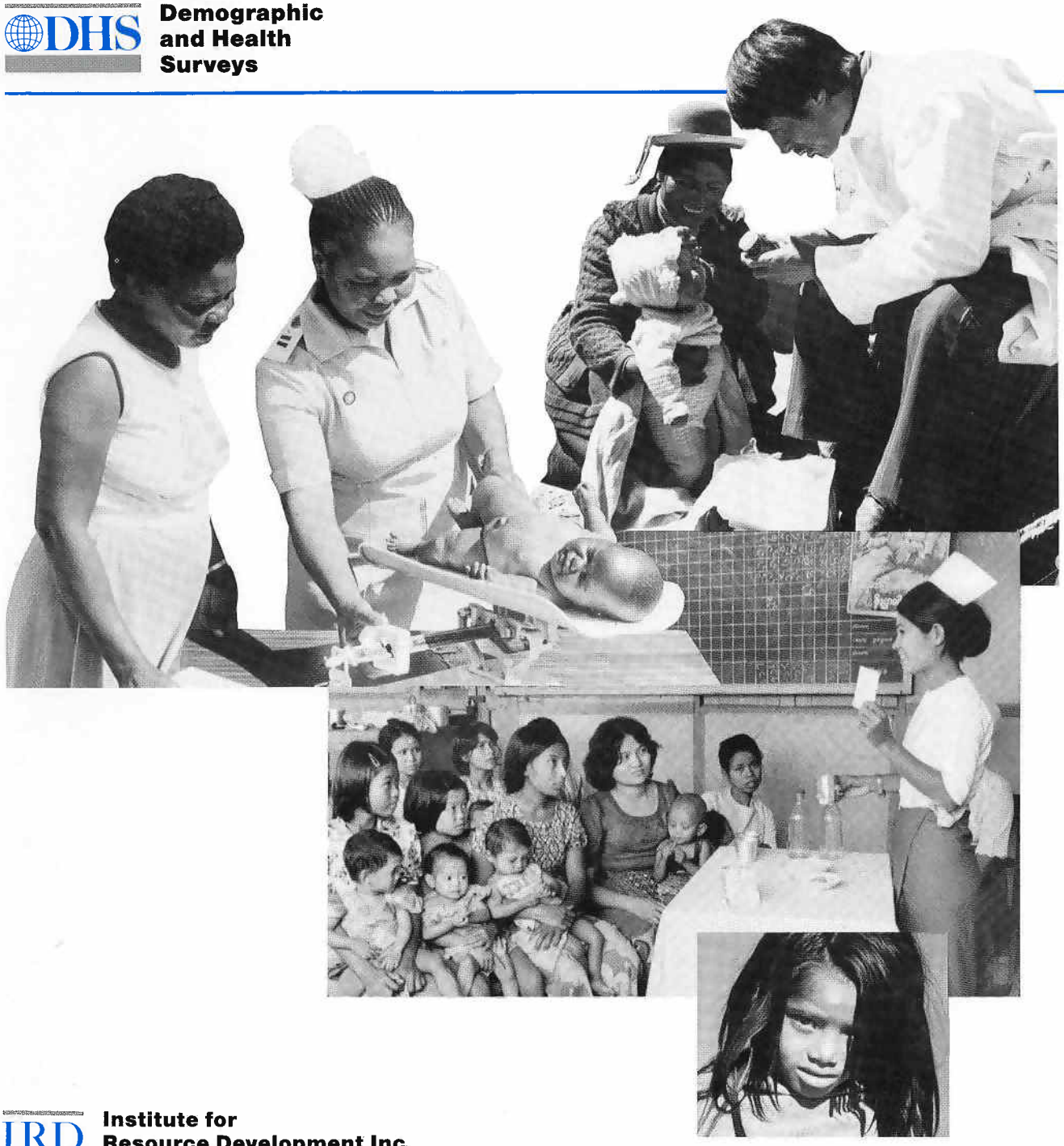
# COMPARATIVE STUDIES 4

## CHILDHOOD MORBIDITY AND TREATMENT PATTERNS

DHS Demographic and Health Surveys



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The main objectives of the DHS program are: (1) to provide decisionmakers in survey countries with data and analyses useful for informed policy choices, (2) to expand the international population and health database, (3) to advance survey methodology, and (4) to develop in participating countries the skills and resources necessary to conduct demographic and health surveys.

For information about the Demographic and Health Surveys program, write to DHS, IRD/Macro International, 8850 Stanford Boulevard, Suite 4000, Columbia, MD 21045, USA (Telephone 301-290-2800; Telex 87775; Fax 301-290-2999).

**Demographic and Health Surveys**
**Comparative Studies No. 4**

# Childhood Morbidity And Treatment Patterns

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# Preface

An important part of the DHS program is the comparative analysis and further analysis of data obtained from DHS surveys. Standard recode files have been prepared for most surveys and researchers worldwide are encouraged to use the datasets for further analysis.

Much of the comparative analysis of DHS data, particularly for major topics such as fertility, mortality, contraceptive use, and maternal and child health, is being carried out by DHS staff in Columbia, Maryland. The results of these analyses are published in the *DHS Comparative Studies* series. A total of 15 *Comparative Studies* are planned.

The studies in this series are based on the standard recode files which were available in early 1990. These include datasets for 25 standard DHS surveys carried out from 1985 to 1989. Data for El Salvador, Ondo State (Nigeria), and Sudan may not be included in all reports because some of the El Salvador and Ondo State data are not comparable with data from other DHS surveys and the Sudan survey was not completed until mid-1990.

Reports in the *DHS Comparative Studies* series provide detailed tables and graphs comparing the results of DHS surveys for countries in sub-Saharan Africa, the Near East/North Africa, Asia, and Latin America/Caribbean. The reports also discuss various issues such as questionnaire comparability, survey procedures, and data quality. Where appropriate, data from previous survey programs, primarily the World Fertility Survey (WFS) and the Contraceptive Prevalence Surveys (CPS), are used to evaluate trends over time.

The *DHS Comparative Studies* series is intended to provide analysts and policymakers with readily available comparisons of data from developing countries. The studies will also be useful to others in the fields of international population and health.

During the second phase of the DHS program (1988-1993), data will be collected for a further 25 countries. An update of the information in many of the *Comparative Studies* reports (including data from DHS-II countries) will be published later in the program.

Martin Vaessen
Project Director

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# 1 Introduction

In developing countries the majority of childhood deaths are a consequence of recurrent bouts of infectious diseases and nutritional deficiencies. Yet, in comparison with child mortality and, to a lesser extent, malnutrition, childhood morbidity has rarely been the subject of national surveys in developing countries.[1] Morbidity data usually come from smaller studies or from health facility records. Among the most common illnesses in children are diarrheal diseases and acute respiratory infections. Malaria is also common, particularly in sub-Saharan Africa.

Diarrheal diseases are considered the leading cause of infant and child mortality in developing countries (UNICEF, 1988). A review of longitudinal studies, however, found marked variation in the prevalence of diarrhea (Snyder and Merson, 1982). The average annual number of episodes varied from 2 per child in Latin America to 5 per child in Africa, although recent community studies have reported up to 10 episodes per child per year (Black et al., 1989). Among the factors that have been shown to affect diarrheal morbidity are feeding patterns, water supply, and sanitary facilities (Feachem, 1986). Most of the deaths ascribed to diarrhea are due to dehydration of the child. Therefore, surveys on the treatment of diarrhea generally attempt to measure the proportion of diarrheal episodes treated with oral rehydration therapy (ORT) as well as the use of anti-diarrheal and antibiotic drugs. The latter are primarily intended for the treatment of bacterial diarrheal disease, such as shigellosis, and are probably used too often for acute viral diarrhea. (There is no indication for the use of anti-diarrheal drugs in treating viral diarrhea.)

In many countries, acute respiratory infections are considered equally or more important than diarrhea as a cause of death in childhood. Data from longitudinal studies indicate that young children may suffer from as many as 8 episodes of respiratory infections per year (Pio et al., 1985). These are mostly upper respiratory tract infections. For mortality, the prevalence of lower respiratory tract infections, especially pneumonia, is more important. Little information is available on the prevalence of pneumonia at national levels. Similarly, treatment patterns for pneumonia, that is, the proportion of children with pneumonia receiving antibiotics, are largely unknown.

For children in tropical countries, particularly in sub-Saharan Africa, malaria is a major problem in childhood and thereafter. Recurrent attacks of malaria often result in severe anemia and may affect the child's nutritional status and subsequent resistance to other infections. In addition, attacks in non-immune children have a high case fatality rate. Treatment of malaria with chloroquine can be very effective if the organism causing the disease is not resistant to the drug.

The Demographic and Health Surveys program (DHS), funded by the United States Agency for International Development (USAID), assisted 29 countries to implement surveys on population and maternal and child health during the five-year period from 1985 to 1989. These surveys provide information for policy and program decisionmaking and for scientific research. Most of the surveys included questions on the prevalence of diarrhea and its treatment. A smaller number of surveys, mainly in countries in sub-Saharan Africa, included questions on the prevalence of cough and/or breathing difficulties, the prevalence of fever, and the treatment of both these problems. DHS surveys have large national samples, which permit an analysis of socioeconomic and demographic differentials in the prevalence and treatment of these illnesses. In this report data will be presented on the prevalence and treatment of diarrhea, respiratory infection, and fever.

[1] The exceptions are the national household surveys on diarrhea and its treatment supported by the World Health Organization.

# 2 Data and Methods

Data from the DHS surveys include information on fertility and childhood mortality levels, the use of family planning, attitudes towards fertility and family planning, marital status, breastfeeding, various maternal and child health indicators, anthropometry, and socioeconomic characteristics. Most of the surveys included questions on the prevalence and treatment of diarrhea. Survey respondents were women of childbearing age, and the sample size ranged from 3,000 to 10,000 respondents.

Morbidity data were collected from the mother for all living children under five years of age. Many cross-sectional morbidity surveys collect information on the prevalence rate, which is defined as the total number of cases present at a point or period in time divided by the population at risk. For diarrhea, a recall period of two weeks was used; for fever and cough/breathing difficulties, four weeks was used. Table 2.1 summarizes the characteristics of 25 DHS surveys carried out from 1986 to 1989 and the information available on childhood morbidity for each country.

The standard DHS questionnaire used in the first phase of the DHS program (DHS-I) assessed diarrheal prevalence as follows:

- For each child under the age of five, the survey respondent was asked, "Has this child (name of child) had diarrhea in the last 24 hours?" The prevalence of diarrhea in the last 24 hours is assumed to be equal to the proportion currently having diarrhea or equal to the point prevalence on the day of interview. Since the interview is, on average, held in the middle of the working day at noon, the reference period includes 12 hours of the previous day.

- If there was no diarrhea in the last 24 hours, the interviewer asked, "Has this child (name) had diarrhea in the last two weeks?" This question refers to the period from the second to the fourteenth day (referred to as 2-14 days) before the interview. The sum of the affirmative answers to these two questions provides an estimate of the period prevalence of diarrhea in the last two weeks.

Summary of information available on childhood morbidity

Table 2.1 Availability of information on morbidity in children under 5 years, for diarrhea, fever, and cough/difficult breathing, Demographic and Health Surveys, 1986-1989

| Country | Date of Fieldwork | Number of Respondents | Number of Children[1] | Diarrhea | Fever | Cough/ Difficult Breathing[2] |
|---|---|---|---|---|---|---|
| SUB-SAHARAN AFRICA | | | | | | |
| Botswana | AUG-DEC 1988 | 4366 | 3069 | YES | YES | YES |
| Burundi | APR-JUL 1987 | 3970 | 3502 | YES | YES | YES |
| Ghana | FEB-MAY 1988 | 4488 | 3690 | YES | YES | YES |
| Kenya | DEC-MAY 1989 | 7150 | 6589 | YES | YES | YES |
| Liberia | FEB-JUL 1986 | 5239 | 4307 | YES | YES | YES |
| Mali | MAR-AUG 1987 | 3200 | 2941 | YES | YES | YES |
| Senegal | APR-JUL 1986 | 4415 | 3708 | YES | YES | NO |
| Togo | JUN-NOV 1988 | 3360 | 2803 | YES | YES | YES |
| Uganda | SEP-FEB 1989 | 4730 | 4373 | YES | YES | YES |
| Zimbabwe | SEP-JAN 1989 | 4201 | 3164 | YES | YES | YES |
| NORTH AFRICA | | | | | | |
| Egypt | OCT-JAN 1989 | 8911 | 8007 | YES | NO | YES |
| Morocco | MAY-JUL 1987 | 5982 | 5602 | YES | NO | NO |
| Tunisia | JUN-OCT 1988 | 4184 | 4250 | YES | NO | NO |
| ASIA | | | | | | |
| Indonesia | SEP-DEC 1987 | 11884 | 7575 | NO | NO | NO |
| Sri Lanka | JAN-MAR 1987 | 5865 | 3877 | YES | NO | NO |
| Thailand | MAR-JUN 1987 | 6775 | 3520 | YES | NO | NO |
| LATIN AMERICA/CARIBBEAN | | | | | | |
| Bolivia | FEB-JUL 1989 | 7923 | 5205 | YES | NO | YES |
| Brazil | MAY-AUG 1986 | 5892 | 3224 | YES | NO | NO |
| Colombia | OCT-DEC 1986 | 5329 | 2616 | YES | YES | YES |
| Dominican Republic | SEP-DEC 1986 | 7649 | 4105 | YES | NO | NO |
| Ecuador | JAN-MAR 1987 | 4713 | 1970 | YES | NO | NO |
| Guatemala | OCT-DEC 1987 | 5160 | 4230 | YES | NO | NO |
| Mexico | FEB-MAY 1987 | 9308 | 5649 | YES | NO | NO |
| Peru | SEP-DEC 1986 | 4999 | 2836 | YES | NO | NO |
| Trinidad&Tobago | MAY-AUG 1987 | 3806 | 1887 | YES | NO | NO |

[1] Includes children born during the month of the interview.
[2] For information about specific data collected, see Section 5, Respiratory Illness.

Diarrhea was not defined in the DHS surveys; it was left to the respondents to decide whether their children had (had) diarrhea or not.

The prevalence data on diarrhea can be used to evaluate data quality. Durations of diarrheal episodes can be estimated from the proportions with diarrhea in the last 24 hours and in the period 2-14 days before the survey. These indirect estimates of durations are compared with reported durations of diarrheal episodes in some of the DHS surveys and in other studies. The methodology and results of this analysis are described elsewhere (Boerma et al., 1991). An important conclusion is that accuracy and completeness of reporting of diarrhea vary considerably between countries and between socioeconomic groups. In addition, it is possible that there is some overreporting of current diarrhea (that is, episodes occurring within the preceding 24 hours), and it is likely that there is considerable underreporting of recent cases of diarrhea (that is, episodes occurring more than 24 hours but less than two weeks ago).

If a child had had diarrhea within the past two weeks, questions were asked about the type of treatment given, with special emphasis on oral rehydration practices.[2] In addition, most surveys included a question on whether the child had been taken to a medical facility. All mothers of children under five years also were queried about their knowledge of oral rehydration solution and how they prepared and used the solution.

The survey questions on the prevalence of fever and respiratory infections varied more between countries than did the questions asked about diarrhea. Some of these questions also were modified and improved during the first phase of the DHS program. The mother was asked whether the child had had fever in the last four weeks, and, if so, where the child had been taken for treatment, and what was done to treat the fever. For respiratory infections the primary interest lies in the occurrence and treatment of pneumonia. The signs and symptoms shown by children with pneumonia include cough accompanied by rapid and difficult breathing. Initially, the survey question did not separate these two symptoms: it asked, "Has your child suffered from severe cough or difficult or rapid breathing in the last four weeks?" This question was followed by the same two treatment questions asked for fever. Since rapid or difficult breathing without cough is relatively rare, the major analytical problem is that children with only cough cannot be distinguished from children with both cough and difficult breathing. In the DHS surveys in Bolivia, Egypt, and Zimbabwe, the questions were changed so that it was possible to analyze children with more severe respiratory infections separately.

Table 2.2 shows the percentage of children under five years whose mothers did not know whether they had had diarrhea in the preceding two weeks. In most countries, this percentage is low. In five, however—Bolivia, Botswana, Liberia, Uganda, and Zimbabwe—the mothers of more than 5 percent of the children did not know whether diarrhea had occurred. As shown in Table 2.2, child fostering is the most important reason for a mother's lack of knowledge about the health status of her child(ren). Child fostering increases with the age of the child: it is rare for infants and highest at age 24-59 months. The majority of mothers whose children did not usually live with them did not know whether their child(ren) had had diarrhea. The last column of Table 2.2 shows the percentage of "don't know" responses for children who usually do live with the mother. Notable is the very high percentage of don't know responses in Bolivia and Togo. Children with a "don't know" response to the question about recent diarrhea have been excluded from the following analyses. Respiratory infections and fever were handled in the same manner.

Mothers' lack of knowledge of child's diarrhea by fostering status

Table 2.2 Percentage of children under 5 years whose mother did not know whether their child had had diarrhea in the 2 weeks preceding the survey by fostering status, Demographic and Health Surveys, 1986-1989

| Country | Did not know if child had diarrhea | Fostered children | Did not know if child had diarrhea: Among fostered children | Did not know if child had diarrhea: Among children with mother | Number of children |
|---|---|---|---|---|---|
| SUB-SAHARAN AFRICA | | | | | |
| Botswana | 11.8 | 14.9 | 71.6 | 1.0 | 3069 |
| Burundi | 1.2 | 0.8 | (68.8) | 0.7 | 3502 |
| Ghana | 2.3 | 4.0 | 47.7 | 0.3 | 3690 |
| Kenya | 1.0 | 2.4 | 22.5 | 0.4 | 6589 |
| Liberia[1] | 8.6 | 10.2 | 70.2 | 0.7 | 4307 |
| Mali | 3.0 | 2.1 | 58.3 | 0.2 | 2941 |
| Senegal | 4.7 | 5.4 | 66.3 | 0.8 | 3708 |
| Togo | 2.0 | 3.1 | 54.7 | 7.0 | 2803 |
| Uganda | 7.8 | 7.2 | 82.9 | 1.4 | 4373 |
| Zimbabwe | 7.6 | 6.6 | 87.1 | 1.1 | 3164 |
| NORTH AFRICA | | | | | |
| Egypt[2] | 0.3 | 0.2 | (42.4) | 0.2 | 8007 |
| Morocco | 0.4 | 0.8 | (10.6) | 0.3 | 5602 |
| Tunisia | 0.1 | 0.2 | (0.0) | 0.1 | 4250 |
| ASIA | | | | | |
| Sri Lanka | 0.4 | 1.2 | (7.4) | 0.3 | 3877 |
| Thailand | 2.0 | 2.7 | 61.6 | 0.3 | 3520 |
| LATIN AMERICA/CARIBBEAN | | | | | |
| Bolivia[3] | 7.7 | 0.8 | (30.5) | 7.2 | 5205 |
| Brazil | 1.8 | 2.5 | 51.4 | 2.2 | 3224 |
| Colombia | 1.6 | 2.6 | 51.8 | 0.2 | 2616 |
| Dominican Republic | 3.9 | 7.2 | 43.3 | 0.7 | 4105 |
| Ecuador[4] | 0.5 | 1.2 | (21.7) | 0.2 | 1970 |
| Guatemala | 0.3 | 0.9 | (29.7) | 0.0 | 4230 |
| Peru[5] | 1.3 | 1.3 | (47.2) | 0.7 | 2836 |
| Trinidad&Tobago | 1.0 | 3.2 | 16.4 | 0.4 | 1887 |

Note: Figures in parentheses are based on fewer than 50 cases. Mexico is excluded because it did not have a question on child fostering.
[1] Diarrhea in the preceding 4 weeks
[2] Diarrhea in the preceding week
[3] Responses were to question on when child had last episode of diarrhea.
[4] Last birth only; "don't know" refers to cough only, since diarrhea did not have such a response category.
[5] Diarrhea in the preceding 15 days

[2] There is some variation in treatment patterns by duration of the diarrheal episode. For details see Boerma et al. (1991).

# 3 Diarrhea

## 3.1 PREVALENCE LEVELS AND DIFFERENTIALS

The prevalence of diarrhea during the two weeks preceding the survey is shown in Table 3.1 by age of the child. Prevalence varies from about 10 percent or less in Botswana, Sri Lanka, and Trinidad and Tobago to more than 30 percent in Bolivia, Ecuador, Mali, Peru, and Senegal (Figure 3.1). The median two-week prevalence of diarrhea for the 24 countries in Table 3.1 is 22 percent.

The percentage of children with diarrhea in the 24 hours preceding the survey ranged from 2 to 20 percent (Table 3.1). In half of the countries, more than 10 percent of the children under five years were reported to have had diarrhea in the last 24 hours.

Prevalence of diarrhea by age group

Table 3.1 Percentage of children under 5 years with diarrhea in the 2 weeks preceding the survey by age of child, and percentage of children with diarrhea in the preceding 24 hours, Demographic and Health Surveys, 1986-1989

| Country | Age of child (months) | | | | | | | Total | Diarrhea in the preceding 24 hours | Number of children |
|---|---|---|---|---|---|---|---|---|---|---|
| | <6 | 6-11 | 12-17 | 18-23 | 24-35 | 36-47 | 48-59 | | | |
| SUB-SAHARAN AFRICA | | | | | | | | | | |
| Botswana | 16.8 | 19.6 | 19.1 | 12.9 | 8.5 | 5.3 | 4.3 | 11.3 | 4.8 | 2648 |
| Burundi | 21.5 | 35.0 | 32.6 | 18.4 | 14.4 | 8.5 | 6.8 | 17.6 | 8.4 | 3403 |
| Ghana | 18.3 | 38.5 | 43.1 | 42.7 | 28.3 | 18.8 | 12.5 | 27.2 | 13.9 | 3529 |
| Kenya | 18.0 | 25.5 | 25.9 | 18.4 | 10.9 | 5.1 | 3.3 | 13.0 | 6.8 | 6390 |
| Liberia[1] | 34.1 | 49.4 | 59.5 | 55.8 | 50.6 | 34.3 | 26.9 | 43.2 | NA | 3841 |
| Mali | 33.2 | 44.5 | 42.5 | 48.7 | 44.9 | 27.2 | 19.2 | 35.9 | 20.2 | 2736 |
| Senegal | 41.2 | 55.6 | 51.2 | 54.0 | 42.9 | 28.2 | 20.9 | 39.9 | NA | 3498 |
| Togo | 30.8 | 39.9 | 36.5 | 41.7 | 33.9 | 25.0 | 15.1 | 30.3 | 14.6 | 2688 |
| Uganda | 27.5 | 43.9 | 43.4 | 36.5 | 21.9 | 15.3 | 8.6 | 26.4 | 15.4 | 3984 |
| Zimbabwe | 15.3 | 41.4 | 33.6 | 33.9 | 20.2 | 13.5 | 9.1 | 21.3 | 9.5 | 2906 |
| NORTH AFRICA | | | | | | | | | | |
| Egypt[2] | 21.4 | 33.9 | 28.4 | 22.7 | 14.1 | 7.2 | 5.5 | 16.0 | 6.9 | 7889 |
| Morocco | 33.4 | 52.7 | 46.9 | 41.0 | 27.4 | 18.5 | 12.5 | 29.1 | 17.7 | 5505 |
| Tunisia | 27.0 | 38.5 | 37.2 | 29.3 | 18.3 | 11.0 | 9.2 | 20.7 | 10.5 | 4208 |
| ASIA | | | | | | | | | | |
| Sri Lanka | 11.1 | 11.3 | 10.6 | 8.8 | 5.0 | 2.6 | 1.9 | 6.0 | 2.2 | 3820 |
| Thailand | 19.0 | 23.3 | 23.5 | 24.5 | 15.0 | 10.6 | 9.3 | 16.1 | 6.3 | 3416 |
| LATIN AMERICA/CARIBBEAN | | | | | | | | | | |
| Bolivia | 24.9 | 39.9 | 44.5 | 41.9 | 31.5 | 23.4 | 17.6 | 30.5 | 16.9 | 4753 |
| Brazil | 22.3 | 25.5 | 25.3 | 28.8 | 18.0 | 10.8 | 8.5 | 17.2 | 7.6 | 3141 |
| Colombia | 16.4 | 32.8 | 28.6 | 24.1 | 19.6 | 13.4 | 11.3 | 19.2 | 10.0 | 2527 |
| Dominican Republic | 27.4 | 42.3 | 39.6 | 33.6 | 25.5 | 19.5 | 12.5 | 26.3 | 14.3 | 3878 |
| Ecuador[3] | 35.9 | 45.9 | 45.2 | 48.2 | 37.8 | 31.1 | 24.3 | 38.9 | NA | 1767 |
| Guatemala | 17.4 | 30.0 | 30.5 | 20.7 | 15.5 | 10.3 | 7.4 | 16.7 | 10.4 | 4170 |
| Mexico | 27.1 | 38.2 | 37.5 | 29.7 | 20.6 | 14.4 | 11.7 | 22.8 | NA | 5265 |
| Peru[4] | 36.8 | 50.7 | 47.4 | 44.7 | 31.1 | 24.0 | 20.1 | 32.6 | 16.6 | 2778 |
| Trinidad&Tobago | 5.6 | 7.4 | 15.8 | 7.6 | 5.7 | 4.7 | 2.5 | 6.2 | 2.1 | 1819 |

Note: Figures include "don't know" and "missing" categories.
NA = Not applicable (question not asked)
[1] Diarrhea in the preceding 4 weeks
[2] Diarrhea in the preceding 7 days
[3] Last births only
[4] Diarrhea in the preceding 15 days

Figure 3.1 Prevalence of diarrhea among children 1-59 months in the 2 weeks preceding the survey, Demographic and Health Surveys, 1986-1989

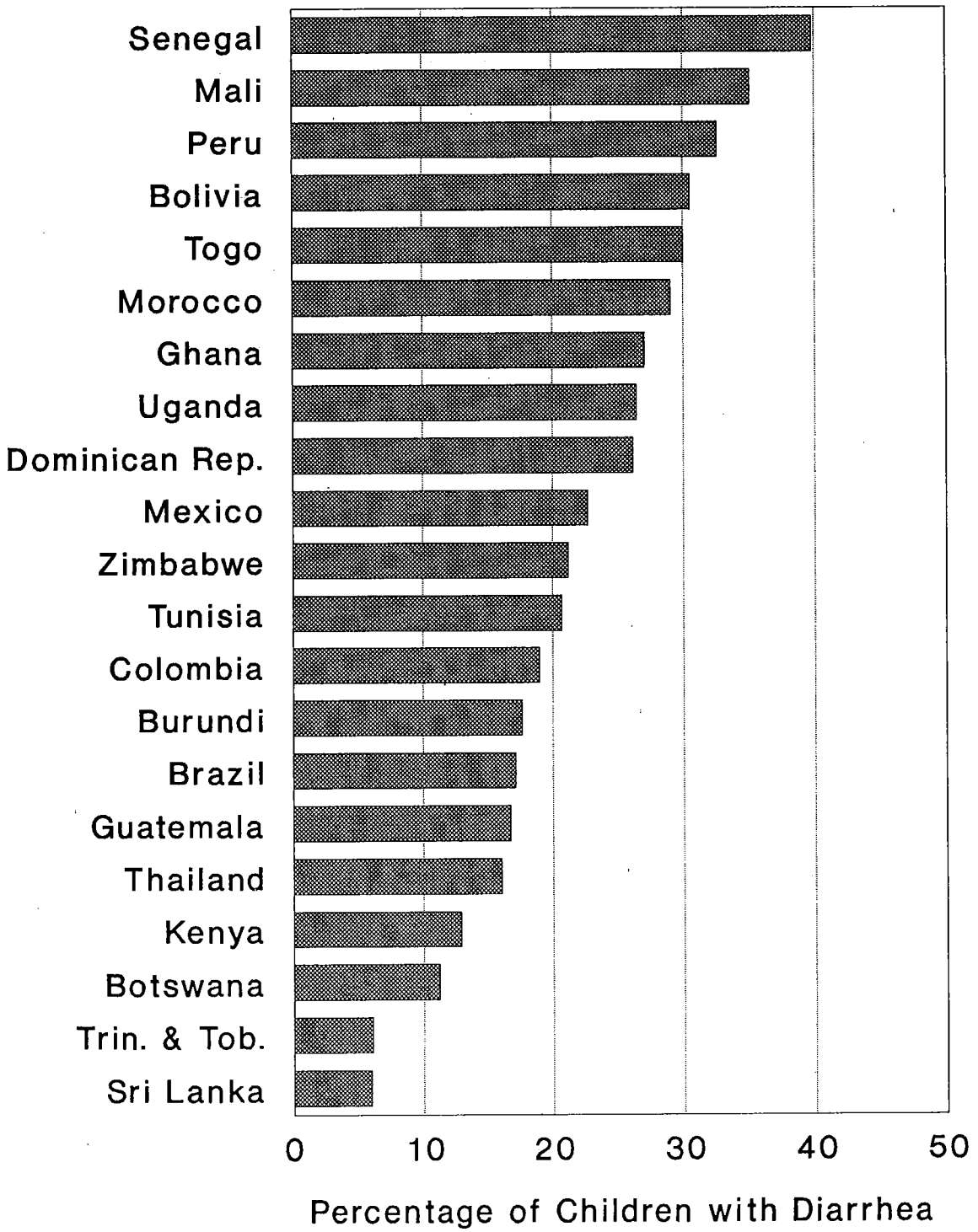
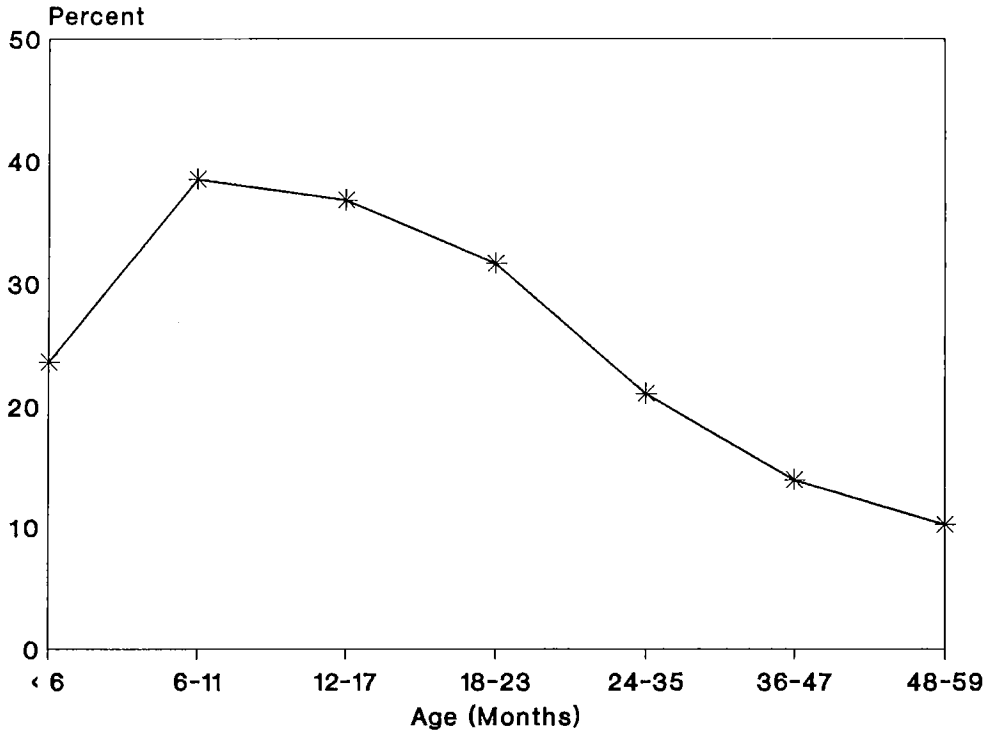


Figure 3.2 Prevalence of diarrhea among children 1-59 months in the 2 weeks preceding the survey by age group, Demographic and Health Surveys, 1986-1989




The age pattern of diarrhea prevalence is fairly consistent for all countries: the highest prevalence rates are reported for children age 6-23 months, with a peak at 6-17 months coinciding with the weaning process (Figure 3.2). In that age group, about one in three children had had diarrhea in the past two weeks. After the second birthday the prevalence of diarrhea declines rapidly with increasing age of the child.

**Relative Differences in Diarrhea Prevalence**

Differentials in diarrhea prevalence are analyzed for socioeconomic and demographic variables, variables related to environmental and domestic hygiene, measles vaccination, and feeding patterns. The purpose of this analysis is to identify inter-country patterns in the relationship of these variables to the occurrence of diarrhea. In order to make comparisons across countries with different levels of diarrhea prevalence, relative differences must be considered as well as absolute differences. (For example, the relative difference between 25 and 30 percent is 5/25 = 20 percent, which is also the relative difference between 5 and 7 percent.) The relative differences for all variables included in the analysis is shown in Table 3.2.

Relative differences in diarrhea prevalence

Table 3.2 Differentials in diarrhea prevalence for children 6-23 months in the 2 weeks preceding the survey: number of countries with specified relative differences between categories, Demographic and Health Surveys, 1986-1989

| CHARACTERISTICS | | Relative differences in diarrhea prevalence (%) | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | Higher by | | | Same | Lower by | | |
| Risk category | Reference category (=1) | ≥30 | 20 to 29 | 10 to 19 | +/-9 | 10 to 19 | 20 to 29 | ≥30 |
| SOCIOECONOMIC CHARACTERISTICS | | | | | | | | |
| Rural residence | Urban residence | 4 | 2 | 4 | 8 | 5 | 1 | 0 |
| Mother no education | Primary education | 3 | 2 | 0 | 14 | 4 | 0 | 0 |
| Mother primary education | Secondary education | 6 | 8 | 2 | 6 | 1 | 0 | 0 |
| No radio in household | Radio in household | 6 | 1 | 4 | 8 | 2 | 0 | 0 |
| DEMOGRAPHIC CHARACTERISTICS | | | | | | | | |
| Female child | Male child | 0 | 0 | 1 | 15 | 6 | 2 | 0 |
| Short birth interval | Interval 24-35 months | 0 | 3 | 6 | 12 | 1 | 1 | 1 |
| Long birth interval | Interval 24-35 months | 0 | 0 | 2 | 13 | 6 | 3 | 0 |
| First birth | Birth order 2-3 | 0 | 0 | 2 | 16 | 6 | 0 | 0 |
| Birth order 4-5 | Birth order 2-3 | 0 | 1 | 2 | 13 | 2 | 3 | 2 |
| Birth order 6+ | Birth order 2-3 | 2 | 0 | 2 | 11 | 5 | 3 | 0 |
| Mother < 20 yrs | Mother 20-34 years | 5 | 2 | 3 | 8 | 1 | 1 | 0 |
| Mother 35+ yrs | Mother 20-34 years | 3 | 1 | 3 | 9 | 6 | 1 | 1 |
| HYGIENE CHARACTERISTICS | | | | | | | | |
| Unpiped drinking water | Piped drinking water | 5 | 2 | 4 | 10 | 1 | 1 | 0 |
| No toilet facility | Toilet facility (not flush) | 4 | 1 | 4 | 11 | 1 | 1 | 0 |
| Dirt floors | Non-dirt floors | 4 | 1 | 3 | 10 | 1 | 0 | 0 |
| VACCINATION STATUS (12-35 MONTHS) | | | | | | | | |
| No measles vaccine | Received measles vaccine | 2 | 6 | 4 | 7 | 1 | 0 | 0 |

## Socioeconomic Characteristics

Table 3.3 shows the percentage of children with diarrhea in the two weeks preceding the survey according to three socioeconomic variables: residence, mother's level of education, and presence of a radio in the household. (The results are summarized in Table 3.2.) Since the prevalence of diarrhea varies considerably by age, children age 6-23 months were selected for the analysis of these differentials. Analysis of the data for the entire group of children under age five showed that the differentials were slightly greater for children age 6-23 months than for all under-fives, but that they generally point in the same direction. Including all children under five offers the advantage of larger numbers in each category, but it may lead to spurious differentials in diarrhea prevalence caused solely by different age compositions.

Urban-rural differentials are minor for most countries (Table 3.3). In four countries, Brazil, Colombia, Thailand, and Zimbabwe, the prevalence of diarrhea is at least 30 percent higher among rural children than among urban. In Kenya and Tunisia, the prevalence of diarrhea is 20-29 percent higher in rural areas. In contrast, there are six countries in which the prevalence of diarrhea is at least 10 percent higher for urban children than for rural, with Sri Lanka having the greatest urban disadvantage.

The expected gradual decline in morbidity with increasing level of education can be observed in a number of countries, but it is not as clear-cut as in the case of child mortality. In 18 of the 23 countries for which data are available, there is hardly any difference between the prevalence of diarrhea among children of mothers with no education and the children of mothers with

Prevalence of diarrhea by socioeconomic characteristics

Table 3.3 Percentage of children 6-23 months with diarrhea in the 2 weeks preceding the survey by residence, mother's level of education, and presence of radio in the household, Demographic and Health Surveys, 1986-1989

| Country | Residence | | Education | | | Radio | | Total | Number of children |
|---|---|---|---|---|---|---|---|---|---|
| | Urban | Rural | None | Primary | Secondary or more | Yes | No | | |
| SUB-SAHARAN AFRICA | | | | | | | | | |
| Botswana | 20.0 | 16.8 | 18.7 | 18.0 | 14.6 | 18.5 | 16.0 | 17.5 | 891 |
| Burundi | (34.9) | 29.7 | 29.7 | 30.9 | (29.1) | 29.8 | 29.9 | 29.9 | 1075 |
| Ghana | 44.0 | 40.3 | 39.6 | 43.7 | 29.3 | 44.2 | 39.5 | 41.3 | 1191 |
| Kenya | 19.5 | 24.1 | 23.4 | 25.0 | 18.9 | 22.0 | 25.7 | 23.4 | 2013 |
| Liberia[a] | 52.6 | 55.3 | 54.4 | 59.4 | 47.7 | 53.0 | 55.8 | 54.2 | 1382 |
| Mali | 51.6 | 42.6 | 44.5 | 47.2 | 46.2 | 45.4 | 44.2 | 44.9 | 926 |
| Senegal | 48.2 | 56.7 | 55.4 | 51.9 | 31.9 | 53.5 | 54.1 | 53.6 | 1218 |
| Togo | 38.7 | 39.4 | 39.4 | 38.9 | 38.7 | 34.5 | 43.7 | 39.2 | 870 |
| Uganda | 37.7 | 42.1 | 41.8 | 42.1 | 38.5 | 37.8 | 43.3 | 41.7 | 1443 |
| Zimbabwe | 29.0 | 38.9 | 37.2 | 34.7 | 39.4 | 34.0 | 37.9 | 36.3 | 902 |
| NORTH AFRICA | | | | | | | | | |
| Egypt[b] | 27.9 | 29.0 | 30.5 | 30.4 | 20.8 | NA | NA | 28.5 | 2372 |
| Morocco | 48.7 | 45.9 | 45.6 | 52.7 | 55.3 | 47.5 | 44.3 | 46.9 | 1653 |
| Tunisia | 31.6 | 38.7 | 40.0 | 31.3 | 24.6 | 33.4 | 39.3 | 35.2 | 1246 |
| ASIA | | | | | | | | | |
| Sri Lanka | 13.6 | 9.7 | 18.8 | 13.0 | 7.8 | 9.2 | 13.0 | 10.2 | 1139 |
| Thailand | 16.8 | 25.1 | 35.5 | 23.6 | 17.1 | 21.1 | 29.0 | 23.7 | 1082 |
| LATIN AMERICA/CARIBBEAN | | | | | | | | | |
| Bolivia | 41.5 | 42.6 | 44.8 | 45.5 | 34.2 | NA | NA | 42.1 | 1628 |
| Brazil | 23.9 | 31.9 | 42.8 | 25.8 | 18.6 | 24.0 | 33.7 | 26.5 | 883 |
| Colombia | 24.8 | 34.0 | 39.5 | 32.6 | 19.0 | 26.3 | 36.1 | 28.2 | 811 |
| Dominican Republic | 40.0 | 36.4 | 33.5 | 40.9 | 34.6 | 37.6 | 39.9 | 38.5 | 1280 |
| Ecuador[c] | 41.8 | 51.5 | 57.0 | 52.2 | 34.2 | 42.9 | 60.5 | 46.5 | 779 |
| Guatemala | 27.0 | 27.5 | 25.6 | 28.7 | 31.3 | 27.6 | 27.1 | 27.4 | 1285 |
| Mexico | 40.3 | 32.6 | 34.6 | 38.9 | 28.7 | NA | NA | 35.4 | 1602 |
| Peru[d] | 44.1 | 51.9 | 50.0 | 52.1 | 41.9 | 47.1 | 50.7 | 47.7 | 796 |
| Trinidad&Tobago | 10.6 | 9.4 | e | 10.7 | 9.2 | 9.7 | 12.7 | 10.0 | 582 |

Note: Figures in parentheses are based on fewer than 50 cases.
NA = Not applicable (question not asked)
[a] Diarrhea in the preceding 4 weeks
[b] Diarrhea in the preceding 7 days
[c] Last births only
[d] Diarrhea in the preceding 15 days
[e] Fewer than 20 cases

some primary education. In five countries, Brazil, Colombia, Sri Lanka, Thailand, and Tunisia, children of mothers with no education have higher diarrheal prevalences. Primary education did not have an effect on the prevalence of diarrhea in any of the countries in sub-Saharan Africa. The effects of some secondary education or higher, however, are substantial in most countries. Large differences between secondary and primary education were found in Bolivia, Brazil, Colombia, Ecuador, Egypt, Ghana, Kenya, Liberia, Mexico, Peru, Senegal, Sri Lanka, Thailand, and Tunisia. Overall, mother's education did not appear to have an effect on the prevalence of diarrhea in Burundi, the Dominican Republic, Guatemala, Mali, Morocco, Togo, Uganda, and Zimbabwe.

The presence of a radio in the household has a slightly greater correlation with the prevalence of diarrhea than does residence. In 7 of the 21 countries for which data are available, relative diarrhea prevalence is at least one-fifth higher in households without a radio than in households with a radio. These countries included Brazil, Colombia, Ecuador, Sri Lanka, Thailand, Togo, and Trinidad and Tobago.

## Demographic Characteristics

Table 3.4 presents the prevalence of diarrhea in the last two weeks among children 6-23 months by demographic variables. (The results are summarized in Table 3.2.) Sex differentials are small, with girls generally having slightly lower diarrhea prevalence. In Sri Lanka and Thailand the prevalence was about 20 percent lower for girls than for boys.

Birth intervals appear to have little effect on the prevalence of diarrhea. In most countries children born after an interval of less than two years have the highest diarrhea prevalence, but in only three countries (Burundi, Colombia, and Trinidad and Tobago) was the relative difference more than 20 percent when compared to birth intervals of 24-35 months.

Differentials by birth order are small as well. No significant increase in the prevalence of diarrhea can be observed either for first births or for higher order births. In Thailand, a marked increase in the prevalence of diarrhea is observed for birth order 6 and over, but that result is based on only 37 children in the category. In Brazil and Colombia, the prevalence of diarrhea was more than 30 percent higher among children whose birth order was 6 or over than for children of birth order 2-3.

Differentials by mother's age are not consistent, although, in most countries, reported prevalence was higher among children of the youngest mothers. In seven countries, prevalence differed by more than 20 percent between children of mothers under age 20 and children whose mothers were age 20-34 years; these include Brazil, Colombia, Ecuador, Kenya, Thailand, Peru, and Zimbabwe.

Prevalence of diarrhea by demographic characteristics

Table 3.4 Percentage of children 6-23 months with diarrhea in the 2 weeks preceding the survey by sex of child, birth interval, birth order, and mother's age, Demographic and Health Surveys, 1986-1989

| | Sex | | Birth interval | | | Birth order | | | | Mother's age (yr) | | | Number of children |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | M | F | <24 | 24-35 | >35 | 1 | 2-3 | 4-5 | 6+ | 15-19 | 20-34 | >35 | |
| SUB-SAHARAN AFRICA | | | | | | | | | | | | | |
| Botswana | 16.7 | 18.3 | 14.2 | 18.8 | 17.0 | 18.0 | 19.2 | 14.5 | 17.1 | 17.6 | 18.4 | 13.6 | 891 |
| Burundi | 31.5 | 28.2 | 33.6 | 26.0 | 30.2 | 34.8 | 33.6 | 25.8 | 27.8 | a | 30.2 | 27.2 | 1075 |
| Ghana | 40.8 | 41.9 | 46.5 | 40.1 | 40.4 | 41.7 | 42.1 | 39.1 | 42.2 | 37.6 | 42.4 | 39.1 | 1191 |
| Kenya | 23.4 | 23.4 | 26.1 | 24.9 | 19.5 | 23.5 | 24.0 | 25.0 | 21.8 | 32.3 | 24.5 | 15.6 | 2013 |
| Liberia[b] | 55.7 | 52.6 | 52.6 | 56.0 | 53.8 | 54.2 | 51.7 | 59.3 | 52.6 | 52.8 | 54.9 | 52.8 | 1382 |
| Mali | 49.2 | 40.3 | 49.0 | 44.6 | 44.7 | 41.6 | 45.9 | 42.2 | 47.8 | 45.2 | 44.2 | 47.1 | 926 |
| Senegal | 55.2 | 52.0 | 54.0 | 53.3 | 52.6 | 55.7 | 54.0 | 52.9 | 52.6 | 58.5 | 51.7 | 58.7 | 1218 |
| Togo | 39.7 | 38.6 | 30.2 | 43.9 | 36.0 | 41.9 | 39.3 | 36.9 | 39.0 | 29.7 | 41.0 | 37.0 | 870 |
| Uganda | 42.7 | 40.8 | 40.3 | 42.7 | 40.3 | 42.5 | 40.6 | 39.6 | 44.0 | 45.7 | 40.8 | 42.9 | 1444 |
| Zimbabwe | 39.5 | 33.5 | 35.3 | 33.5 | 37.0 | 39.4 | 41.0 | 32.1 | 31.8 | 46.4 | 35.3 | 34.9 | 902 |
| NORTH AFRICA | | | | | | | | | | | | | |
| Egypt[c] | 29.4 | 27.6 | 31.0 | 29.8 | 26.9 | 25.9 | 30.2 | 27.7 | 29.0 | 32.7 | 28.9 | 25.6 | 2372 |
| Morocco | 47.5 | 46.3 | 47.6 | 45.1 | 45.1 | 52.0 | 43.6 | 45.9 | 47.7 | 50.0 | 46.2 | 48.6 | 1653 |
| Tunisia | 36.1 | 34.2 | 34.0 | 35.4 | 33.7 | 38.9 | 32.8 | 34.6 | 37.0 | a | 35.7 | 32.1 | 1246 |
| ASIA | | | | | | | | | | | | | |
| Sri lanka | 11.3 | 9.0 | 9.3 | 11.5 | 10.3 | 9.9 | 11.0 | 9.2 | 8.0 | 16.8 | 10.8 | 5.7 | 1139 |
| Thailand | 26.3 | 20.9 | 25.2 | 22.9 | 23.8 | 23.3 | 23.0 | 21.8 | (44.9) | 30.2 | 22.3 | 28.3 | 1082 |
| LATIN AMERICA/CARIBBEAN | | | | | | | | | | | | | |
| Bolivia | 43.2 | 40.9 | 44.1 | 44.3 | 40.1 | 40.1 | 40.0 | 46.2 | 42.7 | 43.8 | 42.8 | 38.8 | 1628 |
| Brazil | 27.0 | 25.9 | 30.1 | 26.3 | 25.1 | 24.9 | 23.9 | 23.8 | 39.0 | 33.2 | 25.3 | 28.2 | 883 |
| Colombia | 28.4 | 28.0 | 36.4 | 29.9 | 23.6 | 24.5 | 25.4 | 31.4 | 41.2 | 31.6 | 26.1 | 37.4 | 811 |
| Dominican Republic | 38.8 | 38.3 | 45.0 | 41.9 | 35.5 | 33.5 | 40.8 | 44.0 | 36.6 | 36.4 | 39.6 | 32.9 | 1280 |
| Ecuador[d] | 46.1 | 46.9 | 50.6 | 52.8 | 41.5 | 44.4 | 44.6 | 48.1 | 51.4 | 59.0 | 46.3 | 40.8 | 779 |
| Guatemala | 30.1 | 24.8 | 28.7 | 25.7 | 27.7 | 28.2 | 31.5 | 20.6 | 27.1 | 29.1 | 27.6 | 25.2 | 1285 |
| Mexico | 35.9 | 35.0 | 40.6 | 36.9 | 33.8 | 32.2 | 38.5 | 34.0 | 34.2 | 37.2 | 34.3 | 39.6 | 1602 |
| Peru[e] | 51.3 | 43.6 | 51.8 | 48.1 | 48.4 | 43.3 | 48.6 | 49.7 | 50.5 | 57.4 | 46.9 | 47.0 | 796 |
| Trinidad&Tobago | 10.8 | 9.2 | 12.2 | 9.8 | 7.5 | 10.8 | 11.5 | 5.8 | 8.3 | 10.6 | 10.6 | 4.8 | 582 |

Note: Figures in parentheses are based on fewer than 50 cases.
[a] Fewer than 20 cases
[b] Diarrhea in the preceding 4 weeks
[c] Diarrhea in the preceding 7 days
[d] Last births only
[e] Diarrhea in the preceding 15 days

## Environmental and Domestic Hygiene

The effects of environmental and domestic hygiene on the prevalence of childhood diarrhea were examined by considering water supply, sanitary facilities, type of floor, and presence of soap in the household. These variables are indicative of both the hygienic situation and the socioeconomic status of the household.

The effects of water and sanitation variables are reported in Table 3.5. (The results are summarized in Table 3.2.) Most of the surveys used country-specific categories to classify drinking water supply and sanitary facilities. In order to make comparisons between countries and regions, these were reclassified using very basic distinctions. Water supply was divided into piped and unpiped; toilet facilities into flush toilet, other facilities, and no facilities.

In the Latin American and North African countries, about two-thirds of all children live in households with access to piped water, compared with less than one-third of the children in sub-Saharan and Asian countries. As summarized in Table 3.2, in 11 of 23 countries the prevalence of diarrhea is at least 10 percent lower for children in households with a piped drinking water supply. (Togo was not included in this figure because it had too few cases with piped water.) In fact, the relative difference is more than 20 percent in seven of these countries: Brazil, Colombia, Kenya, Mexico, Peru, Senegal, and Thailand. However, in ten countries (particularly in Burundi, Mali, and the Dominican Republic) the prevalence of diarrhea is higher in households with a piped water supply.

Prevalence of diarrhea by environmental and domestic hygiene characteristics

Table 3.5 Percentage of children 6-23 months with diarrhea in the 2 weeks preceding the survey by source of drinking water, use of toilet facilities, presence of soap, and type of floor, Demographic and Health Surveys, 1986-1989

| | | Diarrhea | | | Diarrhea | | | Diarrhea | | | Diarrhea | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Country | Piped Water | Piped | Unpiped | Toilet facility used | Flush | Other[a] | None | Soap present | Soap present | No soap | Non-dirt floor[b] | Non-dirt floor[b] | Dirt floor | Number of children |
| SUB-SAHARAN AFRICA | | | | | | | | | | | | | | |
| Botswana | 83.3 | 17.7 | 16.5 | 48.6 | 23.5 | 21.3 | 16.4 | NA | NA | NA | 53.0 | 17.4 | 17.7 | 891 |
| Burundi | 11.1 | 38.2 | 28.9 | 95.3 | c | 29.6 | 38.5 | 83.3 | 30.5 | 27.6 | 4.7 | 30.7 | 29.9 | 1075 |
| Ghana | 24.3 | 41.7 | 41.2 | 62.0 | (33.3) | 41.4 | 41.9 | NA | NA | NA | 65.6 | 42.0 | 40.0 | 1191 |
| Kenya | 27.5 | 19.3 | 25.0 | 85.4 | 12.7 | 24.5 | 21.9 | 92.7 | 23.1 | 26.5 | 27.3 | 22.4 | 23.9 | 2013 |
| Liberia | 33.9 | 52.4 | 55.1 | 55.8 | 51.1 | 53.6 | 55.8 | NA | NA | NA | NA | NA | NA | 1382 |
| Mali | 2.7 | (53.4) | 44.7 | 73.7 | c | 46.1 | 42.2 | 16.8 | 42.3 | 45.5 | 20.3 | 47.0 | 42.3 | 926 |
| Senegal | 13.6 | 43.4 | 55.2 | 55.7 | 31.4 | 53.4 | 56.7 | NA | NA | NA | 53.6 | 50.2 | 57.5 | 1208 |
| Togo | 27.5 | 39.3 | 39.2 | 36.0 | c | 33.1 | 42.7 | NA | NA | NA | 70.6 | 38.9 | 39.6 | 870 |
| Uganda | 7.3 | 44.2 | 41.5 | 83.4 | (34.1) | 40.8 | 48.0 | 84.7 | 40.9 | 46.5 | 12.9 | 37.3 | 41.0 | 1444 |
| Zimbabwe | 40.0 | 34.1 | 38.5 | 59.1 | 30.6 | 39.2 | 38.3 | NA | NA | NA | 57.4 | 33.8 | 39.5 | 902 |
| NORTH AFRICA | | | | | | | | | | | | | | |
| Egypt | 72.5 | 29.0 | 27.3 | 91.5 | 23.9 | 29.8 | 28.7 | NA | NA | NA | 58.1 | 28.7 | 28.1 | 2372 |
| Morocco | 41.6 | 47.3 | 46.6 | 53.1 | 50.3 | 40.7 | 44.1 | NA | NA | NA | 57.7 | 46.2 | 47.8 | 1653 |
| Tunisia | 59.3 | 33.0 | 38.3 | 68.4 | 31.1 | 37.7 | 41.4 | NA | NA | NA | NA | NA | NA | 1246 |
| ASIA | | | | | | | | | | | | | | |
| Sri Lanka | 17.7 | 10.8 | 10.1 | 79.7 | (16.6) | 8.9 | 14.6 | 95.3 | 10.0 | 14.8 | 54.1 | 8.9 | 11.9 | 1139 |
| Thailand | 22.3 | 18.6 | 25.1 | 58.2 | (29.4) | 19.0 | 29.4 | 86.7 | 22.4 | 31.8 | 91.4 | 22.8 | 32.3 | 1083 |
| LATIN AMERICA/CARIBBEAN | | | | | | | | | | | | | | |
| Bolivia | 57.4 | 40.3 | 44.5 | 42.9[d] | 33.3 | 45.3 | 43.2 | NA | NA | NA | NA | NA | NA | 1628 |
| Brazil | 63.4 | 22.1 | 34.0 | 84.4 | 15.3 | 33.7 | 31.8 | NA | NA | NA | NA | NA | NA | 883 |
| Colombia | 77.5 | 25.9 | 36.1 | 76.6 | 24.2 | 28.1 | 38.0 | NA | NA | NA | 78.9 | 26.6 | 34.3 | 811 |
| Dominican Republic | 74.8 | 39.6 | 35.4 | 99.4 | 32.6 | 40.3 | c | 72.8 | 38.2 | 39.4 | 83.4 | 39.0 | 36.1 | 1280 |
| Ecuador | 67.0 | 44.2 | 51.0 | 79.6 | 37.8 | 47.3 | 57.9 | NA | NA | NA | 86.8 | 42.9 | 38.9 | 779 |
| Guatemala | 55.6 | 27.5 | 27.2 | 59.9[d] | 31.3 | 27.5 | 25.7 | NA | NA | NA | 33.6 | 29.2 | 26.5 | 1285 |
| Mexico | 71.5 | 32.1 | 43.7 | 67.7 | 28.3 | 36.0 | 41.7 | NA | NA | NA | 73.4 | 32.2 | 44.5 | 1602 |
| Peru | 50.6 | 43.2 | 52.4 | 36.6 | 32.2 | 53.6 | 53.1 | 88.9 | 47.6 | 49.4 | 40.0 | 40.1 | 52.7 | 796 |
| Trinidad&Tobago | 87.1 | 9.9 | 10.8 | 100.0 | 9.2 | 10.7 | c | 97.4 | 9.9 | NA | 99.3 | 9.9 | NA | 582 |

Note: Figures in parentheses are based on fewer than 50 cases.
NA = Not applicable (question not asked)
[a] Includes mainly pit latrines
[b] Non-dirt floors include cement, tile and wood.
[c] Fewer than 20 cases
[d] Facilities coded as "other" included no facilities.

There is less variation in the access to toilet facilities (whether flush or any other type) between countries and regions; toilet facilities were present in about 70 percent of the children's households (all countries combined). The prevalence of diarrhea is lowest in households with flush toilets, most of which are in Latin American countries. Only four countries in the other regions had more than 100 respondents with flush toilets. Bolivia and Guatemala pose a special data problem: many, perhaps all, households without toilet facilities in those countries were coded as "other" rather than "none." Therefore, in this analysis, those Bolivian and Guatemalan households coded as "other" have been considered no-facility households, since it is likely that there are very few households with a facility other than flush, latrine, pit, or bucket. The prevalence of diarrhea among children age 6-23 months in households with other facilities, mostly latrines, is at least 20 percent lower than that in households without any toilet facility in five countries (Burundi, Colombia, Sri Lanka, Togo, and Thailand). In most other countries, differences are either minor or completely lacking, while in Botswana and Kenya the prevalence of diarrhea is higher in households with toilet facilities than in those with no facilities.

Prevalence of diarrhea by measles vaccination status

Table 3.6 Percentage of children 12-35 months with diarrhea in the 2 weeks preceding the survey by measles vaccination status, Demographic and Health Surveys, 1986-1989

| | Received measles vaccine | | Did not receive measles vaccine | |
|---|---|---|---|---|
| Country | Percentage with diarrhea | Number of children | Percentage with diarrhea | Number of children |
| SUB-SAHARAN AFRICA | | | | |
| Botswana | 12.7 | 798 | 14.4 | 48 |
| Burundi | 21.0 | 637 | 27.1 | 175 |
| Ghana | 34.9 | 433 | 35.7 | 182 |
| Kenya | 17.3 | 1169 | 17.8 | 311 |
| Liberia | 53.9 | 422 | 64.6 | 187 |
| Mali | 45.2 | 102 | 55.0 | 31 |
| Senegal | 43.5 | 278 | 46.6 | 146 |
| Uganda | 28.2 | 642 | 34.5 | 216 |
| Zimbabwe | 27.7 | 913 | 25.4 | 67 |
| NORTH AFRICA | | | | |
| Egypt | 19.3 | 1056 | 20.9 | 784 |
| Morocco | 40.0 | 768 | 34.5 | 200 |
| Tunisia | 25.7 | 1143 | 32.7 | 101 |
| ASIA | | | | |
| Sri Lanka | 6.6 | 851 | 9.2 | 387 |
| Thailand | 14.3 | 264 | 25.3 | 220. |
| LATIN AMERICA/CARIBBEAN | | | | |
| Bolivia | 37.0 | 369 | 42.2 | 110 |
| Brazil | 21.4 | 721 | 23.4 | 136 |
| Colombia | 21.2 | 440 | 2.1 | 1182 |
| Guatemala | 20.6 | 737 | 5.6 | 2032 |
| Peru | 38.5 | 364 | 4.8 | 674 |
| Trinidad&Tobago | 8.0 | 275 | 9.5 | 325 |

Note: Vaccination figures are for card information only.

In ten countries, the respondents were asked whether there was a cake of soap on the premises. In nine of these countries, more than three-quarters of the women said they had soap, but in Mali only 17 percent had soap. The prevalence of diarrhea is lower for children in households with soap in all countries except Burundi.

The proportion of houses with a non-dirt floor (such as cement, wood, or tile) varies from 5 percent in Burundi and 13 percent in Uganda to over 80 percent in the Dominican Republic, Thailand, and Trinidad and Tobago. No data were collected on floor types in Bolivia, Brazil, Liberia, and Tunisia, while Trinidad and Tobago had only a few households with dirt floors. The prevalence of diarrhea is somewhat higher among children 6-23 months in households with dirt floors (sand, clay, mud, or cow dung) in 8 of 19 countries. The relative differences are larger than 20 percent in Colombia, Mexico, Peru, Sri Lanka, and Thailand.

## Measles Vaccination Status

An association between measles vaccination and the reduction of diarrheal morbidity and mortality has been suggested (Feachem and Koblinsky, 1983). Most of the DHS surveys collected data on measles vaccination status from child health cards. In six countries, mother's recall of specific immunizations was also used if the child's health card was not available.

Table 3.6 shows the prevalence of diarrhea in the two weeks preceding the survey according to measles vaccination status. Only children age 12-35 months with a child health card are included, since measles vaccinations are generally given from age 9 months onward. In all countries, with the exception of Morocco and Zimbabwe, the prevalence of diarrhea is lower among children who had been vaccinated against measles. The relative difference is greater than 20 percent in 8 countries: Burundi, Guatemala, Liberia, Mali, Sri Lanka, Thailand, Tunisia, and Uganda.

## Feeding Mode

Mothers were asked if they were still breastfeeding their last child, and, if so, whether they had given water, juice, powdered milk, goat's milk or cow's milk, other fluids, or solid or mushy food in the last 24 hours. If the child received supplements in addition to breast milk, inquiries also were made about the use of a bottle with a nipple to feed the child in the last 24 hours. These data were collected only for the last child born. Because the information is limited to the 24 hours prior to the interview, two errors are possible in the analysis of the association between feeding mode and the prevalence of diarrhea. First, children who are partially breastfed could be classified incorrectly as completely breastfed if they do not receive supplements every day. Second, the presence of diarrhea itself may modify feeding patterns. For example, the mother may temporarily withdraw supplements from the diet of a child with diarrhea or

stop breastfeeding. Since both the prevalence of diarrhea and feeding modes change with increasing age, the analysis was done by age group. Guatemala was excluded because no feeding questions were asked, and Egypt was excluded because the feeding questions did not refer to the last 24 hours.

Table 3.7 examines the prevalence of diarrhea in infants during the two weeks preceding the survey by full, partial, and no breastfeeding.[3] At ages under 3 months the prevalence of diarrhea is generally lower among those children who are exclusively breastfed compared with children who are partially breastfed. In some countries the difference is large (e.g., Burundi, Mali, Thailand, and Uganda). In Zimbabwe and four of the Latin American countries the prevalence of diarrhea is not lower among fully breastfed children, but the numbers are small. Numbers are also too small to compare no breastfeeding versus partial or full breastfeeding in this age group.

At age 3 to 5 months, the prevalence of diarrhea is lower among fully breastfed children than partially breastfed children in 9 of the 10 countries in sub-Saharan Africa (the exception is Kenya) and in Bolivia, the Dominican Republic, and Tunisia. There are too few cases with no breastfeeding to allow any comparison with full or partial breastfeeding in sub-Saharan Africa or Asia. In the remaining countries, with the exception of the Dominican Republic, not breastfeeding appears to be associated with a slightly lower prevalence of diarrhea.

By the age of 6 months, the pattern of higher diarrhea prevalence among partially breastfed children compared with fully breastfed children has disappeared in most countries. In fact, in Colombia, Mexico, Peru, and Tunisia, children who are not breastfed suffer from diarrhea less frequently than those who are partially breastfed.

[3] Full breastfeeding includes both exclusive breastfeeding (no supplements of any kind) and breastfeeding with water also offered to the infant (often defined as full breastfeeding). The latter is a common practice in many countries. For all countries combined, 1,658 children under 6 months of age were exclusively breastfed, while 1,599 children received breast milk and water. Countries in which breast milk with water is more common than exclusive breastfeeding are Brazil, the Dominican Republic, Ghana, Liberia, Mali, Senegal, Sri Lanka, Thailand, Togo, Tunisia, Zimbabwe. Although it would be of interest to analyze the effects of full versus exclusive breastfeeding on diarrhea, the numbers were too small to make such an analysis meaningful. Partial breastfeeding includes all fluids and solids given in addition to breast milk.

## Prevalence of diarrhea by feeding mode

Table 3.7 Percentage of children 0-2 months, 3-5 months, and 6-11 months with diarrhea in the 2 weeks preceding the survey by feeding mode: full breastfeeding, partial or supplemented breastfeeding, and no breastfeeding, Demographic and Health Surveys, 1986-1989

| | Children age 0-2 months | | | | | | Children age 3-5 months | | | | | | Children age 6-11 months | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Full breastfeeding | | Partial breastfeeding | | No breastfeeding | | Full breastfeeding | | Partial breastfeeding | | No breastfeeding | | Full breastfeeding | | Partial breastfeeding | | No breastfeeding | |
| | % with diarrhea | N | % with diarrhea | N | % with diarrhea | N | % with diarrhea | N | % with diarrhea | N | % with diarrhea | N | % with diarrhea | N | % with diarrhea | N | % with diarrhea | N |
| SUB-SAHARAN AFRICA | | | | | | | | | | | | | | | | | | |
| Botswana | 9.3 | 103 | 21.1 | 37 | | 4 | 15.8 | 72 | 24.6 | 108 | | 10 | | 19 | 19.4 | 299 | | 23 |
| Burundi | 21.2 | 154 | | 6 | | 0 | 18.7 | 139 | 27.8 | 55 | | 0 | 28.2 | 87 | 37.2 | 321 | | 6 |
| Ghana | 9.3 | 86 | 14.0 | 50 | | 0 | 14.0 | 50 | 22.9 | 105 | | 0 | 28.8 | 66 | 40.8 | 343 | | 4 |
| Kenya | 11.0 | 125 | 13.7 | 113 | | 1 | 33.8 | 80 | 18.6 | 272 | | 10 | 27.3 | 70 | 24.8 | 612 | 33.1 | 27 |
| Liberia | 24.1 | 89 | 32.2 | 125 | | 7 | 33.7 | 79 | 39.7 | 202 | | 8 | 42.8 | 71 | 51.4 | 441 | 41.1 | 96 |
| Mali | 15.8 | 106 | 52.4 | 38 | | 0 | 32.7 | 165 | 59.9 | 44 | | 2 | 44.4 | 202 | 37.6 | 170 | | 2 |
| Senegal | 26.2 | 107 | 50.0 | 30 | | 1 | 40.4 | 89 | 52.3 | 111 | | 0 | 53.9 | 76 | 56.4 | 351 | | 9 |
| Togo | 20.0 | 35 | 29.3 | 58 | | 0 | 13.8 | 29 | 36.9 | 157 | | 0 | 44.0 | 25 | 39.7 | 277 | | 1 |
| Uganda | 15.2 | 146 | 33.1 | 48 | | 0 | 32.1 | 124 | 36.2 | 113 | | 1 | 43.0 | 85 | 44.8 | 426 | 21.8 | 28 |
| Zimbabwe | 9.1 | 66 | 7.7 | 39 | | 0 | 19.0 | 42 | 20.2 | 124 | | 3 | | 11 | 39.9 | 276 | | 8 |
| NORTH AFRICA | | | | | | | | | | | | | | | | | | |
| Morocco | 23.1 | 147 | 27.5 | 51 | | 14 | 41.8 | 153 | 37.4 | 163 | 33.3 | 42 | 49.4 | 85 | 52.4 | 349 | 54.9 | 122 |
| Tunisia | 12.0 | 92 | 17.3 | 52 | | 1 | 31.6 | 95 | 38.0 | 121 | 32.0 | 25 | 40.8 | 71 | 39.9 | 238 | 34.2 | 117 |
| ASIA | | | | | | | | | | | | | | | | | | |
| Sri Lanka | 6.5 | 96 | 12.3 | 48 | | 5 | 15.7 | 58 | 12.3 | 150 | | 12 | 11.1 | 34 | 11.7 | 276 | 9.1 | 58 |
| Thailand | 5.6 | 38 | 26.1 | 75 | | 12 | | 16 | 19.5 | 117 | | 21 | 29.8 | 29 | 22.0 | 236 | 22.8 | 82 |
| LATIN AMERICA | | | | | | | | | | | | | | | | | | |
| Bolivia | 20.0 | 156 | 11.7 | 75 | | 5 | 25.8 | 121 | 34.1 | 138 | 14.9 | 19 | 34.0 | 79 | 40.8 | 413 | 37.8 | 79 |
| Brazil | | 21 | 15.7 | 76 | | 22 | | 14 | 25.2 | 90 | 25.8 | 68 | | 8 | 25.5 | 115 | 24.9 | 193 |
| Colombia | | 14 | 19.7 | 60 | | 7 | | 11 | 17.3 | 68 | 13.8 | 34 | | 1 | 35.9 | 134 | 27.8 | 129 |
| Dominican Republic | 16.3 | 44 | 19.4 | 105 | 41.7 | 27 | 15.6 | 26 | 31.7 | 116 | 40.0 | 55 | | 20 | 36.8 | 177 | 43.9 | 243 |
| Mexico | 12.1 | 79 | 27.7 | 71 | 21.6 | 45 | 36.9 | 60 | 31.1 | 146 | 29.0 | 104 | 39.5 | 26 | 48.1 | 279 | 28.4 | 283 |
| Peru | 41.2 | 34 | 40.4 | 57 | | 11 | 47.7 | 44 | 32.7 | 107 | | 15 | | 21 | 51.6 | 186 | 44.9 | 69 |
| Trinidad&Tobago | | 12 | 2.4 | 41 | | 9 | | 4 | 5.1 | 39 | | 22 | | 0 | 5.8 | 86 | 8.3 | 121 |

Note: No percentages are shown if N <25; *full breastfeeding* refers to exclusive breastfeeding or breastfeeding with water; Guatemala is excluded because no questions were asked on supplementary feeding.
N = Number of children

The use of a bottle with a nipple for supplementary feeding is common in most countries. Table 3.8 analyzes the prevalence of diarrhea during the two weeks preceding the survey according to bottle use. This table only includes children who are partially breastfed and those who were given water. Generally, no adverse effect of bottle feeding on the prevalence of diarrhea during infancy can be observed. It may be argued that the adverse effects of bottle feeding are more obvious under poorer hygienic conditions. Therefore, the relationship between bottle use and the prevalence of diarrhea was examined for women without formal education. The numbers are too small to draw firm conclusions, but, in general, bottle feeding has no observable effect on the prevalence of diarrhea.

## 3.2 TREATMENT PATTERNS

### Knowledge of ORS Packets

The level of knowledge of ORS packets (prepackaged oral rehydration salts) used in oral rehydration therapy (ORT) is shown in Table 3.9. Information on ORS was collected in 17 countries. The respondents were mothers with at least one live birth in the five years preceding the survey. A mother was classified as knowing about ORS if (1) she had used a packet to treat one of her children for diarrhea in the two weeks preceding the survey, or (2) she claimed to know about ORS. Extremely high levels of knowledge are found in Egypt. In Zimbabwe,

Prevalence of diarrhea by supplementary feeding with a bottle

Table 3.8 Percentage of breastfed children <6 months who received supplements in a bottle during the 24 hours preceding the survey, and the prevalence of diarrhea in the 2 weeks preceding the survey by use of bottle, Demographic and Health Surveys, 1986-1989

| | Breastfed children <6 months | | | | | Breastfed children 6-11 months | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Received bottle | | No bottle | | | Received bottle | | No bottle | |
| Country | % who received bottle | % with diarrhea | N | % with diarrhea | N | % who received bottle | % with diarrhea | N | % with diarrhea | N |
| SUB-SAHARAN AFRICA | | | | | | | | | | |
| Botswana | 39.2 | 11.1 | 86 | 22.2 | 133 | 12.8 | 24.6 | 40 | 18.7 | 272 |
| Burundi | 10.8 | | 10 | 33.4 | 80 | 7.3 | 22.0 | 25 | 37.0 | 231 |
| Ghana | 51.0 | 12.3 | 155 | 23.5 | 149 | 32.1 | 39.4 | 127 | 38.7 | 269 |
| Kenya | 28.5 | 17.1 | 141 | 21.0 | 353 | 21.4 | 16.4 | 140 | 28.2 | 513 |
| Liberia | 33.7 | 32.7 | 149 | 35.4 | 292 | 20.9 | 50.9 | 102 | 50.2 | 386 |
| Mali | 4.1 | | 13 | 31.3 | 316 | 5.9 | | 22 | 43.2 | 348 |
| Senegal | 8.0 | 23.1 | 26 | 43.1 | 297 | 6.3 | 38.5 | 39 | 57.8 | 386 |
| Togo | 14.1 | 24.3 | 37 | 31.0 | 226 | 7.7 | | 23 | 39.7 | 277 |
| Uganda | 5.0 | | 9 | 32.7 | 174 | 2.3 | | 10 | 45.0 | 431 |
| Zimbabwe | 7.9 | | 20 | 14.6 | 234 | 8.5 | 48.0 | 25 | 40.5 | 269 |
| NORTH AFRICA | | | | | | | | | | |
| Morocco | 30.2 | 37.9 | 95 | 34.1 | 220 | 18.2 | 56.2 | 73 | 51.5 | 328 |
| Tunisia | 52.4 | 29.7 | 155 | 27.0 | 141 | 25.3 | 43.2 | 74 | 38.5 | 218 |
| ASIA | | | | | | | | | | |
| Sri Lanka | 56.7 | 10.8 | 181 | 11.2 | 137 | .3 | 8.4 | 162 | 15.0 | 144 |
| Thailand | 63.2 | 23.4 | 144 | 14.6 | 83 | 29.8 | 16.7 | 76 | 24.8 | 180 |
| LATIN AMERICA/CARIBBEAN | | | | | | | | | | |
| Bolivia | 61.3 | 23.0 | 137 | 29.8 | 86 | 45.1 | 41.7 | 172 | 41.3 | 210 |
| Brazil | 82.7 | 20.9 | 162 | 20.6 | 34 | 53.4 | 10.8 | 65 | 42.8 | 57 |
| Colombia | 79.9 | 17.9 | 108 | 23.1 | 27 | 58.4 | 36.6 | 78 | 36.5 | 56 |
| Dominican Republic | 93.3 | 23.7 | 228 | | 16 | 69.9 | 35.8 | 128 | 41.6 | 55 |
| Mexico | 87.6 | 27.8 | 168 | | 24 | 54.6 | 50.2 | 142 | 47.1 | 117 |
| Peru | 84.0 | 33.8 | 136 | 38.5 | 26 | 62.9 | 50.0 | 110 | 58.5 | 65 |
| Trinidad&Tobago | 90.8 | 5.1 | 79 | | 8 | 66.7 | 5.4 | 56 | 7.1 | 28 |

Note: No percentages are shown if N <25; children who received only water are regarded as partially breastfed.
N = Number of children

Knowledge of ORS packets by socioeconomic characteristics and age of mother

Table 3.9 Percentage of mothers who have heard of ORS packets by socioeconomic characteristics and age of mother, Demographic and Health Surveys, 1986-1989

| Country | Residence | | Education | | | Radio | | Age | | | Total | Number of women |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Urban | Rural | None | Primary | Sec+ | Yes | No | <20 | 20-34 | 35+ | | |
| SUB-SAHARAN AFRICA | | | | | | | | | | | | |
| Botswana | 93.6 | 89.3 | 84.4 | 92.1 | 94.4 | 93.4 | 85.0 | 85.4 | 91.0 | 90.9 | 90.5 | 2223 |
| Burundi | 69.6 | 33.7 | 31.5 | 46.1 | 75.5 | 54.2 | 30.8 | 43.7 | 35.3 | 33.6 | 34.9 | 2338 |
| Ghana | 68.6 | 50.9 | 43.7 | 63.3 | 86.2 | 61.6 | 52.5 | 49.4 | 57.4 | 53.6 | 55.9 | 2671 |
| Mali | 26.5 | 7.5 | 10.4 | 20.4 | (58.2) | 16.8 | 7.1 | 13.6 | 12.6 | 10.1 | 12.1 | 2084 |
| Togo | 61.6 | 44.1 | 42.5 | 56.8 | 75.0 | 56.6 | 41.9 | 46.5 | 51.4 | 42.6 | 48.8 | 1867 |
| Uganda | 80.4 | 41.4 | 30.8 | 51.0 | 80.1 | 62.5 | 38.7 | 45.6 | 47.5 | 37.7 | 45.3 | 2912 |
| Zimbabwe[a] | 98.8 | 96.8 | 92.9 | 98.2 | 98.6 | 98.0 | 97.1 | 93.9 | 98.0 | 96.9 | 97.5 | 1936 |
| NORTH AFRICA | | | | | | | | | | | | |
| Egypt | 99.5 | 97.5 | 97.3 | 99.3 | 99.5 | NA | NA | 99.6 | 98.6 | 97.6 | 98.4 | 5211 |
| Tunisia | 66.9 | 46.2 | 48.6 | 68.6 | 64.8 | 62.0 | 45.7 | 40.0 | 60.3 | 50.7 | 57.5 | 2598 |
| ASIA | | | | | | | | | | | | |
| Sri Lanka[b] | 79.3 | 65.3 | 38.0 | 57.6 | 76.1 | 71.6 | 56.3 | 66.5 | 68.6 | 63.2 | 67.3 | 2828 |
| Thailand | 87.1 | 85.1 | 66.0 | 86.3 | 94.0 | 86.3 | 83.4 | 71.5 | 86.8 | 83.7 | 85.5 | 2845 |
| LATIN AMERICA/CARIBBEAN | | | | | | | | | | | | |
| Bolivia | 77.5 | 55.6 | 42.5 | 63.8 | 87.4 | NA | NA | 61.1 | 69.7 | 60.6 | 66.7 | 3692 |
| Colombia | 89.7 | 82.7 | 75.1 | 85.1 | 92.7 | 87.5 | 85.9 | 84.1 | 88.2 | 84.5 | 87.3 | 1841 |
| Dominican | 89.9 | 86.3 | 74.4 | 87.1 | 94.5 | 89.3 | 87.1 | 82.2 | 89.5 | 87.1 | 88.5 | 2742 |
| Guatemala | 74.4 | 50.2 | 38.0 | 72.5 | 89.5 | 62.8 | 48.1 | 52.0 | 59.7 | 51.6 | 57.3 | 2715 |
| Peru | 84.1 | 33.7 | 25.2 | 52.6 | 88.6 | 66.9 | 43.8 | 52.7 | 66.8 | 53.1 | 62.5 | 2014 |
| Trinidad&Tobago | 89.6 | 87.7 | c | 86.8 | 90.5 | 89.2 | 82.2 | 77.3 | 88.8 | 91.0 | 88.5 | 1332 |

Note: Figures in parentheses are based on fewer than 50 cases.
NA = Not applicable (question not asked)
[a] Data are for homemade solution
[b] Includes only women with living children under 5 years of age
[c] Fewer than 20 cases

too, virtually all women know about oral rehydration therapy, but this figure refers to homemade sugar and salt solution, since Zimbabwe does not promote ORS packets. Eighty percent or more of the respondents in Botswana, Colombia, the Dominican Republic, Thailand, and Trinidad and Tobago have heard of ORS or have used it. In four African countries—Burundi, Mali, Togo, and Uganda—less than half of the women know of ORS packets. In all countries combined, two-thirds of the women know about ORS.

Differentials in levels of ORS knowledge are consistent across countries. More urban women know of ORS than rural women in all countries, with very large differentials observed in Burundi, Mali, Peru, and Uganda. Knowledge of ORS packets increases rapidly with women's educational level. In 12 countries, more than 80 percent of women with secondary or higher education know about ORS, and in no country is knowledge below 50 percent. Among women without formal education, in only 2 countries (Egypt and Zimbabwe) do more than 80 percent know about ORS, and in 10 countries knowledge levels are less than 50 percent. Differentials by the presence of a radio in the household are also consistent, but they are smaller than those observed for residence or education. Differentials by age of the respondent are small, with women age 20-34 years having slightly higher levels of knowledge than younger or older women.

Knowledge of ORS packets by health card status

Table 3.10 Knowledge of ORS packets among mothers of children 6-23 months, with and without a child health card, Demographic and Health Surveys, 1986-1989

| Country | Health card present | | No health card | |
|---|---|---|---|---|
| | Know ORS | N | Know ORS | N |
| SUB-SAHARAN AFRICA | | | | |
| Botswana | 84.7 | 933 | 35.9 | 22 |
| Burundi | 45.2 | 780 | 22.6 | 297 |
| Ghana | 69.1 | 709 | 46.2 | 485 |
| Mali | 20.4 | 268 | 8.4 | 661 |
| Togo | 47.8 | 779 | 24.7 | 89 |
| Uganda | 52.3 | 977 | 38.6 | 509 |
| NORTH AFRICA | | | | |
| Tunisia | 60.6 | 1171 | 30.7 | 75 |
| ASIA | | | | |
| Sri Lanka | 71.5 | 1104 | 70.1 | 36 |
| Thailand | 88.0 | 612 | 80.0 | 490 |
| LATIN AMERICA/CARIBBEAN | | | | |
| Bolivia | 73.9 | 1182 | 51.1 | 498 |
| Colombia | 90.0 | 724 | 75.1 | 94 |
| Dominican | 92.7 | 594 | 87.2 | 709 |
| Guatemala | 65.6 | 880 | 43.6 | 408 |
| Peru | 65.0 | 726 | 25.0 | 76 |
| Trinidad&Tobago | 89.7 | 553 | 85.3 | 34 |

N = Number of children

Table 3.10 analyzes the level of knowledge about ORS packets according to whether there is a child health card present for children age 6-23 months. (This is the age group for which card retention is highest.) The presence of a child health card, whether shown to the interviewer or not, indicates contact with the (preventive) health services.[4] In all countries, mothers' level of ORS knowledge is higher if there is a child health card present for children age 6-23 months. In most countries, differentials are considerable between the groups with and without the card.

[4] The only exception is Egypt where the birth certificate is used to record preventive health care activities like immunization. In this case the presence of a card does not necessarily imply contact with the health services.

## Oral Rehydration Therapy Practices

Table 3.11 shows the percentage of children under age five with diarrhea who were treated with oral rehydration solution prepared from ORS packets. These packets could have been given by a health worker or obtained by the respondents. ORS packets were used in less than half of the diarrhea cases in all countries, except Trinidad. More than one-third of the children with diarrhea received oral rehydration solution prepared from ORS packets in Botswana, Colombia, the Dominican Republic, Ghana, and Thailand. By contrast, less than 10 percent of the diarrhea cases were treated with the ORS packets in Brazil, Liberia, Mali, Mexico, Peru, and Senegal. It is important to note the differences in ORS usage between countries in which ORS packet use was probed ("Did you give ORS made from a packet?") and countries which had only an open question on diarrhea treatment practices ("Did you do anything to treat the diarrhea? If so, what?") (Table 3.12).

Table 3.12 indicates that a substantial proportion of women did not use ORS when their child had had diarrhea in the two weeks preceding the survey, even though they had heard of ORS: in most countries 40 to 60 percent of the mothers knew about ORS packets but did not use them. This may be because they could not get a packet, because it was not considered necessary for that diarrheal episode, or because their knowledge of ORS was limited. In countries such as Burundi and Mali, lack of knowledge of ORS packets is common. In four countries (Botswana, Burundi, Ghana, and Trinidad and Tobago) more than half of the mothers who knew of ORS also used it when their child had recently had diarrhea. In some countries usage is markedly lower than expected given the knowledge level. The differences are largest in Egypt, Guatemala, and Peru.[5]

Homemade solutions of water, sugar, and salt are less commonly used than ORS packets in all countries but three: Kenya, Peru, and Zimbabwe. In Peru the question referred to a "home remedy" rather than homemade sugar and salt solution, but the home remedy response is considered synonymous with homemade solutions. In Kenya and Peru almost half of children received homemade solutions, according to their mothers. In Zim-

[5] In Peru, there had been negative publicity about ORS at the time of the survey, which may explain the low usage. Child deaths had been attributed to errors in the commercial preparation of ORS packets in Peru.

Table 3.11 Among children 1-59 months with diarrhea in the 2 weeks preceding the survey: the percentage of children who were treated with ORS packets, recommended home solution, and medicines (including injections); changes in the amount of fluids and solid food given during diarrhea; and the percentage of children who received no oral rehydration therapy (ORS packets, recommended home solution, or increased fluids), Demographic and Health Surveys, 1986-1989

| Country | Treatment received | | | Changes in amount of: | | | | Received no oral rehydration therapy | Number of children with diarrhea |
|---|---|---|---|---|---|---|---|---|---|
| | | Recommended | | Fluids | | Solid Food | | | |
| | ORS packets | home solution | Drugs | More | Less | More | Less | | |
| SUB-SAHARAN AFRICA | | | | | | | | | |
| Botswana | 46.4 | 25.3 | 9.6 | 19.0 | 33.5 | 6.0 | 44.2 | 27.6 | 299 |
| Burundi | 29.8 | 7.8[a] | 14.6 | 0.8[a] | 0.4 | 0.0[a] | 0.4 | 65.8 | 600 |
| Ghana | 33.5 | 6.1[a] | 42.3 | 5.4[a] | 0.2 | 0.3[a] | 0.0 | 58.0 | 960 |
| Kenya | 21.1 | 48.9 | 39.3 | 28.6 | 39.8 | 5.8 | 56.4 | 30.1 | 830 |
| Liberia | 6.4[a] | 3.2[a] | 43.8 | NA | NA | NA | NA | NA | 1659 |
| Mali | 2.2[a] | 1.0[a] | 26.9 | NA | NA | NA | NA | NA | 981 |
| Senegal | 2.0[a] | 4.6[a] | 32.4 | NA | NA | NA | NA | NA | 1394 |
| Togo | 20.4 | 3.2[a] | NA | NA | NA | NA | NA | NA | 814 |
| Uganda | 13.7[a] | 1.3[a] | 11.3 | 7.2 | 12.3 | 1.6 | 18.7 | 79.0 | 1053 |
| Zimbabwe | NA | 70.0 | NA | NA | NA | NA | NA | NA | 620 |
| NORTH AFRICA | | | | | | | | | |
| Egypt[b] | 28.5 | NA | 32.9 | 21.9 | 27.6 | 5.5 | 18.5 | NA | 1255 |
| Morocco | 14.7 | 1.3[a] | 29.7 | 2.3[a] | 0.0 | 0.9[a] | 0.0 | 82.0 | 1604 |
| Tunisia | 16.6[a] | 4.1[a] | 19.7 | 5.6 | 28.3 | 3.2 | 27.4 | 75.6 | 873 |
| ASIA | | | | | | | | | |
| Sri Lanka | 29.0 | 10.3 | 12.5 | 17.6[a] | 2.4 | 0.0 | 4.9 | 50.4 | 231 |
| Thailand | 37.5 | 5.8 | 56.5 | 6.0[a] | 4.3 | 0.8 | 4.9 | 55.7 | 548 |
| LATIN AMERICA/CARIBBEAN | | | | | | | | | |
| Bolivia | 25.6 | 10.8 | 21.9 | 44.7 | 11.1 | 6.5 | 29.5 | 41.2 | 1450 |
| Brazil | 8.9[a] | 2.0[a] | 43.4 | NA | NA | NA | NA | NA | 540 |
| Colombia | 42.2 | 12.1[a] | 39.7 | 26.1[a] | 0.0 | 1.1[a] | 0.6 | 36.3 | 484 |
| Dominican Republic | 37.6 | 10.1[a] | 30.9 | 14.6[a] | 0.0 | 2.8[a] | 0.0 | 49.4 | 1021 |
| Guatemala | 13.2 | 3.9 | 59.6 | 14.8 | 15.0 | 0.0 | 33.8 | 65.2 | 698 |
| Mexico | 4.4[a] | NA | 67.0 | NA | NA | NA | NA | NA | 1201 |
| Peru | 3.6[a] | 45.3[a] | 60.4 | NA | NA | NA | NA | NA | 906 |
| Trinidad&Tobago | 53.1 | 13.3[a] | 10.6 | 18.6[a] | 0.0 | 0.9[a] | 4.4 | 28.3 | 113 |

Note: The subject was probed in all cases except where indicated with a footnote (a).
NA = Not applicable (question not asked)
[a] The subject of the question (ORS packets, recommended home solution, fluid/food practices) was part of an open question.
[b] Diarrhea in the preceding 3 weeks

babwe, where ORS packets are not promoted, 70 percent of children under five with diarrhea received homemade solutions. Homemade solutions are also used commonly in Botswana. In 13 of the 22 countries with data on the use of home solutions, less than 10 percent of children with diarrhea received such a solution. The distinction between the recommended homemade salt and sugar solutions and the components of traditional weaning diets may not have been clear to the respondents, however. Therefore, data on homemade solutions must be interpreted with caution.

In a number of surveys mothers were asked what they did concerning the fluid intake of their children with diarrhea (Table 3.11). As with ORS use, it is important to note the differences in the questions asked in various countries. In seven countries, mothers were specifically asked what they did concerning the fluid and food intake of their children who had had diarrhea in the past two weeks. In eight other countries, however, fluid practices were part of an open question on what mothers did to treat diarrheal episodes within the past two weeks. The large differentials between the countries, which, to a lesser extent, are also present for foods, are most likely due to the variation in

questions. In countries where the mother was asked to tell what she did to treat the child with diarrhea, only a small proportion of women reported changing fluid and food intake. In countries where the mother was asked specifically about fluid and food intake, however, a large proportion of women reported changes. In no country did more than half of the women increase the amount of fluid given the child. In all countries where the mother was specifically asked about fluid practices, a considerable proportion said they decreased the amount of fluids.

Knowledge and use of ORS

Table 3.12 Percent distribution of children under 5 years with diarrhea in the 2 weeks preceding the survey by treatment with ORS packets and mothers' knowledge of ORS: percentage treated with ORS packets, and among those who were not treated with ORS packets, the percentage whose mothers knew of ORS and the percentage whose mothers did not, Demographic and Health Surveys, 1986-1989

| Country | Children treated with ORS packets | Children not treated with ORS packets: Mother knew of ORS | Children not treated with ORS packets: Mother did not know of ORS | Total | Number of children with diarrhea |
|---|---|---|---|---|---|
| SUB-SAHARAN AFRICA | | | | | |
| Botswana | 46.4 | 43.7 | 9.9 | 100.0 | 299 |
| Burundi | 29.8 | 19.2 | 51.0 | 100.0 | 600 |
| Ghana | 33.5 | 29.2 | 37.3 | 100.0 | 960 |
| Mali | 2.2 | 12.1 | 85.7 | 100.0 | 981 |
| Togo | 20.4 | 35.2 | 44.4 | 100.0 | 814 |
| Uganda | 13.7 | 40.5 | 45.8 | 100.0 | 1053 |
| NORTH AFRICA | | | | | |
| Egypt[1] | 28.5 | 69.9 | 1.6 | 100.0 | 1255 |
| Tunisia | 16.6 | 42.2 | 41.2 | 100.0 | 873 |
| ASIA | | | | | |
| Sri Lanka | 29.0 | 45.5 | 25.5 | 100.0 | 231 |
| Thailand | 37.5 | 49.8 | 12.6 | 100.0 | 548 |
| LATIN AMERICA/CARIBBEAN | | | | | |
| Bolivia | 25.6 | 42.0 | 32.3 | 100.0 | 1450 |
| Colombia | 42.2 | 44.3 | 13.5 | 100.0 | 490 |
| Dominican Republic | 37.6 | 51.9 | 10.5 | 100.0 | 1021 |
| Guatemala | 13.2 | 54.5 | 32.3 | 100.0 | 698 |
| Peru | 3.6 | 54.9 | 41.4 | 100.0 | 906 |
| Trinidad&Tobago | 53.1 | 39.8 | 7.1 | 100.0 | 113 |

[1] Diarrhea in the preceding 3 weeks

The last column of Table 3.11 shows the proportion of children with diarrhea that did not receive oral rehydration therapy (ORT) from a packet or homemade solution, or whose mother did not increase the amount of fluids given to the child. Only countries with information on all three sources of rehydration are included. In the 14 countries for which the information was available, the proportion of children who had not received any form of ORT ranged from 28 to 82 percent. In Morocco, Tunisia, and Uganda, at least 75 percent of the children did not receive any kind of ORT. In five other countries (Burundi, Ghana, Guatemala, Sri Lanka, Thailand, and Guatemala), more than half of the children with diarrhea did not get ORT according to the mother.

Differentials in the use of ORS packets are shown in Table 3.13. Rates are lowest for children under 6 months in all countries in sub-Saharan Africa and Asia, as well as in Bolivia and Peru. Rates everywhere increase for the 6-11 month age group and are generally also high at age 12-23 months. At age 24-59 months, use is lowest in the three countries in North Africa and in four of the Latin American countries.

Differentials between the sexes are generally small. There is a slight decrease in the use of ORS with rising birth order, which is most obvious in Colombia, Ghana, Liberia, and Togo. Older mothers (35 years and over) use ORS less than younger mothers. The length of the preceding birth interval has no effect on ORS use (data not shown).

The socioeconomic differentials are generally larger than the demographic differentials for ORS use. ORS use is higher in urban areas, with the exception of Egypt, Kenya, and Peru. In 15 of 20 countries, women with no formal education use ORS less frequently for their children. ORS use is also lower in households without a radio in all but the two Asian countries.

## Medical Assistance

About one-third of the children with diarrhea were taken to a medical facility for consultation (Table 3.14). These facilities include hospitals, small clinics, and private doctors, but not pharmacies. Less than 20 percent of the children were taken to medical facilities in Guatemala, Mali (only 2.8 percent), Morocco, Senegal, and Uganda. Only in Sri Lanka were more than half of the children taken to a facility.

The surveys in sub-Saharan Africa and Colombia also included a question on the occurrence of fever during the four weeks preceding the survey. This episode of fever may not necessarily have been associated with the diarrheal episode reported during the two weeks preceding the survey, though it is likely that in a considerable number of cases diarrhea and fever are part of the same episode of illness. As Table 3.14 shows, the proportion consulting a medically trained person for diarrhea is 1.1 to 1.5 times higher if the child also had fever during the four-week period before the survey.

The differentials in the use of medical facilities for diarrhea generally parallel the differentials in ORS use. In part, this is because medical personnel are the main providers of ORS packets in most countries. Lower utilization of medical services can be observed for children age 0-5 and 24-59 months, children of birth order 6 and over, rural children, children of illiterate mothers, and children in households without a radio.

Drugs, which include tablets, syrups, injections, intravenous fluids, and other medicines, are the most common treatment for diarrhea in children in 12 countries. In Guatemala, Mexico, Peru, and Thailand more than half of the children were treated with drugs.

## Differentials in the use of ORS packets

Table 3.13 Percentage of children 1-59 months with diarrhea in the 2 weeks preceding the survey who were treated with ORS packets by age of child, sex of child, birth order, mother's age, residence, mother's level of education, and presence of a radio in the household, Demographic and Health Surveys, 1986-1989

| | Age of child (mo) | | | | Sex of child | | Birth order | | | | Mother's age (yr) | | | Residence | | Education | | | Radio | | Number of children with diarrhea |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1-5 | 6-11 | 12-23 | 24-59 | Male | Female | 1 | 2-3 | 4-5 | 6+ | <20 | 20-34 | 35+ | Urban | Rural | None | Prim | Sec+ | Yes | No | |
| SUBSAHARAN AFRICA | | | | | | | | | | | | | | | | | | | | | |
| Botswana | 28.5 | 40.5 | 54.8 | 53.5 | 47.3 | 45.4 | 44.0 | 43.6 | 54.2 | 46.8 | (25.3) | 50.8 | (38.8) | 51.9 | 44.4 | 43.8 | 47.3 | (48.5) | 49.5 | 40.7 | 299 |
| Burundi | 21.4 | 38.1 | 30.1 | 26.9 | 28.3 | 31.5 | 32.9 | 27.5 | 28.5 | 31.9 | a | 29.9 | 28.6 | (63.6) | 28.9 | 28.9 | 34.0 | a | 38.2 | 28.0 | 600 |
| Ghana | 20.3 | 40.9 | 36.3 | 30.3 | 34.3 | 32.7 | 37.0 | 35.0 | 32.3 | 29.6 | 40.0 | 34.5 | 28.6 | 44.1 | 29.4 | 26.7 | 38.2 | (42.4) | 39.1 | 30.1 | 960 |
| Kenya | 9.4 | 26.1 | 23.6 | 19.6 | 16.6 | 25.4 | 23.6 | 18.9 | 22.2 | 20.6 | 16.1 | 23.6 | 14.5 | 20.7 | 21.1 | 18.6 | 21.3 | 24.3 | 22.8 | 18.5 | 830 |
| Liberia | 3.4 | 6.9 | 6.5 | 6.9 | 6.3 | 6.5 | 7.8 | 8.1 | 5.5 | 4.2 | 6.9 | 7.4 | 3.1 | 9.8 | 4.4 | 4.5 | 9.2 | 12.3 | 8.8 | 3.5 | 1659 |
| Mali | 1.0 | 3.7 | 2.6 | 1.7 | 2.6 | 1.7 | 1.7 | 4.2 | 1.6 | 1.1 | 3.8 | 2.2 | 1.6 | 6.7 | 0.7 | 1.7 | 3.8 | a | 3.5 | 0.8 | 981 |
| Togo | 4.7 | 17.4 | 25.9 | 21.7 | 20.3 | 20.5 | 27.7 | 21.2 | 18.1 | 16.3 | (18.8) | 22.0 | 15.5 | 28.6 | 17.8 | 15.2 | 27.8 | 43.1 | 25.4 | 16.9 | 814 |
| Uganda | 10.9 | 17.9 | 13.4 | 12.1 | 13.2 | 14.3 | 9.2 | 17.1 | 16.5 | 11.1 | 12.6 | 15.1 | 9.3 | 20.4 | 13.1 | 13.6 | 14.1 | 11.9 | 14.2 | 13.6 | 1053 |
| NORTH AFRICA | | | | | | | | | | | | | | | | | | | | | |
| Egypt | 21.8 | 36.9 | 35.5 | 19.1 | 30.8 | 25.9 | 25.5 | 27.1 | 28.9 | 33.1 | 36.9 | 27.1 | 32.1 | 22.2 | .3 | 30.4 | 28.9 | 20.7 | NA | NA | 1255 |
| Morocco | 13.2 | 16.8 | 18.0 | 11.6 | 14.8 | 14.5 | 18.7 | 15.7 | 13.0 | 12.6 | (10.2) | 16.1 | 11.4 | 22.6 | 10.3 | 12.8 | 23.7 | 23.5 | 15.4 | 11.4 | 1604 |
| Tunisia | 22.1 | 21.3 | 20.1 | 9.7 | 18.5 | 14.5 | 21.3 | 15.8 | 17.1 | 12.9 | a | 17.7 | 12.0 | 21.6 | 13.2 | 14.1 | 20.8 | 20.4 | 18.2 | 13.9 | 873 |
| ASIA | | | | | | | | | | | | | | | | | | | | | |
| Sri Lanka | (12.3) | 32.9) | 37.2 | 27.5 | 29.4 | 28.4 | 29.3 | 26.0 | 37.4) | a | a | 30.8 | (18.7) | (50.1) | 25.0 | 38.4) | 24.0 | 29.2 | 26.6 | 33.4 | 231 |
| Thailand | 17.4 | 39.5 | 37.2 | 41.4 | 35.5 | 40.0 | 39.6 | 40.2 | 36.5 | 15.7) | (26.3) | 39.7 | 31.8 | 41.0 | 37.0 | 33.7 | 36.5 | (55.2) | 37.5 | 37.4 | 548 |
| LATIN AMERICA/CARIBBEAN | | | | | | | | | | | | | | | | | | | | | |
| Bolivia | 12.1 | 19.2 | 34.6 | 23.9 | 26.1 | 25.1 | 24.1 | 23.8 | 28.4 | 26.2 | 22.6 | 26.5 | 23.4 | 26.6 | 24.6 | 19.7 | 26.6 | 29.4 | NA | NA | 1450 |
| Brazil | 7.4 | 18.9 | 7.7 | 6.8 | 8.5 | 9.4 | 15.1 | 5.4 | 6.8 | 9.1 | 15.7 | 9.8 | 3.3 | 12.3 | 3.7 | 7.4 | 8.5 | 14.3 | 9.0 | 8.6 | 540 |
| Colombia | (45.6) | 41.8 | 49.8 | 37.0 | 41.4 | 43.1 | 50.6 | 41.5 | 38.2 | 35.6 | (53.5) | 43.9 | 29.9 | 44.3 | 39.7 | 28.3) | 44.1 | 42.8 | 44.3 | 36.2 | 484 |
| Dominican Republic | 36.6 | 40.9 | 36.5 | 37.1 | 35.8 | 39.3 | 34.0 | 37.2 | 40.8 | 40.8 | 40.0 | 37.6 | 34.9 | 39.5 | 34.7 | 20.5 | 37.1 | 42.8 | 41.7 | 32.1 | 1021 |
| Guatemala | 15.3 | 15.8 | 18.3 | 7.3 | 14.7 | 11.5 | 14.0 | 13.7 | 11.6 | 13.2 | 14.1 | 13.0 | 13.5 | 17.3 | 11.5 | 12.3 | 13.1 | 18.5 | 13.6 | 12.5 | 698 |
| Mexico | 5.1 | 6.6 | 4.9 | 2.8 | 4.5 | 4.3 | 6.3 | 4.1 | 3.6 | 3.7 | 4.8 | 4.5 | 3.5 | 5.2 | 3.7 | 5.9 | 3.7 | 5.2 | NA | NA | 1201 |
| Peru | 1.0 | 2.2 | 4.6 | 4.2 | 4.1 | 3.1 | 4.9 | 3.3 | 1.8 | 4.3 | 10.3 | 2.5 | 4.9 | 2.9 | 4.4 | 4.3 | 3.8 | 3.1 | 4.1 | 2.0 | 906 |
| Trinidad&Tobago | a | a | (44.2) | (56.3) | 55.0 | 50.9 | 54.8) | 52.2) | a | a | a | 54.5 | a | 54.9 | 51.6 | a | 50.0 | 57.1 | 53.1 | a | 113 |

Note: Figures in parentheses are based on fewer than 50 cases.
NA = Not applicable (question not asked)
[a] Fewer than 20 cases

## Use of medical facilities for treatment of childhood diarrhea

Table 3.14 Percentage of children 1-59 months with diarrhea in the 2 weeks preceding the survey who were taken to a medical facility by demographic and socioeconomic characteristics, and the percentage of children with both diarrhea and fever taken to a medical facility, Demographic and Health Surveys, 1986-1989

| Country | Age of child (mo) | | | | Sex of child | | Birth order | | | | Mother's age (yr) | | | Residence | | Education | | | Radio | | Total | Children with diarrhea and fever | Number of children with diarrhea |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 0-5 | 6-11 | 12-23 | 24-59 | Male | Female | 1 | 2-3 | 4-5 | 6+ | <20 | 20-34 | 35+ | Urban | Rural | None | Pri | Sec+ | Yes | No | | | |
| SUB-SAHARAN AFRICA | | | | | | | | | | | | | | | | | | | | | | | |
| Botswana | 38.4 | 27.8 | 60.9 | 48.8 | 44.9 | 46.8 | 37.7 | 45.6 | 51.7 | 52.6 | ( 9.6) | 49.8 | (54.5) | 51.9 | 43.8 | 52.9 | 43.6 | (39.4) | 45.3 | 47.0 | 45.9 | 69.1 | 299 |
| Burundi | 27.8 | 42.2 | 38.6 | 38.6 | 37.8 | 38.5 | 44.1 | 39.4 | 32.0 | 38.5 | a | 38.8 | 37.5 | (54.6) | 37.5 | 36.6 | 44.1 | a | 46.5 | 36.3 | 38.1 | 45.7 | 600 |
| Ghana | 37.3 | 44.7 | 48.6 | 38.9 | 40.8 | 45.6 | 45.7 | 42.9 | 44.7 | 39.8 | 43.6 | 43.3 | 42.4 | 52.6 | 39.4 | 36.2 | 48.1 | (48.5) | 49.5 | 39.2 | 43.1 | 48.9 | 960 |
| Kenya | 55.1 | 49.0 | 49.9 | 38.0 | 47.0 | 46.6 | 52.3 | 49.7 | 49.0 | 39.8 | 56.9 | 48.9 | 34.7 | 58.7 | 45.2 | 42.3 | 49.2 | 46.3 | 47.5 | 45.8 | 46.8 | 49.7 | 830 |
| Mali | 3.1 | 4.7 | 1.7 | 2.7 | 3.2 | 2.4 | 1.5 | 1.8 | 3.8 | 3.6 | 2.3 | 3.4 | 1.4 | 5.8 | 1.8 | 2.2 | 6.0 | a | 3.4 | 2.2 | 2.8 | 3.3 | 981 |
| Senegal | 10.1 | 17.8 | 24.8 | 18.4 | 19.4 | 19.3 | 20.1 | 19.1 | 16.9 | 21.2 | 22.6 | 18.3 | 21.3 | 23.7 | 17.6 | 18.6 | 25.5 | (20.0) | 20.0 | 17.2 | 19.4 | NA | 1394 |
| Togo | 19.8 | 24.8 | 30.0 | 24.3 | 24.2 | 26.7 | 31.9 | 25.5 | 23.8 | 22.3 | (27.1) | 26.5 | 21.3 | 33.7 | 22.8 | 24.0 | 29.3 | 25.9 | 27.8 | 23.8 | 25.4 | 28.9 | 814 |
| Uganda | 7.2 | 16.6 | 17.7 | 13.0 | 13.8 | 15.8 | 17.8 | 15.1 | 13.4 | 13.9 | 19.3 | 14.7 | 12.0 | 20.4 | 14.3 | 12.8 | 16.8 | 9.8 | 17.3 | 13.9 | 14.8 | 18.3 | 1053 |
| Zimbabwe | (21.4) | 36.9 | 32.7 | 33.1 | 33.2 | 32.6 | 33.1 | 32.7 | 27.4 | 39.0 | 34.6 | 32.3 | 34.5 | 38.5 | 31.4 | 33.3 | 31.8 | 35.8 | 34.6 | 31.9 | 32.9 | 34.6 | 620 |
| NORTH AFRICA | | | | | | | | | | | | | | | | | | | | | | | |
| Egypt | 47.8 | 46.9 | 47.0 | 35.3 | 44.3 | 41.9 | 46.6 | 43.1 | 40.2 | 43.2 | 40.1 | 42.3 | 47.4 | 45.7 | 41.4 | 42.3 | 42.1 | 48.6 | NA | NA | 43.2 | NA | 1255 |
| Morocco | 12.1 | 16.4 | 19.0 | 12.4 | 16.1 | 14.0 | 18.4 | 16.8 | 13.8 | 12.6 | (22.4) | 15.6 | 13.0 | 23.5 | 10.5 | 13.1 | 25.6 | 23.5 | 15.9 | 11.7 | 15.1 | NA | 1604 |
| Tunisia | 33.7 | 34.8 | 31.8 | 21.1 | 31.8 | 24.8 | 32.8 | 29.0 | 30.5 | 21.5 | 20.0 | 29.4 | 25.7 | 38.9 | 21.3 | 23.9 | 35.0 | 42.6 | 32.2 | 22.1 | 28.5 | NA | 873 |
| ASIA | | | | | | | | | | | | | | | | | | | | | | | |
| Sri Lanka | (58.6) | (73.5) | 77.7 | 74.5 | 76.1 | 68.1 | 70.2 | 73.0 | (78.8) | a | a | 72.7 | (78.0) | (79.7) | 71.3 | 75.7 | 75.1 | 69.7 | 73.6 | 70.6 | 72.6 | NA | 231 |
| Thailand | 26.8 | 47.9 | 36.8 | 45.3 | 42.4 | 39.5 | 40.9 | 41.8 | 50.8 | 23.1 | (35.6) | 42.1 | 39.3 | 45.4 | 40.6 | 34.8 | 42.2 | 41.3 | 40.0 | 43.0 | 41.1 | NA | 548 |
| LATIN AMERICA | | | | | | | | | | | | | | | | | | | | | | | |
| Bolivia | 21.8 | 31.2 | 36.8 | 26.5 | 31.7 | 28.5 | 38.6 | 29.5 | 27.5 | 26.3 | 43.8 | 29.1 | 29.3 | 35.8 | 24.5 | 18.4 | 29.2 | 42.2 | NA | NA | 30.1 | NA | 1450 |
| Colombia | (48.0) | 35.9 | 32.9 | 25.9 | 29.1 | 33.3 | 36.1 | 35.8 | 23.2 | 23.1 | (40.7) | 31.6 | 25.3 | 31.0 | 31.5 | 27.7) | 30.8 | 33.7 | 34.6 | 21.4 | 31.2 | 39.1 | 484 |
| Dominican Republic | 38.4 | 36.1 | 27.4 | 25.0 | 26.6 | 31.5 | 30.1 | 27.1 | 34.1 | 25.8 | 27.8 | 30.2 | 21.1 | 29.5 | 28.3 | 32.5 | 30.2 | 25.0 | 30.6 | 27.1 | 29.0 | NA | 1021 |
| Guatemala | 25.0 | 25.2 | 18.8 | 8.8 | 17.3 | 16.1 | 20.6 | 18.5 | 10.3 | 16.8 | 12.5 | 17.6 | 15.3 | 26.7 | 12.7 | 14.2 | 16.8 | 31.5 | 17.6 | 15.4 | 16.8 | NA | 698 |
| Peru | 21.4 | 28.1 | 28.6 | 24.1 | 28.5 | 22.3 | 34.1 | 25.8 | 20.7 | 22.5 | 30.9 | 25.0 | 25.7 | 33.0 | 18.2 | 16.8 | 23.5 | 33.7 | 27.5 | 18.3 | 25.6 | NA | 906 |
| Trinidad&Tobago | a | a | (44.2) | (60.4) | 41.7 | 58.5 | 50.0) | 47.8 | a | a | a | 47.5 | a | 54.9 | 45.2 | a | 51.8 | 46.4 | 49.0 | NA | 49.6 | NA | 113 |

Note: Figures in parentheses are based on fewer than 50 cases.
NA = Not applicable (question not asked)
[a] Fewer than 20 cases

Table 3.15 and Figure 3.3 examine the treatments given to children under five years who had visited a medical facility in the two weeks preceding the survey because of diarrhea. In three countries—Kenya, Tunisia, and Guatemala—mothers were specifically asked what had been given during the visit. In all other surveys, the questions on the visit to the medical facility and on the type of treatment given were not necessarily associated with each other. For example, a child could have been taken to a doctor and have obtained drugs at a pharmacy without the doctor's prescription. In spite of these limitations, it may still be useful to look at treatment patterns for children who visited medical facilities as it gives an indication of the emphasis placed on ORT by trained medical personnel.

A considerable percentage of mothers said they neither used drugs nor ORS packets. For example, in Mali, Senegal, and Sri Lanka, more than half of the women did not mention using ORS or drugs in treating the diarrheal episode. Interestingly, in the three countries with direct questions on what was given at the medical facility, it was found that large proportions of children were treated by drugs only: 56 percent in Guatemala, 60 percent in Kenya, and 36 percent in Tunisia. The proportion of diarrheal cases treated by drugs only is also high in Guatemala, Peru, and Uganda. The combination of drugs and ORS is also common, e.g., in Bolivia, Thailand, and Togo. Treatment with ORS packets only was reported for two-thirds of children with diarrhea in Botswana and Trinidad and Tobago and for half of the children in Burundi and Colombia.

In Figure 3.4 the proportion of children with diarrhea taken to a medical facility is plotted against the prevalence of diarrhea. There is a relationship between the two variables: the higher the level of diarrhea in a country, the lower the percentage visiting a medical facility ($R^2$=.60). Two explanations can be proposed. First, the relationship may be the effect of a common cause. A country with a poor overall development level, for example, might have inadequate water supplies and poor hygienic conditions for the majority of the population, so diarrhea would be common. At the same time, retarded development might lead to a poor health infrastructure, so that services would not be available to most sick children. The second explanation may be that there are different reporting tendencies, which vary between countries and cultures. In countries with high levels of diarrhea, larger numbers of less severe cases may be reported, as suggested by the lower levels of utilization of medical services. On the other hand, it seems plausible that mothers in countries where diarrhea occurs more frequently would be *less* likely to report mild episodes.

Treatment of childhood diarrhea at medical facilities

Table 3.15 Percent distribution of results (according to mothers) of visits to medical facilities by children 1-59 months with diarrhea in the 2 weeks preceding the survey, Demographic and Health surveys, 1986-1989

| Country | Received ORS only | Received ORS & drugs | Received drugs only | Other | Total | Number of medical visits |
|---|---|---|---|---|---|---|
| SUB-SAHARAN AFRICA | | | | | | |
| Botswana | 68.9 | 6.2 | 7.2 | 17.8 | 100.0 | 137 |
| Burundi | 54.3 | 13.4 | 10.4 | 21.9 | 100.0 | 229 |
| Ghana | 32.1 | 20.0 | 27.3 | 20.5 | 100.0 | 414 |
| Kenya[1] | 15.5 | 21.3 | 60.5 | 2.8 | 100.0 | 388 |
| Mali | 0.0 | 2.1 | 42.3 | 55.6 | 100.0 | 28 |
| Senegal | 1.9 | 1.5 | 18.5 | 78.1 | 100.0 | 270 |
| Togo | 13.0 | 35.7 | 40.6 | 10.6 | 100.0 | 207 |
| Uganda | 15.3 | 17.8 | 52.7 | 14.3 | 100.0 | 156 |
| NORTH AFRICA | | | | | | |
| Egypt | 26.9 | 21.1 | 25.4 | 26.7 | 100.0 | 541 |
| Morocco | 14.0 | 29.3 | 40.9 | 15.7 | 100.0 | 242 |
| Tunisia[1] | 28.9 | 26.1 | 35.7 | 9.2 | 100.0 | 249 |
| ASIA | | | | | | |
| Sri Lanka | 29.3 | 7.3 | 8.3 | 55.1 | 100.0 | 167 |
| Thailand | 25.7 | 38.8 | 26.2 | 9.3 | 100.0 | 226 |
| LATIN AMERICA/CARIBBEAN | | | | | | |
| Bolivia | 19.5 | 30.0 | 42.7 | 7.8 | 100.0 | 436 |
| Colombia | 49.5 | 21.7 | 14.7 | 14.1 | 100.0 | 151 |
| Dominican Republic | 33.0 | 27.9 | 18.2 | 21.0 | 100.0 | 296 |
| Guatemala[1] | 10.3 | 29.9 | 55.6 | 4.3 | 100.0 | 117 |
| Peru | 3.0 | 5.2 | 80.2 | 11.6 | 100.0 | 232 |
| Trinidad&Tobago | 67.9 | 8.9 | 5.4 | 17.9 | 100.0 | 56 |

Note: Medical personnel and other persons provided treatment in all countries except Guatemala, Kenya, and Tunisia.
[1] Treatment given by medical personnel only

Figure 3.3 Treatment of diarrhea by medically trained personnel among children 1-59 months according to mothers' recall, Demographic and Health Surveys, 1986-1989

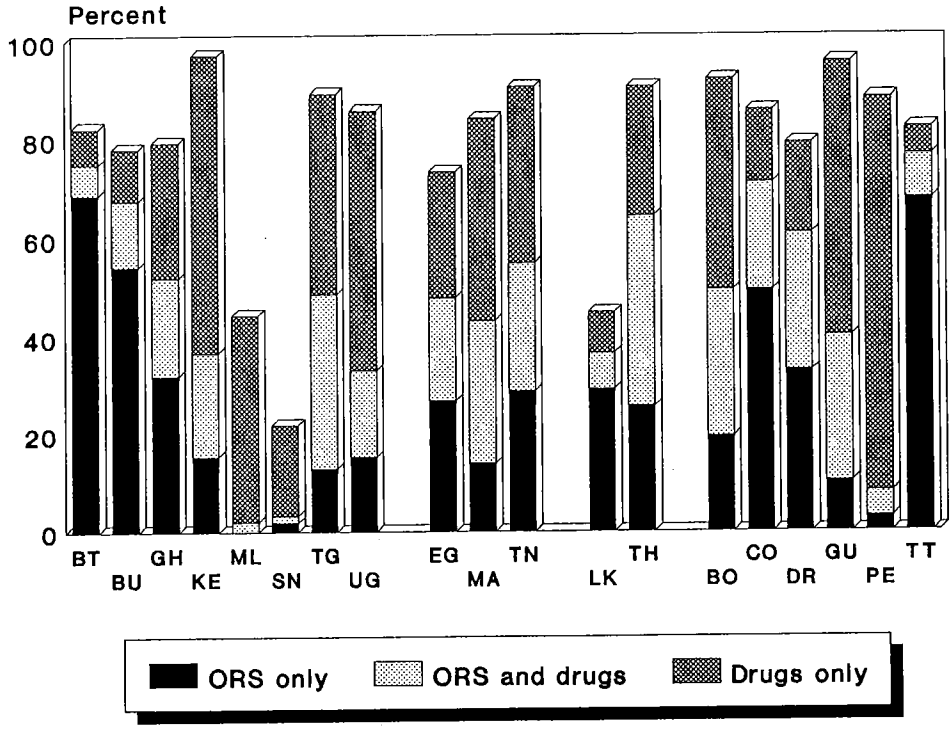
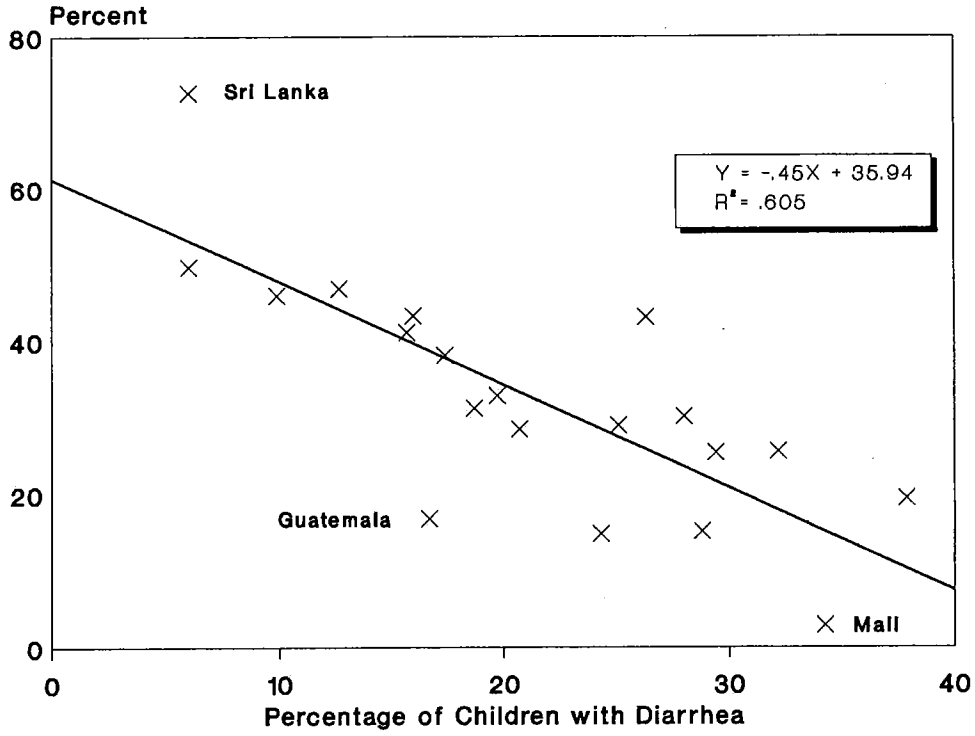



Figure 3.4 Prevalence of diarrhea among children 1-59 months who visited a medical facility in the 2 weeks preceding the survey, Demographic and Health Surveys, 1986-1989



# 4 Fever

## 4.1 PREVALENCE LEVELS AND DIFFERENTIALS

In ten countries in sub-Saharan Africa and in Colombia, mothers were asked about recent episodes of fever among their children under five years of age. In most countries the reference period was four weeks before the survey; in Togo it was two weeks. The main objective of these questions was to assess the proportion of children receiving presumptive treatment for malaria. However, fever is a symptom of many infectious diseases, and, therefore, the results have to be interpreted carefully. In Senegal, mothers were asked whether their children had malaria during the last winter season, which occurred 0-6 months before the survey.

The prevalence of fever in the four weeks preceding the survey is shown in Table 4.1 as are the differentials by demographic and socioeconomic variables. There were large differences between in the percentage of children under five with fever. Low prevalences of less than 10 percent were observed in Botswana, Burundi, and Zimbabwe. In all other countries, the prevalence of fever was at least 30 percent. Analysis by age shows that the prevalence of fever is generally highest at age 6-11 months and, to a lesser extent, 12-23 months. In Ghana, Liberia, and Uganda, prevalence is markedly lower at 1-5 months of age. None of the other demographic and socioeconomic variables showed consistent differentials, as was observed for diarrhea, with the exception of residence. In seven countries, fever prevalence is considerably higher in rural than urban areas. In Burundi, where prevalence is higher in urban areas, the low altitude of the major urban areas is thought to be an important factor.

## Prevalence of fever by demographic and socioeconomic characteristics

Table 4.1 Percentage of children 1-59 months with fever in the 4 weeks preceding the survey by demographic and socioeconomic characteristics, Demographic and Health Surveys, 1986-1989

| Country | Age of child (mo) | | | | Sex of child | | Birth order | | | | Birth interval (mo) | | | Mother's age (yr) | | | Residence | | Education | | | Radio | | Total | Number of children |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1-5 | 6-11 | 12-23 | 24-59 | M | F | 1 | 2-3 | 4-5 | 6+ | <24 | 24-35 | 36+ | <20 | 20-34 | 35+ | Urban | Rural | None | Pri. | Sec+ | Yes | No | | |
| SUB-SAHARAN AFRICA | | | | | | | | | | | | | | | | | | | | | | | | | |
| Botswana | 3.4 | 4.5 | 6.0 | 3.8 | 3.9 | 4.7 | 3.2 | 4.7 | 4.7 | 4.6 | 4.6 | 4.4 | 4.8 | 3.2 | 4.0 | 5.7 | 4.5 | 4.2 | 5.0 | 4.1 | 3.6 | 4.2 | 4.5 | 4.3 | 2751 |
| Burundi | 3.8 | 10.4 | 10.0 | 7.7 | 8.2 | 7.9 | 8.0 | 8.8 | 8.6 | 6.6 | 9.8 | 7.6 | 7.6 | (11.5) | 8.7 | 6.3 | 24.5 | 7.5 | 7.3 | 10.3 | 17.3 | 9.7 | 7.7 | 8.0 | 3419 |
| Ghana | 17.3 | 41.5 | 44.1 | 35.4 | 37.4 | 35.4 | 32.6 | 36.1 | 40.1 | 36.2 | 39.2 | 36.4 | 37.3 | 32.3 | 37.8 | 33.2 | 33.1 | 37.6 | 34.5 | 38.5 | 31.6 | 38.0 | 35.4 | 36.4 | 3541 |
| Kenya | 45.4 | 55.4 | 49.3 | 37.7 | 41.9 | 43.5 | 43.4 | 40.9 | 43.4 | 43.5 | 43.0 | 43.6 | 40.9 | 50.3 | 42.7 | 41.0 | 43.0 | 42.7 | 38.9 | 44.2 | 43.8 | 42.4 | 43.2 | 42.7 | 6415 |
| Liberia | 42.5 | 64.7 | 67.7 | 53.2 | 56.3 | 56.8 | 52.9 | 55.4 | 60.4 | 57.2 | 54.3 | 58.1 | 59.1 | 56.2 | 56.8 | 55.9 | 51.6 | 59.9 | 57.2 | 57.1 | 53.1 | 56.0 | 57.2 | 56.6 | 3831 |
| Mali | 32.7 | 43.6 | 42.2 | 29.7 | 36.0 | 32.9 | 31.9 | 32.8 | 31.7 | 39.3 | 32.7 | 31.3 | 39.3 | 36.5 | 33.8 | 35.9 | 31.4 | 35.5 | 34.5 | 34.5 | 34.5 | (30.7) | 35.1 | 34.5 | 2748 |
| Senegal[1] | (22.6) | 31.9 | 55.2 | 68.2 | 61.9 | 60.1 | 57.2 | 61.3 | 62.0 | 62.4 | 62.5 | 62.7 | 56.4 | 56.8 | 60.5 | 64.2 | 46.6 | 68.9 | 64.8 | 48.1 | 33.3 | 59.7 | 65.9 | 61.1 | 3022 |
| Togo[2] | 43.0 | 57.1 | 51.3 | 39.4 | 44.5 | 44.0 | 42.8 | 40.8 | 46.0 | 47.8 | 36.8 | 45.1 | 46.7 | 41.3 | 43.7 | 46.6 | 40.1 | 45.7 | 44.4 | 46.4 | 36.3 | 43.3 | 45.1 | 44.2 | 2703 |
| Uganda | 35.3 | 53.4 | 50.6 | 41.0 | 44.3 | 44.2 | 40.1 | 43.9 | 47.0 | 44.9 | 42.7 | 46.3 | 45.5 | 46.3 | 44.4 | 42.7 | 35.9 | 45.1 | 41.6 | 48.0 | 34.4 | 43.3 | 44.6 | 44.2 | 4052 |
| Zimbabwe | 6.6 | 6.5 | 7.2 | 7.1 | 7.1 | 7.0 | 6.9 | 7.2 | 6.8 | 7.2 | 6.7 | 6.5 | 7.8 | 8.1 | 6.9 | 7.2 | 5.7 | 7.5 | 8.0 | 6.8 | 6.9 | 6.3 | 7.5 | 7.0 | 2929 |
| LATIN AMERICA | | | | | | | | | | | | | | | | | | | | | | | | | |
| Colombia[3] | 24.6 | 40.3 | 32.8 | 27.8 | 30.1 | 31.3 | 34.3 | 28.2 | 28.2 | 34.2 | 30.9 | 29.1 | 28.2 | 37.6 | 29.2 | 34.6 | 31.7 | 28.7 | 33.8 | 30.6 | 30.3 | 30.0 | 34.0 | 30.7 | 1753 |

Note: Figures in parentheses are based on fewer than 50 cases.
[1] Data refer to malaria during the last cold season (0-6 months preceding the survey)
[2] Data are for the 2 weeks preceding survey
[3] Last births only

## 4.2 TREATMENT PATTERNS

Mothers of children with fever were asked what treatment had been given and whether they had taken their child(ren) to a medical facility (Table 4.2). The proportion of children taken to a medical facility was 40 to 50 percent in 6 of 9 countries. The two extremes are Botswana with 90 percent and Mali with 3 percent. In Togo, 31 percent of the children with fever were taken to a medical facility. The data on treatment of fever are affected by the fact that for many mothers it was probably difficult to remember which drugs were given. The easiest to recall would be an injection, which is usually an antibiotic, although in some cases it may have been a chloroquine injection. In Uganda, 30 percent of all children with fever had received an injection, according to the mother. In Ghana, Senegal, and Togo, more than 10 percent received injections. In Botswana and Colombia, a very small proportion of the children with fever received injections. Oral antibiotics, as recalled by mothers, were given to less than 10 percent of the children in the sub-Saharan countries and to 16 percent of the children in Colombia. In Colombia, most fevers are not related to malaria.

Anti-malarials (particularly chloroquine) are commonly given to children with fever in all countries, with the proportion ranging from 20-30 percent in Burundi, Ghana, and Senegal to well over 50 percent in Togo, Liberia, and Uganda. Antipyretics (such as aspirin and paracetamol) are commonly given as well to reduce fever and pain. The proportion of children with fever receiving antipyretics appears to be related to the proportion of children receiving anti-malarials, suggesting that both are given at the same time.

Differentials in the utilization of medical services for the treatment of fever are greatest for socioeconomic variables, particularly residence (Table 4.3). In all countries, rural children with fever are taken to a medical facility much less frequently than urban children. Children of mothers who have no education and children in households without a radio also visit medical facilities less frequently, but those differentials are not as pronounced. Demographic differentials also exist, but are smaller than the socioeconomic ones. Utilization of medical services decreases with increasing birth order and, to a lesser extent, with increasing age of the mother.

There does not appear to be a relationship between the prevalence of fever and the utilization of medical services, as was observed for diarrhea.

Treatment practices for fever

Table 4.2 Among children 1-59 months with fever in the 4 weeks preceding the survey, the percentage taken to a medical facility, and the percentage receiving various treatments, Demographic and Health Surveys, 1986-1989

| Country | Children taken to medical facility | Treatments received by children with fever | | | | | | Number of children with fever |
|---|---|---|---|---|---|---|---|---|
| | | Anti-malarial | Anti-biotics | Injection | Anti-pyretics | Liquids/ syrups | Other[1] | |
| SUB-SAHARAN AFRICA | | | | | | | | |
| Botswana | 90.2 | NA | 1.5 | 1.2 | 4.6 | 5.6 | 3.4 | 118 |
| Burundi | 49.9 | 19.8 | 3.6 | 5.7 | 9.7 | 6.8 | 20.9 | 275 |
| Ghana | 56.4 | 24.9 | 8.5 | 16.3 | 14.8 | 40.9 | 20.0 | 1288 |
| Kenya | 55.5 | NA | NA | NA | NA | NA | NA | 2741 |
| Liberia | NA | 73.5 | 3.7 | NA | NA | NA | 15.0 | 2167 |
| Mali | 2.9 | 35.5 | NA | 5.7 | 20.0 | NA | 10.7 | 948 |
| Senegal[2] | 57.6 | 26.7 | NA | 14.7 | 11.9 | NA | 21.9 | 1845 |
| Togo[3] | 30.8 | 56.5 | NA | 11.2 | 43.6 | NA | NA | 1196 |
| Uganda | 48.3 | 57.1 | 4.1 | 30.1 | 53.7 | 4.7 | 6.1 | 1792 |
| LATIN AMERICA | | | | | | | | |
| Colombia[4] | 42.2 | 0.2 | 16.0 | 2.1 | 52.5 | 28.3 | 21.1 | 538 |

NA = Not applicable (question not asked)
[1] Includes home treatment and treatments received from traditional practitioners.
[2] Data refer to malaria during the last cold season (0-6 months preceding the survey).
[3] Data are for the 2 weeks preceding survey
[4] Last births only

## Use of medical facilities for treatment of fever by demographic and socioeconomic characteristics

Table 4.3 Percentage of children 1-59 months with fever in the 4 weeks preceding the survey who were taken to a medical facility by demographic and socioeconomic characteristics, Demographic and Health Surveys, 1986-1989

| Country | Age of child (mo) | | | | Sex | | Birth order | | | | Mother's age (yr) | | | Residence | | Education | | | Radio | | | Number of children with fever |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1-5 | 6-11 | 12-23 | 24-59 | M | F | 1 | 2-3 | 4-5 | 6+ | <20 | 20-34 | 35+ | Urb | Rur | None | Pri | Sec+ | Yes | No | Total | |
| SUB-SAHARAN AFRICA | | | | | | | | | | | | | | | | | | | | | | |
| Botswana | a | a | (91.6) | 89.4 | 84.8 | 94.7 | (92.1) | (90.0) | (94.9) | (83.5) | a | 90.2 | (91.8) | (30.3) | 88.2 | (89.8) | 90.9 | a | 89.1 | (92.1) | 90.2 | 118 |
| Burundi | a | (42.7) | 49.6 | 51.8 | 50.9 | 48.8 | (57.0) | 46.7 | 51.7 | 47.3 | a | 51.0 | 44.4 | (69.9) | 47.7 | 47.5 | 54.5 | a | 68.5 | 44.4 | 49.9 | 275 |
| Ghana | 50.0 | 57.9 | 59.2 | 55.2 | 55.1 | 57.8 | 62.1 | 59.0 | 53.2 | 52.1 | 51.0 | 58.2 | 51.7 | 71.3 | 51.3 | 45.3 | 63.2 | 78.6 | 61.2 | 53.2 | 56.4 | 1288 |
| Kenya | 63.6 | 56.8 | 60.1 | 51.5 | 55.8 | 55.3 | 63.1 | 56.6 | 53.9 | 51.9 | 65.6 | 55.9 | 51.5 | 71.5 | 53.0 | 54.2 | 53.7 | 62.7 | 58.8 | 50.8 | 55.5 | 2741 |
| Mali | 6.5 | 3.5 | 2.2 | 2.2 | 4.5 | 1.1 | 2.6 | 3.0 | 2.7 | 3.2 | 3.5 | 3.6 | 1.0 | 7.2 | 1.7 | 2.1 | 7.6 | a | 5.1 | 0.6 | 2.9 | 948 |
| Senegal[b] | a | (29.2) | 58.9 | 58.4 | 58.6 | 56.6 | 58.1 | 56.5 | 59.6 | 47.0 | 61.5 | 58.1 | 55.1 | 75.6 | 51.0 | 55.9 | 71.3 | 63.6 | 59.4 | 51.7 | 57.6 | 1845 |
| Togo[c] | 30.8 | 33.5 | 32.0 | 29.4 | 30.7 | 30.9 | 38.1 | 31.4 | 32.9 | 23.8 | 34.4 | 31.9 | 27.0 | 41.8 | 27.4 | 26.7 | 36.6 | 47.6 | 37.1 | 25.5 | 30.8 | 1196 |
| Uganda | 44.6 | 59.9 | 48.7 | 45.0 | 49.7 | 46.9 | 49.7 | 48.5 | 47.5 | 48.0 | 57.5 | 48.2 | 44.1 | 63.6 | 47.0 | 47.5 | 48.2 | 53.6 | 54.5 | 45.9 | 48.3 | 1792 |
| LATIN AMERICA | | | | | | | | | | | | | | | | | | | | | | |
| Colombia[d] | (45.3) | 53.7 | 40.0 | 37.9 | 43.7 | 40.7 | 49.1 | 47.2 | 37.8 | 20.9 | (39.8) | 47.1 | 25.8 | 49.5 | 27.0 | (30.3) | 37.8 | 51.3 | 41.7 | 44.3 | 42.2 | 538 |

Note: Figures in parentheses are based on fewer than 50 cases.
[a] Fewer than 20 cases
[b] Data refer to malaria during the last cold season (0-6 months preceding the survey).
[c] Date are for the 2 weeks preceding survey
[d] Last births only

# 5 Respiratory Illness

## 5.1 PREVALENCE LEVELS AND DIFFERENTIALS

While 13 country surveys inquired about respiratory symptoms in the four weeks preceding the survey, the specific questions differed between surveys. The results of most surveys reflect the presence of (severe) cough with or without rapid or difficult breathing (Table 5.1). The two major exceptions are Mali and Togo where mothers were only asked whether their children had rapid or difficult breathing. The prevalence of these respiratory problems was 6.9 percent in Mali and 10.8 percent in Togo. In Togo the reference period was two weeks, in Mali four weeks. In the other 11 countries, about 1 in 3 children were reported to have had cough or breathing problems in the four weeks preceding the survey, ranging from 19 percent in Kenya to 50 percent in Zimbabwe. A comparison of the prevalence rates of respiratory symptoms in Table 5.1 with those for diarrhea in Table 3.1 shows that there does not appear to be a relationship between the two prevalence levels at the country level.

There are differentials by the age of the child. As with diarrhea and fever, the prevalence of respiratory symptoms is highest at age 6-11 months in all countries except Mali and is generally followed by children age 12-23 months. Two other demographic variables, birth order and mother's age, show moderate differentials. In half of the countries, prevalence is higher for first-born children; in two-thirds of the countries, children of younger mothers have higher prevalence rates.

Socioeconomic differentials are greatest for residence. In all countries in sub-Saharan Africa and in Bolivia, rural children have higher prevalence rates for respiratory symptoms than urban children. In Colombia there is no difference, and in Egypt prevalence is substantially higher among urban than rural children. As for the mother's level of education, no country shows a dramatic reduction in the prevalence of cough or breathing problems with increasing education. In Egypt, prevalence actually increases with education. Finally, in households with a radio, the prevalence of respiratory symptoms is generally lower than in households without a radio.

## Prevalence of cough and/or rapid/difficult breathing by demographic and socioeconomic characteristics

Table 5.1 Percentage of children 1-59 months with cough and/or rapid/difficult breathing in the 4 weeks preceding the survey by demographic and socioeconomic characteristics, Demographic and Health Surveys, 1986-1989

| Country | Type of question | Age of child (mo) | | | | Sex | | Birth order | | | | Birth interval (mo) | | | Mother's age (yr) | | | Residence | | Education | | | Radio | | Total | Number of children |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 1-5 | 6-11 | 12-23 | 24-59 | M | F | 1 | 2-3 | 4-5 | 6+ | <24 | 24-35 | 36+ | <20 | 20-34 | 35+ | Urb | Rur | None | Pri. | Sec+ | Yes | No | | |
| SUB-SAHARAN AFRICA | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Botswana | (1) | 34.8 | 47.3 | 35.4 | 25.8 | 32.0 | 31.1 | 33.7 | 30.4 | 33.5 | 28.6 | 22.6 | 30.5 | 33.3 | 38.4 | 31.2 | 30.0 | 29.9 | 32.1 | 29.7 | 32.4 | 32.4 | 33.8 | 31.5 | 30.3 | 2754 |
| Burundi | (1) | 46.4 | 47.9 | 43.9 | 35.8 | 41.3 | 42.8 | 40.7 | 38.6 | 38.5 | 42.7 | 36.0 | 37.7 | 43.5 | 35.0 | 40.9 | 37.5 | 32.4 | 39.7 | 43.2 | 23.0 | 39.7 | 40.6 | 39.9 | 38.6 | 3424 |
| Ghana | (1) | 21.0 | 31.0 | 22.4 | 17.7 | 20.8 | 20.4 | 20.6 | 22.0 | 20.7 | 18.4 | 19.8 | 19.9 | 21.3 | 25.3 | 21.3 | 17.8 | 18.6 | 21.4 | 18.9 | 21.9 | 21.5 | 20.6 | 20.6 | 20.6 | 3543 |
| Kenya | (1) | 24.2 | 24.2 | 24.6 | 18.9 | 16.2 | 18.8 | 18.2 | 16.8 | 20.1 | 19.2 | 16.7 | 19.9 | 18.7 | 23.6 | 18.6 | 17.4 | 15.3 | 19.1 | 18.2 | 20.2 | 13.9 | 20.0 | 18.5 | 17.5 | 6409 |
| Liberia | (2) | 36.6 | 53.6 | 43.5 | 36.8 | 41.5 | 40.0 | 36.9 | 41.6 | 42.9 | 40.4 | 43.7 | 41.3 | 40.7 | 38.4 | 41.9 | 38.0 | 39.8 | 41.4 | 40.0 | 44.2 | 40.4 | 40.3 | 40.7 | 41.1 | 3847 |
| Mali | (4) | 8.4 | 6.7 | 7.6 | 6.3 | 6.9 | 6.9 | 6.1 | 6.5 | 5.2 | 8.9 | 7.8 | 5.7 | 7.8 | 3.8 | 6.4 | 9.3 | 3.3 | 8.1 | 7.3 | 4.8 | 4.1 | 7.4 | 6.9 | 6.5 | 2732 |
| Togo | (4) | 12.5 | 13.2 | 11.6 | 9.7 | 11.7 | 9.9 | 8.3 | 9.7 | 10.8 | 13.7 | 10.5 | 11.9 | 11.1 | 7.1 | 10.7 | 12.0 | 8.7 | 11.6 | 11.0 | 10.3 | 10.2 | 12.1 | 10.8 | 9.3 | 2705 |
| Uganda | (1) | 22.4 | 30.6 | 25.9 | 21.6 | 24.0 | 23.7 | 27.4 | 23.4 | 23.7 | 22.5 | 22.3 | 23.5 | 23.2 | 27.9 | 24.3 | 20.6 | 22.7 | 24.0 | 22.3 | 26.0 | 18.5 | 24.5 | 23.9 | 22.2 | 4071 |
| Zimbabwe | (3) | 52.2 | 60.0 | 54.1 | 45.8 | 51.5 | 47.6 | 54.0 | 50.5 | 46.5 | 47.9 | 48.1 | 47.4 | 49.8 | 62.1 | 49.9 | 45.3 | 47.0 | 50.4 | 48.6 | 49.8 | 49.6 | 50.6 | 49.5 | 48.0 | 2942 |
| ASIA | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Egypt | (3) | 37.6 | 51.6 | 49.8 | 41.4 | 44.6 | 42.8 | 49.2 | 46.6 | 41.0 | 37.2 | 42.2 | 40.9 | 46.1 | 45.9 | 44.7 | 40.3 | 52.0 | 37.8 | 37.3 | 46.8 | 57.4 | NA | NA | 43.7 | 7857 |
| LATIN AMERICA | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Bolivia[a] | (3) | 39.1 | 53.0 | 49.8 | 36.0 | 41.8 | 40.5 | 42.2 | 40.2 | 41.2 | 41.6 | 45.2 | 41.3 | 38.9 | 49.8 | 41.3 | 38.9 | 38.2 | 44.0 | 41.2 | 42.2 | 39.4 | NA | NA | 41.2 | 5160 |
| Colombia | (5) | 25.6 | 28.1 | 26.1 | 21.7 | 25.2 | 23.4 | 25.5 | 25.1 | 18.9 | 26.4 | 24.8 | 24.5 | 22.8 | 31.1 | 24.0 | 23.2 | 24.4 | 24.2 | 26.6 | 22.5 | 26.7 | 27.2 | 24.3 | 23.7 | 1754 |
| Ecuador | (6) | 49.3 | 63.2 | 59.3 | 54.5 | 56.4 | 56.9 | 51.7 | 55.0 | 63.2 | 59.0 | 59.2 | 58.8 | 56.8 | 67.2 | 56.7 | 53.2 | 55.5 | 58.0 | 59.3 | 61.2 | 49.1 | 56.5 | 56.7 | 56.7 | 1758 |

Note: Figures exclude "don't know" and "missing" cases.
NA = Not available (question not asked)
(1) Severe cough or rapid or difficult breathing
(2) Cough or difficult breathing
(3) Cough with or without difficult breathing
(4) Rapid or difficult breathing
(5) Severe cough or rapid or difficult breathing (last births only)
(6) Cough (last births only)
[a] Cough in the preceding 2 weeks

## 5.2 TREATMENT PATTERNS

The percentage of children with cough and/or difficult or rapid breathing that were taken to a medical facility ranges from 6 percent in Mali and 22 percent in Bolivia to 66 percent in Kenya and 82 percent in Botswana (Table 5.2). Even though Mali and Togo included only children with breathing difficulties, utilization rates in Mali and Togo are lower than in most other countries which also include children with cough only.

Mothers were also asked about the treatments given, either at the medical facility or elsewhere. These data have serious limitations since mothers often do not know what type of treatment was given to the child. They may remember the form in which the medication was administered, but cannot distinguish between antibiotics and other drugs. The data in Table 5.3 show that cough syrup is the most commonly reported treatment, although some of these syrups may have been antibiotics. Injections were given to more than 10 percent of all children with respiratory symptoms in Kenya, Togo, and Uganda. Oral antibiotics were reportedly given to more than 10 percent of the children with cough or difficult/rapid breathing in Ghana, Uganda, and Zimbabwe (32 percent).

In nine of the countries, a separate question was asked about the prevalence of fever in the four weeks preceding the survey. In a number of cases these episodes of fever may have been related to the episodes of respiratory problems. Table 5.3 suggests that it may be useful to include fever as a symptom of more severe respiratory disease. In most countries, the utilization of medical facilities for children with respiratory illnesses was 10-30 percent higher if there was fever in the preceding four weeks, compared with children who had respiratory problems but no fever. If the question is limited to fever related to the respiratory illness, the gains may be even greater. The proportion receiving either oral antibiotics or an injection during a medical visit, as recalled by the mother, did not vary consistently when comparing respiratory illness with and without fever.

Treatment practices for cough and/or rapid/difficult breathing

Table 5.2 Among children 1-59 months with cough and/or rapid/difficult breathing in the 4 weeks preceding the survey, the percentage taken to a medical facility, and the percentage receiving various treatments, Demographic and Health Surveys, 1986-1989

| Country | Children taken to medical facility | Treatments received by children with cough and/or rapid/difficult breathing | | | | | Number of children with cough and/or rapid/difficult breathing |
|---|---|---|---|---|---|---|---|
| | | Anti-biotics | Syrup | Pills | Injection | Other[1] | |
| SUB-SAHARAN AFRICA | | | | | | | |
| Botswana | 82.3 | 1.1 | 26.7 | 3.1 | 1.0 | 2.7 | 868 |
| Burundi | 36.0 | 0.8 | 15.1 | 12.2 | 5.4 | 14.9 | 1366 |
| Ghana | 49.1 | 13.0 | 38.4 | 8.0 | 8.8 | 24.7 | 729 |
| Kenya | 65.2 | 1.2 | 52.4 | 42.4 | 22.1 | 4.6 | 1189 |
| Mali | 5.9 | 2.0 | 7.1 | 21.8 | 8.2 | 36.0 | 189 |
| Togo | 33.2 | 1.7 | 17.5 | 41.1 | 13.4 | 38.7 | 292 |
| Uganda | 53.1 | 23.1 | 27.0 | 17.7 | 24.2 | 26.2 | 971 |
| Zimbabwe | 54.1 | 25.7 | NA | 33.8 | 22.8 | 38.3 | 1479 |
| LATIN AMERICA | | | | | | | |
| Bolivia | 22.4 | NA | 19.1 | 0.7 | 8.5 | 3.1 | 2260 |
| Colombia | 41.2 | 5.2 | 39.6 | 10.8 | 0.7 | 29.4 | 426 |

Note: For type of question see footnotes for Table 5.1
NA = Not applicable (question not asked)
[1] Includes home treatment and treatments received from traditional practioners.

Treatment practices for cough and/or rapid difficult breathing by presence of fever

Table 5.3 Among children 1-59 months with cough and/or rapid/difficult breathing in the 4 weeks preceding the survey, the percentage taken to a medical facility, and the percentage who received oral antibiotics and/or injections (according to the mother) by presence of fever, Demographic and Health Surveys, 1986-1989

| Country | Children with cough and/or rapid/difficult breathing with fever | | | Children with cough and/or rapid/difficult breathing with no fever | | |
|---|---|---|---|---|---|---|
| | Taken to medical facility | Received antibiotics/ injections | Number of children | Taken to medical facility | Received antibiotics/ injections | Number of children |
| SUB-SAHARAN AFRICA | | | | | | |
| Botswana | 92.4 | 0.7 | 87 | 81.2 | 1.8 | 781 |
| Burundi | 45.1 | 17.7 | 156 | 34.8 | 14.4 | 1210 |
| Ghana | 51.5 | 21.9 | 390 | 46.3 | 30.9 | 339 |
| Kenya | 70.7 | 32.6 | 757 | 56.7 | 35.6 | 432 |
| Mali | 7.3 | 23.7 | 128 | 3.0 | 28.3 | 61 |
| Togo | 36.2 | 40.0 | 221 | 23.9 | 32.2 | 71 |
| Uganda | 57.6 | 63.2 | 566 | 46.8 | 58.6 | 405 |
| Zimbabwe | 58.9 | 74.0 | 163 | 53.5 | 59.4 | 1316 |
| LATIN AMERICA | | | | | | |
| Colombia | 44.4 | 10.7 | 217 | 37.9 | 9.5 | 209 |

Table 5.4 presents the demographic and socioeconomic differentials in the utilization of medical services by children under five years of age with cough or breathing difficulties. Mali had too few cases to be included. Children age 6-11 and 12-23 months were taken more frequently to a medical facility than children of other ages in countries in sub-Saharan Africa. In Bolivia and Colombia, children under 6 months of age were taken the most frequently. Children of higher birth orders (6 and over) were taken less frequently in Bolivia, Colombia, Egypt, Kenya, Togo, and Zimbabwe. Other demographic variables show no clear differentials.

There are large urban-rural differences. On average, urban children with respiratory illnesses are 40 percent more likely to be taken to a medical facility than rural children. Bolivia and Togo have the largest differentials by residence. In most countries, particularly in Bolivia, Egypt, Ghana, Togo, and Uganda, the utilization of medical services is lowest for children of mothers without formal education. Children in households with a radio are also more likely to be taken to a medical facility than other children if respiratory problems occur.

## Use of medical facilities for treatment of cough and/or rapid/difficult breathing by demographic and socioeconomic characteristics

Table 5.4 Percentage of children 1-59 months with cough and/or rapid/difficult breathing in the 4 weeks preceding the survey who were taken to a medical facility by demographic and socioeconomic characteristics, Demographic and Health Surveys, 1986-1989

| | Age of child (mo) | | | | Sex | | Birth order | | | | Birth interval (mo) | | | Mother's age (yr) | | | Residence | | Education | | | Radio | | | Number of |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Country | 1-5 | 6-11 | 12-23 | 24-59 | M | F | 1 | 2-3 | 4-5 | 6+ | <24 | 24-47 | 48+ | <20 | 20-34 | 35+ | Urb | Rur | None | Pri | Sec+ | Yes | No | Total | children |
| SUB-SAHARAN AFRICA | | | | | | | | | | | | | | | | | | | | | | | | | |
| Botswana | 76.0 | 82.6 | 85.5 | 82.4 | 82.5 | 82.1 | 82.8 | 82.4 | 82.0 | 81.7 | 84.3 | 83.8 | 78.1 | 77.6 | 82.2 | 85.1 | 90.3 | 79.9 | 78.3 | 82.0 | 89.3 | 82.6 | 81.9 | 82.3 | 868 |
| Burundi | 38.0 | 44.0 | 37.8 | 32.6 | 34.5 | 37.4 | 36.7 | 35.0 | 34.2 | 38.6 | 38.6 | 35.7 | 32.7 | 26.7 | 37.4 | 32.1 | (63.3) | 35.2 | 34.1 | 41.7 | NA | 46.0 | 33.6 | 36.0 | 1366 |
| Ghana | 39.7 | 58.6 | 55.7 | 44.3 | 47.4 | 50.8 | 54.2 | 49.0 | 46.5 | 47.4 | 46.3 | 45.4 | 55.0 | (18.0) | 49.6 | 48.4 | 61.0 | 45.2 | 42.1 | 52.5 | 68.4 | 52.0 | 47.4 | 49.1 | 729 |
| Kenya | 65.1 | 73.2 | 69.6 | 62.1 | 61.8 | 69.3 | 66.8 | 68.5 | 68.5 | 60.9 | 62.4 | 65.2 | 72.0 | 70.8 | 65.4 | 65.0 | 78.7 | 64.0 | 66.1 | 63.6 | 73.5 | 67.3 | 63.4 | 65.6 | 1189 |
| Togo[1] | (34.3) | 30.0 | 43.9 | 29.1 | 32.5 | 34.1 | (41.5) | 34.9 | 37.7 | 25.3 | (27.8) | 29.1 | 44.0 | 45.5 | 35.1 | 26.6 | 49.2 | 29.0 | 26.6 | 41.4 | (65.2) | 43.6 | 26.3 | 33.2 | 292 |
| Uganda | 36.6 | 63.5 | 53.1 | 52.9 | 53.9 | 52.3 | 51.6 | 52.1 | 53.5 | 54.7 | 52.4 | 54.0 | 53.2 | 60.3 | 52.8 | 49.0 | 62.5 | 52.2 | 49.3 | 54.2 | 66.8 | 60.5 | 50.5 | 53.1 | 971 |
| Zimbabwe | 44.4 | 64.6 | 57.1 | 52.2 | 52.2 | 56.2 | 54.5 | 59.8 | 52.8 | 47.8 | 49.0 | 55.2 | 54.7 | 48.0 | 56.4 | 48.3 | 65.4 | 50.4 | 53.6 | 51.0 | 64.9 | 58.1 | 51.5 | 54.1 | 1479 |
| ASIA | | | | | | | | | | | | | | | | | | | | | | | | | |
| Egypt | 47.1 | 51.4 | 46.6 | 43.5 | 46.6 | 44.2 | 49.5 | 48.1 | 44.2 | 37.2 | 39.5 | 44.8 | 50.3 | 36.8 | 46.0 | 44.8 | 53.5 | 37.5 | 37.1 | 47.4 | 58.9 | NA | NA | 45.5 | 3436 |
| LATIN AMERICA | | | | | | | | | | | | | | | | | | | | | | | | | |
| Bolivia | 27.3 | 24.9 | 24.7 | 19.8 | 22.5 | 22.3 | 26.2 | 27.2 | 21.1 | 13.5 | 21.0 | 18.7 | 28.9 | 28.4 | 24.3 | 15.4 | 30.5 | 15.8 | 7.7 | 19.3 | 39.4 | NA | NA | 22.4 | 2260 |
| Colombia | (62.3) | 42.5 | 34.4 | 39.8 | 41.2 | 41.2 | 46.5 | 42.8 | 40.5 | 27.3 | 33.8 | 37.0 | 49.7 | (49.1) | 41.8 | 34.7 | 45.6 | 32.8 | 30.3 | 35.0 | 51.1 | 43.3 | 32.0 | 41.2 | 426 |

Note: Figures in parentheses are based on fewer than 50 cases.
NA = Not applicable (question not asked)
[1] Data are for 2 weeks preceding survey

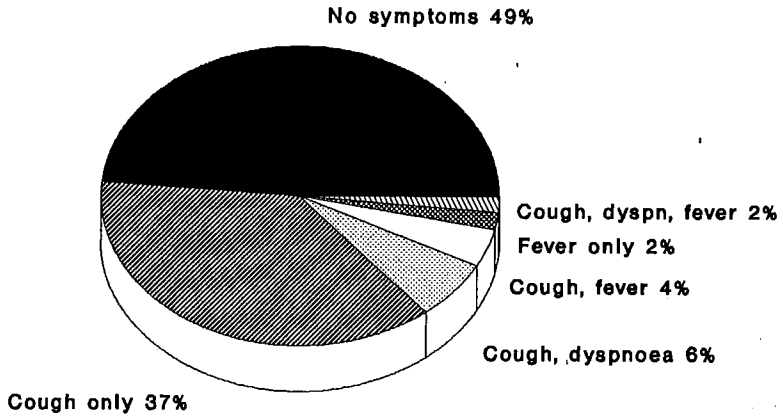
## 5.3 PNEUMONIA: COUGH AND BREATHING DIFFICULTIES

In surveys in Bolivia, Egypt, and Zimbabwe, which were carried out during the last year of Phase I of the DHS program, cough and difficulties with breathing were distinguished from one another in order to gather more accurate information about pneumonia. Rapid and difficult breathing, or dyspnoea, accompanies pneumonia in infants and young children. Thus, the presence of only a cough does not usually imply a lower respiratory tract infection of this type. In Zimbabwe, mothers were asked whether their child had suffered from each of the following symptoms during the preceding four weeks: cough, fast or difficult breathing, noisy breathing, blocked/runny nose, sore throat, earache or discharge, fever, and rash. If any of these symptoms had been or still were present, two questions followed on the utilization of medical services and the type of treatment received. In Egypt, respondents were asked whether children under five years had a cough during the preceding month. If so, they were asked how long it had lasted, whether the child experienced difficult breathing while ill with the cough, and where medical help was sought. In Bolivia, questions similar to those in Egypt were asked, but separate questions were asked on the presence of rapid breathing and difficult breathing.

Data from Zimbabwe allow an assessment of the frequency of cough, difficult breathing, fever, and their combinations. Figure 5.1 shows the distribution of cases. Cough only was the most common event—five times more common than cough with breathing difficulties. Breathing problems without cough were relatively rare. Table 5.5 summarizes the prevalence of cough with and without breathing problems. In Egypt and Bolivia, where questions differed from Zimbabwe, the combination of cough and difficult breathing was almost as common as cough only. In Egypt, 53 percent of the 3,436 children under five years with a cough in the preceding four weeks had no breathing difficulties, while 47 percent had both cough and breathing difficulties. In Bolivia, where cough was reported for 2,260 children, the equivalent figures were 51 and 49 percent. Of the group with both cough and breathing problems, 27 percent had difficult and rapid breathing, 7 percent difficult breathing only, and 15 percent rapid breathing only. Data (not shown) from the three countries suggest that there are no consistent age differentials in the proportion having breathing difficulties.

The proportion of children under five years with breathing difficulties in the preceding four weeks was 22 percent in Bolivia, 20 percent in Egypt, and 8 percent in Zimbabwe. In Mali and Togo (reference period preceding two weeks), only a question on difficult or rapid breathing was posed, but prevalence was

Figure 5.1 Presence of symptoms (cough, dyspnoea, fever) among children 1-59 months in the 4 weeks preceding the survey, Zimbabwe, 1988-1989



Use of medical facilities for treatment of cough (with and without rapid and/or difficult breathing) by symptoms

Table 5.5 Among children 1-59 months with cough (with and without rapid and/or difficult breathing) in the 4 weeks preceding the survey, the percentage who were ill, and the percentage taken to a medical facility by symptoms, DHS surveys in Zimbabwe (1988/89), Egypt (1988/89), and Bolivia (1989)

| | Zimbabwe | | Egypt | | Bolivia | |
|---|---|---|---|---|---|---|
| Symptoms | Children ill | Children taken to medical facility | Children ill | Children taken to medical facility | Children ill | Children taken to medical facility |
| Any cough | 49.5 | 53.9 | 43.7 | 45.0 | 43.9 | 22.4 |
| Cough only | 41.9 | 51.9 | 23.3 | 36.1 | 22.3 | 15.6 |
| Cough with rapid/difficult breathing | 7.6 | 64.9 | 20.4 | 56.2 | 21.5 | 29.5 |
| Cough with rapid and difficult breathing | | | | | 11.8 | 32.4 |
| Cough with rapid breathing only | | | | | 6.5 | 23.6 |
| Cough with difficult breathing only | | | | | 3.2 | 30.9 |

lower: Mali 7 percent and Togo 11 percent (reference periods 4 and 2 weeks, respectively). These prevalence rates for cough and breathing problems are not synonymous with pneumonia prevalence rates. However, they provide an estimate of the proportion of children who need to be assessed by a health worker to determine whether antibiotic treatment for pneumonia is indicated. Early detection and treatment of suspected pneumonia by community-based health workers is advocated by an increasing number of respiratory disease control programs.

Table 5.5 shows the percentage of children with respiratory illness taken to a medical facility according to the severity of illness, as indicated by presence of breathing difficulties. In Zimbabwe the percentage of children taken to a medical facility is substantially higher if breathing difficulties are present in addition to a cough (65 vs. 52 percent). The presence of fever leads to a further small increase in utilization. In Egypt, medical assistance was sought by 56 percent if both cough and breathing difficulties were observed and by 36 percent if there was cough only. Children with any kind of breathing difficulty in addition to cough visited medical facilities in Bolivia twice as often as children with cough only.

## 5.4 CO-EXISTENCE OF SYMPTOMS

Information on the prevalence of all three symptoms—diarrhea (in the two weeks preceding the survey), cough, and fever (in the four weeks preceding the survey)—and on the absence of symptoms, that is, the proportion of children not ill, is presented in Table 5.6. Data on all three symptoms were available for nine countries in sub-Saharan Africa and for Colombia. The latter has a higher proportion of children not sick than all the African countries, with the exception of Botswana. The percentage not ill was remarkably constant in the African countries: in seven of the nine countries, 37-50 percent of the children under five years had no symptoms, and 1-5 percent had all three symptoms. The two exceptions are Botswana, where 61 percent had no symptoms, and Liberia, where 23 percent had no symptoms. Liberia also has a very high proportion of children with all three symptoms. There is a distinct pattern of illness by age of the child. On average, 46 percent of the children in the African countries have no symptoms at age less than six months. This proportion drops sharply to 30 percent at age 6-11 months and then gradually rises to 35 percent at 12-23 months and 53 percent at age 24-59 months.

Presence of symptoms (diarrhea, cough, and fever) as reported by mothers

Table 5.6 Percentage of children 1-59 months with one, two, or three symptoms (diarrhea, cough, fever), and the percentage with no symptoms by age, as reported by mothers, Demographic and Health Surveys, 1986-1989

| Country | Number of symptoms present | | | No symptoms present (age in months) | | | | No symptoms present children 1-59 mo | Number of children |
|---|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | <6 | 6-11 | 12-23 | 24-59 | | |
| SUB-SAHARAN AFRICA | | | | | | | | | |
| Botswana | 30.9 | 6.9 | 0.8 | 55.9 | 43.1 | 53.7 | 70.1 | 61.4 | 2671 |
| Burundi | 37.1 | 11.7 | 1.7 | 45.1 | 33.7 | 40.8 | 56.5 | 49.5 | 3395 |
| Ghana | 34.6 | 17.7 | 4.7 | 59.4 | 28.6 | 29.4 | 48.5 | 43.0 | 3518 |
| Kenya | 36.5 | 14.2 | 3.1 | 39.0 | 30.6 | 36.9 | 53.6 | 46.3 | 6323 |
| Liberia | 30.5 | 29.5 | 17.1 | 33.4 | 15.9 | 13.6 | 26.0 | 22.9 | 3796 |
| Mali | 32.1 | 17.8 | 3.1 | 51.0 | 36.4 | 36.0 | 52.9 | 47.0 | 2714 |
| Togo | 34.2 | 19.7 | 3.9 | 39.8 | 28.4 | 33.1 | 48.6 | 42.1 | 2687 |
| Uganda | 36.1 | 20.9 | 5.6 | 43.7 | 26.7 | 27.7 | 43.1 | 37.4 | 3973 |
| Zimbabwe | 43.3 | 15.4 | 1.3 | 41.5 | 24.5 | 30.2 | 45.8 | 39.9 | 2884 |
| LATIN AMERICA | | | | | | | | | |
| Colombia | 31.0 | 16.0 | 4.4 | 52.2 | 34.1 | 44.2 | 55.0 | 48.6 | 1741 |

Note: Figures exclude "don't know" and "missing" cases.

# 6 Summary and Conclusions

Generally, there are more measurement issues associated with data on morbidity than with other health-related data, such as mortality and anthropometry. There are considerable differences in symptom prevalence between countries and within countries. It is, however, not clear to what extent these differences are due to differential reporting or to genuine disease prevalence differences. In spite of these problems, this report shows that cross-sectional surveys on childhood morbidity and its treatment may provide important data for health planning and evaluation.

Regarding diarrhea, there was considerable variation in the prevalence of diarrhea between the countries: the proportion of children with diarrhea in the two weeks preceding the survey ranged from 6 to 40 percent. There was marked variation by age with peaks at 6-11 and 12-17 months of age. The prevalence of diarrhea declined after the second birthday.

The largest differentials in the prevalence of diarrhea were observed for education, with rates being lowest for children of mothers with secondary or higher education. Urban-rural differences were minor in most countries. Diarrhea was slightly less common if the supply of drinking water was piped (as opposed to unpiped) or if there was a toilet facility (as opposed to no facilities). In most countries, previous measles vaccination was associated with a lower prevalence of diarrhea at age 1-2 years.

Demographic differentials in the prevalence of diarrhea were smaller than differentials by either socioeconomic or hygienic variables. For example, diarrhea prevalence was not associated with the length of the preceding birth interval in most countries.

Full breastfeeding, compared with partial breastfeeding, was associated with lower diarrhea rates particularly at 0-2 months and, to a lesser extent, 3-5 months. Diarrhea was less prevalent among children that were not breastfed at all at age 6-11 months than among children who were partially breastfed. The use of a bottle in the preceding 24 hours did not appear to be associated with higher diarrhea rates.

The mothers of two-thirds of the 46,000 children in the surveys had heard of the ORS packets used in oral rehydration therapy (ORT). Knowledge was higher in urban than rural areas and higher for women with secondary education than for women with no formal education. Usage of ORS was considerably lower than knowledge, however: ORS packets were used to treat only 20 to 25 percent of children who had diarrhea in the two weeks preceding the survey. Urban and more educated women were found to use the packets most frequently; children under 6 months of age were the least likely to receive treatment with ORS packets. Homemade solutions played an important role in only a few countries. More than half of the women responded that they did not increase the amount of fluids (whether ORS solution or other fluids) during diarrhea. Drugs were the most common therapy for diarrhea in 12 of the 23 countries.

One-third of the children with diarrhea were taken to a medical facility. Lower utilization of medical services was found for children age 0-5 months, children of higher birth orders, rural children, children of illiterate mothers, and children from households without a radio. Drugs were still commonly prescribed by the medical staff to treat the diarrhea.

Questions on fever were posed in 10 countries in sub-Saharan Africa and in Colombia. Almost 1 in 3 children had had fever in the four weeks preceding the survey, although there were large variations between countries. The prevalence of fever peaked at 6-11 months of age. There were no major socioeconomic or demographic differentials. Some 40 to 50 percent of the children with fever were taken to a medical facility, which is a greater proportion than for diarrhea. Differentials between rural and urban areas and by socioeconomic status were large. For example, an urban child was 80 percent more likely to visit a medical facility than a rural child.

Questions on respiratory symptoms—cough and/or difficult breathing—were asked in 10 countries in sub-Saharan Africa and in Bolivia, Colombia, and Egypt. About 1 in 3 children had respiratory symptoms (cough). Again, prevalence was highest at 6-11 months, followed by 12-23 months of age. Differentials in prevalence according to socioeconomic and demographic characteristics were generally small.

Half of the children with respiratory symptoms were taken for a medical visit, and if there was fever as well, this proportion was higher. Children age 6-23 months were taken more often than were other children. The mother's recall of what drugs or other treatments were given at the medical visit has only limited usefulness. Mothers primarily remember the form in which the treatment was given, so ORS packets are easily remembered, and questions on the treatment of diarrhea appear to be useful. ORS usage can be compared with drug use in general for the treatment of diarrhea. It is more difficult, however, to find out what was given for the treatment of fevers or pneumonia. Mothers can reliably recall whether it was an injection, tablet, or syrup, but may not know the type of drug given.

Children age 6-11 months and, to a lesser extent, children age 12-23 months carry the heaviest burden of morbidity. The combination of (1) increased environmental exposure to infections as children switch to solid foods and begin moving around, and (2) the immaturity of the immune system during this age period may be responsible for the high infectious disease load. These children should be targeted in child health programs.

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# Appendix

## Summary of DHS Surveys, 1985-1990

| Region and Country | Date of Fieldwork | Implementing Organization | Respondents | Sample Size | Supplemental Studies, Modules, and Additional Questions |
|---|---|---|---|---|---|
| **SUB-SAHARAN AFRICA** | | | | | |
| Botswana | Aug-Dec 1988 | Central Statistics Office | All women 15-49 | 4,368 | AIDS, PC, adolescent fertility |
| Burundi | Apr-Jul 1987 | Département de la Population Ministère de l'Intérieur | All women 15-49 | 3,970 | AM, SAI, adult mortality |
| Burundi | Apr-Jul 1987 | Département de la Population Ministère de l'Intérieur | Husbands | ,542 | KAP study |
| Ghana[1] | Feb-May 1988 | Ghana Statistical Service | All women 15-49 | 4,488 | AM, SM, WE |
| Kenya[2] | Dec-May 1988/89 | National Council for Population and Development | All women 15-49 | 7,150 | H |
| Liberia | Feb-Jul 1986 | Bureau of Statistics Ministry of Planning and Economic Affairs | All women 15-49 | 5,239 | H, TBH, employment status |
| Mali | Mar-Aug 1987 | Institut du Sahel USED/CERPOD | All women 15-49 | 3,200 | AM, VC, childhood physical handicaps |
| Mali (Male Survey) | Mar-Aug 1987 | Institut du Sahel USED/CERPOD | Men 20-55 | ,970 | KAP study |
| Ondo State, Nigeria | Sep-Jan 1986/87 | Ministry of Health, Ondo State | All women 15-49 | 4,213 | AM, H, TBH |
| Senegal | Apr-Jul 1986 | Direction de la Statistique Ministère de l'Economie et des Finances | All women 15-49 | 4,415 | AM, CD |
| Sudan | Nov-May 1989/90 | Department of Statistics Ministry of Economic and National Planning | Ever-married women 15-49 | 5,860 | H, M, MM, female circumcision, family planning services |
| Togo | Jun-Nov 1988 | Unité de Recherche Démographique Université du Benin | All women 15-49 | 3,360 | AM, H, SAI, marriage history |
| Uganda | Sep-Feb 1988/89 | Ministry of Health | All women 15-49 | 4,730 | AM, H, SAI |
| Zimbabwe | Sep-Jan 1988/89 | Central Statistical Office | All women 15-49 | 4,201 | AIDS, AM, H, PC, SAI, WE |
| **NORTH AFRICA** | | | | | |
| Egypt | Oct-Jan 1988/9 | National Population Council | Ever-married women 15-49 | 8,911 | AM, CD, H, MM, PC, SAI, WE, women's status |
| Morocco | May-Jul 1987 | Ministère de la Santé Publique | Ever-married women 15-49 | 5,982 | AM, CD, H, S |
| Tunisia | Jun-Oct 1988 | Office National de la Famille et de la Population | Ever-married women 15-49 | 4,184 | AM, CD, H, S, SAI |

[1]Data available for 943 husbands interviewed with a husband's questionnaire
[2]Data available for 1,133 husbands interviewed with a husband's questionnaire

| Region and Country | Date of Fieldwork | Implementing Organization | Respondents | Sample Size | Supplemental Studies, Modules, and Additional Questions |
|---|---|---|---|---|---|
| **ASIA** | | | | | |
| Indonesia | Sep-Dec 1987 | Central Bureau of Statistics<br>National Family Planning Coordinating Board | Ever married 15-49 | 11,844 | PC, SM |
| Nepal (In-depth) | Feb-Apr 1987 | New Era | Currently married women 15-49 | 1,623 | KAP-gap survey |
| Sri Lanka | Jan-Mar 1987 | Deparment of Census and Statistics<br>Ministry of Plan Implementation | Ever married 15-49 | 5,865 | AM, H, NFP |
| Thailand | Mar-Jun 1987 | Institute of Population Studies<br>Chulalongkorn University | Ever married 15-49 | 6,775 | AM, S, SAI |
| **LATIN AMERICA & CARIBBEAN** | | | | | |
| Bolivia | Mar-Jun 1989 | Instituto Nacional de Estadística | All women 15-49 | 7,923 | AM, CD, H, MM, PC, S, WE |
| Bolivia (In-depth) | Mar-Jun 1989 | Instituto Nacional de Estadística | All women 15-49 | 7,923 | Health |
| Brazil | May-Aug 1986 | Sociedade Civil Bem-Estar Familiar no Brasil | All women 15-44 | 5,892 | AM, H, PC, SM, abortion, young adult use of contraception |
| Colombia | Oct-Dec 1986 | Centro Regional de Población, CCRP<br>Ministerio de Salud | All women 15-49 | 5,329 | AM, PC, SAI, SM |
| Dominican Republic | Sep-Dec 1986 | Consejo Nacional de Población y Familia | All women 15-49 | 7,649 | NFP, S, SAI, SM, family planning communication |
| Dominican Republic (Experimental) | Sep-Dec 1986 | Consejo Nacional de Población y Familia | All women 15-49 | 3,885 | |
| Ecuador | Jan-Mar 1987 | Centro de Estudios de Población y Paternidad Responsable | All women 15-49 | 4,713 | SAI, CD, H, employment |
| El Salvador | May-Jun 1985 | Asociación Demográfica Salvadoreña | All women 15-49 | 5,207 | S, TBH |
| Guatemala | Oct-Dec 1987 | Instituto de Nutrición de Centro América y Panamá | All women 15-44 | 5,160 | H, S, SAI |
| Mexico | Feb-May 1987 | Dirección General de Planificación Familiar<br>Secretaría de Salud | All women 15-49 | 9,310 | H, NFP, S, employment |
| Peru | Sep-Dec 1986 | Instituto Nacional de Estadística | All women 15-49 | 4,999 | H, NFP, employment, cost of family planning |
| Peru (Experimental) | Sep-Dec 1986 | Instituto Nacional de Estadística | All women 15-49 | 2,534 | |
| Trinidad and Tobago | May-Aug 1987 | Family Planning Association Trinidad and Tobago | All women 15-49 | 3,806 | AM, NFP, breastfeeding |

| | | | | | |
|---|---|---|---|---|---|
| AIDS | acquired immnune deficiency syndrome | MM | maternal mortality | SM | social marketing |
| AM | anthropometric measurements | NFP | natural family planning | TBH | truncated birth history |
| CD | causes of death (verbal report of symptoms) | PC | pill compliance | VC | value of children |
| H | additional health questions | S | sterilization | WE | women's employment |
| M | migration | SAI | service availability information | | |