INFANT MORTALITY AND FERTILITY

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1 - Introduction

The relationship between child mortality and fertility has long been a central focus of demographic research. As a result, there is a plethora of literature available. For the most part, the relationship has been investigated at a"macro"level using aggregate date. Results of this approach have consistently demonstrated that in "underdeveloped" countries high mortality is associated with high fertility and in "developed" societies,the lowering of mortality is associated with a lowering of fertility. A number of different "models" have been developed simulating this process.

Research studies may be summarized by two basic models- the theory of demographic transition, with urbanization, moderization and industrialization being key processes which move both mortality and fertility from high levels to lower ones. And the economic development model which stresses'the importance of per capita wealth and style of life as key factors influencing fertility and mortality perocesses. Of these two, the demographic transition model seems to accurately reflect the situation in "developed societies. Since technology has made it possible to control mortality in developing societies, one basic tenet in recent literature has been that as a family's life style changes (improves) there is a concomitant change in mortality which in turn seems to change perceptions of desired family size and thus the number of live births.

Studies of industrialized societies have shown two factors to be important to a rural residence or background which is positively related to family size. Socio-economic status which is probably the most important fertility differential explanandum. Whether measured by income, occupation, education, residential area, value orientations, or family structure differences the results tend to consistently indicate an inverse relation between SES and fertility(Kupinsky, 1971; Powers, 1965; Stokes, 1973).

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It has long been contended that where mortality is high, fertility is high. The rationale given is that this reflects a desire for male survivorship; couples would desire more children to assure that they would have one male child survive to their old age. A number of sources have provided data about this phenomenon, especially in the "underdeveloped" countries of the world. Under these circumstances, couples expect a high death rate among their progeny so they anticipate this with a high rate of productivity. On the other hand, in low mortality areas (the developed nations) the assurance of support could be gained with the birth of a sigle male. Thus, there is little pressure to produce large families.

Two factors are implicit in this argument: perception of mortality levels and a preference for males as supportors. The preferential position of the male in many nations of the world is well documented. Although the perception of life expectancy is not as clearly demonstrated, data gathered concerning levels of mortality are sufficiently striking it would be difficult to see them as not being reflected in awareness levels (Schultz. 1969, 1973; Schultz and Davanzo, 1970; O'Hara, 1972; Simon, 1974; and Rutstein, 1974).

Increasingly, in the literature about the mortality relation to fertility, computersimulation modeling of these processes are in evidence. Heer and Smith (1968, 1969) following the survivorship assumptions, demonstrate that rates of increase are a function both of mortality rates and desired family size. Others (May and Heer, 1975; Ben-Poratha, 1975; and Rizk, 1980) have followed much the same approach but utilized factor analytic and regression models. Shin (1977) for example, indicates that infant mortality acts as an intermediate variable between economic and social development and the fertility rate: The general relation between the two factors-mortality and fertility-has been empirically demonstrated. The explanatory scheme which accounts for the empirical relation varies some what depending upon the source.

One rational revolves about the desire of couples to assure their being supported in their old age and the desire for a surviving son which is part of a cultural system. In this situation, where couples expect a high death rate among their progeny, they would anticipate this with a high rate of productivity. A slight modification of this indicates that couples, under this condition, do not invest themselves psychologically in any of their children (Heer and Smith, 1969; and Schultz, 1978).

Although individual data provide a richer test of the child mortality fertility interaction, there have been fewer studies at the individual level of analysis. Schultz (1978) reports on the analysis of several representative samples of women age 30 - 49 drawn from three Latin American urban surveys carried out in 1964 and a 1970 rural Indian survey. Thirteen samples were included.In all thirteen samples, the level of fertility is positively related. to child mortality and in all but one case the relationshlps were statistically significant associations between cunulative fertility and cumulative child mortality are reported when age, education, income, and origins are controlled.

In this paper, we are concerned with the effect of infant mortality on fertility in a rural area of a developed society where the male primogeniture system is not as strong, nor is the extended family as necessary for survival in age, as is the case in "underdeveloped" societies.

Data and Methods

Setting: The data for this research were collected in Robinson County, North Carolina. The Population of The county (84,842 persons as of the 1970 census) is predominantly rural only about 27 percent of the population was classified as urban in 1970. As stated earlier, the county is basically tri-racial, consisting of approximately 43 percent white, 26 percent black, and 31 percent Indian residents. Although the child-woman ratio (486) and the crude birth rate (26.2) reflect a relatively high fertility pattern for the county, there is some variation among the racial groups - for whites, blacks, and Indians, the fertility ratios are 370, 599, and 588, respectively. In general, the basic demographic character of this county differs from the urban white populations examined in the national fertility studies.

Sample: An attempt was made to devise a sample which would reflect the distribution of women in the fecund ages who had either demonstrated fertility, been married previously, or had a spouse present in the home. The Population sampled consisted of all those households in which a female, ever married, or not currently married with children, aged 18 to 49.

An area probability sampling technique based on census enumeration districts was used to draw the initial list of potential households. This procedure yielded 1,787 households of which 1,004 met the eligibility criteria specified above. Eligibility was ascertained through a process of preliminary interviewing.

Of the 1,004 eligible households, 526 couples (huseholds, and wives were interviewed separately) and 169 women not currently married were retained in the sample. Attrition, in the form of "not-at-home" and "could-not-locate" etc. accounted for a significant loss of cases. The size of working sample was also reduced by the elimination of a small number of incomplete schedules. The analysis for the present study is based only on the interview responses of the 526 currently married women, aged 18 to

49, and the 526 husbands of these women, residing in Robenson County, North Carolina, during the summer months of 1972.

Variables: The variables analyzed in this study include desired number of children, actual number of live births, racial identification, occupation, educational attainment level, family income, age of mother, and infant mortality.

Racial identification was determined by self-reports of the respondents in the interview situation. Twenty-seven percent of the couples in the sample are white, 26 percent are black, and 46 percent are Indian.

Two measures of fertility behavior are utilized: the desired number of children and the actual number of live births. The two fertility indicators represent goals and preferences on one ha and performance on the other.

Families were dichotmized on the basis of whether or not they had experienced an infant death in the first twelve months of a live birth or pregnancy wastage of a stillbirth or miscarriage.

Respondents' levels of occupation, educational attainment, and income were trichotomized by equal categorization into low, moderate, and high groups.

Data analysis was based on computing mean number of live births and desired number of children. The student t-test sampling distribution was used for tests of significant differences between means.

Table 1. Fertility Behavior and Infant Mortality by Race, Income, Education, and Age, Robeson County, North Carolina

	Family Experienced Infant Mortality					
	Yes			No		
	NO.	Mean* Live Births	Mean Desired Births	No.	Mean Live Births	Mean Desired Births
White, low income	2	1.0	1.0	12	2.8	2.8
White, moderate income	22	1.0	2.8	64	3.3	3.3
White, high income	7	1.1	2.0	37	2.6	2.8
White, low education	7	1.0	2.0	24	4.5	3.8
White, moderate education	3	1.0	5.0	25	3.1	3.8
White, high education	21	1.0	2.3	64	2.5	2.9
Black, low income	5	1.0	2.4	46	6.2	4.4
Black, moderate income	12	1.0	2.8	66	4.6	4.7
Black, high income	4	1.0	2.0	6	3.8	4.0
Black, low education	3	1.3	3.0	43	7.8	5.7
Black, moderate education	4	1.0	3.5	24	5.0	4.5
Black, high education	14	.9	2.1	51	3.1	3.5
Indian, low income	6	.8	3.8	58	4.2	4.5
Indian, moderate income	26	1.0	2.5	125	3.7	3.9
Indian, high income	3	1.0	4.0	25	2.4	3.2
Indian, low education	6	.8	2.8	102	4.5	4.5
Indian, moderate education	14	1.0	2.8	49	3.3	3.8
Indian, high education	15	1.0	2.9	57	2.5	3.4
Age, below 30	57	.9	2.4	152	2.3	3.2
Age 30 - 39	15	1.1	2.2	147	3.8	3.9
Age 40 and above	15	1.1	3.9	140	5.8	4.7

*All mean differences were significant at a .05 level.

Findings

Examination of Table I reveals a major result. If a couple experienced a loss of a child, then that couple bore no more children. That finding is consistent across racial, income, occupation, education, and age groups. In comparing the mean live births between families who had or had not experienced infant mortality all means were statistically significant.

One notes that mean number of live births varies inversely with occupation, education, income, and age for families not experiencing an infant death. Fertility was lowest among white respondents, highest among black respondents, and intermediate for Indian couples. While fertility preferences (desired number of children) are slightly lower for families experiencing infant deaths, the variation in means varies as expected by race, age, occupation, education, and income.

The finding of importance is that the loss of a child is sufficient influence to bring about complete fertility control. For example, low income black families without loss had 6.2 mean live births, while low income black families with a loss had 1.0 mean live births.

Conclusions

To reiterate the major finding: infant mortality probuces complete family planners. When a couple experiences an infant loss, their fertility performance ceases. One might raise a question of whether complications at birth and/or subsequent sterilization led to cessation of live births. The proportion of females who reported sterilization procedures among women with infant losses was less than the proportion among women without infant deaths.

The loss of the fertilized zygote or child appears to be so traumatic that couples choose not to procreate further. Whether the solution is abstinence, efficient birth control, or both, the outcome is clear. Evidently, an infant loss produces behavior that is static even though the forces of style of life continue to exert an inverse influence on the fertility of couples who do not experience fertility loss.

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