

THE SOCIAL COSTS OF PRODUCTION  
IN AFRICA

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## Introduction

Those who have held power in modern Africa, whether in the colonial period or after, have made a series of decisions on investment in sanitation, education, health care, and family support which have significantly affected morbidity and mortality. The significance of these decisions can be uncovered if we examine how the social costs of production have been distributed. The costs of production are not only the ones which are counted as factors of production, but take in a wide range of costs which in some societies and at some times are counted as production costs, and at other times are borne by the state, or workers' families, or the entire population. Social costs of production include the cost of keeping workers healthy while they are working, the cost of feeding workers and their families, the maintenance of those who have retired from the work force, and the cost of either controlling or suffering the environmental effects of the production process. Questions about the distribution of social costs of production are relevant not only for understanding the fate of those who work for wages, but also for peasant producers who may benefit from extension services, public education and health services, or who may be compelled to produce cash crops at price levels which lead to immiseration, and for people who happen by chance to live near fields sprayed by harmful pesticides.

The "social cost of production" as I define it is closely related to the terms "social cost," "social good," and "social overhead capital," as used by liberal economists, but with crucial differences. A "social good" is one which cannot be divided and sold separately to individuals (Samuelson 1970: 149-51); it is therefore provided by public policy, and treated by any one individual or firm as an externally caused shift in the utility curve (Samuelson 1970: 454). "Social cost measures the value of the best alternative uses of resources that are available to the whole society, as evaluated by society" (Lipsey and Steiner 1969: 219).

These liberal definitions of social cost and social good do not take account of any levels of experience or solidarity other than the whole of society on the one hand, and the individual or the firm on the other. The definitions furthermore assume that decisions taken by the whole of society benefit the whole of society. They therefore direct attention away from class control. Questions about which groups within society pay the social costs and which enjoy the benefits are irrelevant from the point of view of liberal economic theory, which is concerned with external economies (benefits) and diseconomies (costs) only for the individual or firm. Yet from the point of view of health policy it is very relevant to know that urban dwellers derive benefit from irrigation without sanitation, while the rural population pays costs in ill

health. "Social cost of production" differs from the liberal definitions of social cost in two ways: first by specifying that the relevant linkages are between production and social costs; second by specifying costs and benefits in terms of relevant social sub-groupings, whether by class, by gender, or between rich and poor geographical regions.

These costs have been defined in many works as costs of the reproduction of labor. I intend to retain both terms for use in different contexts, but to give greater emphasis to "social costs of production" for two reasons. The first is that reproduction is something we intuitively think of as being private, the concern of a wife, a husband, and their larger circle of kin. Social costs of production, on the other hand, must be paid at some level of society, but the term itself does not have strong connotations tying it to a particular level (whether domestic, the level of a business enterprise, a local community, or the state). The second reason is that it is very easy to lose sight of the fact that the assignment of costs to either the productive or the reproductive category is not objective or universal, but varies according to historical context. In the U.S. a cook who fries eggs in a restaurant is seen as producing, while one who fries eggs on a domestic kitchen stove is reproducing. In the U.S. the cost of protecting a worker from very high levels of exposure to lead is a productive cost; in South Africa the cost is assigned to

the sphere of reproduction, for the worker is exposed and then at a certain point sent back to a rural home, for relatives to support.

In any given historical setting the particular distribution of social costs of production among workers, capital, the state, and consumers has a certain stability. Some elements in the distribution seem to those in a society to be almost a part of the natural order, and not to be questioned--for example, in colonial Africa the feeding of the families of migrant laborers with food produced largely by women; in the U.S. today, payment for the health costs of industrial pollution either by health insurance subsidized by all employers, or by the afflicted individual, or by the state, but only to a limited extent by the polluter. At each historical moment some previous decisions on the distribution of social costs of production are brought into question, as in the Reagan administration's attempt to reduce social security and health care for the elderly and poor in the U.S. For the U.S., Piven and Cloward have shown that "when mass unemployment leads to periods of turmoil, relief programs are ordinarily initiated or expanded to absorb and control enough of the unemployed to restore order; then, as turbulence subsides, the relief system contracts, expelling those who are needed to populate the labor market" (1971: 3). As this example makes clear, and as we can see from the radical difference between

the distribution of social costs within the metropolitan countries and within their colonies in Africa, each concrete form of the organization of production and of class power has its own characteristic patterns of payment for the social costs of production, including the costs of environmental control. The patterns of morbidity and mortality which grow out of particular forms of production should therefore not be seen as inevitable consequences of the technology of production, for the effects of technology are mediated by decisions on which social costs of production should be paid, and by whom.

The four case studies which follow -- on schistosomiasis, malaria, women's work and malnutrition, and occupational health in southern Africa -- are selective illustrations of social costs and their distribution. Schistosomiasis radically changes its frequency when economic activities alter the landscape. Scholars often describe the disease as an inevitable consequence of development. The present discussion is meant to bring that inevitability, the "naturalness" of the disease, into question. The complex set of relations in schistosomiasis among government planning, the rural economy, hosts, and parasites could as easily have been illustrated with an account of trypanosomiasis, which the essay does not discuss. The second case study, on malaria, reveals some of the same relationships among production, the landscape, and the distribution of disease. Malaria is also worth studying as one

of the most important and rapidly growing disease problems in Africa today. The case study on women's work shows that malnutrition, which often interacts disastrously with infection, emerges from the way policies and economic pressures create the structure within which women shape their daily work. Africa's highest mortality rates are concentrated among infants and children under five years old. The burden of sickness and death, even among those too young to work, is directly related to the organization of work. The final case study shows that South Africa's decision to use a migrant labor force has had significant consequences for health within both the country and the southern African region. The costs of caring for occupational ailments, the costs of old age support, child rearing, and food for workers' families, are borne to the greatest extent possible by the workers and their relatives.

The case studies define the sphere of the work place very broadly. They are meant as a corrective to the ideology which finds its clearest expression in the migrant economy, in which conditions are only counted as work-related if they occur during the brief period the worker is receiving wages.

Employers describe industrial accidents as work-related, but rarely accept responsibility for cancers which appear fifteen years later, or among non-workers living near the factory. In addition the division between the work place and the rest of society has the effect of defining most of women's work, even

women's farming in Africa, as though it is neither labor nor production. If we accept this, then women ought to be studied almost entirely in the reproductive sphere. The present essay tries therefore, both in its definition of social costs and in its case studies, to show that a broad interpretation of production comes closer to revealing the health consequences of work.

#### Case Study on Schistosomiasis

Hughes and Hunter (1970) describe schistosomiasis as one of the "diseases of development." It is a parasitic disease for which snails are the intermediate hosts, and is therefore spread easily at large scale irrigation works where people live near snail-infested water (Kloos and Thompson 1975). This sense of the inevitability of schistosomiasis as a cost of irrigation is misleading, however. Schistosomiasis is inevitable only if policy-makers decide not to pay for sanitation, water supplies, and snail control. This disease provides us with a case study of how a clear decision not to pay one of the social costs of production has created a substantial health problem.

The chain of events by which irrigation creates disease is best understood in terms of "simplification of the ecosystem." The implications of this process were explored by Dunn (1968) in his work on the health of hunter-gatherers and have been studied more recently in articles on large-scale irrigation



(Kloos, DeSole and Lemma 1981; Hill, Chandler, and Highton 1977). According to Dunn (1968: 225), "Parasitic and infectious disease rates of prevalence and incidence are related to ecosystem diversity and complexity." The more species of plants and animals per unit area, and the fewer the individuals per unit area, the greater the diversity. Tropical forests, which have many species of trees per hectare (60 species in one particular study cited by Dunn), with many of the species represented by single individuals, are very diverse ecosystems. Thorn woodlands are simple ecosystems. Large irrigation projects and large-scale commercial agriculture usually contribute to a process of simplification.

In Dunn's interpretation, simple ecosystems (as compared with complex ones) have fewer species of parasitic and infectious organisms. Sexually reproducing organisms which happen to find the particular environment favorable achieve very high densities -- because of the uniformity of the environment -- leading to intense infections. In environments where worms reproduce easily, burdens of worms are heavier. With simplification, there are also fewer species of potential vectors, intermediate hosts, and alternative hosts for parasitic and infectious organisms. But the process of indirect disease transmission (whether of sexual or asexual infectious agents) tends to be highly efficient.

In the case of schistosomiasis, for example, the snails

are intermediate hosts, the irrigation projects are simplified ecosystems which provide an excellent uniform environment for snails, and the increases in infection are enormous. There is frequent contact between people and water in which the parasites live in their free-swimming stage, after they emerge from the snails. Infection rates of Schistosoma mansoni among schoolchildren in some irrigated areas reach 80%.

Schistosomiasis is not, however, an inevitable consequence of irrigation. The cycle of transmission can be broken, and the incidence of infection dramatically lowered if people living near the irrigation ditches have adequate latrines and therefore do not evacuate schistosome eggs into the water, if piped water is provided for domestic use, and if snails are controlled. The problem is that large scale irrigation works are expensive, and are often pushed through as symbols of national achievement. The costs of resettling the people who live near irrigated areas is virtually always underestimated, with final resettlement costs often two to three times the amount budgeted (Scudder 1973). Aid donors and national governments would therefore have to increase the projected costs of irrigation projects considerably if latrines and piped water were to be provided. Quite often the cost, in terms of debilitation, is paid by the poorest of the people who live near irrigated areas. Kloos, DeSole, and Lemma, for example, in a study of 363 people living near irrigation schemes in the

Awash Valley in Ethiopia, found that none of the farmers in settlement schemes were infected with S. mansoni, but 57% of crowded subsistence farmers were infected, as were an identical percentage of migrant laborers and their families, who form 90% of the population of the scheme. According to Kloos et al, "Availability of land for defecation is most limited in labor camps in irrigation farms, largely due to high population density and the use of all available land for irrigation agriculture" (1981: 463). In this particular case it looks as though those who pay the social costs of production are not the people who also gain the benefits.

Policy planners who make decisions on irrigation works rely on a limited range of social research in deciding whether to pay the social costs of production. One important study is a book by Weisbrod, Andreano, et al (1973), which directly approaches the question of the costs and benefits of schistosomiasis control, and which has been quoted widely (see for example Stockard 1978). The authors studied the effects of schistosomiasis on the economic production of banana plantation workers in the Caribbean. The authors show that schistosomiasis reduced the amount earned by banana plantation workers by about 30% for males, but that infected workers "respond to a decrease in their daily productive capacity by working more days per week . . . . In short, the cost of schistosomiasis infection for males is a reduction, not in market production and earnings,

but in leisure" (emphasis as in the original; 1973: 75). In other words, the authors consider only the work done on multinational-owned banana plantations as economic, and all other work, whether on subsistence farms, in crafts, in health care, in food preparation, or in child care as leisure. In my own view this method has the effect of systematically removing many of the social costs of production from the calculation of cost and benefit. The cost of caring for those who are debilitated in old age after a lifetime of schistosomiasis, the cost of reduced smallholder food production, the cost of reduced craft production--all of these are accounted for by the researchers as losses of leisure. In addition, the costs are calculated for one disease at a time, even though it is clear that the conditions which lead to schistosomiasis also increase the frequency of infection with other parasites, and that populations drawn together for irrigation agriculture or plantation work without adequate public health are subject to higher frequencies of non-parasitic infectious diseases (Bayoumi 1979: 203; on the importance of an integrated approach to water projects see Coumbaras 1977B; Hunter, Rey, and Scott 1982). The most important effect of this distorted measurement of economic cost is to justify the policy of providing irrigation without significant sanitation or disease control (see the contributions on the cost of schistosomiasis in Abdallah 1978).

Simplification of the ecosystem combined with narrow limitations on paying social costs of production is characteristic not only of irrigation schemes but also of plantation agriculture. In the enclave pattern government and business invest only in what is directly productive (with production defined in the narrowest way), and shift the greatest proportion of social costs of production to those who are poorest. This pattern was at the heart of colonial policies, and remains a major strand of current development policies.

#### Malaria

The spread of malaria in the twentieth century, like the spread of schistosomiasis, is related to the enclave pattern of development and to the simplification of ecosystems. Many of the ecological changes resulting from the expansion of commercial agriculture have led to a change in the distribution of mosquito species, and especially to an enormous expansion of Anopheles gambiae, the major African malaria vector. In undisturbed forest, A gambiae is one of the less common mosquito species. All over the continent the twentieth century has seen a process of clearing forest and clearing brush, which have led to an increase in the percentage of A gambiae among mosquito species (see Patterson 1981: 37 on forest clearing for cocoa; Roberts 1974: 306 on the enormous expansion of malaria in western Kenya). In the Kano plains rice scheme in Kenya,

A. gambiae went from 1% to 65% of the mosquito population (Desowitz 1976; Hill, Chandler, and Highton 1977). Quarrying, mining, brickworks, road construction, and urban building all lead to the creation of small accumulations of water, and therefore to the expansion of A. gambiae (Dutta and Dutt 1978).

It would be impossible to argue that all forest clearing, farming, and irrigation should be given up. As in the case of schistosomiasis, however, the economics of colonialism and the enclave pattern of development contributed to the seriousness of the problem. Rural poverty plays a role because quality of housing for both people and domestic animals affects prevalence rates. The lack of funding for social costs of production has led to a minimization of measures for basic environmental control, such as the provision of drains. Control measures, which were pursued vigorously for malaria in Europe before World War II, and which were extended to India and Latin America with the use of DDT after the war, were never seriously imposed in Africa. Malaria seemed impossible to deal with in a region where health services were not widely distributed, and where prevalent levels of infection were high (Bruce-Chwatt 1974; Bruce-Chwatt and De Zulueta 1980; Brown et al 1976). Even in holoendemic regions, however, achievements are possible, as shown by the success of a mining company in Liberia in drastically reducing the prevalence of malaria. Hedman et al (1979) estimate the cost of the control program at

\$4 per person (probably an underestimate), but the crucial fact is that gains can be made when there is a determination that the social costs of production are to be paid socially. One important social characteristic of malaria is that it is a scourge which crosses class lines, and therefore gives those with power an additional incentive to work vigorously for its control.

The failure of control efforts in India and Latin America and the consequent resurgence of malaria were direct results of the way in which large scale commercial agriculture, especially on plantations, dealt with the pest problems emerging from simplification of the ecosystem. (On the nature of this process, the fullest and most interesting interpretation is by Chapin and Wasserstrom (n.d.). The use of a single plant species as a crop over an extensive area leads to an increase in the population density of the pests best able to feed on that crop (Gillham 1972). The characteristic response by capitalist agriculture on an industrial model is to find the silver bullet--the chemical capable of wiping out the pest wherever it is found. In the years after World War II DDT was treated as the solution to a wide range of agricultural pest problems. According to Busvine, 97% of all insecticide use is not for disease control, but for direct application to the land for agricultural purposes (1978). When DDT is applied for malaria control insecticide resistant strains of mosquitoes are

unlikely to emerge, because most of the spraying is done in houses to kill adult mosquitoes, or if done outdoors is concentrated on limited areas. When entire fields are sprayed, however, agricultural run-off enters lakes or streams, and the weakened solution kills some but not all of the larvae present. Those which survive are more likely to become resistant mosquitoes. The obvious solution would be to reserve some insecticides for mosquito control, but pesticide manufacturers and large farmers have been unwilling to accept this (Agarwal 1978; 1979). A second element in a rational approach would be integrated pest control, in which insecticides are "carefully chosen and applied to maximize their action on the target organisms and to minimize their impact on non-target species and on human and animal health" (Brader 1979: 226). Biological controls are adopted as part of an integrated program (Ruesink 1978; WHO Expert Committee on Insecticides 1975; WHO Expert Committee on Insecticides 1976; PAHO Advisory Committee on Medical Research 1971; Davidson and Zahar 1973; "Biological Control of Insect Vectors" 1978).



Malnutrition and Rural Women's Work

The majority of policy makers in twentieth century Africa (whether colonial or national) have counted women's non-wage work as domestic activity, of little interest for economic development. This is similar to the way most economists in the U.S. have treated housework. In Africa, however, the sphere of uneconomic domestic activity is defined even more broadly to include women's farming for household consumption. Barbara Rogers (1980: 142-145) and others show that colonial regimes, international aid agencies, and national governments have all tended to count commercial crops as masculine, and have directed credit and extension or marketing services towards men, while treating women's farming as uneconomic subsistence. According to Wolpe (1972), Murray (1981), Meillassoux (1975), and many others, when women's production is not counted as economic wage levels can be reduced, since men at work do not need to support their families.

The general point about women's hidden subsidy of African labor systems is well known and widely discussed. Few scholars, however, have systematically explored how the organization of women's work under these conditions shapes basic patterns of malnutrition. (For an early exception, see Richards 1939; see also Wisner 1983). One obvious set of relationships ties together male migrant labor, pressure on women's work time, and malnutrition among infants and children

(Westcott and Stott 1977; WHO 1983; Turshen 1984; Jakobsen 1978). Women tend to be overburdened if they are left at home to care for farms and children while their husbands work at mines, factories, or plantations. The wives rely on remittances from their husbands -- capricious payments which sometimes arrive, sometimes do not. In a comparison of two localities in South Africa -- one a rural labor-supplying area and the other an illegal urban squatter settlement -- White (1980) found more intense nutritional problems in the rural areas. The reason was that wives who lived near the work place could rely on a larger portion of their husbands' earnings than wives did in the countryside.

The children who are worst off in the migrant labor system (and often also in the non-migrant peasant economy) are the ones whose fathers have severed all ties. According to a study in the Ciskei, for example, 70% of children in the malnourished portion of the sample lived in homes where the father had completely lost touch with the household (Thomas 1981). In our own village study in northeastern Tanzania the children of widows and divorcees, without male support, were most vulnerable to severe malnutrition. The dangerous isolation of mother-centered households is, of course, a consequence of the overall system of production and political control. When migrants stay away from home for long periods they sometimes sever links altogether. When young men in peasant societies

compete to grow cash crops they prefer, in some cases, not to share the profits of their labor and therefore withdraw from large mutual-insurance kin-groups (Haswell 1953; 1963; 1975).

The distribution of women's work time in peasant agriculture has changed drastically over the past century, with significant consequences for the distribution of infant and child malnutrition. The picture is not altogether clear, for scholars have only recently begun to study historical changes in women's work. Even now research tends to be restricted to farming work -- only one part of a total picture which ought to include cooking, carrying firewood and water, child care, crafts, care of the sick, and a range of other activities.

My hypothesis, based on a broad but not overwhelming range of data, is that in much of sub-Saharan Africa crop regimes have changed over the past century so as to intensify seasonal food shortages, and also to intensify seasonal variations in the demands on women's work time. This has led in turn to higher seasonal peaks of both malnutrition and death among infants and children. If the hypothesis is correct, it means that today's characteristic pattern of malnutrition is a recent phenomenon related to changing demands on women's work time.

The tie between malnutrition and rural women's work is clear. In most African settings where malnutrition is a serious problem, fats and oils are in short supply and foods are relatively low in energy. If convenience foods are

unavailable, the level of child nutrition depends on the number of times a day children eat cooked foods. The way to improve child nutrition seems obvious: children need more meals a day, and if possible meals with higher energy content. At the best of times, however, peasant mothers must farm, care for children, carry firewood and water, cook, and do other chores. The multiple demands on their work time can make it impossible for them to provide adequate food. Rural mothers who are a bit better off might, perhaps, buy firewood or have access to piped water, but for the vast majority of peasant mothers the constraints of work time limit child nutrition, even if food is available in adequate quantities.

In rural areas, especially those with a single main rainy season, the amount of labor women devote to agriculture varies widely from one season to another. During the months which demand the heaviest labor, the nutrition of women and children suffers. Schofield (1974) has surveyed the effects on child nutrition: meals are prepared less frequently; vitamins are destroyed in cooking because the pot is left to simmer; children are often asleep before the main meal is prepared; women are not free to gather green leafy vegetables; housecleaning is reduced; fuel and water collection are limited; and mothers devote less time to their children's care. The women themselves, at this time of year, are often hungry. The heaviest work seasons come at times when the previous

year's food is becoming exhausted and the new year's food has not yet ripened. Women tend to get fewer calories than they need at the heavy working time, and to make up the deficits after harvest (Bayliss-Smith 1981).

Nutritional levels and climatic conditions affect the disease picture at the same time. According to McGregor, 78% of childhood deaths in The Gambia occurred during the rainy season (1964; as reported in Hull, Williams, and Oldfield 1983). Diarrhea, which is one of the commonest causes of childhood morbidity and mortality in Africa, appears to affect more children in the hungry rainy season (Rowland et al 1981; Ndagala 1981; Onchere and Slooff 1981). Tomkins (1981) found, in a study at Malumfashi in Northern Nigeria, that diarrhea is especially devastating in wasted children, who have 47% more episodes than well nourished children, and whose episodes last 79% longer. Wasted children are those who have a low weight for height. Wasting is most likely the result of a recent decline in nutritional status, whether because of infection or seasonal hunger. Once again, pressure on women's work is likely to play some role. Seasonal malnutrition is especially severe in its effects on pregnant women, and therefore on the birthweight and subsequent health of newborns (Rowland et al 1981; Hull, Williams, and Oldfield 1983).

Two sets of changes have had a profound effect on the seasonal distribution of women's work time. The first is

change in the agricultural division of labor by gender. Men have increasingly devoted their working time to either wage employment or cash crop production. They therefore pay much less attention than they did a century ago to food crops for home consumption (Bukh 1979; Linares 1981; Johnny, Karimu, and Richards 1981). Households use men's cash income to supplement food stocks in the hungry season. This means, of course, that women-centered households without men have become especially vulnerable, as have debtor households. Haswell found in The Gambia that in the 1950s and 1960s the old system of hungry season sharing was replaced by a new one in which the poor borrowed money for hungry season food, became indebted to those better off, and had even greater difficulty facing the next hungry season (Haswell 1963, 1975, 1981; for a similar process in Ghana see Bukh 1979).

The second major change is a reduction in the number of food crops each household grows. It is clear for the places on which we have detailed information that people grew many more varieties of food crops a hundred years ago than they grow today. I have found this to be true in northeastern Tanzania, where Germans at the turn of the century reported dozens of varieties of food crops which no longer appear in today's diet. Jan Vansina, in a personal communication, reports the same pattern for much of Zaire. Indeed it is clear on a world-wide scale that a few food crops are becoming ubiquitous while very

many localized crops are no longer produced.

The loss of men's labor is only one reason for the change. A second is a basic alteration in peasant farming strategies. African agriculture in the nineteenth century placed heavy emphasis on hedging risks -- on growing alternative foods in case of shortage in the main staple caused by drought or excessive rains, or rains which came too early or too late. The alternative crops might have had slightly different moisture requirements from the main staple. The great diversity of food crops had the effect of spreading labor inputs relatively widely over the labor calendar, although the precise labor schedule must be examined in each locality. A whole range of pressures have led to the reduction in diversity. The loss of men's labor has meant a loss of men's crops. The possibility of hungry season food purchases has weakened the necessity to be completely self-reliant within each locality. In addition, colonial (and later national) governments either forced or encouraged peasants to grow a few chosen crops -- often the ones most easily transported and sold (Chauveau, Dozon, and Richard 1981).

The implication of this somewhat speculative history is that patterns of malnutrition are probably quite different today from what they had been a hundred years ago. Then (as in isolated portions of the continent now), the lack of transport made the rare killing famine a serious affair. But in

non-famine years women's work would have been much more evenly distributed through time, because of the great range of crops, each with its own work calendar, and because men participated more in the production of food crops. Patterns of mutual assistance tended to spread the effects of famine relatively evenly over all those who had full rights in a particular locality. Quite probably the seasonal malnutrition which is so important a part of the health picture in today's Africa did not exist then. It is remarkable that after decades of mature Africanist scholarship we are ignorant on so fundamental an issue.

#### Migrant Labor and Occupational Health in Southern Africa

The differential valuation of women's and men's labor, alongside the differential provision of health services (and in general the differential payment of the social costs of production), is particularly clear in migrant labor systems. These have assumed an extreme form in contemporary South Africa, but were dominant in most parts of Africa during the height of colonial influence, and continue to exist both in Africa and in the guest-worker segment of industrial economies. Scholars have known for decades that systems of male migrant labor have a substantial impact on the health of women and children, although the precise nature of that impact has usually been difficult to document. Most recently the authors of a WHO report on Apartheid and Health (1983) have pieced



together a careful assessment despite the biases in the data.

The gaps in our knowledge are not accidental; they are necessary consequences of the migrant labor system. Governments which place a low value on the health of the migrants' wives and children do not collect adequate health statistics about rural areas in which migrants originate (which are sometimes beyond the national borders). Statistics are especially weak on the women and children from among the migrant population. Scholars then are caught in a peculiar trap of data and method, for they need precise data to be able to sketch the effects of the labor system. Those effects are very much better documented for parts of the population which do receive government services, and so there is a built-in tendency in all our writings to underestimate the damage done by a system of migrant labor. The bias in the data provides a part of the explanation of why Patterson's book on Gold Coast (1981) draws a much more benign picture of the nutritional consequences of colonial rule than does Turshen's (1984) on Tanganyika. Turshen, who defines the focus of her research to match the contours of the labor system, concentrates on a labor-exporting area; Patterson defines his interests according to the availability of archives. He therefore focuses on the Gold Coast's capital city, for which government records are richest, and does not track working men of the capital back to their poorly documented families in Northern Ghana or

Upper Volta.

In the South African mines, where the migrant system is carried to a level of cynical perfection, a Human Sciences Laboratory works on the assumption that not all Africans raised in the mines' periphery will be strong enough to do strenuous work in the mines. It therefore developed a test chamber for sorting out potential workers (WHO 1983: 188).

Dr. C. H. Wyndham, Senior Epidemiologist for the South African Medical Research Council, commented on the importance of work capability data for health planning:

It is also apparent from these results that a much smaller percentage of rural Bantu males than urban Bantu males is capable of continuous high levels of physical effort. This fact must be borne in mind in the siting of Bantu homelands or border areas, or new industries which require hard physical work. In this context, consideration should be given to the improving of the physical work capacities of rural Bantu males. This could be done by better nutrition, particularly more calories and animal proteins, and by improving their health by eradication endemic diseases, such as malaria and bilharzia, for it is unlikely that the health and welfare of rural populations will be improved by their own efforts (quoted in WHO 1983: 188).

The authors of the WHO report on Apartheid and Health stress the importance of the assumptions in this statement that senior members of the South African medical establishment ought to promote medical interventions which maximize profits, and should aim at policies which draw the fittest workers out of the Bantustans. They also note the emphasis on the health and nutrition of "rural Bantu males," excluding African women and children who are not of direct use to South African employers

(1983: 188-189).

This example supports the more general sense that the authorities do not collect data of the kind needed for health planning for the families of migrant laborers because they rarely do the planning. The crucial statistics are missing not only in South Africa, but also on the health (and even at times the existence) of migrants in the U.S., witness the law suit alleging that a significant part of New York City's population was not counted in the most recent census. Guest workers in Western Europe (in many cases coming from Africa) hold the dirtiest and most dangerous jobs, but their occupational diseases are largely undocumented (I.L.O. 1977: pp. 10, 15).

In South Africa, regulation of the work force defines the way in which statistics are collected, which then shapes the thought of scholars. South Africa collects health data on migrant workers only so long as they are at the work place. These workers return to rural areas when they are no longer vigorous enough for employment, and they therefore die in places where their deaths are not counted -- or where the people are counted as non-citizens of South Africa. Official statistics drastically under-report infant and child mortality levels among Africans (Unterhalter 1982: 1113; Wyndham and Irwig 1979) because the government does not collect mortality statistics for Africans in the whole of the country. These statistics exist for only 33 magisterial districts of which 31

are urban (Simkins 1979: 95). Rural areas, where mortality is the highest, and where women and children are concentrated, go unreported.

Local studies report very high levels of rural mortality and malnutrition, but it is impossible to construct a systematic account because of the lack of national statistics. White (1980) discussed one of the reasons for raised levels of rural malnutrition. Rural families, in his study of two localities, received a much smaller proportion of men's wages than did illegal squatters living near the urban work place, and had a higher percentage of malnourished children. Westcott and Stott report that 30% of Transkei children die of malnutrition before the age of 2 (1977: 967, reported by Savage 1979). According to estimates by Knutzen and Bourne (1977) among Xhosa speaking-women, infant mortality rates were more than twice as high in rural areas than in the city. Tobias (1975) reported that adult Africans in several localities appear to have become shorter over the three or four decades preceding the 1960s. His evidence was (in his own view) unsatisfying, but suggestive. The South African evidence on rural health is rarely satisfying. Official birth statistics, along with infant and child mortality statistics, have not been collected for Africans at all (Westcott 1979: 2). The government dealt with the problem of malnutrition by deciding, in 1967, that kwashiorkor would no longer be a condition of

which the authorities must be notified (Unterhalter 1982: 1112; Mechanic 1973: 39). Despite all this, most writers on South African health have no choice but to rely on the official statistics.

The pattern of data collection, and therefore of the scholarship which relies on it, is even more dramatically skewed when it comes to occupational health. The information base is, itself (in South Africa as elsewhere), an integral part of the system for regulating labor. Most African workers are not covered by the system, and therefore their health problems go unreported. The occupational health system covers less than 30% of all workers (Green and Miller 1980).

Occupational health problems are defined in the narrowest possible way, during the period of employment, leading to under-reporting of the health problems of migrants who have returned home. It was the brief of the Erasmus Commission which investigated occupational health to deal only with workers while they are employed, and not after they have left employment. Entering employment is difficult for sick men in South Africa -- migrants are screened carefully before beginning work -- but leaving it is easy. In some occupations migrant workers are simply sent home when they become too sick to work. Even when this is not the case, by the time symptoms appear migrants have often left the work place, and are being cared for by their wives and sisters in rural South Africa, or

in Mozambique, Botswana, or Lesotho.

The South African labor system therefore creates systematic biases in the reporting of health problems as they relate to work, in three ways. First, accidents tend to be reported more accurately than degenerative diseases, because the mines (where accidents are a major problem) keep relatively good records, and because accidents actually happen at the work place -- it is difficult to defer their effects until workers return home. The toll of accidents is in fact heavy. In every year from 1970 to 1977, between 700 and 800 workers died in mine accidents, and nearly 28,000 were injured each year (Kooy 1980; see also WHO 1983: 190-194).

Second, the effects of carcinogens and of toxic substances are very strongly under-reported. This happens in part because of very low standards, and in part because migrants leave the work place before symptoms appear. If lead in the blood were measured by U.S. standards, then 44% of the South African workers exposed to lead would have to be withdrawn from exposure. Over 150,000 workers are potentially exposed (Green and Miller 1980: 148-149). The effects of time lag on migrant workers is dramatic in asbestos mining, and in the asbestos-based industries. The most damaging effects of exposure to asbestos begin to appear between 13 and 30 years after exposure. How many migrant workers are still at the work place to be examined after that period of time?

This is closely tied to the third set of biases in reporting. The more stable the work force, the more adequate are statistics on degenerative diseases. White workers in the asbestos industry are employed continuously over long periods, and are therefore still in employment when cancers appear. The crucial study by Irwig and Botha on asbestos related disease studied only whites and so-called "coloureds," because it was impossible to find adequate epidemiological data on the African workers (Flynn 1982). In 1979 white workers accounted for 51.8% of all reported mesotheliomas (related to asbestos exposure), even though they were only 5% of the work force in the mines. Africans, who were 92% of the work force, reported only 28% of the cases (Myers 1981).

The weak position of migrant labor, and weak reporting on it, are not limited to South Africa. It is clear that the South African occupational health picture can only be understood as part of the overall international division of labor. But precisely because South African employers have greater arbitrary control over their racially disenfranchised workers, South Africa can serve as a recipient country for some of the most dangerous industries. In this respect Castleman's debate with Levenstein and Eller is particularly relevant here. Castleman (1979; 1981; 1983) has argued that hazardous industries are exported to Third World countries because weak standards of occupational health (for example, the extremely

weak South African standards for exposure to asbestos fibers -- see Myers 1981), substantially reduce the costs of industrial production. Levenstein and Eller (1981), who fear an attack on occupational health on the grounds of cost, argue that dangerous industries are exported to the third world not to follow lower occupational health standards (which are relatively inexpensive to enforce), but to follow cheaper labor costs. The argument here has shown, I think, that the dichotomy between health standards and labor costs is a false one. Labor is cheap when neither the government nor the employer pays the costs of reproducing labor. This is part of a general system for reducing responsibility for the social costs of production, including the costs of occupational health at the work place, and health services for the families of workers.

Shula Marks and Neil Andersson (1983) have explored the fascinating history of the South African National Health Commission of 1944, on which a very special set of physicians proposed the creation of a health service for South Africans of all races. It is significant that the doctors' initiative came at a time of extremely rapid growth in South African manufacturing. It was a time when labor stabilization was a serious possibility, supported especially by manufacturers who needed semi-skilled labor. The African mine workers struck in 1946, and their demands reflected a similar desire for



stabilization. The Health Commission's plan, which would have provided benefits for poor whites as well as for Africans, had the possibility of helping to create a political coalition for fundamental change in the South African economy. As it happened, of course, the possibility of stabilization, which was real in the years after the war, was turned back by the coalition of forces which won the election of 1948 and codified apartheid. African urbanization has continued because of changes in the structure of the economy. The South African government has tried to hold down permanent urbanization, and to exploit divisions between stabilized and migrant workers.

#### Conclusion

Health researchers and planners often start with a number of elements in the environment defined as given, and therefore not open to change. Researchers are asked to make recommendations for dealing with malaria without being able to reserve some pesticides for human health uses; they are asked to deal with schistosomiasis but not to change the overall pattern of budgeting for irrigation; they must deal with infant mortality without altering the cycle of hungry season indebtedness or with the pattern of male labor migration. This paper has focused on the "given" elements not susceptible to easy modification.

It is important to recognize, however, that changes in the distribution of social costs do take place, and that the

direction of movement is sometimes positive. We know relatively little about who makes those changes, and how they are made. There are rare and important exceptions. Marks and Andersson, in their work on the South African National Health Commission described above, have examined decisions on social costs at a crucial moment in South African history. The policy documents of British colonial Africa were sometimes very explicit in their discussions of the relationship between characteristics of the labor force and the way social costs were paid. In East Africa at the end of World War II, for example, the British decided to change the basic pattern of paying social costs. They wanted to expand exports of primary products and to substitute African manufactures for imports from outside the sterling zone. Their decision, therefore, was to stabilize labor, and to expand the payment of social costs. The labor advisor to the Secretary of State for the Colonies wrote about stabilization at the time: "This will of course entail heavier charges on industry for the social services at present lacking or superfluous; but the great economy effected, and the resultant increase in efficiency should counterbalance this expense, and eliminate any increase in the cost of production which might handicap competition with trade rivals in other countries" (Orde Browne 1946: para. 58). The increased social services, in this case, include health, housing, and education. Many African governments acted after

independence to change the entire pattern of paying social costs. Tanzania, for example, vastly expanded health services and piped water supplies beyond their colonial base. But because the country had inherited a cheap labor economy, it could only pay for the expansion by relying heavily on overseas aid, which has made it difficult to sustain the new system. We need to know much more about the practical options facing African countries today, and more also about the way political coalitions are forged to influence decisions on social costs.

Social costs are not only changed from above. Labor militants have pressed in a number of places, with some success, for improved health conditions at the work place, and for a family wage. Even the first and least organized generation of African workers at the Southern Rhodesian mines of the turn of the century, pressed employers to improve health conditions by refusing to come to work at mines where conditions were worst (Van Onselen 1976). Popular movements in the countryside have also demanded and received improvements in health conditions. In Tanganyika in the 1920s, at a time when the British had decided to provide health services only at work places and administrative centers, peasants demanded rural dispensaries and paid through their local government units to have them created. These early rudimentary dispensaries served as an indispensable core when later governmental decisions on social costs acknowledged the importance of rural health.

Much of practical health work focuses on finding creative adaptations within the constraints set by the prevailing system of paying social costs. The argument of this paper has been that it is important to have a clear understanding of the constraints and of their context. But the constraints themselves are not set in stone. Alterations in general economic conditions, the formation of new dominant political coalitions, and popular struggles all lead to changes in basic patterns of the payment of social costs.

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IJHS International Journal of Health Services  
 JAH Journal of African History  
 SSM Social Science and Medicine

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