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Who is nutritionally vulnerable in Bosnia-Hercegovina?

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Abstract

***Objective*—To monitor nutritional status and food security in order to identify nutritionally vulnerable groups.**

***Design*—Members of five different household groups (urban and rural residents, displaced people in collective centres and private accommodation, elderly people living without younger family) and all residents of two old people's homes were prospectively followed. Households were selected from 20 local communities and nine collective centres.**

***Setting*—Monitoring carried out in three besieged areas of Bosnia-Hercegovina (Sarajevo, Tuzla, and Zenica).**

***Subjects*—1739 individuals sampled.**

***Interventions*—Data collected every month from December 1993 to May 1994. Information on household food security was collected through structured questionnaires. All subjects were weighed and their heights measured. Weight for age Z scores were calculated for children; body mass index was calculated for adults and elderly people.**

***Results*—From December 1993 to February 1994, before a temporary cease fire, access to food was reduced. In February 1994 no significant signs of undernutrition were detected among children or adults, but elderly people had higher than expected levels of undernutrition (15·5% with body mass index <18·5), a higher rate of weight loss than adults (1·2 kg over two months), and a higher prevalence of self reported illness.**

***Conclusions*—Elderly people in Bosnia-Hercegovina are at greater risk of undernutrition than other age groups. Undernutrition may be precipitated in elderly people by sickness, cold, stress, and problems related to food preparation. The health and welfare of elderly people during the emergency in Bosnia-Hercegovina require special attention, and integrated age care programmes are needed.**

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Introduction

Bosnia-Hercegovina entered the third year of war in April 1995. Populations in besieged areas continue to be subjected to constant bombardment, an uncertain food supply, disruption of power and water supplies, a depressed economy, and shrinking financial and physical reserves.

Humanitarian food aid began to flow into Bosnia-Hercegovina at the end of 1992 but supply routes have been fraught with logistical problems. In the second half of 1993, only 16-69% of estimated monthly food aid requirements were delivered to central Bosnia (where Zenica and Tuzla are located) and 62-94% to Sarajevo.[1] In February 1994 as a result of the declared cease fire there was a temporary lessening of hostilities and an improvement in food supply as blockades were lifted and humanitarian and commercial traffic was resumed.

Priorities for humanitarian aid agencies in emergency situations are to detect and prevent increased morbidity and mortality and to identify and protect those at nutritional and health risk. In response to a need for objective information, the World Health Organisation implemented a nutrition and food security monitoring system in three besieged cities in Bosnia-Hercegovina (Sarajevo, Tuzla, and Zenica) between December 1993 and May 1994. The aims were to detect early signs of deterioration in nutritional status and access to food and to identify those who were most severely affected.

Methods

Five distinct household groups (groups of people who usually live and eat together) were identified who potentially differed in terms of vulnerability to insecure food supplies. These were urban residents, rural residents, displaced people living in private accommodation, displaced people living in collective centres, and elderly people living alone (without younger family or friends).

Sample size was calculated on the basis of a population of 280 000 (the estimated population of Sarajevo) and assumptions of a prevalence of 7% adult undernutrition (body mass index <18·5 with an unacceptable level of 14%. Using EPI-INFO software for population or descriptive studies,[2] a minimum sample size of 102 adults at 5% significance was calculated. On the

assumption that a household would have an average of two adults, a minimum of 51 households from each household group needed to be sampled.

Sample selection proceeded in two stages. In the first stage, a total of 20 local communities, roughly equivalent to wards in Britain (17 urban and three rural) and nine collective centres were selected so as to minimise security risks for fieldworkers. In the second stage, households were selected. A starting point within each local community was randomly chosen and a direction in which to proceed was randomly ascertained. Fieldworkers knocked on doors until a predetermined number of households in each household group had been selected. Households in collective centres were randomly selected from lists. Refusals to participate in the survey were few (less than 5% of total sample) and were substituted with the nearest appropriate household at the first visit only. All elderly residents living in old people's homes in Sarajevo and Tuzla were included in a separate sample. The sample consisted of 1469 household members from 398 households and 270 residents of the old people's homes. During the study period, 34 households (8·5%) dropped out, most of whom had been living in collective centres and had relocated after the February 1994 cease fire.

Households were visited every month from December 1993 to May 1994. At each visit a structured, pretested questionnaire including questions on household food and fuel stocks, food aid, recent sickness, access to water and heating, occupation, and income was administered. All household members were weighed with 7300 Soehnle digital scales (150×100 g). Adults and children over the age of 2 years had their heights measured (cms) with a pocket stadiometer with spirit level (model 1A25). Children under 2 years had their length measured with a plastic baby length board. Demispan (the distance between the sternal notch and tip of the middle finger of the outstretched arm) was measured with a tape measure in elderly people (≥60 years). Demispan was used as a proxy for stature in the elderly people because it changes less with age than does height and can be easily measured.[3] Clinical signs of micronutrient deficiencies were noted. Elderly inhabitants of the old people's homes were measured and examined for signs of micronutrient deficiencies only.

Nutritional status was assessed in children aged from 6 months to 11·5 years by comparing weight for age Z scores (standard deviations from the mean) with a reference population.[4] Body mass index (weight (kg)/height(m)^2) was calculated for adults (18-59 years, excluding pregnant women) and elderly people (≥60 years). Height in elderly people was estimated from demispan by using a formula derived from measurements of 960 Scottish adults: height = 2×demispan(m)×0·73+0·43 (M Golden, personal communication). Conventionally accepted cut offs were used to indicate undernutrition: weight for age less than 2 SD below the mean[4] and body mass index 18·5.[5] A cut off point of body mass index <20 was adopted to indicate low nutritional status.[6]

Data were analysed using EPI-NUT and EPI-INFO software packages.

TABLE I—*Nutritional status (weight for age) of children in Bosnia-Hercegovina, February 1994*

	Under 5s (0-59 months)	School age (6-11·6 years)
Sample size	72	145
Mean (SD) weight for age Z score	0·49 (1·09)	−0·17 (0·86)
95% confidence interval	0·23 to 0·74	−0·31 to 0·03
% Undernutrition (weight for age < −2Z)	0·0 (n=0)	0·7 (n=1)
% Undernutrition in healthy populations*	2·5	2·5

*Standards from American children[4]

TABLE II—*Nutritional status (body mass index) of adults and elderly people in Bosnia-Hercegovina, February 1994*

	Adults (18-59 years)	Elderly people (≥60 years)
Sample size	546	542
Mean (SD) body mass index	23·0 (3·2)	22·8 (4·1)
95% confidence interval	22·7 to 23·3	22·5 to 23·1
% Undernutrition (body mass index <18·5)	5·1	15·5
% Low nutritional status (body mass index <20)	14·8	26·8
% Undernutrition in healthy populations*	3·5-5·1	NA
% Low nutritional status in healthy populations†		
Men	12·0	18·3
Women	6·0	11·5

*Standards from: French, Hungarian, and American adults.[7]
†Standards from: British adults[6], British elderly people.[3]

TABLE III—*Nutritional status of adults by household group in Bosnia-Hercegovina, February 1994*

		Displaced people		
	Urban residents	In private accommodation	In collective centres	Rural residents
Sample size	186	128	123	109
Mean (SD) body mass index*	22·5 (3·0)	22·7 (2·9)	23·0 (3·0)	24·0 (3·7)
95% confidence interval	22·1 to 22·9	22·2 to 23·2	22·5 to 23·5	23·3 to 24·7
% Undernutrition (body mass index <18·5)	8·1	5·5	3·1	1·8
% Low nutritional status (body mass index <20)	18·3	18·0	13·8	6·4

*ANOVA for mean body mass index: F=5·417, P=0·001.

Results

Indicators of nutritional status and health are presented for February 1994 only, when conditions were poorest. As table I shows, no undernutrition was found in children. Undernutrition (body mass index <18·5) was three times more prevalent in elderly people than in adults (15·5% *v* 5·1%). The percentage of adults and the elderly with low nutritional status (body mass index <20) was higher than in the British population and was particularly high (27%) among elderly people (table II). No reliable pre-war data are available on the nutritional status of adults or elderly people in Bosnia-Hercegovina.

Analyses of variance were carried out to test for differences in nutritional status between household groups (tables III and IV). The mean adult body mass index was significantly higher in rural residents than in urban residents or displaced people (F=5·417, P=0·001). Elderly people in old people's homes had significantly lower body mass indexes than elderly people living in the community (F=14·249, P<0·0001). An unpaired *t* test showed that people aged over 70 had significantly lower body mass indexes than those aged from 60 to 69 years (mean 21·7 (SD 4·3) *v* 23·2 (3·9); *t*=12·8, P<0·001). Mean body mass index of elderly men and women did not differ significantly.

Table V presents data on weight change in adults and elderly people between December 1993 and May 1994. In 14 cases, weight change was found to be greater than 10 kg; these cases were excluded from the analysis as they were probably due to recording errors. The weight change pattern is divided into two distinct periods: a period of weight loss before the cease fire (December 1993 to February 1994) and a period of weight gain after the cease fire (February to May 1994). The greatest weight loss (1·54 kg) was experienced by elderly people living alone in the community.

Household members were asked if they had been ill and unable to leave the house during the previous month. More than a third of elderly people reported recent illness (table VI). The major cause of illness was chronic disease, which was defined as an illness that had been present for one month or more.

TABLE IV—*Nutritional status of elderly people by household group in Bosnia Hercegovina, February 1994*

	Living alone	With families	Old people's homes
Sample size	348	43	151
Mean (SD) body mass index*	23·4 (4·1)	23·2 (4·6)	21·3 (3·7)
95% confidence interval	22·9 to 23·8	21·8 to 24·6	20·7 to 21·9
% Undernutrition (body mass index 18·5)	11·5	11·6	25·8
% Low nutritional status (body mass index < 20)	21·6	25·6	39·1

*ANOVA for mean body mass index: F = 14·249, P = 0·0000.

TABLE V—*Illness in children, adults, and elderly people in Bosnia-Hercegovina, February 1994*

	Under 5s (0-59 months)	School age (6-11·6 years)	Adults (18-59 years)	Elderly people (≥ 60 years)
% Ill in previous month	13	11·8	15·4	31
% Ill with chronic disease	8	29·0	46·0	55

TABLE VI—*Weight change in adults and elderly people in Bosnia-Hercegovina, December 1993 to March 1994*

	Adults (18-59 years)	Elderly people (≥ 60 years)
December 1993 to February 1994		
Sample size	448	465
Mean (SD) weight change (kg)	−1·00 (2·24)	−1·22 (2·33)
February 1994 to May 1994		
Sample size	490	459
Mean (SD) weight change (kg)	1·14 (2·40)	1·54 (2·47)

Discussion

Consistent with previous survey results,[8] undernutrition was not detected among children; this suggests that children had been protected against food shortage and adverse environmental conditions. Adults also seem to have weathered the hardships better than elderly people.

The poor nutritional status of elderly people in Bosnia Hercegovina can be attributed to a number of physiological and psychosocial factors. Dietary energy requirements were probably increased by cold temperatures and lack of heating during the winter months and by the physical exertion required for collecting fuel, water, and food rations. Elderly people may be particularly disadvantaged because of impaired mechanisms for conserving body heat.[9] Despite higher than average quantities of household food stocks, age related disabilities which cause problems with vision and manual dexterity may have affected ability to prepare and cook meals. Violence, separation from families, isolation, and breakdown of formal and informal support systems may have triggered depressive illness, which is known to be accompanied by weight loss and ill health. This may be particularly disabling in elderly people.[10]

An increased vulnerability among elderly people to political, social, and economic upheavals has been shown in Russia and Armenia.[11] Up to half of a representative sample of elderly people (> 69 years) surveyed had experienced a weight loss of 5 kg during the previous six months, and most had dental problems and illnesses that affected their ability to eat.

Despite the apparent physiological and social risk factors, the nutritional vulnerability of elderly people generally receives little recognition during an emergency. Young children and pregnant and lactating women tend to be targeted for limited resources, and children's nutritional status is frequently used as an early marker of distress in a population. The emphasis on young children is based on the high child mortality, morbidity, and malnutrition rates existing in developing countries, where most large scale disasters have occurred in recent years. However, this narrow focus may not be appropriate in a developed country where the population was previously comparatively healthy and well fed.

The nutritional and social vulnerability of elderly people have considerable implications for the management of the emergency in Bosnia Hercegovina. The former Yugoslavia has an aging population.[12] A more dramatic demographic shift may have been triggered by the war as elderly people have been left behind by fleeing families either because of inability to travel or choice.

Any response to the nutrition problems of elderly people in Bosnia-Hercegovina should address all the factors that contribute to their undernutrition. There is a need for well planned integrated programmes which supply hot nutritious meals, medical care, fuel, winter clothing, counselling, and opportunities to socialise through public kitchens, domiciliary care schemes, day care centres, and community volunteer networks.

Key messages

- The conflict in Bosnia-Hercegovina has grave implications for the nutritional health of the affected population
- This study shows that elderly people in Bosnia are at greater risk of undernutrition than other age groups
- Undernutrition in elderly people is due not only to absolute lack of food but to sickness, cold, stress, and difficulties in food preparation
- Integrated care programmes for elderly people are essential to protect them and mitigate the impact of the emergency in Bosnia

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