LEADING ARTICLE

Forced Movements of Population and Health Hazards in Tropical Africa

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Significant interactions between disease and population mobility have been demonstrated in tropical Africa in recent decades. Problems arising are greater than in the past. During the last two decades forced movements have become important. These are associated with refugees, coerced resettlement and victims of environmental catastrophe. The health hazards associated with them are reviewed from medical and social science literature for North East Africa (refugees and resettlement) and for West Africa (pastoralists affected by drought). Political, social and economic settings are of importance but tend to receive only limited attention. There is need for more social science input in studying and ameliorating problems arising from health hazards associated with and exacerbated by forced movements of population.

Over three decades the significance of interactions between diseases and population mobility has been demonstrated in tropical Africa—for malaria—trypanosomiasis, onchocerciasis, cholera, schistosomiasis and guinea worm among others. Mobility affects disease and disease influences mobility. The problems arising from these interactions are greater now than in the past, and there is need for greater recognition and more comprehensive knowledge and understanding of the interactions between population movements, disease transmission and diffusion, and programmes for disease control and the improvement of public health.

Mobility/disease interactions change over time, with changes in the nature and forms of mobility and of disease. To the many forms of mobility occurring in tropical Africa in the 1950s and 1960s have been added forced movements of people on a large scale during the last two decades. The health of people forced to move is affected, and in turn may affect the health of people with whom they come into contact. Through movements existing pathologies may be exacerbated and new pathologies acquired. For example, the spread of falciparum malaria resistant to chloroquine has been facilitated by movements of people, particularly of refugees in South East and South Asia.

In this review of forced movements and health hazards in tropical Africa during the last two decades the term ‘forced’ is widely interpreted. Consideration is given to:

(a) political refugees, as defined by the UN and the Organization for African Unity, who flee from and within their own countries as a consequence of political/ideological pressures;
(b) those forced to move as a consequence of immediate environmental catastrophe or longer-term environmental deterioration;
(c) those forced to resettle for political/administrative seasons.

It is frequently difficult to distinguish clearly movements in these categories. They overlap and reinforce one another.

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POLITICAL REFUGEES IN NORTH EAST AFRICA*

In the 1960s the Horn of Africa (newly-independent Somalia and the adjacent Ogaden region of Ethiopia) exhibited a 'pattern of conflict'. The predominantly nomadic Somali pastoralists were traditionally in conflict with a harsh environment, and Somali tribal and clan groups were in competition and sometimes in conflict with one another for scarce pasture and water on which their lives depended. In contemporary terms there was conflict developing between Somalia and Ethiopia and erupting into open warfare in the 1970/80s. These conflicts had a significant impact on health.

Conflict has extended in the last two decades to the greater part of North East Africa—civil war between north and south in Sudan; civil war between dissident parts of Ethiopia and the central government; and inter-tribal feuding in Somalia. These conflicts have produced the greatest number of refugees in Africa south of the Sahara. The patterns of their movements and their subsequent distributions are complex—international in both directions between Ethiopia and Sudan and in both directions between Ethiopia and Somalia as well as internal within each of these countries. To this complexity have been added forced population movements as a consequence of the drought which has afflicted much of North East Africa and government resettlement programmes in Ethiopia and to a lesser extent in Somalia.

Refugee movements are unplanned and unforeseen and directions of movement are random and often chaotic. Refugees numbers increase within relatively short periods of time. Medical workers differentiate between the surge in the initial 'emergency phase' when the impact on mortality is highest, and subsequent time when mortality is much reduced. During initial disruption and movement mortality rates may be up to 60 times greater than might be expected; recent reviews have indicated the highest crude mortality rates in northern Ethiopia and southern Sudan. Rates for refugees are considerably higher than those for host populations.

The chaotic patterns of refugee movements resolve in part by refugees returning spontaneously to their places of origin when pressures ease, in part by spontaneous settlement in the areas to which they have fled, and in part by settlement in refugee camps. Little is known of the health hazards in the first two categories. They are probably less severe than in camps where hazards are associated with overcrowding and poor accommodation, inadequate water supply, sanitation and waste disposal, and the amount and quality of food available. Conditions predispose to parasitic and communicable diseases (malaria, typhus, measles, cholera), respiratory infections, intestinal disorders (diarrhoea, dysentery), malnutrition and mental stress. People are massed at relatively high densities which favour the outbreak and spread of epidemics.

Health care services are rudimentary, and children are particularly vulnerable if the means to protect them by immunization, vaccination and oral rehydration therapy are limited. Mortality rates are highest for those under 5 years old. Among refugee Ethiopian children in eastern Sudan, in this group the crude mortality rate was more than twice that for children 5–14 years and nearly eight times that for people 15–44 years. More than half the deaths in the emergency phase are due to measles (which has been responsible for many deaths throughout north east Africa), diarrhoeal diseases and acute respiratory infections. Over time child deaths in camps are reduced, in some instances to below levels expected in rural tropical Africa, and morbidity and nutritional status improve, as a consequence of improved health care.

Malaria is a major hazard when refugees from areas of low endemicity are forced to move into areas of high endemicity. Other diseases, which may not be fatal, as well as malaria, contribute to mortality by their debilitating effects which increase susceptibility to diseases which are fatal. Cholera, which generally is not fatal, was widespread in the Horn of Africa in the 1980s among refugees and famine victims. There was inadequate case detection and the disease flourished, particularly in more arid parts, where water supplies are limited, of poor quality and have to be transported over great distances. Daily water allowances may be 50% or more below the recommended minimum.

Undernutrition is reported as a cause of death, and reduces capacity to withstand diseases. Lack of sufficient food may continue even in camps which have been established for a long time. Supplies to camps in more remote areas are erratic, and in all camps there are problems of inequitable distribution. Even when supplies are sufficient in amount there may be deficiencies in the quality of the food. The general lack of fresh fruit and vegetables results in vitamin C deficiency with periodic outbreaks of scurvy. Pregnant women and young children are particularly at risk of

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* This section was drafted before the dramatic developments in southern Somalia from the summer of 1992 onwards. The severity of the famine brought about by the collapse of government at national and local levels has caused mortality directly from shortages of food as well as by reducing the ability of people to withstand the fatal effects of infectious and communicable diseases.
malnutrition which can be countered by supplementary feeding.34

The health hazards cited affect some refugees who were sedentary agriculturalists and others who were nomadic pastoralists. These differ in their attitudes and in their behaviours. In camps, the former may have a slight advantage over the latter in having some experience of health services, even though this is limited, and they may thus be more able to participate in rudimentary community health care.32,33 Because of their mobility nomads are not faced with the build-up of waste materials since their camp sites are occupied for only short periods of time; they are therefore less able to cope with conditions when forced to adopt more sedentary ways. In camps where refugees are pastoralist in origin women and children predominate, men are away either fighting or remaining with their animals and continuing the traditional separation of the sexes. In these circumstances adult male labour is not available to undertake heavier work.

FORCED RESETTLEMENT IN NORTH EAST AFRICA

The Ethiopian and Somali governments have attempted to resettle people forcibly, exposing them to a range of health hazards which otherwise they would not have experienced. Some hazards are similar to those to which refugees are exposed, others are different. While movements for resettlement have been forced over relatively short periods of time they have not been as precipitate as those of refugees.

Before the collapse of Somalia into anarchy in 1992 the government attempted to settle drought-stricken nomadic pastoralists from the interior in the north east coastal regions of the country. In addition to the social and economic problems associated with changes from a mobile to a sedentary life there were effects on health. Previously dispersed populations were concentrated at greater densities with increased risks from communicable diseases, and there were dietary problems arising from changed location and means of economic support. Camel milk, a staple of diet of Somali nomads which supplies important nutrients, was in short supply and consequently expensive.35 Fish which would have provided a source of protein was unfamiliar to nomads and consequently difficult for them to accept.

Government resettlement in Ethiopia has been on a much larger scale and settlers have been subject to comparable pressures to those experienced by political refugees. Civil war, repressive administration and drought have exacerbated the problems of forced resettlement.

The first phase of resettlement, beginning in the 1950s, under the Imperial Government of Haile Selassie, moved approximately 1 million people under relatively benign conditions. They were subsistence farmers who were moved over relatively short distances, making few changes necessary in agricultural practices and crops cultivated.35,36 Some were moved from the Ethiopian plateau to peripheral escarpments and lowlands and were exposed to health hazards associated with changes in altitude;37 although at the time it was believed that there were reduced risks from malaria and from human and animal trypanosomiasis at lower altitudes.38 Some settlers suffered under- and malnutrition, but since resettlement was alleviating food shortages in densely populated areas without it these shortages would have been greater.

This phase of resettlement caused only limited physical and mental stress but serious ecological damage, and doubts were expressed about the long-term viability of some of the new settlements. Overall the advantages and disadvantages of resettlement in this phase were probably fairly evenly balanced.

The Revolutionary Socialist Government, which overthrew the imperial regime in 1974, pursued a harsh and coercive resettlement policy to reallocate land, alleviate unemployment and conserve natural resources. A 10 year plan to resettle about 1 million people was overtaken by both political and environmental crises, accelerating resettlement and the forced movement of more than 600,000 in the first 2 years. There was little concern for the health or other aspects of the settlers’ lives.39,40 People were moved from higher altitudes in the north and centre of the country to lower-lying areas in the west and south west; from the relatively malaria-free Ethiopian plateau above 2000 m to lower altitudes where malaria was endemic. Settlers lacked immunity and were at risk of high morbidity and mortality. Risks of malaria infection were increased further in settlements with irrigation which extended in space and time the habitats favourable for vector breeding. Irrigation projects at altitudes below 2000 m also extended areas of endemic schistosomiasis.41

Both general movements, and more specifically those of migrant labourers, spread and maintained malaria transmission.9 Problems were compounded by the spread of chloroquine-resistant *falciparum* malaria from the borderlands with Sudan and Kenya where resistance appeared earlier than in Ethiopia. Settlers from northern and central Ethiopia to the low-lying lands of the west and south-west were also exposed to endemic trypanosomiasis and onchocerciasis, though
with adequate land management the risks of infection could be mitigated. Clearing vegetation and siting settlements away from rivers reduce the numbers of vectors and their contacts with people. At lower altitudes settlers on the forest fringes were exposed to yellow fever, and local short-distance population movements, for example to farms and to markets, contributed to outbreaks of kala azar (visceral leishmaniasis).

Settlers were moved to where the traditional cereal crops of the Ethiopian plateau could not be grown. They experienced nutrition problems, and in the time taken to adjust to new crops in new environments intervening malnutrition increased susceptibility to other diseases.

Ethiopian pastoralists were affected both directly and indirectly by the resettlement of sedentary agriculturalists. Increased contacts with settlers increased risks of infection with schistosomiasis.\(^{39,41}\) Resettlement also reduced pastoral mobility, and seasonal movements made in the past to escape vector infestation were no longer possible. However, pastoralists suffer less than settled agriculturalists from intestinal infections; risks are greater in permanent settlements where people are concentrated at higher density than in temporary pastoral camps where people are more dispersed.\(^{40}\)

Disruption from resettlement has been so great as to make adjustment to new locations and to new ways of life difficult. Resettled agriculturalists have taken at least 4 years to attain self-sufficiency in basic food requirements. Some resettled pastoralists have still been dependent on aid after nearly 20 years. The psychological impact of such dependency on people previously independent and self-sufficient has not been assessed. Clearly coercion, exposure to strange environments and to new diseases, unrealised expectations and the limited information of all kinds given to settlers have combined to produce psychological stress. Some discontented settlers have abandoned schemes and returned to the places from which they had been moved, particularly when coercion was relaxed and drought conditions ameliorated.

It remains to be seen how most recent political changes in Ethiopia affect resettlement and health. A less authoritarian and coercive government and a reduction in civil strife may hopefully bring about improvement.

**PASTORALISTS AND DROUGHT IN WEST AFRICA**

The impact of drought is less immediate than the impact of war or of political decisions in forcing people to move. It is cumulative over time and less obviously striking. In the West African Sahel in the 1970/80s drought had as great an impact on pastoralists as on any other people in the region. Living near and beyond the limits of cultivation the environments which they traditionally exploited were most vulnerable as a consequence of lower rainfall. Pasture and water were reduced and pastoralists were in increased competition with sedentary agriculturalists for greatly reduced resources in areas where their respective demands overlapped. Their traditional marginal political and economic position in society further restricted access to reduced resources. They may have gained from traditionally having to move widely to meet needs for pasture and water, experience which may have helped them to adapt to the new forms of mobility into which they were forced.

Progressively reduced pasture and water forced a more southerly displacement of the annual circuits of movement in which pastoralists in West Africa are normally involved. They were forced from the Sahel to penetrate deeply into the Sudan and Guinea savannas, which under less severe conditions they would have avoided or into which they would have moved only for limited periods in the dry season. In these more southerly regions they are more exposed to risks from malaria (against which they have only limited immunity), from onchocerciasis (river blindness), and from trypanosomiasis (animal and human).

Besides increased exposure to these endemic diseases pastoralists were involved in the cholera epidemic which affected many parts of West Africa in the 1970s.\(^8\) The second peak of the epidemic in the Niger valley in Mali (January/March 1971) was associated with incoming pastoralists forced southwards by drought. They had no immunity having been in more northern pastures during the first epidemic wave. Cholera remained endemic in West Africa after the early 1970s and its effects were exacerbated by intensifying drought—increased population movements increased transmission, relief camps for drought victims had poor water supplies and sanitation, and poor nutrition reduced resistance to infection.

To relieve the economic impact of drought some members of pastoral groups were forced to seek employment often at great distances from the areas in which they usually lived. In new ecological conditions they faced increased health hazards and in alien social circumstances, working in towns and separated from kin groups and normal social relationships, they experienced psychological stress and were at risk to sexually-transmitted diseases.
For some pastoralists the drought caused a total collapse of the traditional economy and forced them to alternative means of support—some in camps set up with international aid, others changing their lifestyle and taking up sedentary agriculture or moving into towns. In camps, those who had lived in small dispersed communities were concentrated in conditions—high density, limited water and poor sanitation—favourable for the transmission of diseases to which they were not exposed previously. Those who moved into towns lived in conditions of much closer physical contact than their normal experience with increased risks from infectious and communicable diseases. In camps and in towns there were also nutritional problems, as a result of having to accept foods not usually eaten.  

General statements like those above can be made about the health of pastoralists forced to move by pressures of drought. Limited demographic and medical data make it difficult to specify changes in health status under these pressures. Following the first phase of drought in West Africa in the 1970s an overview of the evidence for the affected population (pastoralists and sedentary agriculturalists) concluded that mortality rates had not been significantly increased and that reports of mortality were exaggerated.  

There are more data on the health of pastoralists in francophone West Africa where they are in greatest numbers, particularly for Mali in the late 1970s and the following decade. A health survey for the Ministry of Planning in 1979 compared several groups—sedentary cultivators, Tuareg desert nomads, transhumant Fulani practising more limited mobility than nomads, and a few Moors who had lost their herds through drought—all of whom were living in the great northern bend of the Niger river. Levels of nutrition were generally low with children under 5 years old worst affected. Transmission of *falciparum* malaria was continuing into the dry season, but there was little evidence of schistosomiasis, filariasis or guinea worm. Leprosy was a problem and tuberculosis, though not diagnosed systematically, was expected among the pastoralists, associated with contaminated milk, poor nutrition, population mobility and poor access to health services. The last of these had contributed to increased syphilis prevalence among pastoralists, for they were missed out in the treatment campaigns with penicillin in the 1950/60s when they were living in areas further to the north and which they were forced to abandon in the drought in the 1970s.  

Comparison of the health status of the several groups showed that the transhumant Fulani were in relatively good health while the nomad Tuareg and the destitute Moors were not. The general conclusion was that further improvements in the health of all groups would depend on more and better quality water being available and on better access to health services. Opinions differ as to how services to pastoralists may be best organized and delivered.  

Studies of pastoralists and other groups in Mali were also made between the phases of extreme drought in the 1970s and in the 1980s. These found high levels of infant and child mortality, with little improvement from 15 years earlier. Conditions for the spread of disease were less favourable among more dispersed and mobile pastoralists than among more densely concentrated sedentary agriculturalists. The pastoralists lost out by having poorer water supplies with the consequent risk of intestinal infections. They were free from malaria for much of the year by being in areas unfavourable for vector breeding; but lack of immunity made them susceptible to infection in the wet season when vector-breeding habitats were extended. The prevalence of other diseases also varied with the seasons—guinea worm was prevalent during the rains (May–September), conjunctivitis in the dry season (October–April) and rheumatism during the cold season (December–February). Apart from the risk of malaria in the wet season, pastoralists suffer greatest stress in the dry season when they make the greatest physical efforts; ranging most widely with their animals to find grazing and having to draw water from deep wells.  

Qualitative rather than quantitative evidence points to a reduction, at least in the short term, of the health status of pastoralists forced to move under pressures of drought. The longer-term implications are unclear. These is some tentative evidence from areas where the drought has ended which indicates that the resilience of pastoralists is permitting the rebuilding of herds and a return to traditional life in the more northerly parts of West Africa, where the risks, at least from vector-borne diseases, are less.

**CONCLUSION**

A general conclusion from this review is the similarity of health hazards to which people are exposed when forced to move under different pressures. Movements have their most obvious impact when they are made over short periods of time, often precipitately, as with political refugees—higher levels of mortality and morbidity are experienced particularly from infectious and communicable diseases. People forced to move for resettlement or from environmental pressures are most exposed to diseases
associated with ecological conditions which differ from those in which they have lived previously. The consequences are not immediately apparent, and since many environmental pressures are cumulative over time they may engender health hazards which develop more insidiously. Overall changes in morbidity rather than in mortality are likely from forced movements associated with resettlement and environmental pressures, though there is limited evidence to qualify this statement. A study in Timbuktu in Mali in the mid 1980s, besides recording nutritional problems comparable with other parts of the West African Sahel, calculated a crude mortality rate nearly twice the national rate. This was attributed to famine conditions at the time.42

Since they are most dramatic, the health hazards experienced by political refugees receive most attention and have been investigated more than those associated with other forced movements. Some caution is necessary in respect of these investigations, though this reservation in no way reflects on the valuable work that is done under very difficult conditions. The majority of studies are undertaken in conditions of crisis, when the resources to alleviate health problems are severely strained. Studies are frequently of a random nature and based on small samples; their results are likely to be indicative rather than representative. Furthermore, studies undertaken by medical and paramedical personnel concentrate most specifically on medical matters, with less scope for attention to the socioeconomic-cultural-political contexts in which medical conditions are occurring. For example, movements of refugees do not end in camps but continue between camps and to other places. Such lesser movements may be of significance for health. In a tuberculosis programme in Somali camps half of those treated were lost in the follow-up phase, some having moved to other camps. Children were particularly elusive.51

For health hazards which develop from pressures over a longer period baseline data indicative of conditions before the pressures began is lacking.52 Surveys are undertaken of specific groups, usually of limited size, at particular times and for limited periods of time. It is therefore impossible to obtain accurate longitudinal perspective. Methods of data collection vary and allow only very general comparisons between one study and another. Wide variations between measures for one group of people and another may, thus be artefacts of methodology and technique rather than indicative of actual differences.42 These might explain the widely-varying proportions of children reported as suffering from malnutrition in the West African Sahel in the mid 1970s—50% in Burkina Faso, 17% in Mauretanias, 2% in Niger. Surveys, based on very small samples but using the same methodology, indicated that 10% of children suffered from acute undernutrition in Mauretaina, Mali, Burkina Faso and Niger, and 20% in Chad.53

Measures to alleviate the health problems of the people forced to move are set out by Toole and Waldman 18 with particular reference to ‘refugees and displaced persons’. These include direct medical interventions such as immunization and vaccination (particularly against measles), but some of these may be difficult to effect among elusive populations.51 Malaria control is difficult since reduced vector breeding has not proved particularly successful in circumstances where populations are transient. This is not surprising knowing the difficulties of vector control even in less difficult circumstances among populations which are relatively static.84

When vector control is not possible protection with drugs should be reserved for non-immune high-risk groups (malnourished children and pregnant women) who have been forced to move into areas where malaria is endemic. In resettlement schemes vector control for malaria and for other diseases should be possible and should be integral in their plans, but generally it has been neglected particularly when resettlement is coerced and enforced.

Indirect interventions to prevent or to alleviate health hazards can be employed for all categories of people forced to move. These include ensuring food that is adequate in quality as well as in quantity to reduce susceptibility to disease from malnutrition, and adequate clean water, sanitation and waste disposal. The positive effects of these measures are well established, but making them available is another matter.

Establishing systems of health care which involve the communities at risk links with the promotion of primary health care as part of the strategy of ‘Health for all by the year 2000’. Many of the direct and indirect measures indicated above can be applied and monitored by people with a minimum of training, who can also play a major role in promoting community health education.55,56

The health hazards arising from the forced movements considered here are more exaggerated versions of the health hazards experienced by most people in tropical Africa. While common measures can be taken to alleviate these hazards, the settings (environmental, cultural, political, social and economic) in which these measures are applied differ greatly from one another. More attention needs to be given to these
differences than in the past. Recognition of this need is slowly but steadily increasing, particularly in the work of the Socio-Economic Working Group (SER) of the World Bank/UNDP/WHO Special Programme for Research and Training in Tropical Diseases (TDR).\textsuperscript{57}

The initiation of SER/TDR has been of signal importance in advancing social science contributions to the better understanding of health hazards and of the means to combat them. This work has included studies of the relationships between population mobility and health hazards,\textsuperscript{58-62}

To date the SER/TDR has directed little attention to health hazards associated with forced movements of population. Investigation of these relationships involves particular problems over and above those associated with movements which are less constrained. Movements which are not of a forced nature are made for good reasons, generally with the intention of improving living standards both economically and socially. Those forced to move do so because only in this way will they survive. Unintentionally movements of all kinds create and exacerbate health hazards.

Neither forced nor unforced movements can be prevented, even when authoritarian measures are applied. Medical interventions to ameliorate health hazards should be designed to accommodate to movements when these have been identified, investigated and understood. In the past this has been inadequate. Epidemiology requires an increased contribution from social science, particularly from medical anthropology, medical sociology and medical geography. Interaction between medical and social sciences in understanding relationships between health hazards has improved in recent time, but the need remains and there is scope for greater and more fruitful interaction in the future.

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