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and, above all, without any belief that they can control the conditions of their own lives. Under these circumstances, he argues, efforts to gain acceptance and promote efficient use of modern contraceptive methods are unlikely to succeed.

Certainly, one message is clear to Brody: Development, in terms of improving all aspects of life for the less privileged, is essential if modern methods of contraception are to be truly accepted and if responsible attitudes toward reproduction and family life are to be the norm. Thus, in describing the appalling conditions of the life in the shantytowns of Kingston, the author draws attention to "the incongruities between the failure to supply half the population with adequate plumbing and easily available water . . . , the lack of privacy, and the expectation that people living in such surroundings would effectively use sophisticated contraceptive technology" [p. 81]. However, Brody also notes that Jamaica may not be able to achieve modern status without a reduction in the rate of population increase. In his concluding chapter, he makes a number of suggestions, in addition to developmental improvements, that might help to reconcile the private needs of individuals and the public goals of the country's population policy.

The shortcomings of the book are mainly in the areas of demography and statistics. For example, in the introductory chapter, crude birthrates are constantly referred to as general fertility rates. It is suggested that, until 1970, Jamaica had not reached the stage of "lowered death rates"; in fact, this phase first became evident in the 1920s. In later chapters, the statistical analysis is not always easy to follow, and the text is not always clearly related to the tables. But these are minor flaws in a most interesting and useful study.

Comment

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By William E. Bertrand, Jane T. Bertrand, Richard Thornton and Kabamba Nkamany

The aggressive use of a family planning program to limit population growth has become more justifiable politically and economically, but some pockets of strong resistance remain in the developing world. For example, a number of African governments have stood out as being very hostile to family planning, at least at high administrative levels. (However, this position may be softening.)

Aside from their rapidly increasing populations, African nations face a host of other problems. Drought, underproduction and civil strife have combined with the effects of a worldwide recession to make high levels of malnutrition endemic in many of these countries. The overall low level of health in Africa is reflected by the continent's score of about 35 out of a possible 100 on the physical-quality-of-life index (an assessment scale that summarizes infant mortality, life expectancy at age one and literacy).[1] The score for Asia, in contrast, is over 50, and for Latin America the score is in the low 70s. Partly in response to these well-documented problems, development programs of all sorts have been established or intensified, from those dealing with agricultural production to those addressing national nutritional planning. However, the strategic plan recently drawn up by the Africa bureau of the U.S. Agency for International Development (AID) concentrated mainly on increasing agricultural production.[2] Family planning is generally not emphasized in such initiatives because of the presumed social barriers to its introduction.

There is sparse but relatively convincing evidence, including some of our own data from Zaire, that family planning can be considered an important nutrition intervention. In fact, as will be seen, Zairian national policy on family planning was positively influenced by local studies that showed nutritional improvement to be a potential consequence of family planning. We believe that an aggressive family planning program is an appropriate and potentially effective nutrition intervention, one of the few that may be feasible within Africa right now.

Perhaps the strongest argument in the scientific literature in favor of family planning as a nutrition intervention also has the strongest validity on its face: Given two families with similar income levels, the family with the greater number of children will have proportionately less to divide among the children. This relationship has been demonstrated through bivariate analyses,[3] and additional studies have substantiated the relationship cross-culturally.[4] In addition, the relative contribution of family size to increased mortality has been well documented.[5]

It is surprising, given such evidence, that more specific studies have not examined family planning as a key variable having an impact on nutritional status. The relatively small body of research on specific nutritional outcomes of family planning programs should be updated using larger data sets and multivariate techniques. Indeed, as established nutrition interventions are evaluated more rigorously, it becomes evident that even the moderate short-term improvements attributable to family planning would be preferable to some alternatives (e.g., nutrition planning programs, household gardens and food distribution programs).

The Case of Zaire

As is often the case in developing countries, very little community-level information on nutrition was available for Zaire, so the country's National Nutrition Planning Center launched a series of studies to investigate the extent of malnutrition and provide the data needed to find the most cost-effective nutrition interventions. The Planning Center organized a complete census of the population in three areas of Kinshasa, the capital of Zaire. Detailed interviews were conducted in a random sample of one-fifth of the sur-

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veyed households containing children under five years of age. The interviewers collected information on personal and demographic characteristics, health knowledge, contraceptive use, birth history, eating habits and a number of other subjects.

Socioeconomic status could not be estimated by use of such conventional measures as income and education, since these were difficult to establish in Zaire. Instead, indicators of the physical quality of life, based mainly on the presence or absence of particular knowledge or certain household goods, was used to represent socioeconomic status. Indices were constructed to determine ideal and average ratios of weight to age and weight to height. An index of mothers' use of health services and of their health knowledge was constructed from a number of questions included in the survey. These two factors, along with socioeconomic status, migrational status, maternal age, family size and other measures thought to be related to nutritional status, were used as independent variables in a logistic regression analysis. The results showed that if children whose weight-to-age ratio is less than 90 percent of the minimum expected ratio are considered chronically malnourished, then about half of the 2,100 children from Kinshasa who were studied were malnourished. If chronic malnutrition is defined as being at less than 75 percent of the minimum weight/age ratio, then one-third of the children could be classified as malnourished. The regression analysis indicated that the three most important variables for predicting malnutrition were the family's socioeconomic status, the size of the family and the use of health services by the child's mother.

However, we also analyzed the relationship between family size and nutrition according to socioeconomic status. In each of the socioeconomic groupings, nutritional status tended to be higher among small families than among larger families, and the association appeared especially strong in the lowest of the class groupings. Although these findings were only marginally significant, the consistency of the relationship and the gravity of the outcome reinforce our argument about the importance of limiting family size.

Implications

We believe that these results have important implications for those who plan development programs in African nations. First, it must be remembered that the general characteristics of this survey population were about the same as those of the population at risk of malnutrition across all of Zaire. That important differences exist within a group of people who appear to be relatively homogeneous with respect to income may be due to any number of background factors, including broken families, poor child-care skills or an inability to function in an urban environment. Subtle differences such as these must be taken into account when planning a nutrition intervention.

Of the major variables that emerged as predictors of chronic levels of malnutrition, two can be considered relatively insensitive to short-term intervention. The most obvious of these is socioeconomic status. If world economic trends continue, Zaire is unlikely to gain sufficient capital or human resources to achieve radical improvements in individuals' living conditions in the near future. It might be more feasible to increase women's use of maternal health services, but this also depends upon making health services available for a large urban population. At present, the overall level of health services for mothers and children is very low in Zaire, and because of the chronic lack of resources, it is unlikely that much will be done soon to improve the situation.

Thus, of the three key predictors of chronic malnutrition, only one—family size—appears to have the potential for short-term change. A presentation in support of family planning services was made to officials of the Ministry of Health and to other important Zairian policy-makers. Given the country's strong feelings of nationalism and large Catholic minority, as well as low levels of contraceptive use and family planning activity, we expected resistance to our recommendation. However, the use of nutritional data to support the argument in favor of family planning convinced many members of the government, and the availability of family planning funds through the AID generated further interest.

Another important influence on the decision to support family planning as a health and nutrition intervention was that the National Nutrition Planning Center had been the source of the data and that Zairian scientists had been deeply involved in the preparation of the results. In the end, the government of Zaire proved to be surprisingly open to the implementation of a relatively high-profile family planning program as part of its overall health strategy. A positive reference to family planning was included in the 1982 five-year plan, and since 1980, Zaire has been the site of much new activity in family planning.

We believe that a similar strategy could be implemented throughout francophone Africa, admittedly one of the most difficult areas in which to initiate family planning programs. In countries where childhood malnutrition has been shown to be a major cause of mortality—as is the case in many African nations—it can be demonstrated that the most feasible nutrition intervention is family planning.

However, studies undertaken to show the multivariate nature of malnutrition need to originate from within the country and must be legitimized by the participation of prestigious government-related research institutions and local scientists. The results need to be presented in the form of scientific data to the top-level technical decision-makers in the ministries of health and family planning, which often have well-trained, methodologically sophisticated leaders. Many national planners are trained economists who understand multivariate techniques, while others have advisors who have had such training.

We believe that family planning programs should be only one component of a multilevel attempt to improve nutrition and health in Africa. Furthermore, the linkage of family planning activities to other nutrition interventions, be they well-baby centers or maternal and child health care programs, should be encouraged. With strong evidence that family planning has a direct impact on nutritional status, there should be a new drive to integrate population and nutrition programs, with a specific focus on the African subcontinent.

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