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Original article

Health problems and expenditure in an area with food crisis: Mekit woreda, North Wollo Zone

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Abstract

Background: Famine and forced migrations are common emergencies affecting large populations in developing countries. However, the effects of food crisis on the health care during these periods are not fully documented.

Objective: To assess the health problems, health-coping strategies and health care demand of non-displaced communities in food-crisis areas. **Methods:** A cross-sectional study was conducted in North Wollo Zone, Mekit Wereda between May 1998 and July 1998. Households were selected using a multi-stage sampling procedure. Health-related problems were assessed for three-month recall period.

Results: In the three-month recall period, 748 (29.4%) of the 2,547 household members were reported ill, out of which only 112 (16.3%) sought modern medical care. The annual per capita income for the surveyed population was estimated to be US\$43.70. The source of income to cover the health expenditure for 72 (48.6%) of the households was from sale of animals and animal products, 32 (21.6%) from sale of grains and the rest from loans, savings, sale of household utensils, sale of fire-wood, and working in food-or cash-for-work programs. About half of the 531 studied households had no single animal, and 85.5% were dependent on food aid at the time of the study. A relatively high number of the households (24.6%) were found to consume famine food *Lathyrus sativus* (legume), which results neuro-toxicity when consumed for a long period as main diet.

Conclusion: The finding shows that the health-coping mechanisms are extremely exhausted during food-crisis to the extent that families cannot seek any kind of medical care. We recommend that health aid should be part of food aid during food crisis.

Introduction

Over the last three decades, the most common emergencies affecting the health of large populations in developing countries have involved famine and forced migration (1). The public health consequences of mass population displacement have been extensively documented (2). Although the morbidity and mortality rates of famine-affected populations that have been displaced are relatively better-documented, reliable information on the mortality and morbidity of populations in Africa that are facing food crisis but are not displaced is scarce. Very little information is available on mortality, which can be reliably related to changes in the quantity of food available, to changes in nutritional status or even, in many cases, to inadequate description of the economy of the population concerned (3).

The most direct and obvious results of famine/food shortages are severe under-nutrition and death. Longitudinal studies have demonstrated that undernourished persons, particularly children, are at higher risk of mortality, and that the immediate causes of death are usually communicable diseases (such as measles, diarrhoeal diseases, malaria, or acute respiratory tract infections) which may account for 60%–90% of all deaths (1,3,4). Groups at high risk of mortality during non-famine times, namely the poor, the elderly, women, young children, and members of female-headed households are the same groups that are the most at risk for the morbidity and mortality caused by famine (1,5).

Protein energy malnutrition (PEM) prevalence was registered as high as 50–70% in under-fives (1,6).

In February 1998, in Wagehemera and North Wollo (Ethiopia), the mean weight-for-length was 89.4% and 92.4%, respectively (7). PEM reported during food shortages is usually accompanied by micronutrient deficiencies (8,9). Common problems include vitamin A deficiency, which can lead to blindness and is related to increased mortality in children; vitamin C deficiency leading to outbreaks of scurvy; iron and folate deficiencies resulting in anemia, particularly among pregnant and lactating women, and vitamin B complex deficiencies (1,8). These various deficiencies arise not only because of insufficient food in the famine-affected communities, but also when distributed food rations are unbalanced and do not meet the standard micronutrient requirement (1).

Mortality rates are the specific indicators of the health status of emergency-affected populations. It is usually reported that mortality is higher in displaced populations than in populations that remain in their original village and home (1,4). Actually, a comparison of mortality in displaced, famineaffected populations is difficult because displacement itself may reflect a more serious baseline situation (4). Nonetheless, studies have shown that displaced and refugee populations experience a markedly higher crude mortality rate (CMR) than non-displaced populations (1,4).

Few reports are available on internally displaced populations. In Mozambique (1983), Ethiopia (1984-1985), and the Sudan (1988), CMRs estimated by surveillance or by population-based surveys of internally displaced persons ranged 4–70 times the death rates in non-displaced populations in the same country (1). With regard to mortality in non-displaced populations facing food shortage; the 1973–74 Centers for Disease Control (CDC) survey of the West Africa Sahel drought found an extreme mortality of 7% (over an assumed normal mortality for west Africa of 2.4%) in a group of nomads in Niger (10). A village study in Niger found a high but stable death rate in the successive years followed by an abrupt increase in 1974 (CMR of 43.2); the increases reflect the deaths of scores of children, particularly those born during the drought years, as many succumbed epidemic meningitis (11).

At the time of the survey food aid was given at the level of 12.5 kgs of grain/person/ month for households eligible for food aid, but no specific health aid was planned beyond the usual service (Regional and Zonal Disaster Prevention and Preparedness Commission (DPPC) and Woreda Health Office, personal communication).

There are no studies on the health care demand and expenditure of communities that are in food aid but are not displaced. This study aimed to study the morbidity burden and the health care expenditures of a non-displaced community in food shortage. The study will be helpful for those involved in crisis management.

Methods

A Cross-sectional study on health problems, disease patterns and health service demand and utilization was conducted in a household survey from sampled households. The study area was in Amhara Region, North Wollo Zone, Mekit Worda. The area has been chronically affected by food shortage for over 12 years. A multi-stage sampling method was used to select the study units (households). The woreda has 35 peasant associations (PA), out of which 10 PAs were selected by simple random sampling. The lists of households from the ten sampled PAs were obtained from the woreda finance office's taxation list. The sample size was calculated based on morbidity rate of 37% (a study report in Gondar area), relative precision of 3% and 95% confidence level. Based on these assumptions, sixty households were selected by systematic sampling from each PA to get the total 600 sampled households.

A structured questionnaire was developed in such a way that measurement of the following variables was achieved: (a) health condition in the past three months (b) health service utilization (c) health service affordability (d) health coping strategy during food shortages, and (e) household economy. Other socio-demographic variables such as age, sex, marital and educational status were included to determine the relationship with the major dependent variables. The questionnaire was prepared in English and translated in to Amharic. The Amharic version was pre-tested in a PA not included in the sample. The respondents were heads of households, or the spouses or any members of the households aged over 18 years. Trained 12th grade graduates collected the data. The collected data were then entered using EPI-Info version 6 statistical package. Rates and ratios were used to analyze the data. To get the crude per capita income of households, the annual income of each household were asked and the price of the items at the time of the survey was assessed in the local markets of the area and converted into monetary terms (the estimate is too crude as it is difficult to get the actual income from the households as every body wants to be poor to get food aid).

Illness in this study is defined as any ill health reported by a person or parents/guardian for young children regardless of the duration and the degree of illness. A timad is equivalent to a quarter of a hectare.

Results

A total of 531 (88.5%) households were included in the study. Four hundred-nineteen (78.9%) of the questionnaires were answered by the heads of the households, 99 (18.6%) by spouses, and the remaining 13 (2.4%) by other members of the family aged over eighteen years. In questionnaires specific to the child part mothers were specifically interviewed, if they are around.

A total of 2547 people were found in the 531 sampled households. Fifty two point nine percent of these were males and 47.1% females. The age and sex distribution was: 45.3% under fifteen years of age, 38.5% 15-144 years, 12.3% 45-64 years, and 3.9% 65 years. Among he 2179 individuals seven years of age and above, 1866 (85.6%) were illiterate, 195 (8.9%) could read and write, 107 (4.9%) had grade 1-6 education and the remaining 11 (0.5%), had grade 7 or above educational level.

Out of the 2547 household members, 748 (29.4%) were reported ill during a three-month recall period. Three hundred thirty four (44.7%) of the reported ill individuals were aged 45 years and above, 277 (37%) 15-44 years, and the rest (18.3%) were children under fifteen years of age. The illness had not prevented 157 (29.6%) of the 531 ill individuals aged seven years and above the productive forces in the rural set up from working, while 374 (70.4%) reported that the illness had prevented them from working. Out of the latter, 100 (26.7%) were unable to work for less than seven days, 208 (55.6%) for eight to 30 days, and the remaining 66 (17.6%) were unable to work for more than one month. The five symptoms most frequently reported were joint pains (18.1%), abdominal complaints (18.0%), eye complaints (11.0%), fever (10.0%), and symptoms related to the respiratory system (9.5%); only 0.8% of the reported symptoms were related to malnutrition.

Five hundred twenty-four (70.1%) out of the 748 did nothing for their illness, 122 (16.3%) were treated in health institutions, 95 (12.7%) by traditional healers, and 7 (0.9%) bought drugs in the local drug shop without examination. The five top reasons from the total responses for not visiting health institutions were: lack of money (72.7%), supposing no treatment is available for their illness (9.2%), assuming that the illness was not serious (7.4%), assuming modern health care will not suffice for the illness (6.0%), and the health institutions are too far (1.3%). Out of the 748 individuals reported ill in the three-month recall period, 371 (49.6%) were cured at the time of the survey, 371 (49.6%) were ill on the day of the survey, and 1 (0.1%) had died; for the condition was not reported 5 (0.7%).

Out of the 748 individuals reported ill in the past three months, 122 (16.3%) had visited a health institution and the information was complete for 116 of these, Ninety (77.6%) had visited a health station, 13 (11.2%) a health center, and 13 (11.2%) a hospital. The main reasons for choosing a particular health institution were: nearness of the health institution for 88 (75.9%), the availability of medications in the health institution for 10 (8.6%), being referred from a lower health institution for 7 (6.0%), the presence of higher level professionals for 5 (4.3%), low cost for 4 (3.4%), and other reasons 2 (1.7%). The means of transport used to reach health institutions were walking 58 (50.0%), house/mule 23 (19.8%), carried by human 19 (16.4%), and public vehicles 16 (13.8%). For the ill and accompanying individuals, the mean±S.D. expenditure for transport and living expenses for the entire trip was 36.36±7.4 birr/person (the expenditure varied from 1 to 230 Birr/person).

Eighty-six (74.1%) paid for all services, 15 (12.9%) received free medical examination and whatever drugs available in the health institution, 8 (6.9%) received free services for all components, and 7 (6.0%) were examined at no charge but were given prescription to buy medications. Ninety-six (82.8%) of the ill were treated as outpatients, while 20 (17.2%) were admitted. The mean±S.D. payment for those who paid for medical examination and/or the whole treatment, including drugs, was 12.1±11.2 Birr/person.

Out of the 531 households surveyed, responses for health service affordability were as follows: 270 (50.8%) could pay only in good harvest years, 202 (38.0%) could not pay for the needed health services even in good harvest years; 26 (4.9%) could not pay that year because their assets had been used to purchase food items; 23 (4.3%) could not pay for health services that year since the illnesses were too frequent due to the food shortage; and 10 (1.9%) gave a combination of reasons.

Views of the 531 surveyed households on the cost of government-provided medical care were: 326 (61.4%) households said it should be free for the poor and with payment for the 'rich' at times of food crisis; 92 (17.3%) said free for all; 72 (13.6%) said decrease the payment for all; 28 (5.3%) all should pay; and 13 (2.4%) said that at times of food crisis, special medical centers should be established for victims.

One hundred forty-eight households provided information on the sources of income they used to pay for health services: 72 (48.6%) got the money from the sale of animals and animal products; 32 (21.6%) from the sale of grains; 14 (9.5%) from loan; 11 (7.4%) from savings; 5 (3.4%) from the sale of household utensils; and the remaining 14 (9.5%), from the sale of fire-wood, by working in food or cash-for work programmes, remittances, and petty trading.

Four hundred fifty-four (85.5%) of the 531 households in the study were getting food aid at the survey year, 60 (11.3%) were not, and 17 (3.2%) gave no response.

It was reported that in June-July 1997, 140 (26.4%) of the 531 households enrolled in the study had no plough ox, while by June-July 1998, the number of households without ox reached 237 (44.6%). The mean number of oxen owned decreased from 1.2±1.0 in 1997 to 0.7±0.5 in 1998. The same decrease in total animal ownership was observed (the mean number of cows in 1997 was 1.2±1.2 to 0.6±0.7 in 1998) (Table 1). The crop production decline is also shown in table 2. One hundred forty-nine (28.1%) of the sampled households had an additional income from trading and remittance; the remaining 382 (71.9%) had no additional income besides their farm products.

Almost every household owned land, though differences in the surface of holding: 57 (10.7%) owned one timad, 175 (33.0%) two timads, 171 (32.2%) three timads, 74 (13.9%) four timads, and 51 (9.6%) five or more timads; three (0.6%) owned no land at all.

In this year of food shortage, there was no single household that was self-sufficient in food all year through. Two hundred ninety-three (55.2%) had produced enough for three months or less, 152 (28.6%) for 4-6 months, 37 (7.0%) for 7-10 months, and 38 (7.2%) had not produced anything; 11 (2.1%) households did not respond.

The staple food grains grown are barley, wheat, peas and beans in the dega (altitude 2000-4000m) and in the woyna dega zones (1500-2000m), and teff in the woyna dega and kola. In the kola (below 1500m) in addition to teff, sorghum is also grown in some areas. In good harvest years, 75.8%, 69.7%, 34.4%, and 16.7% of the households consume peas and beans, teff, barley, and wheat, respectively. Other food items consumed are oil seeds (12.0%), maize (0.9%), and millet (1.7%). In the 1998 food shortage, the pattern of grains consumed showed some differences: millet was consumed by 78.9% of the households, maize by 33.6%, peas and beans by 28.6%, *Lathyrus sativus* by 24.6%, barley by 14.3%, and teff by only 6.2% of the households. Table 3 shows the changes in the pattern of consumption of food grains between good harvest years and 1998.

The main reasons given for change in the food grains consumed were: because the grain items consumed during food shortage are cheaper to buy at the market (86.3%); because the newly consumed items grow easily with minimal rains and in less fertile soil (specified for *Lathyrus Sativus*) (1.3%); because the grains are given as food aid (0.4%); and 12.1% gave a combination of the above reasons.

The annual per capita income of the survey population was found to be 310.40 Birr (US\$43.7) in 1998.

Discussion

In the three-month recall period, 29.4% of the populations in the sampled households were reported ill. The study in Ethiopia by Assefa et al. found a morbidity rate of 37% in a two-week recall period (12). Bitran, in a two-week recall period, found a self-reported illness prevalence of 45%, 37%, 35%, 37%, and 11% in El Salvador, the Dominican Republic, Colombia, Peru, and Zaire, respectively (13). The findings of the current study are lower than most of the above findings. This may be due to the difference in definitions of illness from one community to another. An individual may report illness if he/she is unable to work, or when the illness is recognizable by another person; others may define illness as a few minutes to hours of discomfort. For example,

one of the early warning signs of food shortage is malnutrition, which was high (the mean weight-for-length was 89.4% and 92.4% in two areas) at the time of the survey that warranted food aid (7), but it was not reported as a health problem during the interview. This tells us that the self-reporting of illness may not be reliable by itself to determine the morbidity level. From the total 748 individuals reported ill in the three-month recall period, 70.1% had not sought any medical help. This finding is similar to the findings in El Salvador and in the Dominican Republic where 83 and 69%, respectively, of those who perceived themselves to be ill did not seek care. It was only in Zaire that 89% of the reported ill persons sought medical care outside their home (13).

In this study, the main reason given by the majority of the respondents for not seeking medical care was lack of money, either for medical expenses or for expenses related to transportation and accommodation for the patient and care giver. Among those patients who sought medical care, the main reason for choosing a particular health unit was proximity (in 75.9% of the cases). This is in agreement with other studies in least developed countries where demand for a particular type of

health care service from a given provider was a function of the quantity of that service. This was in turn, assessed by those who are willing to obtain the service as a function of the characteristics of the individuals (for example perception of need, income, location, insurance coverage), and the characteristics of all providers (for example, price, location and quality) (13,14). Lack of money is therefore likely to be the main reason for the low health care demand observed in this study population. This finding points to the need for seeing health issues as part of the disaster, and for giving health aid together with the food aid.

The main sources of income for covering the health costs were the sale of animals and animal products (48.6% of the responses), the sale of grains (9.5%), loans (7.4%), and from savings (3.4%). However almost half of the households didn't have a single animal, and even those that did had one or two, afraid to sell because they don't have a guarantee to substitute tomorrow. The grains produced were not enough for consumption (85.5% had not produced anything in the study year) let alone for selling for health care; and due to the recurrent nature of the food shortage, households did not have savings (the per capita income was US\$ 43.7 which is much less than the country's estimate of 100). Based on these findings, it is possible to conclude that the health-coping mechanism of the community in the study area appears to be exhausted. In food crisis households compensate for the food deficit by selling their assets and through food aid. The major objective of selling assets is nutritional, i.e. to take care of consumption, not for health care. Similar findings are recorded in India, and Mali food crisis (15,16). Households over-weigh between the selling of their assets and preserving it. At most times, they prefer to reduce their food consumption rather than selling all their assets, for the obvious reason that they don't have a means to substitute for what they sold, and if they sell the whole family will get impoverished. They don't have also a guarantee what will happen in the coming years. As a result they will not sell their meager assets for health care.

The diets consumed are not the ones usually produced in the area, millet, which is not produced in the area was consumed by 1.1% of the households in good harvest years, but during the study period it was consumed by 78.9%, and *Lathyrus sativus* (a type of grass-pea) was being consumed by 24.6% of the households. Both grains are imported to the area since they are cheap. The findings are consistent with other studies in food crisis situations, whereby the common foodstuff are scarce, and there is reliance on cheap, wild or 'famine foods', which were previously not eaten but are now consumed out of desperation (5, 17). There are reports of neuro-lathyrism from consumption of *L. sativus* in the Gondar area in previous famines (18).

In conclusion, the health care utilization is very low in the area and needs to consider the health care along the food aid. In food crisis situations, newly consumed grains, such as *L. sativus* present health hazards and there is a need for education on their usage. If it is possible other variants, which can grow in less fertile soil and minimal rain, should be substituted.

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Tables

Table 1: changes in animal ownership between the year 1997 and 1998 (n=531), Mekit Woreda, 1998

Animal Ownership	1997		1998		Change in Percent (1997-98)
	No.	%	No.	%	
Oxen					
0	140	26.4	237	44.6	+18.2
1	195	36.7	225	42.4	+5.7
2	162	30.5	67	12.6	-17.9
3	34	6.4	2	0.4	-6.0
Cows					
0	206	38.8	257	48.4	+9.6
1	161	30.3	221	41.6	+11.3
2	91	17.1	48	9.0	-8.1
3	52	9.8	5	0.9	-8.9
4	21	4.0	0	0	-4.0
Pack animals					
0	375	70.6	392	37.8	_3.2
1	84	15.8	107	20.2	_4.4
2	37	7.0	26	4.9	-2.1
3	23	4.3	6	1.1	-3.2
4	12	2.3	0	0	-2.3
Shoats					
0	232	43.8	330	62.1	+18.3
1	14	2.6	42	7.9	-5.3
2	17	3.3	47	8.9	-5.7
3	268	50.5	112	21.1	-29.4

Table 2: Percentage change in main crops produced between the 1997 and 1998 harvest in quintals (n=531), Mekit Woreda, 1998.

Crop production in quintals	1997		1998		Change in percent from 1997 to 1998
	No.	%	No.	%	
Teff					
0					
1	182	34.3	209	39.4	+5
2	44	8.3	161	30.3	+22
3	74	13.9	103	9.4	+55
	231	43.5	58	10.9	-32.6
Wheat					

0					
1	394	74.2	434	81.7	+7.5
2	29	5.5	46	8.7	+3.1

3					
	33	6.2	29	5.5	-0.7
	75	14.1	22	4.1	-10

Barley

0					
1	283	53.3	342	64.4	+11.1
2	26	4.8	67	12.6	+7.9
3	40	7.5	42	8.0	+0.5
	182	34.3	80	15.1	-19.2

Beans

0					
1	385	72.5	342	64.2	-8.3
2	36	6.8	67	12.6	+5.8
3	36	6.8	42	7.9	+1.2
	74	13.9	80	15.1	+1.1

Peas

0					
1	470	88.5	501	94.4	+5.9
2	21	4.0	23	4.3	+0.4
3	15	2.8	5	0.9	-1.4
	25	4.7	2	0.4	-4.3

Maize

0					
1	508	95.7	522	98.3	+2.6
2	9	1.7	6	1.2	-0.5
3	8	1.5	2	0.4	-1.1
	6	1.1	1	0.2	-0.9
Oil seeds					
0					
1	448	84.4	476	89.6	+5.2
2	63	11.9	50	9.4	-2.5
3	13	2.4	4	0.8	-1.6
	7	1.3	1	0.2	-1.1
Others					
0					
1	353	66.5	376	70.8	+5.2
2	27	5.1	76	14.3	+9
3	39	7.3	44	8.3	+1.0
	112	21.1	35	6.6	14.5

1998.

Type of crop	Good harvest year	1998
	Percentage of households consuming	Percentage of households consuming
Barley	34.4	14.3
Teff	69.7	6.2
Wheat	16.7	2.3
Peas and Beans	75.8	28.6
Oil seeds	12.0	16.4
Maize	0.9	33.6
Millet	1.1	78.9
Lathyrus	1.7	24.6
Other grains	16.2	10.9

Table 3: Percentage change in the type of grains consumed between a good harvest year and the 1998 food -shortage year in Mekite Woreda,

Figures

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