S. Freedman (with Eva Mueller) |
| 12. | Economic Modules for use in Fertility Surveys in Less Developed Countries | Deborah S. Freedman and Eva Mueller |
| 13. | Ideal Family Size | Helen Ware |
| 14. | Modernism | David Goldberg |
| 15. | The Fiji Fertility Survey: A Critical Commentary | M. A. Sahib *et al* |
| 16. | The Fiji Fertility Survey: A Critical Commentary–Appendices | M. A. Sahib *et al* |
| 17. | Sampling Errors for Fertility Surveys | L. Kish *et al* |
| 18. | The Dominican Republic Fertility Survey: An Assessment | N. Ramírez *et al* |
| 19. | WFS Modules: Abortion · Factors other than Contraception Affecting Fertility · Family Planning · General Mortality | WFS Central Staff |

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