Research Division
Population Services International

ATTITUDES TOWARDS WATER QUALITY AND WATER USE PRACTICES IN LOW INCOME AREAS IN LUSAKA

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Executive Summary

Study Objective: To examine perceptions of water quality, methods of water storage and water use, and awareness and practice of water purification in two low-income neighborhoods of Lusaka.

Methods: The study is based on reports from 825 randomly selected men and women from two low-income areas of Lusaka who were administered a structured knowledge, attitude, practices questionnaire on water use. Cross-tabulations are used in this study to examine the relationships between independent variables (such as age, gender education and household assets) and outcomes (water storage practices, perception of water quality).

Findings

- As expected, residents in the two neighborhoods are poorer, on average, than residents in urban Zambia

- Even among residents of these low-income neighborhoods, there are substantial differences in wealth and access to water and sanitation. For example, less than 1% of households with one or fewer assets have a flush toilet, compared to 36% of households with four or more assets.

- The majority (70%) of households use 20 liter containers for storing drinking water. Wealthier households in these neighborhoods are more likely to use 5 liter containers for water storage. Just over half (53%) of households keep water containers completely covered. Another 33% partially cover water containers and 13% do not cover water containers at all. Most respondents report pouring rather than scooping water out from containers.

- The majority of respondents are aware that poor quality water can result in diarrhea (87%) and cholera (70%). However, most respondents also believe that the quality of drinking water they receive is good (52%) or very good (29%). This suggests that their perception of being at risk of diarrhea or cholera, at least through drinking water, is low.

- About half (54%) of respondents believe that the quality of drinking water can be improved. More educated, wealthier and male respondents are more likely to believe that water quality can be improved. About 49% of respondents know that boiling water is a way of improving water quality, 15% believe in the efficacy of chlorine in improving water quality and about 3% know about adding purifying solution or tablets. Being male and of higher socio-economic status increases the likelihood of believing that water quality can be improved by boiling water or using chlorine.

- About 13% report ever having done something to improve water quality and 7% report doing something on a regular basis to improve water quality. These positive outcomes are correlated with higher socio-economic status. About 8% of women and 5% of men report doing something regularly to improve water quality. Overall, 6% of respondents report boiling water and 2% report adding chlorine on a regular basis to improve the quality of drinking water.

- Hygiene practices expose individuals to high risk of fecal-oral contamination or to eating contaminated food. Among respondents who prepare food (mostly women), only 10% always wash hands with soap and water. About 40% report never washing their hands with soap and water before food preparation. Only 5% of respondents always wash hands before eating food, while 57% never do. Only 21% always wash hands after using the toilet.

Hygiene practices are better among those with more education and higher SES. In part, poor hand-washing practices reflect the inability of low-income Zambians to purchase soap.

- Exposure to environmental contaminants is high. About 38% of respondents report that garbage is disposed in a pit near their homes while 56% report that it is disposed in a heap along the road. About 78% of respondents report that garbage is never collected from their neighborhoods. Only 15% report that monthly garbage collection takes place.

- The incidence of diarrhea among children in these low-income neighborhoods is about 42% higher than the national (urban) level. About 34% of respondents report that a child under five (in their households) had diarrhea in the last two weeks. Respondents with secondary education report lower rates of diarrhea among children under five. The association between socio-economic status and diarrhea in the last two weeks appears to be somewhat stronger than the association between education and diarrhoea.

Conclusions

Although respondents are aware of the relationship between drinking poor quality water and disease, they do not seem to make the link between the quality of water that they drink and risk of water borne disease,. While more than half of respondents believe that water quality can be improved, a very small proportion of households are regularly taking measures to improve water quality. If residents of low-income areas can be convinced that they are personally at risk of water-borne diseases and that it is possible to improve the quality of water through using a water purification solution, introduction of such a product could

lead to its adoption. However, the introduction of a water purification agent by itself is likely to have limited impact unless it is introduced within the framework of a strong educational campaign that enables low income people to improve their hygiene practices. Moreover, investments in sanitation infrastructure in Zambia will remain important in reducing exposure of young children to environmental contaminants (e.g. only 10% of households have access to a flush toilet).

INTRODUCTION

1.1 Background

The inadequate quality of drinking water consumed in Zambia places an enormous burden of water borne disease on the health of Zambians, particularly on the health of children. For example, the 1996 DHS showed that 24% of Zambian children under five experienced diarrhea in the 2 weeks preceding the survey (Central Statistical Office, 1997). Cholera and diarrhea are outcomes of poor water quality.

The US Centers for Disease Control has determined that dilute chlorine solution is an effective water purification agent. In co-ordination with the CDC, and based on qualitative consumer research conducted during 1998, SFH introduced a product (called *Clorin*) consisting of Sodium Hypochlorite solution in a 250 ml bottle SFH/PSI and introduced it through social marketing to low-income areas of Lusaka.

Clorin was first introduced in low-income areas in Lusaka, Chaisa and Mandeva/Marapodi. To assess the impact of the intervention on water purification practices, an evaluation strategy was designed that consisted of pre and post surveys to measure changes in water purification and use practices. This report is based on data from the first round, pre-intervention, household KAP survey conducted prior to the introduction of *Chlorin*.

1.2 Research Objectives

The aim of the research was to provide baseline information on knowledge, attitudes and behaviour concerning water use practices among low-income families. Specifically, the research was expected to provide information on the following:

- Sources of water
- Patterns of water use and storage
- Perceptions of water quality
- Awareness of water purification methods
- Use of water purification
- Hygiene practices

1.3 The Context

A survey of households in Chaisa and Mandevu/ Marapodi, two low-income neighbourhoods of Lusaka, was conducted in October 1998. The two neighbourhoods are adjacent to each other and sprawl to the north of Lusaka. The households in these neighbourhoods are typically poor. They use communal sanitation and obtain water from communal taps. Most homes lack electricity.

The development of these neighbourhoods was not planned systematically. Houses are close to each other, and offer little privacy. The security in these neighbourhoods is poor and the crime rate is high. With the exception of a few main roads, most other roads are dirt roads. Because residents have been living in these neighbourhoods for some time, facilities such as schools, churches and community halls, as well as markets, grocery stores and beer taverns have been constructed. Chaisa is considered as being as slightly better off in terms of socio-economic factors than Mandevu/Marapodi.

METHODOLOGY

2.1 Sampling

A sample size of 800, consisting of equal numbers of men and women, was considered appropriate to a) measure changes in key variables over time and b) to provide large enough cell sizes to permit detailed analyses. Respondents 15 and older were interviewed. In each household, a male or a female who was responsible for providing health care for children was interviewed.

Upon contact with a household, an adult member of the household was asked the name of the person (in that household) who knew most about health of the family members. If the named person was not available at that time, the interviewer made an appointment to conduct the interview at a later date or time.

2.2 The questionnaire

The questionnaire collected information socio-demographic characteristics of household members, exposure to the media, sources of water, knowledge of water purification methods, sanitation facilities and hygiene practices. The questionnaire was pre-tested and modifications were made accordingly.

2.3 Interviewer training

Interviewer training was conducted to ensure that interviewers understood the objectives of the study and became familiar with the questionnaire. The training was completed in three days. Six interviewers were used to conduct the field-work. Two experienced field supervisors were used to monitor the performance of interviewers.

2.4 Field-work

Supervisors were provided with maps of Mandevu / Marapodi and Chaisa. These maps were obtained from the Central Statistical Office (CSO). The maps showed the two neighbourhoods, demarcated into the Census Supervisory Areas (CSAs) used in the 1990 Census of Zambia. In turn, CSAs are divided into Standard Enumeration Areas (SEAs). Each interviewer was allocated a clearly demarcated area on the map in which they conduct interviews. The interviewers were instructed to approach each street that fell in their field-work area and select every third household for an interview. The actual number of interviews completed was 825.

2.5 Duration of field-work

The field-work was completed in four weeks. Since SFH intended to launch *Clorin* during the last week of October 1998, the fieldwork was completed by October 19, 1998.

2.6 Data Processing

The data was entered using Microsoft Access. The data was cleaned in Microsoft Access and then converted to SPSS for analysis.

2.7 Analysis

Independent variables used in this analysis include age, gender, education and an index of assets. The following possessions and amenities were used to create the index of assets: bicycle, motorcycle, car, van, refrigerator, television, radio, cassette player, paraffin stove, electricity and telephone. Dependent variables include indicators related to water storage, the perception of water quality, knowledge of ways of improving water quality, actual water use and hygiene practices.

Characteristics of the Sample

Table 1 shows the distribution of the male and female respondents in the sample. Female respondents were slightly younger than male respondents: 21% of women and 13% of men were 15-24 year old. Male respondents had a higher level of education: 35% of men had attained a secondary or higher education, compared with 15% of women. Male respondents were also slightly more likely to be from wealthier households: 28% of male respondents were from households with four or more assets compared to 19% of female respondents. That male respondents were wealthier is probably because of female-headed households, which constitute 23% of all households in Zambia (Central Statistical Office, 1997).

Table 1. Percentage distribution of the sample

	Women (n=451)	Men (n=374)
Age		
15-24	21.0	13.3
25-29	23.8	24.6
30-34	16.7	20.7
35-39	17.2	17.6
40 and older	21.2	23.8
Education		
None	35.5	12.8
Primary	32.2	27.5
Middle	17.7	24.6
Secondary or higher	14.6	35.0
Assets		
None	26.2	15.8
One	23.7	24.3
Two or three	31.0	31.6
Four or more	19.1	28.3
Total	100.0	100.0

Table 2 shows the percentage of respondents who listen to radio at least once a week. About 76% of respondents listen to radio at least once a week. Frequency of radio listenership is higher among men (82%) than women (67%). Respondents with secondary or higher education (93%) and those from households with four or more assets (95%) are more likely to listen to the radio at least once a week.

Table 2. Percentage who listen to the radio at least once a week

	%	n of cases
Age*		
15-24	69.9	136
25-29	79.3	188
30-34	76.4	144
35-39	83.7	135
40 and older	71.8	174
Sex		
Female	67.0	451
Male	82.1	374
Education		
None	56.7	208
Primary	65.7	248
Middle	84.3	172
Secondary or higher	92.9	197
Assets		
None	29.4	177
One	77.8	198
Two or three	85.7	258
Four or more	94.8	192
Total	76.2	825

* Age was not recorded for 48 respondents

RESULTS

Sanitation Facilities and Sources of Water

Figure 1 shows toilet facilities in the sample households. About 10% of households have a flush toilet, 12% have a ventilated improved (VIP) latrine and 78% have a traditional pit toilet. In comparison, 41% of households in urban Zambia have flush toilets, 0.3% have VIP latrines and 49% have traditional pit toilets (CSO, 1997).

Figure 1. Toilet facilities in household

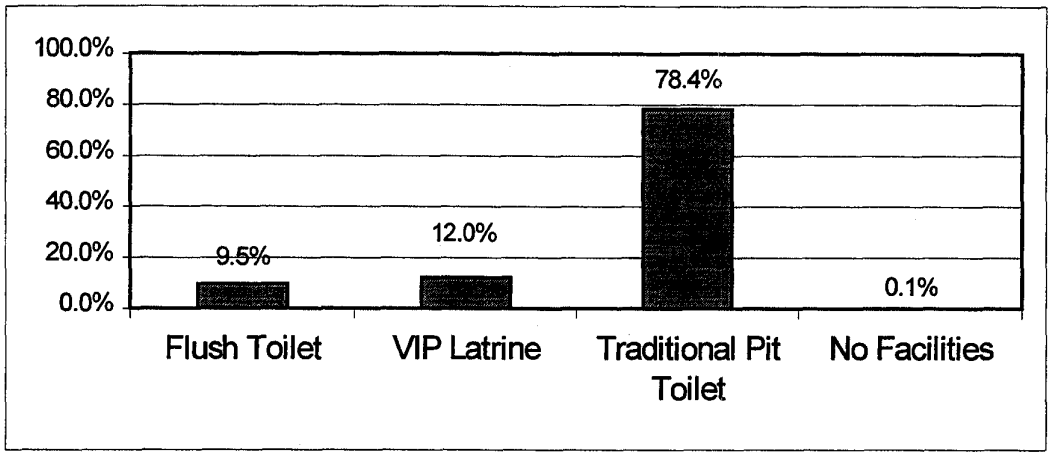


Table 3 shows the percentage of households with a flush toilet. There are dramatic differences in having a flush toilet by education and household assets. Only the wealthiest households in these low-income areas have a flush toilet: about 27% of respondents with secondary or higher education compared to less than 6% of other respondents have a flush toilet; nearly 36% of households with four or more assets compared to less than 3% of other households have flush toilets.

Table 3. Percentage of households with a flush toilet

	%	n of cases
Education		
None	3.8	208
Primary	2.4	248
Middle	5.8	172
Secondary or higher	27.4	197
Assets		
None	0.6	177
One	0.5	198
Two or three	2.7	258
Four or more	35.9	192
Total	9.5	825

The main sources of drinking water for the sample households are shown in Figure 2. About 19% of households have piped water in their homes, 78% obtain water from a public tap and 3% obtain water from other sources. In comparison, 47% of urban Zambian households have piped water and 34% obtain water from a public tap (Central Statistical Office, 1997).

Figure 2. Main source of drinking water for household

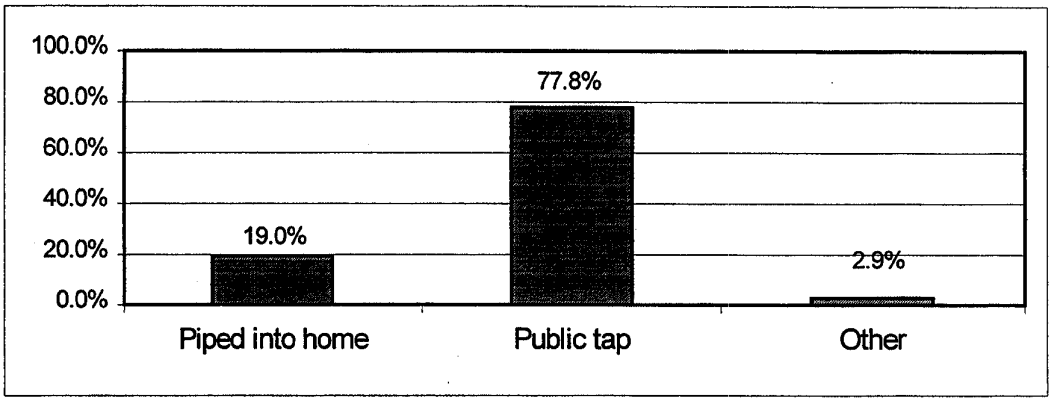


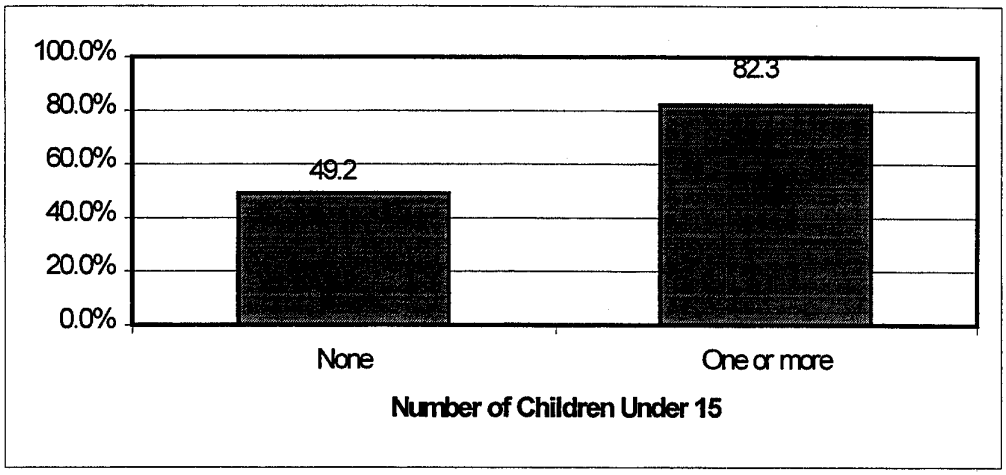
Table 4 shows the percentage of households in which the main source of drinking water is piped water. There are substantial differences in access to piped water by household wealth. About 37% of respondents with secondary education compared with less than 15% of other respondents drink piped water. Nearly 44% of households with four or more assets have piped water compared to less than 16% of other households.

Table 4. % of households for whom piped water is the main source of drinking water

	%	n of cases
Education		
None	13.5	208
Primary	14.1	248
Middle	12.2	172
Secondary or higher	37.1	197
Assets		
None	9.6	177
One	15.2	198
Two or three	10.1	258
Four or more	43.8	192
Total	19.0	825

For households that do not have piped water, children often obtain water. Figure 3 shows the percentage of respondents who receive help in obtaining water by the number of children under 15 in their households. There is a substantial difference between households without any child under 15 and households with at least one child under 15. About 49% of respondents living in households without a child under 15 compared to 82% of respondents living in households with at least one child under 15 receive assistance in obtaining water.

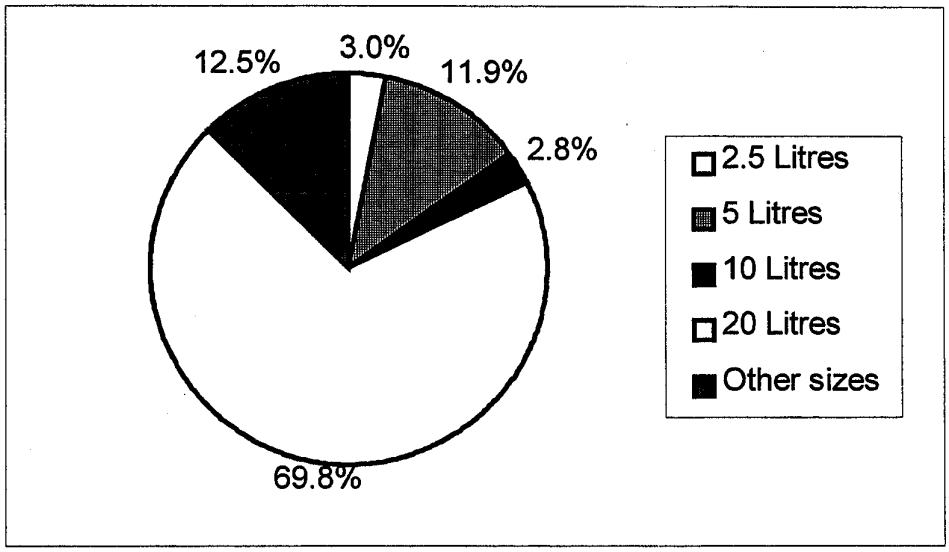
Figure 3. % of respondents who receive help in obtaining drinking water, by number of children under 15 (among households who do not have piped water)



Storage of Drinking Water

Figure 4 shows the sizes of containers used for storing drinking water. Most households (70%) store drinking water in 20 liter containers. About 12% of households store drinking water in 5 liter containers. Containers of other sizes are less frequently used for water storage.

Figure 4. Sizes of containers used for storing water



The percentage of households in which 20 liter containers are used to store water is shown Table 5. Wealthier households are less likely to use 20 liter containers for water storage. About 56% of respondents with secondary or higher education use a 20 liter container compared to 78% of respondents with no education. About 54% of households with four or more assets compared to 78% of households with no assets use 20 liter containers for water storage. This is probably because wealthier households have water piped into their homes and are less likely to need large water containers.

Table 5. Percentage of households who use a 20 liter container

	%	n of cases
Education		
None	77.9	208
Primary	72.6	248
Middle	71.5	172
Secondary or higher	56.3	197
Assets		
None	78.0	177
One	77.3	198
Two or three	70.2	258
Four or more	54.2	192
Total	69.8	825

Table 6 shows the percentage of households who use 5 liter containers. Wealthier households are more likely to use 5 liter containers to store drinking water. About 21% of respondents with secondary or higher education compared to less than 11% of other respondents use 5 liter containers. Nearly 22% of households with four or more assets compared to less than 11% of other households use 5 liter containers. .

Table 6. Percentage of households who use a 5 liter container

	%	n of cases
Education		
None	8.2	208
Primary	8.5	248
Middle	10.5	172
Secondary or higher	21.3	197
Assets		
None	7.5	177
One	7.6	198
Two or three	10.5	258
Four or more	21.9	192
Total	11.9	825

Coverage of Water Containers

Figure 5 shows whether drinking water containers in homes are not covered, partially covered or completely covered. Drinking water containers are not covered in 13% of households, partially covered in 34% of households and completely covered in 54%.

Figure 5. None, partial or complete coverage of drinking water containers

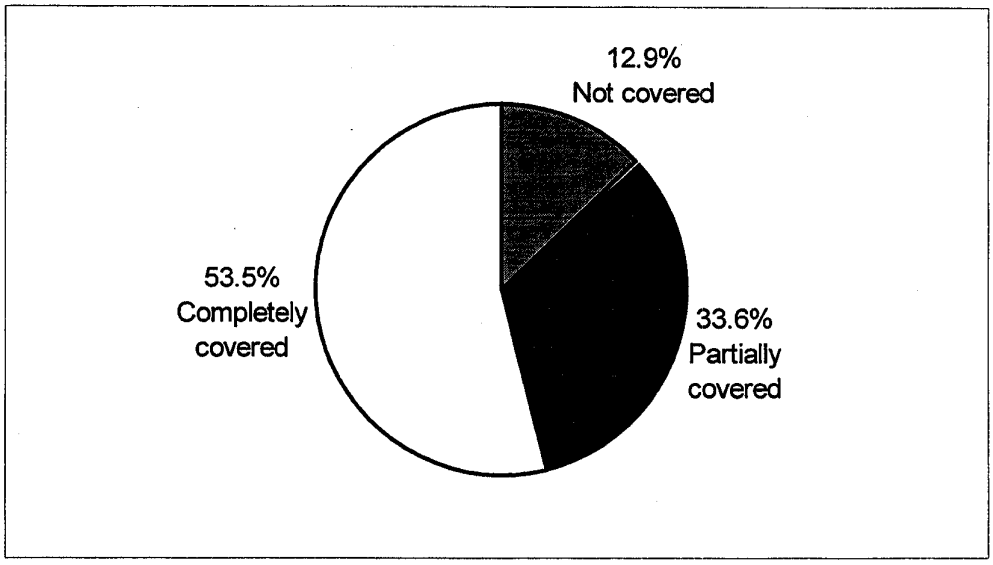


Table 7 shows the percentage of households in which containers are not covered and the percentage in which containers are completely covered. Non-coverage of containers is lowest among respondents with secondary or higher education (10%) and among households with four or more assets (7%). Complete coverage of containers is highest among respondents with secondary or higher education (64%) and among households with four or more assets (68%). Non-coverage is higher when containers are 10 or 20 liters or other sizes. Complete coverage of containers is higher when containers are 2.5 (88%) or 5 liters (87%).

Table 7. Percentage of households in which water containers are not covered and percentage in which they are completely covered

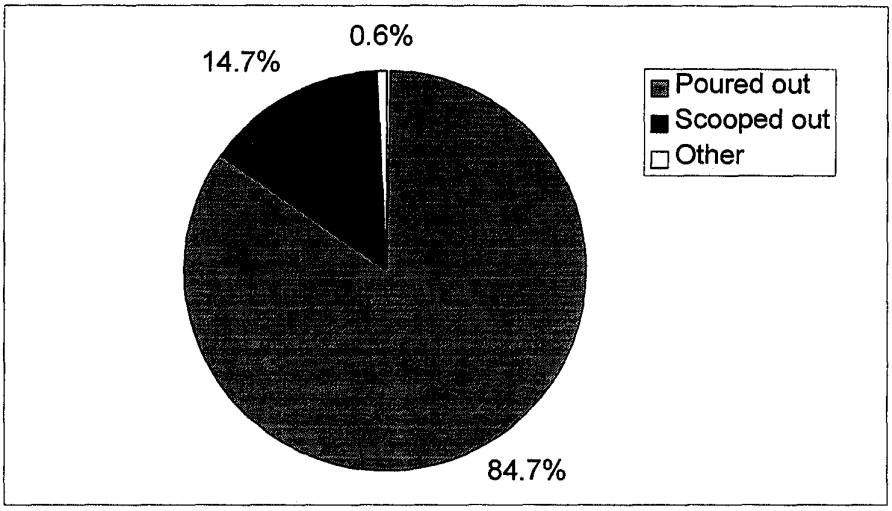
	Not covered %	Completely covered %	n of cases
Education			
None	13.9	43.8	208
Primary	14.5	51.2	248
Middle	12.8	54.7	172
Secondary or higher	9.6	64.0	197
Assets			
None	15.3	53.1	177
One	19.2	39.4	198
Two or three	10.9	52.3	258
Four or more	6.8	68.2	192
Size of Container			
2.5 liters	8.0	88.0	25
5 liters	3.1	86.7	98
10 liters	43.5	30.4	23
20 liters	13.4	48.4	576
Other sizes	13.6	43.7	103
Total	12.8	53.1	825

Using Water From Containers

If drinking water is scooped out from a container by a person whose hands are not washed, the chances of stored water becoming contaminated increase.

Figure 6 shows that in about 85% of households water is poured out from the container rather than being scooped out with a glass or a cup.

Figure 6. Drinking water poured or scooped out of container



The percentage of households in which drinking water is scooped out with a glass or a cup is shown in Table 8. Compared to the average (14%), this practice is less common among the most educated respondents (8%) and the wealthiest households (5%). That wealthier households are less likely to scoop out water from a container is consistent with the use of smaller containers in wealthier households.

Table 8. Percentage of households in which drinking water is scooped out with a glass or cup

	%	n of cases
Education		
None	13.0	208
Primary	18.5	248
Middle	16.9	172
Secondary or higher	8.1	197
Assets		
None	15.3	177
One	19.7	198
Two or three	16.7	258
Four or more	4.7	192
Total	14.3	825

Awareness of Ways to Improve the Quality of Drinking Water

Respondents were asked which diseases could result from drinking poor quality water. Table 9 shows the percentage of respondents who know that diarrhea and cholera can be caused by drinking poor quality water. Most respondents know that diarrhea (87%) and cholera (70%) can result from drinking poor quality water. It was somewhat unexpected that there were no consistent relationship between independent variables (such as education and household assets) and knowledge of the relationship between water quality and disease.

Table 9. Percentage who report that diarrhea and cholera are diseases caused by drinking poor quality water

	Diarrhea is caused by poor quality water %	Cholera is caused by poor quality water %	n of cases
Age*			
15-24	80.1	61.0	136
25-29	90.4	78.5	188
30-34	86.8	69.4	144
35-39	85.9	65.2	135
40 and older	86.8	70.1	174
Gender			
Female	86.5	71.5	451
Male	86.6	67.9	374
Education			
None	86.5	77.4	208
Primary	85.1	58.1	248
Middle	84.9	71.9	172
Secondary or higher	89.8	75.0	197
Assets			
None	84.7	61.6	177
One	88.9	70.7	198
Two or three	86.0	72.9	258
Four or more	86.5	72.6	192
Total	86.5	69.9	825

* 48 cases on the age variable were missing

Perception and Assessment of Water Quality

Perception of water quality may have important implications for practices to improve water quality. If respondents believe that the quality of water they receive is good, they are not likely to take prevention measures such as the use of water purification agents.

Respondents were asked what they considered to be sources of good quality drinking water. Figure 7 shows the percentage of respondents who report what they consider to be sources of good quality drinking water. About 50% of

respondents consider piped water to be of good quality and about 44% consider public tap water to be of good quality.

Figure 7. Sources of good quality drinking water

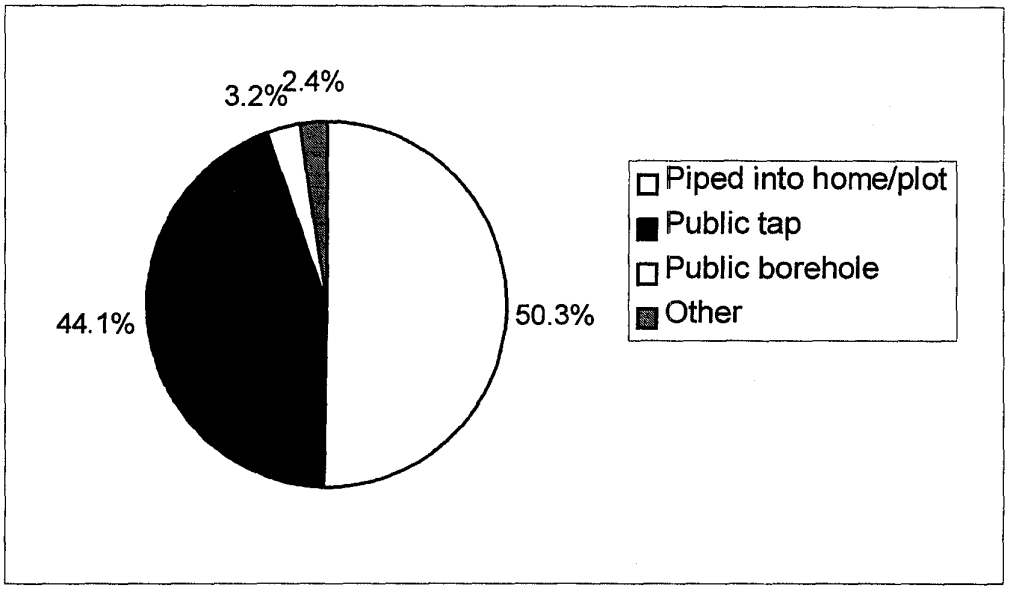
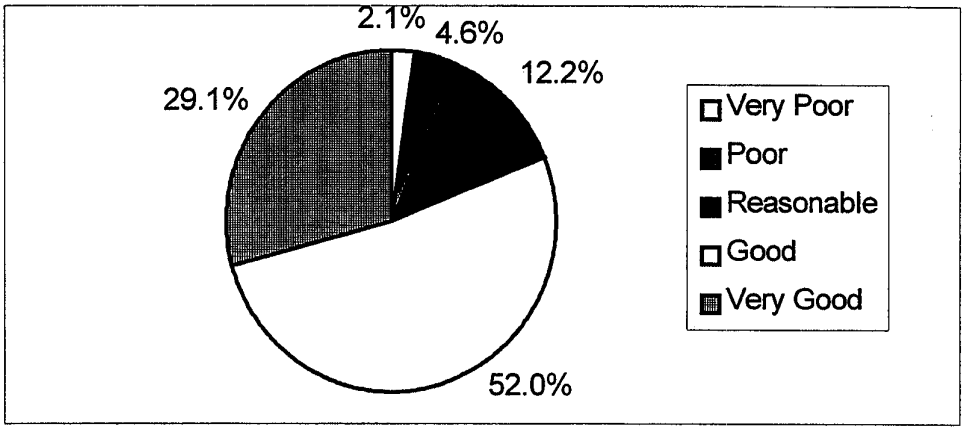


Figure 8 shows respondents' perception of the quality of water that is available to their households. About half (52%) the respondents believe that the water they drink is of good quality and more than a third believe that the quality of their drinking water is very good.

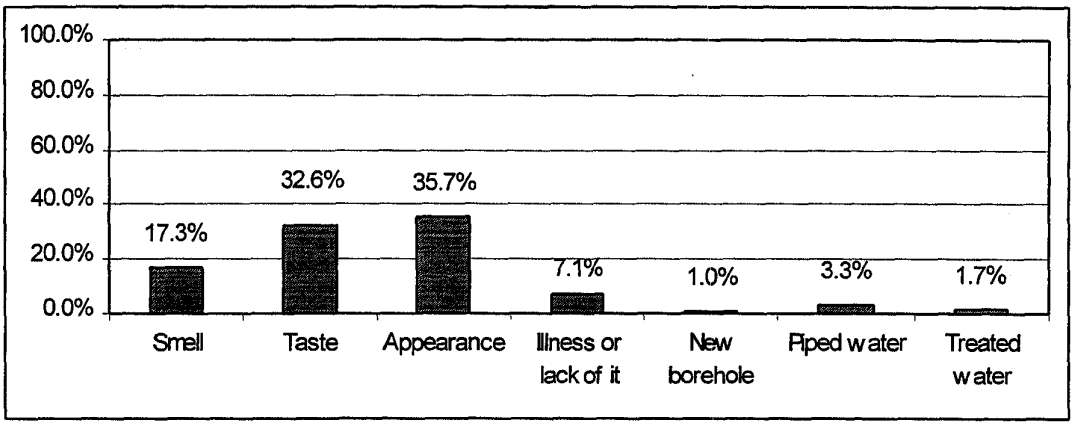
Figure 8. Perception of quality of drinking water available to household



We examined how the perception that the quality of water is poor or very poor (a perception shared by only 6.6% of respondents) varied by other variables (not shown). There was no variation in the perception that the quality of water available was poor, either by education or by household assets. However, respondents living in households that received their drinking water from other sources were more likely to believe that their water quality was poor (25%), compared to respondents who received piped water (5%) or respondents who received water from a public tap (6%).

Respondents were also asked how they assessed the quality of drinking water available to their household. Figure 9 shows that respondents use the appearance of drinking water (36%), its taste (33%) and smell (17%) as the main criteria for determining quality of drinking water. Illness (or lack of it) is another criterion for assessing water quality (7%).

Figure 9. Respondent assessment of the quality of drinking water



Improvement in Water Quality

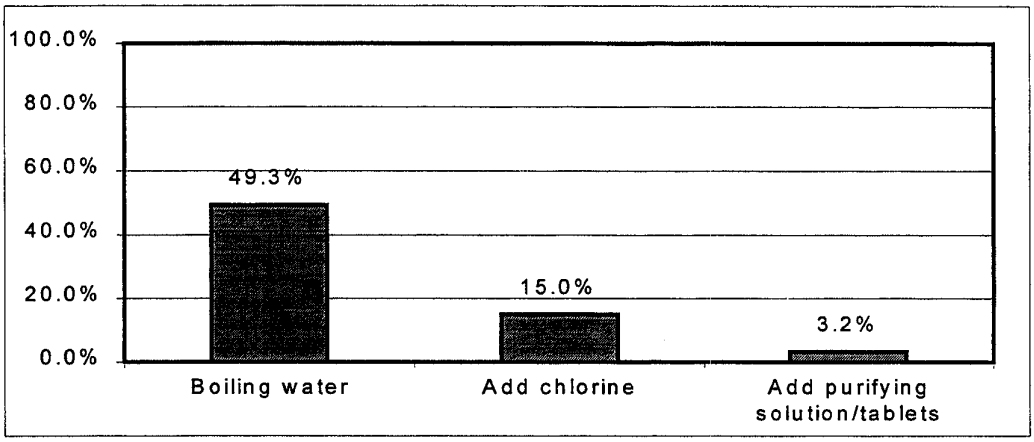
Respondents were also asked whether there was any way of improving the quality of drinking water. Table 10 shows the percentage of respondents who believe that water quality can be improved. About 54% of respondents believe that water quality can be improved. Older respondents are less likely (41%) to believe that quality of water can be improved. Men (61%), respondents with secondary or higher education (74%) and households with four or more assets (70%) are more likely to believe that the quality of water can be improved.

Table 10. Percentage who believe that the quality of drinking water can be improved

	%	n of cases
Age		
15-24	56.6	136
25-29	56.4	188
30-34	57.6	144
35-39	54.1	135
40 and older	40.8	174
Gender		
Female	47.7	451
Male	61.0	374
Education		
None	38.9	208
Primary	44.0	248
Middle	62.8	172
Secondary or higher	73.6	197
Assets		
None	44.1	177
One	51.0	198
Two or three	50.0	258
Four or more	70.3	192
Total	53.7	825

About 49% believed that water quality could be improved by boiling water, 15% by adding chlorine and 3% by adding purifying solution or tablets.

Figure 10. The percentage of all respondents who believe that the quality of drinking water could be improved by boiling, adding chlorine or adding tablets



The percentage of all respondents who believe that water quality can be improved by boiling water is shown in Table 11. Respondents 40 and older are less likely to believe that boiling water helps improve water quality. Men (56%), respondents with higher education (68%) and wealthier households are more likely to believe in the benefits of boiling water (67%).

Table 11. Percentage of all respondents who report that boiling water is a way to improve the quality of drinking water

	%	n of cases
Age		
15-24	50.0	136
25-29	51.1	188
30-34	54.2	144
35-39	51.1	135
40 and older	39.1	174
Gender		
Female	44.1	451
Male	55.6	374
Education		
None	34.6	208
Primary	40.7	248
Middle	58.7	172
Secondary or higher	67.5	197
Assets		
None	37.9	177
One	45.5	198
Two or three	47.3	258
Four or more	66.7	192
Total	49.3	825

Table 12 shows the percentage of all respondents who believe that adding chlorine is a way of improving the quality of drinking water. Respondents 40 and older are less likely to believe that adding chlorine helps improve water quality. Men (20%), respondents with higher education (33%) and wealthier households are more likely to believe in the benefit of boiling water (29%).

Table 12. Percentage of all respondents who believe that adding chlorine is a way of improving the quality of drinking water

	%	n of cases
Age		
15-24	11.8	136
25-29	21.3	188
30-34	14.6	144
35-39	15.6	135
40 and older	11.5	174
Gender		
Female	10.6	451
Male	20.3	374
Education		
None	4.8	208
Primary	9.3	248
Middle	15.7	172
Secondary or higher	32.5	197
Assets		
None	6.8	177
One	10.6	198
Two or three	13.6	258
Four or more	29.2	192
Total	15.0	825

Table 13 shows the percentage of respondents who report ever having done something to improve the quality of drinking water. The percentage who have ever done something to improve the quality of water is higher for respondents with higher education (22%) and for households with four or more assets (26%).

Table 13. Percentage who report ever having done something to improve the quality of drinking water

	%	n of cases
Age		
15-24	15.4	136
25-29	16.0	188
30-34	9.0	144
35-39	17.0	135
40 and older	9.8	174
Gender		
Female	14.0	451
Male	12.0	374
Education		
None	9.1	208
Primary	9.3	248
Middle	12.8	172
Secondary or higher	22.3	197
Assets		
None	6.8	177
One	10.1	198
Two or three	10.1	258
Four or more	26.0	192
Total	13.1	825

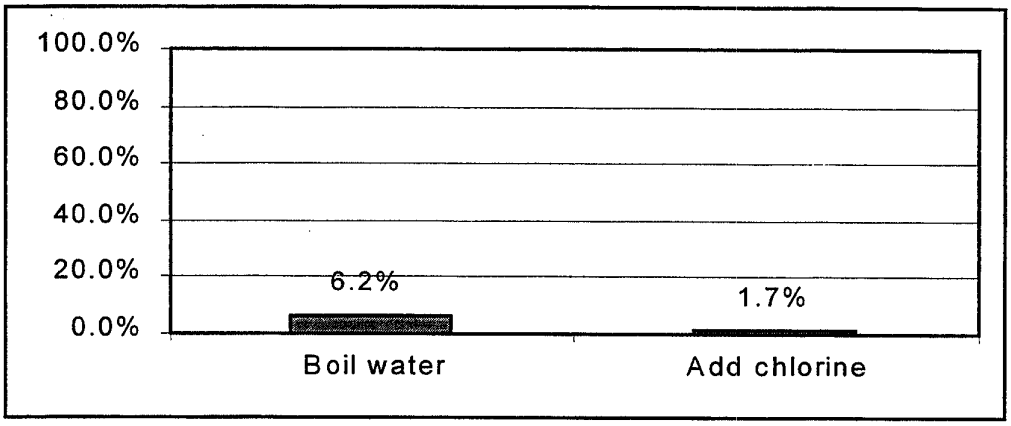
The percentage of respondents who report that they regularly do something to improve the quality of drinking water is shown in Table 14. The proportion of those who regularly do something is higher for those with secondary or higher education (13%) and those from households with four or more assets (15%).

Table 14. Percentage who report that they or a household member regularly do something to improve the quality of drinking water

	%	n of cases
Age		
15-24	8.8	136
25-29	6.9	188
30-34	6.9	144
35-39	8.1	135
40 and older	5.2	174
Gender		
Female	8.2	451
Male	5.3	374
Education		
None	3.4	208
Primary	7.3	248
Middle	4.1	172
Secondary or higher	12.7	197
Assets		
None	4.4	177
One	2.5	198
Two or three	6.2	258
Four or more	15.1	192
Total	6.9	825

Figure 11 shows the percentage who regularly boil water or add chlorine to improve the quality of drinking water. About 6% of respondents boil water to improve its quality and about 2% add chlorine to it.

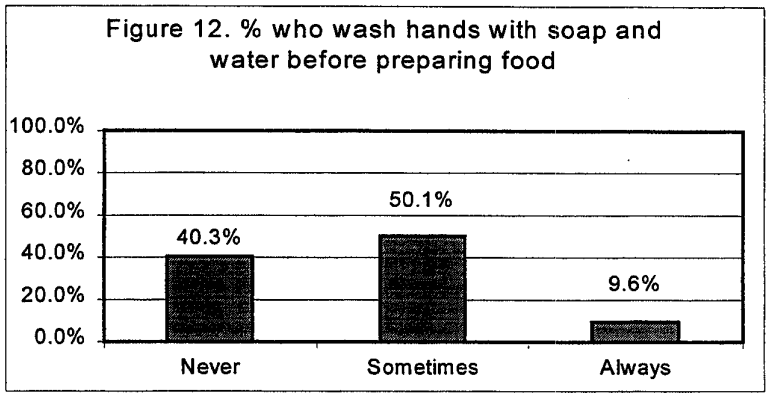
Figure 11. Percentage of all respondents who engage in specific activities to improve the quality of drinking water



Hygiene practices

Hand-washing

Among those who prepare food (mostly women), the percentage who wash their hands with soap and water before preparing food is shown in Figure 12. Only 10% of respondents always wash their hands with soap and water before preparing food.

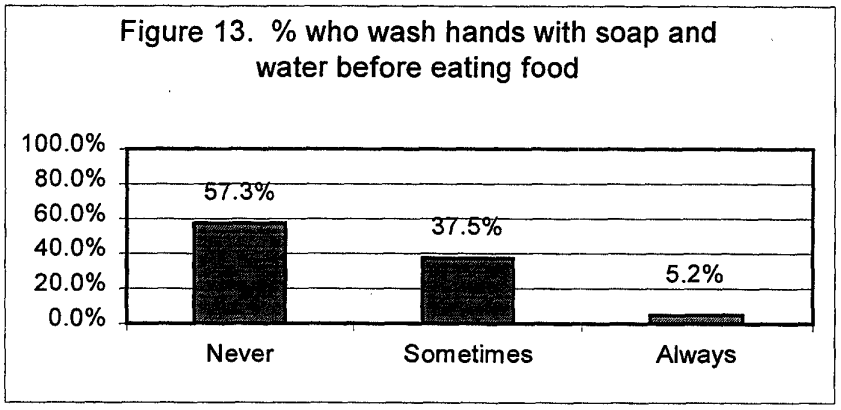


The percentage of respondents who never wash their hands with soap and water before food preparation is shown in Table 15. Respondents over 40, those with lower education and lower SES are more likely to never wash their hands with soap and water before preparing food.

Table 15. % who never wash hands with soap and water before preparing food

	%	n of cases
Age		
15-24	37.6	101
25-29	40.4	109
30-34	36.9	65
35-39	36.4	66
40+	50.0	64
Gender		
Female	40.3	375
Male	40.7	54
Education		
None	45.7	138
Primary	47.4	135
Middle	35.4	79
Secondary+	23.4	77
Assets		
None	49.5	111
One	52.1	96
Two or three	39.4	132
Four or more	17.8	90
Total	40.3	429

The percentage of respondents who wash their hands with soap and water before eating food is shown in Figure 13. Only 5% of respondents always wash their hands with soap and water before eating food.

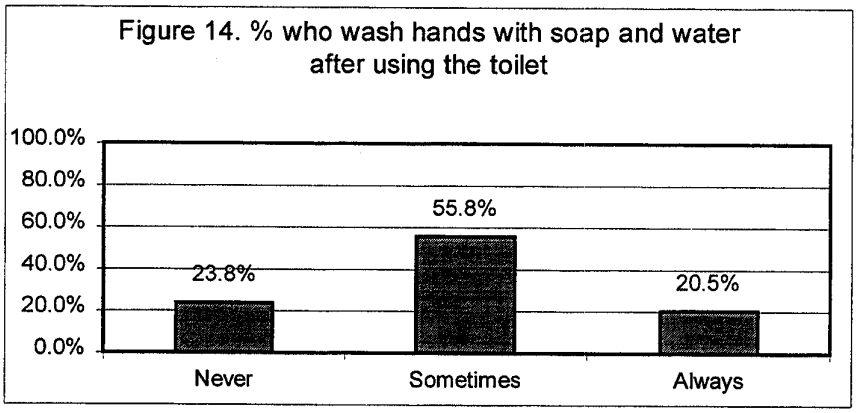


The percentage of respondents who never wash their hands with soap and water before eating food is shown in Table 16. Men are more likely than women to never wash their hands before eating food. Persons with lower SES are also more likely to not wash their hands with soap and water before eating.

Table 16. % who never wash hands with soap and water before eating food

	%	n of cases
Age		
15-24	55.9	136
25-29	55.9	188
30-34	56.9	144
35-39	54.1	135
40+	62.1	174
Gender		
Female	52.8	451
Male	62.8	374
Education		
None	53.4	208
Primary	66.5	248
Middle	58.1	172
Secondary+	49.2	197
Assets		
None	63.8	177
One	63.6	198
Two or three	58.5	258
Four or more	43.2	192
Total	57.3	825

Figure 14 shows the percentage of respondents who report not washing their hands with soap and water after using the toilet. Only 21% of respondents always wash their hands with soap and water after using the toilet.



Incidence of Diarrhea

The percentage of respondents who report that diarrhea occurred to a child under five in the last two weeks is shown in Table 18. Overall, about 34% of respondents reported that diarrhea occurred to a child under five. This is about 42% higher than the average for urban Zambia (Central Statistical Office, 1997). The incidence of diarrhea among children is higher in households where respondents have lower education and SES. Washing hands with soap, before eating food, does not seem to have a direct relationship with the occurrence of diarrhea among children. However, respondents who always wash their hands with soap after using the toilet reported lower incidence of diarrhea among children under 5 (26%).

Table 18. % who report that diarrhea occurred to child under 5 in last two weeks

	%	n of cases
Education		
None	38.4	125
Primary	39.8	176
Middle	33.1	124
Secondary+	23.3	120
Assets		
None	47.7	109
One	40.4	141
Two or three	31.0	171
Four or more	20.2	124
Wash hands with soap before eating food		
Never	37.3	324
Sometimes	29.2	195
Always	34.6	26
Wash hands with soap after using the toilet		
Never	37.7	122
Sometimes	35.5	324
Always	26.3	99
Total	34.3	545

Note: Restricted to households with children under 5

CONCLUSIONS

Residents of Chaisa and Mandevu/Marapodi compounds have limited access to sanitation facilities and piped water. Most respondents to this survey rely on pit latrines for toilet facilities and obtain their water from public taps and relatively few households have piped water. This means that water has to be decanted into containers and transported to and stored in homes. This provides multiple opportunities for the water to be exposed to contaminants.

There is significant awareness of contracting diseases such as diarrhea and cholera from drinking poor quality water. Personal hygiene practices can be improved and a relatively small proportion of persons who prepare food wash hands with soap and water before food preparation. Use of soap to wash hands after using the toilet is also low. This is probably because of the inability of poor households to purchase soap.

Respondents judge water quality by its appearance and smell and, as a consequence, remain unable to accurately assess water quality. Thus, they perceive that the water they drink is of good quality. About half the respondents know that water quality could be improved further (the most commonly known method of water purification is boiling water). However, a very small proportion of households (7%) do anything on a regular basis to improve the quality of their drinking water.

The findings from this study suggests that an intervention to introduce a water purification agent may be successful if residents of these low-income areas are convinced that they are personally at risk of exposure to water-borne diseases. The multiple sources water contamination include the process of water collection and storage itself. Personal hygiene practices (especially, the use of soap in washing hands) are also extremely important in avoiding oral-fecal or food contamination. Because of poor hygiene, practices interventions that focus on

improving water quality are more likely to be effective in reducing diarrhea and other water borne diseases among children if they are accompanied by strong public health messages and interpersonal communication that focuses on better personal hygiene. Programs should also help people to more accurately assess the quality of their water supply, and should increase awareness that water which looks clean and does not smell can be contaminated.

REFERENCES

Central Statistical Office [Zambia]. 1997. **Zambia Demographic and Health Survey, 1996.** Calverton, Maryland: Central Statistical Office and Macro International Inc.

ZAMBIA WATER USE PRACTICES BASELINE QUESTIONNAIRE, 1998

Interviewer Name: _____

Date of Interview: _____

Location: _____

CSA # _____

Street Name _____

House Number _____

Sex of Respondent _____ (Male, Female)

Marital Status: _____ (Single, Married, Divorced, Widowed)

If Married Female: Does your husband stay with you? _____

Time Interview Began: _____

Time Interview Completed: _____

Supervisor signature: _____

Introduction: My name is _____. We are conducting a research project to improve the health of the people in Zambia. Your community has been chosen to take part in this project. In order to ensure that this project is successful, we would like to know about you, your family, your water handling and health practices. The questions we are about to ask will take about 15 minutes of your time. The answers you provide will not be shared with anyone outside this project, and will only be used for the benefit of you and the community. During this interview, we would also like to view your water and toilet facilities. Please think carefully about each question and answer as best as you can. You can choose not to answer any of the questions. We would like to speak to the person who knows the most about the health of your family members. Who would that be?

Background Characteristics

No.	Questions and filters	Coding categories	Skip to
101	In what month and year were you born ?	Month ---------- __ __ DK Month ---------- 98 Year ---------- __ __ DK Year ---------- 98	
102	How old are you ? (COMPARE Q101 and Q102, CORRECT IF INCONSISTENT)	Age in completed yrs __ __	
103	Have you ever attended school ?	Yes --------- 1 No ---------- 0	Q106
104	What is the highest level of school you attended: primary, middle secondary or higher ?	Primary ---------- 1 Middle ---------- 2 Secondary ---------- 3 Higher ---------- 4	
105	What is the highest class you completed at that level ?	---------- 1 ---------- 2 ---------- 3 ---------- 4 ---------- 5	
106	What is your religion ?	Catholic ---------- 1 Protestant ---------- 2 Other Christian --- 3 None ---------- 4 Other ---------- 5	
107	What is your occupation ?		

Media Exposure, Assets and Housing Characteristics

No.	Questions and filters	Coding categories	Skip to
201	Do you usually listen to the radio at least once a week ?	Yes ------- 1 No -------- 0	Q203
202	At what time do you usually listen to the radio ? (MULTIPE ANSWERS ARE POSSIBLE)	**AM** 1-3 ---------- 1 4-6 ---------- 2 7-9 ---------- 3 10-12 ---------- 4 **PM** 1-3 ---------- 5 4-6 ---------- 6 7-9 ---------- 7 10-12 ---------- 8	
203	Do you usually listen to the television at least once a week ?	Yes ------- 1 No -------- 0	Q205
204	At what time do you usually watch television ? (MULTIPE ANSWERS ARE POSSIBLE)	**AM** 1-3 ---------- 1 4-6 ---------- 2 7-9 ---------- 3 10-12 ---------- 4 **PM** 1-3 ---------- 5 4-6 ---------- 6 7-9 ---------- 7 10-12 ---------- 8	
205	Do you usually read a newspaper at least once a week ?	Yes ------- 1 No -------- 0	
206	Do you or any members of your household own ... (READ LIST) (MULTIPE ANSWERS ARE POSSIBLE)	No Yes A bicycle --------- 0 1 A motorcycle ----- 0 1 A car ---------- 0 1 A van or truck -----0 1 A VCR ----------0 1 A cassette player --0 1 A radio ----------0 1 A television --------0 1 A refrigerator ----- 0 1	
207	Does your house have ... (READ LIST)	No Yes Electricity--------- 0 1	

	(MULTIPE ANSWERS ARE POSSIBLE)	A telephone -------0 1	
208	What kind of walls does you house have ?	Brick/cement ------- 1 Mud ---------- 2 Wood ---------- 3 Other ---------- 4	
209	What kind of floors does your house have ?	Cement/tile/vinyl ---- 1 Wood planks ---------- 2 Mud/sand ---------- 3 Other ---------- 4	
210	What kind of toilet facilities does your household have?	Flush toilet Own flush toilet -- 1 Shared flush toilet -- 2 Pit Toilet/Latrine Traditional pit toilet --3 VIP latrine -- 4 No facilities/bush/field - 5 Other _____ (SPECIFY)	
211	How many persons, including children, share these toilet facilities ?	____	
212	How many adults 15 and older live in your house ?	Number _____	
213	How many children under 15 live in your house ?	Number _____	

Sources of Drinking Water

No.	Questions and filters	Coding categories	Skip to
301	What are the different uses of water in your house ? RECORD MULTIPLE RESPONSES	drinking ---- 1 cooking ---- 2 washing clothes ---- 3 cleaning plates ---- 4 bathing ---- 5 other (specify) _____	
302	What is the main source of drinking water for members of your household ?	Piped water Piped into home or plot --1 Public tap -- 2 Well water Well in residence/plot -- 3 Public shallow well -- 4 Public traditional well -- 5 Public borehole -- 6 Surface water Spring -- 7 River/Stream -- 8 Pond/lake -- 9 Tanker truck -- 10 Rainwater -- 11 Bottled water -- 12 Other -- 13	 Q308 Q308 Q401 Q308
303	How many times in a week do you obtain drinking water from this source ?	Once a week ------- 1 twice a week ------- 2 three times a week ------- 3 four times a week ------- 4 five times a week ------- 5 six times a week ------- 6 every day -------- 7	
304	Does any member of your family assist you in obtaining drinking water ?	Yes ------- 1 No -------- 0	
305	What is the relationship of that person to you ?	child --- 1 husband --- 2 other adult male relative -- 3 adult female relative --- 4 Other ---- 5	
306	What is your mode of transport to that source ?	walking ---- 1 bus ---- 2 car ---- 3 other ----- 4	

No.	Questions and filters	Coding categories	Skip to
307	How long does it take to go there, get water and come back ?	___ minutes ___ hours	
308	Do you have to pay for the water ?	Yes ------- 1 No -------- 0	Q401
309	How much do you pay ?	___ per container ___ per ... ___	

Storage and Use of Drinking Water

No.	Questions and filters	Coding categories	Skip to
401	How many containers do you use for storing drinking water ?	____	
402	What are the sizes of containers used for storing drinking water ?		
403	Are the containers in which drinking water is stored...	not covered -- 1 partially covered -- 2 completely covered -- 3	
404	Is drinking water poured out into a glass or a cup from these containers or does a person have to use a glass or a cup to scoop water out ?	Water is poured out -- 0 water is scooped out -- 1 Other _____ (SPECIFY)	
405	How many people obtain drinking water from these containers ?	___	
406	How much drinking water is consumed in your house every day ?	___	

Sources of Washing and Cooking Water

No.	Questions and filters	Coding categories	Skip to
501	Are the sources of drinking water and water used for washing clothes the same ?	Yes ------- 1 No -------- 0	Q503
502	What is the source of water used for washing clothes?	Piped water Piped into home or plot --1 Public tap -- 2 Well water Well in residence/plot -- 3 Public shallow well -- 4 Public traditional well -- 5 Public borehole -- 6 Surface water Spring -- 7 River/Stream -- 8 Pond/lake -- 9 Tanker truck -- 10 Rainwater -- 11 Bottled water -- 12 Other -- 13	
503	Is water for washing clothes kept in the same container as drinking water ?	Yes ---- 1 No ----- 0	
504	How much water is used for washing clothes every week ?	____	
505	Are the sources of drinking water and water used for cooking the same ?	Yes ------- 1 No -------- 0	Q507
506	What is the source of water used for cooking ?	Piped water Piped into home or plot --1 Public tap -- 2 Well water Well in residence/plot -- 3 Public shallow well -- 4 Public traditional well -- 5 Public borehole -- 6 Surface water Spring -- 7 River/Stream -- 8 Pond/lake -- 9 Tanker truck -- 10 Rainwater -- 11 Bottled water -- 12 Other -- 13	

507	Is water for cooking kept in the same container as drinking water ?	Yes ------- 1 No -------- 0	Q509
508	Are the containers in which cooking water is stored ...	not covered -- 1 partially covered -- 2 completely covered -- 3	
509	How much water is used for cooking every day ?	____	

Water Quality

No.	Questions and filters	Coding categories	Skip to
601	Is the quality of drinking water that is available to your household ..	very poor -- 1 poor -- 2 reasonable -- 3 good -- 4 very good -- 5	
602	How do you know that the quality of drinking water available to your household is ____ (USE REPONSE FROM q601)	smell --1 taste --2 appearance -- 3 people get sick -- 4 children get sick -- 5 other _____ (SPECIFY)	
603	What are the the consequences of drinking water that is of poor quality ? MULTIPLE RESPONSES ARE POSSIBLE	causes poor health ----- 1 causes _____ (SPECIFY) Other _____ (SPECIFY)	
604	What are diseases that can result from drinking poor quality water ?	diarrhoea -- 1 cholera -- 2 other diseases _____ _____ _____ _____ (SPECIFY)	
605	What are the sources of poor quality drinking water?	Piped water Piped into home or plot --1 Public tap -- 2 Well water Well in residence/plot -- 3 Public shallow well -- 4 Public traditional well -- 5 Public borehole -- 6 Surface water Spring -- 7 River/Stream -- 8 Pond/lake -- 9 Tanker truck -- 10 Rainwater -- 11 Bottled water -- 12 Other -- 13	

606	What are the sources of good quality drinking water ?	Piped water Piped into home or plot --1 Public tap -- 2 Well water Well in residence/plot -- 3 Public shallow well -- 4 Public traditional well -- 5 Public borehole -- 6 Surface water Spring -- 7 River/Stream -- 8 Pond/lake -- 9 Tanker truck -- 10 Rainwater -- 11 Bottled water -- 12 Other -- 13	

Measures for improving water quality

No.	Questions and filters	Coding categories	Skip to
701	Is there any way of improving the quality of drinking water?	Yes ------- 1 No -------- 0	Q708
702	What are the ways of improving the quality of drinking water ?	Boiling --1 add chlorine --2 add iodine --3 add purifying solution --4 add purifying tablets --5 other _____ (SPECIFY)	
703	Have you or has any household member ever done anything to improve the quality of drinking water?	Yes ------- 1 No -------- 0	Q707a
704	What have you or another household member done to improve the quality of drinking water ?	Boiling --1 add chlorine --2 add iodine --3 add purifying solution --4 add purifying tablets --5 other _____ (SPECIFY)	
705	Do you or any household member regularly do something to improve the quality of drinking water?	Yes ------- 1 No -------- 0	Q707b
706	What do you or another household member do to improve the quality of drinking water available ?	Boiling --1 add chlorine --2 add iodine --3 add purifying solution --4 add purifying tablets --5 other _____ (SPECIFY)	
707	a) Why have you or another household member not done anything to improve the quality of drinking water ? b) Why do you or another household member not do anything to improve the quality of drinking water ?	water quality is good -- 1 too expensive -- 2 too time consuming -- 3 method not available -- 4 method difficult to carry out -- 5 other _____ (SPECIFY)	
708	Have you ever heard of chlorine ?	Yes ------- 1 No -------- 0	Q712

709	Have you ever used chlorine?	Yes ------- 1 No -------- 0	
710	Do you know that chlorine can be used to improve the quality of drinking water ?	Yes ------- 1 No -------- 0	
711	Would you use chlorine to improve the quality of drinking water if it were available ?	Yes ------- 1 No -------- 0	
712	Would you use a special disinfectant to improve the quality of water if it were available ?	Yes ------- 1 No -------- 0	
713	Where would you expect to find this product ?		
714	Who decides which products should be purchased for your household?	respondent -- 1 husband/wife -- 2 father/father in law -- 3 mother/mother in law -- 4 other _____ (SPECIFY)	

Hygiene Practices

No.	Questions and filters	Coding categories	Skip to
801	How many times a day do you wash hands with soap and water ?	Once -- 1 twice -- 2 thrice -- 3 four or more times -- 4	
802	Who usually prepares the food in your household ?	respondent -- 1 husband/wife -- 2 father/father in law -- 3 mother/mother in law -- 4 other _____ (SPECIFY)	
803	Do you wash hands with soap and water before preparing food ... (READ OUT OPTIONS)	Never -- 1 Sometimes -- 2 Always -- 3	
804	Do you wash hands with soap and water before eating food ... (READ OUT OPTIONS)	Never -- 1 Sometimes -- 2 Always -- 3	
805	Do you wash hands with soap and water after using the toilet ... (READ OUT OPTIONS)	Never -- 1 Sometimes -- 2 Always -- 3	
806	How often do you take a bathe ?	Less than once a week -- 1 Once a week -- 2 twice a week -- 3 more than once a week -- 4 every day -- 5	
807	How often do children in your household bathe ?	Less than once a week -- 1 Once a week -- 2 twice a week -- 3 more than once a week -- 4 every day -- 5	
808	Where is garbage from your house thrown ?	Pit near house -- 1 heap along the road -- 2 other _____ (SPECIFY)	
809	How often is garbage collected or cleared in this area?	daily -- 1 weekly -- 2 forthnightly -- 3 monthly -- 4 yearly -- 5 never -- 6	

Health Facility Use

No.	Questions and filters	Coding categories	Skip to
901	Have you visited a health facility for any reason in the last month ?	Yes --- 1 No ----0	Q903
902	What type of facility was that ?	Public sector Government hospital -- 1 Government health center --2 Field worker -- 3 Other public -- 4 Private medical sector Private hospital/clinic -- 5 Mission hospital/clinic --6 Pharmacy --7 Private doctor -- 8 Mobile clinic --9 Fieldworker --10 Other private -- 11	
904	Have you visited a traditional healer for any reason in the last month ?	Yes --- 1 No ----0	
905	Has your household been visited by a health worker in the last month ?	Yes --- 1 No ----0	
906	Is there at least one child under 5 years of age in your household?	Yes --- 1 No ----0	Q908
907	Has any child children under 5 years of age in your household had diarrhoea in the last two weeks?	Yes --- 1 No ----0	
908	What causes diarrhoea?	contaminated water -- 1 contaminated food -- 2 flies -- 3 poor hygiene -- 4 other _____ (SPECIFY)	
909	Have you ever received any information about prevention or treatment of diarrhoea?	Yes --- 1 No ----0	END

910	Where did you receive this information from?	family member --1 friend -- 2 health worker -- 3 government clinic -- 4 private clinic -- 5 NHC member -- 6 community meeting -- 7 poster -- 8 radio -- 9 television -- 10 other _____ (SPECIFY)	