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When the rains fail...

The degree to which abnormally low rainfall adversely affects people's health depends in large measure on the viability of their socioeconomic structures. High levels of self-sufficiency and social collaboration allow communities to cope much better with hostile climatic conditions than would otherwise be possible.

Drought occurs when there is a decline in the quantity and/or regularity of rainfall of sufficient magnitude to bring about ecological changes that outstrip a society's ability to adapt to or keep pace with them. The amount of rainfall corresponding to drought conditions varies widely. For instance, during the recent severe drought in southern Ghana, the 864 mm of rainfall at Kumasi in 1983 were over 500 mm below the region's annual average, yet would have been considered normal or even higher than normal in more northerly parts of the country.

A crisis may arise suddenly if, for example, a monsoon fails to materialize. However, it is more usual for drought to be associated with the exacerbation of permanent structural deficiency. This is true in north-east Brazil, north-west China, and the Sahel. Drought is a sign that the ecological balance between man and his environment has collapsed in the face of a combination of factors, among which climatic variation is not necessarily the major determinant. It is desirable, but difficult, to separate the direct effects of drought on health from the effects of associated factors, such as migration, the breakdown of social frameworks, economic structural constraints, wars, and insecurity. The recent famines in East Africa were triggered by drought but there was an underlying refugee problem. The hungry in Brazil may be suffering more from the system of land tenure than from recurrent drought.

The absence of reference data makes it far from easy to assess the extent to which drought is responsible for ill health. A study of the situation in the extreme northern areas of Upper Volta (now Burkina Faso) during the drought of 1973 suggested that, although the population was on a low plane of nutrition, the general situation was not unusual for rural Africans living in similar environments and that there was no reason to suppose that the spectrum of disease observed was other than that normally present in the region (1).

Mortality

Little has been done to quantify excess mortality associated with recent episodes of

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drought. In the absence of precise data, authors resort to indirect or empirical measurements and make comparisons between supposedly similar populations. Seldom is it explained that excess mortality attributable to drought is an insignificant fraction of that attributable to under-development. Large-scale mortality occurs when there is an accumulation of causes additional to drought, especially civil unrest and epidemics, which may continue for several years after a drought has ended, as was the case in Bengal several decades ago (2).

Communicable diseases

Drought has often been blamed for diseases observed during crisis situations, including malaria, respiratory disease, skin infections, and meningitis. However, a distinction has to be made between real increases in the incidence of disease and increased reports of cases as attention becomes focused on populations in drought-affected areas. With regard to malaria, the vectors of which require surface water in which to breed, it is clearly unlikely for transmission to increase during a drought. Diseases such as tuberculosis should not come into the reckoning, because in respect of them excess numbers result solely from the fact that relief operations bring case-finding to hitherto unexamined populations. Contagious diseases, whose incidence increases every time there are migrations or concentrations of people, should also be set aside.

The incidences of skin infections, streptococcal infections, conjunctivitis, and external ear infections almost certainly increase as water becomes scarcer, for below a certain threshold of consumption they are closely related to the quantity of water used. The drought of 1976–77 in Haiti left the areas of Port-au-Prince which were normally supplied by pumping without water for ten weeks, whereas the areas supplied by gravity systems received more or less normal supplies. A survey failed to demonstrate any significant health differences between the two areas. However, taking the two populations together, increased frequencies of diarrhoea, scabies, conjunctivitis, and febrile episodes were noted among children under the age of six years in families of more than four persons with a consumption of less than 20 litres of water per day. The fact that the frequency of diarrhoea, which depends on the quality as well as the quantity of water, showed the same variation as conjunctivitis and scabies, which depend only on quantity, seemed to demonstrate that the scarcity of water was indeed the cause of the increased number of cases observed.

There is little reason to think that drought has a direct effect on water quality. However, dwindling water supplies may lead to the use of polluted water, and when users crowd around the remaining water points there is obviously an increased risk of pollution. On the other hand, as polluted surface sources dry up it becomes necessary to look for deeper reserves, and these ought to be much safer.

Cerebrospinal meningitis occurs across the Sudan and the Sahel in dry-season epidemics every five to ten years. It has been suggested
that prolonged drought has been responsible for a renewed outbreak of the disease in western Africa and for its extension southwards. Although the theory is attractive, there is as yet no corroboration. Indeed, epidemic peaks since 1957 have occurred outside periods of drought. Furthermore, the southward extension of the endemic area has not been confirmed. The regional distribution of notified cases in Côte d’Ivoire and Ghana over the last ten years shows that meningitis has remained sporadic outside the most northerly areas of these countries and is showing no clear tendency to spread beyond the area in which it traditionally occurs. However, the ecological conditions found in the meningitis belt are extending southwards and it would be logical to expect the next epidemic surge to do the same.

In Chad, in May 1971, about 5000 cases of cholera were notified in ten days during the dry season, when the ground temperatures, between 50° C and 80° C, were above the limit at which vibrios can survive, and when it seemed reasonable to suppose that the lack of water would make propagation impossible. In the Sahel, the two epidemic peaks that followed the initial outbreak in 1971 coincided with the height of the 1973 and 1984 droughts. After remaining confined to the coastal areas of Ghana for

A limit to the beneficiary state’s capacity to absorb aid will rapidly be reached.

11 years, cholera struck the northern region for the first time in 1982, then again in 1983, which were the years of severest drought. The epidemics in South Africa and Mozambique coincided with the severe drought of 1982-83. It seems that drought is likely to trigger cholera epidemics based on direct interpersonal transmission.

With regard to vectorborne diseases, droughts may have a beneficial effect. In Burkina Faso (previously Upper Volta), the 1972-73 drought pushed back the northern limit of the tsetse fly, the vector of sleeping sickness, by more than 100 km (3). For onchocerciasis, the annual transmission potential by blackflies was reduced to a tenth of its mean value, or even to nil, in the White Volta Basin during the drought years of 1973-75. Observation of the prevalence and intensity of the disease showed that the drought represented a gain equivalent to two years of effective vector control.

Nutrition

Malnutrition is probably the most widespread disease in the world, yet virtually nowhere is it reflected in medical morbidity statistics. With or without drought, the food intake of a quarter of the population of the developing countries is below the critical threshold. The problem is structural and persistent, shifting from one region to another over the years. It does not depend solely on the vagaries of the climate or on prices. There is a direct relationship between drought and loss of food production but the extent to which populations affected are vulnerable depends on the structure of their socioeconomic systems. People died in Ethiopia in 1973 not because of an extreme shortage of food, but because of an extreme shortage of money; the country’s overall agricultural production was practically normal (4). It is impossible to draw general conclusions from the multiplicity of surveys of nutritional status in drought-affected populations. The only common factor is that drought triggers or reveals a crisis. Data on the underfed say
nothing about the severity of drought; they are indicators of social adjustment to adverse situations.

A good example of the impact of drought on quantitative malnutrition at the country level is to be found in birthweight curves for children in Ghana. In the drought years of 1982 and 1983 there was a drop in mean birthweight, pointing to maternal malnutrition during pregnancy. It should be recalled that low birthweight is associated with increased neonatal and infant mortality and with a high prevalence of physical and mental handicaps.

Iron deficiency anaemia and folate deficiency are delayed effects of nutritional inadequacy and should not be considered to be related to recent or temporary shortages caused by drought. Nor is vitamin B deficiency an acute problem in times of famine, for requirements vary with calorie intake. Vitamin A deficiency, however, may occur at an early stage in drought-affected areas because of an insufficiency of green vegetables and fruit.

Poisoning from substitute foods is common and is most often the result of eating bad meat or chemically treated seeds. In 1961 the inhabitants of two Chinese villages suffered selenium poisoning after planting maize in dried-up rice fields; this crop concentrated five times as much selenium from the soil as rice would have done. In Afghanistan there was a deadly epidemic of veno-occlusive hepatic necrosis during 1974, caused by the rapid proliferation of a toxic desert plant in corn fields during two years of drought.

In Mozambique, spastic paraparesis struck more than 1000 people in five districts of the province of Nampula during 1981. An investigation concluded that the cause was cyanide intoxication resulting from the consumption of cassava. In 1980-81 this region received its lowest rainfall ever recorded and drought destroyed all food crops with the exception of bitter cassava; it also intensified the toxicity of all other varieties of cassava. Detoxification by drying may take up to a year. The people were forced to adopt a diet consisting exclusively of cassava, and because of the food shortage it was sometimes eaten after a period of drying that was far too short to achieve detoxification. The absence of protein intake reduced their ability to metabolize the toxin.

Management of health services

A drought-stricken country will simultaneously experience an economic crisis, a loss of export earnings from cash crops, the need to buy food, the drifting of the rural unemployed to the cities, and a drop in industrial output as a result of electric power rationing. Loss of revenue and unforeseen expenditure disrupt budget implementation and result in the reallocation of operational credits. The health service, which is heavily dependent on the state, loses the means to carry out its activities. It is very difficult to obtain illustrations of this phenomenon because it is not revealed in published documents.

If a crisis worsens and famine or mass migration begins, the health service will be required to redirect its activities towards
priority groups or areas. This will be done to the detriment of the rest of the population, since there will be no increase in the resources available. Thus the crisis leads to the disorganization of the system and the
disruption of most of the regular activities that cover already underserved populations. The impact of drought on health may be felt well beyond the areas where the rains have failed. If drought is accompanied by political instability the system may collapse and large sectors of the population may find themselves without institutional support.

National solidarity and international aid tend to bring about long-term dependence on outside assistance.

International solidarity and international aid thus generate further inequalities. Above all, they tend to bring about long-term dependence on outside assistance, destroying the ability of communities to adapt to environmental change. The vulnerability of the affected societies increases as their dependence deepens. Sudden and temporary disasters give way to a permanent structural crisis. The mechanisms by which people have learnt to survive in given environments break down. Unless the social and economic conditions in which these mechanisms can function are restored, it is to be feared that the people will remain at the mercy of climatic fluctuations and that international aid will have to be provided from time to time.

Community support

It may be possible to diminish the social effects of drought through better organization of society so as to satisfy the basic needs of all its members and through the promotion of social collaboration, community participation, and self-sufficiency. The best recommendation often seems to be that affected societies should be radically restructured although the political feasibility of this may be doubtful.

The establishment of pilot areas offers no solution. They usually require a vast infusion of resources and a high level of external support and technical assistance. This type of showcase project benefits only a very small proportion of the population in need; it cannot be expanded or replicated, and gradually disappears when external support comes to an end.

It would also be wrong to believe in the possibility of a quantitative solution of all problems: increased food production,
fertilizer consumption, numbers of physicians, and so on. The most urgent requirements are for a reorientation of the activities of health services, a better distribution of resources, including manpower, and a restructuring of production and marketing networks.

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Drought takes many people from chronic to acute malnutrition and introduces malnutrition to new population groups. It is important to prevent the failure of conventional health statistics systems to deliver early warning signals. There is an urgent need to monitor the extent of malnutrition in risk groups and in populations at large, to reduce the underregistration of vital events, and to reduce the bias of existing reporting networks towards urban areas. The data collected should be evaluated in relation to food production, distribution, stocks and prices, and to employment and income in different segments of the population. This allows provision to be made for relief operations before the social effects of drought have become excessive. The monitoring of chronic pre-catastrophe situations makes possible a useful diagnosis of developing processes. When a catastrophe has struck, all observed effects may be attributed to it, and the officers in charge may absolve themselves from the responsibility of taking action.

Once the worst has happened, the community is already destabilized and nothing can prevent further disruption associated with international assistance. External aid organizations should limit their support to the alleviation of the most dreadful, life-threatening consequences and shift their attention as soon as possible to the rehabilitation of drought-stricken populations in a viable environment. Any improvement beyond the average level of pre-crisis conditions, whether in housing, nutrition, or health service delivery, will perpetuate the demand for external assistance and may make a return to self-sufficiency impossible.

References


