THE RELATIVE CONTRIBUTIONS OF HEALTH CARE AND SOCIAL FACTORS TO HEALTH
PUBLIC POLICY IMPLICATIONS

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Apparently by common consent, at least among the fraternity of public health and medical care professionals, we seem to be on the verge in this country of a massive re-structuring of our system for the delivery of personal health services. In fact, proposals toward this end--many alternative and some even contradictory to one another--are plentiful in the U.S. Congress currently and, not surprisingly therefore, they provide a basis for the spirited public policy discussion now taking place.

In that discussion, reasoned argument in support of proposals to restructure the system is often stated as follows:

1. The health level of the population of the United States, as measured by its infant mortality rate and/or years of life expectancy (the most common indicators), is substantially below that of other Western, industrialized countries. (This formulation represents the beginning of the classic "social problems" approach to health, i.e., that a "substantial discrepancy" between "ideal" health level and reality is perceived by a "significant collectivity" in the body politic as existing in this country, a discrepancy which is perceived as rectifiable by collective social action. For a more elaborate formulation of this approach, see Lerner, 1971, pp. 296-8).

2. Since the "goal" of any health services' system anywhere is to "produce" health, i.e., to maintain the health of the population at a high level (and/or to improve it), and since the health level of the U.S. population is obviously lower than it should be, the system in this country is obviously deficient. This deficiency in system, in turn, may result from corresponding deficiencies in either (or both) of two factors--the quantity of resources allocated as input to the system, and the structure of the system, i.e., its patterns of financing and/or organization.

3. Since the quantity of resources allocated to the system in the United States is relatively high, i.e., expenditures on health constitute a larger percentage of Gross National Product (GNP) in the U.S. than is the case for most, possibly even all, of the other Western, industrialized countries, therefore the deficiency must, by elimination, result from a corresponding deficiency in the structure of the health services' system. This is especially true because, in several crucial respects, the structure of the system in this country differs from the structure in many of these other countries. The faultily-structured system in this country performs inadequately, it is argued, and its product is, therefore, inadequate.

4. Among the major structural changes currently under consideration, one proposal is to replace present voluntary health insurance arrangements by national compulsory health insurance[♦]. A second is to replace present fee-for-service solo or group medical practices by health maintenance organizations. Still others are to replace present patterns of professional self-regulation within medicine by professional services' review organizations, or to expand the capabilities of public planning agencies. These proposals have been suggested singly and in various combinations.

As merely one recent example, among very many, of this type of argument, consider these remarks by Dr. Jesse Steinfeld, recently Surgeon General of the U.S. Public Health Service:

> "The United States has the best medical research apparatus in the world, the best undergraduate, graduate, and post graduate medical education in the world, and the most modern, best equipped hospitals in the world... Best research... Best education... Best doctors... Best hospitals... What's the problem?
>
> Among developed countries, the United States ranks 12th in life expectancy for women and 27th in life expectancy for men. We rank 15th in infant mortality. But in expenses or annual costs for each citizen for health, we rank 1st.
>
> Obviously, something is wrong. Something is wrong with our health apparatus. And as we examine the health apparatus, we find that there is no system. Its a non-system. Nobody...no group...no governmental body is responsible for research, education, or the quality, availability, and delivery of health care. That is the major problem. Lack of responsibility. Lack of accountability. Lack of a system. Lack of planning.
>
> What we have is high-priced chaos. We have an unplanned, often unresponsive and incredibly

[♦] Fraser (1972) provides some evidence, admittedly crude, that in nine Western, industrialized countries the degree of government participation in health expenditures is unrelated to the level of infant mortality.

wasteful non-system, utilizing far too excessively our limited human, medical, and technical resources. Health care in the United States is a marvel of high cost and inefficiency." (Steinfeld, 1973, pp. 1-2).

However, there are those who refuse to accept the argument that, because the "product" or our health services' system is not adequate compared to others, therefore the "fault" lies in the structure of the system. Usually one or more of four major classes of counter-argument (singly or in combination) are advanced, as follows.

The first rejects the assertion that health in the U.S. is substantially lower than in other Western, industrialized countries. Health, it is asserted, is a multi-dimensional characteristic, much broader than merely the quantity of life, so that indicators of a population's quantity of life--its infant mortality rate and its years of life expectancy--tap merely one dimension of health.[♦] Further, measures of the quantity of life may not be perfectly, or possibly even substantially, correlated with measures of those aspects of the "quality" of life which are related to health, e.g., freedom from physical and/or emotional illness, impairment, or disability, and possession of "social well-being" and even "positive health", however defined.

Along these lines, the assertion is that at some levels, although perhaps in only relatively minor degree in relation to the total, there is some reason to think that the average quantity of life for a population aggregate may actually, under some circumstances and for short periods of time, be negatively correlated with an aggregate's average quality of life, at least as the latter is reflected in freedom from illness, disability, and impairment (Lerner, 1973d). This occurs when case-fatality rates decline, as they have with advances in medical science and technology, especially in recent years, for those illness conditions where survivorship leaves the individual substantially "impaired" rather than completely "cured" of the condition or, in some instances, of its residual effects. Following the line of reasoning developed in this counter-argument, there may be no "fault" with the structure of the health services' system, since its "product" is not necessarily inadequate when compared to others.

The second class of counter-argument, while agreeing that health in the U.S. is lower than it should be, provides an alternative explanation for it. It asserts that lower health here is the consequence of inadequacies in the system which in turn follow from the allocation of an insufficient quantity of resources to it; even though expenditures on health as a percentage of GNP are higher here than in comparable countries elsewhere (or at least as high), nevertheless they should be even higher than they are. Thus we are said to have a shortage of primary physicians or physicians' services, so that greater output from the medical schools is needed or the productivity of physicians should be extended by the introduction on a massive scale of various kinds of physicians' assistants or other kinds of paramedical personnel. Similarly, the quality of medical personnel is said to be inadequate (e.g., because physicians and others providing the great bulk of patient care in this country are unable to keep up with the latest advances in medical technology emanating from this country's great medical centers), so that we need extensive programs of continuing medical education. Finally, we are said to lack an adequate supply of highly specialized medical equipment (renal dialysis units, cobalt machines, etc.) and personnel (to operate this equipment), of emergency medical services (to provide care instantly and on the spot), of outreach services (particularly to serve the under-privileged), and of home health services and skilled nursing facilities. Each of these inadequacies in the system has in common the characteristic that its correction or amelioration requires additional resources, very likely public resources[♦].

Three types of reasoning support this counter-argument by providing an explanation for the requirement of higher expenditures here than elsewhere. One holds that we may be victims of our own success, i.e., that our very success in reducing mortality from the communicable diseases and other illness conditions, especially at the younger ages and mid-life, has resulted in the survivorship to mid-life and the older ages of many with chronic illness, impairment, or disability. For these people, it is argued, the provision of health services can be, and often is, very expensive, especially because of the elaborate and complicated equipment (renal dialysis units, cobalt machines, etc.), surgical procedures (kidney and heart transplants, etc.), and medications required to maintain them. Perhaps we in the United States have invested more heavily than is true elsewhere in this elaborate and complicated equipment and surgical procedures, and in production of expensive medications, but perhaps even heavier investment is required just because of our very success.

The second type of reasoning in support of the need for higher expenditures here argues that a considerable part of our medical care expenditures is accounted for by the massiveness of our clinical and bio-medical research; its products (both technology and trained personnel) are adopted elsewhere at very little cost. But also, the results of this effort often do not appear in the statistics, either because the years of life saved are too few or because the saving is in freedom from pain and discomfort rather than in years of life. This would be true if, here compared to elsewhere, more of the expenditures for medical care are actually used for the treatment of

[♦] Even these two commonly used measures of health, although probably not completely independent of one another, are nevertheless far from perfectly correlated. Each merits independent investigation.

[♦] Additional resources, whether public or private, would obviously have to be diverted from elsewhere, so that other societal needs might be less adequately met than at present.

essentially incurable or irreversible chronic illnesses.

The third type of reasoning supporting this counter-argument holds that it may be the uniqueness of this country's life-styles, when coupled with its wide heterogeneity in cultural patterns and the enormous physical and geographic mobility of the population, which requires that expenditures for health be higher here to provide the same level of health as elsewhere. Persons holding this view argue that our affluence[♦], the relatively high proportion in sedentary occupations, the large amount of motor-vehicle traffic, our high levels of environmental pollution (related to high industrialization and urbanization), our attachment to cigarette smoking, etc., all of these present special hazards and problems, the solution of which requires additional resources. Yet, even though these problems, by default, have become the responsibility of the health services system, additional resources have not been allocated to the system, and its performance, therefore, appears to the observer to be less effective than it may be in actuality.

Persons holding these views are likely to argue also that Americans demand more of their health services' system than is the case elsewhere. For example, Americans insist on a "personal" relationship to their physician, whatever the structure of the system may be, and further they have been, at least in the past, willing to pay the additional costs thereby incurred. Also, perhaps as a consequence of differences in cultural patterns and in family structure, Americans expect their formal institutions to assume a substantial portion of the burden of caring for the chronically ill, whereas elsewhere this may more likely be done within the family; and while expenditures for the sheer "room-and-board" aspect of the care provided by institutions (nursing homes, etc.) appear in the statistics as medical care expenditures, this is not the case when the same care is provided in the family.

[♦]Glazer (1971), citing an earlier statement by Fuchs, argues that although in the past rising levels of living were beneficial to health, in the United States, at least, we may have entered the stage at which this is no longer true. Auster et.al. (1969), studying the relationship of mortality of whites to both medical care and environmental variables by means of a regression analysis across states using 1960 data, found a positive association between high income and high mortality when the effects of medical care and education were controlled for. They speculated that this may reflect unfavorable diets, lack of exercise, psychological tensions, and other factors, and that it may explain the failure of death rates to decline rapidly in recent years. The logic here is that adverse factors associated with the growth of income may be nullifying the presumably beneficial effects of increases in the quantity and quality of medical care. For some further supporting reasoning, see also Lerner (1973d).

The third class of counter-argument, like the second, also accepts the premise of the argument for re-structuring the system, i.e., that the health level of the United States is lower than is appropriate under the circumstances. However, it argues that the remedy lies not in restructuring the system or even in increasing the allocation of resources to it. Rather it argues that, even at present levels of allocation, the performance of the system (i.e., the health level of the population) could be improved materially by changing the "mix" currently making up the health services' system, i.e., the resource allocation pattern presently existing among its various subsystems, in the direction of increasing the share, relative to others, of those providing the largest return on investment. Return, for this purpose, is measured in terms of improvement in the major indicators of system performance in current use in public policy debate, i.e., life expectancy and the infant mortality rate, or whatever other indicators become the vogue. However, the merit of this counter-argument appears to rest largely on the usefulness of the taxonomy of sub-systems and the feasibility of basing public policy on it.

One such taxonomy which appears to merit careful consideration has been advanced by Stewart (1971). He divides the health services' system into four sub-systems[♦] defined by their objectives: treatment, prevention, information, and research. At least two other sub-systems could perhaps be added here, one intended to bring about recovery and rehabilitation, and the other relief from dissatisfaction, pain, and discomfort (this latter perhaps including relief from anxiety about illness). Also, each of the proposed sub-systems could itself in turn be further sub-divided; for example, under treatment a separation might be made between surgical and medical. Thus, one school of thought points to an apparent "over-supply" of surgeons in this country and an apparent "under-supply" of primary-care practitioners (Stevens, 1971). Again under treatment, a separation might be made by place of treatment, e.g., inpatient versus outpatient ambulatory; by type of disorder, e.g., life-and-death situations or conditions including emergencies, chronic progressive conditions, and relatively mild self-limiting diseases (Teeling-Smith, 1973); by age-group of patients (the aged, persons in adulthood and mid-life, children and youth, and infants); or in any other way that seems appropriate.

Finally, the fourth class of counter-argument holds that, even though the "goal" of the health services' system in the United States is to maintain the health of the population at a high level (and/or to improve it), and clearly the system does have an enormous effect on health, nevertheless factors other than the health services' system also exert a substantial influence on the health level of the population (Lerner, 1973a; Benham, 1971; Glazer, 1971). Thus if the health level is too low, it should not be

[♦]Stewart uses the terms "industry" and "primary system" to mean what is designated above as "system" and "sub-system".

attributed, at least not solely, to the structure of the system. Rather, the influence on health of these other factors--factors other than the health services' system--should be investigated and measured, so that their possible manipulation in the interest of improving the health level of the population, either as an alternative to or in addition to changing the structure of the system, should also become a matter for public policy debate.

Although some isolated studies along these lines have been conducted, on the whole this activity--investigation and measurement of the relative influence of the health services' system and of non-health services' factors on health levels--has not previously been carried on in systematic fashion, possibly because of the stridency of the public policy debate centered around changing the structure of the system, but possibly also because no systematic framework has heretofore been available within which discussion of the results of these studies could be located. The present effort is offered as a contribution to what is perceived here as the desirable widening of the focus of that debate. It provides a very preliminary framework for conceptualization of the non-health services' factors which may influence health levels, and it suggests lines along which it may be profitable to pursue further inquiry.

The framework--independent variables

The framework of independent variables suggested here represents a modification and further development of one presented earlier by the present author (Lerner, 1973c) on behalf of a working group established under a grant from the Carnegie Corporation to the Medical Sociology Section of the American Sociological Association to explore the "Non-Health Services' Determinants of Health Levels". That framework divided the factors affecting health levels into two major categories: those "endogenous" and those "external" to the individual.

To quote directly from the earlier report...

"The endogenous factors consist of five major sub-categories: genetic endowment; biology of the organism; personality factors; cognitive factors; and behavioral patterns. By the last of these sub-categories, behavioral patterns, what is really meant is life styles considered at the level of the individual, i.e., as selected by the individual for whatever motives or under whatever constraints from among the various alternative life-styles available to him. In turn, and for present purposes only, a life-style might be defined operationally to include these components: level of living; type of occupation; food and nutritional habits; degree of social insurance and/or other forms of protection against various types of ecomonic and social insecurity; propensity to use, and the availability of, medical care services; and, finally, personal hygiene habits and patterns.

The factors external to the individual are conceptualized here as including the following sub-categories: the "environment" in which the individual lives and/or in which his "community" is situated; his "community"; the social groups which are significant to each individual and may be hypothesized as directly affecting his health; and finally the system for the delivery of personal health services, but only to the extent here that it introduces iatrogenic factors, presumably "unintended" as detrimental to the health of the individual, but nevertheless in fact having that consequence. Each of these sub-categories in turn merits some further discussion.

The environment includes not only the more obvious physical and biological features impinging on health, but also a very large social component... Much of the advance in health throughout human history has...taken place as a consequence of advance in human ability to modify and control for "social" purposes the physical and/or biological features of the environment, and there really is no reason to suppose that this chapter is closed. Under "social environment" we include culture (conceptualized here as wider in scope than community), and location. Culture, in turn, in our formulation includes values, the state of the arts and the level of technology, and the modes, types, and speed of cultural change.

But individuals live in a community as well as in an environment. Communities, by their very nature, engage to some degree in collective activities, e.g., for the provision of food and other forms of subsistence, maintenance of security and order, integration of moral values, and maintenance of social control. Each of these is crucial to the continued survival of the community and the individuals within it. But communities at a more "advanced" level also engage in public health activities--e.g., disposal of liquid and solid waste; food sanitation activities; water and air pollution control, etc.--and the consequences of each of these activities for health is substantial. Finally, and still under the category of the "community", they provide some sort of a social structure--a stratification system, an occupational structure, etc.--and each of these has ramifications for health...

Within the community--from one point of view, a sub-category of it--individuals are members of, or have reference to, various significant social groups, e.g., their families, other "primary" and various "secondary" groups, formal and informal organizations, residential institutions, etc. In these significant social groups, as defined here, they engage in role relationships and receive support, either positive or negative, through them. The quality and/or quantity of this support is believed by many to be a most significant factor influencing the health of the individual."

For purposes of the present discussion, social factors are defined as including all of the major categories and most of the specific items under "factors external to the individual". But it also includes any endogenous or external factor believed to be capable of being altered, at least in some degree, by collective social and/or political

decision. Thus this definition of factors as social, and yet as affecting health levels, cuts across the earlier categorization. Presumably many, perhaps most, external factors can obviously be modified by collective decision, but presumably also even the endogenous factors which are seemingly "given" (genetic endowment, biology of the organism, etc.), are nevertheless capable of alteration by social and/or political decision (e.g., at least in the sense that, even if they cannot be changed for a single individual at a given point in time, nevertheless their distribution in the population can probably be altered by "eugenic" policies). Thus the concept "social factors", as defined here, is directly relevant to public policy formulation.

The framework--dependent variables

The framework of dependent variables follows an earlier formulation (Lerner, 1973a). Since life is the necessary pre-condition for health, health is perceived in that formulation as a function of both the quantity and quality of life. Quantity of life is measured by life expectancy and (for a population) mortality rates. Although this conflicts with implicit social valuations, each unit of life, regardless of age or stage of development of an individual, is customarily given the same weight in computing life expectancy and mortality rates.

Quality of life, in turn, consists of physical, emotional, and social well-being. States of physical and emotional well-being are related to the presence and/or absence, frequency, and severity of illness, impairment, and disability, with the latter (disability) perceived as the subjective response to objective conditions (illness and/or impairment). Social well-being consists (Lerner, 1973b) of the following sub-components: economic welfare; major-social-role-related coping ability (ability to cope with challenges related to major social roles, lack of dependency, and ability to take advantage of opportunities for personal improvement and development); family health (the health of the family qua family, primarily considered in terms of the social support it provides to the individual to cope with threat, anxiety, illness, etc.); social participation (engagement) in the community (outside one's immediate family) and the quality of personal experience; and perception of moral worth.

The measurement problems here are as yet unresolved. One major problem is the weight to be given in the construction of an aggregative index: 1. to the quantity versus the quality of life; 2. to the various components of the quality of life; 3. under physicial and emotional well-being, to the frequency versus the severity of illness, impairment, and disability; and 4. under social well-being, to its various sub-components as designated above. Clearly, if improvement in the population's health is a desired goal of social policy, some sort of a weighting system, reflecting a consensus of social valuation, should be devised and made explicit, if only for the purpose of making possible the development of a logical framework in terms of which to assess, for public policy purposes, the relative contributions to health of social factors, as here defined, and of the system for the delivery of personal health services.

The framework--the relationship of independent to dependent variables

The independent variables include two broad classes of factors--the health services' system and the "social" factors as here defined. If the objective of social policy is to maximize health, and the quantity of societal resources to be allocated for this purpose is fixed, what is the optimum sub-allocation by factor? To find some answers to this is a major problem for public policy research.

Within the health services' system at current levels of resource allocation, two major types of change are possible. One is to alter its structure, along one or more of the lines indicated earlier. The second is to change its resource allocation pattern, again along lines indicated earlier. It should be noted that neither change is likely to be without cost, even if this is nothing more than the cost of the change itself, i.e., to move the system in the desired direction. Also, many proposed changes combine elements of these two major types. For example, the current HMO proposals suggest structural changes in medical practice (from fee-for-service solo to group practice of medicine) along with changes in the pattern of allocation by sub-system (curative to preventive care, inpatient to ambulatory, etc.)†.

Insofar as social factors are concerned, again at current levels of resource allocation, there is no system in the same sense as a health services' system exists, and other than the entire economy and social system, the structure of which could be altered to improve health. However, changes in resource allocation patterns among various current social interventions could occur, perhaps paralleling those suggested earlier as applicable to the health services' system. This becomes much more complicated, however, and it seems more likely that additional increments, rather than resource transfers, are likely to be considered.

Where could additional increments of social intervention be expected most efficiently to improve health? One proposal is to invest heavily in reducing air pollution. (For an excellent discussion of benefits, see Lave and Seskin, 1970 and 1972.) Merely some others might be to reduce cigarette smoking and other addictions deleterious to health; reduce accidents of all kinds, but especially motor-vehicle accidents; and encourage weight reduction among the moderately overweight and obese, by improving the population's nutritional intake (Henderson, 1972), and promoting widespread participation in regimes of light to moderate exercise, and in other ways††. Many similar proposals exist.

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† For a most perceptive statement along these lines, see Garfield (1970).

†† Each of these policies is, at this point, not widely considered to be the responsibility of the health services' system, but there is considerable support, at least in some quarters, for the sentiment that they ought to be.

Another social intervention is to strengthen the family as a family, e.g., by providing alternatives to institutionalization for the aged and infirm, by expanding the scope and variety of social services available to families, and by providing counselling services to "problem" families or families on the verge of dissolution.

Two points should be noted about these and probably any other major social interventions which might be proposed for the purpose of improving health. One, each is likely to involve direct economic cost of substantial magnitude; and two, no certainty exists, and possibly not even a substantial probability, that each of these interventions is likely to be "successful" in achieving that improvement. Also, those proposed here reflect merely the bias of this author; they may not be those which will be found in practice to provide the greatest health benefit to the community for the least allocation of its resources.

Many, and perhaps all, of these and other social interventions have their counterparts at the level of individual behavior, often involving the lifestyles and the economic choices of individuals. (It is in this sense that the distinction between characterisics endogenous and those external to the individual become less meaningful for purposes of public policy formulation.) For example, the social interventions aimed at reducing the hazards of the physical and/or biological environment usually, if not always, involve motivating and/or educating individuals not to engage in behaviors which expose them to these environmental hazards. Since these behaviors often provide short-term gratifications to those who engage in them--for example, the tension reduction believed to be provided by cigarette smoking, driving at excessive speeds, and "overeating"--and for other reasons, success in health education aimed at altering these behaviors has by and large proven to be elusive; even more elusive has been success in motivating individuals in our society, at least on a large scale, to engage in preventive, "positive" activities beneficial to health.

A complication in using social intervention to improve health is that the social factors to be altered simultaneously serve societal purposes and needs other than health. Any alteration along these lines, even when beneficial for health, may nevertheless as a secondary effect be socially deleterious otherwise. The example that comes most readily to mind here is that the presumably beneficial consequence for the health of the American people which would result from the elimination of cigarette smoking would certainly have a deleterious secondary effect, at least in the short run and unless offset by expensive "rehabilitative" measures, on the economy of tobacco-growing and cigarette-manufacturing North Carolina and elsewhere. Much the same statement can probably be made about most social interventions and/or public health measures, i.e., the health benefit they produce may often, in considerable degree, be offset by their negative secondary effects on the economy or society. Although decision as to the relative weights to be accorded to primary and secondary effects of any intervention should be made by the body politic as part of the political process, this decision can certainly be informed by precise measurement of effects, whether primary or secondary, as part of a research endeavor.

In many instances these forces operate in reverse, i.e., social policies adopted to meet societal needs other than health may also have secondary consequences for health. Here the instance that comes most readily to mind concerns the current energy shortage. This shortage is surely the long-run consequence of many factors but in the short-run most immediately of the decision by the Arab oil-producing nations to curtail oil production; the response in the United States was to reduce both the volume of motor-vehicle use and travel speeds. Very likely, although definitive data are not yet♦ at hand in this matter, a secondary consequence of these steps will probably be a fairly substantial reduction in motor-vehicle deaths, and therefore an improvement in the health of the American population and perhaps even of its international ranking in life expectancy. This was surely not the intent of the oil producers nor even of the U.S. Government. However, other consequences may perhaps also follow from reduced motor vehicle use, deleterious for the economy as employment drops, beneficial for health as air pollution from motor-vehicles declines, deleterious for health as emergency medical services are reduced due to the gasoline shortage, and many others. The ramifications appear endless, and measurement becomes correspondingly complex.

Still another complication in altering social environments to improve health is the distributional consideration, i.e., that the impact of these alterations may be unequally distributed among different segments of a population♦♦. (The same unequal distribution of benefits may, of course, also result from alterations in the structure of the health services' system or from alterations in the pattern of allocation of resources for that system.) This follows from the assumption that the health of any population or population segment is a function of the resources (whether public or private) devoted to the health services' system or other aspects of society serving it; thus, since resources are finite, the distribution of health among populations approximates a zero-sum game. That is, at any given level of resource allocation, if the level of health for one population is to be relatively "high", the corresponding level for another will have to be relatively "low". To the degree that social policy determines resource allocation, and to the degree that resource allocation influences health, the relative health of populations represents the results of policy decisions related to resource allocation.

Perhaps the best way of stating the public policy question here is not to ask about the relative

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♦ December, 1973.

♦♦ For a perceptive discussion along these lines, see Rivlin (1971, pp. 56-60).

influence of social and health services' system factors on health, but rather to ask about the relative influence on health of marginal increments or decrements of resources allocated to either of these general factors or to their specific components. The question then becomes: Given the availability of an additional dollar (or, conversely, if we have to take one away), where should that dollar be invested to produce the maximum increase in health? And here the difficulty is that, while at least theoretically even the very diverse factors comprising the independent variable as here conceptualized can ultimately be expressed in terms of dollar costs to the community, this is not (perhaps not yet) true of the dependent variable, health. No one has constructed a generally acceptable index to represent health in which comparable units of the quantity and quality of life could be aggregated into a single number, ultimately the number of dollars♦.

♦Robertson (1971) uses work-loss as an indicator of health, but even this approach does not quantify the non-income benefits of health.

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