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POPULATION AND DEVELOPMENT RESEARCH
IN THE PHILIPPINES: A SURVEY

by

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Abstract

A review of social science research on population and development in the Philippines reveals that we know more about fertility levels, less on migration and much less so on mortality; and generally, in each of the variables, we know more about trends at the national level than at the sub-national level and among social groups.

Studies that examined the impact of rapid population growth at the national level point to the adverse effects of such growth on per capita income, employment, and the provision of basic services such as education and health. However, these did not study the actual consequences of demographic trends, rather these consequences were inferred from the results of simulation exercises using economic-demographic models of different specifications. A new generation of consequence studies seem to be needed, namely those that would determine who are the most adversely affected by demographic trends, what are their characteristics, and where are they located. Such information could help formulate policies and programs geared directly towards specific population groups.

With respect to the determinants of demographic trends, the studies reviewed suggest potential relationships among demographic variables, e.g., differential migration patterns can have significant impact on nuptiality patterns and therefore on fertility. In addition, the studies reviewed suggest that changes in the values of the non-demographic areas of concern could have discernible impact on demographic trends: with respect to fertility, through changes in education and health, as well as through female employment via its effects on the age at marriage; with respect to migration, through availability of employment opportunities and access to education services; and finally, with respect to mortality, through improved health and nutrition services and improved environmental sanitation. Hence, policies and programs that affect these areas of concern could have significant impact on the demographic variables. What is not precisely known, however is (a) the quantitative extent and the specific mechanisms through which these policies and programs affect these areas of concern; and (b) through what specific mechanisms and to what quantitative extent do changes in these broad non-demographic areas of concern in turn affect the demographic variables. These types of information are critical in the optimal design of policies and programs that address both the non-demographic and demographic objectives.

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Alejandro N. Herrin*

INTRODUCTION

This paper attempts to review the state of social science research on population and development relationships in the Philippines with the aim of taking stock of what we know about such relationships as a guide to development planning, and of providing a basis for formulating recommendations to guide future research on the topic.

The many population-related studies by independent investigators often contain reviews of past studies and suggestions for further research. In addition, efforts to bring together experts in various fields to focus on the status and directions of population-related research have also been made in the past. (Concepcion, 1966, 1969; Bulatao, 1976). However, neither singly nor in combination do these efforts readily provide a unified view of the larger perspective needed for the development of a systematic knowledge base and a national research agenda specifically geared to the needs of policy makers and planners in the 1980s.

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Background

The increased concern of the role of population in development led many governments at the turn of the 1970s to adopt an official population policy whose main focus was the reduction of the rapid population growth. The main population program was the family planning program aimed at providing contraceptive technology to reduce fertility. The rapid declines in fertility noted in some countries have been attributed in varying extent to the impact of such programs. It was difficult however, to assess the impact such program has had on the population growth since the countries that had achieved the most rapid declines in fertility were also the countries which underwent rapid economic and social transformation. Among other factors, this led many governments to view rapid socioeconomic transformation as an important factor for the rapid and sustained decline in fertility. This view further reinforced by discussions at international forums (e.g., the 1974 Bucharest Conference) has led to the recognition of the necessity of formulating population policies and programs as integral parts of the social and economic development strategy.

The present concern in the Philippines for such integration has been more clearly stated in the report of the Special Committee to Review the Philippine Population Program (1978). Noting that while some efforts

have been taken to link the Philippine Population Program with other economic and social dimensions of development, the Committee found that to a large extent, the program has remained essentially a family planning program. Moreover, the Committee observed that whenever population was considered in the formulation of development plans, it was often treated more as a demand variable than as a factor that can be influenced by economic and social development. Hence, the Committee recommended that "the Philippine Population Program should be designed on a broader scale and be fully integrated in the national development plans of the country. Economic, social and institutional policies and programs should be evolved with a conscious consideration of their impact on demographic behavior and objectives". (p. 122).

Part of the failure to fully integrate population into the overall development plan is the difficulty of such integration at the operational level. This in turn is partly due to the complexity of the interaction between population and socioeconomic development, and partly due to the inadequacy of the empirical knowledge base both internationally and nationally for the assessment of such inter-relationships for development planning. An additional reason has been suggested, namely that "until recently, there has been an unclear institutional responsibility for advocating and overseeing the fuller integration of population in development concerns. This has resulted

in a rather weak and uncoordinated effort towards integration."
(Pante and Morales, 1980).

It is within the context of the above developments that this present effort to review social science research on population and development relationships in the Philippines is made. The ultimate aim is to hasten the operational integration of population in development concerns by expanding the knowledge base necessary to support such effort.

Coverage and Approach

A note on the coverage and approach of this review is in order. Population-related research has sometimes been classified into: (a) research on demographic levels, trends and patterns; (b) research on socio-economic-demographic relationships; and (c) action or program-oriented research. In the Philippines, considerable work has been done with respect to the first and third of these categories and some recent attempts at synthesis have been made. (Concepcion and Smith, 1977 for the first category, and Laing, 1979 for the third category). The main focus of this review, therefore, will be on the second category of researches as indicated by the title of this paper.

Within this second broad category of researches, the review is organized around the examination of empirical studies focusing primarily on the major demographic variables, namely: (a) fertility, (b) mortality, and (c) migration. Within the fertility variable, studies dealing with nuptiality and other immediate correlates of fertility are examined, while within the migration variable, studies dealing with internal and international migration are distinguished. Emphasis was placed on those empirical studies which analyzed data whose coverage included the nation as a whole (e.g., census, vital registration, national survey data) to reflect findings that would be representative of the national situation.

For each of the major variables, the review is further organized around the following questions, modifying somewhat the approach adopted by the International Review Group of Social Science Research on Population and Development (1978):

- (a) How much is known about the determinants, including individual, household and community level determinants, of the variable and its components?
- (b) How much is known about the consequences of the particular demographic behavior for individuals and families; for geographical, communities and specific groups; and for

the nation as a whole?

- (c) How much is known about the impact of public policies and programs on the variable in question?

In view of the existing synthesis of studies dealing with the levels, trends and patterns of the demographic variables in question, only a brief introduction is made in this review to put the subsequent discussions into proper perspective, and to identify issues that could later be clarified by further research.

The subsequent sections of this report are organized as follows. In the succeeding four sections a review of studies is made focusing respectively on mortality, fertility, internal migration, and international migration. The final section highlights the more important findings regarding population and development relationships and the most critical gaps in knowledge requiring serious investigation. Both these aspects are discussed within a simple framework of population-development relationships geared towards a policy maker's and planner's viewpoint.

MORTALITY

Writing in 1974, Flieger (1976) lamented the fact that compared to fertility, information regarding mortality has been quite scanty, and that whatever available information there are, they refer almost totally to the national population, leaving "an almost complete lack of mortality information for regions and provinces." Part of the problem has been that the major sources of data for the estimation of mortality were either deficient or defective. Vital registration data, for example, were only about 60 percent complete for the Philippines in 1970, and the completeness of registration varied from 30 percent in Western and Southern Mindanao to 80 percent in Southern Tagalog (Abenoja and Flieger, 1979). Censuses, on the other hand, contained defects in the age-sex structure data making the application of indirect estimation techniques difficult.

The above assessment of the state of mortality information is still generally valid today. However, notable gains have been achieved since then, and although accumulating slowly and unevenly, the studies in the last five years have provided us more information than heretofore been available. These developments included the emergence of new sources of data such as the sample vital registration system project of the National Census and Statistics Office implemented during 1971-1973, and the 1968 and 1973 National Demographic Surveys. Paralleling these were the increased efforts to apply indirect techniques of mortality estimation

from census, vital registration, and survey data to produce not only national mortality estimates but also differential mortality estimates by region, province, and social group. In spite of this progress, however, important gaps in knowledge still exist especially in the area of mortality-development relationships as the subsequent discussion will reveal. A review of available studies, however, provides some concrete basis for making inferences regarding their relationship.

Levels, Trends and Differentials

National Levels and Trends. What we know about national mortality levels and trends in terms of such indicators as the crude death rate or the life expectancy at birth, are based mostly upon the estimates of several investigators using different sources of data and measurement techniques (e.g., Aromin, 1961; Lorimer, 1966; Madigan and Avanceña, 1965; Mijares, 1976; Flieger, 1976; Zablan, 1975a). These sets of estimates compiled recently by Zablan (1978) reveal a pattern of gradually declining mortality from the earlier part of the century up to the beginning of the Second World War, a rapid decline during the postwar period up to the end of the 1960s, and a somewhat slackening of the decline thereafter up to the early 1970s. Estimates for the mid- and late 1970s are hard to come by. The emerging pattern is roughly illustrated as follows. Estimates of life expectancy at birth place an upperbound value of 38 years in 1918 which increased to 40 years in

1938. From a level of 45 years in 1948, it rose to 59 years in 1968, and to around 61 years in 1973. The average annual increase in the respective periods are 0.10, 0.70 and 0.40 years.

The rapid decline in mortality after the Second World War is a common observation in many developing countries. The major factor for such dramatic decline, especially in the earlier part of the postwar period, has often been attributed to effect of the introduction of relatively inexpensive public health measures more than to the effect of general economic development. While the relative quantitative contribution of each factor to mortality decline in the immediate postwar period has yet to be firmly established in the Philippines, one additional and perhaps more important finding that needs explanation is the slackening of the mortality decline in the most recent past. While one can expect an eventual slowing down of the rate of mortality decline once some low level of mortality has been achieved, there is a suggestion that, on the basis of observed international mortality patterns, the slowing down of the mortality decline in the early 1970s may be somewhat premature. The average annual increment in life expectancy of 0.40 years observed between 1968 and 1973 is expected generally of populations which have achieved a high level of life expectancy of around 70 years or so. If our estimates of life expectancy of around 60 years for that period is correct, the expected annual increments

should have been still around 0.56 years (UN, 1956 cited in Zablan, 1977). That we are falling below the expected rate of mortality decline suggests the need for a more careful quantitative study of recent mortality determinants.

Differentials. Several estimates of areal mortality differentials have been made. These include (a) estimates from the NCSO's Sample Vital Registration Project which provide direct estimates of crude death rates by region for 1971 (Flieger, 1976) and for 1971-73 (Mijares, 1976); (b) indirect estimates by region and by provinces using census and vital registration data for 1970 (Flieger, 1979); and (c) indirect estimates by region using 1968 and 1973 NDS data (e.g., Smith *et. al.*, 1975; Zablan, 1975b). Zablan (1978) has provided a convenient summary of some of the results of the studies conducted using the 1973 NDS data.

All these studies point to the fact that the mortality levels by region, and even by provinces within regions are far from uniform; suggesting that a single national mortality estimate hides more than it reveals in terms of mortality conditions in the country. For example, the results of the analyses from the 1968 and 1973 NDS data summarized in Zablan (1978), show that the life expectancy at birth (a measure not affected by the age composition of the population) in 1973 ranged from 43-45 years in such regions as Metro Manila, Ilocos, Central Luzon, Southern Tagalog, Bicol, and Central Visayas, to a low of 56-58 years

in such regions as Northern Mindanao, Western Mindanao, Eastern Visayas and Cagayan Valley. The Philippine average was around 61 years.

In addition to the differential mortality levels, regional estimates for 1968 and 1973 further reveal areas where life expectancy has either declined, or failed to increase as fast as the other regions. Regions with already low life expectancies in 1968 and had further declines in life expectancies in 1973 include Cagayan Valley, Eastern Visayas and Northern Mindanao. On the other hand, regions with already high life expectancies in 1968 and had further increases in life expectancies in 1973 include Central Luzon, Southern Tagalog, Bicol, and Metro Manila. These differential trends tended to further widen existing regional mortality differentials over time. That some regions with high life expectancies in 1968 (Ilocos and Southern Mindanao) showed declines in life expectancies that tended to narrow differentials among regions somewhat is no consolation at all. Even differentials among provinces within a given region vary a great deal, sometimes varying as much as 11-14 years of life expectancy in 1970, (Rizal vs. Palawan or Ilocos Norte vs. Mt. Province) (Flieger's data, 1979).

An analysis of mortality differentials by sub-groups of the population based on the 1973 NDS data was made by Alcantara (1975). The results however, are highly subject to measurement error which render interpretation difficult. Nevertheless, the results tend to show that

childhood mortality measured in terms of the probability of dying from birth to age two (q_2) tend to be higher among farm wives than among professionals and related workers, and higher among wives with low than with high educational attainments. Likewise, childhood mortality is higher in the rural than in the urban area.

Determinants.

What the above data do not reveal, however, is why differentials occur, and why trends vary among region, in some cases reversing a favorable trend. Practically no systematic effort has yet been made to quantitatively identify the determinants of both areal and household or individual mortality levels and differentials. The most that has been done by way of empirical analysis has been to relate regional mortality levels with a set of socio-economic indicators in an attempt to develop a regional typology by levels of health welfare (Zablan, 1977) or by computing simple correlation coefficients between provincial mortality and a few socio-economic variables (Abenoja and Lim, 1979).

Zablan (1977) related regional life expectancies at birth with several socio-economic indicators to reflect average regional levels of nutrition, sanitation, income, health facilities, health manpower, infrastructure, literacy, urbanization, farm activity and government per capita health expenditures. On the basis of the rank orders of the

regions for the indicators, three types of regions by level of health welfare was identified namely: (a) regions with low levels of health welfare as exemplified by Cagayan Valley, Northern Mindanao, Western Mindanao, Southern Mindanao, Eastern Visayas and Bicol; (b) regions with varying levels of health welfare as exemplified by Ilocos, Western Visayas and Central Visayas; and (c) regions with high levels of health welfare as exemplified by Metro Manila, Southern Tagalog and Central Luzon. Zablan suggests that the disparities in the levels of health welfare across regions seem to reflect to a large extent, the degree of access to health services, and to a lesser extent, the level of socio-economic development obtaining in the region (Zablan, 1977). This exercise while suggesting important socio-economic demographic interrelationships, stopped short of attempting to quantify such possible relationships say, through application of multivariate statistical techniques. The purpose of the exercise was more on targetting areas where substantial mortality decline can be achieved through public interventions rather than identifying the determinants of the observed mortality differentials.

In a different approach, Abenoja and Lim (1979) applied simple correlational analysis between 1970 provincial male life expectancy at birth in the Visayan regions, with a few socio-economic indicators. High positive and significant correlations were found between life

expectancy and (a) the opportunities for non-agricultural employment, indexed by the proportion of experienced workers in secondary and tertiary sectors and by the number of large establishments per 10,000 population; (b) the average level of living as indexed by the percent of households with refrigerators; and (c) the degree of urbanization as indexed by population density.

The results of both the studies cited above, however, are inadequate to determine the effect of these socio-economic factors on mortality. Both mortality and socio-economic variables were measured either in the same year as in the case of the Abenoja and Lim study or even beyond the period of reference in which mortality levels were measured as in the case of the Zablan exercise. Such correlational findings, however, provide an initial basis for future testing of hypothesis with respect to the determinants of areal mortality differentials.

An indirect approach to the understanding of the major sets of determinants of mortality trend would be the analysis of the different causes of deaths. This approach used by Preston (1975; 1979) to examine international mortality trends looks at what portions of the decline in mortality can be attributed to the declines in deaths due to different diseases. The assumption is that diseases vary in the degree to which they are responsive to living standards or are capable of being controlled

by medical technology. Unfortunately cause of death statistics, if available, are often unreliable in view of the inherent difficulty of assessing the precise cause of death and they are most likely incomplete. Nevertheless, from whatever data is available, mostly those collected by the Disease Intelligence Center of the Department (now Ministry) of Health, some tentative analysis can be made concerning the possible role played by general economic development and public health measures in reducing mortality in post-war Philippines. Data on death rates by leading causes compiled from the above source and reported but unanalyzed by Zablan (1978) for the period 1946 to 1972 reveal that death rates due to such diseases as pneumonia, influenza, bronchitis, dysentery, gastro-enteritis and nutritional deficiency, diseases often associated with environmental changes due to economic development have posted major declines since 1946. However rates due to control of such diseases as malaria, measles and tuberculosis which are often associated with application of inexpensive modern medical technology have likewise declined. Between 1946 and 1960 death rates due to all of the causes of death enumerated above declined by 57 percent (from 888 to 383 per 100,000). Two-thirds of this decline was accounted for by the decline in mortality from the first set of causes. Between 1960 and 1972, mortality declined by only 18 percent (383 to 315 per 100,000), a much slower rate of decline, of which the first set of causes contributed again about 70 percent of such decline. It would appear that mortal-

ity declines associated broadly with general economic development have been more important than mortality declines associated with the introduction of inexpensive public health measures, especially in the more recent period. This would tend to be contrary to international opinion regarding mortality declines in the post-war era in less developed countries. Although this type of analysis is at best crude in view of the incompleteness and perhaps inaccuracy of the cause of death data and in view of the failure to account for the interaction between the two sources of mortality decline due to specific diseases, it suggests two important tentative hypothesis requiring further systematic study. First, the proportion of deaths due to causes easily amenable to reduction by inexpensive narrowly defined public health measures are quite low to start with, and any mortality reduction due to these causes, however large and rapid, would have a relatively minimal impact on overall mortality decline. Secondly, the rate of decline in mortality due to the first set of causes has considerably slowed down between 1960 and 1972, suggesting that further gains in mortality decline would have to be associated with the effects of a broad based public health program and economic development. Just exactly what type of program and what type of development will have the greatest impact on mortality is still to be determined by more systematic social science research. Detailed analysis of better cause of death statistics could be an important aspect of such policy-oriented research from which a specific

strategy of mortality reduction could be based. For example, the percentage of all deaths due to pneumonia and respiratory tuberculosis were still the highest in 1972 as they were in 1946, both accounting for 27 percent of all deaths. Clearly, significant mortality reduction can be achieved by strategies that bear upon such diseases.

A set of studies which do not deal directly with mortality but could provide concrete hypothesis for the study of mortality determinants are the studies dealing with nutrition, morbidity, and the distribution and utilization of health services (Florencio, 1977; Layo, 1977; Paqueo, 1977a; 1977b; Battad, 1977, 1978; Adorna, 1977). These studies collectively suggest large differentials in nutritional status and morbidity by type of diseases across regions and provinces as well as differentials in the distribution of health services. These differentials may well be directly related to the observed areal differences in mortality rates. At the household level, these studies suggest the importance of such variables as income and education as well as household size and composition as determinants of incidence of malnutrition among pre-schoolers (Battad, 1977, 1978; Paqueo, 1977a). On the other hand, such factors as (a) household size and composition, (b) environmental variables such as quality of drainage and quality of ventilation, (c) traditional health beliefs and health knowledge, and (d) education beyond elementary school have been found to be significant predictors

of morbidity, with the first two sets of variables being more significant than the latter two (Layo, 1977). Together these factors indirectly affect mortality via their impact on nutrition and morbidity. Much more detailed analyses are needed, however, before a set of definitive conclusions can be made.

Consequences

The most discussed effect of declining mortality at the macro level is the increase in population growth. At the household level, this is reflected in increased family size, as more births survive to adulthood. While declining mortality may reduce fertility somewhat, the results of international studies show that the replacement effect of reduced mortality is less than compensatory, thus leaving a net effect of increased family size (Preston, 1975a). In turn, the consequences of increased family size is often discussed in relation to fertility, and hence, these studies will be treated in the next section.

Public Policy

Quantitative studies on the impact on mortality of public interventions, even specific health interventions, are practically nonexistent. This is probably due to the strongly held, but unsystematically documented view, that the public health programs would naturally

have an impact on mortality. Another reason may be the difficulty of evaluating the impact of such programs in view of the limited data available and of the complex factors that affect mortality. A recent evaluation of large-scale maternal and child health-based family planning project implemented in Bohol for example, did not show a decline in mortality as conventionally measured during the five-year duration of the project (1974-79). While many factors were probably responsible for this observed lack of mortality impact (e.g., short duration of observation period and relatively small sample size), the evaluators suggest that perhaps an important contributory factor may be that the project efforts were not closely tailored to the major causes of death, which in turn was primarily due to the inadequate data on this aspect (Parado, Williamson, and Maturan, 1980). Nevertheless, evaluations of the mortality impact of public health programs are necessary in order to determine what specific types of programs will tend to have the largest impact on mortality per unit of resource used. The concern for the need to reallocate resources within the health sector to redress existing geographical and social group imbalances could be guided by the results of such studies.

Research Agenda

The main problem from a policy and program standpoint seems to be the determination of the type of health program and the type of

development that will have the greatest effect on mortality. The research strategies suggested by an International Review Group of Social Science Research on Population and Development seem specially worthy of consideration, namely (a) to increase the awareness of both policy-makers and the general public of the existing inequality in health status between the rich and the poor; (b) to establish more precisely the cost-effectiveness and likely mortality impact of reoriented health policies, and to make such results well known; and (c) to determine the feasibility of reorienting health policies in the absence of broader changes in political and institutional structure (IRG, 1979, p. 80).

In the Philippine context the above strategies could be operationalized more specifically in terms of studies dealing with determinants and consequences of, and the impact of public policy on, mortality and perhaps on two of its closest correlates: morbidity and nutrition. Firstly, the earlier attempts to describe and analyze mortality differentials by geographical areas and by social groups needs to be continued. New data sets, that have become available since the 1973 NDS include several rounds of the Area Fertility Surveys, (one round includes direct information on mortality), the 1978 RPFS, and the recently concluded 1980 census. Application of indirect estimation techniques such as the Brass methods as earlier done, could be pursued. These methods, however, provide estimates of past mortality levels and patterns, and are more

accurate for child mortality in the recent past than for adult mortality. Application of indirect estimation techniques from widowhood data have been shown to yield reasonable estimates of adult mortality in some international applications. This approach could be explored. The resulting estimates from this approach could be fitted with child mortality estimates to generate a complete and consistent set of age-specific mortality rates and life expectancies. In addition, infant mortality can be estimated from pregnancy history data collected in the above-mentioned surveys, and from which analysis of differentials could also be made. Finally, even as vital registration is being improved, various techniques of estimation using vital registration data could still yield reasonable estimates of mortality trends.

Secondly, multivariate analysis of known or suspected determinants of mortality trends and differentials needs to be made. Since existing data sets do not often contain such rich data on possible explanatory variables, serious consideration should be made in collecting such information in future survey rounds of on-going demographic projects, or in designing new surveys specifically meant to implement such types of analyses. Complementary to such multivariate statistical analysis would be the careful in-depth micro-level analysis of the mechanisms by which broad socio-economic correlates, e.g., income and education, affect mortality change. The first and second research leads suggested

above should likewise apply to morbidity and nutrition studies.

Thirdly, cause of death statistics should regularly be compiled and analyzed for possible trends and differentials. While admittedly such data sets tend to be unreliable in view of the difficulty in most cases of determining the precise cause of death, it may still provide useful indicators of trends in types of causes that could most effectively be affected by redesigned public health measures.

Fourthly, there is a need to evaluate the mortality effects of a wide range of public interventions not only the more narrowly defined public health measures but also such programs as food and nutrition, water supply, housing, and environmental sanitation. The evaluation could also seek to what extent current interventions first affect the immediate correlates of mortality among the population groups exhibiting highest mortality; namely, morbidity and malnutrition. While the evaluation of such interventions is made difficult by the lack of adequate evaluative research methodology, the experience of the ESIA/WID Projects would hopefully provide useful research strategies for such evaluations.

FERTILITY:

Levels, Trends and Differentials

Compared to mortality, we have more information regarding levels, trends and differentials in fertility. While vital registration data still remain inadequate as a major source of reliable estimates, census data and more recently, the national and regional demographic surveys, have provided current estimates of fertility at both the national and regional levels, as well as by social groups. What we know about fertility levels, trends and differentials are summarized recently in several studies (e.g., Concepcion and Smith, 1977; de Guzman, 1978; Concepcion and Mijares, 1979; WFS-RPFS, 1979).

National Level and Trends. Available estimates of national fertility levels reveal a fairly constant birth rate ranging from 50 to 56 births per thousand population in the first half of the century, gradually declining beginning the 1950s to reach around 40 to 43 births per thousand in 1970. A somewhat faster decline occurred in the mid-1970s so that by 1977, the crude birth rate has been reduced to around 30-32.

Estimates of total fertility rate and total marital fertility rate for the more recent period from 1965 to 1977 likewise reveal a downward trend. Total fertility rate declined from 6.3 births per

woman in 1965 to 5.89 in 1970 and then to 5.01 in 1977. Total marital fertility rate on the other hand declined from its 1965 level of 9.67 births per ever married woman to 9.65 in 1970 and 9.10 in 1977 (WFS-RPFS, 1979, Table 5.12). The evidence, however, indicates that the decline in fertility rates under age 25 has been due largely to deferment of marriage, than to reduction in fertility within marriage. In fact, marital fertility rates for the three periods have slightly increased for women ages 15-19 and 20-24 years. Within marriage, the declines started among women by age 25 years and over with largest absolute declines occurring among women ages 25-39 years. This pattern suggests that older and higher parity women take the lead in reducing fertility through contraception. This pattern of fertility decline reflects the relative roles played by the two proximate determinants of fertility change, to be described later, namely, changes in nuptiality patterns and changes in contraceptive prevalence.

Regional Differentials. Data from three national demographic surveys (1960 and 1973 NDS, and 1978 RPFS) provide further information on rural-urban and regional fertility differentials. Preliminary estimates of mean children ever born to ever-married women who have been married 10-19 years at the time of the 1978 RPFS survey reveal lower fertility in the urban than in the rural areas; 4.5 versus 5.3; and generally lower fertility in Metro Manila than the rest of the country, with a gradient of higher fertility as one moves from Luzon to Visayas

and to Mindanao: 4.2, 5.1, 5.2 and 5.4, respectively (WFS-RPFS, 1979, Table 5.7). Similar regional pattern is observed for the period 1963-1967 and 1968-72 from the 1968 and 1973 NDS data. In this latter set of data as reported by de Guzman (1978; Table 103), evidence of declining total fertility rates is evident in almost all regions with the consequence of slightly narrowing regional fertility differentials during the two periods. It is difficult at present, however, to pinpoint precisely the determinants of these more recent regional trends.

Some earlier studies, however, have attempted to relate regional or provincial fertility differentials to several socio-economic factors. Smith (1971) found that socio-cultural, demographic and socio-economic factors as indexed in 1938 by such factors as physical characteristics of dwellings, education, occupation, literacy, religion, sex ratio and density, are negatively associated with overall level of fertility in 1960 but that this effect is felt almost exclusively via the association between these factors with the marriage pattern. The association with the level of marital fertility is negligible, and in most cases positive. Regional fertility differentials could also have been due to differential migration patterns which affected nuptiality patterns (Smith 1975a). Relating regional fertility differentials observed in the 1960s with socio-economic factors, proxied by per capita incomes, and health conditions, proxied by infant mortality rates, Flieger (1975), found no

finite association with respect to the former variable, and a slight
 on the latter. Finally, Pascual (1971), related
 regional fertility to a development constructed
 by combining such as the percent of the population that is
 urban, the percent of population units with radios, and the
 percent in non-agricultural occupations. She found
 a nonlinear relationship between these two variables, with fertility
 (children ever born per 1,000 ever married women ages 35-44 or
 45-49) increasing from the least developed areas to some level and
 then decreasing. The relationship
 was found in the most and in the least

Social Groups. Studies on fertility
 by social groups are many. Among the most intensive of
 (1963, 1964) and Pascual (1971).
 in de Guzman (1978) incorpo-
 rating estimates from
 In most general terms
 have been more commonly noted, mostly in the
 nonlinearities, in social
 of the husband,

religion, type of households, and place of residence (rural-urban). Such information is suggestive of the factors affecting fertility. However, the lack of controls characterizing most descriptive analyses limits the usefulness of such analyses in assessing the effect of socio-economic factors on fertility. Statistical analysis which controls for several explanatory variables from which further inferences can be made are described below.

Determinants

Some Statistical Associations. Several attempts have been made to distinguish several socio-economic factors that are closely related to fertility by applying multivariate statistical analyses. Among the more clearcut associations so far noted are those between fertility (measured in terms of the number of children ever born) on the one hand, and education and income on the other. Controlling for the timing and duration of marriage, age of woman and residence, Encarnación (1973, 1975) and Canlas and Encarnación (1977) have found that there is a threshold level of education of the wife and family income such that the effect of each respective variable on fertility is positive below some threshold level and negative above it. Such results have been obtained using data from both the 1968 and 1973 national demographic survey.

Among the less clearcut statistical associations are those between fertility and female labor force participation. Earlier studies that controlled for some possible confounding variables (Concepcion, 1973; Feranil and de Guzman, 1977), have suggested that female labor force participation per se may not greatly affect fertility; the type of work done and the place of work, to a large extent are what really matters. Specifically, the findings show that working women in highly urbanized areas, as well as those specifically engaging in economic activities away from their homes, in non-family enterprises or on an employee status generally exhibited lower fertility. Women working in home or family arrangements exhibited fertility levels comparable with those of non-working women.

More recent econometric studies suggest that there is very little direct effect on fertility of female labor participation independent of other possible determinants notably duration of marriage (Herrin, 1980), and likewise very weak sequential relationship is observed between past female employment and current or expected fertility (Herrin, 1980; Rosenzweig, 1976). The observed variations between female employment and fertility can in fact be explained in large part by their dependence on a common set of economic and social factors (Herrin, 1980).

With respect to the effect of mortality on fertility, Harman (1970) found that infant and child mortality had a significant positive

impact on fertility especially among older women. The same relation was observed when the perception of the risk of losing a child as measured by the community infant safety factor was used. Fernandez (1979) and Paqueo and Fernandez (1979), found that life expectancy appears to have an insignificant effect on the fertility of wives with family income below threshold values, while the effect is significantly negative above such threshold.

While the studies cited above (and others not cited) singly and in combination offer insights into the possible interaction between socio-economic factors and demographic variables, the specific mechanisms involved in their interactions have yet to be firmly established. In most cases, the socio-economic variables that are being related to fertility are merely proxies for the major determinants hypothesized. For example, in the threshold-type studies, education and family income below some threshold are taken to represent more basically, the level of health and nutrition of the mother which in turn directly affect her fecundity or capacity to bear live births. Social science research dealing directly with the effect of health and nutrition of mothers on fertility have yet to be conducted systematically in the Philippines. On the other hand, above some threshold values, both education and family income could represent a host of intervening factors which ultimately affect fertility. A review of international literature on the relation

between education and fertility for example, (Cochrane, 1978), suggest that education could affect fertility indirectly through its effect on the age at marriage, contraceptive knowledge, alternative satisfactions, infant mortality, etc. Following a framework developed by Davis and Blake (1956), understanding the determinants of fertility would require more intensive investigations on its more proximate determinants, i.e., those factors related to entry into unions, contraception, and gestation.

Among the proximate determinants of fertility, nuptiality patterns and contraception have received attention in the recent past notably by the studies of Smith and Laing. Only recently have collection of data and analyses have been made on such other proximate determinants as breastfeeding, separation of spouses, age at menarche, etc. (WFS-RPFS, 1979; Laing, 1979).

Nuptiality Patterns. It was mentioned earlier that fertility trends observed in the more recent period especially among younger women appears to be much more a result of changing nuptiality patterns than in declining marital fertility. Thus continuing information of nuptiality patterns is important in understanding the processes behind fertility changes.

A recent synthesis of available analysis on trends and differentials in nuptiality as well as inferences on the social processes

involved have been made by Smith (1978).

Marital status distributions by age obtained from census data from 1903 to 1970 reveal a significant long-term trend which is more pronounced for females than for males. The percentage never married increased steadily especially among younger women ages 15-19 and 20-24 years over the seven decades, with the shift among women 15-19 years of age occurring before 1939, while for women age 20-24 the shift occurred later (Smith, 1978, Table 113). The singulate mean age at marriage have risen from 20.9 years in 1903 to 22.8 years in 1970.

Data from the same sources likewise reveal areal variations in marriage patterns both at the regional and provincial levels. Some of the most sizeable nuptiality differentials have been traced to the effects of selective migration with respect to age, sex and marital status.

The overall nuptiality patterns has also been related to three important social processes as gleaned from the 1973 National Demographic Survey by Smith (1978). These are (a) urbanization, and the expanded role of females in rural-to-urban transfers as they seek jobs and education; (b) the rise of mass education, and the increased participation of females therein; and (c) the growth of the non-agricultural labor force, in which females have also had an increasingly important

role. The first factor tends to lower the sex ratio as migration to urban areas become female-dominated. This reduces the probability of early marriage. Data provided by Smith (1978) as well as the most recent preliminary estimates by WFS-RPPS (1979) show increasing age at marriage as educational level increases. Finally, female employment especially in the modern sector and in high level jobs is associated with delayed marriage, partly due to the effect of education, however.

In summary, the sources of nuptiality change over the course of seven decades can be traced, on one hand, to environmental pressure on the traditional systems of land holding in the rural sectors, and on the other, to several interrelated processes of modernization including urbanization, educational expansion and the shifting composition of the labor force. The first of these forces had led to differential migration patterns which in turn affected marriage patterns in both receiving and sending areas in the earlier part of the century; while the second set of forces have played an increasingly larger role during the post-war period especially beginning the 1960s.

If nuptiality is a determinant of fertility, how much of fertility change can be attributed to changes in the marriage pattern? Smith (1975b) analyzing data from 1900 census and the 1973 NDS found that between 1960 and 1970, 15 percent of the decline in overall fertility in the Philippines can be attributed to nuptiality, while for the earlier

period from 1903 to 1960, 63 percent of the decline in overall fertility is due to nuptiality. Furthermore, large regional variations characterize the role of nuptiality in fertility change. Nuptiality account for all the change in overall fertility in three regions, and between 40 to 73 percent in another five regions. In Metro Manila, nuptiality accounted for only less than five percent of the change in overall fertility from 1960 to 1970. Metro Manila already had much lower overall fertility by 1960 compared with the other regions: the more recent decline in overall fertility, therefore, is due mostly to changes in marital fertility through contraception.

Contraception and Other Determinants of Marital Fertility. The evidence on fertility levels and trends presented earlier suggest that the decline in total fertility rate observed in the period from 1965 to 1977 has been due to changes in nuptiality patterns especially among younger women, and to changes in marital fertility for women age 25 years and beyond. Within marriage, however, fertility is proximately determined by several intermediate variables including contraception, involuntary infecundity, voluntary and involuntary abstinence, and induced and spontaneous abortions (Davis and Blake, 1956).

While several studies have been made on contraceptive prevalence, which has increased from 16 percent in 1968 to 42 percent in 1978 (Laing, 1979), very little data are available until recently regarding the other

proximate determinants of fertility. Laing (1979) reports of an analysis of 1974 National Acceptor Survey (NAS) data which indicated that family planning acceptors who breastfed their children were protected for over four months longer, on the average, than acceptors who did not breastfeed. The effect of breastfeeding was equivalent to 0.15 births averted, comparable to the average protection provided by condoms following an acceptance of that method.

In the recently completed 1978 WFS-RPFS survey, information was sought on factors other than age at marriage and use of contraception that have a direct effect on fertility. These included information on breastfeeding, post-partum amenorrhea, regularity of menstruation, frequency of sexual relations, post-partum abstinence, etc.. Preliminary analysis have been made on the data on breastfeeding, post-partum amenorrhea, post-partum sexual abstinence, temporary separation of spouses and age at menarche. The results show in general that the length of breastfeeding, because of its suppressing effect on ovulation, is the factor that exerts the greatest influence on the length of the birth interval. Data for the last closed interval revealed that 85 percent of women 15-49 years of age breastfed their child for an average of 11.2 months. Older women and those who reside in rural areas tended to breastfeed their children slightly longer than other groups of women. The length of the post-partum amenorrhea is positive-

ly related to the length on months of breastfeeding. Women who did not breastfeed or who breastfed only for up to two months had a mean amenorrhic period of 3.5 months, while women who breastfed for a full year have a mean amenorrhic period of 8.6 months. Women who breastfed for 30 months have a mean amenorrhic period of 12.5 months.

Post-partum abstinence, if sufficiently prolonged, can lengthen the pregnancy intervals. The duration of post-partum abstinence is usually related to medical reasons, cultural norms, social pressure and individual inclination. The data from the survey suggest, however, that post-partum abstinence does not constitute an important factor in determining the length of either the open or the last closed pregnancy interval. Majority of the women (56 percent) had resumed sexual relation two months after the pregnancy has ended. Higher post-partum abstinence is directly but slightly related to age of woman and indirectly to level of education.

Temporary separation of spouses due to sickness, work or family obligations can also lengthen the pregnancy intervals. The data available, however, suggest that temporary separation is not widespread in the Philippines (only 3 percent reported temporary separation of 3 months or more), nor is it of long duration (the mean length of temporary separation of all women is a mere 0.3 months). None of the background variables show any relationship with duration of separation of

spouses.

Finally, the onset of menstruation, which is a biological factor influenced by the women's general health and nutritional state, ranged from 12 to 19 years of a woman's age, averaging 13.9 years. The data further reveals that younger women tended to have earlier age at menarche. This suggests that the trend in health and nutritional levels in the country over the years may have affected this trend of increasing age at menarche, which in turn could have some influence on overall fertility. The trend towards later age at marriage, however, would tend to minimize the impact of this factor on overall fertility.

In view of the deficiencies of the quality of the data noted by the study, more detailed analyses are required to assess the implications of these proximate determinants of marital fertility.

Value of Children. One of the more recent social science contributions to the understanding of fertility is the value of children (VOC) studies conducted in several countries including the Philippines (e.g., Bulatao, 1975; 1978; 1979a; 1979b; and Bulatao and Arnold, 1977). The main purpose of the study was to identify various domains in which, in the case of the Philippines, the Filipino child is perceived to provide some utility, and to determine whether the degree of a person's concern with these domains relates to childbearing preferences. One

advantage of such an approach is that it puts the conventional economic cost-benefit calculus commonly suggested by economists into the broader social-cultural and psychological context of childbearing decisions. One disadvantage, however, is that the values are related more to fertility preferences rather than to actual fertility. Nevertheless, the results are interesting, and in most cases, reassuring for those who have confined their investigations solely to the economic determinants of fertility.

In the more detailed analysis of the data obtained from a national sample of 1,691 wives and 382 of their husband in 1975, Bulatao (1978) reports that the value domains within which children are considered are several: (a) the domain of instrumental assistance or practical help; (b) the domain of interactions that are socio-emotionally rewarding; (c) the domain of psychological appreciation; (d) the domain of coping with social pressures; (e) the domain of marital security and closeness; (f) and the domain of family and kin preservation. The instrumental-assistance value, including financial help expected from children, old age security, help with household chores, and caring for other children were found to be highly salient as well as among the most central values. However, the second domain, the domain of interactions that are socio-emotionally rewarding such as companionship the children provide, the opportunity to give and receive love and affection, happiness from

being with children, etc., were about equal in salience to instrumental-assistance values and perhaps marginally ahead in centrality. The third and fourth domains were found to be both low in salience and in centrality while the fifth and the sixth were low in salience but high in centrality.

The four major disvalues include: (a) emotional strains of having children, including worries about childbearing; (b) financial problems caused or aggravated by children; (c) restriction on parents' activities and limitations on time for oneself or one's spouse; and (d) concern about overpopulation. The results of the analysis indicate that financial costs were less salient than worries of child rearing, but appeared more central and ranked first in importance among the disvalues. The other two sets of disvalues appeared most less frequently and received less importance; indicating that few respondents see a child in the context of opportunity costs or the social costs of overpopulation.

The analysis also revealed that the contribution of a child in each value domain depends on at least two factors, its sex and its birth order. Childbearing intentions are influenced by different considerations as a family grows. The analysis also revealed that Filipino parents appear to value children for largely individualistic reasons. The respondents tend to be less influenced by pressures from relatives, from the community, or from religion as reasons for child-

bearing.^{1b} Such pressures may operate nevertheless through the value themselves, through couples internalizing and identifying as their own personal motives the dominant cultural patterns to valuing children."^(p. 171) Finally, changes in the perceived values and disvalues of children may occur as modernization proceeds.

In summary, the VOC studies, by providing better understanding of the values of children should provide significant insights into fertility behavior as well as guide efforts toward fertility control that consider and, possibly compensates for, the values that may be lost as families reduce their size.

Consequences of Fertility Trends

Relative to the studies dealing with the correlates of fertility, very little quantitative studies have been done on the actual consequences of fertility change, either at the macro or the micro level. Part of the reason is the lack of adequate and reliable historical data that would allow such quantitative analysis. Another reason is perhaps the fact that the persuasive rhetoric of the 1960s both internationally and locally regarding the adverse consequences of rapid population growth has convinced government authorities of the need to launch public programs to reduce the birth rate. Once such commitment has been obtained, there was little need for more detailed studies showing the generally

held but often simplistic view that rapid population growth will have adverse consequences to the national well-being.

(p. 171).
A review of available Philippine studies dealing with implications of high fertility is made below.

Macro Studies. Largely influenced by the earlier work of Coale and Hoover (1958) on the impact of alternative fertility trends, several studies have been conducted in the Philippines to examine the impact of alternative fertility trends on such macro variables as per capita income, saving and investments, and employment. In general, these macro-level studies are simulation exercises to determine the economic implication of alternative fertility trends (or alternative population growth paths). They do not therefore reflect actual consequences of past demographic trends. Notable among these earlier studies are those by Lampman (1967) and Ruprecht (1967, 1969). In examining some interactions between economic growth and population change in the Philippines, Lampman (1967) asked two questions: (a) what is the economic price or cost associated with the post-war acceleration of population growth; and what economic benefits would flow from a gradual return to a lower rate of population growth; and (b) given the present rate of population growth, what costs must be paid to accelerate the rate of economic growth. The answer to the first question is based on a simple mechanical exercise of assuming a given GNP, then calculating the per capita

GNP under constant and a sharp decline in fertility. Predictably the result would be a higher per capita under the latter than in the former fertility regime. Similarly, given the level of GNP, since population will be larger under constant fertility, and that a larger population would require larger investments and social expenditures, the amount available for consumption will necessarily be lower under a higher fertility regime than under a declining one. Hence, consumption per capita will be lower under constant fertility.

With respect to the second question, the price of growth under the high rate of population growth situation will tend to be higher in both the aggregative level (more capital, more labor, more technical advance, and so forth), and in the intersectoral and inter-group level (more risk, loss of preferred and secured status for some, and considerable change in the way of life for all).

Ruprecht (1967), on the other hand, developed an econometric model which allows the projection of GNP as a function of land, capital, labor and time, and two submodels which allow for the projection of three alternative population growth, and of savings and investment. Having projected GNP, population growth rates, investment rates, etc., under different conditions of fertility control, the advantage in terms of per capita GNP of immediate fertility control over no or postponed

control is demonstrated. One important implication of the exercise is that the initiation of fertility decline cannot wait until its adverse economic effects become apparent. By that time it may be too late as the population momentum at that point is overpowering.

Ruprecht (1979) in a subsequent study attempted to analyze the impact of alternative population trends and consequent growth of income on the structure of the economy (in the input-output sense), on the assumption that different rates of population growth would have somewhat different effects on different sectors of the economy, with the growth of some sectors being retarded, and the growth of other perhaps accelerated. He also examined the employment implications of the resulting structural effect and at a more disaggregated level, the structural implications on several manufacturing sectors. The results of the exercise suggest that for the Philippines, "a reduction in fertility would contribute to an economic structure which emphasized non-agricultural activities to a greater extent, was more capable of providing full employment, and which produced in the manufacturing sector a greater inducement for subsequent growth." (p. 11).

Among other limitations of studies of the type represented above, is the omission of the cost of birth control program necessary to effect the fertility reduction in the first place. Such cost could in fact be sizeable and hence there is a need to explicitly consider

this cost in analyzing the macroeconomic benefits to be derived from reduced fertility.

The recent work by Paqueo (1974; 1977) specifically addressed this issue of the cost of the public intervention to assess the implications of fertility reduction on the economy. In general, Paqueo constructed a family planning submodel that allows translation of the number of family planning acceptors into births averted. This submodel is then grafted into a larger econometric model which is a modification of an earlier economic-demographic model developed by Encarnación, Mangahas, Paqueo and Smith (1974), to analyze the economic effects of the birth control program.

In general, the results of the simulation exercise by Paqueo suggest that the effects of birth control on per capita income and real wage rate is significant. Family incomes, however, appear largely unaffected and the effect on the traditional investment to output ratio seems minimal. Of considerable significance is the finding that while per capita incomes tend to increase, aggregate output due to a relatively smaller labor force is actually reduced. The pay-off of the fertility reduction, therefore, is essentially due to the decrease in the number of persons sharing national output and not from increased production and saving. As Paqueo (1977) concludes: "This observation

would suggest that population control does not necessarily lead to more rapid growth defined as sustained increase in total output. This interpretation should, of course, be qualified by the fact that many causal processes whereby family planning could enhance productivity and capital (human and material) formation are not included in the model. Nevertheless, in the light of the debate regarding development versus population control, it would seem appropriate to end this study by noting that family planning is not a substitute for effective development policies." (p. 215).

In addition to the above studies looking at the probable consequences of alternative fertility (and therefore population growth) trends on per capita income and other aspects related to it, several studies have looked at specific sectors of the national economy that will be affected by population growth. These sectors include health, education, food, housing, natural resources and environment (Calzado, et al., 1978; dela Paz, 1978; Intengan, 1978; Luna, 1978; etc.). These studies generally suggest that while rapid population growth exerts pressure on the demand for basic services, the problems associated with their provision are more directly due to a set of factors more complex than just a rapid increase in population would imply.

Micro-level Studies. Turning now to the micro level impact of fertility change, several studies have focused on the impact of family size on family savings and expenditures (Peek, 1974; Power, 1971; Mangahas, 1974), on morbidity rates (Layo, 1977) and nutritional status of household members (Battad, 1977).

Using data from the PSSH of the BCS for 1961, 1965 and 1971, Peek (1974) examined the effects of family size among others on household savings, defined alternatively as per capita savings, per household savings and per adult equivalent savings. Among the tentative conclusions are as follows: (a) gross dependency burden (not taking into account the contribution of the dependents to family income) has a negative impact on the savings rate which is only to a small extent, offset by economies of scale in consumption; (b) there is a negative life cycle effect on savings in terms of expected dependency burden, which more than offsets the positive economies of scale effect of savings.

One limitation of Peek's study is that the effect of family size on family income is not explicitly considered in the model. Such effect, however, is considered by a study conducted by Mangahas (1974). This study attempted to quantify two processes by which family size may affect family expenditure (and as a residual, savings). Firstly,

he considered the relationship between family size and the number of working family members. The size of the family's working force then affects family income and hence, family expenditure. Secondly, the study considered the relationship between family size and the number of adult-equivalent consumers in the family. The latter variable, jointly with family income determines family expenditure. The data used were the Family Income and Expenditure Surveys (FIES) of 1957, 1961, 1965 and 1971, of the Bureau of the Census and Statistics, and the National Demographic Survey (NDS) of 1968.

The interrelationships suggested are as follows: Increases in family size leads to increases in the family labor force and in turn to the number of working members, which in combination with the age of the household head, the education of the wife, and (in urban areas) the labor force participation of the wife, then determines family income. In the second process, family size determines the number of equivalent adult members in the family. In combination with family income, this in turn determines the consumption level for the family.

With respect to the potential effect of family size on morbidity, Layo (1977) found that the most important determinants of total illness in the household as measured by the magnitude and significance of the regression coefficients are the number of household members 0-5 years old and the number of older members age 45 and over controlling for

such factors as education, per capita income, rural-urban residence, quality of drainage, of ventilation and of water, health beliefs and knowledge. For acute illness, the best predictors continue to be the demographic variables especially the number of household members age 0-5 years old.

Battad (1977) in a study of the determinants of nutritional status of Laguna preschoolers of 1975, found a negative effect of the number of children less than six years on a measure of child nutritional status, controlling for such factors as income per capita, education of the mother, age and sex of the child, mother's nutritional status and incidence of chronic illness. The measure of child nutritional status is the ratio of the child's actual weight to the standard weight for age and sex.

The main explanation for such negative relationship is as follows: the more young children, the greater the time inputs into child care by the mother and other household members, the harder it gets to meet each child's nutrition needs. Battad also states that the negative marginal effect of the number of children was larger for 2-3 years olds than for 4-6 year olds. This is probably explained by the fact that children age 2-3 years are still evolving feeding habits, are just starting to exercise self reliance, and still need much supervision from the mother. By the 4-6 years of the child, a child is more capable of

handling the shift in the mother's attention but the net effect may still be a lowering of nutritional status.

Popkin (1976) found that an addition to the number of children aged zero to 6 years increases the Laguna mothers' time for child care. That the nutritional status of children aged 0-2 was not significantly affected by an additional preschooler probably indicates that the Laguna mothers concentrate more attention to the newborn or younger preschoolers than to the older ones. Poulier (1976) found that an additional infant increased mother's time for child care more than in additional older preschooler and that the increase moved according to family size. In larger families, more older children substituted for the mother's time, hence, the increase was not as large as in small families. This substitution of mother's care may contribute to the decline in older preschoolers' nutrition status.

Impact of Public Policy

Studies dealing with the impact of public interventions on fertility, other than that of the family planning program, are virtually non-existent. The studies thus far available (e.g., Herrin (1979), on the impact of rural infrastructure; and Paqueo (1978), on the impact of public health and education) are as yet too tentative to provide firm guidelines for possible public policy redirection or program

redesign. Nevertheless, there is growing interest in evaluating the impact on demographic trends, notably fertility, of public programs primarily designed with non-demographic objectives in mind. While such evaluation activities currently suffer methodological and research design problems, such studies could have significant contribution to policy-making and program design in the near future as studies, e.g., the ESIA/WID Project, begin to cumulate.

The past and current planning and design of public programs, therefore, can still be characterized as essentially population-responsive. Estimates of age-sex composition and geographical distribution of the population are virtually the only demographic inputs in designing the scale and coverage of public programs. Designing public programs with a view to also affect demographic variables has yet to wait for more definitive results from social science research on the topic.

Towards a Research Agenda

On the basis of the foregoing discussion of of social science research bearing upon the relationship between fertility and economic development, several areas for further research seem worth exploring.

Levels, Trends and Differentials. First, we have noted that more and more demographic data of reasonably good quality are becoming available. These data sets include the censuses, the regular national

demographic surveys, and the several rounds of area fertility surveys. While determining the levels and trends at the national context will be a continuing task, [there is greater need to now emphasize the estimation of regional and areal differentials in fertility levels and trends, to pinpoint which areas are lagging behind in the overall trend in fertility decline.] In addition to regional or areal differentials, we need to also continually monitor fertility differentials by social groups to pinpoint which sub-groups of the population are still exhibiting high fertility. [Such information are essential for designing policies and programs that will effectively make a difference in reducing national fertility.] This information are also important from welfare point of view, to the extent that high fertility among some groups is shown to be associated with negative effects on their socio-economic and health welfare.

Determinants. With respect to the determinants of fertility, several types of research can be suggested. First we have noted significant regional fertility differentials both in terms of levels and trends. Nevertheless, we have practically no studies in the more recent years examining the determinants of such differentials. Demographic surveys often collect only very limited information on socio-economic characteristics of the respondents and practically none on the communities where the respondents reside. It will be extremely

helpful in understanding the current fertility declines observed in many regions, to relate such demographic information with corresponding area-level information on socio-economic factors likely to have affected such observed fertility trends, including the role of family planning inputs. One viable research approach might be to relate fertility trends with an analytical description of the socio-economic changes that have occurred in the area combined with the knowledge of the timing of the availability and use of family planning inputs.

At a more disaggregated level than regions there seems to be a greater need for understanding fertility change as they occur at the community or village level. At this level there seems to be a greater potential for combining institutional analysis with the usual micro-level statistical studies characteristic of past approaches in the Philippines. At this level, one needs to delineate the patterns of social organization in the community and examine how these patterns influence individual economic and demographic decisions. Micro-level decisions are to be viewed not only as responses to opportunities and constraints prevailing at the household level, but at the community level as well.

Several issues can be investigated within such a research framework, including the economic roles of children, the distributional

consequences of reproductive behavior, the impact of demographic factors on the economic and social structure of the community as well as the influence of such structure on fertility behavior.

Consequences of Fertility Trends. Here what has often been a neglected area in Philippine social science research is the distributional impact of alternative fertility trends. Studies that shed light on this issue could provide indicators as to where (among what groups) efforts to implement fertility policy would be to the greatest national advantage (taking distributional goals into consideration). These studies might also suggest the advisability of policies of other kinds that would attempt to compensate for the distributive outcomes of current reproductive patterns.

Demographic Impact of Public Interventions. As stated earlier, studies of this sort are just beginning. As such theoretically and methodologically sound research designs have yet to be developed. Cumulative experience in this area, however, could not only advance the state of the arts, but also begin to provide some guidelines for possible restructuring of development strategies and programs to maximize the attainment of traditional development goals and of the demographic objectives as well. Emphasis may be placed on evaluating those programs geared towards raising the levels of educational opportunities for both males and females, improving health and reducing mortality,

promoting greater female participation, etc.; that is, programs already desirable on traditional grounds and which already expend large amount of the national budget. Knowledge of their possible additional indirect demographic impact could lead to a possible modification of such programs to maximize their overall developmental impact, or could lead to policies and programs that will minimize their possible adverse demographic consequences.