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Working Paper No. 119

**Knowledge and Practices
Related to
Diarrheal Disorders,
Oral Rehydration Therapy,
and Vaccinations
in Lubumbashi, Zaire**

by

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1989

This is one of a series of working papers produced by the Center for International, Health, and Development Communication, University of Pennsylvania. The research reported here was done in collaboration with the Health Education and Nutrition Unit of the Zaire Ministry of Health and was supported in part by the Academy for Educational Development through its Communication for Child Survival contract with the U.S. Agency for International Development, Bureau of Science and Technology, Offices of Health and Education (Contract no. DPE-1018-C-00-5036-00). This paper is the responsibility of the authors and may not represent the views of those who have supported the research.

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1. SUMMARY OF MAJOR FINDINGS AND RECOMMENDATIONS

1.1 Symptoms and diagnoses of diarrheal disorders

The symptoms reported are different for each of the five types of diarrheal disorders named in Swahili. The HEALTHCOM project, with the collaboration of the Chief Medical Officers (Médecins Chefs de Zone) of Lubumbashi, should address the three most frequent and most serious illnesses.

During our initial study in November, 1988, we had found that women identified five types of diarrheal illness in Swahili: maladi ya kuhara, kilonda ntumbo, lukunga, kasumbi, and buse. In terms of the proportion of diarrheal disorders given such a diagnosis, the latter two (kasumbi & buse) are far less important than the other three illnesses. These two together made up only seven percent of all diarrheal disorders reported in the survey, whereas 48% were identified as kuhara, 25% as kilonda ntumbo, and 15% as lukunga. A study of the associated symptoms revealed clear differences in these three major illnesses. Thus the women used their knowledge of specific symptoms they had observed to diagnose their children's illnesses in Swahili.

The most notable contrast in among these illnesses is that between kuhara, which we would simply gloss as diarrhea without dehydration, and lukunga, for which the symptoms indicate diarrhea with dehydration. Since a child suffering from lukunga must be rehydrated without delay, it is essential to locate cases of this illness, both in the general population and in the health centers.

1.2 The choice of treatment

As treatments are frequently administered at home, oral rehydration therapy (ORT) must be promoted in the general population. However, this promotion should also be addressed to health services which continue to prescribe a variety of medicines rather than ORT.

Treatments chosen by the women differed according to their perception of the severity of the illness and their diagnosis. The symptoms considered most particularly as signs of serious illness were vomiting and a sunken fontanelle. Analysis of the data on reported treatments showed that the probability of giving SSS (called serum in Lubumbashi) to the patient was four times as great for a case of kuhara than for a case of lukunga.

Diarrheal disorders were more frequently treated in the home than elsewhere. Of the cases treated at home, 31% received a form of traditional medicine, 28% a modern medicine, and 16% a water/sugar/salt solution (SSS). In the health centers patients were given syrup (36%), pills (27%), a commercial brand of medicine (20%), and SSS or ORS in packet (31%). Health services gave patients with diarrhea much more medicine than ORS.

1.3 The use of SSS and ORS

The data indicate that only one-fourth of diarrheal cases were receiving ORT. It is therefore necessary to find the means of reinforcing the use of ORT both in the population and in the health clinics.

The probability of using some form of ORS was somewhat higher in medical service treatment (31%) than in home treatment (20%). Sometimes rice water is also administered at home. Of the cases treated in the home, 52% of kuhara patients were administered SSS, as compared to 14% of lukunga cases. A comparison of all the responses showed that SSS or ORS was used in 25% of the cases. We did not find significant variations in the use of ORS among the different administrative zones.

1.4 Knowledge of SSS and ORS formulas

If the health services wish to promote the use of SSS as the main form of ORT, a uniform and simple formula for its preparation must be accepted and then promoted in an extensive publicity campaign that would reach both the health clinics and the general population. Presently women are most often taught the preparation and use of SSS in the health centers.

Almost all of the women interviewed (91%) had heard of SSS and three-fourths said they knew how to prepare the formula. They had all learned this through health services. However, few women (15% in all) knew the correct proportions. Many used too much salt and not enough sugar. Most of the women (79%) had already seen a packet of ORS. They understood its function and 55% had used it at least once.

1.5 Knowledge of vaccinations

The level of knowledge concerning vaccinations appears very high in the population. Considering this fact, an information campaign on vaccinations, conducted without other measures, would not significantly raise vaccination coverage in the area.

Women were well acquainted with vaccinations and 87% were aware of the fact that vaccination protects their children from diseases. Three-fourths of the women knew at what age BCG and measles vaccines should be administered.

According to the indicators used in the survey, there was no relationship between the level of knowledge concerning vaccinations and the economic status of households.

1.6 Vaccination coverage

An analysis of vaccination coverage showed that the medical system was unable to adequately provide vaccination cards and record dates. Children often came late to be vaccinated. Our findings show that an improvement in vaccination services is necessary to raise the level of vaccination coverage.

We have estimated vaccination coverage by two means: according to the information found on the vaccination cards and according to the mothers' statements. Vaccination coverage as indicated by the cards was low, in part because only 54% of the women could show a card. Complete vaccination coverage done at the appropriate ages was only 15% according to the cards, 29% without considering age, and 69% according to women's statements.

One of the main reasons for the low level of verified vaccination was the lack of vaccination cards. Judging from women's answers, the level of coverage was quite high, between 82% and 91% per vaccine. Without considering the age of inoculation, the actual vaccination coverage may be between 60% and 75% per vaccine, but the majority of children were vaccinated late.

There is a strong association between the level of knowledge concerning vaccination and vaccination coverage. Although this linear connection is quite clear, it is not possible to determine whether the women present their children for vaccination because they know they should, or whether they learn about vaccinations

because they go to the clinics for other reasons. We are inclined to believe the second explanation.

Vaccination coverage does not vary much among the different health zones in Lubumbashi. However, Ruashi health zone showed the highest proportion of non-vaccinated children and the lowest proportion of children completely vaccinated.

1.7 Use of health services

The quality of care was the most frequent reason cited for choosing a health service. It also appears that if all women can be persuaded to bring their children for growth monitoring, vaccination coverage would increase.

Women choose health services for the quality of care and the price of the services. Eighty-eight percent of the women took their children to be weighed, a higher proportion than expected.

The children who were brought to be weighed had a high vaccination coverage, whereas those who were not had low coverage.

1.8 Radio and television listenership

Many women in the Lubumbashi, Kamalondo, Kenya, and Kampemba zones could be reached through radio and television, but few in the other zones. However, if radio is used, frequent broadcasts should be programmed since women do not listen to the radio every day.

Half of the women in the survey listened to the radio but not on a regular basis. They preferred to listen most in the middle of the day and least in the evening. The zones of Katuba, Ruashi and the Zone Annexe had a much lower proportion of listeners than the other administrative zones.

The survey found that 40% of all the women watched television but this proportion was considerably lower in Katuba, Ruashi and the Zone Annexe.

2. INTRODUCTION *

2.1 Objectives of the survey

The HEALTHCOM Project, administered by the Academy for Educational Development and funded by USAID, began its activity in Zaire in August 1988. At the national level the project is attached to FONAMES (Fond National Médico-Sanitaire) in Kinshasa, and at the provincial level it operates in Shaba province. The Project is active in the rural health zone of Kabongo and in the city of Lubumbashi, especially in the health zone of Ruashi.

The evaluation team from the Annenberg School of Communications conducted a survey in Lubumbashi, Shaba, in March 1989 to collect data for the project and for the evaluation. The overall objective was to provide administrative and medical authorities with data on the use of medical services and information concerning popular knowledge and practices in relation to diarrheal disorders and vaccinations. The specific objectives were to 1) furnish information that could be used to better plan medical intervention in diarrhea cases and vaccinations, and 2) obtain data that would serve as a basis of comparison with a second survey that would follow interventions organized by HEALTHCOM in collaboration with the Chief Medical Officers (Médecins Chefs de Zone) of Lubumbashi.

2.2 Conducting the survey

The HEALTHCOM Project retained the services of Professor Nizurugero Rugagi and Lecturer Bihini Yanka from the Department of Sociology at the University of Lubumbashi. Their role was to obtain and examine demographic data, to contact political and administrative authorities, and to organize the movements of the survey teams in the different zones selected. Together they visited the seven zones

* We would like to thank all the people who collaborated to the success of this survey and without whom it would not have been possible. The advice and support of Dr. Mongolo, the Médecin Inspecteur Régional, was indispensable. The encouragement and support of the Médecin Chef de Zone of Ruashi, Dr. Tshiula was of great help. Professors Nizurugero and Bihini carried out many important tasks. The administrative assistant of HEALTHCOM in Lubumbashi, Kashimika, handled all financial matters and at times dealt with public relations. Joan Schubert, the technical advisor of HEALTHCOM, did a tremendous amount of work to facilitate our task. We would like to express our gratitude to all of these people.

and the 41 neighborhoods of Lubumbashi in order to contact the local authorities, present the survey objectives, and solicit their collaboration. Before the survey began, the Governor of Shaba, the Mayor of Lubumbashi (Commissaire Urbain), and all of the Chefs de Zone had received a letter from the Médecin Inspecteur Régional, Dr. Mongolo, informing them that a health survey would be conducted between March 6 and 23, 1989.

The administrative authorities willingly furnished demographic data from their zones and instructed their assistants to provide any necessary information. The names of cells, avenues and streets were furnished either by the Chefs de Quartier from their memory or from documents, or by their colleagues in the office. Thus the Chefs de Quartier, whom we had contacted the day prior to our arrival, made available the leaders of selected cells who accompanied the interviewers and indicated the locations of the streets and avenues that had been selected at random for the purposes of the survey.

The survey took place over a 13 day period and was conducted by a team of 18 women who had followed a two-week training workshop. These women whom we had selected and hired as interviewers had several years of higher education and proved quite capable in following the discussions and assuming their responsibilities.

During the training the women were especially helpful in determining the best way to formulate questions and write the answers in the Swahili currently spoken in Lubumbashi. The questionnaire and the subsequent responses were composed and printed in Swahili. Data entry was organized and supervised by Tshilumba Matenda, a computer specialist at the School of Public Health at the University of Kinshasa.

2.3 Sample selection

We based our selection of the sample population on three available demographic data sources:

- 1) the 1984 census survey;
- 2) 1987 population figures classified by health zones;
- 3) 1988 population figures classified by administrative zone.

We rapidly concluded that the 1984 figures were no longer valid because, in some cases, the limits of the administrative zones had since been modified. We could not use the 1987 figures either, because it was difficult to determine to what extent health zones corresponded to current administrative zones.

We therefore considered the 1988 demographic figures obtained in the neighborhoods and zones of the city to be the most reliable. Before this, we had compared the demographic data of 1987 and 1988 obtained from the administrative zones and found them to be generally coherent. Sometimes a discrepancy was found in the total population of each neighborhood (quartier) as given by the zone or by the neighborhood itself. As the zones were working off of figures established by the neighborhoods, we always opted for the figures given by the neighborhoods.

Our sampling was established using the 1988 demographic data of all city zones. Since we wished to retain 75 clusters in the city, we divided the total Lubumbashi population (640,650) by 75 to determine the sampling interval. After selecting a number with which to begin from a random numbers , we selected the cells of every 8542nd person. In this way we identified the 75 cells of the survey. In each cell we interviewed 15 women, which gave us a total sample of 1125 for the entire city.

2.4 Use of the findings

The data from the survey will be useful for better understanding the population's behavior toward the health services, especially with regard to the use of ORS and to vaccinations. The data analysis suggests certain measures to better promote ORS and vaccinations. The technical advisor of the Lubumbashi HEALTHCOM Project, Joan Schubert, will collaborate with the Médecins Chefs de Zone in examining the findings and identifying results that are relevant to the promotion of ORS and vaccinations.

2.5 Characteristics of the women in the sample

Interviews were conducted with women (or care-takers) who were at home at the time of the interview and had in their care at least one child under three years of age. In this sampling, 98% were the mothers and 2% were care-takers. Of the 1125 women interviewed, 873 (78%) had just one child under three years old, 243 (22%) had two, and nine had three children of that age.

Most of the women had been living in Lubumbashi for a long time. We found that 48% had lived in the city since their birth and that another 29% have been there for over ten years. Most of the women (86%) spoke Swahili with their children. Half (51%) could read a Swahili sentence with ease and 18% with some difficulty. As for formal education, 8% had never been to school, 12% completed one to three years of primary school, 33% completed from four to six

years of primary school, 31% completed one to three years of secondary school, and 15% completed secondary school or more.

Only 5% of the women were employed, but 49% of them did something to earn money. Many (37%) lived in a two-room house; 19% lived in a three-room house. Only 28% of the households had electricity. Half of the women had a radio at home.

We found that 91% of the women were married at the time of the survey and 70% of the husbands were employed. As almost all the husbands have been to school and 33% finished at least secondary school, the degree of education among the men was higher than that of the women.

3. DIAGNOSES AND SYMPTOMS OF DIARRHEAL DISORDERS

3.1 General notions of diarrhea

We asked a number of questions in the survey about the most recent case of diarrheal illness the women had observed in their children and questions of a more general order concerning diarrhea. When asked what were the signs of a serious case of diarrhea, the women named the following symptoms, indicated here with the frequency of the response:

SYMPTOMS OF SEVERE DIARRHEA

frequent stools	56%
fatigue	51%
watery stools	27%

Thus, 56% of the women indicated "frequent stools" as a sign of severe diarrhea, 51% "fatigue," and 27% "watery stools." All other symptoms were mentioned less than 10% of the time.

We then asked what effect chronic diarrhea had on the body. The women mainly gave the following responses:

loss of weight	45%
fatigue	40%
loss of fluid	36%
sunken eyes	9%

It is noteworthy that fatigue was frequently cited in answer to both questions and that a high percentage (36%) of the women said

that chronic diarrhea provoked a loss of fluid. Therefore more than a third of the women knew that diarrhea can cause dehydration.

3.2 Diagnoses of diarrheal disorders in Swahili

Prior to this survey, we had conducted an ethnomedical study of the terms and symptoms associated with common childhood diseases in Lubumbashi. We found that the population identified several forms of diarrhea and, furthermore, recognized other illnesses that included frequent and watery stools as characteristic symptoms which were not classified as diarrhea. This way of considering diarrheal disorders is common in Africa and Asia.

In Swahili a simple diarrhea is called maladi ya kuhara, which means "illness of frequent and watery stools," and those were the symptoms most often cited for this illness in the ethnomedical study. There are different types of kuhara that are linked to specific behaviors (such as teething, walking, weaning, changes in diet) but we are dealing with essentially the same disorder. We found, however, four other types of illness that we consider diarrheal disorders but that the population does not classify as diarrhea. These illnesses are lukunga, kilonda ntumbo, kasumbi, and buse. If, during our survey, we had merely asked questions about diarrhea or kuhara, we could not have gathered pertinent information about these other forms. Therefore, we stated in the questionnaire that we were interested in all five illnesses, and, after having questioned the women as to the symptoms observed in each case, we asked them to identify their child's illness.

When we speak of diarrheal disorders in this report we are therefore referring to the five illnesses which, for us, include frequent and watery stools as characteristic symptoms. Initially all five deserve attention. Note, for example, that by the symptoms indicated we can identify what is called lukunga in Swahili (kibende in Bemba) as diarrhea with dehydration. Kilonda ntumbo is characterized by frequent stools but also by blood in the stools, fever, and a wound at the anus which suggests chronic dysentery.

We are not certain to what extent formulating the questions with local diagnosis in mind changed the results of the survey, but we are convinced that if we had only asked questions about diarrhea or maladi ya kuhara, a considerable number of cases of dehydration and dysentery would have gone unnoticed.

3.3 Symptoms of diarrheal disorders

We asked the women to name the symptoms they remembered of a current case of a diarrheal disorder or of the last case that they had observed in their children. We then asked them to name the illness in question.

The following table lists the symptoms given but classified by illness. The frequency of each symptom for each illness is also indicated. For example, in the case of kuhara, the "%" column shows that for 52% of the cases identified as kuhara, the women mentioned "frequent stools," for 48% "watery stools" and so forth. The "N" below each list indicates the number of cases involved.

SYMPTOMS CITED BY ILLNESS

<u>maladi ya kuhara</u>		<u>kilonda ntumbo</u>		<u>lukunga</u>	
frequent stools	52%	frequent stools	44%	tongue clacking	45%
watery stools	48%	mucus in stools	34%	frequent stools	38%
weakness	17%	watery stools	18%	watery stools	32%
fever	13%	fever	15%	sunken font.	18%
mucus	8%	weakness	8%	vomiting	14%
vomiting	5%	blood in stools	7%	mucus	11%
blood in stools	1%	vomiting	1%	weakness	7%
sunken eyes	1%	sunken font.	1%	sunken eyes	4%
dry skin	1%	dry skin	1%	fever	3%
tongue clacking	1%				
	(N=170)		(N=154)		(N=73)
	<u>kasumbi</u>		<u>buse</u>		
frequent stools	31%	frequent stools	39%		
watery stools	23%	weakness	31%		
fatigue	15%	watery stools	15%		
fever	8%	mucus	15%		
mucus	8%	fever	15%		
other	85%				
	(N=13)		(N=13)		

A study of the preceding table reveals the following points:

- 1) The symptom most often cited was that of frequent stools.
- 2) Frequent and watery stools characterized maladi ya kuhara.

- 3) The clacking of the tongue distinguished lukunga from the other illnesses. It is also worth noting that, except for 1% of the kilonda ntumbo cases, lukunga was the only illness for which a sunken fontanelle was mentioned.
- 4) The symptoms of kilonda ntumbo indicated that we might be dealing with a case of chronic or amoebic dysentery.
- 5) There were no specific symptoms of kasumbi or buse that indicated other than simple diarrhea.
- 6) Kasumbi had few of the symptoms cited. We know that this illness is not considered serious and that it is characterized by a rash, especially on the buttocks. For this illness the category "other" appeared 85% of the time, which we believe is due to there being no listed symptom for the rash.

These data and others that we have examined show that illnesses diagnosed in Swahili are recognized by the women and can be distinguished by certain symptoms.

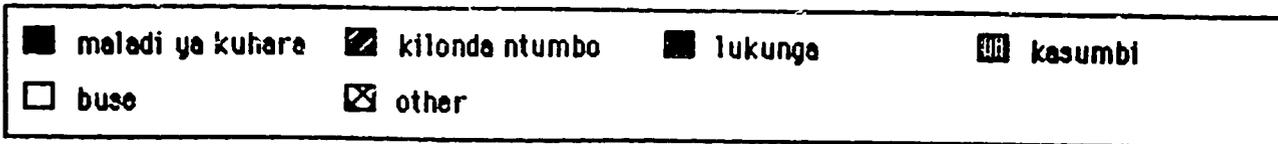
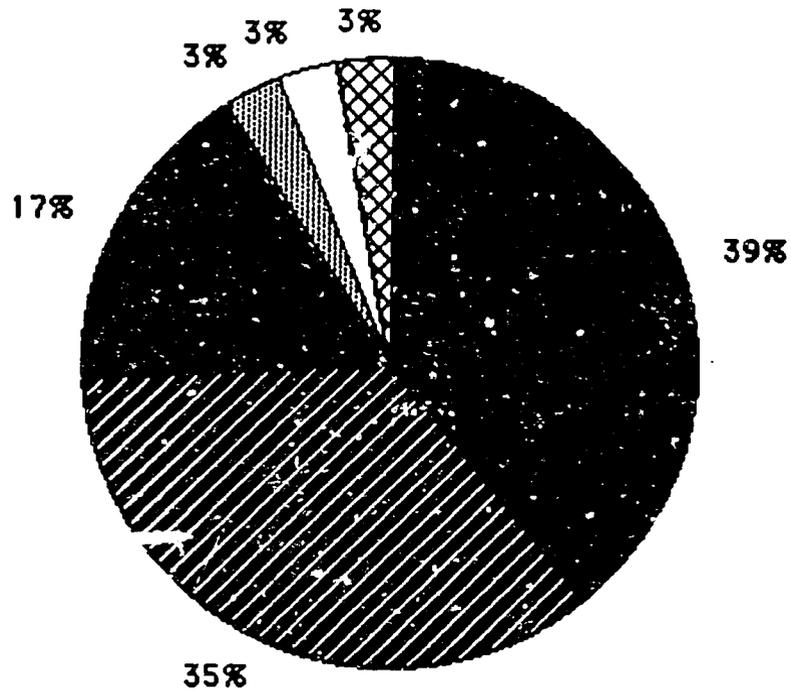
There is another way of asking about the distribution of symptoms in these illnesses. After having asked open questions, we then asked if the children had shown any of four major symptoms (fever, blood, vomiting, sunken fontanelle) during the illness. The women had to answer "yes" or "no." When asked whether the fontanelle was sunken in the case of lukunga, 65% of the women responded affirmatively as compared to 13% for kuhara and 4% for kilonda ntumbo.

The two illnesses, kasumbi and buse, seemed much less important than the other three, for they together made up only six percent of the recent cases of diarrheal disorders. Figure 1 shows the proportion of each of the five types of illnesses identified by the mothers as current or recent illnesses.

The figure indicates that of the current or recent cases of diarrheal disorder cited by the women, 39% were identified as kuhara, 35% as kilonda ntumbo and so forth. We considered only current and recent (in the preceding two weeks) cases in these calculations to assure more accuracy in the response. Answers concerning past cases yielded different percentages: 56% were identified as kuhara, 19% as kilonda ntumbo, 14% as lukunga, and 7% were kasumbi and buse together. The farther cases were situated in the past, the more the percentage of diarrheal disorders

Figure 1

Diarrheal Disorders Identified in Swahili:
Current and Recent Cases



198

identified as kilonda ntumbo diminished, whereas the proportion of kuhara cases increased.

4. CHOICE OF TREATMENT FOR DIARRHEAL DISORDERS

4.1 Perceptions of symptoms and severity

This analysis examines the association between certain symptoms and the severity of the illness and the association between the mother's estimation of the severity and the treatment chosen. For each one of four particularly important symptoms, (fever, vomiting, bloody stools, sunken fontanelle), women were asked if their child had that symptom when ill, yes or no. The results for current or recent cases (N=444) can be seen in the following table, with the proportions of illnesses classified according to their estimated severity. The "N" column indicates the number of affirmative replies.

	SYMPTOMS CLASSIFIED BY SERIOUSNESS			
	<u>Fever</u>	<u>Vomiting</u>	<u>Bloody stools</u>	<u>Sunk. Font.</u>
	N=243	N=125	N=96	N=78
Not sick	17	15	20	17
Somewhat sick	46	34	47	28
Very sick	<u>37</u>	<u>51</u>	<u>33</u>	<u>55</u>
	100%	100%	100%	100%

It is noteworthy that the women consider vomiting and sunken fontanelle as signs of severe illness. In over half (55%) the instances where a sunken fontanelle was indicated, the child was considered as seriously ill. An examination of symptoms spontaneously given (without direct questions) according to the mothers' perception of the cases yielded the same results.

There is an association between the perception of the severity of the illness and the diagnosis, as is indicated by the following table.

PROPORTIONS OF RELATIVE SEVERITY BY ILLNESS

	<u>Kuhara</u>	<u>Kilonda ntumbo</u>	<u>Lukunga</u>
	N=170	N=154	N=73
Not sick	30%	32%	21%
Somewhat sick	42%	49%	34%
Very sick	<u>28%</u>	<u>19%</u>	<u>45%</u>
	100%	100%	100%

It is clear that cases of lukunga are considered serious more often than the others.

The relationship between the estimation of the seriousness of the illness and the choice of treatment at home is not strong. However, severity is important in the choice of taking the child out of the home or not. It appears evident that if the mother considers the child seriously ill, she will seek advice and, eventually, treatment elsewhere. We found that in only 31% cases considered "not sick" treatment was sought elsewhere, whereas 70% of the cases considered "very sick" treatment was sought outside the home.

4.2 Treatments at home

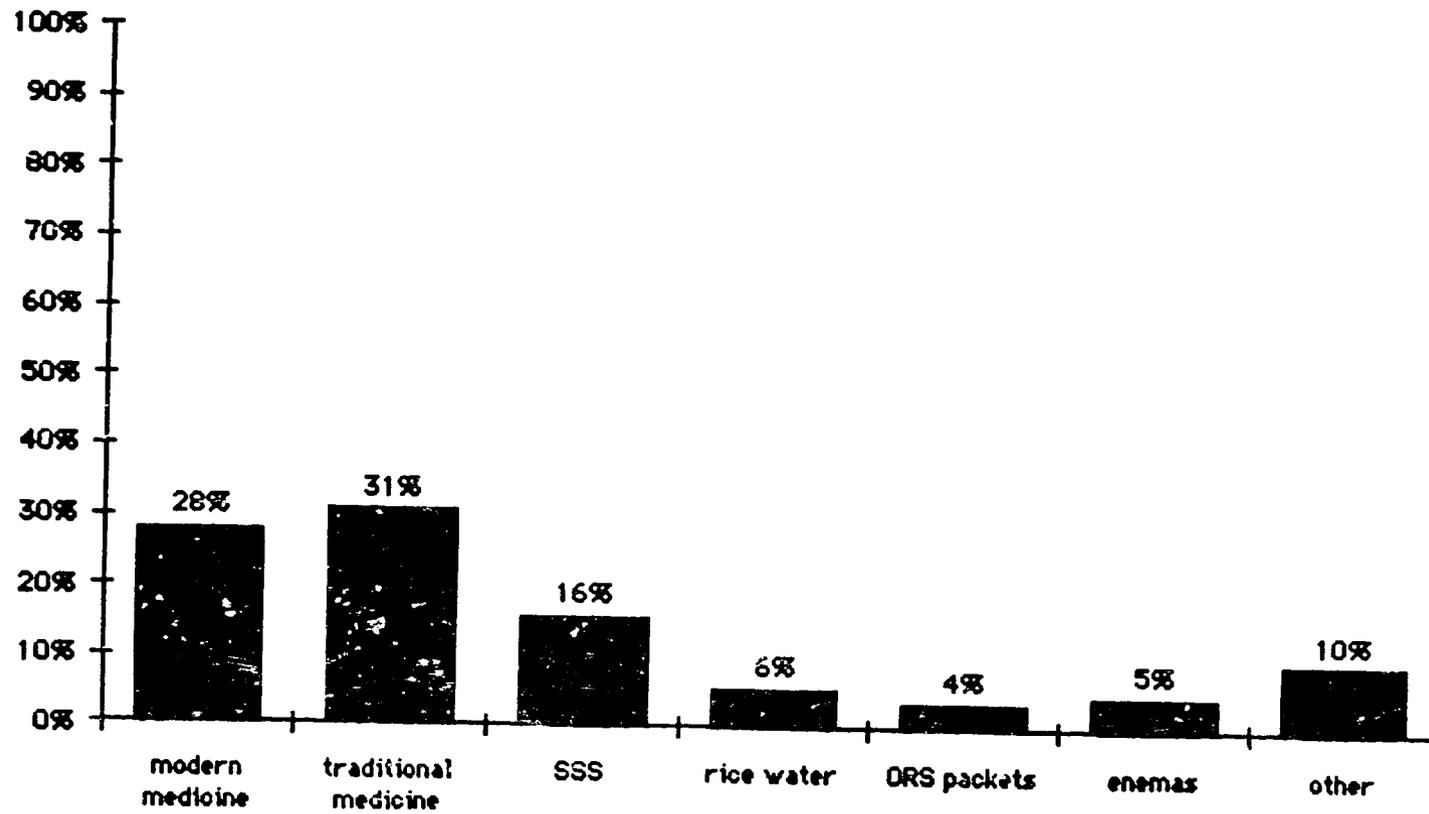
We asked a series of questions concerning what the mother did to treat the illness at home and what she did elsewhere. To better understand the treatment process, we examined the current and recent cases (within two weeks). The following table indicates the proportion of cases treated and where they were treated.

PLACE OF TREATMENTS

No treatment administered.....	20%
Treatment only in home.....	39%
Treatment only outside of home.....	14%
Treatment both in home and elsewhere.....	<u>27%</u>
	100%
Total treated at home.....	65%
Total treated elsewhere.....	40%

Figure 2

Home Treatments



low

We can see that the women treated certain cases at home and certain cases elsewhere, some exclusively outside of the home, and some in both the home and elsewhere, which explains the last two figures.

This table shows the importance of treatment administered in the home. The proportion of cases treated exclusively outside of the home is only 14%, whereas 39% are treated exclusively in the home.

In doing this analysis we examined the 444 cases of current or recent diarrheal disorder. Of these cases 65% (290) were treated at home. A study of the medicines administered in these cases gives the results shown in Figure 2. We found that 20% of the cases treated at home were given either SSS or ORS, and that 6% were given rice water. The majority of cases treated with traditional medicines (31% of the cases) were either kilonda ntumbo or lukunga.

Because 65% of childhood diarrheal disorders were treated at home, it is clear that hopes for improving treatment lie in addressing what mothers do in the home for diarrheal disorders.

4.3 Treatments selected by local diagnosis

We examined the types of medicine administered at home according to the Swahili diagnosis. The following table shows the percentages of cases that received different types of medicine by illness.

HOME TREATMENT BY ILLNESS

	<u>Kuhara</u>	<u>Kil.Ntu.</u>	<u>Lukunga</u>	<u>Kasumbi</u>	<u>Buse</u>
Modern medicine (brand)	28	27	30	20	22
Trad. medicine	11	39	50	70	22
"Serum" (SSS)	30	4	11	10	45
ORS Packets	8	3	0	0	0
Rice water	14	2	2	0	0
Enemas	2	9	0	0	11
Other	7	<u>16</u>	7	0	0
	100%	100%	100%	100%	100
	N=98	N=121	N=44	N=10	N=9

Note that the term "modern medicine" refers to a medicine identified by a brand name or drug name (penicillin, ampicillin, terramycine, etc.).

Certain facts can be seen in this table:

- 1) Three sorts of medicine are often administered at home: modern medicines, traditional medicines and SSS.
- 2) The treatments most frequently administered for kuhara are SSS, a modern medicine identified by a brand name, and rice water.
- 3) Traditional medicines are rarely administered for kuhara but are frequently given for lukunga (50% of the cases) and for kasumbi (70%). Again, it is the cases of lukunga that are of particular interest to this study.
- 4) SSS is given especially for kuhara and buse. The fact that a high percentage of buse cases are given SSS is not significant since these cases only account for nine out of all the cases studied.
- 5) In short, treatments administered at home vary according to the diagnosis of the mother.

4.4 Medical service treatments

The variety of medicines prescribed outside the home for diarrheal disorders were examined. While this report is concerned mainly with what medical services are providing, we have added other sources of treatment to provide a comparative view. The category "H.C./Hop." indicates health centers, hospitals, and nurses. The following table shows the principal sources of external health aid.

MEDICINES GIVEN OUTSIDE HOME

	H.C./Hosp.	Family/ Neighbors	Healers	Pharmacy
syrup	36%	3%	-	-
SSS	24%	6%	-	-
modern medicine	20%	13%	-	75%
pills	27%	0%	-	-
ORS packets	7%	6%	-	-
rice water	3%	0%	-	-
traditional medicine	1%	72%	100%	-
	N=136	N=32	N=2	N=4

The vertical columns of the table above indicate the percentage of cases having received treatments at a given source. For example, the column "Family/Neighbors" indicates that 13% of the cases brought to this source were prescribed a modern medicine and 72% a traditional medicine.

The columns for traditional healers and pharmacies represent so few cases that we cannot generalize about them. The column "family/neighbors" shows the importance of traditional medicines in family treatment. This table and others indicate that mothers receive traditional remedies more frequently from friends and relatives than from local healers.

Figure 3 shows the proportion of each treatment administered by medical services, that is, by health centers and hospitals. In 136 cases brought to health clinics or hospitals, 31% received SSS or ORS (24% + 7%). However, an examination of the total of pills, syrups and brand medicines shows that modern medicines were administered in two-thirds to three-fourth of the cases. A simple addition of the percentages gives 83% for modern medicine, but since multiple answers were permitted for each case, the total is somewhat less than 83%.

In short, there is every reason to believe that health centers and hospitals very often administer antidiarrheal remedies and antibiotics, for most of the syrups, pills, and brand medicines cited are one or the other.

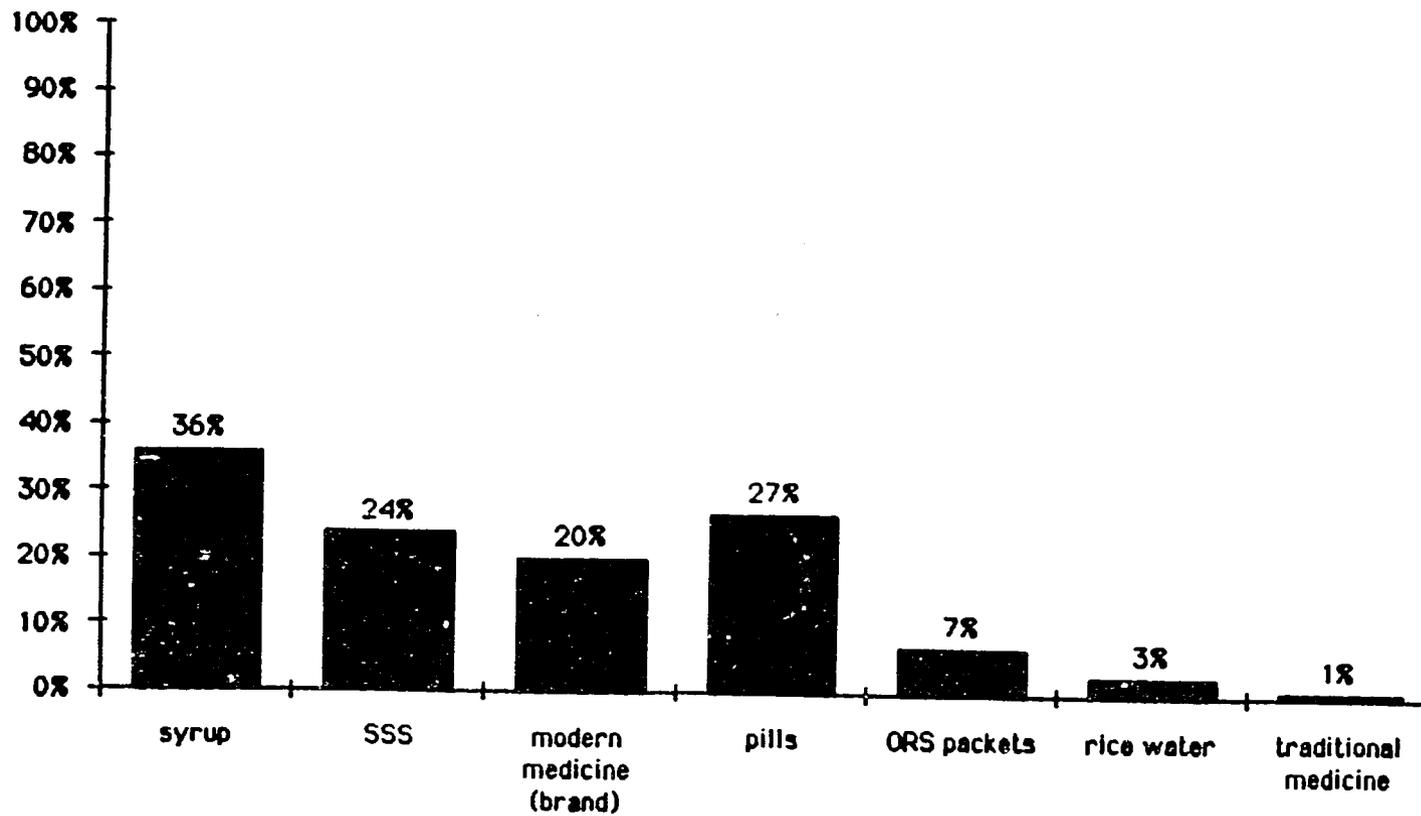
5. USE OF SSS AND ORS

5.1 Use of SSS and ORS in the home

Among the current or recent cases of diarrhea reported, 65% (N=444) were treated at home. SSS or ORS was administered to 20% of those cases and rice water to 6%. If we include rice water as a rehydrating remedy, we find that 26% of the cases treated at home were rehydrated. It is worth noting that 52% (N=98) of kuhara cases were rehydrated, whereas only 14% (N=44) of lukunqa cases appeared to be receiving rehydration therapy. Thus in treatments given at home, 52% of simple diarrheal cases were given ORS but only 14% of the cases of dehydration received ORS.

Figure 3

Treatments Given at Health Services



19/02

5.2 Use of SSS and ORS in health centers

As previously noted, among the current or recent cases of diarrheal disorders, 31% were taken to medical services such as hospitals, health clinics or nurses. Of these cases, 27% received SSS and 4% ORS. Thus less than one-third of cases of diarrheal disorders taken to health centers were given ORS. Health Center personnel should be encouraged to increase their use of ORS for these cases. At the time of the survey there was little difference in the proportion of cases rehydrated at home (26%) and at health centers (31%).

Another way of considering the phenomenon of oral rehydration is to examine the total percentage of recent cases (N=444) who were given SSS or ORS. Mothers gave SSS or ORS to 57 (13%) cases, the health services to 10% of the cases. This makes a total of 87 cases, or 20%, that were treated with SSS or ORS either at home only or in a health service only. Some cases received ORS in both places.

6. FOOD AND BEVERAGES GIVEN DURING ILLNESS

6.1 Feeding during illness

There is much recent evidence that a child afflicted with diarrhea should continue to eat and drink regularly. Of all the women interviewed, only 5% said they stopped breastfeeding during the last case of diarrhea. It appears, therefore, that most mothers in Lubumbashi correctly continue to breastfeed during episodes of diarrhea.

If a child has already been weaned, he or she sometimes eats less than usual when suffering from diarrhea for one of two reasons: either the child refuses to eat, or the mother has decided not to feed the child. We found that in 32% of the cases of recent diarrhea, the child did not eat at all and in 37% the child ate less than usual. Our data suggest that if children afflicted with diarrhea ate less food or nothing at all, in two-thirds of the cases it was because they lost their appetite.

Many women (43%) prepared special foods during the last bout of diarrhea, but the majority (57%) continued to prepare the usual foods. Of those who cooked special foods, 44% prepared a rice porridge, 18% a corn porridge, and 5% a porridge of manioc. The value that mothers placed on porridge for children suffering from diarrhea is evident.

6.2 Liquids given during illness

Considering only current and recent cases of diarrhea, we found that 62% of mothers noticed that the child was more thirsty than usual during the diarrhea and that 37% prepared special beverages for these cases. The following liquids were those most often given:

<u>Beverage</u>	%
Tea	28%
Serum (SSS)	23%
Rice water	18%
Oralite (CRS)	7%
Soft drink	6%

Thus, 48% (23 + 18 + 7) of the women who offered some form of special liquid gave SSS, rice water, or ORS during the illness. This suggests that a message stressing the importance of giving a special liquid during diarrhea would increase the proportion of cases being rehydrated, since one-half of those giving special liquids give a correct liquid.

7. KNOWLEDGE OF SSS AND ITS PREPARATION

7.1 Knowledge of SSS

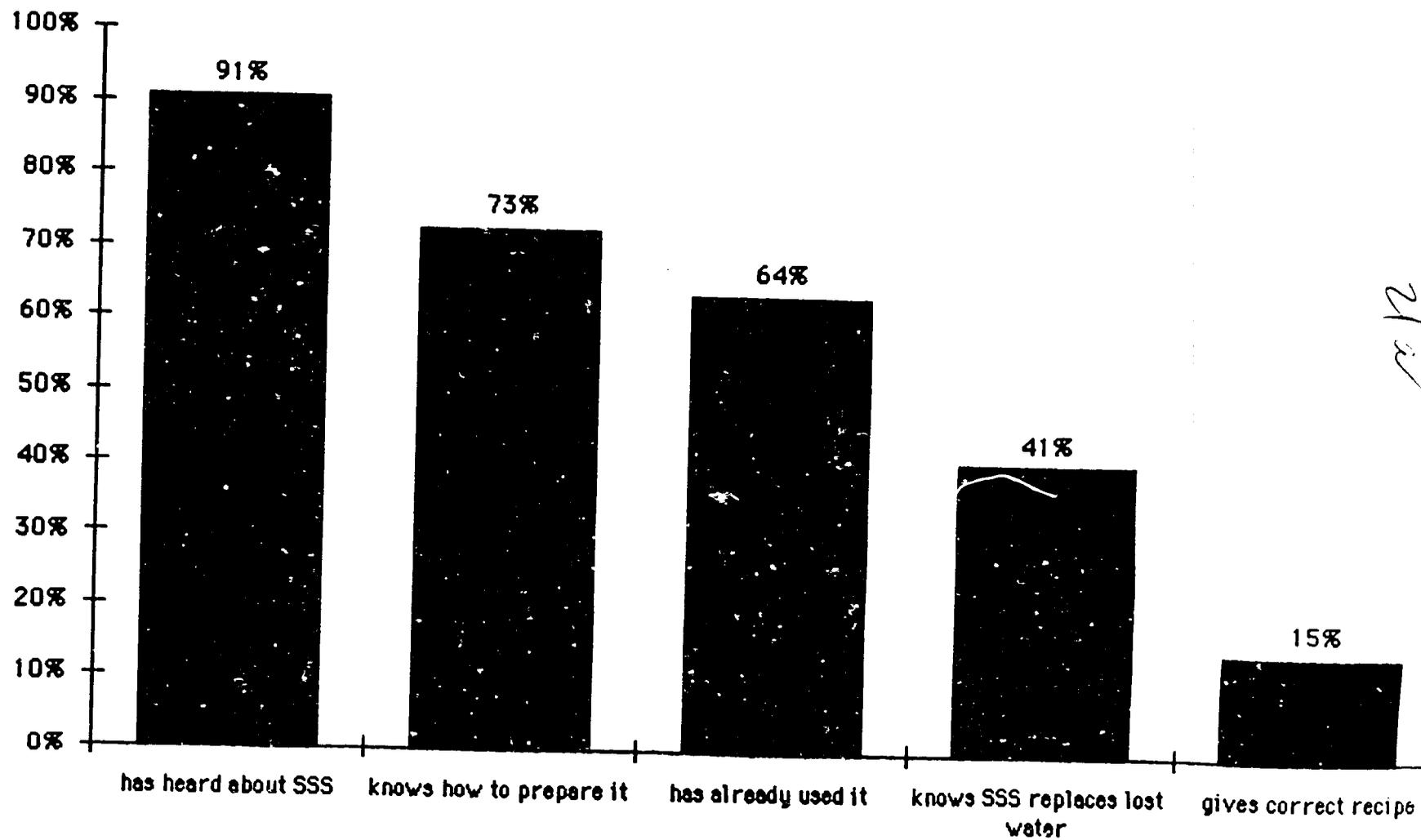
Women were asked if they had ever heard of "serum" (SSS) and then asked a series of questions concerning its use. The responses to those questions are given below:

<u>The women said :</u>	<u>Percentage of all women interviewed (N=1125)</u>
I have heard of serum.....	91%
Serum replaces lost water.....	41%
I know how to prepare it.....	73%
I have already used it.....	64%

Figure 4 also represents these findings and compares them to the percentage of women able to supply the correct formula for SSS.

Figure 4

Knowledge of Water/Sugar/Salt Solution



Note the steep decline in the proportions giving affirmative answers from left to right. Most importantly, while 73% say they know how to prepare SSS, only 15% gave correct mixing proportions.

The women appear to be well informed about SSS. It is generally assumed that there is a relationship between knowledge and behavior and that, if one learns a reason for changing a behavior, a change will more likely ensue. We might therefore assume that the women who are aware of the fact that SSS replaces lost water would be more likely to use it than those who are not, but that is not the case in this survey. It seems it is not sufficient to teach what SSS actually does in order to have people use SSS.

Almost all the women who claimed to know how to prepare SSS had learned the formula in the health centers. Only 8% had learned a recipe from neighbors or relatives and 1% had heard it on the radio. Thus the radio as a means of spreading information about SSS is not used or is not effective at this time. The findings show that the health centers are the major source of information for the use of SSS for diarrheal disorders.

The association between knowledge of SSS and owning a radio were examined, because we thought that people of a higher economic status would be more likely to own a radio. We found that those who did own a radio were not better informed about SSS than those who did not. Although this concerns only one indicator of resources (radio ownership), these data do suggest that there is no connection between financial resources of households and knowledge of the serum.

Most of the women (75%) had already seen an ORS packet and 85% of this group knew that it replaces lost fluid. Of the 55% who had actually used Oralite, 52% had received the packet in a health center and 20% had purchased it in a pharmacy.

7.2 Knowledge of the correct SSS formula

The Zairian government has recommended the following formula for the preparation of SSS: a beer bottle (750 ml.) filled with potable water, the tip of a teaspoon of salt, and four teaspoons of sugar. But some health centers are teaching other proportions and there is, therefore, a certain confusion in the population. For the quantity of water alone, four means of measuring water were given: one liter, one beer bottle, one Guigoz can, or one and a half beer bottles.

There was some confusion for the quantity of water to use as well as for the quantities of sugar and salt, for while 81% of the women who said they knew how to prepare SSS gave a measure which corresponded to a known formula, only 59% of the total sample supplied a quantity of water mentioned in the various recipes for SSS.

The proportions of salt and sugar, however, varied a lot and was not always matched to the correct quantity of water. Approximately 25% of the respondents indicated "a pinch" or "the tip of a teaspoon" of salt which is the correct amount for a 750 ml. bottle of beer but insufficient for a liter of water. It is noteworthy that 39% of the women indicated a full teaspoon of salt which is too much. We believe this quantity is being taught in some places in Lubumbashi. Another 10% of the women interviewed said they used a tablespoon of salt, an amount which could be dangerous.

As for the amount of sugar, 32% indicated three to four teaspoons which appears approximately correct. Still, 31% indicated one or two spoonfuls, an amount which is insufficient for a good solution.

The two most frequent errors in mothers' statements about how they prepare SSS were using too much salt or not enough sugar. For the sugar it would be relatively easy to remind them of the four teaspoon amount. For the salt, since many women have a tendency to use a full teaspoon rather than a tip, another measuring device should be considered.

Although 73% of the women indicated that they knew how to prepare SSS, only 15% of the total sample were able to provide the correct quantities. It should be noted that only 20% of the women who claimed they knew how to prepare SSS were able to give the correct proportions of water, sugar, and salt. In other words, 80% of the women who said they knew the preparation did not give the correct formula.

The two main reasons for the errors in the SSS formula are:

- 1) It seems that certain sources of information are recommending a full teaspoon of salt;
- 2) Women forget the exact number of spoons of sugar to use.

8. USE OF HEALTH SERVICES

8.1 Consultation for diarrheal disorders

To better understand the population's behavior when a child becomes sick, we asked several questions concerning the use of pharmacies and health services. Eighty-two percent of the women interviewed had brought their child to a health center or a hospital for a case of diarrhea at least once. Thirty-four percent had bought medicine for diarrheal disorders from a pharmacy at some point, and 17% had consulted a traditional healer for diarrhea at some time.

The following remedies for diarrhea, according to the respondents, were most often administered in health centers and hospitals:

<u>MEDICINE</u>	<u>%</u>
SSS	34
Syrup	21
Brand medicine	15
ORS	12
Pills	8
Injection	5
IV	4
Other	2

We can see that 46% of the women expected the health centers and the hospitals to give either SSS or ORS for diarrheal disorders. The category "brand medicine" indicates that the woman gave the name of a commercial pharmaceutical product. The total number of responses indicating remedies other than SSS or ORS or IV serum constitutes 50% of the cases. Thus, one-half of the women expected to receive some form of modern medicine and one-half expected SSS or ORS for their children's diarrhea.

When we compare what women say that health centers usually give for diarrheal disorders and what was given in the last case, we find some interesting contrasts. The following percentages indicating what is "usually" expected and what was given for the last case are drawn from the same group of respondents.

MEDICINES ADMINISTERED

	<u>Last case</u>	<u>Usually</u>
Syrup	36%	21%
Pills	27%	8%
Modern medicine	20%	13%
SSS	24%	34%
ORS	10%	12%

Thus, 36% of diarrhea cases recently brought to the health centers were given a syrup, but only 21% of the women claim that syrup is usually given for diarrhea. It is striking to note that for syrups, pills and modern medicine (brand names), the percentages for reported "last case" use are far higher than for the "usually" percentages, while the opposite is true for SSS.

8.2 Consultations in general

The reasons given for the choice of a medical service show that women paid most attention to the quality of care and the price of the services. The following is a list of the reasons given and the frequency with which they were cited.

<u>REASONS</u>	<u>%</u>
Nurses tend well to patients	35
Service is free	16
The clinic is near home	10
Company pays	7
They give medicine	6
Other reason	4
Do not know	22
	100%

When we examine these reasons in relation to the types of health centers available (health center or state hospital, company clinic, private clinic, missionary clinic), important differences emerge. Here are the reasons classified by type of health center:

	State	Company	Private	Miss.
Nurses tend well to patients	33	17	43	45
Service is free	9	46	2	2
The clinic is near home	9	2	12	20
Company pays	2	16	4	2
They give medicine	5	4	9	7
Other reason	8	0	5	8
Do not know	34	17	21	15

The above table confirms the importance of the quality of care and the price of the service in the selection of a medical center. One can also see that the choice of a center other than a state-run clinic is based on more clearly articulated reasons.

9. KNOWLEDGE OF VACCINATIONS

9.1 General knowledge

Data analysis showed that the level of vaccination knowledge among the women interviewed was quite high. Eighty-seven percent of the women said that children were vaccinated in order to protect them from disease. When we asked which vaccination was to be given first, 64% replied "BCG." When asked at what time BCG should be given, 75% said "at birth" or within the first week. When asked at what age the last vaccination was to be given, 80% replied "at nine months," and 75% knew it was the measles vaccine.

These figures indicate that lack of knowledge concerning vaccines or the process of vaccinations is not a major problem in Lubumbashi. Nothing allows us to suggest that, if women learned more about vaccinations, the level of coverage would increase significantly. We must look for explanations other than lack of knowledge for why mothers bring their children to be vaccinated late or not at all.

Women were asked why they had brought their child to a health center the last time the child had received a vaccination. Sixty-two percent replied that they had come for the vaccination, but 32% replied that they had brought the child for growth monitoring. Therefore, about 30% of the children had received their last inoculation because they had been brought to the clinic to be weighed rather than because the mother was aware the child needed the vaccination at that time.

9.2 Association with other variables

We examined the relationship between indicators of financial resources taken from several questions and the level of vaccination knowledge in six other questions. As an indication of financial status, we asked questions concerning six household possessions, that is, the presence/absence of electricity, radio, dining room furniture, living room furniture, television, refrigerator. The level of vaccination knowledge was measured through questions concerning vaccine types and the appropriate age for giving vaccinations.

To our surprise, there appeared to be no connection between financial status and the level of vaccination knowledge. We also examined financial resources by the 75 clusters of the sample and found great contrasts among the groups. When we followed the same

procedure by clusters and scale of knowledge, the differences found did not follow the same patterns.

The data indicate, among other things, that the factors which contribute to a high level of vaccination knowledge are not dependant on the financial resources of households.

10. VACCINATION COVERAGE

10.1 Vaccination coverage in general

The data on vaccination coverage concern the eight vaccinations that must be administered to children between birth and nine months of age: BCG, DPT1, DPT2, DPT3, Polio1, Polio2, Polio3, and measles. According to the World Health Organization, BCG should be given soon after birth, DPT1 and Polio1 at six weeks, DPT2 and Polio2 at ten weeks, DPT3 and Polio3 at 14 weeks, and measles at nine months. In Lubumbashi, as in the rest of Zaire, the EPI (Expanded Programme on Immunisations) programme, a government organization, is responsible for organizing the distribution and promotion of vaccinations in all the health services.

Vaccination coverage data is most frequently presented for children between the ages of 12 and 23 months. This can be done taking into consideration the appropriate age or without considering at what age the child was vaccinated. We have adopted the following rather generous criteria in defining the appropriate age.

BCG	up to three months
DPT1	up to six months
Polio1	" " " "
DPT2	up to nine months
Polio2	" " " "
DPT3	up to twelve months
Polio3	" " " "
Measles	up to twelve months

According to these criteria, all children should have received the entire vaccination series by the age of twelve months.

This survey provided data on the vaccination coverage of the youngest child of the 1125 mothers interviewed plus 243 second children under three years of age. The data reported here concern only the youngest children of the 1125 women.

Each woman was asked if she held a vaccination card for her youngest child. If said "yes" and could show the card to the interviewer, the information on the card was recorded on the questionnaire. If the woman could not supply the card, the interviewer would ask her if the child had received each vaccination, one by one. Thus there are two sources of vaccination coverage data: the cards and the women's responses.

10.2 Vaccination coverage by vaccine

Using the above criteria, Figure 5 shows the vaccination coverage of the youngest children of all the 1125 women interviewed according to the vaccination cards. Thus a child is considered vaccinated if he or she received the BCG before three months, DPT1 and Polio1 before six months, and so forth. The percentage of BCG inoculation is, in fact, much higher than the 38% shown, since the vaccinations that were recorded without a date are not counted here. We found that the nurses frequently checked the box indicated for BCG without writing down the date.

In general, the percentages of children with vaccination records up to date is encouraging but the quality of coverage can be improved, particularly in the case of measles, because 23% is very low. Attention should also be given to the fact that only 15% of the cases could show complete vaccination coverage as recorded on the cards at the appropriate age, a percentage which appears very low.

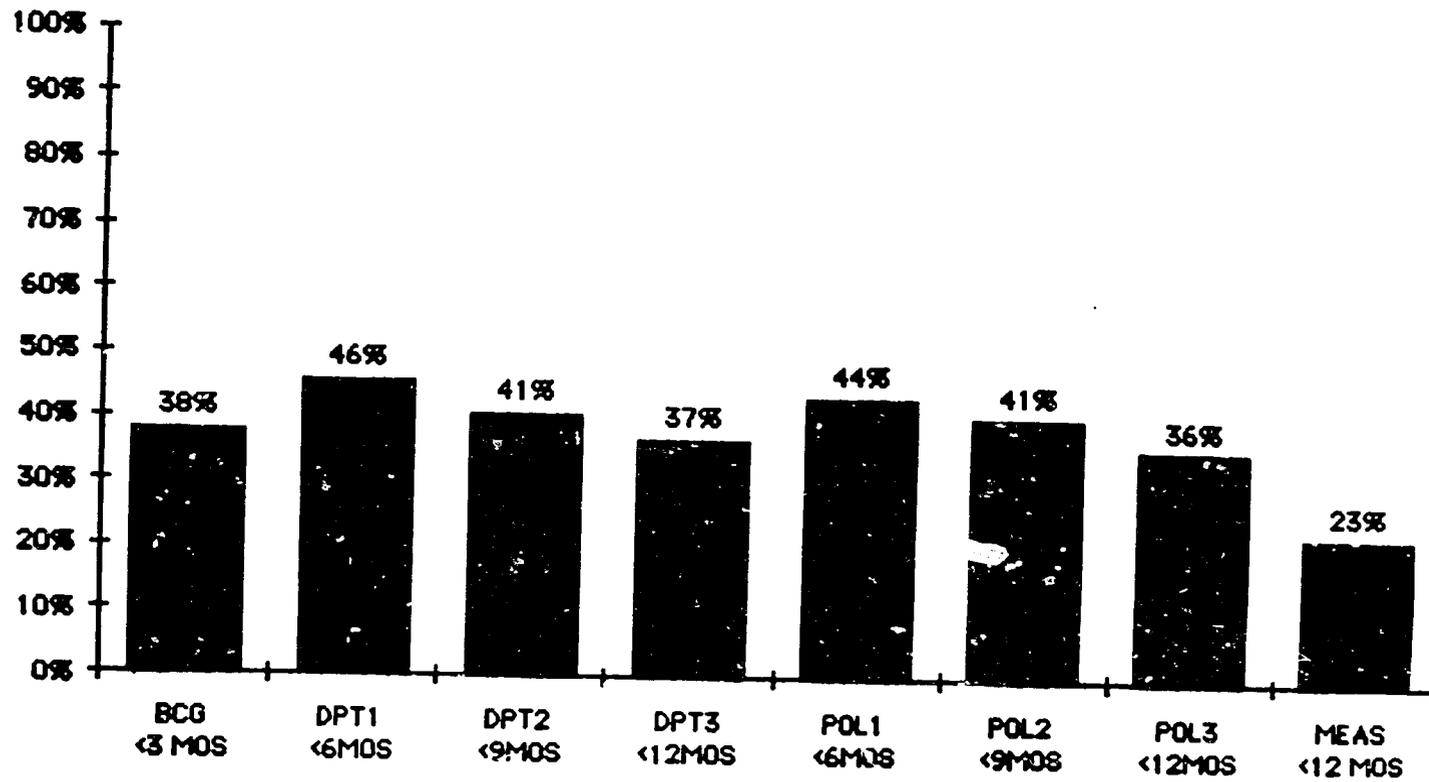
Figure 6 presents another way of viewing vaccination coverage. Here we consider the children from 12 to 23 months (N=418) and we give two figures per vaccine. The left column shows the percentage of children vaccinated with a dated vaccination card; the right column indicates a figure based on the mothers' statements when asked if the child had received each vaccination.

We are assuming that the women have a tendency to respond affirmatively when asked if their children have been vaccinated, and that, consequently, the figures cited for the women may appear slightly higher than they should. The real figures should be somewhere between the two that are given, slightly lower than those furnished by the women but higher than those exclusively recorded on the cards. According to the cards, the percentage of children with complete coverage, regardless of age, is 34%

A comparison of the two figures shows a particularly wide discrepancy in the case of measles. In Figure 5 we see that 23% of

Figure 5

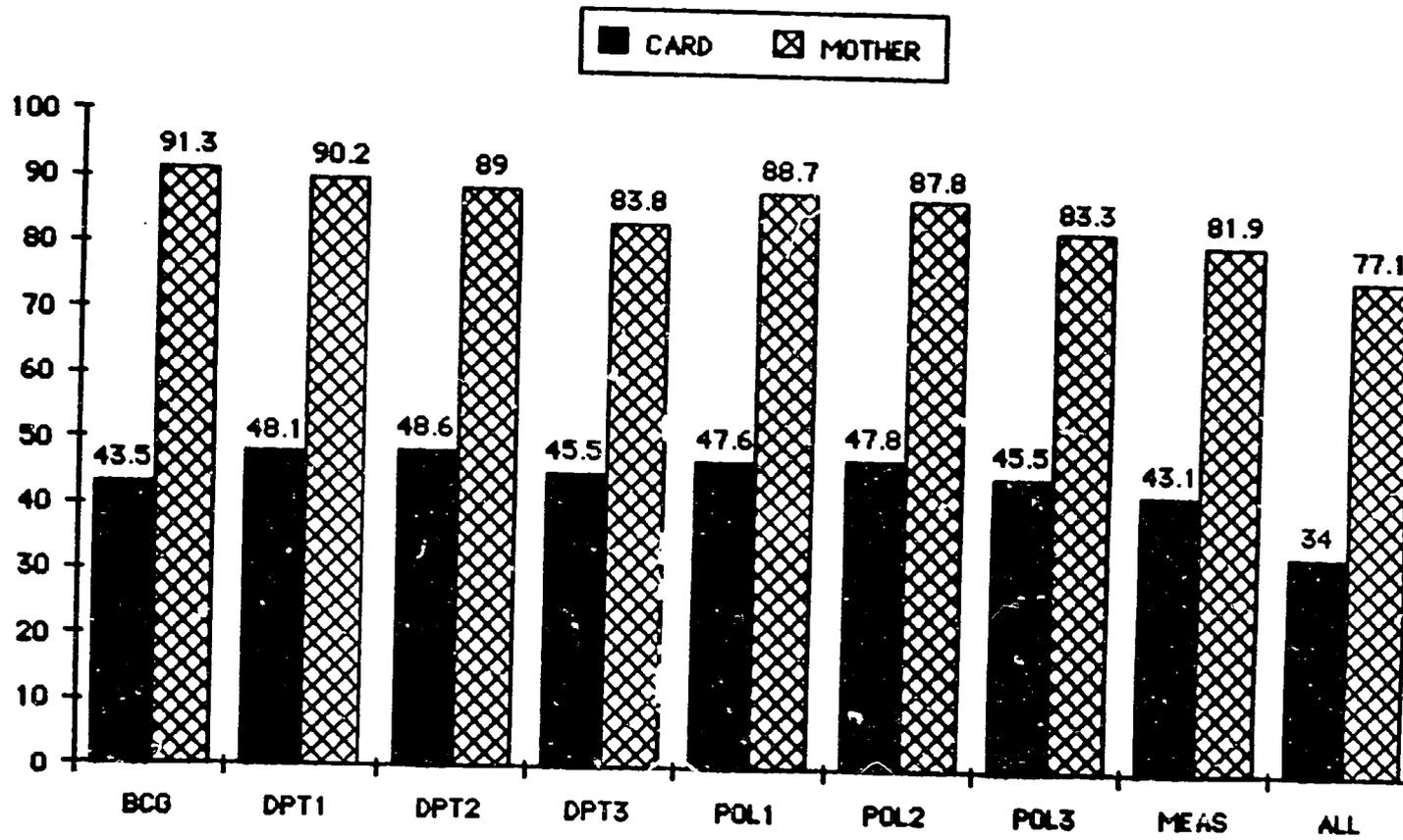
Vaccination Coverage of Youngest Children
(according to cards)



282

Figure 6

Vaccination Coverage of Children 12-23 Months Old



285

the children were vaccinated according to the dated cards, but the total figure in Figure 6 is 43% for measles. It is to be noted that these figures do not represent quite the same sample since Figure 5 includes the children from one to 35 months and Figure 6 only considers those from 12 to 23 months. Nevertheless, the discrepancy between 23% and 43% indicates many children are inoculated for measles after 12 months of age.

According to the vaccination dates inscribed on the available cards (54% in all), the delay in vaccination after DPT1 and DPT2 is not large. There is, however, a very significant delay between DPT3 and measles.

10.3 Variations in vaccination coverage

There is not a great deal of variation in vaccination coverage among the different health zones of the city. The following table shows the proportions of children aged 12 to 23 months (N=418) who had never been vaccinated and those who had complete coverage.

<u>Vaccinated</u>	<u>Health Zones</u>				
	Lubumbashi	Kenya/ Kamalondo	Kampemba	Katuba	Ruashi
No vaccination	39%	42%	48%	47%	51%
1-4 vaccinations	25%	30%	22%	24%	26%
All vaccinations	36%	28%	30%	29%	23%

This table reveals that the zone of Lubumbashi has the highest percentage of children vaccinated and that the Ruashi zone has the lowest, but the differences are not statistically significant. We also examined vaccination coverage according to the type of medical center the women habitually went to and where the child had last been immunized. We did not find significant differences in either case.

However, a comparison of the children who were brought in for growth monitoring and those who were not revealed an enormous difference. Of all the children (1125), 88% had been brought to a clinic to be weighed at least once. Of the group that have no vaccination recorded (N=516), 76% had been brought in for growth monitoring and 24% had not. Of the children who had received at least one vaccination (N=279), 97.8% (1 out of 330) had been

brought in to be weighed. This shows the enormous importance of regular growth monitoring in assuring vaccination coverage.

10.4 Associations with other variables

The most apparent association of variables with vaccination coverage is evident in the correlation between vaccination knowledge and the fact of having been vaccinated. We divided the children from 12 to 23 months of age (N=418) into two categories: vaccinated or not vaccinated. We also categorized knowledge into three levels: 1) zero to one correct answer; 2) two to three correct answers; 3) four to six correct answers. The vaccination categories were then cross-tabulated with the levels of knowledge based on the number of correct answers. The results are found below:

KNOWLEDGE AND VACCINATIONS

	1	2	3
No vaccinations	83%	29%	2%
1-8 vaccinations	<u>17%</u>	<u>71%</u>	<u>98%</u>
	100%	100%	100%

There appears to be a strong relationship between knowledge of vaccination and having been vaccinated. As noted before, we are unable to determine whether increased knowledge leads to more vaccinations or whether the process of getting vaccinated increases mothers' knowledge of the process, or some of both.

11. RADIO AND TELEVISION

11.1 Radio listening

Each member of our sample was asked if there was a radio in the home, if it worked at that moment, and if she listened to radio programs. The percentages of affirmative replies is found below:

<u>Question</u>	<u>Percentage</u>
Radio at home	48%
Radio works	42%
Listens to radio	52%

It appears that about half the women in Lubumbashi listen to the radio. Yet there were only 87 women (8%) who said they had listened to the radio the day before the interview took place. This is difficult to explain. Perhaps current radio programs are not particularly popular, or the question was not clearly understood.

The proportion of existing radios varied among the different administrative zones. Figure 7 shows the distribution of radios and the listening audience among the women grouped by the seven zones. There are evidently fewer radios in the zones of Katuba, Ruashi, and the Zone Annexe than in the other zones. The difference is statistically significant ($p < .05$).

We also examined the number of radio owners according to health zones. The findings were not essentially different from those of the administrative zones. There were nine clusters in our sample in the Zone Annexe that are added to the Lubumbashi, Kampemba, Ruashi and Katuba zones. It is possible to see the patterns of radio ownership in the health zones through the administrative zone distribution in Figure 7.

As in the case of the administrative zones, the populations of the Katuba and Ruashi health zones clearly show fewer radios than the others. It is not surprising that the Lubumbashi zone in the center of the city shows a higher percentage of households owning radios.

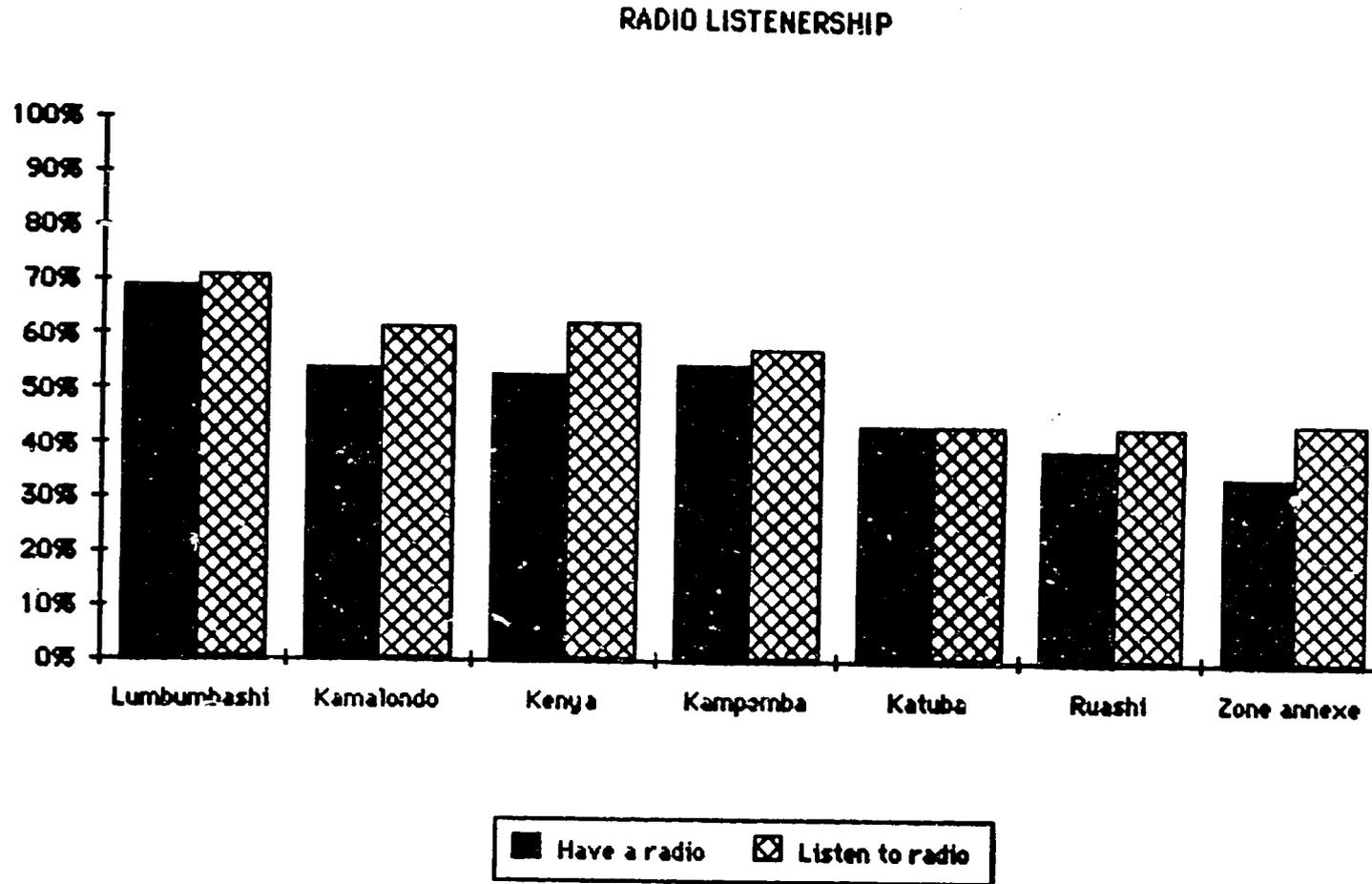
Women who said they listened to the radio were asked at what time of the day they preferred to do so. The times indicated in Figure 8 are based on their statements of preference. This is not necessarily a reflection of the actual listening times since only one reply was requested (only one answer allowed).

11.2 Television watching

The data show that 28.3% of the households in the survey owned a television set, and that 39.6% of the women watched television somewhere. We asked during which hours these respondents watched television and we recorded the first answer given among four possible answers:

<u>Time</u>	<u>%</u>
All evening	4%
From 6 to 6:30 p.m.	16%
From 6:30 to 8 p.m.	32%
After 8 p.m.	29%

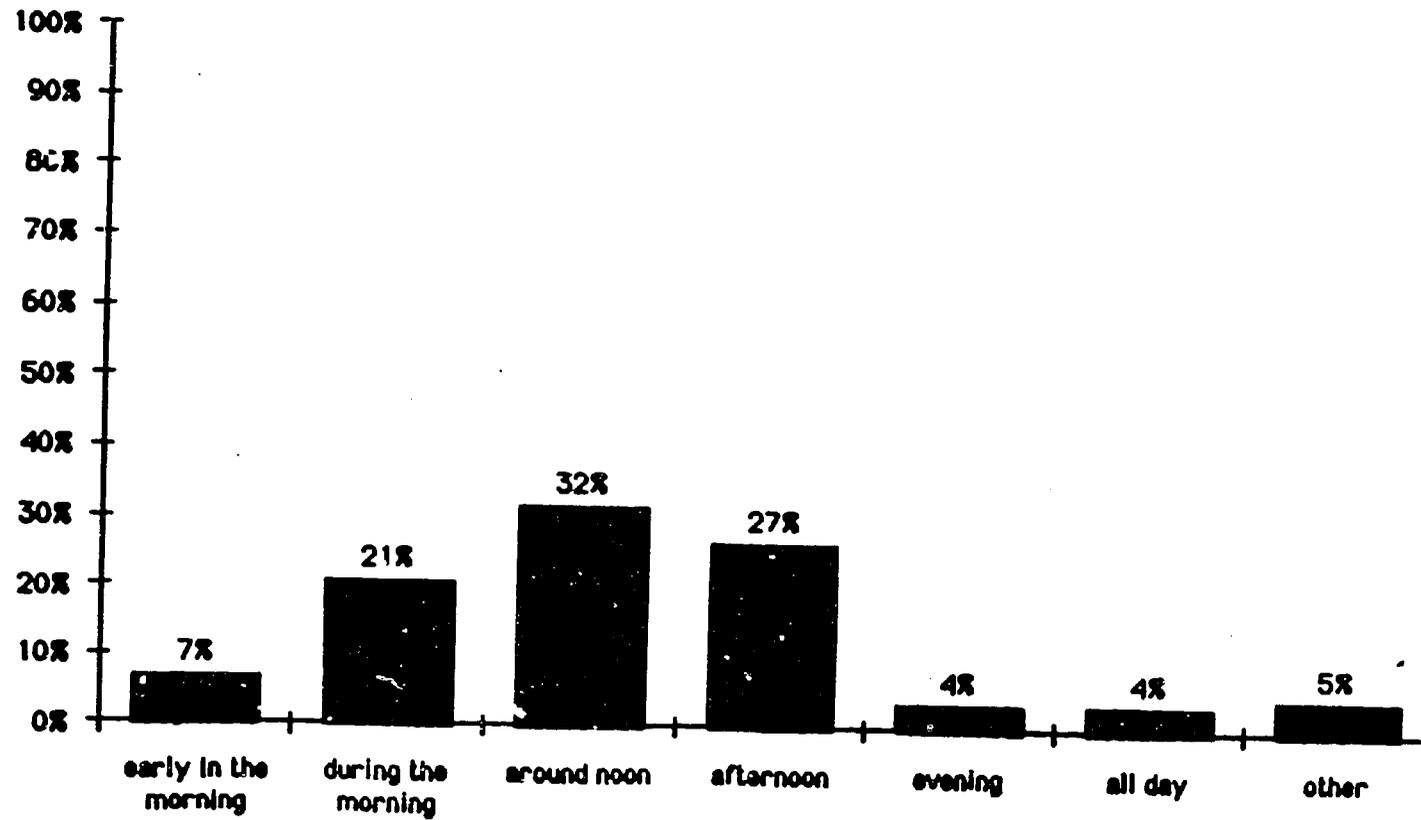
Figure 7



3/2

Figure 8

Favorite Time for Listening to the Radio



2/6

The possible answers were determined by the hours of broadcasting and the fact that the Lubumbashi station broadcasts local programs only from six to eight in the evening. After eight o'clock, the programs are broadcast from Kinshasa. We can see from this table that half of this audience (52%) watch programs originating in Lubumbashi. If 40% of all the women watch television occasionally and half of the regular listeners watch between the hours of six and eight p.m., we can estimate that spots programmed during local broadcasting would, theoretically, reach 20% of all the women.

There is, however, a remarkable difference in the number of televisions per household when classified according to administrative zone. Figure 9 shows the proportion of televisions and listeners by zone.

As in the case of the radio (Figure 7), we find the percentages of television listenership (see Figure 9) to be much lower in the zones of Katuba, Ruashi, and Zone Annexe and much higher in the Lubumbashi zone. The difference between the Lubumbashi, Kamalondo, and other zones is worth noting. If, through television, we can reach a considerable number of women in the Lubumbashi, Kamalondo, Kenya, and Kampemba zones, this is not the case for the other three.

11.3 Population reached through electronic media

It is clear that a certain percentage of the population can be reached through radio and television but that this is impossible for another faction of the population. The following table represents the percentages of target audience that would be reached through the two media.

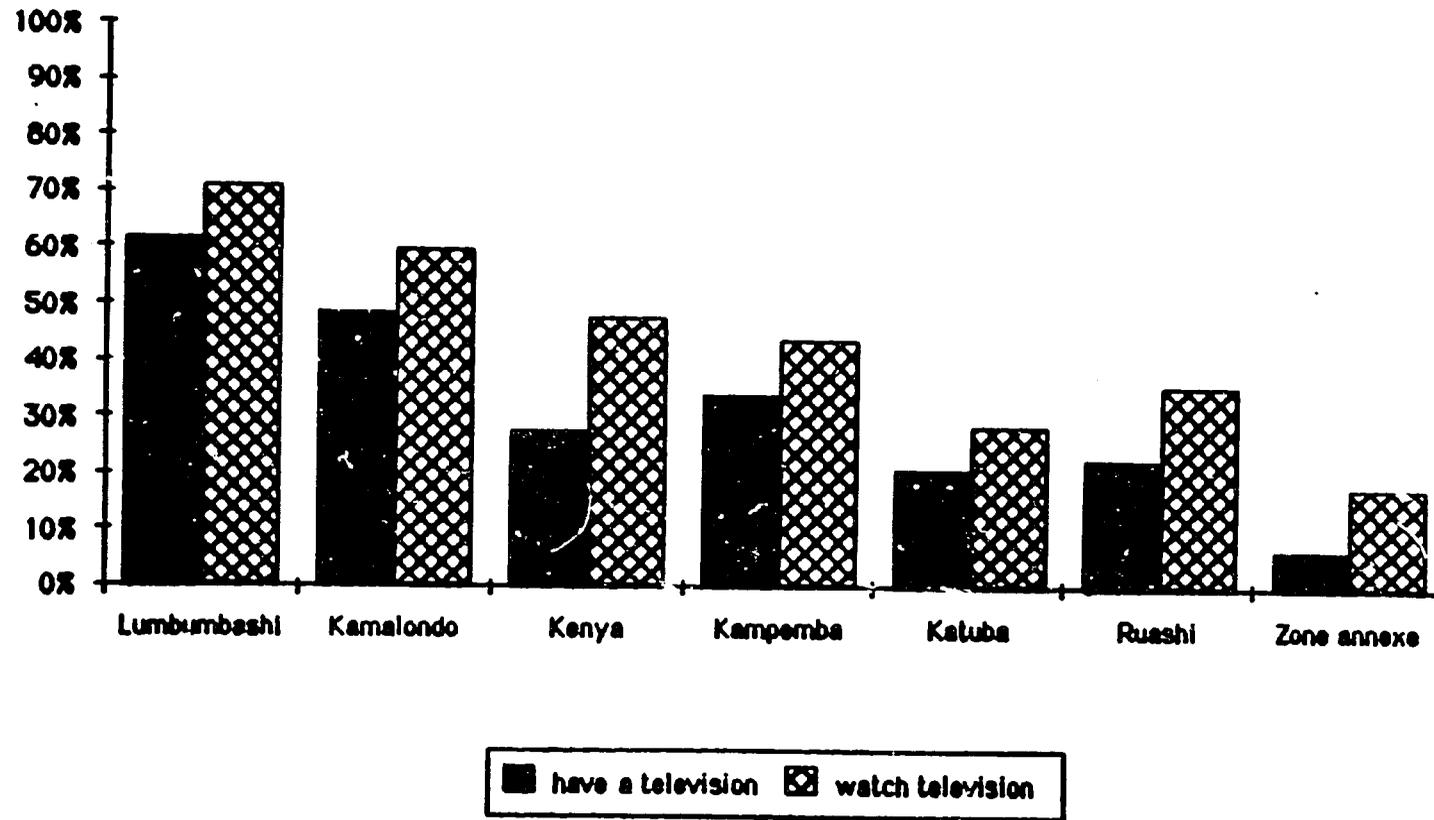
RADIO AND TELEVISION LISTENERSHIP

Listens to both radio and television	28%
Listens only to radio	24%
Listens only to television	12%
Does not listen to either one	<u>36%</u>
	100%

Listenership as shown in the above table varies according to the administrative zones. The following table classifies by zone the percentage of the population who listen to both radio and television and those who listen to neither media.

Figure 9

Television Watching by Zone



2/20

	RADIO <u>AND</u> TELEVISION	NEITHER
Lubumbashi	55%	12%
Kamalondo	44%	22%
Kenya	36%	22%
Kampemba	34%	34%
Katuba	19%	46%
Ruashi	21%	40%
Zone Annexe	13%	51%

This table clearly demonstrates the diminishing progression of the radio/television audience as one moves from the center of the city (Lubumbashi/Kamalondo) to the peripheral areas (Ruashi/Zone Annexe). Any communication strategy must take this into account.