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PLAN FOR THE STUDY  
OF THE  
ECONOMIC AND SOCIAL EFFECTS  
OF  
INVESTMENTS IN HEALTH IN DEVELOPING COUNTRIES

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OUTLINE OF DISCUSSION

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## A

### Significance of the Problem

Policymakers, planners, and administrators whose responsibilities involve multiple aspects of economic development are constantly confronted with the question of the relationship between health and social and economic improvement in developing countries. Economists, social scientists, and medical and public health specialists, furthermore, are deeply interested in revising traditional theories about the meaning of capital and the role played by healthier human beings in the investment process.

Little has been done, however, to measure the qualitative and quantitative effect of investments in human beings. Developing countries need more systematic data and better guide lines when, a) allocating their scarce national resources among health and other investments and b) deciding which health investments should receive highest priority because of their short term beneficial effects on the national economy.

The problem of determining the economic value, if any, of investments in health is complicated because such investments are not separate in their effect, but are complexly interrelated with other types of investments. It may be that agricultural reform and industrialization, for example, lead to greater productivity which in turn leads to greater wealth, and that wealth ultimately leads to better health. On the other hand, it is possible that "good health"; at least to some extent, is a prerequisite to the acceptance and success of agricultural reform and industrialization.

Better understanding of the consequences of various forms of investment in any development program is, therefore, of major importance in rational planning. It is in this context that the present exploratory study on the economic and social effects of investments in health is presented.

B

The Study Group

For the past eighteen months a group of Harvard University faculty have been discussing the problems and potentials of research on the economic and social effects of investments in health and education in developing countries. Although the discussion in this report is concerned primarily with investments in health, much of the rationale and methodology presented are equally applicable to the analysis of the effects of investments in education.

Members of the Harvard group are:

1. Professor Charles T.W. Curle (education specialist), Director, Center for Studies in Education and Development, Graduate School of Education.
2. Professor John T. Dunlop (economist), Chairman, Department of Economics.
3. Dr. Robert H. Hamlin (physician, lawyer, and public health administrator), Roger Irving Lee Professor of Public Health and Head, Department of Public Health Practice, School of Public Health.
4. Associate Professor Sol Levine (social psychologist), Department of Public Health Practice, School of Public Health.
5. Professor David C. McClelland (psychologist), Chairman, Department of Social Relations.
6. Associate Professor A.J. Meyer (economist), Associate Director, Center for Middle Eastern Studies.
7. Dr. John C. Snyder (physician and microbiologist), Dean and the Head of the Departments of Microbiology and Demography, School of Public Health.

Field studies to explore the feasibility of research on the economic and social effects of investments in health commenced in September 1963. Since that time, Professor McClelland, who is on sabbatical leave, has been in North Africa devoting a considerable proportion of his time to the feasibility study. He has been supported by two full time field personnel from Harvard: Dr. Edward J. Rolde, Research Fellow at the School of Public Health, and Mr. Barclay M. Hudson, Research Assistant at the Center for Middle Eastern Studies. Dr. Rolde and Mr. Hudson are making planned exploratory visits to twelve countries in Africa and the Middle East, supported by selected visits by Professor McClelland.

The progress of the feasibility study and plans for future research were discussed in Tunis, Tunisia during the period December 7-14, 1963, by Professor McClelland, his field staff, Dr. Hamlin and Dr. Levine. This report summarized their deliberations.

C

Objectives of the Research Program

1. To accumulate basic knowledge on the economic and social effects of different types of health investments, as a step in helping developing countries to plan their investments in these areas. The ultimate goal is to determine which investments have the maximum effect both on health and economic development.
2. To choose a research site where it will be possible to carry out a study in which health "inputs" can be traced through their quantitative effects on indexes of health status, attitude and behavior change, and economic behavior. The study should, if possible, permit inferences as to how these several effects or "outputs" are interrelated or influence each other.
3. To develop an adequate methodology for carrying out research of this sort, particularly for trying to estimate the macroeconomic effects of changes in attitudes or economic behavior detected in household surveys.

4. To choose a research site and program where training for United States personnel can be provided on methods to carry out such research under the conditions existing in developing countries and, simultaneously, to alert public administrators through the research and training to the possibility that alternative investments in health can and should be evaluated at least in part in economic terms.

#### D

#### Limitations of the Research Program

There is considerable theoretical discussion in the literature and among policy makers and planners on applying allocation theory and "cost-benefit" analysis to assist developing countries plan their investments in such "human capital" areas as health. Almost no information exists, however, which has enough specificity to be of practical value to them when they make their decisions on how much of national resources should be allocated to health or what suballocations should be made within the health sector. Decisions are now made without systematic data and with considerable ignorance of their economic ramifications. The principal reason for the lack of needed information on the effect of health investments is the failure so far to develop measures or "indexes" which are sensitive enough to indicate the complex interrelated changes in health status, attitudes, and economic behavior.

Although the ultimate objective of the research proposed in this presentation is to determine the relative effect of various alternative health investments on economic development, the first stage must be concerned with methods to measure changes in health status, attitudes, and economic behavior. The subsequent research plan is therefore primarily directed to the development and testing of such measures in limited studies.

Once these measures have been developed by focusing on one or several carefully selected health investments or "inputs", similar measures and methodology may be used in subsequent research to determine the economic and social effects of a range of individual or combined health investments. By this process, the ultimate objective of providing systematic data on the contribution of various health investments to economic and social development could be realized.

In addition to developing measures of health status, attitudes, and economic behavior which may be applicable to a wide range of health investments, the study should provide valuable additional information on the process by which health investments affect attitudes and economic behavior.

## E

### Research Design

The basic design of our proposed research involves measuring the effects through household surveys of existing or planned health programs in one or several countries. The steps necessary to carry out the design are as follows:

1. Household surveys on representative samples are to be carried out in pairs of communities (an "experimental community" and a "control" community) matched so far as possible to establish comparable base rates in indexes of health status, value orientations, and economic behavior.
2. Next, there must be a health input of some sort into random members of one of each pair of communities (the "experimental" community).
3. Finally a re-survey must be made two or three years after the input, preferably of the same informants, to see whether changes have taken place in the "experimental" as contrasted to the "control" communities.

It may also be desirable to do additional surveys during the course of the "treatment" to follow the process of any changes discovered, and not only to measure any final change.

This type of longitudinal study is extremely difficult to carry out in practice because of turnover in either research or local administrative personnel. Therefore any project planned must:

1. Provide for maximum continuity and availability of field supervisory personnel. This in effect means choice of a location for a field project director which is:
  - a) centrally located with respect to all the communities or studies planned, and

- b) a sufficiently attractive place to live and work so that it will be possible to get field staff to stay continuously for two or more years.
2. Provide a real, tangible, and desired service to the host country or countries so that local political changes will be less likely to force abandonment of the project.

F

Health Input Alternatives: Summary and Evaluation

The choice of an input to be studied will have to be made from existing or planned health programs of the country or countries chosen as research sites. While project personnel may be able to "lend a hand" with such a program (and perhaps should as part of the "tangible" service), the input program should not be supported primarily by staff brought in from the outside or from project funds. That is, it is not part of the plan to introduce the input ourselves or particularly to administer its application, but rather to study the effects of an input operated by the country itself.

Possible inputs include the following:

1. Introduction of a health facility into an area, such as a hospital or a rural health dispensary.
2. Introduction of a particular type of medical personnel, usually, the products of a special training program, e.g., for nurse-midwives, rural health visitors, medical assistants, sanitarians, etc. A change in personnel might be the focus of study: for example, what is the impact of substituting a fully trained doctor for a medical assistant or a medical assistant for a nurse?
3. Mass campaigns to control diseases such as malaria, tuberculosis, trachoma, and venereal disease.
4. Efforts to improve nutrition.
5. Environmental sanitation and water supply programs.
6. Health education programs.
7. Industrial and school health programs.

8. Family planning or birth control programs.
9. Variations in forms of medical administration. As, for example, when rural health centers are used primarily for discovering seriously ill people to be sent elsewhere for treatment versus being used as curative centers.

Criteria for selecting which inputs to study include the following:

1. Ability to isolate the input. In many cases it will be hard to determine just what inputs produced the effects observed even though we have control communities. This is particularly true in cities where, although two matched neighborhoods are chosen, it would be hard to be sure that the input was affecting only one and not the other, or to be sure that other major events in the city complex were not swamping any input whose effects were to be measured. This argues for a rural setting in which inputs are easier to isolate.
2. Measureability and strength of the input. The input must be "strong" enough to have a real impact, and in particular there must be ways of determining how much of a "dose" is really "put in". In these countries many programs, budgetary categories, and even personnel can be located where the program exists more on paper than in fact. Public health nurses may exist but not be seeing families, medicines may be distributed but not taken, etc. There must be strong reason to believe that the chosen input will be put into effect and some way to measure how far in fact it is being put into effect.
3. Economic impact. The health input should have an effect not only on health but on economic productivity or household expenditures, either directly (as in permitting a person to work harder) or indirectly through attitude change.

In effect this criterion almost restricts choice of inputs to those with fairly short-run economic impacts. It tends to make less interesting such health inputs as immunization programs, nutrition or health education programs where the effect is measured

largely in terms of morbidity and mortality of young children. Inputs of this type are often easy to isolate and their effects on economic productivity may be very substantial in the long run after the children grow up. However, during the course of our study, the economic effects of such programs might be quite small and undetectable. What effects there are might be in re-distribution of family expenditures resulting from better child health.

4. Importance of findings. The usefulness of findings has both a political and an economic aspect. On the political side, findings, for example, that medical assistants are as effective as doctors in certain settings, would be unlikely to influence most underdeveloped countries to spend more of their money on training medical assistants. They want the best medical care possible and the high status of training their own physicians, and this means for all practical purposes, primary emphasis on training high quality doctors.

On the economic side, it may be easier to isolate the effect of a health input in a rural setting, but it can be argued that such health inputs are really quite marginal to the performance of the economy as a whole. More dramatic economic effects will be more likely to result from urban health care programs where the patients are key men in the economic development process. As a specific example, a farmer is by definition a part-time worker, at least during part of the year. Absence from work due to illness during certain parts of the year might therefore have very little effect on the output of his farm, whereas the same would not be true of a factory worker or an executive for whom days missed have a more direct effect on productivity.

Despite this last point, the consensus at the present time is that the highest priority should be given to a project which involves introducing some kind of a medically trained person into a fairly distinct rural community, primarily to isolate the reason for any changes the selected measures detect. The objection that such a study would not be very useful, even if significant results were obtained, can at least be met partially in several ways:

- (a) The rural community need not be very small; it could be a village of 10,000 - 30,000 people since such villages in these countries do not contain a variety of medical and other social service inputs;
- (b) what happens in such villages should be more directly relevant to the core of the growth process;
- (c) the medically trained person could be chosen to be a type whose function is at least in part educational so that attitudes engendered by health education might be expected to generalize to economic matters ( as in introducing the notion of planning or conserving health);
- (d) even though this study does not directly attack the effects of health inputs on the most easily influenced part of the economic growth complex (in the city), it does add to knowledge in the area of health investments and knowledge which could supply a better basis for urban health investment decisions than now exists.

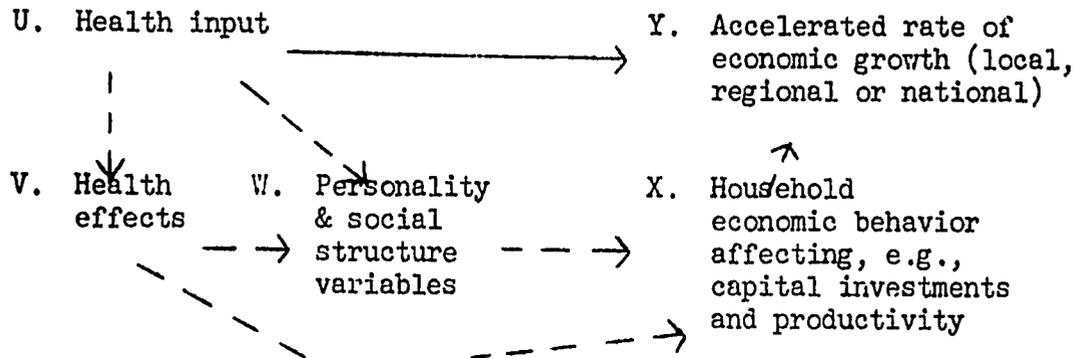
The second choice of input at the moment is probably an industrial (or possibly a school) health program. Here the research advantages are obvious; the health input can be easily identified, described, and often controlled; the population is well-defined and accessible; the effect on production (in the case of a company) easily measured; and the relationship of increased productivity to economic growth aggregates is fairly straightforward. The biggest disadvantage seems to be that the results when obtained might appear to have very little general significance or usefulness, for example, to a government of a developing country trying to decide how to invest its money. The relevance question might be answered, however, by arguing that demonstration of the effectiveness of an industrial health program might persuade governments to introduce health inputs occupationally rather than geographically, as so many do now via district health centers.

In addition continuing consideration will be given to health inputs of any sort that are found in the field work.

G

Economic, Social, and Health Output Alternatives

In a sense "outputs" are critical in designing the study because inputs must be chosen that potentially have some direct or indirect measureable effect on the economy. The potential causal sequences may be represented as follows:



In theory the ultimate interest is in the relationship of U to Y, but in practice much more must be learned about the links in the causal chain, e.g., from U to V to W to X to Y. Almost any set of relationships in this chain of events is conceivable. For example, a health input (U) like a vaccination program may effect health status (V) by reducing debility (as from smallpox) which may increase productivity (X) without any real attitude change (W). Or it may affect rate of economic growth directly without affecting either W or X by reducing infant mortality (V) which in theory must save some money from a very unproductive investment in feeding children from whom there is no productive return. However, interest of this project starts with X and works back to what personality or cultural factors and health inputs will affect household economic behavior, and forward to what changes in X have a rational or empirical relationship to economic growth (Y). So the project would start with measures of X, and will not give much attention to how to measure aggregative changes in regional economic development (Y) except to note that such methods of measurement are well worked out for advanced countries (see Kuznets) and have been discussed for underdeveloped countries by Colin Clark, McClelland, and several economists like Schultz on the agricultural side.

In addition to this theoretical rationale for selecting among output indexes, it is realized that two other methodological criteria are important in judging what indexes to use:

- (a) The measures must be simple and objective enough to obtain through household interviews conducted by relatively untrained enumerators;
- (b) Generally speaking, items should be chosen which can be accumulated into indexes or scales (Guttman or otherwise) because such composites have greater reliability than an individual item.

Obviously which measures are ultimately used will depend on the specific input chosen. For the most part, the following indexes have been selected with a view to their applicability in a rural or village setting:

X. Measures of household economic behavior

1. Monetary activities

Income

- a. Total individual and household income in monetary terms.
- b. Number in household working for money.
- c. Time spent per person per month working for money.

Note: In case of crops sold, estimate in terms of percentage sold for money.

- d. Adult males for whom entrepreneurial practices account for 75% or more of income. For definition of "entrepreneurial practices", see McClelland; The Achieving Society, p. 489.

Monetary income distribution

- e. Monetary savings in cash and in institutions.

Note: Cash savings do not ordinarily accelerate economic growth, but institutional savings should.

- f. Installment buying.
- g. Direct taxes (government "saving").

Respondent will often be able to complain about direct taxes whereas he will not know indirect taxes.

Note 1: It is generally assumed that increases in "monetary activities" (participating in the market economy) accelerates economic growth (except for savings in cash or gold).

Note 2: Provision is not made here for the usual questions on how

money is spent accurately, because it is not certain how such information relates to economic growth, and because much of the same information can be better obtained from repeated household inventories (see below).

2. Productivity indexes

- a. Agricultural indexes of productivity, such as crop yields per unit of area, animal yields in milk, eggs, etc.; extent and fate of surpluses; and check list for use of recommended farm practices.

Note: Seasonal or disease variations make yields a rather poor short-term indicator. Adoption of recommended practices for the area is probably the best single long range index.

- b. Industrial indexes

Productivity per man hour and days missed through illness.

Note: Such measures are useful only in a controlled company setting.

- c. Proposed household index

Time spent per week at various levels of complexity of activity, scale for the latter to be determined by psychologists' data on what level of intelligence is required to carry out the activity. In effect this means creating more steps in the usual "skilled" versus "semi-skilled" versus "unskilled" breakdown. The chart will look like this:

		<u>Hours spent per week</u>
<u>Activity</u> <u>Complexity</u>	Reading	5
		4
		3
		2
	Sitting, doing nothing	1

Note: The assumption is that people functioning at higher intelligence levels more often are contributing more to economic growth.

3. Inventories

- a. Inventory of household possessions (cf. work of the anthropologist John Roberts at Cornell as to methods for doing this).

Items should be broken down more or less as follows:

<u>Items increasing productivity</u>	<u>Consumption items</u>	<u>Health items</u>	<u>Liquid capital</u>
most animals	animal pets	soap	jewelry
fruit trees	comb	brooms	gold
farm tools	comic books	well for drinking	cash
sewing maching	dishes	bathing equipment	
pencils, pens	kitchen utensils	medicines	
irrigation well	furniture (beds)		
school books	clothing		
clock that works	heating equipment		
scissors			

Increases in the first column should be most directly related to productivity and economic growth.

b. Inventory of skills

- (1) Skills possessed and used by members of household  
 masonry, bricklaying, housebuilding  
 bicycle repairing  
 reading and writing  
 speaking ccommand of a second language  
 midwifery  
 veterinary skills  
 machine sewing

Note: Such a checklist should be prepared for local conditions. The assumption is that acquisition of such skills should lead to greater productivity and economic growth.

- (2) Number of months or years of schooling of various types for each household member
- (3) Mobility: e.g., distance travelled in last month by each family member.

Note: The assumption is that travel provides information which is a useful "skill". Both mobility and years of schooling are considered investments in human capital by Schultz and his followers. Many of the objections to

their assumptions do not apply in underdeveloped countries. For example, one can assume full employment of almost all school-taught technical skills in these countries because the shortages are so great.

- W. Personality and social structure variables which might be affected by health inputs and might affect some of the indexes listed in X (measures of household economic behavior) above.
1. Intelligence, as determined by a short list of culture-free items or tests. Brighter people can and do more often perform more productively, and several health inputs may "increase" intelligence in the sense of controlling diseases or infections that prevent its development.
  2. Information, as determined by a simple checklist, of knowledge of nearby towns, how to get there, where work can be found, the nature of governmental or social institutions (police, banks, post offices), the name of the head of the country, etc. This is a key variable because most health inputs should even indirectly increase such knowledge, and information of this kind is a good "capital stock" which should affect productivity. For a limited rationale, cf. Stigler, G.J. "Information in the Labor Market", J. Pol. Economy, 1962, 70, 94-105.
  3. "Attitudinal" variables related to economic growth or modernization.
    - a. n Achievement, to be measured by expressive drawing or circle-stone test.
    - b. Other-directedness
    - c. Nature as a source of cooperation pressure (as increased by working together to control disease, or to get a better water supply etc.).

Note: For methods of measurement and rationale for the importance of variables a, b, and c, see McClelland, The Achieving Society.
    - d. Future orientation: planning versus resignation
    - e. Level of aspiration for education, material possessions, etc.

The method of measurement should be Mischel's: e.g., would you rather have a job paying X now or a job two years from now after training which pays 3X?

4. Social structure

- a. Changes toward nuclear family type to be estimated from inventory of household by age, sex, and relationship.

For the reasons why this and other family changes are related to modernization, see Goode, W.J., "Industrialization and Family Change" in Hoselitz, B.F. and Moore, W.E. (eds.), Industrialization and Society. Unesco: Mouton, 1963. A case can also be made for the fact that health is a form of social security which should permit and facilitate "nuclearization" of the family.

- b. Improved status of women.

For explanation of relationship to economic growth, see McClelland, "Changing Values for Progress." Most health measures improve the status of women.

- c. Universalism (meaning, so far as recruitment for labor is concerned, that anyone is permitted to do any job, and restrictions due to class, caste, race, religion, age and sex tend to disappear). Facilitated by health programs because they are universalistic (people get treated not-in terms of who they are but in terms of what disease they have) and related to economic growth by removing rigidities in the labor market.

V. Measures of health status. The listing is not by method of obtaining the measures (i.e., through interviews, physical examination, or laboratory examination), but by general indexes which may be expected to relate to economic behavior (X).

1. Mortality indexes. Here the health measures are in terms of decreases in infant mortality or mortality from various diseases like tuberculosis, the assumption being that such decreases are general indicators of improvements in health conditions in underdeveloped areas. The relationship to economic growth is indirect: one estimates the number of people in the experimental community who did

not die (by subtraction from death rates in the control community) and then aggregates their estimated life income streams.

2. Disability indexes. Here one records major disabilities (e.g., loss of limbs or sense organs, being bed-ridden, etc.) and estimates what the income of the person was or would be without the disability. This is very difficult because of the well-known capacity of the human body to compensate for disability. Thus loss of one eye probably has little or no effect on productivity whereas loss of two may reduce it to near zero. Also disabilities are often irreversible so that improvements are hard to record.
3. Debility indexes. Here one works with general indexes of fitness which in this study can be correlated either with work performed (from correlations with measures under X in the initial survey) or which have a well-established relationship to ability to perform work.

- a. Deafness (often due to untreated ear infections)

Recent data from the USSR has demonstrated the relationship of minor hearing loss to intelligence loss which in turn is definitely related to productivity. The Russians have estimated that perhaps one-third of the people in their institutions for the feeble-minded have partial (and usually undetected) hearing loss. Psychologically the explanation probably lies in the fact that as children there were early and irreversible interferences with language acquisition, since the children could not hear or discriminate well what was being said to them. Decreases in deafness can be related to economic productivity via changes in productivity of persons of various intelligence levels.

- b. Physical fitness index. Conceivably some simple measure of ability of the physiological system to adjust to mild stress can be found (like the Schnieder Index) which will be easy to measure and demonstrably related to ability to perform manual labor.

- c. Anemia (again a general index of "weakness")
  - d. Tuberculosis morbidity
  - e. Nutritional level index (e.g., estimate of caloric intake)
  - f. Observable symptom checklist (e.g., coughing, vomiting, fever, bleeding (as opposed to asking where it hurts), on the assumption that the more symptoms the less able the person is to work at a high level.
  - g. Activity restraint. Cultures differ as to what they prescribe for illness, but, so far as work is concerned, the primary interest of the project is in the extent to which the person is restricted in what he does (e.g., hours spent lying down, not going out, etc.).
  - h. Subjective symptoms. Subjective reports are notoriously unreliable, but with suitable care it should be possible to find the construct system the people use to describe how they feel. If so, we have considerable evidence to show that people who describe themselves as "feeling bad" generally engage in less complex activities.
- 4, Measures of variables known to be related to health.
- a. Purity of water consumed.
  - b. Check list for cleanliness of persons or places.
  - c. Flies and other insects observed per unit time or space.
  - d. Health knowledge (e.g., knowledge of health facilities available, causes of common symptoms, and ways to prevent symptoms).
  - e. Use of health resources (e.g., facilities, public health nurse, dispensary, medicines, doctors).
  - f. Health attitudes and practices (e.g., unhealthy nutritional habits, unhealthy habits of personal care, and fatalism about illness versus prevention)

Note: These must be worked out in terms of local conditions. There are many examples, from wading in Lake Victoria, which may result in schistosomiasis, to lack of care in handling human excreta.

Some of these measures will have a very tenuous connection with economic productivity. For example, use of a rural health dispensary is very often greatest among the non-productive members of the population (the old, the idle, and the very young). Even this if it were known for a fact would be useful in planning health investments, since more money could go into industrial health programs where the productive sector of the population can be reached more readily.

## H

### General Technical Considerations Affecting the Conduct of the Research

#### 1. Organization

a. Technical difficulties will arise no matter where this research is attempted and the extent of the difficulties becomes a major factor in deciding where to locate the project.

#### b. Regional focus.

The project and/or projects should be centered in one region rather than scattered for several reasons:

- (1) While several field studies may be in progress at once, they should be under the supervision in the field of a senior research officer, preferably from the Harvard Staff. It will be difficult to get even one such person to the field every year and he should be centrally enough located to be able to keep in touch with all field studies.
- (2) It will be desirable and economical to have one central base to provide logistic support for field operations (i.e., a base where laboratory work can be done, where field staff can return for rest and advice, etc.).
- (3) Maintaining only one such base should simplify problems of political and administrative relationships with the host country.

#### c. Regions under consideration.

At the moment there appear to be three possible regional foci, each with some advantages and some drawbacks. They are listed in approximate order of their attractiveness at the moment:

East Africa. Here the central base could be in Nairobi or Kampala which would still permit fairly close contact with field work as far away as Ethiopia, Saudi Arabia, and Tanganyika. Living conditions are excellent, the European language is English, and there is an excellent medical complex to provide basic support at Makerere College. One possible difficulty is that in the East African Federation the medical orientation is almost exclusively toward Britain and British Universities.

Northwest Africa. If the base were in Morocco, the Maghreb (Libya, Tunisia, Algeria, Morocco) and as far South as Senegal and even Nigeria would be included. So far the project investigations in this area have not been extensive, but the disadvantages are clear: probably considerable political instability except in Tunisia, necessity for speaking French (except in Nigeria and Libya), and a French oriented medical tradition. But living conditions are excellent and many medical "experiments" (from the American point of view) which can be evaluated have been initiated by the French in these former territories.

Eastern Mediterranean. Here the most logical base would be Beirut with field work possibly as far away as the Balkans, Turkey, and Jordan on one side or Egypt on the other. So far the project explorations in this area have not turned up anything of interest, and the very variety of languages and cultures makes a large comparative program more difficult to establish than in the other two areas.

d. Political stability in the host country.

This is important for several reasons: to make sure the project is not suddenly interrupted after several years of work, to keep at least some administrative continuity with cooperating medical personnel, and to make sure the medical input continues long enough to be evaluated.

2. Design of the experiment.

- a. Self-contained surveys. While the design calls for a Before-After comparison, longitudinal studies are notoriously difficult to complete particularly under uncertain field conditions. Therefore the surveys should each be designed in such a way as to give useful information in themselves, as for example on relationships between health status (V), personality variables or attitudes (W), and economic behavior (X). Very little is known about some of these matters and even if the input or the re-survey fails to materialize much useful information from a single survey can be obtained if it is designed to yield it.
- b. Defining the population will be a major problem in most countries where census and map data do not exist in any detail. Even before a sample is selected, some mapping and surveying will be necessary to define the limits of the group of people to be studied. Definition of the population will be particularly difficult when it is very mobile (as with Bedouin tribes) or not collected into village centers but spread evenly through the countryside (as in parts of Uganda). Membership in households also varies widely from year to year in some places.
- c. Use of data from earlier studies.  
Most of the countries under consideration have been the sites of various medical, social and economic surveys carried out by investigators from former colonial powers, the United Nations, or various member organizations of the United Nations. For example, at least two careful surveys have been carried out in Libya within a 10-year period. In Tunisia some baseline data have been obtained on a population of 25,000 in a district of Tunis by a World Health Organization team working on tuberculosis control research. Usually these data are disregarded and considered useless for a new investigation, but the advantages might be very great if the raw data could really be recovered from some of these studies and used in planning subsequent studies. It is worth spending time in the field searching for it.
- d. Assuring the input.  
This has been stressed several times, but it would be hard to

exaggerate its importance. More research has failed for lack of anything to measure than for any other reasons.

### 3. Personnel

#### a. Interviewers

Potential interviewers seem available in all countries, though a period of preliminary training is essential and close supervision should be maintained throughout the survey.

#### b. Shortage of host country personnel.

There will often be a critical shortage of available host country personnel on a supervisory or collaborative level. Suitably educated and experienced individuals are as yet few in number in most of the countries under consideration, and those that do exist have large demands placed on their time by administrative and educational responsibilities. So far, in every country visited such people have expressed great interest in having a Harvard research project in their country, but one must not be deceived as to the time they can actually give in helping to establish such a project. Their approval is necessary, but often that is about all they will have time to give to it. Research and administrative personnel must be supplied by Harvard. However, it will also be necessary to hire "local counterpart" personnel to help overcome language, cultural, and administrative barriers.

#### c. Location of research centers.

It would be very useful to base the research near centers where medical institutions and senior personnel exist, as at Makerere or American University in Beirut, because such centers can be of great assistance in anticipating and helping overcome technical difficulties.

#### d. Effectiveness of American personnel.

Political and social attitudes in some cultural groups will limit the effectiveness of some American personnel. For example, some Arab countries will not welcome Jewish staff members and in some parts of Africa there is prejudice against whites. However we have run into little prejudice against Americans, as such, since

America is not a former colonial power.

e. Living conditions.

Studies in rural communities will require the recruitment of personnel willing and able to spend long periods of time in remote areas and will also require logistic support, in particular transport.

f. Community relationships.

It will frequently be necessary, especially in more traditional societies, to establish rapport with a community before taking a survey. Initial contact should be made through local leaders, and the offering of a service to the community may often be essential.

g. Female personnel.

Seclusion of women in Moslem communities frequently makes it difficult to study complete families, but there is great variation in this respect in the Moslem world. The difficulty may be overcome by the employment of appropriately experienced local female personnel.

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Conclusion

This statement summarizes the interest of a group of Harvard University faculty in the economic and social effects of investments in health in developing countries. Much remains to be done to further refine the research plan.

The present research plan, despite its complexity and lack of precedent, has the potential of providing new knowledge on the development process and systematic data to assist in important policy decisions on the allocation of resources in developing economies.