Nutrition and baseline survey of older people in Haraze Albiar, Chad, June 2012

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HelpAge International helps older people claim their rights, challenge discrimination and overcome poverty, so that they can lead dignified, secure, active and healthy lives.

Acknowledgements

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Most importantly, thanks to the 721 older women and men in the Haraze Albiar district, who agreed to be interviewed, measured and sometimes photographed for this survey.

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HelpAge International
PO Box 70156
London WC1A 9GB, UK
info@helpage.org
www.helpage.org

Written by Dr Pascale Fritsch, Emergency Health and Nutrition Adviser, HelpAge International with Mark Myatt, Consultant Epidemiologist, Brixton Health.

Front and back cover photos: Interviewing older people in Haraze Albiar, June 2012
Photos © HelpAge International

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Abbreviations and acronyms

ACAPS	Assessment Capacities Project
ADL	activities of daily living
AIDS	Acquired Immunodeficiency Syndrome
BMI	body mass index
CI	confidence interval
CMAM	community management of acute malnutrition
DDS	dietary diversity score
FANTA	Food and Nutrition Technical Assistance
FCFA	franc de la Communauté Financière Africaine
GAM	global acute malnutrition
GBP	pound sterling
HIV	Human Immunodeficiency Virus
MAM	moderate acute malnutrition
MSF	Médecins Sans Frontières
MUAC	mid-upper arm circumference
NGO	non-government organisation
OCHA	Office for the Coordination of Humanitarian Affairs
PAM	Programme Alimentaire Mondial
PSUs	primary sampling units
RR	risk ratio
SAM	severe acute malnutrition
SMART	standardized monitoring and assessment of relief and transitions
UNICEF	United Nations Children's Fund
UNHCR	United Nations High Commission for Refugees
WFP	World Food Programme

1 Executive summary

From 21 to 30 June 2012, HelpAge International, with support from regional and district health and administrative authorities and our partner Merlin, conducted a nutrition and health survey among people aged 60 years and above in the administrative district of Haraze Albiar, Hadjer Lamis region, Chad. The main objectives of the survey were to:

- Assess the nutritional status of people aged 60 years and above in the Haraze Albiar district (prevalence of acute malnutrition).
- Raise awareness of the nutrition and health needs of older people in Chad and in the Sahel region.

A total of 721 older people in 47 villages were interviewed, and their mid-upper arm circumference (MUAC) measured. The team used questionnaires to collect data on eating habits, hunger scale, disabilities, social and health status, and access to water and sanitation.

Key findings

The prevalence of malnutrition found among older people in Haraze Albiar, using mid-upper arm circumference (MUAC) and oedema-based case definitions for global acute malnutrition (GAM), moderate acute malnutrition (MAM) and severe acute malnutrition (SAM) is as follows:

Class	Case definition	Prevalence	
GAM	**MUAC <210mm or oedema**	**6.1%**	(95% CI[1] = 4.0 ; 9.1)
MAM	**185mm≤ MUAC <210mm without oedema**	**4.9%**	(95% CI = 3.2 ; 7.2)
SAM	**MUAC <185mm or oedema**	**1.2%**	(95% CI = 0.5 ; 2.2)

Based on the 2009 census population figures, these results indicate that around 284 to 647 older people are severely or moderately malnourished in the district and require care and attention.[2]

Risk factors identified by the survey that are significantly associated with malnutrition are ageing, having a low score for activities of daily living, having disabilities – in particular poor eyesight and poor hearing, not attending a health facility when sick, and being bedridden.

Recommendations

- **Nutrition interventions:** the prevalence of GAM and SAM in the population aged 60 and above is concerning. Older people have to be acknowledged as a vulnerable group by the Ministry of Health, the Nutrition Cluster and World Food Programme (WFP). Dietary support in the form of supplementary or therapeutic foods is required to rehabilitate wasted older people. Serious efforts should, therefore, be made to include older people with a MUAC below 210mm and/or oedema in selective-entry curative feeding programmes such as community-based supplementary and therapeutic feeding.
- **Health interventions:** primary health care services for older people, especially chronic diseases management, should be integrated in the Chadian health system, both at health facility and community levels. Home-based care with physical and occupational therapy, pain management (such as for arthritis), and the provision of hearing aids, spectacles, cataract surgery, trachoma care, and walking aids are some of the services that should be available. Financial accessibility is also an issue, and older people should be entitled to free primary health care in public health facilities for the duration of the current food and nutrition crisis.

[1] confidence interval (CI)
[2] These figures would be 496 to 1,129 using the population estimates widely used by health authorities.

2 Context

At the time of the survey, the Sahel region of Africa is again facing a severe food and nutrition crisis.

In Chad, the number of vulnerable people increased from 500,000 in 2009 to almost 4 million in 2011 due to floods, disease outbreaks, drought, instability and limited resources, which have contributed to an on-going complex emergency (The Humanitarian Response Index 2011, ACAPS 2012). In March 2012, 3.6 million people in Chad were food insecure and 1.18 million were severely food insecure (ACAPS 2012). In addition, the health system is performing poorly,[3] the government has few emergency stocks in comparison with other countries in the Sahel region, and food import options are severely limited this year, as the Libyan and Nigerian borders are closed.

There is an unequal geographical distribution of humanitarian assistance in Chad, and the response tends to prioritise the assistance to refugees and internally displaced persons in the East. There is thus a coverage problem in the Sahel belt, which is most heavily affected by severe food insecurity and malnutrition.

2.1 Demographic data

Population

People aged 60 years and over represent approximately 4.5 per cent of the population of Chad.[4] The official population in the Haraze Albiar district is approximately 155,000, with approximately 7,000 people aged 60 and above, according to the general census of May 2009.

However, it seems that this official figure is less than the reality, and health authorities and non-government organisations (NGOs) are estimating the population of Haraze Albiar to be around 274,000, bringing the number of older people in the district to approximately 12,330. The discrepancy between the census data and the observed population might be due to large numbers of transhumant pastoralists, who travel through the region and settle down for a few months, and were not captured by the census.

Mortality

A standardized monitoring and assessment of relief and transitions (SMART) survey carried out in May and June 2012 by UNICEF and the Ministry of Public Health in eleven regions of Chad shows that crude mortality rates vary from 0.21 (95% CI = 0.11 ; 0.41) to 0.96 (95% CI = 0.69 ; 1.35) deaths / 10,000 persons / day in these regions (Ministère de la Santé Publique and UNICEF 2012). In the Hadjer Lamis region, the crude mortality rate was 0.39 deaths / 10,000 persons / day (95% CI = 0.19 ; 0.79).

2.2 Existing data on nutrition and food security

Anthropometry

UNICEF, the Ministry of Public Health and other partners carry out regular anthropometry surveys in the eleven Sahelian regions of the country.

In August to September 2011, the surveys showed that all of the eleven regions were above the World Health Organisation (WHO) alert point of 10 per cent GAM among children under five years, and that six regions (including Hadjer Lamis) were above the crisis threshold of 15 per cent (using weight for height <-2 z-scores and / or oedema).

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[3] "Poor performance by early warning systems for prone epidemic diseases monitoring, weak coverage rate of routine immunization for preventable diseases, weakness in the drugs supply with frequent stock out" (CHAD consolidated appeal 2012, Office for the Coordination of Humanitarian Affairs, http://reliefweb.int/sites/reliefweb.int/files/resources/Full%20Report_399.pdf)

[4] See http://esa.un.org/unpd/wpp/unpp/panel_indicators.htm

The last round of SMART surveys (Ministère de la Santé Publique and UNICEF 2012) shows that nine of the eleven regions are above this emergency threshold for children under five, using weight for height <-2 z-scores and / or oedema. The Hadjer Lamis region has a GAM prevalence of 19.7 per cent (95% CI = 15.9 ; 24.2).

In children under five years, GAM prevalence using middle upper arm circumference (MUAC< 125 mm and / or oedema) varies from 4.3 per cent (95% CI = 3.1 ; 6.0) to 10.4 per cent (95% CI = 7.4 ; 14.5). The Hadjer Lamis region has a GAM prevalence of 8.6 per cent (95% CI = 5.6 ; 13.1).

The same SMART survey also shows the prevalence of GAM in women aged 15 to 49 years, using a MUAC-based definition. In the Hadjer Lamis region, the prevalence of non-pregnant, non-lactating women with a MUAC below 210 mm is 4.8 per cent (95% CI = 1.5 ; 8.2).

Micronutrients

UNICEF acknowledges that there is a serious problem of lack of micronutrients in the general population, and is planning to start a programme of "sprinkles"[5] distribution to the whole population in 2013.

Iodine deficiency is also a problem, affecting mostly the Eastern regions and N'djamena, where non-iodised salt is available from Sudan or Cameroon. The national average consumption of iodised salt is 56 per cent of total population. A national survey done in 2003[6] shows that the total goitre prevalence among school children (aged 6 to 13) was 5.6 per cent, and 11.0 per cent for the age group 13 to 21. In the Sahelian zone, the prevalence for these age groups was respectively 8.2 and 14.6 per cent. WHO considers that a prevalence of goitre between 5.0 to 19.9 per cent among school children is a public health issue of mild severity.

Food security

The WFP regularly conducts national food security surveys in partnership with the Chadian Government. The survey which was carried out in November and December 2011 shows the following findings (Programme Alimentaire Mondial (PAM) et Ministère de l'Agriculture et de l'Irrigation 2012):

- Harvest production was very poor in 2011: around 34 per cent less staple food production than in 2010, and 8 per cent less than the average of the last five years. The most affected regions are those of the Sahelian band, especially the eastern ones: WFP estimates that in this zone, around six households out of ten are facing food insecurity and four out of ten in the Sudanian (southern) zone.
- The Hadjer Lamis region is one of the less affected regions of the Sahelian band: around 80 per cent of the households have food security. Markets are still functioning, but the prices of staple food have increased dramatically: villagers reported that a hundred-kilo bag of maize or mil now costs at least 25,000 FCFA (around US$48), while last year it was 15,000 FCFA (around US$29), and 8,000FCFA in 2010 (around US$15). A hundred-kilo bag of rice now costs around US$35, compared to US$24 last year.
- Stockbreeders are reported to be relatively more food secure than farmers.

2.3 HelpAge International assessment

From 26 April to 5 May 2012, the HelpAge Worldwide Emergency team carried out an assessment of the situation of older people, both at national level and in the district of Haraze Albiar, where our partner, Merlin, is working. The conclusions of this assessment are the following:

- The food security situation is critical in the regions of the Sahelian band, where WFP and NGOs are organising the distribution of a general food ration, as well as selective feeding

[5] Sprinkles are sachets of tasteless powder containing the recommended daily intake of 16 vitamins and minerals for one person
[6] WHO global database on iodine deficiency, Vitamin and mineral nutrition information system, http://who.int/vmnis/iodine/data/database/countries/tcd_idd.pdf

programmes for children under five and pregnant and lactating women. Older people are not included in these programmes, though they are at risk of malnutrition and food insecurity.

- WFP acknowledges that households whose head is more than 60 years old are more likely to suffer from food insecurity (41.9 per cent of such households) (PAM et Ministère de l'Agriculture et de l'Irrigation 2012).
- The national protocol for integrated management of acute malnutrition (République du Tchad and UNICEF 2011) mentions older people as a group that "might be targeted" if allowed by the availability of resources. Given the relatively small proportion of older people in the general population (4.5 per cent) as compared to children under five (around 20.0 per cent) or pregnant and lactating women, including them in feeding programmes would not be a significant additional burden on resources. However, the methods commonly used to allocate resources (in general, targeting children aged 6 to 23 months and women with infants for blanket supplementary feeding[7]) tend to exclude older people because their households do not often include young children.
- The Hadjer Lamis region is affected by the food crisis, but the Haraze Albiar district is relatively secure, at least in its western part near the river and the lake. At the time of writing, WFP is not planning to intervene with a general food distribution in this region.
- Older people are invisible in general in Chad. They are not considered a priority for nutrition assessments or selective feeding programmes. Health-wise, the system focuses on communicable diseases and maternal and child health, and there is no capacity for the diagnosis or treatment of chronic diseases. Support from family is not guaranteed; in the Hadjer Lamis villages, it is not rare to meet isolated or neglected older people.
- All international health and nutrition agencies in Haraze Albiar, including our partner, Merlin, are focussing on child and maternal health and nutrition.

In conclusion, in April 2012 the food situation in the Haraze Albiar district was fragile but not yet an emergency. HelpAge then decided to carry out a nutrition survey among people aged 60 and above at district level, in order to assess the relevance of a nutrition intervention.

[7] OCHA Tchad Janvier-mars 2012

3 Objectives and methodology

3.1 Objectives of the survey

The objectives of the survey were to:

- Assess the nutritional status (prevalence of acute malnutrition) of people aged 60 years and above in the Haraze Albiar district. Nobody knows what the extent of the current problem is. May, June and July are the "lean season", the months immediately before the rainy season is due to arrive. The May assessment showed that people were already struggling to find food in the district.
- Use the survey to raise awareness of the nutrition and health needs of older people. The main targets for this awareness raising are: in Chad, the Ministry of Public Health, the Nutrition Cluster and WFP, all of whom do not consider older people to be vulnerable; in the Sahel region, the Global Nutrition Cluster, whose focus is on children and women.
- Assess the relevance of adding a component for older people's nutrition in the existing Merlin project in Haraze Albiar. The May assessment did not allow us to have a clear idea of whether older people in Haraze Albiar are in need of a nutrition intervention.
- Continue global evidence-gathering about older people and nutrition, started last year with the nutrition survey in Dadaab, Kenya (Fritsch P and Myatt M 2011). It is proving to be effective for raising awareness on the need to include older people in the nutrition agenda.

3.2 Sampling procedures

The survey employed a systematic spatial sampling method.

We obtained a list of towns and villages for the administrative district of Haraze Albiar (which is slightly different from the health district) with their respective populations. These were based on the 2009 national population census, and are shown in Table 1.

Table 1: Population figures for the Haraze Albiar district, 2012

District total population	158,972 people
District population without the nomads	156,725 people
Population aged 60 years and above (4.5%)	7,053 older people
Total number of villages	651
Estimated mean number of older people per village	7,053 / 651 = 10.8 rounded to 10

Sample size:[8]

Desired precision:	3.00 %
Estimated prevalence of malnutrition:	10.00 %
Population size:	7,053

95% Confidence Interval specified limits (7%-13%)

(these limits equal prevalence plus or minus precision)

Estimated sample size: n = 365

With an expected design effect of 1.5 (many small clusters) we need a sample size of about:

n = 365 * 1.5 = 548 older people

[8] Calculated through http://sampsize.sourceforge.net/iface/index.html

With an average population of 10 eligible older people per cluster we need about:

548 / 10 = 55 clusters of 10 eligible people or 28 clusters of 20 eligible people

Because the population was scattered in a multitude of small villages, we decided to sample 28 pairs of neighbouring villages as clusters.

With 651 villages and 28 clusters, the sampling interval is 651/28 = 23; random number: 14.

The administrative list of the 651 villages was sorted by sub-prefectures and cantons (administrative sub-division).

We selected 28 villages from this list using systematic sampling. We then paired each selected village with the nearest neighbouring village. The use of a list sorted by sub-prefectures and cantons ensured a nearly even spatial sample.

The objective was to reach at least 10 older people in each village. If the selected villages were too small in terms of population, another village would be selected according to its geographical proximity to the selected village. All eligible individuals were sampled from all sampled villages.

A total of 58 villages were thus selected, with an expected sample size of 573 older people. In each village, we aimed to reach the whole population of people aged 60 and above.

At the end of the survey, we had surveyed 721 people aged 60 and above in 47 villages. The difference between the number of villages selected for sampling (58) and the number of villages surveyed (47) arose from the fact that in some villages the population of older people was much higher than expected: by surveying all of them, the number of individuals surveyed was enough to reach the cluster's quota of at least 10 people.

The 47 villages were scattered across the administrative district in the three sub-prefectures. See Table 2 for the distribution of the villages in the three sub-prefectures and cantons;[9] Annex 1 for a district map of the villages.

Table 2: Distribution of villages surveyed by sub-prefectures and cantons

Sub-prefecture	Canton	Number of villages surveyed
Mani	Boutelfil	7
	Alkoudou Hamadie	2
	Foulbe nomade	4
	Mani	5
N'Djamena-Fara	Afrouck	9
	Suburbain	3
Massaguet	Allouane 1	3
	Nawala nomade	1
	Khouzam	4
	Bilala Ouled Ali	4
	Beniwail-Aboukhider	2
	Khouzam de Karme	5

[9] An administrative division of a sub-prefecture

3.3 Training and supervision

With the help of Merlin and the health and administrative authorities, we recruited three teams of three surveyors, including three team leaders. The nine surveyors were Chadian, mostly from the district, and spoke several local languages.

The survey questionnaire was not translated into local languages, but each team was able to translate the questionnaire from French to Chadian Arabic. This was extensively practised during the three-day training course for team members.

The survey teams were supervised by HelpAge International's Emergency Health and Nutrition Adviser, assisted by the Health Officer from the HelpAge International Office in the Democratic Republic of Congo.

The three-day training course took place in Massaguet, the main town and administrative centre of the Haraze Albiar district, from 18 to 20 June 2012, as follows:

- Day 1: presentation of HelpAge International, HelpAge International code of conduct, rationale and objectives of the survey, sampling method, and questionnaire (explanation, translation and testing).
- Day 2: field procedures, MUAC measurements, questionnaire testing and translation practice, standardisation exercise (10 older people volunteered to have their MUAC taken).
- Day 3: field test in Massaguet.

The survey was carried out from 21 to 30 June 2012.

4 Data analysis

4.1 Software used

The data were entered and checked using Microsoft Excel 2003™. Data were analysed using the R Language for Data Analysis and Graphics (R Core Team 2012).

4.2 Data management: complex sample

The sample is *complex* in the sense that a two-stage cluster sample design was used. Primary sampling units (PSUs) – that is, villages – were selected systematically from a list of all communities sorted by sub-prefecture and canton.

Population proportional sampling was not used, because population data was likely to be inaccurate due to the nature of the population being sampled, in that a sizeable proportion of the population were transhumant pastoralists.

Population data was collected from the sampled communities as a survey activity. Estimation procedures had, therefore, to account for the loss of sampling independence due to the use of a cluster sample design and to weight results by the populations in each of the PSUs. This was done so that data from large communities received more weight than data from smaller communities and vice-versa.

A blocked bootstrap technique was employed to account for cluster sampling. Bootstrap replicates were drawn by sampling (with replacement) entire clusters from the survey dataset rather than single observations.

The sample collected data from 28 PSUs, so each bootstrap replicate consisted of data from 28 PSUs sampled with replacement from the survey dataset. Clusters were included in a replicate with probability proportional to their estimated population using a "roulette wheel" algorithm. This implemented posterior weighting. Each estimate used 1,999 bootstrap replicates.

Three types of estimate are presented:

- Estimates of simple proportions were produced by calculating the proportion observed in each replicate. A basic (percentile) bootstrap approach was used. The accumulated

observed proportions were sorted and the 2.5th, 50th, and 97.5th percentile reported (that is, for the 95% lower confidence limit, the point estimate, and the upper 95% confidence limit).

- Estimates of differences in means were produced by calculating the means observed in subsets (that is, of cases and not cases) of each replicate dataset and calculating the difference between them. A basic (percentile) bootstrap approach was used. The accumulated observed differences were sorted and the 2.5th, 50th, and 97.5th percentile reported (that is, for the 95% lower confidence limit, the point estimate, and the upper 95% confidence limit).
- Estimates of risk ratios (relative risks) were produced by calculating the risk ratio observed in a two-by-two table of risk factor by outcome (that is, case or not case). The accumulated observed risk ratios were sorted and the 2.5th, 50th, and 97.5th percentile reported (that is, for the 95% lower confidence limit, the point estimate, and the upper 95% confidence limit).
- The estimation procedure could be termed a blocking weighted basic (percentile) bootstrap estimator.

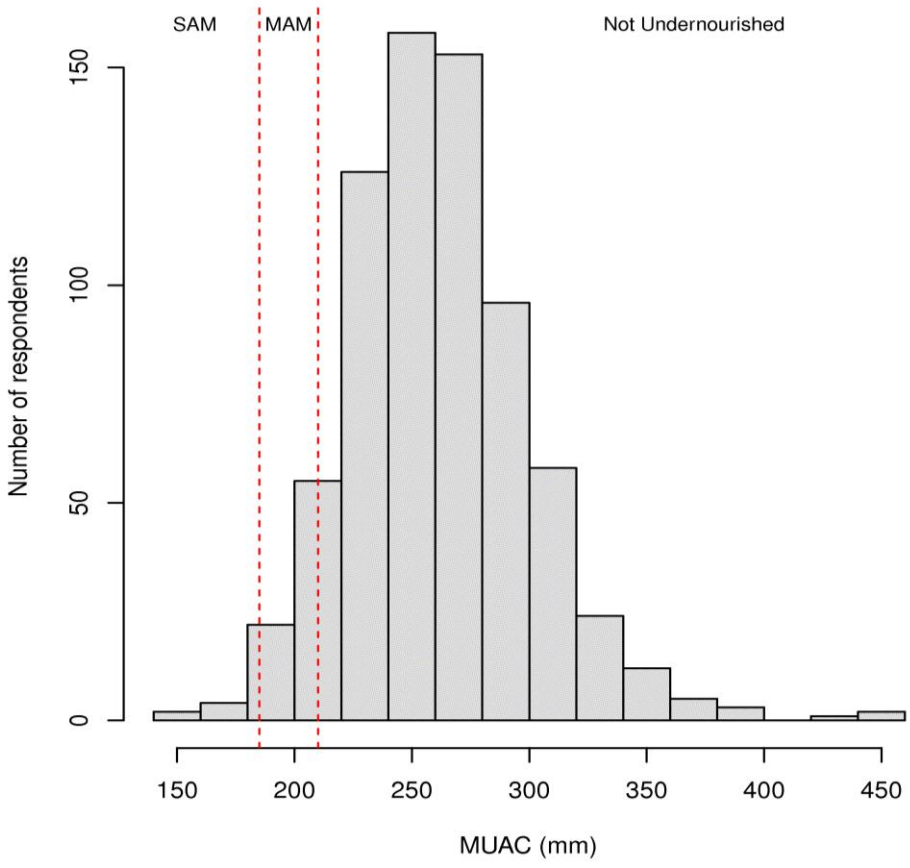
The procedure described here was implemented using purpose-written scripts in the R Language for Data Analysis and Graphics.

4.3 Data management: mid-upper arm circumference (MUAC)

The team measured the MUAC of each older person, to the nearest 0.2cm using a non-stretch MUAC tape (designed by Médecins Sans Frontières).

The distribution of MUAC in the survey sample is shown in Figure 1.

Figure 1: Distribution of MUAC in the sample



MUAC data were combined with data on the presence of bilateral pitting oedema to identify cases of GAM, MAM and SAM using the following case definitions:

GAM	MUAC <210mm or oedema
MAM	185mm≤ MUAC <210mm without oedema
SAM	MUAC <185mm or oedema

4.4 Data management: dietary diversity

The following dietary data were collected:

- Number of meals eaten the previous day
- Whether or not yesterday's meals included any of the following:

  Cereals: bread, porridge (maize, sorghum, mil, millet, rice, wheat), dumplings

  Potatoes, yams, manioc, cassava

  Vegetables

  Fruits

  Meat: beef, pork, lamb, goat, chicken, liver, kidney, heart, or other organ meats

  Eggs

  Fish: fresh or dried

  Legumes, pulses: beans, peas, lentils, or groundnuts

  Milk products: cheese, yogurt, milk, or others

  Oil, fat, or butter

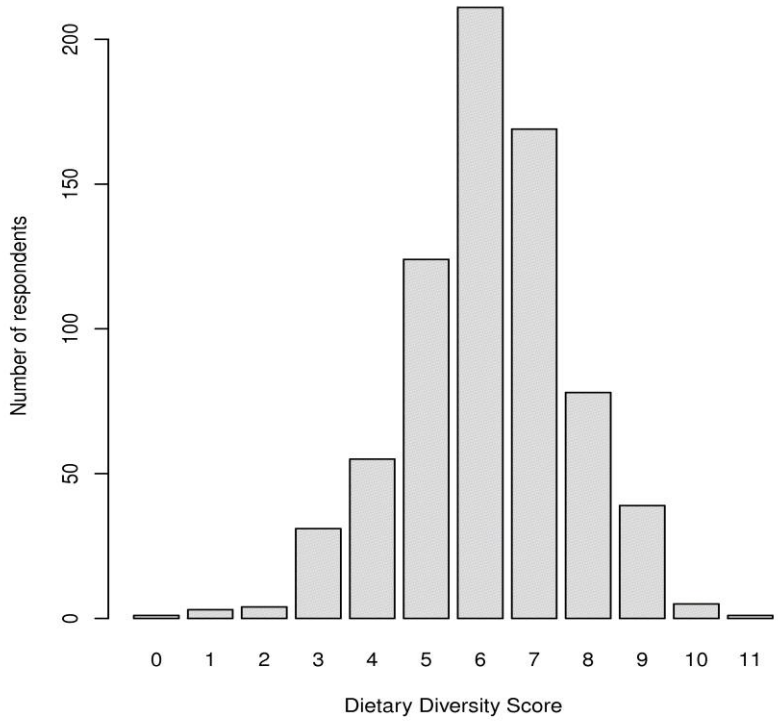
  Sugar or honey

  Other: tea, coffee, salt, or others.

These data were combined into a dietary diversity score (DDS), following the Food and Nutrition Technical Assistance (FANTA) guidelines (Swindale A and Bilinsky P 2006). The score ranges between 0 (low diversity) and 12 (high diversity).

The distribution of the DDS is shown in Figure 2.

Figure 2: Distribution of dietary diversity score in the sample



4.5 Data management: hunger scale

The questionnaire included three questions aiming to calculate the individual hunger scale score based on the FANTA guidelines (Ballard T et al. 2011):

- In the past four weeks/30 days:

  Was there ever no food to eat of any kind in your house because of lack of resources to get food?

  Did you or any household member go to sleep at night hungry because there was not enough food?

  Did you or any household member go a whole day and night without eating anything at all because there was not enough food?

- How often did this happen in the past four weeks/30 days?

The score ranges between 0 and 6 with increasing probability of hunger, as shown in Table 3, below.

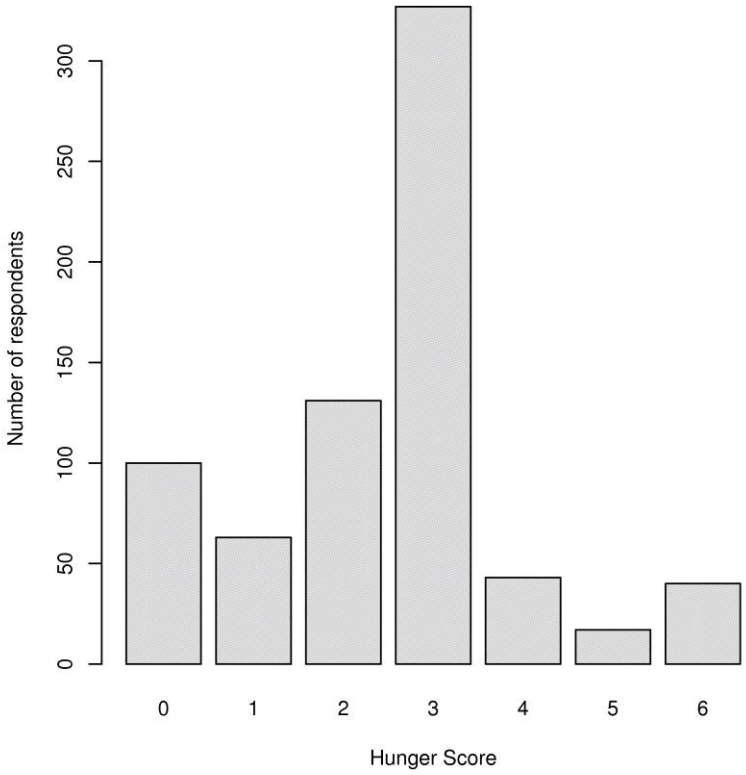
Table 3: Categorical indicator of Household Hunger Scale

Indicator	Household Hunger categories
0–1	Little or no hunger in the household
2–3	Moderate hunger in the household
4–6	Severe hunger in the household

Source: Ballard T et al. 2011

The distribution of the hunger scale score in the sample is shown in Figure 3.

Figure 3: Distribution of the hunger scale score in the sample



4.6 Data management: activities of daily living

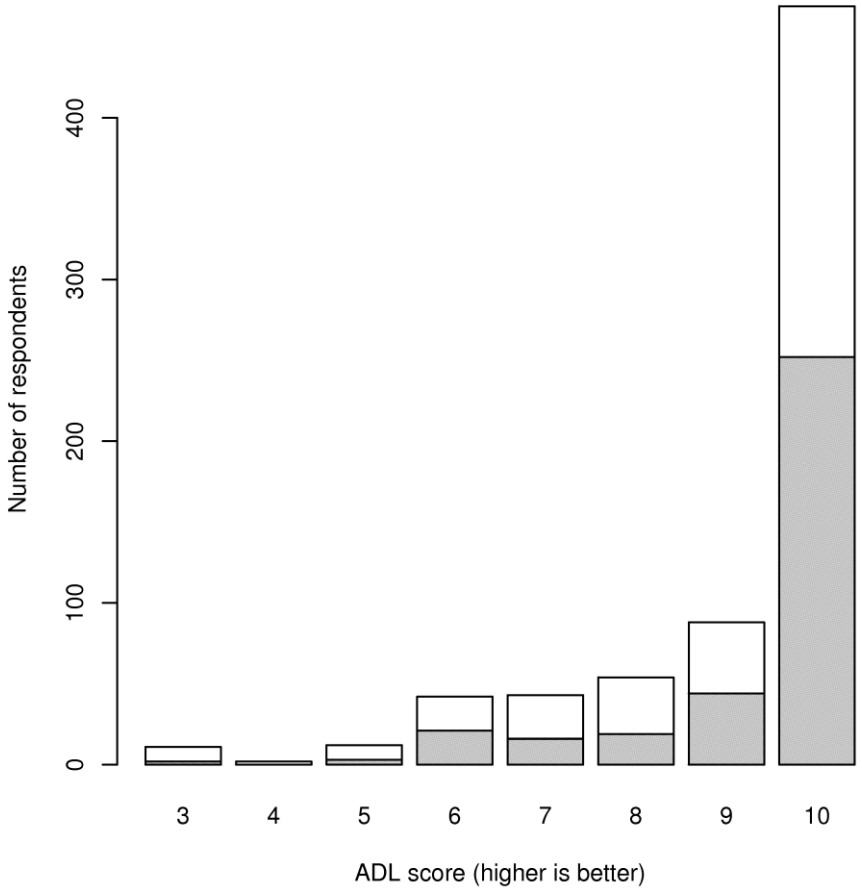
Data were collected about:

- Mobility: difficulties standing up or walking, with a score from 1 (bedridden) to 4 (no difficulty).
- Self-care: difficulties dressing or washing, with a score from 1 (unable to) to 3 (no difficulty).
- Usual activities: ability to carry out normal activities (such as praying, housework, cooking, eating, and so on), with a score from 1 (unable to) to 3 (no difficulty).

These scores were added into a score of activities of daily living (ADL) as a simple sum of the three scores. The ADL score varies from 3 (unable to carry out ADL) to 10 (no difficulties).

The distribution of the ADL score by sex in the sample is shown in Figure 4.

Figure 4: Distribution of ADL score in the sample, by sex



Females are shown in the white upper bars ☐, males are shown in the grey lower bars ▩.

4.7 Case definitions

The nutritional status of the population was defined using the criteria set out in Table 4, below.

Table 4: Indicators for nutritional status

Class	MUAC (mm)
Severe malnutrition	MUAC <185 or oedema*
Moderate malnutrition	210> MUAC ≥185
No malnutrition	MUAC ≥210

*Bilateral pitting oedema only

See paragraph 6.2 for the rationale of these criteria.

5 Results of the survey

5.1 Demographic information

A total of 721 people aged 60 and above were interviewed, and their MUAC measured. In some cases where the person being interviewed was very old and frail, confused, or sick, a family member or neighbour answered the questions on their behalf.

Table 5: Person answering the questionnaire

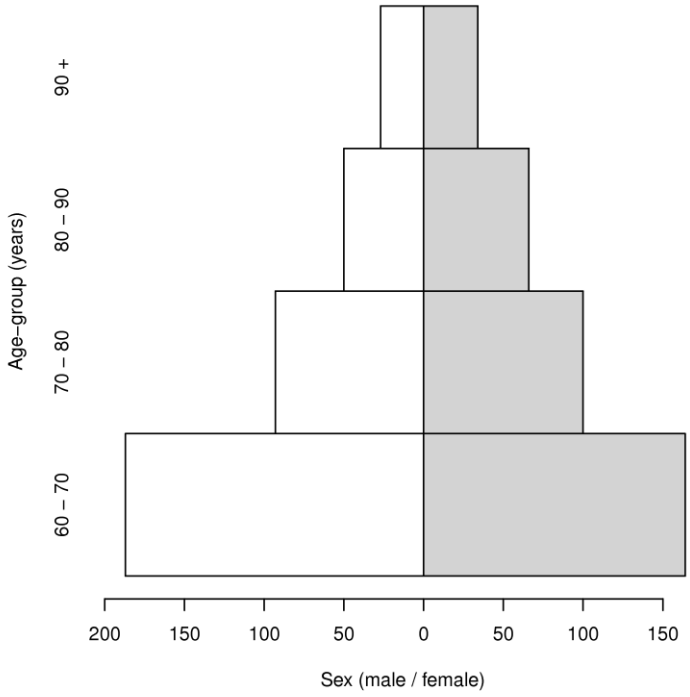
Person answering	Number of respondents	Percentage of respondents
Self	691	95.8%
Family	28	3.9%
Other	2	0.3%
Total	**721**	**100.0%**

Women represented 50.5 per cent of respondents.

Respondents' ages (self-reported) ranged from 60 to 120 years old, with a mean age of 71 years and a median age of 70 years. Figure 5 shows a population pyramid (that is, the distribution of age by sex) in the survey sample.

All respondents were Chadian. Cantons such as Foulbe Nomade, Nawala Nomade, and some villages in Mani and Allouane 1 were mostly populated by people of nomadic background who chose to be sedentarised around 10 years ago. Even though they are not travelling any more, these populations have kept the same way of living, and are still cattle holders.

Figure 5: Distribution of respondents' age by sex



5.2 Nutritional status of the population aged 60 and above

Table 6 shows the nutritional status of older people in the district, using MUAC and oedema-based case definitions for GAM, MAM and SAM.

Table 6: Nutritional status of older people (MUAC and oedema-based case definitions)

Class	Case definition	Prevalence	
GAM	**MUAC <210mm or oedema**	**6.1%**	(95% CI = 4.0 ; 9.1)
MAM	**185mm≤ MUAC <210mm without oedema**	**4.9%**	(95% CI = 3.2 ; 7.2)
SAM	**MUAC <185mm or oedema**	**1.2%**	(95% CI = 0.5 ; 2.2)

Only five older people had oedema.

We did not distinguish primary malnutrition from secondary malnutrition (malnutrition due to factors such as chronic disease).

The prevalence of malnutrition did not vary significantly between sub-prefectures (cantons). Table 7 shows the prevalence of GAM in people aged 60 and above in the three sub-prefectures: Mani, Massaguet and N'Djamena Fara.

Table 7: Prevalence of GAM in the older people by sub-prefecture

Sub-prefecture	Prevalence of global acute malnutrition	
Mani	**8.2%**	(95% CI = 4.7 ; 13.0)
Massaguet	**4.4%**	(95% CI = 1.4 ; 8.8)
N'Djamena Fara	**3.6%**	(95% CI = 1.8 ; 6.5)

5.3 Health status

Almost two-thirds of those we interviewed (61.9 per cent) were regularly taking "official" medicines (as opposed to traditional remedies). The main diseases treated were "pains" (53 per cent) and malaria (24.7 per cent). High blood pressure and diabetes are not frequently treated (respectively 3.8 and 0.7 per cent), but the Chadian health services at primary level do not include the diagnosis and treatment of these diseases.

A large proportion of respondents (81.8 per cent) had been sick during the four weeks before the survey. The main "sickness" was pain (51.6 per cent), which includes muscular or joint pains, gastric pains, and headaches. The second cause of illness was malaria (20.1 per cent, self-reported diagnosis). Other infections and diarrhoea accounted for 6.6 per cent of reported illnesses.

1.8 per cent of respondents were bedridden or housebound, or a total of thirteen older people. Eleven of the thirteen were women.

Three-quarters of all respondents (75.7 per cent) did not need any help walking or standing, 86.8 per cent did not need help for washing and dressing, and 72.1 per cent were able to carry out their usual activities on their own.

The average score for activities of daily living (see p.11) is 9.1, which is close to the maximum of 10, meaning that on average, older respondents are coping well with their daily activities.

Almost two-thirds (62.8 per cent) of the respondents declared having a disability, whether a physical, visual or hearing impairment. More than half of the older people surveyed have poor eyesight. Table 8 summarises the data we collected on disability.

Table 8: Frequency of disabilities

Disability	Prevalence	
Physical disability	**7.9%**	(95% CI = 5.8 ; 9.9)
Visual impairment	**56.3%**	(95% CI = 51.5 ; 61.2)
Hearing impairment	**20.3%**	(95% CI = 16.4 ; 25.9)

Close to one in five respondents (19.3 per cent) declare having more than one disability. Women are more likely than men to have two disabilities. Table 9 shows the frequency of the number of disabilities.

Table 9: Frequency of number of disabilities among the respondents

Number of disabilities	Number of people affected	%
0	268	37.2
1	314	43.6
2	131	18.2
3	8	1.1
Total	**721**	**100.0**

With regard to mental health, 97.8 per cent of those we interviewed said they had no problem. Just over 2 per cent (2.1 per cent) admitted that they were feeling depressed. However, the question about depression was difficult to translate into Chadian Arabic: the enumerators felt that it was improper to ask people if they were feeling bad about their lives, and the concept of sadness associated with tiredness and lack of hope was not easily understood.

More than one quarter (28.4 per cent) reported having lost a family member in the three months before the survey.

5.4 Social status

A majority of the respondents were married (65.1 per cent) or widowed (32.2 per cent).

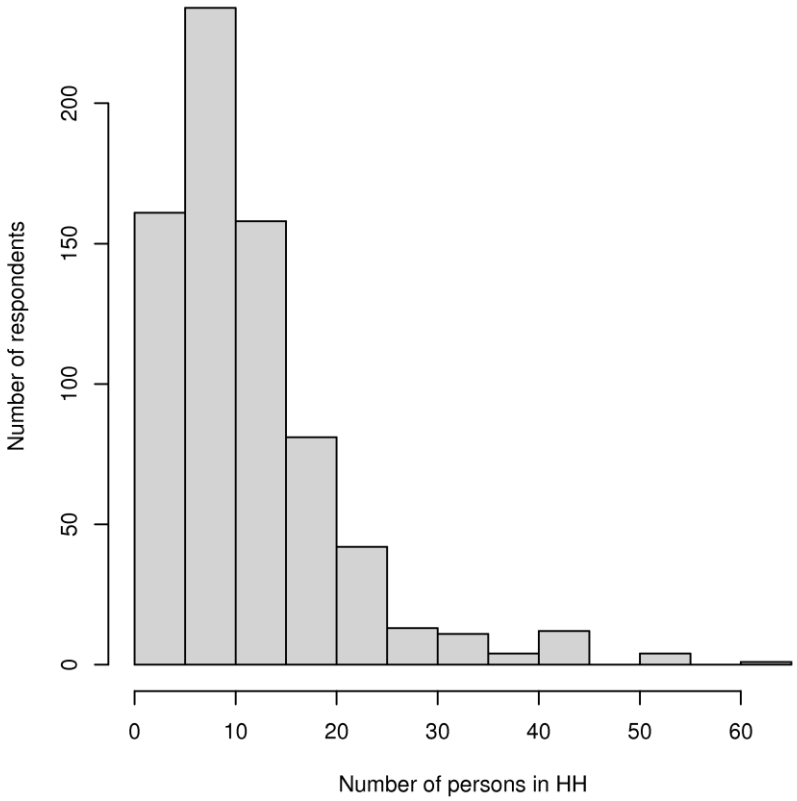
Table 10 shows the proportion of men and women according to their marital status. Men are allowed to marry several wives, and they tend to marry younger women, so they are less likely to be widowers (69.1 per cent of married respondents are men). The proportion of widowed or separated older women is much larger (89.5 per cent of widowed respondents and 73.7 per cent of divorced respondents).

Table 10: Marital status of the respondents by sex

Sex	Married		Widowed		Divorced/ Separated	
	Number	%	Number	%	Number	%
Male	320	*69.1*	24	*10.5*	5	*26.3*
Female	143	*30.9*	205	*89.5*	14	*73.7*
Total	**463**	***100***	**229**	***100***	**19**	***100***

Twenty-seven older people reported that they were living alone (3.7 per cent), five men and 22 women. All other respondents were living in households with between one and sixty others. The average size of households in the sample is 11.3 people. The largest households are found in the villages of sedentarised nomads. See Figure 6 for the distribution of the household size among the respondents.

Figure 6: Household size among the respondents



A small majority (58.7 per cent) of the older people we interviewed reported that they were the head of the household. Among these household heads, 25.3 per cent were women.

Less than half of the respondents say that they have a source of income (46.2 per cent), of which two-thirds are men (66.1 per cent). For both sexes, the main declared source of income is the sale of farming products (29.7 per cent of respondents). See Table 11 and Figure 7 below about the declared sources of income by sex.

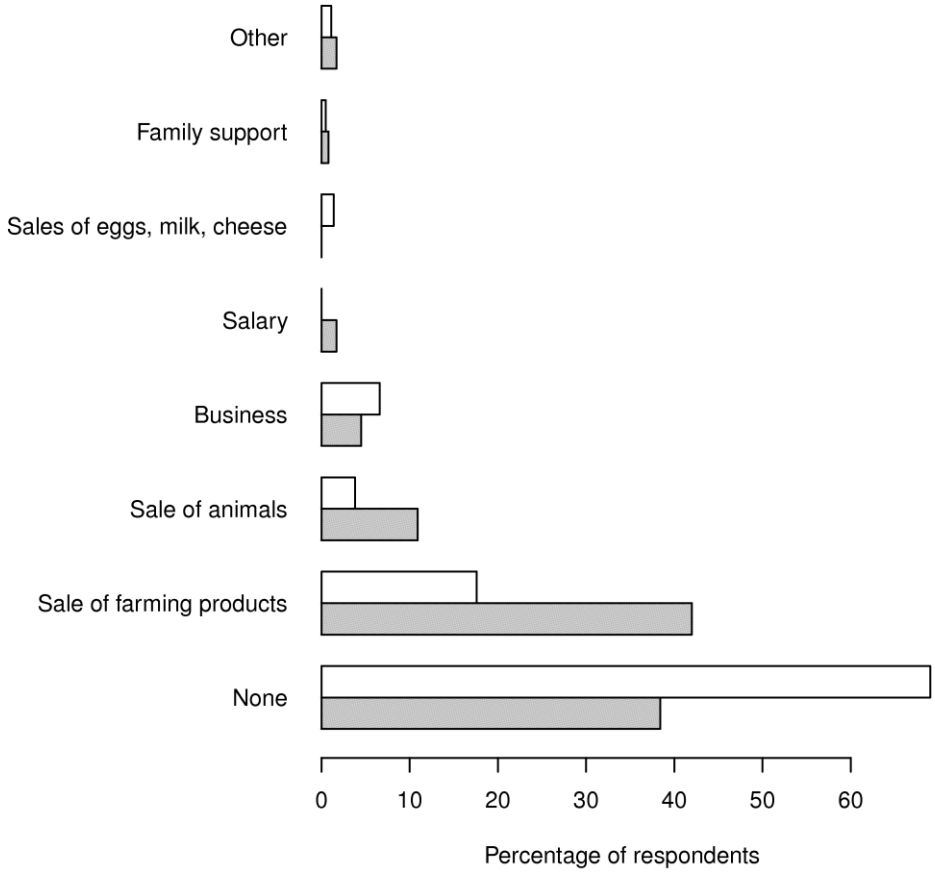
Almost two-thirds (61.3 per cent) of those we interviewed had responsibility for taking care of children or adolescents, 64.5 per cent being men.

15.8 per cent were involved in community activities (village chief, going to community meetings, being a community representative, or others), and 85.1 per cent of those involved were men.

Table 11: Declared source of income by sex

Source of income	Men	Women	Total
	frequency *row percentage* *column percentage*	*frequency* *row percentage* *column percentage*	*frequency* *row percentage* *column percentage*
Business	16 40.0% 4.5%	24 60.0% 6.6%	40 100.0% 5.5%
Salary	6 100.0% 1.7%	0 0.0% 0.0%	6 100.0% 0.8%
Sale of farming products	150 70.1% 42.0%	64 29.9% 17.6%	214 100.0% 29.7%
Sale of animals	39 73.6% 10.9%	14 26.4% 3.8%	53 100.0% 7.4%
Sales of eggs, milk, cheese	0 0.0% 0.0%	5 100.0% 1.4%	5 100.0% 0.7%
Family support	3 60.0% 0.8%	2 40.0% 0.5%	5 100.0% 0.7%
Other	6 60.0% 1.7%	4 40.0% 1.1%	10 100.0% 1.4%
None	137 35.3% 38.4%	251 64.7% 69.0%	388 100.0% 53.8%
Total	**357** **49.5%** **100.0%**	**364** **50.5%** **100.0%**	**721** **100.0%** **100.0%**

Figure 7: Declared source of income by sex



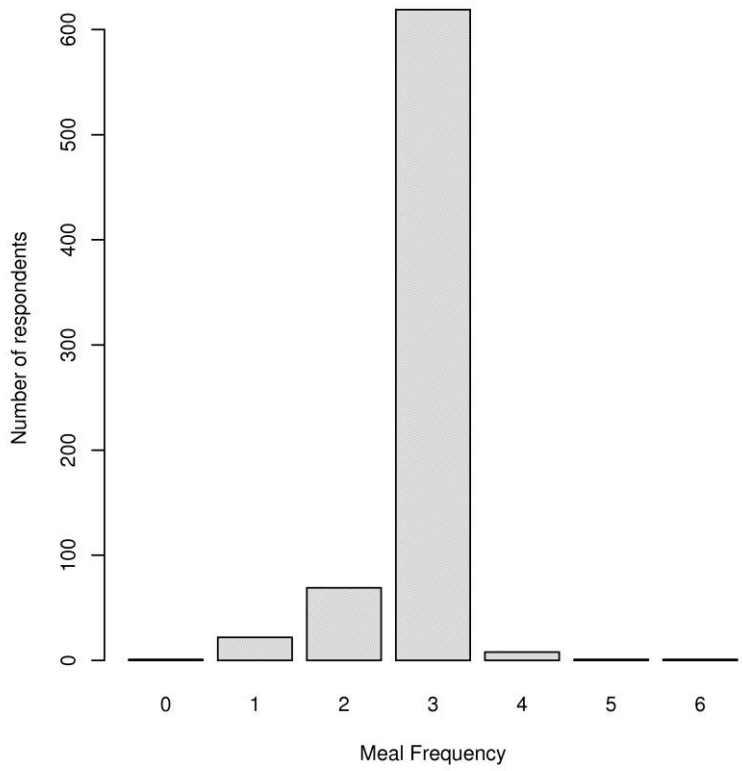
Females are shown in the white upper bars □, males are shown in the grey lower bars ▒.

5.5 Access to basic services

Food

On average, the older people we interviewed had three meals (or snacks) per day, with only 2.3 per cent of them having four or more meals (or snacks) per day. Figure 8 shows the distribution of the meal frequency among the respondents.

Figure 8: Meal frequency among the respondents



The food habits of the older people are quite homogenous: most of them have a meal made of grain porridge, with a sauce cooked with some oil and sometimes vegetables, meat or fish. Sugared tea is widely consumed. The respondents said that eggs and fruits were very difficult to find (though the team noted that there were mangoes and eggs available in most markets at the time of the survey). The data are summarised in Table 12.

Table 12: Type of food consumed by the respondents

Food	Number of older people eating this food	%
Porridge (made from millet, sorghum, maize), bread, rice, wheat	711	98.6
Any other foods, such as condiments, coffee, tea	690	95.7
Sugar or honey	670	92.9
Oil, fat, or butter	597	82.8
Vegetables	447	66.3
Meat	388	54.0
Cheese, yogurt, milk or other milk products	356	50.2
Fresh or dried fish	206	30.9
Legumes, beans, peas, lentils, or groundnuts	150	20.8
Fruits	78	10.7
Potatoes, yams, manioc, cassava	61	8.5
Eggs	19	2.8

The dietary diversity score (see p.9) varies from 0 to 11. The median as well as the mean is six for both sexes, meaning that approximately half of the respondents eat six or fewer food items every day.

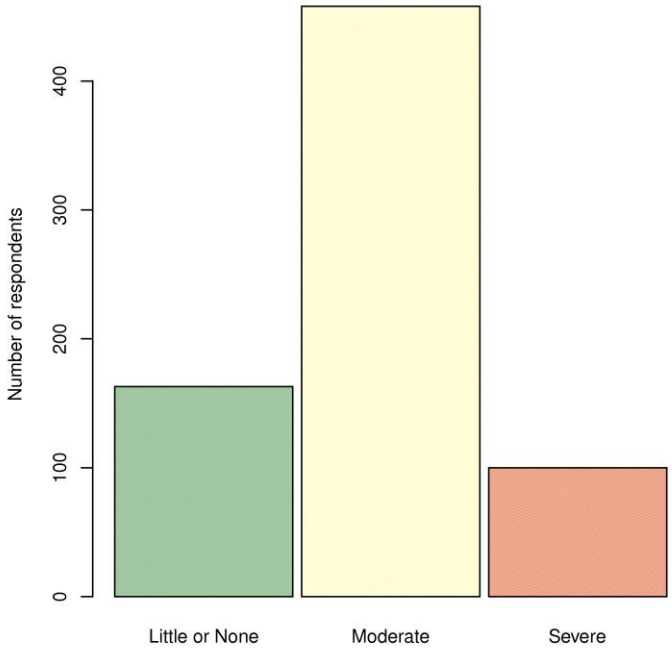
The hunger scale (see p.10) shows that a majority of the respondents and their households (77.4 per cent) were exposed to moderate to severe hunger during the four weeks preceding the survey. Table 13 shows the number and proportion of the respondents in each hunger class.

Table 13: Distribution of respondents by hunger class

Hunger class	Number of people in the hunger class	%
Little or no hunger in the household	163	22.6
Moderate hunger in the household	458	63.5
Severe hunger in the household	100	13.9
Total	**721**	**100.0**

Figure 9 below shows the distribution of the respondents according to the three hunger classes: little or no hunger, moderate, and severe hunger.

Figure 9: Distribution of respondents by hunger class



Almost all older people surveyed (91.1 per cent) reported giving food to other members of their family. This reflects the eating habits in Chad: people all eat together from the same large tray (although men and women eat separately), and sharing is thus normal behaviour. Most of the respondents ate with other people, but 11.9 per cent of the respondents were eating alone.

Most of the respondents (88.9 per cent) reported having a good appetite. 34.7 per cent had problems chewing food.

Water and sanitation

All the villages surveyed had a borehole, but 14.0 per cent of respondents were not satisfied with the drinking water supply, saying that the water was bitter and sometimes turbid.

Most of the respondents (86.5 per cent) were living in a household with no latrines. The proportion of respondents benefitting from probable adequate faeces disposal (that is, having any type of toilet or pit latrine, or digging a hole in the ground) is only 31.2 per cent.

Healthcare

Less than half of the respondents (44.8 per cent) attended a health facility when they were sick.

The main reason given for not attending a public health facility was that it is too expensive (82.4 per cent). Women also said that they did not attend because it was too far, or they could not go there alone.

People who took medicines regularly mostly purchased their drugs in the market (49.8 per cent), a practice that is called "buying at Doctor Chukwu". Health facilities are implementing a cost recovery system for essential drugs, and 38.6 per cent of the respondents are buying their drugs through this service.

Almost two-thirds of the respondents (60.9 per cent) are receiving some help or care at home, mostly women (59.9 per cent).

5.6 Assessing nutritional vulnerability (risk factors)

A number of risk factors and risk markers for vulnerability were collected in this survey, as shown in Table 14, below.

Table 14: Risk factors and markers collected in the survey

Group	Risk factor / marker	Associated with malnutrition?	Notes	Comments Relative risk RR (95% CI) Mean difference MD (95% CI)
Demography	Sex	**Yes**	Being female	Men are less likely to be malnourished. RR: 0.21 (0.11; 0.34)
	Age	**Yes**	Self-report	The oldest people are more likely to be malnourished. MD: 9.45 (5.27; 13.31) years
Family life	Living alone	No	Self-report	No association with malnutrition. RR: 0.44 (0.18; 1.61)
	Having a regular carer	**Yes**	Self-report	Older people with a regular carer are more likely to be malnourished. Possibly linked with poor health status and increasing age. RR: 1.76 (1.01; 3.49)
	Looking after children	**Yes** **Protection factor**	Self-report	Older people looking after children are less likely to be malnourished. Possibly linked with better social status, or being younger and having young grandchildren. RR: 0.16 (0.03; 0.39)
Functional ability	Poor ADL score	**Yes**	Calculated by adding scores for mobility, self-care and carrying on usual activities (all self-reported)	Older people with a poor ADL score are more likely to be malnourished. MD: -1.96 (-2.76; -1.05) points
Disability	Housebound	**Yes**	Self-report	Housebound older people are more likely to be malnourished. Strong association with malnutrition. RR: 11.73 (5.79; 20.91)
	Poor eyesight	**Yes**	Self-report	Older people with poor eyesight are more likely to be malnourished. RR: 3.26 (1.54; 9.95)
	Poor hearing	**Yes**	Self-report	Older people with poor hearing are more likely to be malnourished. RR: 4.03 (1.73; 8.63)
	Physical disability	No	Self-report	No association with malnutrition. RR: 1.34 (0.22; 3.15)
Health	Healthcare	**Possible protection factor**	Self-report Did attend health facility when last sick	Older people having attended a health facility when last sick are less likely to be malnourished. RR: 0.42 (0.13; 0.99)
	Chronic disease	No	Self-report Regularly takes prescribed drugs	No association with malnutrition. RR: 1.39 (0.63-3.79)

Group	Risk factor / marker	Associated with malnutrition?	Notes	Comments Relative risk RR (95% CI) Mean difference MD (95% CI)
Mental state	Recent death in family	No	Self-report	No association with malnutrition. RR: 1.02 (0.58; 1.94)
	Depression	No	Self-report	Any mental illness: no association with malnutrition. RR: 1.88 (0.56; 4.49)
	Confusion	No	Self-report or interviewer's determination	
Food intake	Hunger Score	No	Self-report Calculated by adding scores about lacking foods in the 4 previous weeks	No association with malnutrition. MD: 0.54 (-0.24; 1.29)
	Dietary diversity score	No	Self-report Number of types of foods (from a list of 12 different types) eaten the previous day	No association with malnutrition. MD: 0.09 (-0.35; 0.44)
	Meal frequency	No	Self-report Number of meals eaten the previous day	No association with malnutrition. MD: 0.05 (-0.09; 0.17) meals / day
	Poor appetite	No	Self-report	No association with malnutrition. RR: 1.19 (0.54; 2.53)
	Gives food to others	No	Self-report	No association with malnutrition. RR: 0.40 (0.18; 1.05)
	Chewing problems	No	Self-report	No association with malnutrition. RR: 1.40 (0.78; 3.26)

All these risk factors were tested for their association with malnutrition, using MUAC and oedema-based case definitions.

The following variables were positively associated with malnutrition using MUAC and oedema-based case definitions, that is, older people with these factors are more likely to malnourished:

- Sex: being female
- Age: being older
- Having a regular carer
- Not looking after children
- Having a poor ADL score
- Being housebound
- Not attending a health facility when last sick
- Having poor eyesight
- Having poor hearing

6 Discussion

6.1 Risk factors associated with malnutrition

In our survey, none of the risk factors relating to food and diet are significantly associated with malnutrition. Meal frequency, dietary diversity, food availability as reflected by the hunger scale or by sharing food with children, quality of appetite and existence of chewing problems were not linked with malnutrition.

Almost all the factors significantly associated with malnutrition have a relation with health. These include: being very old, having a regular carer (the need for which is possibly linked with the person's health status), having a poor score for activities of daily living (such as having mobility problems, difficulties caring for oneself and being unable to carry out usual activities), being housebound or bed-ridden (the latter being strongly associated with malnutrition), having poor eyesight or poor hearing, and not attending a health facility during the last episode of illness.

Having a physical disability other than poor vision and hearing is not a factor of malnutrition according to this survey. It is possible that these self-reported disabilities were minor, or that the question was not properly understood. This concerns a small percentage of older people (7.9 per cent).

Poor vision and poor hearing seem to increase by respectively three and four the risk of being malnourished. These disabilities are affecting the capacity of the older people to access food. They might be factors of exclusion, preventing the affected older people to take part in the common meals. They would also be associated with increasing age.

Mental health and chronic diseases do not seem to be associated with malnutrition according this survey.

This analysis points to the poor performance of the Chadian health system: 55.2 per cent of the respondents in our survey report that they don't attend any health facility when they are sick, mostly for financial reasons. About the same percentage of the respondents declare having no source of income (53.8 per cent). It seems that the cost recovery scheme in place in Chad for health services is tending to exclude large numbers of the population in need of healthcare: older people do not have the financial capacity to pay for the services, and only 38.6 per cent of the respondents are purchasing essential drugs through the official system.

Our field assessment revealed that older people are not targeted by health services, which focus on maternal and child health. Women and children are also the priority target of all humanitarian and development NGOs intervening in health, food assistance, and nutrition in Chad. Yet evidence on child health supports the case that grandparents should be targeted as well, as studies have found that children who still have their grandparents, particularly a grandmother, have greater chances of survival and growth (Sear R et al. 2000, Gibson MA and Mace R 2005).

There is no national programme for the prevention and management of non-communicable diseases, which disproportionately affect older people. At primary health care level, staff are not trained to identify chronic diseases such as diabetes or high blood pressure, and no drugs are available to treat these illnesses. This omission can have serious consequences for older people: untreated diabetes and high blood pressure may lead to complications such as physical, visual or hearing disabilities. In our survey, almost two-thirds of the respondents have at least one disability, with 51.5 to 61.2 per cent of older people having poor eyesight, and 16.4 to 25.9 per cent having poor hearing. There is currently no health service available in the rural areas to tackle these disabilities. We met one older woman who had to travel across the border to Cameroon for a cataract intervention and to get a pair of glasses (see the case study in Annex 2).

6.2 Case definition of malnutrition in older people using MUAC

In a previous report (Fritsch P and Myatt M 2011), we argued that MUAC is a better tool than body mass index (BMI) to assess the nutritional status of older people, and we made recommendations for the systematic use of MUAC when screening older people for malnutrition.

We also made recommendations that the thresholds for screening older people for malnutrition should be revised in order to be more sensitive, and that the case definitions/admission criteria shown in Table 15 should be used. These thresholds, which are widely used for adults (including in UNICEF SMART surveys in Chad[10]), should be used for screening older people in all situations where they are at risk of malnutrition, and we used them in this survey.

Table 15: Case definitions/admission criteria recommended by HelpAge International for screening older people for malnutrition

Indicator	Classification	Course of action
MUAC ≥210mm	Normal	Screen again within 30 days
MUAC <210mm	Moderate acute under-nutrition	Refer to supplementary feeding programme (SFP) and follow up
MUAC <185mm	Severe acute under-nutrition	Refer to therapeutic feeding programme (TFP), for medical screening and follow up
Oedema	Severe acute under-nutrition	Refer to TFP for medical screening and follow up

These thresholds differ from the thresholds currently proposed in the UNHCR guidelines, which are shown in Table 16, below. The thresholds in Table 16 were developed based on data derived from famines (ie generalised and extreme scarcity of food)[11]. The rationale behind these thresholds is that in situations of famine, resources are likely to be scarce and large numbers of people are undernourished.

Table 16: MUAC thresholds for diagnosing acute under-nutrition in famines

Classification	MUAC
Normal	≥185mm
Moderate acute under-nutrition	<185mm
Severe acute under-nutrition	<160mm

Current UNHCR guidelines are based on these "famine thresholds" and propose admission into SFP for older people with a MUAC between 160mm and 185mm (UNHCR 2011), and admission into TFP for older people with a MUAC below 160mm (Collins et al. 2000; Borrel 2001).

However, the "famine thresholds" are likely to lead to large numbers of unidentified malnourished older people, as well as severely malnourished ones being treated as moderately malnourished. More sensitive thresholds than those presented in Table 16 have been used in programmes providing nutritional support to women (whether or not they are pregnant or lactating), people living with AIDS, and the chronically sick (Republic of Zambia 2011). In

[10] Ministère de la Santé Publique and UNICEF 2012

[11] Famine, in this context, means a generalised and extreme scarcity of food leading to very high prevalence of wasting in both adults and children, with under five years mortality approaching or exceeding 10/10,000 per day. The "famine thresholds" were developed using data from adult therapeutic feeding programmes in the 1992 Somali emergency. Levels of wasting observed in this emergency were so extreme as to redefine the degree of wasting in adults believed to compatible with survival (Collins 1995).

these programmes, a threshold of 210mm is common. This is an internationally accepted minimum that is frequently increased to 230 mm when resources allow. We recommend that these thresholds, and not the "famine thresholds", be applied to identify the health and nutrition needs of older people in Chad and elsewhere. This recommendation is based on the humanitarian principle of impartiality, "which requires that [assistance] be provided *solely on the basis of need* and in proportion to need" (emphasis added, The Sphere Project 2011, p.22).[12]

It is thus HelpAge's recommendation that the thresholds presented in Table 15 should be used to assess older people's nutritional status, in the absence of any contrary evidence.

7 Recommendations

The results of our survey demonstrate two main issues: nutrition and health, which both need to be equally addressed.

7.1 Nutrition

- The results of our survey show that there are older people in Haraze Albiar who are malnourished or at risk of malnutrition, and there is a necessity for an intervention to address their needs. Humanitarian principles affirm that everyone has the right to humanitarian assistance, following the principles of impartiality and non-discrimination: "…no one should be discriminated against on any grounds of status, including age, gender…" (The Sphere Project 2011, p.22).[13]
- Older people are not currently included in any food assistance programmes in Chad. They are not included in WFP's blanket distribution, which targets children 6 to 23 months and women breastfeeding infants less than six months (OCHA-Chad April 2012), nor in the programmes targeting MAM and SAM. They are not acknowledged as an at-risk group by donors or NGOs, and are overlooked in all the reports produced by the nutrition cluster and UN Office for the Coordination of Humanitarian Affairs.

Inclusion and identification

Malnourished older people must first be identified in order to be referred for the appropriate treatment. The Sphere Project's core standard 4[14] suggests using disaggregated data in order to analyse how different groups of people are affected by a disaster, and to design programmes to meet the needs of all affected populations, including older people.

We recommend that:

- **Sex- and age-disaggregated data (SADD) should be routinely and systematically collected** and used in Chad for assessments and reporting.
- **The nutrition cluster should acknowledge older people as a vulnerable group**, and promote the collection of SADD. Currently older people are only identified as a group that "might be targeted" according to the national protocol. Including older people in selective feeding programmes would not be a huge burden on resources: in Hadjer Lamis, where older people are around 7,100 (based on the 2009 census population figures), there would be between 284 and 647 globally malnourished older people, including between 228 and 512 moderately malnourished and between 36 and 157

[12] www.spherehandbook.org/en/the-humanitarian-charter/
[13] www.spherehandbook.org/en/the-humanitarian-charter/
[14] Design and response, The Sphere Project's core standard 4, www.spherehandbook.org/en/core-standard-4-design-and-response/

severely malnourished needing to be included in community-based management of acute malnutrition (CMAM).[15]

- **Systematic screening of older people at health centre level should be carried out** by NGOs working in the health and nutrition sector, using sensitive case definitions/admission criteria (see below). Community-based health workers should be trained to detect malnutrition in older people through a process of on-going screening. Taking the MUAC measurement is simple enough for this work to be done by community-based volunteers.
- **The following case definitions/admission criteria should be used for all adults in Chad:**

Table 17: Case definitions/admission criteria for all adults

Indicator	Course of action
MUAC ≥210mm	Screen again within 30 days
MUAC <210mm	Refer to supplementary feeding programme (SFP) and follow up
MUAC <185mm	Refer to therapeutic feeding programme (TFP) for clinical screening and follow up
Oedema	Refer to TFP and follow up

Access

The Sphere Project's core standard 4 also recommends designing the response so that vulnerable groups have full access to assistance and protection services.

In the Haraze Albiar district, the prevalence of GAM is between 4.0 and 9.1 per cent (95% CI), which means that between 284 and 647 older people are in need of nutrition rehabilitation (based on 2009 census population figures).[16]

We recommend that:

- **Older people are acknowledged as a priority group for malnutrition** and included in the seasonal WFP blanket feeding programmes.
- Older people with a MUAC between 185mm and 210mm should be included in existing supplementary feeding programmes and provided with the appropriate high energy food items.
- **Older people with a MUAC of less than 185mm or oedema and who are not bedridden should be referred to the nearest hospital**, assessed for causes of secondary malnutrition (for instance, tuberculosis or other chronic diseases), treated accordingly, and enrolled into a therapeutic feeding programme, including CMAM. Community health workers should identify bedridden malnourished older people and include them in CMAM.

7.2 Health

The main risk factors associated with older malnutrition seem to be linked with their health status and the existence of vision or hearing impairments. This means that there is a need for health interventions as well as nutrition interventions targeting older people.

Given the poor performance of the Chadian health system and the priority given to maternal and child health and the control of communicable diseases, it is going to be very difficult to

[15] There would be between 496 and 1,129 globally malnourished older people according to the data widely used by health authorities and NGOs, with 397 to 893 moderately malnourished, and 62 to 273 severely malnourished older people.
[16] 496 to 1,129 older people in need of nutrition rehabilitation according to health authorities figures.

implement specific health interventions for older people without a national commitment. Our recommendations are therefore mostly about **advocacy to the Ministry of Health**, which should be done by the health cluster members, such as the WHO and humanitarian NGOs working in health.

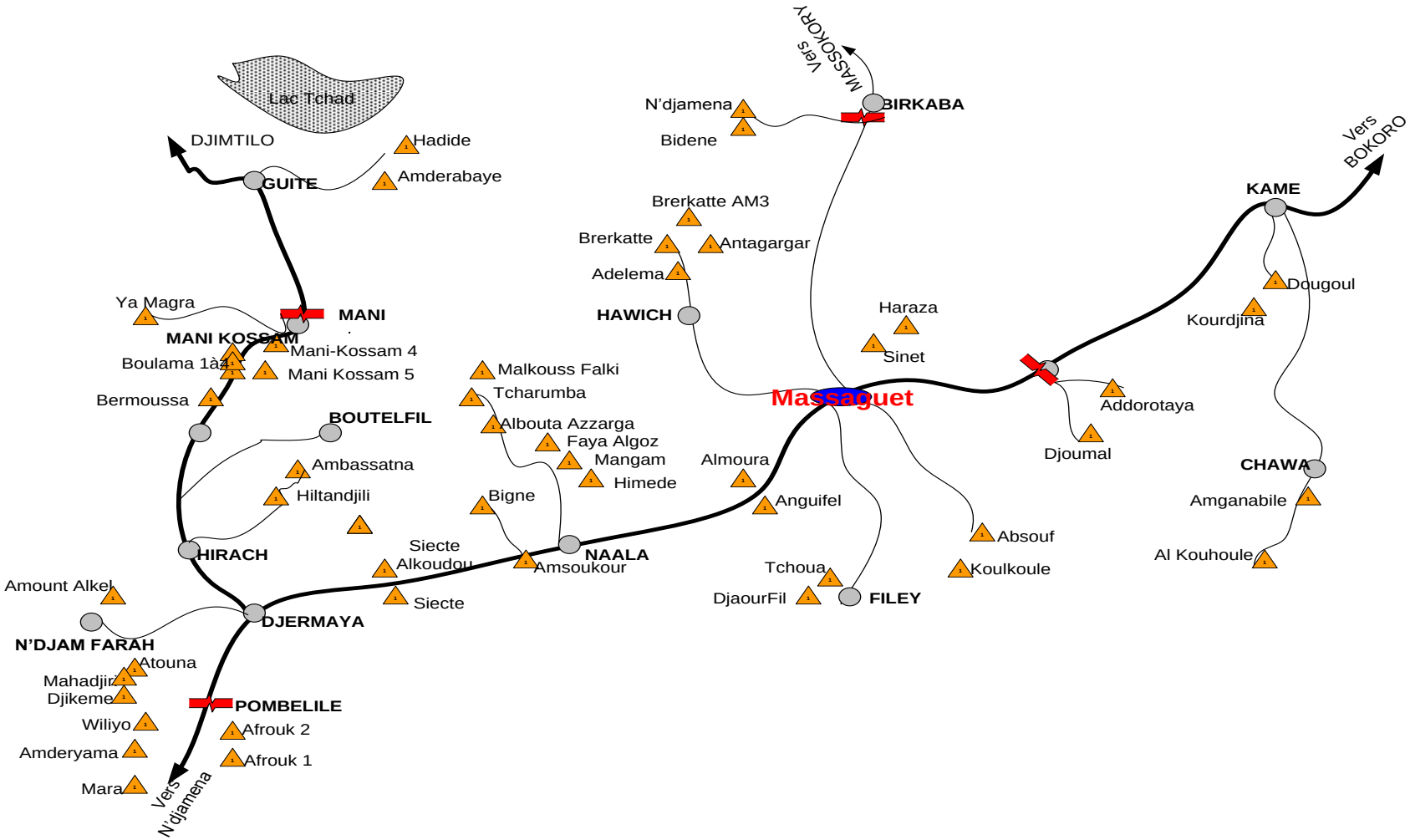
We recommend that:

- **The Ministry of Health should acknowledge the importance of non-communicable diseases as a public health issue**, and take steps to provide people with access to essential therapies to reduce morbidity and mortality due to acute complications or exacerbation of their chronic condition.[17]
- **Organisations working in health should be aware of the prevalence of visual and hearing impairments and their association with malnutrition.** Health NGOs should put in place surgery services to operate on cataracts, glaucoma (often a complication of untreated diabetes), and trichiasis (a complication of trachoma), as well as provide spectacles and hearing aids to people in need.
- **Mobility aids should be provided to older people.** Even though the prevalence of physical disability is not associated significantly with malnutrition in our study, providing mobility aids is an effective and efficient way to support older people to be more independent.
- **Older people should be exempted from the cost-recovery system for primary healthcare for the duration of the food crisis**.[18] Our survey identified the cost of health services as a reason for older people not to attend public health facilities. Low income and increases in the prices of staple foods are leading older people to exclude themselves from the health system, increasing the risk of malnutrition.
- **Community-based services targeting older people should be developed.** Community health workers are currently taking care of women and children. There are no home visits to disabled people of all ages, or to vulnerable older people.
- **Community-based health workers should be trained for the care of older people**, especially the bedridden ones. Along with hygiene, health and nutrition education and referral of serious cases, they should be able to provide physical and occupational therapy, pain management (such as for arthritis) and care for chronic diseases.

[17] Minimum Standards in Health Action, Standard 2.6, Essential health services – non-communicable diseases, The Sphere Project 2011, www.spherehandbook.org/en/essential-health-services-non-communicable-diseases-standard-1-non-communicable-diseases

[18] Minimum Standards in Health Action, Standard 4, Health financing, The Sphere Project 2011, www.spherehandbook.org/en/health-systems-standard-4-health-financing

Annex 1: Map of villages surveyed in Haraze Albiar



Annex 2: Case study

Adoura L, 80 years old, Danouna, Haraze Albiar district

Mrs Adoura L was born 80 years ago in the village of Danouna. She used to grow okra for a living on her own lands, and used to have 30 goats. Because of successive droughts, the lands became un-farmable and four years ago, the goats all died. She had to start another income generating activity. She became, and she still is, a potter.

Adoura's daughter died 18 years ago, leaving Adoura in charge of her two daughters who are now 18 and 20 years old. The two girls don't go to school; they support Adoura with the pottery sold on the local markets and they help with daily chores such as gathering wood and cooking.

Danouna is a well-known place for pottery. Adoura sells a jar for 500 to 750 FCFA (US$0.95 to $1.4). At 80 years old she has difficulty working: she has back and belly pains, and she suffers from frequent bouts of malaria. There are not enough medicines available in the local health centre. Paracetamol and chloroquine cost 10 FCFA (US$0.02) per tablet. Three years ago she had a chance to go to Cameroon in order to be operated for her cataract, and she bought glasses for 10,000 FCFA (US$19); but she still has a lot of difficulties with her eyesight.

Adoura says she is nostalgic for the past when everything was easier, when the lands were fertile and the seasons were predictable. Now she and her granddaughters don't find enough food. They eat principally rice and sometimes fish, but in recent years food prices have increased considerably. A sack of corn that was 12,500 FCFA (US$24) two years ago is now 18,500 FCFA (US$35); a sack of rice or millet that was 8,000 (US$15) is now 27,500 FCFA (US$52). The river has dried up and there is not enough fish anymore.

Despite her difficult situation, Adoura does not receive any food assistance. WFP distributes food rations to the health centre, but these are for pregnant and lactating women and children only. If there is a severe medical case of malnutrition, the patient is referred to the hospital in Massakory, but the cost of the transportation is 15,000 FCFA (US$28) – equivalent to the price of 30 of Adoura's clay jars.

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Older people are speaking out

we're listening

HelpAge International
PO Box 70156
London WC1A 9GB, UK

3rd Floor, Tavis House
1-6 Tavistock Square
London, WC1H 9NA, UK

info@helpage.org
www.helpage.org

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