A Description of Child Illness and Treatment Behavior in Guatemala

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ABSTRACT

This paper uses a new calendar design implemented in the Guatemalan Survey of Family Health to analyze diarrheal and respiratory illness among children. The calendar provides a much richer description of child illness and treatment behavior than do conventional data typically collected in health interview surveys. The resulting estimates reveal that Guatemalan children experience high rates of diarrheal and respiratory illness and that these illnesses often involve multiple symptoms that only partially overlap one another. In addition, estimates from the calendar demonstrate that the measurement of illness frequency is fairly complex and that classification of illness into distinct categories may not always be feasible or meaningful. Results regarding treatment behavior indicate that the vast majority of illnesses are treated and that mothers almost always receive advice regarding their children's illnesses from relatives. On the other hand, health providers are sought for advice and treatment in only about one-third of illnesses. When families do seek providers, they are more likely to rely on biomedical ones – especially pharmacists, doctors and personnel at health posts and centers – than traditional practitioners. By far, the most common form of treatment – recommended by both relatives and providers – consists of readily available Western medicines. In contrast, the use of traditional remedies appears to be relatively low.

Keywords: diarrhea, ARI, health interview survey, child illness, treatment, Guatemala, calendar

INTRODUCTION

In recent years, epidemiologists and demographers have devoted increasing attention to studying the epidemiology and treatment behavior of two of the leading causes of childhood mortality, diarrheal illnesses and acute respiratory infections (Boerma and Van Ginneken, 1992). Among childhood deaths in developing countries in 1993, about 27 percent have resulted from acute respiratory infections (ARI), making ARI the largest single cause of childhood mortality, and another 23 percent from diarrhea (UNICEF, 1995). In addition, these illnesses are associated with high rates of morbidity and poor nutritional status. In the Global Burden of Disease Study – a major project designed to provide standardized assessments of health problems across a large number of countries– lower respiratory infections and diarrheal diseases were found to be the two leading causes of disease burden in the world (Murray and Lopez, 1996). Since many of the children (and adults) who experience these illnesses in developing countries do not receive formal treatment, and hence medical records are not available for a population-based sample, researchers have relied heavily on health interview surveys to provide information about morbidity and treatment patterns.

Health interview surveys in developing countries typically involve a single cross-sectional interview in which respondents are asked to report about the illnesses that they have experienced and the health services or treatment that they have used within a specified period prior to interview. In surveys of child illness, mothers are typically proxy respondents for their children. Although health interview surveys have several advantages over clinical and longitudinal studies – most notably, their low cost and ease of obtaining a representative sample of a large population – they are more likely to produce inaccurate reports of illness and treatment behavior. In view of these limitations, there have been several attempts in recent years to improve and standardize the design of health interview surveys. In particular, many researchers now rely on a two-week recall period

for questions related to morbidity – a period which appears to offer the best balance between recall error and maintaining a feasible sample size – and greater reliance on a list of tracer conditions and symptoms to identify particular illnesses (Ross and Vaughan, 1986; Kalter et al., 1991; Boerma and Van Ginneken, 1992).

These enhancements have undoubtedly improved the estimates resulting from health interview surveys. Specifically, reliance on well-established tracer symptoms permits investigators to define child illnesses such as diarrhea and ARI in terms of symptoms shown to have the highest sensitivity and specificity (based on studies which validated symptom reports with physicians' records; e.g., Kalter et al., 1991). Reliance on the two-week recall period appears to increase the reliability of estimates of incidence and prevalence and permits comparability of estimates across surveys occurring in different countries or at different times. Nevertheless, the types of standardized questions that are typically incorporated into these surveys do not allow for an adequate representation of (1) the complexity of child illness, in terms of the timing and nature of symptoms and perceptions about the causes and seriousness of the illness; or (2) the complexity of treatment behavior, in which families typically seek advice or treatment from multiple sources.

In their efforts to learn more about child illness and health-seeking behavior, medical anthropologists have taken a very different approach to data collection, usually relying on informal or semi-structured interviews and/or focus groups of mothers and practitioners. These interviews or focus groups typically collect considerable information on the symptoms and perceived causes of illness as well as on use of non-biomedical treatments and informal providers, such as home remedies, pharmacists and traditional practitioners (e.g., Delgado et al., 1994; Gorter et al., 1995; Iyun and Tomson, 1996). However, from the perspective of epidemiologists, the resulting estimates are generally of limited utility because of non-random selection of respondents, limited geographic area of the sample, small sample sizes, and lack of standardization in the wording of questions.

In this paper, we rely on a new survey design for the collection of information about child illness and treatment behavior that incorporates the strengths of both the medical anthropologists' and the epidemiologists' approaches. The most important modification to the typical health interview survey is the incorporation of a calendar of morbidity and treatment behavior for the two-week period prior to interview (Goldman et al., 1998). While a calendar approach has been shown to have several advantages over more conventional designs in other contexts (such as for the collection of contraceptive histories; see, for example, Goldman et al., 1989), it has rarely been used in health interview surveys. In an effort to learn more about child and maternal illness and treatment behavior, the calendar approach was recently implemented in a large-scale sample survey, the Guatemalan Survey of Family Health, fielded in 60 rural communities of Guatemala in 1995.

This analysis focuses on using the calendar information to describe the nature of diarrheal and respiratory illness among children and associated treatment behavior in rural Guatemala. The objective is to provide not only conventional measures, such as the incidence and prevalence of these illnesses, but also to examine patterns of illness and treatment behavior that take into account the detailed information reported by the mother. We pay particular attention to the role of different family members in providing support or advice during the child's illness, to the types of treatment recommended by relatives and providers, and to the relative importance of biomedical and non-biomedical forms of treatment. Although there have been numerous ethnographic studies related to childhood illness and treatment behavior in Guatemala (e.g., Logan, 1973; Cosminsky and Scrimshaw, 1980; Hurtado and Esquivel, 1986; Tedlock, 1987; Burleigh et al., 1990; Weller et al., 1991), few quantitative assessments of the major childhood illnesses have been carried out on population-based samples. A related objective of the present analysis is to explore some of the difficulties associated with the measurement of child illness and treatment behavior.

In the first section of the paper, we describe the Guatemalan Survey of Family Health, with a focus on the calendar information related to child illness, and assess the quality of reports of illness. Subsequently, we examine characteristics of illness, in terms of both individual symptoms and patterns of symptoms, and explore the criteria that mothers use to assess the severity of illness. In the next section, we describe health-seeking behavior for diarrheal and respiratory illnesses, in terms of persons giving advice, practitioners consulted, and treatments administered to the child. In the final section, we discuss the implications of the findings, especially the prominence of biomedical treatment, and the advantages of the calendar approach for the study of child illness.

BACKGROUND

Guatemala is the largest country in Central America with a population of approximately 10.5 million in 1995 (CELADE, 1997). Although only 108,889 square kilometers in size (INE, 1988), many rural areas remain relatively isolated from urban Guatemalan life, which is centered primarily in the capital, Guatemala City. Guatemala remains a highly stratified society with high income inequality and the vast majority of the population living below the poverty line (Steele, 1994). A small elite controls much of the land and economy, and retains political power. A majority of the rural population does not have adequate access to such public services as water, sanitation, and electricity (Steele, 1994).

The population is divided into two ethnic groups of roughly equal size: the indigenous population, who are descendants of Mayas and other pre-conquest groups, and *ladinos*, who, regardless of ethnic origin or phenotype, speak Spanish, wear European clothes, and view themselves as part of the mainstream Guatemalan culture. Ethnicity is closely tied to social class: the indigenous population is, with few exceptions, poor, while ladinos are members of all social classes.

As elsewhere in Latin America, mortality rates among children have fallen since the 1950s, although they remain among the highest in the region. For example, the probability of dying before age five declined from 150 deaths per 1000 in 1972-76 to 68 per 1000 in 1990-95 (MSPAS, INCAP and DHS, 1989; INE et al., 1996). Throughout this period, rates in rural areas have exceeded those in urban areas, reaching levels of 74 and 55 per 1000 respectively for the period 1990-95 (INE et al., 1996). Similar differentials characterize infant mortality (the probability of dying before age one). The most recent estimates indicate a national level of about 50 per 1000 for the early 1990s, with rates in rural and urban areas equal to 56 per 1000 and 41 per 1000 respectively (World Bank, 1995; INE et al., 1996). Although accurate estimates of child morbidity are not available, the prevalence of stunting (low height-for-age) among Guatemalan children – a widely used indicator of malnutrition and chronic illness – is greater than in any other Latin American country and is one of the highest values in the world (de Onis et al., 1993).

DATA

The Guatemalan Survey of Family Health

The data for this analysis come from the Guatemalan Survey of Family Health (known in Spanish as the Encuesta Guatemalteca de Salud Familiar or the EGSF), conducted by Princeton University, RAND, and the Instituto de Nutrición de Centro América y Panamá in 1995. The survey was designed to examine the ways in which rural Guatemalan families cope with childhood illness and pregnancy and the role of ethnicity, poverty, social support and health beliefs in this process.

The EGSF is based on a sample of households in rural communities (i.e., communities with between 200 and 10,000 inhabitants) within four departments of Guatemala (Chimaltenango, Totonicapán, Suchitepéquez and Jalapa). The four departments were selected on the basis of social, economic, and environmental diversity, and ethnic composition: one primarily ladino

(Jalapa), two predominantly indigenous (Chimaltenango and Totonicapán) and one of mixed ladino/indigenous population (Suchitepequez). The two indigenous languages spoken in three of these departments, K'iche and Kakchiqel, are two of the largest indigenous language groups in Guatemala.

A total of 60 communities were included in the survey, 15 randomly selected (with probability proportional to size) from each of the four designated departments. Within each of these communities, approximately 100 households were randomly selected and an adult member of the household provided basic information on all household residents. The resulting household roster was used to identify all female residents ages 18 to 35, who were eligible to receive the detailed individual interview. In total, household interviews were conducted in 4,792 households and individual interviews were administered to 2,872 women ages 18 to 35; the response rate for the individual interviews was 89 percent. In addition, interviews with key community informants and health providers were carried out in each of the sampled communities. The fieldwork took place during the period from May through October 1995.

The EGSF questionnaires were derived from instruments used in previous demographic and health surveys, from earlier health-related research in Guatemala and from a qualitative survey conducted as part of the EGSF project one year prior to the fieldwork for the larger survey. The questionnaires were extensively field tested and were translated and backtranslated in Spanish and two indigenous languages. The individual questionnaire administered to women ages 18-35, which forms the basis of the analysis presented in this paper, contains information on the background of the respondent and other household members, a complete birth history, a calendar of problems and treatment behavior during the respondent's recent pregnancies, a calendar of problems and treatment behavior for recent illnesses among young children, considerable information on the respondent's social support network and health beliefs, and detailed data on the economic situation of the household.

The analysis presented below is derived largely from the section of the questionnaire devoted to children's illnesses, in which mothers were asked questions related to diarrheal and respiratory illness for a maximum of two children born since 1990 (the youngest and the penultimate child). This section of the questionnaire begins with a two-week calendar, shown in the Appendix. Based on the calendar, mothers were asked whether each of eight specific symptoms related to acute respiratory infection or diarrhea occurred during the preceding two weeks; the eight symptoms are constant cough; boiling of the chest; panting, wheezing, or difficulty breathing; high fever; weakness, apathy, or lethargy; diarrhea more than three times a day; blood in stools; and vomiting.[1] Many of these symptoms (e.g., the use of three or more stools in the definition of diarrhea) have been shown in other studies to have high sensitivity and specificity (Kroeger, 1983; Baqui et al., 1991; Kalter et al., 1991; Boerma and Van Ginneken, 1992). The symptoms were adapted to the rural Guatemalan setting on the basis of medical anthropological research and our own pilot study. For example, "boiling of the chest" (*hervor de pecho*) and panting/wheezing/difficulty breathing (*cecido/pito/fatiga*) were found to be associated with cough, bronchitis, and broncopneumonia in a field study in Ciudad Vieja in Guatemala (INCAP, 1994).

If a child experienced any of the eight specified symptoms during the preceding two weeks, mothers were asked the remaining questions contained in the calendar. They were first asked when the symptom began and on which days during the past two weeks the symptom was present. They were also asked about any other symptoms experienced during this time (non-solicited symptoms); a maximum of one non-solicited symptom per day was recorded. Subsequently, mothers were asked whether the symptoms were perceived as serious,[2] whether the mother asked others (relatives, neighbors or friends) for advice or visited providers regarding their child's illness, and

[1] The Spanish terms for these eight symptoms are: tos necia, hervor de pecho, cecido/pito/fatiga; calentura; debilidad/cansancio/desgano; asientos (más de tres veces al día); sangre en el popó; arrojadera, vómitos. Boiling of the chest (hervor de pecho) refers to the noise made by the congestion (INCAP, 1994).
[2] In the Spanish questionnaire, mothers were asked "Usted creyó que (LOS SINOTMAS) eran graves?"

whether any treatment was administered by the mothers themselves or by anyone else. Information regarding the presence of symptoms, severity, advice and treatment were recorded in the appropriate days of the calendar, indexed from 14 (14 days or two weeks before interview) to zero (the day of interview; see the Appendix). Additional information including the nature of the advice and treatment as well as the cost and perceived effectiveness was subsequently obtained (in tabular format) about each of the persons, providers and treatments recorded in the calendar.

Data quality

Validation of maternal reports of childrens' illnesses is generally problematic, particularly with regard to diarrheal illnesses, because of the difficulty of obtaining an accurate assessment to serve as a standard (Stanton et al., 1987; Goldman et al., 1998). Although validation of estimates of illness from the EGSF is not possible, there are two ways in which the quality of these estimates can be assessed: (1) comparisons with other surveys; and (2) internal consistency checks.

Estimates of prevalence for the most recent two-week period derived from the EGSF can be compared with corresponding values obtained from the 1995 Demographic and Health Survey (ENSMI) in Guatemala (INE et al., 1996). Since the ENSMI was nationally representative and the EGSF is based on a sample of rural areas in four departments, comparisons from the ENSMI were restricted to rural areas of the same four departments. The comparisons are complicated by the use of different terms to describe illness in the two surveys: e.g., constant cough (*tos necia*) in the EGSF vs cough or cold, with short and rapid breathing (*tos o resfriado, con respiraciónes cortas y rápidas*) in the ENSMI. Nevertheless, the estimates in Table 1 indicate that the two sets of estimates are very similar, with the exception of a higher prevalence of diarrhea with blood in the ENSMI. (The agreement in the case of the respiratory symptoms is quite surprising since these two sets of symptoms are clinically distinct.) Additional estimates for diarrhea derived from the EGSF (e.g., average duration of episodes and age patterns) are consistent with values obtained from surveys in other developing countries (Goldman et al., 1998).

An important advantage of the calendar approach for the collection of information on symptoms of illness is that it permits the analyst to carry out not only checks of external consistency – as in the comparisons described above – but also checks of internal consistency. The latter checks reveal that, not surprisingly, data in the EGSF suffer from recall error, a problem that has characterized virtually every health interview study. Many previous studies have revealed that underreporting of illness is more likely to occur as the length of time between the occurrence of the illness and the interview increases, particularly for nonsalient illnesses or illnesses of short durations. Results from the EGSF confirm this finding, even though the survey followed the recommended protocol of a two-week reference period. For example, results presented in Peterson et al. (1997) and in Table 2 reveal that estimates of prevalence for the penultimate week are lower than those for the most recent week prior to interview, suggesting that the former are underestimated (Peterson et al., 1997). In addition, there is some evidence of underreporting of illness for the next-to-youngest as compared with the youngest child, in the presence of controls for age, birth order and other relevant variables (Peterson et al., 1997). In summary, the evaluation of data quality suggests that while the estimates of illness from the EGSF are plausible and consistent with other available information, estimates of prevalence for the most recent two-week period are likely to be biased downwards.

A DESCRIPTION OF CHILD ILLNESS

Frequency and duration of symptoms

In Table 2, we present estimates of prevalence, incidence and duration for each of the eight solicited symptoms and for additional (non-solicited) symptoms reported by the mother. Three estimates of prevalence are presented: a two-week period estimate (the presence of the symptom on any day in the 14 days prior to interview); a two-week average point estimate (the average daily prevalence during the two-week period); and a one-week average point estimate (the average daily

prevalence during the most recent week prior to interview). All estimates exclude the day of interview since it reflects a partial day of exposure. Incidence is calculated as the probability that a child with no symptoms at the start of the two-week period experiences the symptom prior to interview (Kleinbaum et al., 1982).[3] Thus, incidence measures the frequency of new manifestations of a symptom whereas prevalence measures the frequency of all manifestations, new and continuing. The final column of the table presents the median duration of each symptom, with duration defined as the number of consecutive days that a symptom is reported. These median values exclude left-censored illnesses (i.e., illnesses that began prior to the calendar period and were present on the first day of this period). They are derived from life table calculations that take duration of illness into account and thereby adjust for right censoring – that is, illnesses that are ongoing on the day prior to interview are included in the calculation up to their current duration (see Chiang, 1984).[4]

The prevalence estimates in the second and third columns highlight the reporting problem noted above: the average daily prevalence is about 15 percent higher for the most recent one-week period than for the entire two-weeks; the discrepancy is apparent for all symptoms regardless of the severity or frequency. The estimates also reveal that the frequency of diarrhea or ARI-related symptoms is high in the rural Guatemalan population. During the most recent two-week period, nearly half (45.3 percent) of children age five and under experienced at least one of the eight solicited symptoms, and on any given day, almost one-quarter (22.8 percent) had at least one of the symptoms. The most frequently experienced symptoms were high fever, diarrhea and constant cough. The estimates indicate substantial variability in the length of different symptoms, ranging

[3] The estimates of incidence refer to a 13-day rather than 14-day period since they are based on children with no symptoms on day 14 and day 0 is excluded from the analysis.

[4] Children who had gaps of one day or more without the symptom between successive periods with the symptom contributed more than one "episode" to the calculation of the median duration. However, these gaps were relatively uncommon: the proportion of children for whom mothers reported a recurrence of a

from about two days for vomiting, blood in the stools and high fever to 11 days for constant cough. On average, respiratory symptoms (constant cough, boiling of the chest, and panting) lasted considerably longer than gastrointestinal ones (diarrhea, vomiting, blood in stools).

Patterns of illness

As noted earlier, the recommended practice among epidemiologists is to ask respondents questions about specific symptoms in an effort to estimate the frequency of illness from health interview surveys. This strategy is especially critical in the study of child illness, since such terms as "diarrhea," "cold," and "flu" are used frequently but imprecisely in general populations and ARI is not an expression in popular usage. Although the EGSF followed this recommended strategy and adapted symptom terminology to local usage, the results presented below indicate that measures of the frequency of illness do not follow unequivocally from detailed data on symptoms.

One problem concerns the choice of algorithm (e.g., set of symptoms) used to identify the illness. Reasonable estimates of the prevalence of diarrheal illness can be obtained relatively straightforwardly based on the EGSF reports of the presence of a single symptom (more than three occurrences of *asientos* per day; Goldman et al., 1998). Estimates of the prevalence of ARI, or classification of ARI into upper and lower respiratory infections, are much more difficult to obtain and depend heavily on the algorithm used, a finding noted previously by Kalter et al. (1991). For example, based on the single symptom of constant cough, the prevalence of ARI during the past two weeks is 19.8 percent (as shown in Table 2). This estimate is almost certainly too high, since it is likely to include relatively mild colds. If fever is added to the algorithm for ARI (as is commonly done in epidemiological studies of bronchitis and pneumonia), the prevalence (not shown) is almost halved to a value of 10.8 percent. The further addition of

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symptom after a gap of one or more days was below 1 percent for all symptoms except panting (1.1%), high fever (3.5%), diarrhea (2.6%), and vomiting (1.3%).

panting/wheezing/difficulty breathing (symptoms frequently used to identify pneumonia) reduces the prevalence to a mere 2.5 percent. Similar problems arise in attempts to identify specific respiratory diseases such as pneumonia from the types of recognizable symptoms incorporated into the EGSF and other health interview surveys (Lanata et al., 1984).

Estimation of the incidence or duration of a particular illness – whether it be diarrhea or ARI – is even more problematic since it requires the identification of the beginning and ending of the illness. Such identification is complicated by the resumption of symptoms after short or moderate gaps. Although these gaps are relatively uncommon for individual symptoms (see note 4), a more frequent occurrence in the EGSF is the appearance of a new symptom two or more days after the termination of all previous symptoms. Calculations (not shown here) indicate that about eight percent of children with at least one symptom reported in the calendar have some gap (i.e., the presence of one or more days without any symptoms between days with potentially different symptoms) within their two-week illness history. In these circumstances, the analyst is required to decide whether to consider the illness history as a single illness or multiple episodes of potentially distinct illnesses.

A related issue, that affects estimates of illness frequency as well as the classification of the illness, is the finding that mothers often report the occurrence of more than one symptom. Table 3 presents the percent distribution of the number of accompanying (i.e., additional) symptoms experienced during the two weeks, for each specific symptom reported during this time period. As shown in the last row of the table, only about one-third (35.1 percent) of children with symptoms reported for the calendar period experienced only one symptom; on average, they experienced 2.4 symptoms. Some symptoms are particularly unlikely to occur alone; for example, the majority of children experiencing boiling of the chest, panting, weakness, blood in the stools or vomiting experienced three or more accompanying symptoms during the two-week period. One consequence of these complex patterns of symptoms is the difficulty noted above of developing an

accurate algorithm for the identification of illness (e.g., ARI) on the basis of health interview surveys. Another problem concerns the categorization of illness. For example, although the literature treats diarrheal illness as distinct from respiratory illness and analysts typically provide separate estimates for each, results from the EGSF indicate that this categorization is far from straightforward. For example, tabulations (not shown) reveal that among children experiencing at least one respiratory symptom, 42 percent also experienced at least one gastrointestinal symptom during the calendar period.

A description of illness is complicated further by the changing character of the illness throughout its duration. Table 4 presents the distribution of the number of symptoms per day, for children experiencing a given total number of symptoms in the calendar; the distributions are based on all days between (and including) the first and last occurrence of any symptom. As revealed by the estimates on the diagonal of this matrix, a relatively small proportion of children experienced all of their symptoms simultaneously. Estimates in the last several columns of the table indicate that days with only one or two symptoms were commonly reported even for children experiencing at least five symptoms during the two-week period. Thus, the data suggest that individual symptoms typically begin and end on different days from one another, possibly changing the nature of the illness over even a relatively short duration.

These findings indicate that conventional epidemiological measures may lead to an oversimplified portrayal of the nature of diarrheal and respiratory illnesses. The calendar data, which yield a much richer description of child illnesses, highlight the need for additional measures that capture the true complexity of symptom patterns.

Perception of the severity of illness

Since previous research has suggested that perceptions of illness severity are an important determinant of treatment behavior (e.g., Rosenstock and Becker, 1988; Yoder and Hornik, 1996),

respondents in the EGSF were asked to identify the days on which they perceived their child's illness to be serious. Overall, 23 percent of days with at least one reported symptom were considered to be serious. By comparing these reports with characteristics of the illness, we can infer the basis on which mothers assessed severity. The data in Table 5 suggest that the likelihood that a day of illness was assessed as serious varies both by the type of symptom experienced and by the number of symptoms. For example, more than 40 percent of days with vomiting (whether or not the vomiting was accompanied by additional symptoms) were assessed as serious in contrast to less than one-quarter of days with constant cough. In addition, the percent of illness days considered as serious generally increases monotonically with the number of symptoms experienced on that day, ranging from only 15 percent for days with a single symptom to 46 percent for days with six or more symptoms.

TREATMENT BEHAVIOR

A large social science literature on medical choice (e.g., Young, 1981; Mullen et al., 1987; Pescosolido, 1992) as well as previous research by anthropologists in Guatemala (Hurtado and Esquivel, 1986; Cosminsky, 1987; Rosenthal, 1987; Delgado et al., 1994), demonstrates that treatment behavior is more aptly characterized as a multi-stage process involving many participants than as a single decision made by an individual or a parent. Specifically, families' treatment of sick children often consists of home remedies and changes in diet, behavior and activities as well as other typically more expensive forms of advice and treatment. Advice and treatment are sought from a wide range of practitioners and from family members and friends. Treatment is available from (1) biomedical providers (both through the publicly-financed health care system, consisting largely of health posts and centers, and through private doctors); (2) popular practitioners who often dispense modern drugs and give injections without biomedical training; and (3) traditional practitioners (Cosminsky and Scrimshaw, 1980; Pebley, Goldman and

Rodríguez, 1996). The last group consists of midwives (*comadronas*), lay curers (*curanderos*), massage-specialists (*sobadores*), herbalists (*hierberos, naturistas*), spiritual healers (*espiritistas*, *brujos*) and others. In addition, relatives and friends often play an important role in helping parents cope with child illness by providing access to information, means of transport to health facilities, material support, advice about self-administered treatments, and comfort and assistance. Previous research suggests that treatment behavior is an on-going process in which families continue to consider alternative forms of advice and treatment until the child illness is no longer perceived as problematic, or all feasible options have been exhausted, or the child dies.

As noted earlier, the EGSF collected extensive information about the nature and timing of various forms of advice and treatment received during the two-week calendar period. However, information about treatment prior to the two-week period, for illnesses that were in progress 14 days before interview, is less detailed. As a result, the estimates of treatment presented in this analysis (Tables 6 through 9) are based only on children whose first symptom in the calendar period occurred subsequent to day 14 (i.e., illnesses beginning in the calendar period).

Summary measures of treatment are presented in Table 6. These estimates reveal that for almost three-quarters of illnesses, mothers received advice regarding their child's illness from a relative, friend or neighbor and almost 90 percent of ill children had some form of treatment administered. By contrast, only about one-third of sick children saw a health provider during the two-week period. Among children whose mothers received advice, advice was given an average of 1.3 times during the calendar period (almost entirely from relatives). Among children who saw a provider during this time, an average of 1.1 visits occurred; that is, few children made more than a single visit or saw more than one provider during the calendar period. Finally, among children who were given treatment, they received an average of 1.8 treatments. The corresponding maximum values for advice, provider visits and treatment are 5, 2 and 9 respectively.

The estimates in the final two columns are derived from life table calculations in which exposure begins on the day of the first symptom. The estimated one-week probabilities are very similar to the observed proportions: about one-third of children saw a provider within seven days of the onset of symptoms, a level about half that for seeking advice or receiving treatment.[5] The median values indicate that advice and treatment are typically sought close to the start of an illness. For at least half of the children, the first advice is given to mothers and the first treatment is administered to the child on the same day that the symptoms began. The median timing of the first visit to a provider occurs slightly later, on the second day of illness; these estimates are very low in part because they include many illnesses of short duration.

Persons Offering Advice

Table 7 identifies the persons providing advice to the mother of the sick child along with the type of recommendation given or action taken by each type of person. The first column indicates that among children for whom advice was sought (73 percent of children according to Table 6), mothers most frequently sought the husband's advice (82 percent). Most of the time, the husband was the only person consulted: i.e., only 40 percent of mothers seeking advice spoke with someone other than the husband. The mother's own mother or mother-in-law were the other family members consulted most often, perhaps because they frequently co-resided with their children. Only rarely did another relative provide advice to the mother about the child's illness.

The type of advice or recommendation varies considerably according to the giver of the advice; estimates for any given row in Table 7 typically sum to more than 100 percent because a person may have offered more than one type of advice. Husbands frequently provided three types of assistance: giving money for medicine or seeing a provider; giving or purchasing medicine,

[5] Children contribute exposure to the life table between the first day with a symptom and the time of the event or the day prior to interview, whichever occurs sooner.

remedies or herbs; and bringing the child to a provider or hospital. The mother and mother-in-law were most likely to be involved in the administering of a remedy or providing transport and were much less likely than the husband to provide money.

Providers

Table 8 presents the corresponding information for providers seen during the two-week calendar period. As shown in Table 6, about one-third of children were seen by a provider during this time. The most frequently consulted providers were pharmacists (who frequently dispense advice as well as medication without professional training; Van der Stuyft et al., 1996), staff of the government-sponsored health posts or centers, and doctors (usually private doctors). For example, as shown in the first column of Table 8, among children seeing a provider in the calendar period, 30 percent saw a pharmacist. Previous research indicates that Guatemalans are often reluctant to use government-sponsored health facilities because they are often understaffed or have poorly trained staff, have few supplies or medications, and appear to be critical of poor and indigenous patients (Annis, 1981; Rosenthal, 1987; Pebley et al., 1996). However, these data suggest that the staff at these facilities are more likely to be used than most other providers– perhaps because of their low cost and relative accessibility. It is also possible that use of government-sponsored health facilities increased during the most recent decade. The data indicate that the services of curers – persons who specialize in treating folk illnesses and, at least until recently, relied primarily on folk remedies – and other traditional practitioners were sought less frequently than those of biomedical ones, although it is possible that respondents were more reluctant to acknowledge their visits to traditional practitioners.

The remaining columns of Table 8 indicate the recommendation or action taken by each provider; as with the previous table, estimates typically sum to more than 100 percent across the rows because providers frequently took more than a single action. The majority of all providers

gave medicine, home remedies or herbs, or a prescription for medicine. Doctors were the group most likely to examine the child, considerably more so than the staff of health posts or centers. Other forms of treatment frequently discussed in the ethnographic literature, such as raising the fontanelles (a traditional treatment for depressed or sunken fontanelles, which may occur during serious dehydration) and prayer, occurred much less often.

Treatments administered

About 90 percent of sick children were given some form of treatment during the calendar period. That is, very few illnesses reported in the calendar period received no form of treatment, even though most of these illnesses were of relatively short duration. The data in Table 9 indicate the nature of the treatment, permitting a breakdown of the category of medicines/remedies/herbs into its specific components. The estimates in the bottom row of the table indicate that, among children receiving some treatment, about 90 percent were given medicine; much lower proportions were given herbs/herbal teas or other home remedies (about 11 percent each).

For each treatment given to the child, mothers were asked if they decided on their own to give the remedy or treatment, whether someone else recommended the treatment, or both. In Table 9, these treatments are classified according to the person recommending the treatment. As shown in the first column of the table, more than half of the treatments (53 percent or 765/1444) administered during the calendar period were decided on by the respondent herself, about 11 percent were recommended by her husband, about eight percent each by doctors or pharmacists, and about six percent by health post or center personnel. Thus, respondents and their husbands were more likely sources of treatment than were any particular type of provider. This result is consistent with previous research on medical choice in Guatemala which demonstrates that home treatment is usually the most prevalent form of treatment for most illnesses (Cosminsky and Scrimshaw, 1980; Hurtado and Esquivel, 1986; Weller et al., 1997).

Regardless of the person recommending the treatment, the majority of recommended treatments were medicines, ranging from about two-thirds of treatments suggested by the respondent's mother or mother-in-law or a curer, to 90 percent or more for doctors, personnel in health posts and centers, and pharmacists. The former group were more likely than other persons to recommend herbal or other home remedies. The respondent and her husband occupy an intermediate position with regard to medicines versus home remedies, being less likely than their parents (or curers) to recommend herbal or other home remedies and more likely to suggest medicines – but not as likely as biomedical practitioners.

The mothers' verbal descriptions of the type of treatment indicated that the vast majority consisted of medicines. With the assistance of a Guatemalan physician, we classified the medicines (which were often described by their brand names) into broad categories. This classification in presented in Table 10, by the type of relative or provider recommending the use of the medicine. The comparisons are complicated by the relatively high percentage (19 percent) of medicines that cannot be classified (usually because the mother provided insufficient information, indicating only the form of the medicine – e.g., syrup or pills – rather than the purpose). The results indicate that the most common form of medicine administered to children with diarrheal and respiratory symptoms was analgesics/antipyretics (i.e., pain relievers and fever reducers). The next-most-common type of medicine was anti-diarrheal drugs. The types of medicines vary by the recommender, with relatives being especially likely to rely on analgesics/antipyretics and anti-diarrheal medication, and only rarely on cough medicine. As expected, doctors, personnel in health posts and centers, and pharmacists were more likely than others to recommend antibiotics (as well as cough medicine). A surprising finding is that curers frequently recommended modern medicines (Table 9), most notably analgesics/antipyretics and anti-diarrheal drugs for the child illnesses reported in the EGSF.

DISCUSSION

This study of child illness and treatment highlights the advantages of the calendar approach. The detailed information collected in the daily two-week calendar (1) permits a much richer description of illness and treatment than obtainable from conventional surveys; and (2) permits the analyst to evaluate the quality of the resulting data through the use of internal consistency checks. Although an evaluation of data quality revealed the presence of some recall problems in the EGSF, such errors appear to be unavoidable in a cross-sectional health interview in which potentially non-salient information is obtained retrospectively, even for a relatively short recall period. The analysis presented here demonstrates that the quality of information from health interview surveys can be greatly enhanced at relatively modest costs.

The resulting estimates of the frequency of symptoms associated with diarrheal and respiratory analysis indicate that almost half of Guatemalan children experienced at least one of these symptoms in a two-week period. Almost one-quarter of children experienced high fever and about one-fifth experienced diarrhea and constant cough during this time interval. These data suggest high rates of both diarrheal and respiratory illness among Guatemalan children.

The patterns of symptoms reported in the EGSF reveal a complexity of illness not captured by conventional health interview surveys and not easily summarized. This complexity undoubtedly arises in part from the synergistic effects of malnutrition and infectious illness, and multiple disease burdens, typical of poor populations and likely to be especially prevalent in Guatemala given its high rate of malnutrition (Martorell and Ho, 1984). One consequence of the reporting of multiple (and frequently non-overlapping) symptoms is that estimates of the frequency and duration of illness cannot be readily obtained from the data without a set of assumptions that permits the researcher to identify the starting and ending point of an episode of illness. In addition,

identification of particular diseases or illnesses, or categories of illness, is especially problematic. For example, estimates of the frequency of pneumonia or of acute lower respiratory infection depend to a large extent on the specific algorithm (combination of symptoms) used. Moreover, the frequent co-occurrence of respiratory and gastrointestinal symptoms suggests that the classification of illnesses into broad categories (such as diarrheal vs. respiratory) is ambiguous and may not always constitute the preferred strategy for analyses of child illness.

The analysis also demonstrates that the vast majority of illnesses are treated, most often on the basis of mothers' or other relatives' recommendations, and that on average treatment begins on the same day as the first symptom appears. The respondent's husband, mother or mother-in-law provide considerably more assistance or advice with child illness than do other family members or friends. Their advice is sought much more often than is assistance from providers, usually on the first day of illness. When families do seek providers, they are more likely to rely on doctors, personnel at health posts and centers and pharmacists than other types of practitioners.

By far, the most common form of treatment recommended by both relatives and providers consists of readily available medicines, such as analgesics or antipyretics, anti-diarrheal drugs, antibiotics and cough medicines. The types of treatment typically offered by curers, spiritists and other traditional practitioners – such as herbal remedies, massage and prayer – are reported relatively infrequently by mothers.

Overall, this analysis implies that the use of Western pharmaceuticals is currently a dominant aspect of the treatment of child illness in Guatemala and that the use of traditional remedies and healers is quite low. This result is consistent with those from numerous other studies. For example, findings from three recent small-scale studies in Guatemala (Delgado et al., 1994; Van der Stuyft et al., 1996; and Weller et al, 1997) indicate that modern pharmaceuticals are the predominant treatment for most childhood illnesses and that herbal and traditional remedies are rarely used, except for particular child ailments (such as worms; Delgado et al., 1994; Van der

Stuyft et al., 1996). In addition, among mothers who seek treatment from providers, pharmacists and medical services are used much more frequently than traditional healers (Delgado et al., 1994; Weller et al., 1997). Findings from earlier ethnographic studies in rural Guatemala are less clearcut. Although some mention the decreasing prevalence of traditional medicine (e.g., Cosminsky, 1977), others (e.g., Cosminsky and Scrimshaw, 1980; Cosminsky, 1987; Burleigh et al., 1990) suggest a much more important role for traditional healers and treatments.

Some of the variation in results across studies is almost certainly due to the increasing influence of biomedical practices as part of the more global process of modernization. Nevertheless, inferences based on comparisons between the EGSF and ethnographic studies are beset with difficulties, for several reasons. First, ethnographic studies are typically limited to very small geographic areas and often focus on folk illnesses, which are more likely to be treated with traditional remedies or healers as compared with such general childhood symptoms as diarrhea, fever and cough (Young, 1981; Hurtado and Esquivel, 1986; Delgado et al., 1994). Second, the nature of the treatment has been shown to vary with the length of the illness, with traditional providers more likely to be sought later in an illness (Woods, 1977; Cosminsky, 1997). And third, traditional treatments may have been underreported by respondents, particularly in the EGSF. A comparison of reports of illness and treatment from a standardized questionnaire with those from case studies, carried out in a rural settlement in the highlands of Guatemala, revealed fewer references to traditional practitioners in the standardized survey instrument as compared with the in-depth case studies (Cosminsky, 1977).

Such underreporting of traditional treatments may be the result of respondents' reluctance to acknowledge these practices to relatively highly educated interviewers. Nevertheless, two characteristics of the EGSF support the accuracy of reports from the survey. One is that the EGSF attempted to minimize reporting bias by relying on interviewers who came from the same department and spoke the same language as the respondents. A second factor is that many more

women in the EGSF reported the use of traditional providers (primarily midwives) as compared with biomedical providers for pregnancy-related care, a result that suggests that at least in this case women use and report non-biomedical treatment. On the other hand, data collected as part of a qualitative study within the EGSF reveal a plausible mechanism for underreporting of traditional treatments: these qualitative data suggest fairly frequent use of traditional remedies on their own and mixtures of herbs, plants and pharmaceuticals.[6] It is possible that women in the EGSF who used both traditional remedies and medicine reported only the latter.

However, unless the underreporting of traditional treatments in the EGSF and similar surveys is vast, it appears that the most child illnesses in rural Guatemala are treated with Western pharmaceuticals, frequently on the basis of decisions made by family members. Undoubtedly, many of these treatments are not appropriate for the particular illness. For example, antibiotics are not effective against viral respiratory infections and anti-diarrheal drugs are generally thought by the medical profession to be unsuitable treatments for diarrhea (Bulla and Hitze, 1978; Coetzer and Kroukamp, 1989). The results from the EGSF are consistent with findings from many developing countries that Westernization and globalization often entail the absorption of modern medical practices – particularly pharmaceuticals – into the local culture (van der Geest and Whyte, 1988; Etkin and Tan, 1994). One widespread consequence of this increasing biomedicalization is a high and often inappropriate use of modern drugs (Trostle, 1996).

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[6] The qualitative study was carried out in four rural communities of Guatemala in 1994 (Pebley et al., 1999). Descriptions about treatment behavior were given in response to questions about the most recent illness experienced by the respondent's child and about treatments for diarrheal and respiratory illnesses

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among children in general. Remedies which combine herbs, plants and pharmaceuticals have been reported in other studies (e.g., Hurtado and Esquivel, 1986).

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Table 1. A comparison of estimates of the prevalence of diarrheal and respiratory symptoms for the two weeks before the survey, EGSF(1995) and ENSMI(1995)

Symptom	EGSF (n=3,193)		ENSMI (n=1,731)[7]	
	Wording	%	Wording	%
Cough	Tos necia	19.8	*Tos o resfriado, con respiraciónes cortas y rapidas*	19.7
Fever	Calentura	24.4	Fiebre	23.7
Diarrhea	Asientos	21.8	Asientos	18.8
Diarrhea with blood	*Sangre en el popo*	1.4	*Asientos con sangre*	3.8

[7] Refers only to the rural areas of the four departments in which EGSF was conducted.

Table 2. Prevalence, incidence and median duration by type of symptom

Symptom[9]	Prevalence (%)[8]			Two-week incidence(%)[10]	Median Duration (days)[11]
	Two-week period prevalence	Two-week average point prevalence	One-week average point prevalence		
Constant cough	19.8	10.8	12.3	12.6	10.8
Boiling of the chest	12.0	5.6	6.6	8.4	8.7
Panting	5.6	2.4	2.9	3.9	7.2
High fever	24.4	6.1	6.9	20.2	2.3
Weakness	12.6	6.6	7.5	7.6	7.7
Diarrhea	21.8	7.9	9.8	17.3	4.5
Blood in the stools	1.4	0.5	0.5	0.9	2.5
Vomiting	4.8	1.0	1.8	4.1	1.7
Any of the eight solicited symptoms	45.3	22.8	26.2	33.7	5.8
Other symptom	14.2	7.7	8.9	11.3	---

[8] Estimates of prevalence are based on 3,193 children. The estimate of prevalence for "other" symptoms is restricted to the 1,446 children reporting one of the eight solicited symptoms during the two-week period.

[9] See note 1 for the Spanish translation of these symptoms.

[10] Estimates of incidence are based on the 2,323 children who did not have any symptom 14 days before the day of the interview. The estimate of incidence for other symptoms is further restricted to the 870 children with at least one of the eight solicited symptoms during the two-week period.

[11] Estimates of median duration are based on life tables and refer to the number of consecutive days with the symptom, for symptoms beginning subsequent to day 14 of the calendar. A given child may contribute more than one episode to the estimate if the symptom stopped and resumed on a later day during the two-week period.

Table 3. Percent distribution of the number of accompanying symptoms reported during the calendar period, by type of symptom

Symptom	Number of accompanying symptoms (% distribution)					Average number of symptoms in total	Number of children with symptom
	None	One	Two	Three or more	Total		
Constant cough	14.8	22.7	24.0	38.5	100	3.2	633
Boiling of the chest	5.7	16.7	23.2	54.4	100	3.8	383
Panting	3.4	8.4	19.6	68.6	100	4.4	179
High fever	18.0	26.9	21.6	33.5	100	3.0	778
Weakness	7.1	19.1	23.7	50.1	100	3.7	392
Diarrhea	30.2	24.3	18.1	27.4	100	2.7	695
Blood in the stools	6.8	15.9	18.2	59.1	100	4.0	44
Vomiting	2.6	13.2	28.9	55.3	100	4.0	152
Other symptom	---	39.1	22.7	38.2	100	3.4	207
Any symptom[12]	35.1	27.1	17.6	20.2	100	2.4	1,446[13]

[12] Includes other symptoms.

[13] The total number of children experiencing at least one symptom during the two-week period (1446) is smaller than the sum of the numbers experiencing specific symptoms because some children experienced more than one symptom during the calendar period. In these cases, children contribute to the calculation for each of the relevant symptoms.

Table 4. Percent distribution of the number of symptoms reported per day, according to the total number of symptoms recorded in the calendar[14]

Number of symptoms per day (% distribution)	Total number of symptoms recorded in the calendar										
	0	1	2	3	4	5	6	7	8	9	Total
None		2.2	5.0	3.9	4.5	3.5	2.0	0.7	0.0	0.0	3.7
1		97.8	52.4	34.2	21.4	19.3	19.0	11.4	7.1	0.0	49.6
2			42.6	34.5	29.4	21.7	15.9	20.7	14.3	0.0	25.9
3				27.5	22.4	19.3	18.4	21.4	14.3	22.2	11.8
4					22.4	18.6	17.5	7.1	21.4	0.0	5.5
5						17.7	16.5	7.1	7.1	11.1	2.4
6							10.7	15.0	21.4	11.1	0.8
7								16.4	14.3	44.4	0.3
8									0.0	11.1	0.0
9										0.0	0.0
Total		100	100	100	100	100	100	100	100	100	100
Mean number of symptoms per day		1.0	1.4	1.9	2.4	2.8	3.2	3.9	4.3	5.9	1.8
Number of days		2546	3021	2459	1457	950	559	140	14	9	11155
Number of children	1747	507	392	254	140	88	49	13	2	1	3193

[14] Based on all days between the first and last occurrence of a symptom.

Table 5. Percent of days when symptoms are considered serious, by type and number of symptoms

	% Serious	Number of days
Type of symptom		
Constant cough	22.6	4846
Boiling of the chest	25.7	2486
Panting	30.8	1069
High fever	30.4	2720
Weakness	28.5	2938
Diarrhea	26.8	3548
Blood in the stools	27.2	206
Vomiting	42.5	447
Any of the eight solicited symptoms	22.8	10742[15]
Number of symptoms on a given day[16]	% Serious	Number of days
1	14.6	5531
2	27.7	2889
3	34.1	1321
4	38.4	614
5	34.6	272
6+	46.1	115

[15] The total number of days with any of the eight solicited symptoms (10742) is smaller than the sum of the numbers for specific symptoms because some children experienced more than one symptom on a given day. In these cases, children contribute days to the calculation for each of the relevant symptoms.

[16] Includes non-solicited symptoms.

Table 6. Summary measures of treatment behavior[17]

	Observed proportion (%)	Mean number [18]	Maximum number	One week probability (%)[19]	Median day of first consultation/ treatment[2,3]
Advice sought from relative or friend	72.6	1.3	5	75.3	1
Provider seen	32.1	1.1	2	33.7	2
Treatment administered	89.1	1.8	9	90.8	1

[17] **Based on the 870 children whose first symptom in the calendar period occurred subsequent to day 14**.
[18] Refers only to the children for whom advice is sought/provider is seen/treatment is administered.
[19] Based on life table calculations.

Table 7. Percent distribution of recommendation or action taken by type of relative/friend

Relative/friend	% children ever getting advice from person[20]	Distribution of recommendation or action by type of relative/friend (% of consultations)[21]								
		Number of consultations	Medicine/ remedies/ herbs	Bring child to a provider/ hospital	Give money	Give more liquid	Raise the fontanelles	Bathe	Ointments	Other
Husband	81.8	521	42.6	36.3	26.7	2.5	0	0.2	0.6	10.4
Mother	15.8	100	45.0	37.0	5.0	3.0	1.0	0	1.0	17.0
Mother-in-law	16.3	103	55.3	25.2	3.9	1.0	0	0	1.9	18.4
Sister	1.7	11	81.8	18.2	0	9.1	0	0	9.1	0
Sister-in-law	2.7	19	57.9	10.5	10.5	5.3	5.3	5.3	0	10.5
Other female relative	2.7	18	55.6	27.8	0	5.6	0	5.6	0	16.7
Male relative	2.1	13	46.2	61.5	7.7	0	0	0	0	0
Friend/neighbor	3.6	25	68.0	16.0	8.0	0	0	0	0	8.0
All advice		810	46.5	33.7	18.9	2.5	0.2	0.4	0.9	12.0

[20] These percentages are based on the 632 children for whom advice was sought during the calendar period. The percentages sum to greater than 100 because some mothers received advice from more than one relative or friend.

[21] Recommendations may sum to more than 100 percent for each relative/friend because relatives/friends may have given more than one type of recommendation.

Table 8. Percent distribution of recommendation or action taken by type of provider

Provider	% children ever seeing provider[22]	Number of visits	Distribution of recommendation or action by type of provider (% of visits)[23]								
			Examine the child	Medicine/ remedies/ herbs	Give prescription	Bring child to a provider/ hospital	Give injection	Give more liquids	Raise the fontanelles	Prayer	Other
Pharmacist	30.1	84	4.8	92.9	1.2	0	7.1	1.2	0	0	1.2
Doctor	21.5	65	70.8	53.8	38.5	0	10.8	1.5	0	0	1.5
Someone in the health post/center[24]	22.2	64	45.3	73.4	25.0	1.6	1.6	0	0	0	3.1
Curer	13.6	38	21.1	55.3	15.8	0	2.6	2.6	5.3	10.5	23.7
Promotor[25]	7.5	21	47.6	61.9	9.5	0	19.0	0	0	0	9.5
Midwife	5.0	14	14.3	71.4	0	14.3	0	7.1	14.3	0	28.6
Nurse	3.2	9	44.4	77.8	0	0	0	0	0	0	0
Other provider[26]	1.4	4	25.0	50.0	0	0	25.0	0	0	0	25.0
All providers		299	34.8	71.2	16.7	1.0	6.7	1.3	1.3	1.3	6.7

[22] These percentages are based on the 279 children for whom a provider was seen during the calendar period. The percentages sum to greater than 100 because some mothers received advice from more than one type of provider.

[23] Recommendations may sum to more than 100 percent for each type of provider because providers may have given more than one type of recommendation.

[24] Also includes hospitals, clinics, and health technicians.

[25] Health promotors in Guatemala are volunteers associated with the Ministry of Health who receive minimal training in basic health issues.

[26] Other providers include 2 witch/spiritists, 1 injectionist, and 1 masseur.

Table 9. Percent distribution of nature of treatment administered by type of relative or provider recommending the treatment

Relative/provider	Number of recommended treatments	Distribution of nature of treatment by relative or provider recommending treatment (% of recommended treatments)								
		Medicine	Herbs	Other home remedies	Injection	Ointment	Oral Rehydration	Massage	Other	Total
Self (child's mother)	765	79.3	6.3	7.5	0.1	2.6	1.2	1.6	1.4	100
Husband	160	73.1	8.1	5.0	0	3.8	5.6	1.9	2.5	100
Mother	39	66.7	15.4	10.3	2.6	2.6	0	0	2.6	100
Mother-in-law	52	69.2	7.7	15.4	1.9	5.8	0	0	0	100
Other relative/friend	55	76.4	20.0	9.1	0	0	3.6	0	3.6	100
Pharmacist	108	89.8	0	0.9	8.3	0	0.9	0	0	100
Doctor	113	92.9	0	0.9	5.3	0	0.9	0	0	100
Someone in health-post/center[27]	83	89.2	0	0	3.6	1.2	6.0	0	0	100
Curer	37	67.6	13.5	13.5	2.7	0	2.7	0	0	100
Other provider[28]	64	82.8	1.6	4.7	12.5	0	1.6	1.6	3.1	100
All treatments	1444[29]	78.3	6.3	6.4	2.1	2.1	1.9	1.2	1.7	100
% children ever receiving treat-ment[30]		89.8	11.4	10.7	3.9	3.9	3.5	1.5	3.4	

[27] Also includes hospitals, clinics, and health technicians.

[28] Other providers primarily include promotors, midwives, and nurses.

[29] The numbers of recommended treatments in this column sum to more than 1444 (the total number of treatments included in the table) because treatments that were recommended by more than one person were assigned to each of the relevant relatives/providers.

[30] These percentages are based on the 775 children to whom treatment was administered during the calendar period. The percentages sum to more than 100 because some children received more than one type of treatment.

Table 10. Percent distribution of type of medicine administered by type of relative or provider recommending the medicine

Person	Number of recommended medicines	Distribution of type of medicine by relative or provider recommending the medicine (% of recommended medicines)							Total
		Analgesic/ antipyretic	Antibiotic	Anti-diarrheal	Cough	Other medicines[31]	Other[32]	Unknown[33]	
Self (child's mother)	949	53.3	3.8	22.9	5.1	1.3	3.8	9.9	100
Husband	175	58.3	5.1	21.1	3.4	0	1.1	10.9	100
Mother	48	50.0	4.2	25.0	2.1	2.1	2.1	14.6	100
Mother-in-law	66	45.5	4.6	22.7	1.5	0	4.6	21.2	100
Other relative/friend	85	27.1	10.6	36.5	2.4	2.4	2.4	18.8	100
Pharmacist	162	18.5	16.1	13.6	17.9	2.5	3.1	28.4	100
Doctor	220	15.0	22.3	4.1	18.6	1.8	4.1	34.1	100
Someone in health-post/center[34]	138	25.4	20.3	3.6	12.3	0	4.4	34.1	100
Curer	53	28.3	0	28.3	3.8	0	11.3	28.3	100
Other provider[35]	90	21.1	16.7	12.2	5.6	0	5.6	38.9	100
All Medicines	1,915[36]	40.6	9.0	18.6	7.8	1.2	3.9	18.9	100

[31] Other medicines include anti-nausea drugs, antihistamines, antiseptics, and medicines for cardiovascular problems.
[32] Other includes vitamins, teas, diuretics, laxatives and non-medicines.
[33] Unknown includes responses that are not sufficiently detailed to be classified.
[34] Also includes hospitals, clinics, and health technicians.
[35] Other providers primarily include promotors, midwives, and nurses.
[36] This number exceeds the corresponding number of medicines in Table 9 because it is based on all medicines reported in the calendar period, including those for illnesses which began prior to the calendar period (i.e., illnesses for which symptoms were present on day 14); the number of children to whom medicines were administered equals 1168. The numbers of recommended medicines in this column sum to more than 1915 (the total number of medicines included in the table) because medicines that were recommended by more than one person were assigned to each of the relevant relatives/providers.