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THE CONTRIBUTION OF HEALTH TO PRODUCTIVITY
IN THE
AGRO-PASTORAL SECTORS IN NIGER

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INTRODUCTION

This paper reviews and analyzes ongoing and planned health interventions, supported by USAID in Niger, for their consistency with the Mission's overall development assistance objective to assist the country to achieve food self-sufficiency. The major intervention reviewed is the Rural Health Improvement Project (RHIP) which is strengthening Niger's rural primary health care (PHC) system. In addition, other health interventions are reviewed which relate to the RHIP but are integrated into USAID's rural development projects.

Good health has tangible economic value as a "production good". According to a 1980 World Bank Report, policies and programs to develop human resources, which include health, can raise the growth rate of countries output.

From the production point of view, the value of the Government of Niger's (GON) rural health program is in the improvements which it brings about in "human capital". In the short run, improved health can be related to expanding the output of Niger's agricultural and pastoral sectors through affecting the amount of time rural laborers have available and actually use for market activities.*

In this economy, there are opportunities for improving productivity through the health program since the per capita rural labor supply is a constraint both on agricultural and livestock output. Among the agricultural work force in Niger, labor supply is a seasonal constraint on output; among herders, it is a year-round one. (2,3) The rural health program can exploit

*Niger's agriculture sector contributes approximately 14 percent of Gross Domestic Product and 16 percent of foreign exchange earnings, as well as basic food needs for the country's growing population. Since 1975, there has been a fluctuating upward trend in millet and sorghum production, Niger's cereal crops. Niger's livestock sector contributes approximately 9.9 percent of Gross Domestic Product and 14 percent of foreign exchange earnings. The livestock sector provides a means of livelihood for 15 percent of the rural population and a source of food for which Nigerien demand is increasing. Nigerien farmers are also increasingly dependent on livestock (for manure) to maintain soil fertility and use as traction. (2,23)

these (short-run) opportunities to enhance productivity in the agro-pastoral sectors to the extent that the services provided prevent or ameliorate disease and disability which otherwise reduce the amount of time spent working during periods of peak labor demand.

In the long run, improved health may also contribute significantly to the development of Niger's rural economy by affecting individuals' willingness to innovate, take risks and alter traditional attitudes about family size. In a developing country context, the potential benefits of substantially raising the qualitative aspects of the lives of the majority of the people could have far greater value than short-term productivity gains. (4)

Apart from the value of Niger's health program to rural productivity, there are two other very important (though perhaps less obvious) benefits to be emphasized.

First, health-improvements derived from the program have economic value as "consumption" as well as "production" goods. Whereas the latter contributes to expanding national economic output, the former contributes to improving the individual's sense of satisfaction and well-being. Second, the health program has political benefits. By establishing a national position of concern for the health of Nigerien people, and a presence in the rural areas through the service delivery system, the GON demonstrates a commitment to the principles of social and economic equity.

I. Summary

The Government of Niger (GON) and USAID are committed to the proposition that improvements in the health status of the population can contribute in important ways to the economic and social development of the country. The ultimate goal of Niger's rural PHC program, which USAID supports through the RHIP, is to improve, at low cost, the health status of rural Nigerienes and to increase their quality of life and capacity to work (emphases added) (5)

The increasing percent of the GON's annual health operating budget between 1979 and 1980 for rural health care as opposed to urban hospital services reflects the Government's rural health priorities: allocations to hospitals decreased from 43 percent to 35.3 percent while those to the rural health care system increased from 57 percent to 64.7 percent. (6)

The design of the rural PHC delivery system is appropriate for improving the access of agricultural workers and herders in Niger to basic services and drugs which treat or prevent frequently-occurring causes of illness and disability during periods of peak labor demand. The focus of USAID's project support to Niger's health sector is on the training and deployment of village-based workers: secouristes and matrones. These front-line workers are supposed to improve the rural population's access to basic health services and drugs by their: (1) physical proximity, (2) ability to detect and treat common illnesses and injuries, (3) social and cultural acceptability and (4) affordability in a village economy.

There is evidence that the secouristes and matrones in Nigerien villages are providing services which are valued and used by the villagers they serve. However, neither the effectiveness nor the costs of the rural PHC system that uses these workers to reduce disease and disability among rural laborers are known. Targeting of health interventions to these laborers could be improved if such information was routinely available. Through the RHIP, USAID is working with the Ministry of Public Health (MOH) to strengthen the health data base and Nigerien capabilities to use the information to plan and manage the future development of the national health care system.

Integrating health interventions with those of the agro-pastoral sectors is a potentially useful direction for a future health development strategy to take in Niger. The experience of the GON and USAID in such projects strongly suggests that a closer linking of health and agro-pastoral program activities can improve the results of each. Intersectoral links would be most useful in the following three areas:

2. What are the
experiences

- Health services delivery and financing with rural cooperative development;
- Nutrition monitoring and intervention with agricultural policies and extension services to women farmers;
- Family planning with population policies and food production targets.

II. The Rural Health Improvement Project and Agro-Pastoral Labor Demand

The Rural Health Improvement Project (RHIP) is the centerpiece of USAID's health strategy in Niger. Through it, USAID supports the GON's program to develop a national PHC system. The theme of the rural health program is medicine de masse, carried out by a village health team (VHT). The members of the VHT are trained and supervised by the MOH but selected and financially supported by their fellow villagers to whom they supply basic health services and drugs. Extension of basic health services to the rural areas is designed to occur by actively involving the villagers in the local delivery of basic curative and preventive services that address their health needs, are culturally appropriate, affordable and valued by them.

The VHT is at the base of a pyramidal-structured rural health care system since its members are the most numerous and least trained workers. When confronted with cases that exceed their capacity to intervene, they are taught to refer them to rural dispensary nurses, who work in the lowest level of fixed facilities in the canton. In principle, the referral network proceeds successively "upward" to the arrondissement, departmental and national levels with their corresponding facilities and personnel becoming more technologically sophisticated and less numerous.

USAID has influenced the course of events in Niger's health sector since 1964, by financing a major GON study (assisted by WHO): A Ten Year Perspective on the Development of Health Services, which set the direction and

priorities for the present rural health program. Village-based health care has been supported by all succeeding Nigerien administrations since this time. Thus, when RHIP began in 1978, the Government had already made the basic policy, administrative and budgetary reforms needed to decentralize the health care delivery system. (5)

The GON's priority objective of food self-sufficiency in the current (1979-83) national plan is coupled with an articulation of its strategy to achieve this objective: Societe de Development. It is significant that the Minister of Public Health presides over the Commission de Mise en Place (to "put the development philosophy in place") and is a prime moving force in the GON's attempts to redirect political and economic structures "from the bottom up" for national development. Inclusion (post hoc) of key features of the rural health program in Niger's rural development efforts is evidence that it serves as a prototype for the strategy that is evolving to achieve food self-sufficiency (as discussed in III A). (7,8)

Timely use of effective health care by the rural work force can make an important contribution to increasing agricultural output and thus achieving the goal of national food self-sufficiency. From an economic (short-run) point of view, improvements in health increase the per capita labor supply and thus the level and duration of time individuals are able to devote to all activities, market and non-market. Whether or not the extra time available is actually used productively depends both on individuals' decisions and the marginal productivity of labor given current technology. Individuals will engage in income-earning, productive activities to the extent that the "disutility" of work (i.e., the opportunity costs of foregone time) is offset by the "utility" of income (the former increasing on the margin and the latter decreasing). The use of additional labor will improve the efficiency of existing production processes to the extent that lack of labor is a binding constraint on output (i.e., the marginal productivity of labor is greater than zero).

A clear cut case of this principle in the agricultural sector is the abandonment of otherwise fertile cropland due to endemic diseases such as onchocerciasis and schistosomiasis. In Niger, multidonor efforts (including that of USAID) are underway in Niamey Department (i.e., Say Arrondissement) to reclaim an area of relatively high fertility, infested by the black fly, for settlement and cultivation. Schistosomiasis from irrigation projects is also a threat in Niger which USAID is addressing. (2)

In the Sahel (and elsewhere in Africa) the presence of large-scale unemployment and underemployment in the traditional agricultural sector is often taken as evidence that labor supply increases will not expand output in the short-run (i.e., the marginal product of labor is considered to be zero). (10) However, the short-run conditions affecting agricultural labor demand, such as agricultural prices, cropping patterns, and alternative wage opportunities, differ by country. In Niger, demand for agricultural labor is seasonal and when it peaks, labor is stressed. The amount of land which is annually cultivated and thereafter harvested (September and October) is restricted by the (prior) weeding season's labor requirements (from approximately June to August). (2,9) Yet, precisely when the demand for agricultural labor is at its highest, so too is the threat of disease and disability.

Nigerien farmers use family labor as much as possible throughout the agricultural season. (9,11) Therefore, the inability of any member to carry out assigned tasks, as the result of sickness, adversely affects the entire production process. Just prior to the first rains (May-June), men and boys (as young as 6-8 years) clear and prepare lands for sowing. This is arduous work which frequently leads to injury and accidents. Since this is also the end of the dry season (March-June), food and water supplies and thus nutrient intake and energy levels are low. As the incidence of acute malnutrition grows, resistance to diarrhea and, in turn, to infectious diseases such as measles is lowered.

Sowing begins with the first rains, at the same time the mosquito vectors of malaria appear. Men, women and children are involved in this activity. The

very critical weeding periods which follow are times of peak physical stress for all rural laborers. Weight loss is greatest during this time and up until the early harvest.

While women are primarily responsible for caring for babies and small children, they also work in the fields when their labor is required. Babies sick from fever, diarrhea and related complications are heavy burdens on women during the agricultural season because they decrease available work time. These babies are also at particularly high risk of dying during this time because needed health care is often delayed. (12) Due to the high opportunity costs of time spent away from the fields during the agricultural season, needed health care can often be delayed for all family members. Thus, it is probably reasonable to assume that the increased cases of fevers and diarrhea reported during the peak work period are more severe than those reported at other times of the year.*

*National statistics for 1980 reported from MOH facilities show that approximately one-half of all cases of fever (with the presumption of malaria) appeared in the third quarter of the year. The only age specific morbidity data available during this time are from Maradi Department; they confirm the peaking of reported fevers among all age groups during July - September. The numbers reported increased four times among children one to five years and two times among all other age groups from those reported during the preceding three months. During the third quarter, fevers represented 34 percent of all cases for children, birth to five years, and approximately 25 percent of all cases for all other children and adults.

Nationally, reported cases of diarrhea peaked between the second and third quarters, and represented 39 percent of all cases. Maradi Department statistics show diarrhea was the most frequently reported cause of illness among all age groups during the second quarter and the second most frequently reported cause of illness among children birth to five years during the third quarter. However, total numbers of cases reported for all age groups were the highest during the third quarter. Between the second and third quarters, reported cases increased 50 percent among children one to five and approximately 30 percent among all other age groups. (6,13)

Due mainly to environmental conditions and population density, the distribution of illnesses in the (nomadic) pastoral population differs from that in the (sedentary) agricultural population. For example, intestinal, parasitic and infectious diseases are not major health problems in the pastoral zone whereas conjunctivitis and urithritis are.) However, the constraints on productivity result from similar seasonal phenomena.

During the dry season, when adult workloads peak, working conditions are also the most strenuous due to a combination of high temperatures and water shortages. Supplies of milk, a major source of nutrients and cash for herders, are also depleted during this time due to the deteriorated condition of the livestock. Both children and adults lose weight during the dry season and recuperation is slow, increasing the risk of diarrhea and malaria as with the sedentary population. (Fever follows the seasonal cycle of mosquitos in the pastoral zone with one to two months delay.) (3)

Given the seasonal patterns of labor demand and disease in Niger, the rural health program is appropriately designed to increase the access of the rural work force to the most efficacious services and drugs that are affordable by the Government and the villagers.

VHTs and health facilities are concentrated in Niger's prime agricultural areas, where the majority of the population resides. Increasing emphasis is being given to training secouristes within the nomadic groups and upgrading services in fixed facilities along the southern perimeter of the pastoral zone.

VHTs are being trained to detect and treat or prevent frequently occurring causes of illness and disability during periods of peak labor demand in the agro-pastoral sectors, such as fevers, diarrhea, minor infections, wounds and conjunctivitis. The targeting of services to all members of the rural household, especially women and children, is consistent with the role of the Nigerien rural family as the basic production unit in the agro-pastoral sectors.

VHT members live in the villages where they work to reduce the amount of time and money agricultural workers spend obtaining drugs and basic health services. Herders trained as secouristes travel with their nomadic family group.

VHT members are nominated for training by self-constituted village committees, convened by the chiefs, to assure that they are socially and culturally acceptable and familiar to the local people. The candidates usually chosen for the matrones position are traditional midwives, already recognized by villagers as health care specialists.

VHT members are not government employees but must generate their own revenues from their clientele for resupplying drugs and receiving compensation for their time and travel costs. At the village level, drug prices are not (officially) controlled, thereby obliging these workers to be responsive to villagers' (seasonal) demands for them.

There is some evidence that Niger's rural health program is accomplishing what it is designed to do. When the RHIP began in 1978, 1496 or approximately 17 percent of Niger's dispersed 8620 villages had health workers operating in them. By the end of 1982, this number increased by 95 percent to 2913, or approximately one-third of all villages. (6,14)

In addition to their physical presence in villages, secouristes and matrones appear to be used by the local population. Contacts reported by secouristes in 1980 were estimated to increase those reported at fixed facilities by 20-25 percent. In 1981, the reported increase in contacts over fixed facilities rose to 30 percent. (6,15) Unfortunately, it is not possible to adjust these reported figures to account for seasonal disease patterns, changes in use rates of fixed facilities or numbers of VHTs. However, an independent check made on the validity of the reported statistics in one Department (Dosso) shows actual contacts in 1981 to be six times those reported. (15) At least in this one Department, there is good reason to believe that secouristes are increasing villagers' access to health care.

The same independent check (in Dosso) was made on records of deliveries assisted by matrones. Again, actual deliveries by matrones were underreported, by a factor of two. When comparing these reported numbers of matrones-assisted births in 1980 to those in 1981 (for the departments with completed data), large increases are still found (In Agadez, as in Dosso, the numbers increased by just over one half; in Tahoua they increased three times). (6,15)

Although undocumented at this point, the MOH, as well as other knowledgeable sources, consistently report that villagers both respect the community roles of the secouristes and matrones and are eager to choose local candidates to be trained for these positions. Their claimed popularity among villagers is consistent with (more undocumented) information that VHT drop-out rates have always been low (ie, approximately 15 percent since 1962). (12)

The most recent evaluation of the RHIP (August 1981) concluded that "... the rural health system in Niger is generally well designed, appropriate to the GON's general situation and provides a good foundation on which to gradually improve the quantity and quality of health coverage for the nation." Accordingly, a 30-month extension of the RHIP is being negotiated between the MOH and USAID. Activities to be undertaken during the extension should improve the capacity of the rural PHC program to target services to the rural labor force.

Particularly important in the short-term will be the increased involvement of the VHTs in the prevention of diseases in the rural areas, for example, through nutrition and sanitation interventions and national efforts in childhood immunization and oral rehydration therapy. Another new initiative with longer-term benefits to the future development of the rural health program aims to strengthen health policy-making in the MOH by developing planning and management systems linked to the collection and analysis of health and related data, particularly at the village-level.

Through these incremental resources, especially those for the RHIP planning and management activities, USAID can assist the GON, through its MOH, to better exploit the productivity-enhancing potential of the rural health program. USAID has already begun to integrate PHC activities into various rural development projects in recognition of the links among improved health, productivity and expanded agricultural and pastoral outputs. As will be explained, the results of intersectoral activities in Niger have been sufficiently positive to merit future development by USAID. Therefore, the time appears to be "ripe" for the GON and USAID to take advantage of these resources and opportunities to formulate a comprehensive health development strategy linked to the agro-pastoral sectors.

III. A Health Development Strategy Linked to the Agro-Pastoral Sectors

As stated, timely targeting of appropriate health interventions to populations in agricultural and pastoral zones can decrease time lost from market activities due to illness and injury, and thereby improve productivity in the rural economy. Also, various interventions in the agricultural sector, such as stabilizing grain prices and improving distribution and stockpiling systems, significantly affects the health of the rural population while directly increasing the efficiency of food production. Due to these and other synergistic relationships between health and agro-pastoral interventions, successfully achieving both sectoral objectives are clearly interdependent. In Niger there are a variety of opportunities to exploit these intersectoral linkages as the result of current programming which is experimenting with integration.

A. Health Services Delivery and Financing and Rural Cooperative Development

For the agricultural population, the RHIP extension should improve the capacity of the rural health system to monitor the introduction and spread of disease and illness, (especially) in the production zones, so as to target

interventions on a timely basis. Coordination of agricultural extension agents and rural health personnel through Niger's cooperative system (also discussed in III, B), could form a basis for eventually establishing a range of such "occupational services" aimed at agricultural working families. While the development of rural cooperatives is in the early stages, it is completely compatible with the rural health program under Niger's national strategy for developing rural economies.

Rural cooperatives are cast as village-level organizations capable of self-management and decision-making and responsible for local level development activities. Once proven viable to supply agricultural inputs and credit, these multi-purpose village development organizations could also handle other commodities, such as drugs and medical supplies. (16)

Social financing schemes operated through cooperatives for village-level delivery of health services could also be feasible means for the agricultural work force to pay for services (and be protected against the risk of not being able to pay for and thus not receive medical care when needed). Cooperatives which are successful in supplying credit to farmers would be likely candidates for also sponsoring health financing schemes (if these should otherwise prove to be feasible) for the working rural population. (17)

Herders are also supposed to be organized into cooperative associations under the national strategy which, if successful, should greatly improve both livestock productivity and human health. Because herders lack access to stable sources of grain and credit, their economic position is directly affected by the physical deterioration they and their animals suffer in the dry season. Currently, when herders' demand for grain is the most insensitive to price, supplies are at their lowest levels and prices are at their highest. Trade can only occur by selling livestock which, in contrast to grain, are priced at their lowest levels at this time of the year due to the physical wasting which previously has occurred (i.e., during the dry season). (3)

Through herder associations, a variety of development interventions are being planned with USAID's support; human health care is one which has already begun. The simple interventions delivered by herders trained as secouristes under the rural health program (eg., malaria prophylaxis, ocular ointment, aspirin), should be able to reduce the frequency of bed confinement. In this population, the immobility of any member of the family unit imposes severe burdens on the others since all available labor (excluding only the very young children) is fully employed year-round. There are also plans for teaching nomadic women the basic principles of maternal and child health care and midwifery through the herder associations (no traditional practices of this sort exist among the Wodaabe, for example). Rural health personnel located in facilities near the (southern perimeter) rainy season nomadic camps will continue to be sensitized to the herders' health needs and cultural traditions in order to increase their use of (fixed) rural health services (which now is very low and crisis-oriented). (3)

B. Nutrition, Agricultural Policies and Extension Services to Women Farmers

A major constraint to increasing agricultural production in Niger, identified by USAID, is agricultural pricing policies. Bilateral (mainly non-project) assistance is being proposed in order to facilitate negotiation and implementation of policy reforms to decontrol prices of grains and livestock. The overall efficiency of the agro-pastoral output and input markets is expected to improve with the elimination (or reduction) of price and trade restrictions. (18) However, some consumers of these products will have to curtail or significantly decrease their purchases, due to their inability to pay the higher prices which should result (at least in the short-run).

The likely negative effects of these free-market policies on consumers are nutritional, especially since basic food crop production is at issue. Low income women and children are particularly vulnerable to rising food prices and attendant reductions in household supplies, due to cultural practices

which give priority to feeding adult males and restrict women's access (through land tenure practices) to fertile land for home production. (2) The possibilities of simultaneous reductions in farmers' outputs and incomes, as a result of their inability to use higher-priced agricultural inputs, could compound these negative nutritional effects by also restricting their ability to purchase all other goods and services.

Countering these views, is the notoriously bad performance of countries' attempts to regulate agro-pastoral prices and restrict free trade. The creation of "black markets" and chronic shortages, combined with the steady decapitalization of the agro-pastoral sectors in Niger, has adversely affected the income and nutritional status of certain high risk groups. (3) Over the longer run, the costs to both consumers and producers of maintaining agro-pastoral sector controls will likely outweigh any benefits of their moderating price rises in the short-run.

One possible solution to these conflicts over pricing policies lies in targeting either in-kind or cash subsidies to low income, needy groups in the immediate term while allowing the forces of free trade to improve efficiency within the agro-pastoral sectors as a whole. USAID has essentially taken this position in this proposed Rural Development Sector Grant Project. Rural health program resources could be drawn upon to implement such a subsidy program. For example, rural health personnel, working through health facilities in tandem with agricultural (and related) authorities and agents, could assist in identifying disadvantaged groups at the village level and targeting appropriate subsidies (especially in-kind) to them.

Forging stronger functional links (particularly at the village level) between agricultural extension and health workers would serve a variety of health and productivity-enhancing objectives. In addition, if the coordination and management issues could be handled, such linking could also exploit possible economies-of-scale (i.e., reduce costs) in recruiting, training and supervising these village agents. In Niger, these costs are major recurrent burdens. (2,19)

Malnutrition, especially among children, is more than a health problem, it is an economic problem of major proportions. It causes wasting of resources in rearing infants who die before they become useful citizens and in the foregone output of malnourished adults. It complicates medical treatment and increases these expenditures by prolonging the frequency and duration of illness. And probably most devastating for the future of developing countries, is evidence that retardation in the physical development of infants is paralleled by impaired mental development that is probably permanent. (20) Poverty alone is not seen as the cause of malnutrition, except in extreme cases. Instead, "...the allocation of time and resources within households directly affects the nutrition of children in that it determines the quantity and quality of the food they receive..." Long-lasting and significant gains in the nutritional status of children have been brought about (e.g., in Uganda) by promoting the home production of protein foodstuffs, increasing the efficiency of women's allocations of time among work tasks and their control over resources. (21) Experience in carrying out agricultural extension services in Niger points to areas where significant headway could be made in each of these three areas.

Nigeriene women (e.g., the Hausa) control significant amounts of village lands (estimated to be as high as one-third), but have not been productive cultivators of them. While these female-owned fields are generally the least fertile (since ownership results from gifts of land by males), they are also the least likely to benefit from the application of yield-raising inputs (such as manure), since women tend to invest in alternative assets (such as livestock) which have higher returns than land. However, productivity project interventions (i.e., credit, new techniques, information) have not specifically targeted women landholders, so the potential for their expanding production on these lands is unknown. (2)

Shortages of agricultural extension agents in Niger and the traditional male biases against women as village-level economic decision makers (both by village leaders and predominantly male extension agents), make a case for experimenting with alternative-means for delivering nutrition and productivity-enhancing technologies to women. Involvement of rural health

personnel is logical, given the likely health effects of the interventions, and facilitated by the advent of health planning in the rural health program and its increased emphasis on health prevention and promotion. The ongoing experimentation with agricultural extension techniques and workers supported by USAID and others (e.g., aides encadreurs and farm couples) offers parallel opportunities for collaborating with the health program. (2)

C. Family Planning, Population Policy and Food Production Targets

Despite low and unpredictable rainfall and poor soils, Niger has been more successful than other Sahelian countries in producing sufficient quantities of food to feed its population. In 1981, Niger was the only country in the Sahel that did not require emergency food aid. This relatively successful track record does not guarantee a continuation of the trend into the future due to the country's rapid rate of population increase (2.7 percent per year according to GON statistics). Annual increases in food production are barely keeping up with population growth.(23)

Population shifts to the urban areas are decreasing the numbers of agricultural producers relative to the total population. In 1970, there was one person to feed 2.5; in 1990, this is expected to decrease to one to 3.0. (2) With birth rates at high levels, the dependency ratio is also increasing-compounding the pressures on the rural sector for maintaining, not to mention improving productivity. At the same time, population pressure leads to intensified and improper use of both the prime agricultural lands in the south (e.g., by shortening fallow periods) and the more marginal lands of the north, which are ecologically fragile and prone to desertification. (2)

Niger's expanding population is not only making larger demands on the food producing capacity of the nation but also on foreign exchange. Patterns of consumption (especially among urban dwellers) have been changing, reflecting shifts in preference from locally-grown (millet and sorghum) to imported grains (wheat and rice).

At least at present, the herder population may be an exception to these national population trends. The data that are available on their birth and death rates show them to be lower than in the sedentary population and relatively stable. (3) However, if cultivation continues to encroach upon the pastoral zone and/or the terms of trade between livestock and grain do not improve for the former, this population stability is likely to be disrupted in unpredictable ways.

The importance given to a national health program by the GON and its pervasiveness throughout large portions of the rural areas is often cited as contributing further to the growth of population (since it is credited with decreasing mortality rates). This perspective overlooks the longer run dynamics of population growth, wherein a fall in death rates must usually precede a fall in birth rates, and the role of the health system as a rural amenity countering urban migration and encouraging family planning acceptance and use. Family planning is a key element of PHC since uncontrolled fertility is a major health hazard to both women and children. In international forums on policies of health care and population, African leaders agree with others from developing countries that family planning services must be integrated into the health delivery system to be acceptable to them and their people.

With urbanization and education, the reported high (and increasing) divorce rates among certain population groups (such as the Hausa) and the maturation of the health delivery system, the stage is being set for introducing family planning in Niger. (2) Policy dialogues with GON officials in both the health and agricultural sectors could usefully relate the productivity and human health implications of rapid population growth and shifts in distribution and cooperate in devising strategies to reduce them.

IV. Formulating A Research Agenda

Research agenda for the VHT approach to deliver the present (and presently being planned) array of curative and preventive services.

A. The cost-effectiveness of the VHT approach to deliver the present (and presently being planned) array of curative and preventive services.

Various activities of the RHIP-supported PHC program have never been systematically analyzed for their effects on costs and indicators of service provision, use and health status. A comparison of the relative merits of alternative ways to carry out the following activities are considered to be priority areas for future research:

- 1) The method and frequency of VHT supervision;
- 2) The content of the VHT curricula, method of instruction, length and frequency of the training sessions;
- 3) The supply and distribution of drugs to villages.

B. The cost-effectiveness of alternative integrated approaches to deliver health interventions.

The integration of health with agro-pastoral projects in Niger offers unique opportunities to undertake research on intersectoral relationships. In particular, the health and agro-pastoral programs could collaborate on designing a research component which is linked to the implementation of the second phase of the Niger Range and Livestock Project. Such research should be simply designed (so as not to hinder Project operations) and include analyzing the effects of the integrated interventions on short-term "process" indicators (e.g., service use) as well as longer term "outcome" indicators (e.g., morbidity changes).

C. The public and private financing mechanisms which can efficiently and equitably support the delivery and use of health services in the rural areas.

From the GON's point of view, it is especially important to economize as much as possible on the cost of public health sector activities, given the fiscal austerity program which was just announced in September. The research objective in this area should focus on estimating the total costs of rural PHC delivery and the changes in these costs which occur under: (1) various assumptions about service expansion, and (2) alternative ways to organize key activities (such as VHT supervision and the supply and distribution of drugs to villages, mentioned in A above).

Costs from the rural population's point-of-view to use PHC services provided through the rural delivery system must also be analyzed. Rural people "pay" to use health services both in terms of cash and time. As discussed in the foregoing chapters, the opportunity cost of time is a major (seasonal) constraint on service use among the agricultural population. Among the pastoral population, lack of cash is considered to be a major barrier to use. Such costs must be gauged to these people's ability and willingness to pay for services if use of the services is to be maintained.

The risks of people foregoing needed medical care because of excessive costs must be weighed against the requirements of the delivery system to generate revenues. Therefore, factors determining the viability of current methods used in villages to support VHTs should be more fully understood. Research would also be useful to explore the feasibility of alternative financing schemes which do not rely exclusively on fees-for-service. The health and agro-pastoral programs could collaborate on such research to explore linking health financing (and perhaps provision of drugs) to rural cooperative development.

D. The contribution of health to economic development, particularly in the rural areas of Niger.

Current questions about the value of the health status "output" of PHC programs to improving the economic performance of developing countries delve to the heart of the problem of the intersectoral allocation of development resources. Policymakers seeking to maximize the (marginal) contribution of government expenditures to economic growth can only begin to do this if there is information about the value of the trade-offs among various intersectoral allocations during specific planning periods.

For example, as discussed in the foregoing chapters, there are short-term opportunities to enhance rural productivity in Niger through health interventions. While easy to measure, these are only a portion of the benefits to be realized from improved health. Looking broadly at the Sahel region, it will not always be possible to equate health sector investments with efficiency gains in the short-term due to the limitations of traditional technologies and modes of organization, especially in the rural sector.

But it may be reasonable to regard traditional methods and techniques themselves as adaptations to the constraints of long-standing patterns of morbidity and mortality in the population, as for example, the availability of natural resources and rainfall. If so, ill-health can be seen as an important factor inhibiting innovating risk-taking behavior and attitudes which are necessary for the evolution of traditional economies. Thus, it is hypothesized that the greatest contribution which improved health can have on the economy of a developing country will be forthcoming in the "longer-run", through technical and organizational changes induced by improved health status. (4)

Designing and conducting research to test this hypothesis are large tasks which would require national and perhaps even regional-level cooperation over a number of years to undertake. However, if policy-makers are seriously interested in improving the efficiency of national expenditures, this sort of research is indispensable.

References

1. World Development Report, 1980, The World Bank.
2. Niger Agricultural Sector Assessment, USAID/Niger, Vols. I and II, 1979
3. Loutan, Louis, Health and Nutrition in a Group of Wodaabe (Bororo) Herders in Central Niger. Rapport Preliminaire - Number I, February 1982, Niger Range and Livestock Project, Tahoua, Niger.
4. Stevens, Carl M. "Health and Economic Development: Longer-Run View," Social Science and Medicine Vol. II, PP. 809-817. Pergammon Press, 1977.
5. Niger-Improving Rural Health Project Paper, (683-0208) March 20, 1978.
6. Rapport d'Activites 1980. Republique du Niger, Ministere de la Sante Publique et des Affaires Sociales.
7. Belloncle, G. and Fournier, D'Georges. Sante et developpement en milieu rural africain. Editions Economic et Humanisme des editions ouvrieres 1975.
8. Conversation with Louis Siegel, Consultant to Ministry of Planning. September 24, 1982 in Niamey.
9. Patterns in Niger also noted in East Africa by Cleave, John in African Farmers: Labor Use in the Development of Small Holder Agriculture. Praeger Publishers, 1974.
10. Accelerated Development in Sub Sahara Africa: An Agenda for Action. The World Bank, Washington, DC, October 1981.
11. Conversation with John Curry, Technical Staff Assistant, Niger Range and Livestock Project, September 27, 1982 in Niamey.
12. Conversation with Dr. Yves Renault, Advisor, DEESN, Ministry of Health; Dr. Claude Bourlard, Epidemiologist, Division of Infrastructure and Statistics, Ministry of Health; Dr. Jean-Marie LaMotte, former Director, Belgian Medical Assistance Team to Niger, September 28, 1982, in Niamey.
13. Fiche Epidemiologique de Liaison, Republique du Niger. Conseil Militaire Supreme, Ministere de la Sante Publique et des Affaires Sociales, Division Infrastructure et Statistique, 1980-81.
14. Midterm Evaluation Report. Niger Rural Health Improvement Project (683-0208), US Team Evaluation Report (Uncut draft version).
15. Independent checks made by Dr. Yves Renault, Advisor, DEESN, Ministry of Health, Niger, 1982.
16. Conversation with Ray Waldron, USAID/Niamey, Agricultural Economist, September 9, 1982, in Niamey.

17. Stevens, Carl M. Assessing the Feasibility of Social-Financing Schemes for the Basic Health Services in Developing Countries. (revised draft) Contract DPE-1406-S-00-1044-00, February 1982.
18. Rural Development Sector Grant (proposed PID), USAID/Niamey, September 1982.

19. Project extension of Rural Health Improvement Project ~~(draft)~~ September, 1982.
20. Scrimshaw, Nevin, "Food: World Problems", in International Encyclopedia of the Social Sciences (ed) David L. Sils; Vol. 5, MacMillan, NY, 1966, pp. 502-507.
21. Sharman, Anne, "Nutrition and Social Planning," Journal of Development Studies, 6(4), 1970, pp. 77-91.
22. Niger Niamey Department Development Project Phase II (683-0240), Vol. I and II, April 28, 1981.

23. Agriculture Sector Overview (draft) prepared by USAID, 1982.

Other Sources Consulted

1. Basta SS; Soekirman MS; Karyadi D.; Scrimshaw N.S. "Iron Deficiency Anemia and the Productivity of Adult Males in Indonesia." American Journal of Clinical Nutrition 32:916-925, April 1979.
2. Elliott J., "The Country Situation, Policy Issues and the AID Country Program in Niger." Synopsis and Update. (draft), March 30, 1982.
3. Joseph, Stephen; Scheyer, S.C. A Strategy for Health as a Component of the Sahel Development Program. Final Report, Contract No. AID/AFR-C-TT38, Work Order No. 8, May 17, 1977.
4. Latham, M.C.; Stephenson, L.D. Kenya: Health Nutrition and Worker Productivity Studies. Final report for the World Bank, January 1981.
5. Teitelbaum, Joel M. Nutrition Impacts of Livestock Development Schemes Among Pastoral Peoples, Food and Nutrition Service, USDA, PASA/AG/PPC, 096-1-80; November 1980.
6. Thomas, Randall. "Production Function Analysis of Small Farm Agricultural Production in Niger: Translog and Cobb-Douglas Estimations." December 18, 1981.
7. Thomas, Randall S. "Cobb-Douglas Production Function: Results of the Analysis." Center for Research on Economic Development, March 1982.
8. BILAN au 30 September 1980 and 1981. Office of National des Produits Pharmaceutiques et Chimiques, Niamey.
9. Niger CDSS, FY 83, February 1981.
10. Conversations with the following:

USAID Staff: Irving Rosenthal, Mission Director
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