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HEALTH AND NUTRITIONAL STATUS OF THE ELDERLY IN THE FORMER YUGOSLAV REPUBLIC OF MACEDONIA

Results of a national household survey

November 1999

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ABSTRACT

Elderly people themselves are growing older, increasing the numbers and proportions of the very old. The majority of elderly people are women, often in ill health and vulnerable as they are particularly poor and more likely than men to be widowed. In recent years there has been an increasing international awareness of the health issues relating to aging populations and in April 1995, WHO launched a new programme on Aging and Health. In 1999,World Health Day focused on the goal of Active Aging. An aging population should not be seen as a crisis. The real crisis of aging, where it exists, is the personal crisis of day-to-day existence – a present reality faced by older individuals and their carers. Health policies must respond by increasing the quality of life of both present and future cohorts of elderly populations. Prior to this survey, information has not been available at a population level on the health and nutritional status of the elderly in the former Yugoslav Republic of Macedonia. WHO therefore advocated and provided resources for the inclusion of the elderly within a national survey of health and nutrition planned by UNICEF. It is hoped that the information gained will be of use in raising awareness of the needs of this important and growing sector of society and provide a useful resource for policy-makers and planners. This survey was conducted in September/November 1999.

Keywords

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Summary

A household survey of men and women aged 65 years or over was conducted in the former Yugoslav Republic of Macedonia in September 1999. Households were selected using a cluster sampling methodology with one urban and one rural stratum, each containing 30 clusters. Eleven elderly men and 11 elderly women were selected at random from each cluster (1015 households) and invited to take part in the survey. Respondents were asked to reply to a questionnaire, anthropometric measurements were taken and haemoglobin was determined using a haemocue. Data were obtained from 1287 people.

The median household size was 4 people (range 1–12) and the household head was usually male. However, 11.6% of elderly people in urban areas and 6.6% in rural areas were living alone. The proportion of households containing elderly people without any younger family members living with them was higher in urban (36.5%) than in rural areas (27.1%). The median age was 71 (range 65–102) and there were no differences in age by strata or sex.

Pensions followed by salaries, farming and private business were the most common main sources of cash income in households containing elderly people. However, in households in which elderly people lived without other younger family members, pensions had an increased significance, with 93.8% reporting these to be their main source of income.

Water and sanitation facilities were generally good in urban areas but more variable in rural areas where water piped into the household was only reported for 61.4% of households and flush toilets in only 58.1%.

The population mean body mass index (BMI) was 26.89 (95% confidence interval (CI) 26.49–27.29) with men having a mean of 25.48 (95% CI 25.04–25.92) and women a significantly higher figure of 28.36 (95% CI 27.78–28.94). BMI was also higher in urban than in rural areas with a mean of 27.59 (95% CI 27.05–28.13) compared to 26.19 (95% CI 26.49–27.29).

Using cut-offs of <18.5 for thinness and $> = 30.0$ for obesity (corresponding to the adult cut-offs for grade 1 thinness and grade 2 overweight) gives an overall prevalence of 2.9% (95% CI 1.92–3.81) for thinness and 25.1% (21.9–28.3) for obesity. Only 14.4% (95% CI 11.2–17.5) of men were found to be obese compared to 36.3% (95% CI 31.2–41.3) of women (relative risk (RR) = 0.396; 95% CI 0.31–0.50). The ability to perform activities for daily living (ADLs) such as eating, walking and washing was found to be compromised by both high and low extremes of BMI.

Chewing difficulties were reported by 5.0% (95% CI 2.5–7.4) and elderly people reporting this problem were much more likely to be thin (BMI less than 18.5; RR = 2.38, 95% CI 1.15–4.93). A dental prosthesis was worn by 29.7% (95% CI 17.3–30.4) but this was not associated with chewing difficulties or thinness.

The presence of diagnosed respiratory disease, including tuberculosis, was associated with thinness (RR = 2.68; 95% CI 1.34–5.36) and this, together with chewing difficulties and the expected decline in BMI with age, were the major risk factors for low BMI in this elderly population.

Mean haemoglobin concentration was significantly higher for men (14.3 g/dl; 95% CI 14.1–14.4; range 7.5–17.5) than women (13.5 g/dl; 95% CI 13.4–13.6; range 7.5–17.5) but there was no

difference in mean haemoglobin or anaemia between urban and rural areas. The prevalence of anaemia was 14.9% (95% CI 14.1–14.4) with 17.3% (95% CI 13.8–20.8) of men and 12.6% (95% CI 9.9–15.2) of women affected. Men were more likely to be anaemic with a risk ratio of 1.4 (95% CI 1.0–1.8).

Diagnosed osteoarticular and cardiovascular diseases were the two most widely reported conditions. Differences in the pattern of diagnosed disease were seen in urban and rural populations. Respiratory disease was lower in urban areas (RR = 0.676; 95% CI 0.46–0.99) while endocrine disease was more common (RR = 1.83, 95% CI 1.16–2.88).

Symptoms reported during the previous two weeks showed significant differences between the sexes with women, significantly more likely to report all symptoms except breathing difficulties, diarrhoea and problems with urination.

Some 22.1% (95% CI 18.6–25.6) of elderly people currently smoked, and of those that did 77.0% were male (RR = 3.3; 95% CI 2.25–4.73). Current smoking was associated with the presence of respiratory disease (RR = 1.4 95% CI 1.0–1.99).

Some 13.6% (95% CI 10.7–16.5) of elderly people reported not being able to hear a person speaking in a normal voice (13.0% of men and 14.1% of women) while the ownership of hearing aids was low with only 2.3% of men and 1.3% of women having one.

Dietary diversity and quality, as measured by a food frequency questionnaire, were lower in households containing only elderly person. Home production of fruit, vegetables and animal products was also undertaken less frequently in these households, suggesting an increased risk of micronutrient deficiencies.

The demographic profile of the former Yugoslav Republic of Macedonia indicates that, in common with most other countries, there will be a large increase in the proportion and absolute numbers of people in this age range over the coming years. Long-term planning of health and social welfare services for this sector of the population is required if adequate provisions are to be made.

Measures that would be likely to improve the public health and quality of life of the country's elderly population include: efforts to ensure income and food security, including diet diversity; advancement of effective health education and other measures to reduce the prevalence of smoking; promotion of healthy lifestyle messages so as to control risk factors for obesity; continued improvement of water supply and sanitation facilities, especially in rural and underprivileged urban areas; effective treatment and control of tuberculosis; and improved provision of hearing aids and probably spectacles.

Introduction

The former Yugoslav Republic of Macedonia covers 25 713 km^2 and is bounded by Albania, Greece, Bulgaria and the province of Kosovo. Data from the last census, conducted in 1994, indicate a population of 1 945 932 which was estimated to have risen to 1 996 869 by 1997 (*Statistical yearbook of the former Yugoslav Republic of Macedonia*, 1998). Based on the 1997 estimates, elderly people over the age of 65 years (181 728) comprise 9.1% of the total

population with a female to male proportion of 1:2. Taking into account the demographic profile, a continuing increase in the number of elderly people is to be expected.

The importance of aging in public health

On a global scale, while the world's population grows at an annual rate of 1.7%, the population over 65 years is increasing by 2.5% per year. The process of population aging commenced earlier in Europe compared to other parts of the world, and 18 of the 20 countries with the highest percentages of elderly people are in this region (the others are Japan and the United States), with 13.2–17.9% of their population already over 65 years. In these countries, the increase in the elderly population will be of the order of 30–140% in the next 30 years, depending on the country.

Elderly people themselves are growing older, increasing the numbers and proportions of the very old. The fastest growing population in most countries of the world is of the oldest old, 80 years and above. The majority of elderly people are women, often in ill health and vulnerable as they are particularly poor and more likely than men to be widowed.

In recent years there has been increasing international awareness of the health issues relating to aging populations, and in April 1995, WHO launched a new programme on Aging and Health. In 1999 World Health Day focused on the goal of active aging.

An aging population should not be seen as a crisis: aging has a lead time of decades rather than years and provides societies with the opportunity to prepare themselves through appropriate policies and programmes. The real crisis of aging, where it exists, is the personal crisis of day-to-day existence – the reality faced by older individuals and their carers. Health policies must respond by increasing the quality of life of both present and future cohorts of elderly populations.

Even those countries which first witnessed significant aging of their populations are having to review their past policy responses in the face of rapid social, economic and political change. They are experiencing an increased need for care of frail old people as well as a need to increase health promotion for those now growing old. Nonetheless, it should not be forgotten that although more older people will mean greater demands for services, this sector of the population also represents a precious resource for society.

The situation in the former Yugoslav Republic of Macedonia

Prior to this survey, information was not available at population level on the health and nutritional status of the elderly in the former Yugoslav Republic of Macedonia. WHO therefore advocated and provided resources for the inclusion of the elderly within a national survey of health and nutrition planned by UNICEF.[1] It is hoped that the information gained will be of use in raising awareness of the needs of this important and growing sector of society and provide a useful resource for policy-makers and planners. This survey was conducted in September/ November 1999.

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[1] Multiple Indicator Cluster Survey in the former Yugoslav Republic of Macedonia with micronutrient component, 1999.

Methods

Design of the survey

This survey was of a nationally representative sample of elderly people who were defined as 65 years of age and older. The sampling strategy utilized cluster sampling in two strata, urban and rural. Thirty clusters were selected from each strata based on sampling proportional to size.

Cluster selection

The location of the clusters was decided by a two-stage procedure. At the first stage, the number of individuals that could be classified in each of the two strata was listed by region, using 1994 census information. In the absence of a clear definition of rural, all centres with fewer than 8000 inhabitants, in which agriculture was the main occupation and houses the main type of dwelling, were considered rural. Clusters were allocated to each of the regions with a probability proportional to size methodology. At the second stage, within each region and each stratum, clusters were allocated to smaller administrative units (cities, villages, settlements) with a probability proportional to size methodology. The list of administrative units chosen is in Annex 1. In each location a household selected at random was chosen as a starting point of a random walk. Household selection procedures are specified in the guidelines for field staff in Annex 2 and summarized by the flow chart.

Data collection

Data collection was carried out by nine teams of three people. Each team was composed of one person with specific training in interview techniques, one medical doctor and one laboratory technician. A senior person was appointed to supervise a set of three teams. The supervisors were responsible for selecting the cluster, controlling interview technique, standardizing measurement procedures, controlling data entry, and controlling biological sample collection.

Design of the questionnaire

A questionnaire was designed to provide relevant indicators of the health/nutritional status of elderly people. Questions were translated into Macedonian and back-translated into English. The questionnaire covered the following areas:

- household characteristics: number of people in different age groups, gender and education level of the household head;
- household vulnerability and food security: presence of disabled people; source of income, sale of assets, meal skipping, access to a country house/orchard; availability of food in the previous week; humanitarian aid received;
- mortality: number and age of household members who died in the past year;
- water and sanitation;
- activities for daily living and social interaction;
- diagnosed disease and presence of symptoms;
- disability;
- health risk factors (smoking and drinking).

The questionnaire containing questions concerning the elderly is in Annex 4.

Anthropometry

Weight was determined to the nearest 100 g using a UNICEF electronic scale. Scales were checked daily by measuring the weight of a team member and weekly using items of known weight. Arm span was measured using a steel tape measure and mid-upper arm circumference (MUAC) using a flexible soft tape. Anthropometric measurement procedures were standardized using guidelines published by the United Nations (1989)[2] and WHO (1995)[3]. Measurers were adequately trained and carried out a quality control exercise.

Survey teams consisted of three people: a medical doctor, an interviewer and a laboratory technician. At least one member of each team was female. Teams underwent a four-day training programme involving survey design and objectives, sampling methodology, and separate sessions for the team members responsible for conducting interviews, collecting blood samples for haemoglobin and performing anthropometry.

Haemoglobin

A field haemoglobin analyser (haemocue™) was used to assess haemoglobin to the nearest 0.1 g/dL. Haemoglobinometers were checked several times a day with a control cuvette. The instruments were only used if the reading was within ±0.3 g/dL of the cuvette factory value. Cut-off points of 13.0 and 12.0 g/dl were used to define anaemia in men and women, respectively. 7.0 g/dl was used to define severe anaemia.

Data management and analysis

Data were entered using an application developed in Microsoft Access. Analysis was performed in EpiInfo Version 6.04 and SPSS Version 8. In order to estimate national prevalence figures, the figures for urban and rural strata were combined. It was not possible to apply a weighting factor to account for differences in population between the two strata as no information was available on the numbers of elderly people living within each stratum.

Confidence intervals of proportions were calculated using Epi6 cluster sampling analysis (CSAMPLE). The primary sampling unit (PSU) was the cluster number. The primary stratum from which PSUs were chosen were the population strata. In these calculations the "design effect" was also considered.

Results

Characteristics of the survey population

Table 1 presents the characteristics of the survey population within the different strata. No significant differences in age or sex ratio were detected between strata. Also, and rather surprisingly, no differences in the median or mean age according to sex were found. Individuals were selected from a total of 1015 households, 499 in the urban and 516 in the rural strata. A histogram of the age distribution is presented in Fig. 1.

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[2] *How to weigh and measure children: assessing the nutritional status of young children in household surveys.* New York, United Nations, 1989.

[3] WHO Technical Report Series, No. 854, 1995 (*Physical status: the use and interpretation of anthropometry:* report of a WHO expert committee).

Table 1. Characteristics of survey population by strata

Strata	No. interviewed	Sex		Age (median and range)
		Male	Female	
Urban	638	321	317	70 (65–97)
Rural	649	333	316	71 (65–102)
Total	1287	654	633	71 (65–102)

Fig. 1. Age distribution of population surveyed
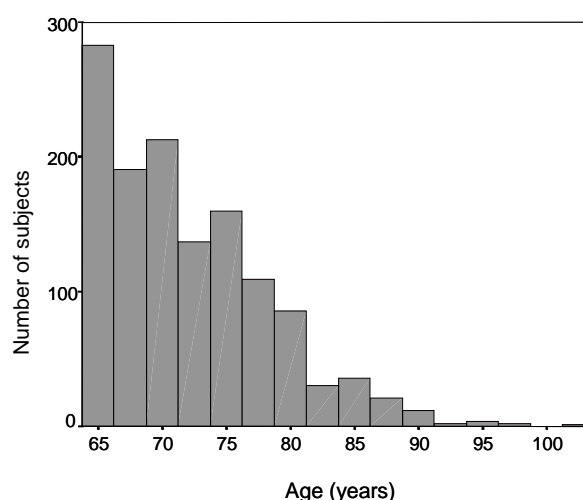
Family and household characteristics

The family status of the study subjects is summarized in Table 2. No differences in marital status between strata were detected (chi square p = 0.036). However, women were significantly more likely to have been widowed than men (p<0.000).

As shown in Table 3, the size of households ranged from 1 to 12 members with a mean of 3.8 and a median of 4. Rural households were slightly larger (t-test, p<0.000).

The gender of the household head was usually male; only 11.3% of households were headed by a woman. Households in the rural strata were significantly more likely to be headed by a male (92.6% vs. 84.8%, chi square p<0.000, n = 1013).

Table 2. Marital status

	Sex				Total	
	Male		Female			
	No.	%	No.	%	No.	%
Single	12	1.9	15	2.4	27	2.1
Married	482	74.6	350	55.6	832	65.2
Divorced/separated	4	0.6	5	0.8	9	0.7
Widowed	148	22.9	260	41.3	408	32.0
Total	646	100	630	100	1276	100

Table 3. The size of households in rural and urban areas

Strata	No. of households sampled	Size of household		
		Mean	Median	Range
Urban	499	3.5	3	1–10
Rural	516	4.1	4	1–12
Total	1015	3.8	4	1–12

Households containing only elderly people, without other family members such as sons or daughters, are more likely to be found in urban areas (36.5%) compared to rural areas (27.1%) (chi square p = 0.001). Elderly people living in urban areas are also more likely to be living alone. In these areas 11.6% live by themselves compared to 6.6% in rural areas (chi square p = 0.002).

For the majority of households containing elderly people, the main source of cash income was from a pension (59%) followed by salary, farming and private business (Table 4a). Farming and private business were more important in rural areas, while salary and pensions more frequently formed the most important source of cash income in urban households. Apart from cash income, 6% of households in urban areas and 5% of rural households had received social assistance in the form of food aid within the previous six months. Some 1.1% of households reported having no source of cash income.

Table 4b shows the sources of cash income for the 490 households containing only elderly people. Pensions are by far their most important source of income, with 97% of urban and 88% of rural households reporting this as their main source of cash income. Some 10% of elderly-only rural households reported farming as their main source of income.

Water and sanitation

Water and sanitation facilities show some differences between urban and rural households, with facilities being more variable in rural areas (see Tables 5 and 6). Significantly fewer households in rural areas have their drinking-water piped into the house or possess flush toilets – only 58.1% of rural households have these. Some 2.1% of rural households reported that their toilet facilities were more than 50 m from their dwelling and some uncovered latrines were reported.

Table 4a. Main source of cash income for households containing elderly people

Households' main source of cash income	Strata				Total	
	Urban		Rural			
	No.	%	No.	%	No.	%
Private business	19	3.8	37	7.2	56	5.5
Salary	123	24.6	105	20.4	228	22.5
Pension	329	65.9	269	52.3	598	59.0
Farming	7	1.4	79	15.4	86	8.5
Social aid	16	3.2	17	3.3	33	3.3
No cash income	5	1.0	6	1.2	11	1.1
Don't know/No answer	0	0.0	1	0.2	1	0.1
Total	499	100	514	100	1013	100

Table 4b. Main source of cash income for households
containing only elderly people without younger family members

Households' main source of cash income	Strata				Total	
	Urban		Rural			
	No.	%	No.	%	No.	%
Private business	1	0.5	0	0.0	1	0.3
Salary	2	1.1	0	0.0	2	0.6
Pension	177	97.3	125	89.3	302	93.8
Farming	0	0.0	14	10.0	14	4.3
Social aid	2	1.1	0	0.0	2	0.6
No cash income	0	0.0	1	0.7	1	0.3
Don't know/No answer	0	0.0	0	0.0	0	0.0
Total	182	100	140	100	322	100

Table 5. Source of drinking-water

Drinking-water source	Strata				Combined	
	Urban		Rural			
	No.	%	No.	%	No.	%
Piped in dwelling	488	97.8	315	61.4	803	79.3
Public tap	4	0.8	64	12.5	68	6.7
Tube well or bore hole	5	1.0	93	18.1	98	9.7
Protected well or spring	2	0.4	33	6.4	35	3.5
Unprotected well or spring	0	0.0	8	1.6	8	0.8
Total	499	100	513	100	1012	100

Table 6. Toilet facilities

Type of facility/ Distance from dwelling	Strata				Combined	
	Urban		Rural			
	No.	%	No.	%	No.	%
(a) Type of facility						
Flush to sewage system	453	90.8	145	28.3	598	59.1
Flush to septic tank	29	5.8	153	29.8	182	18.0
Pour flush latrine	8	1.6	29	5.7	37	3.7
Covered dry latrine	9	1.8	177	34.5	186	18.4
Uncovered latrine	0	0.0	8	1.6	8	0.8
No facilities	0	0.0	1	0.2	1	0.1
Total	499	100	513	100	1012	100
(b) Distance from dwelling						
Within dwelling	465	93.4	190	37.0	655	64.8
Less than 50 m	31	6.2	311	60.6	342	33.8
50 m or more	2	0.4	11	2.1	13	1.3
Don't know	0	0.0	1	0.2	1	0.1
Total	498	100	513	100	1011	100

Morbidity

The presence of diagnosed disease in elderly populations living in urban and rural areas is presented in Fig. 2. It can be seen that cardiovascular and osteoarticular disease are the two most prevalent conditions. Significant differences in the prevalence of respiratory disease (including tuberculosis) and endocrine disorders are seen between urban and rural areas. Respiratory diseases are lower in urban areas (RR = 0.676; 95% CI 0.46–0.99) while endocrine disease is more commonly diagnosed in these areas (RR = 1.83, 95% CI 1.16–2.88). Cardiovascular disease and diseases of the digestive system are also more common in elderly people living in urban areas, but the differences were not statistically significant.

Fig. 2. Percentage of elderly people reporting diagnosed disease in urban and rural areas
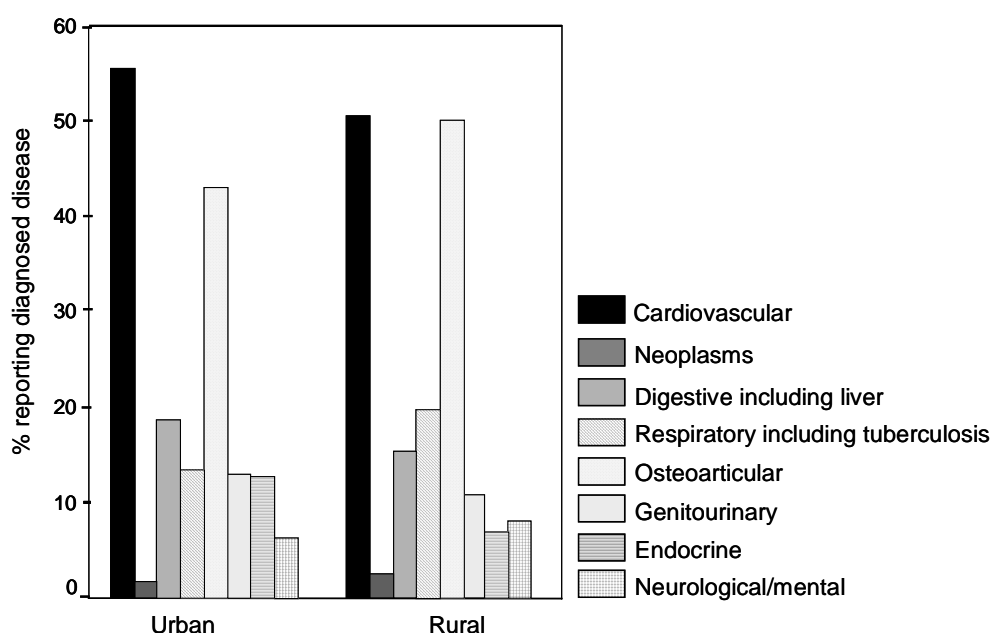
Reporting of symptoms during the previous two weeks (Fig. 3) revealed that heart palpitations were reported less frequently among the urban elderly (RR = 0.66; 95% CI 0.48–0.91). There were also significant differences between the sexes, with women significantly more likely to report all symptoms except breathing difficulties, diarrhoea and problems with urination.

Smoking

Some 22.1% (95% CI 18.6–25.6) of elderly people currently smoked, and of those that did 77.0% were male (RR = 3.3; 95% CI 2.25–4.73). Some 19.4% of elderly people living in urban areas and 24.8% of those living in rural areas smoked but this difference was not statistically significant. Current smoking was associated with the presence of respiratory disease (RR = 1.4 95% CI 1.0–1.99).

Fig. 3. Percentage of elderly people in urban and rural areas
reporting symptoms of disease in previous two weeks
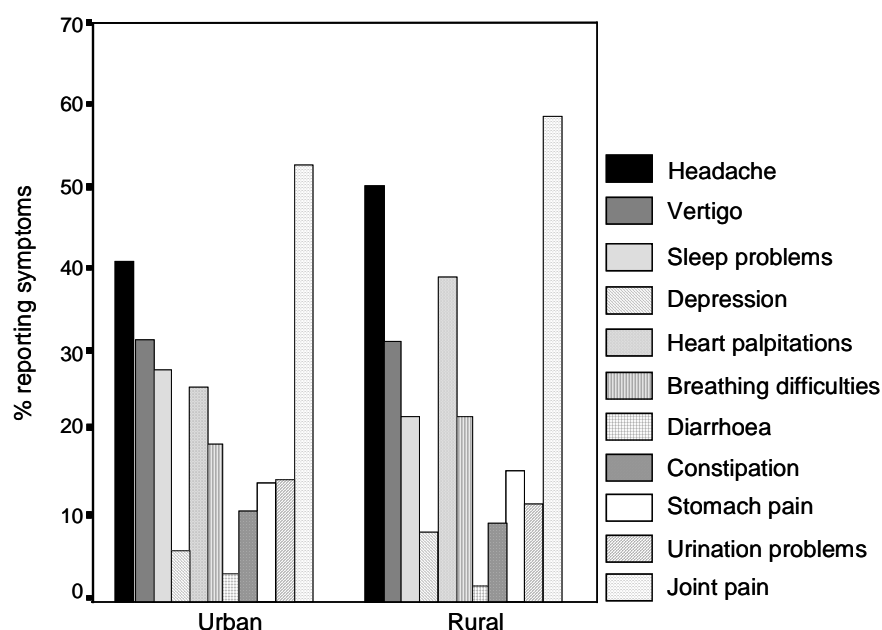
Alcohol consumption

The pattern of consumption of alcoholic drinks is shown in Table 7. Men consumed alcoholic drinks more frequently than women, with significantly more women never consuming them. There was also a tendency for alcoholic drinks to be more frequently consumed among elderly people living in urban areas.

Table 7. Consumption of alcoholic drinks

Frequency of consumption	Urban				Rural			
	Men		Women		Men		Women	
	No.	%	No.	%	No.	%	No.	%
Never	148	46.8	247	77.9	214	65.0	245	78.3
Occasionally	135	42.7	63	19.9	89	27.1	62	19.8
Once a week	3	0.9	0	0.0	3	0.9	0	0.0
Once a day	26	8.2	7	2.2	13	4.0	6	1.9
More than once a day	4	1.3	0	0.0	10	3.0	0	0.0
Total	316	100	317	100	329	100	313	100

Anaemia

Table 8 summarizes the prevalence of anaemia and mean haemoglobin for men and women and Fig. 4 shows the distribution of haemoglobin levels in elderly people. The cut-off points for anaemia were taken as 12.0 g/dl for women and 13.0 g/dl for men.[4] The mean haemoglobin level

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[4] *Indicators for assessing iron deficiency and strategies for its prevention.* WHO/UNICEF/UNU, 1993 Technical Workshop.

for men was 14.3 g/dl with a range of 7.7 to 18.3 and 13.5 g/dl for women with a range of 7.5 to 17.5. The mean difference of 0.817 g/dl was statistically significant. There was, however, no difference in mean haemoglobin between urban and rural areas. The prevalence of anaemia was 14.9%, with 17.3% of men and 12.6% of women affected. Men were more likely to be anaemic with a risk ratio of 1.4 (95% CI 1.0–1.8). There was no difference in the prevalence of anaemia between urban and rural populations.

Table 8. Anaemia in elderly men and women (n = 1246)[a]

	Men	Women	Total
Mean haemoglobin (g/dl)	14.3 (14.1–14.4)	13.5 (13.4–13.6)	13.9 (13.8–14.0)
Anaemia (%)	17.3 (13.8–20.8)	12.6 (9.9–15.2)	14.9 (12.6–17.2)
Haemoglobin < 10g/dl (%)	1.4 (0.4–2.5)	1.5 (0.5–2.4)	1.4 (0.6–2.3)
Haemoglobin < 7g/dl (%)	0.0	0.0	0.0

[a] 95% confidence intervals are given in brackets.

Fig. 4. Distribution of haemoglobin levels in elderly people
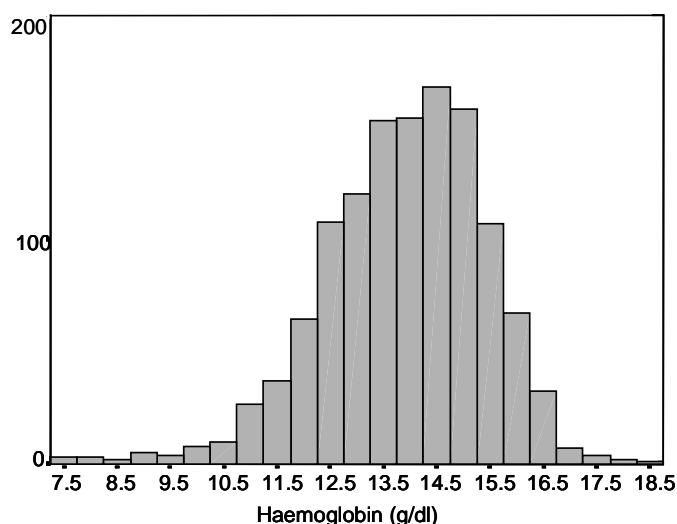
Anthropometry

Body mass index (BMI)

Body mass index (BMI – weight in kg/height in metres^2) was calculated from directly measured weight and height. These measurements were obtained from 1188 out of 1287 (92%) subjects. Weight or height was not obtained where the subject declined to be measured, was bed-bound, disabled or where spinal curvature made an accurate assessment of height impossible. The population mean BMI was 26.89 (95% CI 26.49–27.29), with men having a mean of 25.48 (95% CI 25.04–25.92) and women a significantly higher figure of 28.36 (95% CI 27.78–28.94). BMI was also higher in urban areas than in rural with a mean of 27.59 (95% CI 27.05–28.13) compared to 26.19 (95% CI 26.49–27.29). The prevalence of different classes of BMI are shown in Table 9 and the distribution in Fig. 5.

Table 9. Prevalence of different classes of BMI

BMI (kg/m^2) categories		< 16.00	16.00–16.99	17.00–18.49	18.50–24.99	25.00–29.99	30.00–39.00	> = 40.00
Urban (%)	Men	0.7	0.0	2.7	35.6	43.3	17.1	0.7
	Women	0.3	0.0	0.7	23.1	37.4	36.1	2.4
	Total	0.5	0.0	1.7	29.4	40.4	26.5	1.5
Rural (%)	Men	0.3	0.0	0.7	23.1	37.4	36.1	2.4
	Women	0.3	1.0	1.4	33.0	30.2	32.3	1.7
	Total	0.3	1.2	2.0	44.1	30.2	21.3	0.8
Total (%)	Men	0.5	0.7	2.6	45.2	36.6	14.0	0.3
	Women	0.3	0.5	1.0	28.0	33.8	34.2	2.1
	Total	0.4	0.6	1.9	36.8	35.3	23.9	1.2

Fig. 5. Distribution of BMI
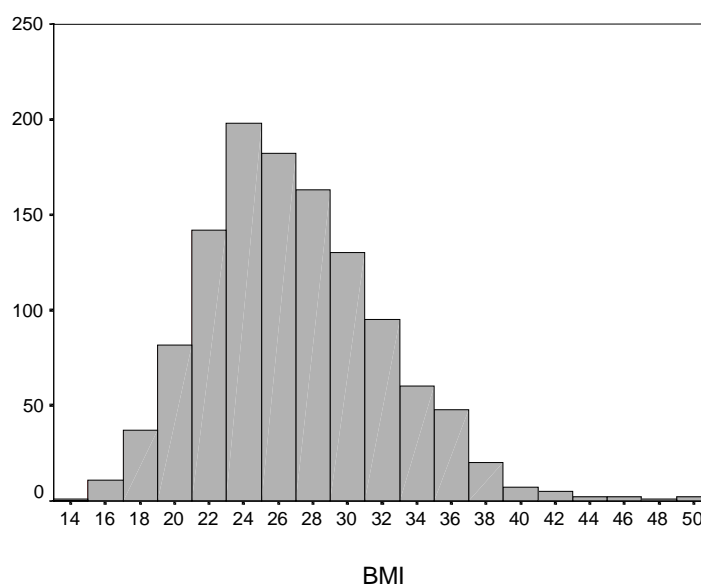
Using cut-offs of <18.5 for thinness and > = 30.0 for obesity (corresponding to the adult cut-offs for grade 1 thinness and grade 2 overweight) gives an overall prevalence of 2.9% (95% CI 1.92–3.81) for thinness and 25.1% (21.9–28.3) for obesity.

Thinness was found in 2.2% (95% CI 1.0–3.4) of the urban population and obesity in 28.0% (95% CI 24.0–32.1). In the rural areas these figures were higher for thinness, 3.5% (95% CI 2.0–5.0), and lower for obesity with only 22.2% (95% CI 17.3–27.1) being affected. However, the differences between the urban and rural populations were not statistically significant.

There was a significant difference in the numbers of overweight men and women, with fewer men affected (RR = 0.396; 95% CI 0.31–0.50). Only 14.4% (95% CI 11.2–17.5) of men were found to be overweight while 36.3% (95% CI 31.2–41.3) of women had a BMI > = 30.0.

Mid-upper arm circumference

Mid-upper arm circumference (MUAC) measurements were obtained from 1220 or 95% of subjects. The mean and range are presented in Table 10 by strata and sex.

Table 10. Mid-upper arm circumference in men and women

Mid-upper arm circumference (cm)		Mean (95% CI)	Range	No.
Urban	Men	29.4 (28.7–30.1)	20.0–39.5	302
	Women	30.3 (29.7–30.9)	19.0–45.5	300
Rural	Men	27.9 (27.3–28.5)	13.6–45.7	319
	Women	29.1 (28.4–29.8)	17.0–52.0	299
Total	Men	28.6 (28.2–29.1)	13.6–45.7	621
	Women	29.7 (29.2–30.2)	17.0–52.0	599
	Combined	29.2 (28.8–29.6)	13.6–52.0	1220

Overall, women were found to have a higher mean MUAC than men with a difference of 1.1 cm. Urban males had an MUAC on average 1.5 cm greater than those living in rural areas but the difference between women in urban and rural areas were not significant.

MUAC cut-offs for malnutrition in the elderly are not well defined and so are not presented here.

Disability

Five subjects reported disability through the loss of a limb while 61 reported not being able to stand without assistance.

Activities for daily living

Several questions were asked to assess a subject's ability to undertake activities for daily living (ADLs) (Table 11). These included washing, dressing, use of toilet facilities, eating and walking.

Table 11. Activities for daily living

Activity	Percentage of subjects reporting inability or unwillingness to perform activity alone	No.
Washing	29.0	1274
Dressing	27.3	1275
Use of toilet	6.1	1275
Eating	3.7	1276
Walking	10.4	1276

ADL and nutritional status

As described above, the prevalence of thinness, defined as a BMI of less than 18.5, is very low. Nevertheless, to see if thinness or obesity (grade 3 overweight, BMI $> = 40.0$) was associated with functional impairment, an ADL score was calculated and compared with BMI. The ADL score was derived by giving a score of 1 for each of the 5 activities listed in Table 11 which could be performed unaided and then adding the scores together for each individual. The score could therefore range from 0 to a maximum of 5. Scores were computed for the 1274 subjects for which data were available on all the activities.

The relationship between mean ADL score and BMI is shown in Fig. 6. As expected, a relatively low functional ability is associated with both extremes of BMI, indicating that optimal health is not compatible with a high degree of thinness or obesity. The reduction in ADL score for those people with a BMI of $> = 40$ was statistically significant (2.79 versus 3.38; ANOVA $p = 0.026$). The small numbers of people with BMI <16 (0.4% of the total population) meant that the relationship between thinness and impairment of ADL score did not reach statistical significance.

Fig. 6. The relationship between ADL scores and BMI
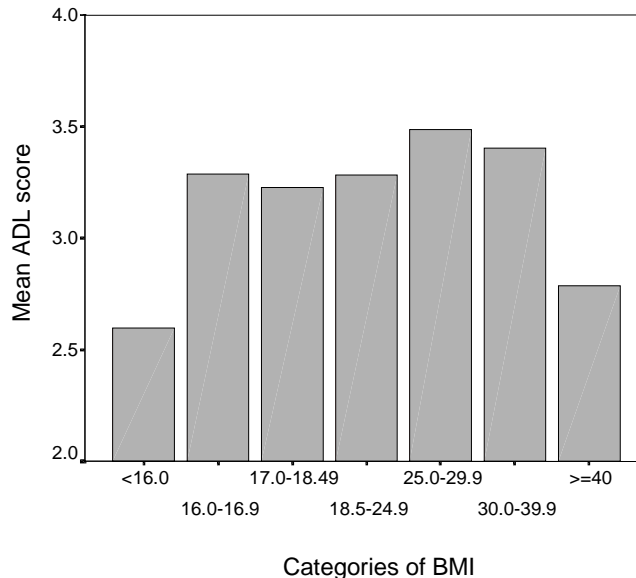
Ability to hear and use of hearing aids

Of the 1275 out of 1287 people (99%) who responded to the question, 13.6% (95% CI 10.7–16.5) reported not being able to hear a person speaking in a normal voice (13.0% of men and 14.1% of women). However, the ownership of hearing aids was low with only 2.3% of men and 1.3% of women having one. More people in urban areas had hearing aids compared to the rural population (2.2% and 1.4%) but the difference was not statistically significant.

Diet diversity in elderly households

Household level data were obtained for the frequency of food consumption. As no information on intra-household distribution was available, dietary intake was calculated for elderly households and compared to other households surveyed in which elderly people lived with other, younger family members. This analysis was carried out to see if there was less dietary diversity in households containing only elderly people.

As can be seen in Fig. 7, the mean frequency of food consumption is lower in households which consist only of elderly people. This is true for meat, milk, pasta/rice potatoes, pulses and fruit (ANOVA $p<0.05$). This may be related to their level of income, access to markets or sources of their own production, dietary preferences, or other factors. Some differences between urban and rural populations were also detected. While the frequency of milk consumption was slightly higher in urban areas, pasta and pulse consumption was lower (ANOVA $p<0.05$).

Fig. 7. Frequency of food consumption for individuals in elderly-only and mixed households
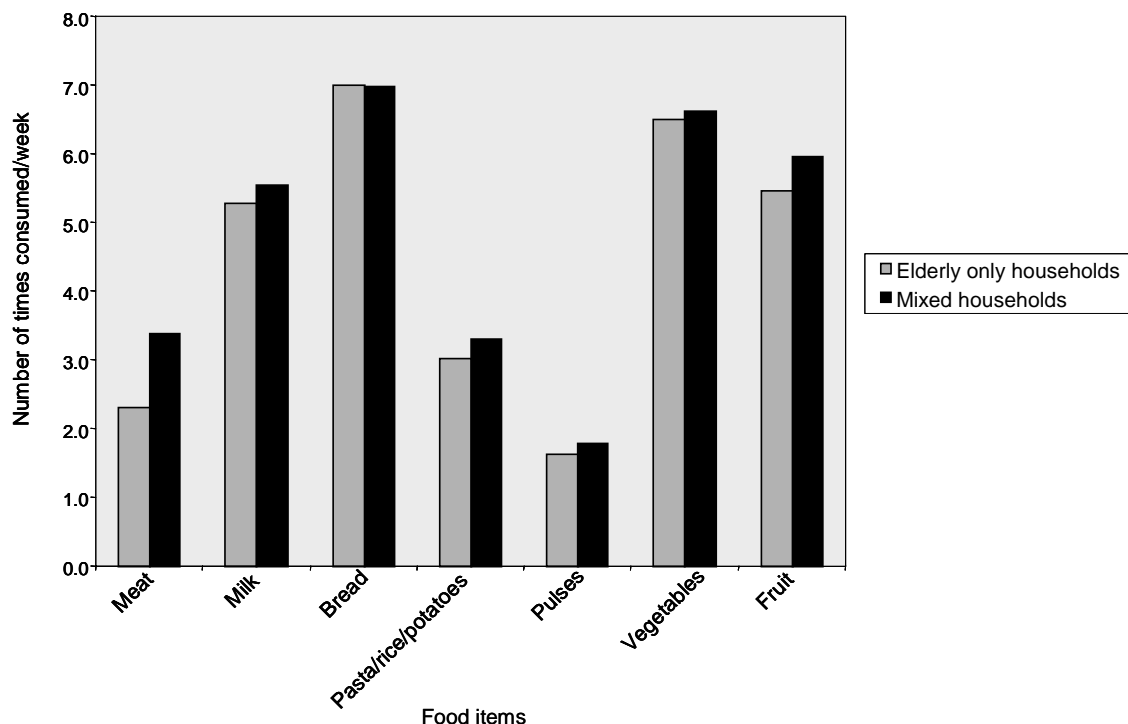
The possibility of supplementing food items bought by growing fruit or vegetables at home was taken less frequently in households containing only elderly people compared to mixed-age households – 37.0% (95% CI 27.1–46.1) versus 56.7% (95% CI 49.0–64.3) (RR = 0.65; 95% CI 0.52–0.81). Likewise, the keeping of small animals for meat or milk was less frequent in these households – 31.4% (95% CI 22.5–40.2) versus 47.2% (95% CI 41.2–53.4) (RR = 0.66; 95% CI 0.51–0.87). Taken together, these data suggest the relative vulnerability of elderly-only households to less diversity in their diet and to micronutrient deficiencies.

Risk factors for low BMI

Social factors such as care provided by other family members may be important determinants of dietary intake and nutritional status. We therefore asked a number of questions about social habits and specific feeding issues.

Living alone or eating alone were not independent risk factors for low BMI or obesity. However, chewing difficulties were reported by 5.0% (95% CI 2.5–7.4) and elderly people reporting this problem were much more likely to be thin (BMI<18.5; RR = 2.38, 95% CI 1.15–4.93). A dental prosthesis was worn by 29.7% (95% CI 17.3–30.4) but this was not associated with chewing difficulties or thinness. Problems with self-feeding were not associated with wearing a dental prosthesis or chewing difficulties and did not result in thinness.

The presence of disease may result in malnutrition, and malnutrition results in an elevated risk of disease. In this elderly population an association was found between the presence of diagnosed respiratory disease, the definition of which included cases of tuberculosis, and thinness (RR = 2.68; 95% CI 1.34–5.36). Some 35.3% of people with a BMI <18.5 reported diagnosed respiratory disease.

BMI is known to decline with age and this effect is clearly seen in this elderly population. Fig. 8 shows the decline in mean BMI with age. The mean age of subjects with BMI <18.5 was greater than those with a higher BMI (74.7 years; (95% CI 72.0–77.5) and 71.9 years; (95% CI 71.4–72.4)). The presence of repiratory disease, chewing difficulties and increasing age therefore appear to be the major risk factors for thinness identified during this survey.

Fig. 8. The relationship of BMI to age
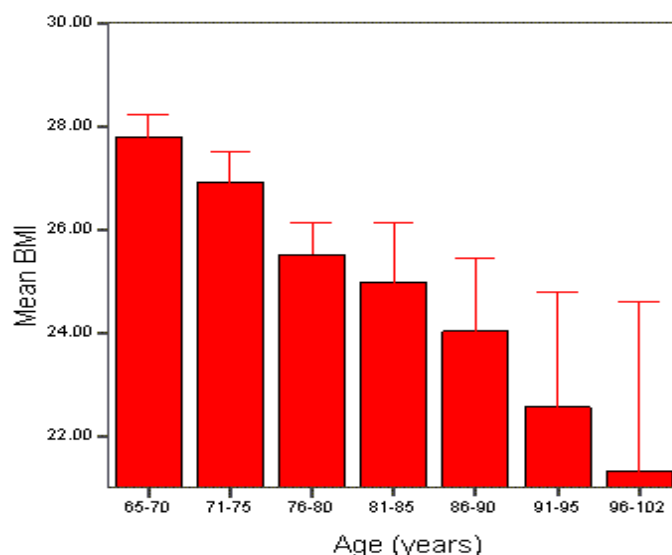
Utilization of the health service

Some 32.7% of subjects had attended a health facility during the previous week. Utilization was slightly higher in urban areas (34.3 versus 31.1%) and by women but the differences were not significant. The mean number of visits during the previous week was 0.5, with men visiting 0.46 and women 0.53 times. Some 72.4% of subjects reported paying for their own drugs.

Table 12. Attendance at health facilities during previous week

Frequency of visits	Men (%)	Women (%)	Total (%)
0	69.6	64.9	67.3
1	21.1	24.4	22.7
2	6.5	6.8	6.7
3	1.1	2.4	1.7
4	0.9	0.3	0.6
5	0.2	0.6	0.4
6	0.0	0.0	0.0
7	0.6	0.5	0.5
Mean no. of visits	0.46	0.53	0.50

Discussion

This survey has provided the first national picture of the health and nutrition situation of the elderly people in the former Yugoslav Republic of Macedonia. It is hoped that it will provide useful baseline data which will allow identification of problems, and the monitoring of changes over time and response to interventions.

Analysis of the data from urban and rural areas has illustrated a number of interesting comparisons. Differences in the prevalence of diagnosed disease were found between urban and rural areas. Current living location may or may not represent where the person lived during periods of their life when exposure to disease risk factors occurred. Therefore these data, while interesting, do not provide direct evidence of the impact of the urban and rural environments on the risk of developing disease. What they do is indicate that the ideal focus for preventive, palliative and curative health services for elderly people in urban and rural areas may be different.

A further difference between urban and rural areas is that alcohol consumption is higher in urban areas and among men. This may be partly due to the distribution of religious affiliation between urban and rural areas.

Many questions remain about the effective use of anthropometry in the elderly as a predictor of functional impairment or risk of morbidity. In the measurement of height there are currently no guidelines regarding the degree of spinal curvature that would invalidate the measurement of height.[5] The question of which individuals should or should not be measured therefore becomes a matter of judgement for the field teams. During this survey certain individuals were not measured due to obvious kyphosis or other postural problems, but it is recommended that this selection procedure is standardized with photographs or diagrams prior to the next survey. For future surveys it is also recommended that a regression equation should be derived that would allow the calculation of height from the measurement of arm span or knee height.[5] This procedure allows height data to be obtained from individuals who cannot be measured normally due to standing problems or spinal curvature.

Using BMI, thinness was found in only a small number of individuals whereas obesity was much more prevalent. BMI is known to act as a predictor of morbidity, mortality and reduced functionality and is characteristically related to these outcomes by a U-shaped risk curve.[5] In this cross-sectional survey both thinness and obesity were associated with reduced functional ability. Recent bereavement has been shown to be associated with reduced food intake[6,7]. Unfortunately, it was not possible from the data collected in this survey to examine the effect of bereavement on low BMI or dietary intake. Nevertheless, there is good evidence from previous work that individuals recovering from the loss of family members will be vulnerable to reduced nutrient intake.

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[5] WHO Technical Report Series, No. 854, 1995 (*Physical status: the use and interpretation of anthropometry*).

[6] Quandt, S.A. et al. Nutritional self-management of elderly widows in rural communities. *Gerontologist,* **40**: 86–96 (2000).

[7] Rosenbloom, C.A. & Whittington, F.J. The effects of bereavement on eating behaviors and nutrient intakes in elderly widowed persons. *Journal of gerontology*, **48**: S223–S229 (1993).

Dental health has been found to be a predictor of dietary intake and nutritional status.[8] It was therefore not surprising that chewing problems were associated with thinness. More work might be usefully done to investigate more systematically the status of dental health in elderly people in the former Yugoslav Republic of Macedonia and its impact on nutritional status.

Dietary data are obviously affected by the season in which the data are collected. Conclusions about the issues of dietary diversity must therefore be interpreted with this in mind. Nevertheless, the reduced diversity observed in elderly-only households argues for special attention to be paid to maintaining and improving the nutrient intakes of this group. It is hoped that future surveys will include biochemical assessment of micronutrient status.

A main determinant of income security in this age group is the availability of a reliable and appropriate level of pension payment. For many individuals, income security will equate to food security and therefore be a major determinant of health status. The activities of the social welfare and health sectors, as well as private business, are complementary in contributing to the health and quality of life of elderly people in the former Yugoslav Republic of Macedonia.

A number of possible interventions to improve the health and nutrition situation of this sector of the population are presented below.

Recommendations

The results of the survey have allowed a number of measures to be identified that would be likely to improve the public health and quality of life of the country's elderly population These include the following.

1. Promotion of healthy lifestyle messages to the whole population so as to control risk factors for the development of obesity.

2. The development of dietary guidelines, still not achieved in the former Yugoslav Republic of Macedonia, should be supported and included as part of a national action plan for nutrition.

3. Advancement of effective health education and other measures to reduce the prevalence of smoking, which is a major risk factor for respiratory disease

4. Dietary quality should be improved, especially in elderly-only households, by increasing availability and access to fruit, vegetables, meat and milk throughout the year. Possible mechanisms to be investigated include:

    *   subsidies
    *   establishment of a meal preparation and delivery service for the most vulnerable individuals
    *   support for home gardening
    *   improvements in the production and marketing infrastructure
    *   food donations.

5. Long-term strategic planning of health care and social welfare provision should be undertaken with a view to the demographic changes occurring in the country.

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[8] Steele, J.G. *National Diet and Nutrition Survey: People Aged 65 Years and Older, 2: Report of the Oral Health Survey.* London, Stationery Office, 1998.

6.   Maintenance of reliable and appropriate levels of pension payments should be ensured as they are a major determinant of food security, and therefore health, in this age group.

7.   Continued improvement of water supply and sanitation facilities, especially in rural and underprivileged urban areas, should be a high priority.

8.   Effective treatment and control of tuberculosis and other respiratory diseases should be pursued.

9.   Mechanisms for increasing access to the provision of hearing aids (and probably spectacles) should be investigated with the aim of ensuring their availability to all those who require them.

10. The findings from this survey should be disseminated at a workshop involving representatives of all relevant social welfare, employment, health, and planning departments of the government and nongovernmental organizations in the former Yugoslav Republic of Macedonia. There is a need to produce a clear action plan, grounded in local knowledge and experience, for prioritizing and pursuing the recommendations contained in this report.

Annex 1

CLUSTER SELECTION, SECOND STAGE

Urban		**Rural**	
Cluster number	**Municipality**	**Cluster number**	**Municipality**
1	Kicevo	31	Bitola
2	Kochani	32	Bosilovo
3	Kumanovo	33	Valandovo
4	Kumanovo	34	Veles
5	Ohrid	35	Vrapciste
6	Ohrid	36	Gostivar
7	Prilep	37	Demir Kapija
8	Probistip	38	Dolneni
9	Sveti Nikole	39	Zelino
10	Strumica	40	Ilinden
11	Tetovo	41	Kavadarci
12	Stip	42	Klecevce
13	Gazi Baba	43	Kriva Palanka
14	Gazi Baba	44	Kukurecani
15	Gorche Petrov	45	Labunista
16	Karposh	46	Lozovo
17	Karposh	47	Mogila
18	Kisela Voda	48	Negotino
19	Kisela Voda	49	Orizari
20	Kisela Voda	50	Petrovec
21	Centar	51	Radovis
22	Centar	52	Rostusa
23	Chair	53	Saraj
24	Chair	54	Star Dojran
25	Bitola	55	Strumica
26	Bitola	56	Tearce
27	Veles	57	Tetovo
28	Vinica	58	Cesinovo
29	Gostivar	59	Gazi Baba
30	Delcevo	60	Kisela Voda

Annex 2

GUIDELINES FOR INTERVIEWERS AND MEASURERS

Choosing clusters

The team supervisors and team leader are responsible for choosing clusters. They should proceed in the following order, with the suggestions listed in order of desirability. You may have to use a combination of these methods.

Option 1.   Ask the local authorities to provide you with a list of households and their addresses. Number progressively the households listed and randomly pick a single household.

Option 2.   Map the area and number all dwellings. Randomly pick a single household.

Option 3.   Divide the area into segments of approximately equal population and randomly choose a single segment. Continue to segment that area until you have a small area, then count and number the households and randomly choose the first household.

Option 4.   Divide the cluster by natural boundaries, e.g. a stream and a mountain range, then approximate the number of persons living in each segment. Number the population in each segment consecutively, e.g. if segment A contains 450 people, assign the number 1–450 to that segment. Randomly choose a number between 1 and the total population of that cluster. Choose the segment that includes that number. Continue to segment that area until you have a small area, then count and number the households, and randomly choose the first household.

Option 5.   Allocate a number of starting points spread out on the boundary map. Put these points on easy to locate spots along the boundary of the map, with at least two points in the middle of the map. Link points to a landmark so they can be identified. Randomly choose one of the numbers, and make that your starting point.

Option 6.   Locate the centre of your cluster. Spin a bottle. Follow a line out of the edge of the village/ area of the town, count all the households that fall on that line. Pick a random number between 1 and the total number of households that fall on that line. That will be your first household.

Choosing households

*   Begin at the single household that was randomly chosen. Ask if among the household members there is a child under 5 or an elderly man or woman. If there are members of that category of people you are looking for, proceed with your survey. If there are not, continue to the next closest house to your left, as you exit the house. This is the next house that you survey. Always proceed to the next house to the left, until you have completed your cluster.

*   If you arrive at the edge of town before you have completed your quota of interviews, continue to the next closest house to the left, even if it is in the next town/village.

*   If you visit 10 consecutive households whose members do not include any of the people you are looking for, ask a local person where the next suitable household can be found in the same direction you were heading (i.e. to the left). Proceed to that household.

- If you come across an apartment block or other multi-storeyed building, choose a random number between 1 and the total number of floors and begin your next interview at the first door to the left as you come into that floor. After surveying all households on that floor, flip a coin. If the coin is "heads", proceed with the next floors up, until all households above have been surveyed and proceed with the next dwelling to the left of the apartment building. Likewise, if that coin is "tails" proceed with the next floors down.

- Watch the running totals for different target groups (children 0–59 months; children 0–24 months; men >65 and women >65). Until you survey 22 children aged 0–59 months, complete all relevant parts of the questionnaire for those children and their mothers. After you have completed your quota of children aged 0–59 months, carry on looking only for other households containing target individuals for whom you have not yet completed a quota (i.e. children 0–24 months and elderly people).

- For the additional households that only include children 0–24 months complete the relevant parts of the questionnaire, but do not perform anthropometry, clinical or laboratory measurements.

- For the additional households that only include elderly people, complete the household section and the relevant parts of the questionnaire.

- If you have completed the quota for elderly people, do not include additional elderly people even if you find them in the households that are included because of children.

- If you have completed the quota for children under 5, do not include additional children even if you find them in the households that are included because of elderly people.

Definitions

- Dwelling: a building or residential unit. It may contain one or more households.

- Households: a group of persons who live together and share their meals and share their resources.

What each interviewer should do

- Follow the instructions to select the next household in the cluster (look at flow chart).

- Fill out the cluster control sheet for each cluster. Note the time of second visit. Each empty house, refusal, or house where not all the women or children were at home, must be revisited at least once. If the mothers are not back within the day, go to the next house and do not include data on children.

- Introduce yourself to household members and conduct the interview.

- Apply the questionnaire to the mother of every selected child. Measure all the selected children and all their mothers. Don't measure weight, height or haemoglobin, nor examine the thyroid of pregnant women.

- If the household also has elderly men and women, administer the elderly questionnaire. If the household has elderly people but not children under 5, only apply the household and elderly questionnaire.

- If the household is composed of multiple couples, but all share their meals and source of income, they should be treated as a single household, and information about women, children and elderly people should be included in the same questionnaire. If the couples only share the dwelling, they should be treated as separate households.

- If the household hosts other individuals temporarily (i.e. for less than 1 year) and if they qualify for the assessment, do not include them as the other members of that household; if other individuals or relatives are hosted for longer periods, regard them as members of that household.

- Fill out the data collection sheet carefully, with neat handwriting.

- Check all answer sheets at the end of the day to validate accuracy, completeness and legibility. Then review again with the supervisor.

Special situations in the field

1. The selected small area cannot be reached

Survey the closest area to the original one that cannot be reached. Record all replacements in the field notebook.

2. The selected small area contains fewer households than the required cluster size

Survey all houses in the area, then move to the area that is closest to the last household you did in the original area.

3. The household contains refugees in addition to residents

Survey the residents only, if the household complies with inclusion criteria. Note the presence of refugees in the questionnaire (Q.3)

4. Some members of the household are not at home

If the missing household members are persons we would measure, ask if the household member will be home at a later time and make arrangements to return, if possible. If it is not possible to meet the missing person later, record the information for this person as "don't know/no answer" on the answer sheet.

5. The residents refuse to be interviewed

Never accept a refusal as definite. Encourage the household members to participate, offer to return later in the day, etc. Ask the other team interviewer to try later in the day. Make at least one additional attempt to convince the household member to participate. If they still refuse, do not add any additional households.

CLUSTER CONTROL SHEET

Strata (urban or rural): _____ Cluster name:_____ ***Remember you need a total of:*** 11 men > 65 years
11 women >65 years
22 children 0–59 months and their mothers
plus additional children to give a total of
24 children aged 0–24 months

Cluster number: /__/__/ Team leader: _____ Team Number: /__/

Address and name of household head (House or flat number and road name)	Did you speak to people: 1 = in the house 2 = neighbours 3 = no one	Did the house contain people you needed to complete your quota? 1 = yes 2 = no	If they refused, what was the reason? 1 = not interested 2 = no reason given 3 = household head not present 4 = other	Questionnaire number given to the household	No. of men > 65 in each house (A) and running total (B)		No. of women > 65 in each house (A) and running total (B)		No. of children aged 0–59 months in each house (A) and running total (B)		No. of children aged 0–24 months in each house (A) and running total (B)	
					A	B	A	B	A	B	A	B

Continue on a new sheet if necessary (remember to fill in all the information at the top of the sheet).

Annex 4

QUESTIONNAIRE

Household information: to be observed and registered by the interviewer

1	Type of dwelling	1 = flat; 2 = house
2	Number of rooms	Enter number

Household interview. Respondent: mother

3	Status	1 = residents; 2 = residents hosting refugees;
4	Ethnic group	1 = Macedonian; 2 = Albanian; 3 = Roma; 4 = Turkish; 5 = others.
5	Report age (in years and months) and sex of each household member. List mothers with codes W1–W4; children under 5 with codes C1–C4; elderly people with codes E1–E4 and other individuals with codes O1–O4	
6	Gender of the household chief?	1 = male; 2 = female
7	What is the head of household level of education?	1 = illiterate 2 = incomplete elementary school 3 = elementary school 4 = secondary school 5 = short university degree 6 = long university degree 9 = don't know/no answer
8	What is your family's main source of cash income?	1 = private business 2 = salary 3 = pension 4 = farming 5 = social aid 6 = no cash income 9 = don't know/no answer
9	In the last week did your family receive food from your relatives/ friends/neighbours?	1 = yes; 2 = no; 9 = don't know/no answer
10	Did your family sell or trade any household good in the past month?	1 = yes; 2 = no; 9 = don't know/no answer
11	Did you receive social assistance in food aid in the last six months?	1 = yes; 2 = no; 9 = don't know/no answer
12	Do you grow fruit or vegetables?	1 = yes; 2 = no; 9 = don't know/no answer
3	Do you keep small animals for meat and milk production?	1 = yes; 2 = no; 9 = don't know/no answer
14	Are there any disabled people among the household members?	1 = no 2 = yes, blind 3 = yes, deaf 4 = yes, motor disability 5 = yes, mental disability 6 = yes, terminal disease 9 = don't know/no answer
15	In the last week how many times did the family meals include meat or fish?	Enter number (0–7times/week); 9 = don't know/no answer
16	In the last week how many times did the family meals include milk, sour milk, yoghurt or cheese?	Enter number (0–7 times/week); 9 = don't know/no answer
17	In the last week how many times did the family meals include bread?	Enter number (0–7 times/week); 9 = don't know/no answer
18	In the last week how many times did the family meals include pasta, rice or potatoes?	Enter number (0–7 times/week); 9 = don't know/no answer
19	In the last week how many times did the family meals include pulses (beans, lentils, peas, etc.)?	Enter number (0–7 times/week); 9 = don't know/no answer

20	In the last week how many times did the family meals include vegetables?	Enter number (0–7 times/week); 9 = don't know/no answer
21	In the last week how many times did the family meals include fruit?	Enter number (0–7 times/week); 9 = don't know/no answer
22	In the last year, did any members of your family die? (if no, jump to 24)	1 = yes; 2 = no; 9 = don't know/no answer
23	At what age did the person die (for children aged<12 months, write 1 year) (more than one answer is allowed).	Enter number of years 999 = don't know/no answer
24	What is the source of drinking-water for members of your household?	1 = piped-in dwelling 2 = public tap 3 = tube well or borehole 4 = protected dug well or protected spring 5 = unprotected dug well or spring, rainwater 6 = pond, river or stream 7 = tanker/truck 8 = other 9 = don't know/no answer
25	How far is this source from your dwelling?	1 = on premises 2 = less than 100 m 3 = 100–500 m 4 = 500 m – 1 km 5 = more than 1km 9 = don't know/no answer
26	If there is a pipe, how often do you have water?	1 = constantly 2 = once a day 3 = every two or more days and so on 9 = don't know/no answer
27	What kind of toilet facility does your household use?	1 = flush to sewage system 2 = flush to septic tank 3 = pour flush latrine 4 = covered by dry latrine (luftcloset) 5 = uncovered latrine 6 = no facilities at all 9 = don't know/no answer
28	How far is the facility from your dwelling?	1 = in dwelling 2 = less than 50 m away 3 = 50 m or more away 9 = don't know

Elderly (adults 65 and above): repeat for each one of them present in the house

78	Individual code	Report code from question 5
79	Presence in the house and ability to respond to the interviewer	1 = the elderly person is able to respond to the questions: go to 80 2 = the elderly person is not able to respond to questions; responses are given by a caregiver: go to 80 3 = the elderly person is not able to respond to questions and there is no caregiver 4 = the elderly person is absent for working or leisure reasons: 5 = the elderly person is absent because sick 8 = refuses to answer (from 3 to 8, leave the rest of the questionnaire blank and move to the next elderly person in the house or to next household)
80	What is your date of birth?	Enter day/month/year
81	What is your family status?	1 = single 2 = married 3 = divorced or separated 4 = widow 9 = don't know/no answer

82	a. Main diseases diagnosed (check medical records) cardiovascular neoplasms digestive systems (including liver) respiratory (including tuberculosis) osteoarticular genitourinary endocrine (including diabetes) neurological/mental	1 = yes, 2 = no ; 9 = don't know/no answer
83	a. Individual symptoms felt in the last two weeks headache vertigo difficult sleep depression palpitations breathing difficulties diarrhoea constipation stomach pain problems in urinating pain in joints or back	1 = yes, 2 = no; 9 = don't know/no answer
84	How many times did you attend the health services in the past week?	Enter number of times 0 = never; 9 = don't know/no answer
85	Did you have to pay for your own drugs?	1 = yes; 2 = no; 9 = don't know/no answer
86	How long do you spend walking during the day?	0 = don't walk 1 = less than one hour 2 = one – two hours 3 = more than 2 hours 9 = don't know/no answer
87	Can you hear a person speaking in a normal voice?	1 = yes; 2 = no; 9 = don't know/no answer
88	Do you have a hearing aid?	1 = yes; 2 = no; 9 = don't know/no answer
89	Can you read newspapers or books?	1 = yes; 2 = no; 3 = never did; 9 = don't know/no answer
90	Are you able to feed yourself?	1 = yes; 2 = no; 9 = don't know/no answer
91	Do you normally eat alone or in company?	1 = alone; 2 = in company; 9 = don't know/no answer
92	Do you have chewing difficulties?	1 = yes; 2 = no; 9 = don't know/no answer
93	Do you have a dental prosthesis?	1 = yes; 2 = no; 9 = don't know/no answer
94	How often do you drink alcohol?	1 = never 2 = occasionally 3 = once a week 4 = once a day 5 = more than once a day 9 = don't know/no answer
95	Do you smoke?	1 = yes; 2 = no; 9 = don't know/no answer
96	Do you need any help going to the toilet?	1 = yes; 2 = no; 9 = don't know/no answer
97	Do you need any help to get dressed?	1 = yes; 2 = no; 9 = don't know/no answer
98	Do you need any help in washing yourself?	1 = yes; 2 = no; 9 = don't know/no answer
99	How many times did you meet friends or relatives in the past week?	Enter number of times 0 = none; 9 = don't know/no answer
100	Physical disability	1 = missing limb 2 = cannot stand 3 = no physical disability; 9 = don't know/no answer
101	Weight. Measure the weight of the person in kg to 0.1 kg	Enter value 888.8 = refused; 999.9 = not present /not measurable
102	Right demi-arm span. Measure the distance from the tip of the right middle finger to the sternal notch, to the closest 0.1 cm	Enter value 888.8 = refused; 999.9 = not present/ not measurable

103	Left demi-arm span. Measure the distance from the tip of the left middle finger to the sternal notch (in cm, to the nearest 0.1 cm)	Enter value 888.8 = refused; 999.9 = not present/not measurable
104	Total arm-span. Measure the distance from the tip of the left middle finger to the tip of the right middle finger (in cm, to the nearest 0.1 cm)	Enter value 888.8 = refused; 999.9 = not present/not measurable
105	Height. Measure standing height (in cm, to the nearest 0.1 cm)	Enter value; 888.8 = refused; 999.9 = not present/not measurable
106	Anaemia. Record haemoglobin value (from Hemocue) to the nearest 0.1 g/dL	Enter value 88.8 = refused; 99.9 = not present
107	Mid-upper arm circumference (in cm, to the nearest 0.1 cm)	Enter the value 88.8 = refused; 99.9 = not present/not measurable

Annex 5

SELECTION OF RESOURCES ON PUBLIC HEALTH AND THE NUTRITION OF THE ELDERLY

World Health Organization, Aging and Health Programme (http://www.who.int/aging/)
For further information, contact the Aging and Health Programme at: activeaging@who.int

Help Age International – an international nongovernmental organization active in promoting activities to benefit the elderly (http://www.helpage.org/)

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