

The use of calendars to measure child illness in health interview surveys

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- Background** During the past two decades, health interview surveys have become an increasingly common source of information about current morbidity patterns and utilization of health services in developing countries. This study describes a recent effort to enhance the utility of these surveys by incorporating a calendar format.
- Methods** A calendar of morbidity and treatment behaviour during the 2-week period prior to interview was implemented in the Guatemalan Survey of Family Health (EGSF), a large-scale sample survey that was fielded in 60 communities in rural Guatemala in 1995. A total of 2872 women aged 18–35 were interviewed and provided information on 3193 children born since 1990.
- Results** The EGSF calendar data provide estimates of diarrhoeal illness that are consistent with those obtained from more conventional questionnaire designs. However, in contrast to conventional health survey questions, these calendar data: (1) permit a much more complete evaluation of the accuracy of reporting; and (2) offer a richer and more complex description of child illness and treatment behaviour. For example, the results demonstrate that even the preferred 2-week recall period suffers from underreporting of diarrhoeal illness, that the majority of children with diarrhoea experience at least one additional symptom, and that mothers assess severity of diarrhoea from the type and number of accompanying symptoms.
- Conclusions** The findings indicate that additional implementation and evaluation of calendar formats is warranted in order to provide the most useful and accurate data possible at relatively low cost.
- Keywords** Calendar, child illness, diarrhoea, health interview survey
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During the past two decades, health interview surveys have become an increasingly common source of information about current morbidity patterns and utilization of health services in developing countries.^{1–3} These surveys typically involve a single cross-sectional interview in which respondents are asked to report the illnesses that they have experienced and the health services or treatments that they have used within a specified period prior to interview. In surveys of child illness, mothers are typically proxy respondents for their children.

Single cross-sectional interviews have several advantages over clinical studies and longitudinal surveys, most notably their low cost and the ease of obtaining a representative sample of a large population. On the other hand, they are more likely to result in inaccurate reports of illness and treatment behaviour, particularly in comparison with studies that rely on medical professionals or clinical records for the assessment of illness

and treatment. In view of these limitations, there have been several attempts in recent years to improve and standardize the design of health interview surveys. These efforts have resulted in some enhancements, such as use of a 2-week recall period for questions related to morbidity—a period which is considered by many investigators 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.^{1,3,4}

The present study describes a recent effort to further improve the usefulness of the health interview survey, by providing a much richer description of illness. The essence of the new survey design is its reliance on a calendar of morbidity and treatment behaviour in the 2-week period prior to interview. 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),⁵ it has rarely been used in health interview surveys. The authors recently implemented a calendar approach in a large-scale sample survey, the Guatemalan Survey of Family Health (EGSF),⁶ which was fielded during May–September, 1995 in 60 rural communities

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of Guatemala. The survey data were designed to measure child and pregnancy-related illness and treatment behaviour, along with important family- and community-level factors such as social support, poverty, health beliefs, and the availability of health providers. A total of 2872 women aged 18–35 were interviewed and provided information on 3193 children in the household who were born since 1990.

This paper examines the nature and quality of information obtained from the calendar, focusing specifically on the epidemiology of diarrhoea among young children. In the first section, we describe the design of the calendar approach used in the EGSF. Subsequently, we examine various characteristics of diarrhoeal illness, including the complexity, frequency, and seriousness of illness, and briefly explore patterns of treatment. Finally, we discuss our findings with regard to the advantages and drawbacks of the calendar approach in the study of child illness.

Questionnaire Design

The questionnaires employed in the EGSF were based on questions included in previous demographic and health surveys, on the results of health-related research in Guatemala, and on a qualitative survey conducted as part of the EGSF project. The questionnaires were reviewed by an interdisciplinary team of researchers, were extensively field tested, and went through translation and backtranslation procedures in Spanish and two indigenous languages.⁷

In the section of the questionnaire devoted to children's illnesses, mothers were asked for detailed information pertaining to a maximum of two children born since 1990 (Appendix). They were first asked whether each of eight specific symptoms related to respiratory or diarrhoeal illness (E1–E8) occurred during the 2 weeks, and if so, when the symptom began and on which days during the past 2 weeks the symptom was present. These symptoms have been shown in other studies to have high sensitivity and specificity^{1,2,4,8} and were adapted to the rural Guatemalan setting on the basis of medical anthropological research and on the EGSF qualitative study carried out in four rural Guatemalan communities.⁹ Respondents reporting at least one of the eight symptoms during the 2 weeks were asked about any other symptoms experienced during this time (E10), whether the symptoms were serious, whether mothers asked others for advice (E12) or visited providers (E13) regarding their child's illness, and whether any treatments were administered by the mother or by anyone else (E14). This information was noted in the calendar in the appropriate days. Additional information (such as cost and perceived effectiveness) was subsequently obtained about each of the people, providers and treatments recorded in the calendar, and about hospitalization, perceived causes of illness, and general health status of the child.⁶

These questions on child illness permit us to address many of the methodological weaknesses of previous health interview surveys. For example, Ross and Vaughan³ note that studies often fail (or are unable) to: (1) identify whether episodes of illness which began prior to the recall period but extend into the period are included in reports and measures of illness; and (2) distinguish complete from incomplete episodes of illness. The calendar approach used in the EGSF permits identification of both left and right censoring of episodes and leads to unbiased estimates

of illness frequency and duration as long as the analyst employs appropriate life table techniques. Another benefit of this calendar approach is that it permits the analyst to carry out internal checks of consistency of the data and to thereby assess the quality of reporting of illness. A third advantage is the ability of the calendar to capture complex illness histories (i.e. several partially overlapping symptoms and treatment behaviours), without the analyst having any *a priori* definition of an (episode of) illness. For example, the analyst can explore the sensitivity of estimates of acute respiratory illness (ARI) to alternative definitions (i.e. combinations of symptoms). These benefits of the calendar approach are demonstrated below in the study of diarrhoeal illness among young Guatemalan children.

Complexity of Reports of Diarrhoeal Illness

As is generally recognized in the epidemiological literature, validation of a diarrhoeal episode in community surveys is problematic because of the difficulty of obtaining daily observations or stool collections for a large population.^{8,10,11} This is especially true for young children, for whom the collection of all soiled diapers would constitute an excessively intrusive and demanding undertaking. As a result, mothers' or care givers' reports have been used as the generally accepted procedure for identifying cases of diarrhoea in epidemiological research based on young children.^{10,11} Although numerous studies have shown high agreement between mothers' perceptions about the occurrence of diarrhoea and mothers' responses to standardized questions on the frequency and consistency of stools,⁸ the latter approach has generally been preferred.^{8,10,11}

In the EGSF, the occurrence of diarrhoea on any given day in the last 2 weeks was determined by mothers' responses to question E6 about whether the child experienced 'asientos', at least three times on the given day. In extensive field tests prior to the survey, 'asientos' was shown to be the term for diarrhoea that was most likely to be understood by the rural Guatemalan population. For example, when asked to describe the symptoms associated with 'asientos', mothers were most likely to report the watery consistency of stools, along with increased frequency of defecation.⁹ The use of three or more stools in the definition of diarrhoea has been shown to lead to high sensitivity and specificity.⁸

A definition of a diarrhoeal episode requires further delineation as to the number of intervening diarrhoea-free days required to define a new episode. Among the 705 children reporting any diarrhoea in the 2-week period (22% of children born since January, 1990), only 20 children (3%) have a gap (of one or more days) between two occurrences of diarrhoea. Given the reports of multiple periods of diarrhoea in the EGSF are relatively rare, estimates are very robust to alternative specifications of the length of the diarrhoea-free period required to define a new episode. In the remainder of this analysis, we use a definition of two or more diarrhoea-free days; this definition results in a total of 722 episodes of diarrhoea during the calendar period.

A salient problem concerning the definition of a diarrhoeal episode is whether and how to incorporate reports of other (non-diarrhoeal) symptoms. As shown in Table 1, almost two-thirds of diarrhoeal episodes have at least one additional symptom reported within the episode. The majority of these were elicited

Table 1 Measures of complexity of diarrhoeal episodes,^a Guatemalan Survey of Family Health (EGSF) (1995)

Characteristics of episodes	Proportion of episodes
Multiple episode (2 nd or 3 rd) within calendar	0.02
At least one accompanying symptom	0.62
At least one non-solicited symptom ^b	0.10
At least one symptom occurring completely outside the episode of diarrhoea	0.19
Number of diarrhoea episodes	722

^a Two Intervening days without diarrhoea are required to define a new episode.

^b Symptoms reported in column E10 of the calendar, see Appendix

by questions E1–E5 and E7–E8 on specific symptoms; however, for 10% of episodes, respondents reported a symptom within the diarrhoeal episode in response to a general question (E10) about other problems experienced during the illness.

The description of an illness becomes even more complex when we recognize that symptoms reported in the calendar period can extend beyond or occur totally outside the period of diarrhoea. The actual illness history for one child in the EGSF sample (whom we call Ana) is shown in the Appendix. Ana had diarrhoea for only 2 days in the calendar but had several other symptoms for longer periods (including a constant cough for the past 9 months). Fever occurred both on the days with diarrhoea and on several days prior to the start of diarrhoea. Moreover, several days of vomiting—which are likely to be part of the same illness as diarrhoea—occurred totally outside the episode of diarrhoea. Such complicated histories are not rare. For example, as shown in the last row of Table 1, almost one-fifth of episodes have a symptom that falls totally outside the period of diarrhoea. These occurrences point to the ambiguities associated with the definition of an episode of diarrhoea (or of any other illness).

Frequency of Diarrhoeal Illness

Tabulations of starting dates, ending dates, and durations of diarrhoeal episodes (not shown here) indicate some heaping of responses. The most marked levels of heaping occur for

the starting dates 8 and 15 days before interview (i.e. 1 and 2 weeks). Heaping on the latter date, which occurs just outside the 2-week calendar, is likely to have arisen because the Spanish expression used to describe the most recent 2-week period is 'estos últimos 15 días' (these last 15 days). As a result of the apparent heaping, we calculated estimates of prevalence for three alternative periods, excluding the day of interview: the most recent 2-week period (21.8%), the most recent 1-week period (18.3%), and the penultimate 1-week period (11.6%). These estimates reveal a substantial underestimate in the next-to-last week compared with the last week, due to a deficit in reporting of diarrhoea for this period or to a displacement of days with diarrhoea from the penultimate to the last week (or to both). The heaping of reported starting dates on the day prior to the calendar period (15 days ago) suggests that some of these episodes probably began within the calendar period and that estimates for the penultimate week as well as for the entire 2-week period may be too low. On the other hand, the estimated prevalence of 22% from the EGSF for the past 2 weeks is slightly higher than alternative estimates for Guatemala: 20% for rural areas according to the 1995 Demographic and Health Survey (DHS) in Guatemala (based on our own calculation) and 17% for the national sample in the 1987 Demographic and Health Survey in Guatemala.¹²

In Table 2, we present estimates of incidence and prevalence by age for two reference periods that are likely to encompass the true rates: the last week (which may yield overestimates) and the last 2 weeks (which may yield underestimates). We use a risk measure of incidence defined as the probability that a diarrhoea-free child at the start of the relevant period develops diarrhoea within the ensuing period.¹³ The quality of the EGSF estimates is supported by the finding that all estimates of incidence reveal the expected age pattern of diarrhoeal illness, with peak rates during the latter half of infancy and the second year of life. Especially high morbidity from diarrhoea during these ages occurs in a large number of developing countries, presumably from poor weaning practices (e.g. inappropriate foods and unhygienic practices).^{14–17}

In Table 3 we explore differentials in incidence and prevalence by whether or not the child is chronically malnourished, using an indicator of stunting (i.e. more than two standard deviations below the median height for age as defined by the

Table 2 Prevalence and incidence of diarrhoea for 1-week and 2-week period prior to interview, by age, Guatemalan Survey of Family Health (EGSF) (1995)^a

Age	No. of children	Prevalence ^b		Incidence ^b	
		1 week	2 weeks	1 week	2 weeks
0–5 months	352	0.20	0.22	0.11	0.18
6–11 months	368	0.25	0.29	0.15	0.23
1 year	701	0.29	0.34	0.19	0.29
2 years	629	0.19	0.24	0.13	0.19
3 years	571	0.11	0.13	0.07	0.10
4 years	410	0.07	0.09	0.05	0.06
5 years	160	0.06	0.08	0.04	0.06
Total ^c	3193	0.18	0.22	0.12	0.18

^a Calculations exclude day of interview since it represents an incomplete day of exposure.

^b Prevalence is measured as the proportion of children with any diarrhoea during the specified recall period. Incidence is measured as the probability that a child who is diarrhoea-free at the start of the specified recall period begins an episode of diarrhoea during the period

^c Includes two children older than 5 years.

Table 3 Prevalence, incidence,^a and median duration of diarrhoea for the 2-week period prior to interview, by whether child is stunted, Guatemalan Survey of Family Health (EGSF) (1995)^b

	Number of children ^c	Prevalence	Incidence	Duration (days) ^d
Stunted	2059	0.23	0.18	5.2
Not stunted	1134	0.20	0.16	5.4
All children	3193	0.22	0.18	5.3

^a See Table 2 for definitions of prevalence and incidence.^b Calculations exclude day of interview since it represents an incomplete day of exposure.^c Stunting is defined as being more than two standard deviations below the median height-for-age according to the NCHS/WHO standard (WHO Working Group, 1986).^d Median durations are based on 550 episodes of diarrhoea beginning during the 2-week period.

NCHS/WHO reference population).¹⁸ The estimates in this and subsequent tables are based on the 2-week recall period. Our conclusions would remain the same if we had used the last week as a reference period, but the 2-week period has the advantage of including longer episodes of diarrhoea (i.e. greater than 7 days) and of larger sample sizes.

The results in Table 3 indicate modest (but not statistically significant) differences in the frequency of diarrhoea by stunting. In spite of clearly established negative associations between diarrhoea and children's physical growth,^{19–21} earlier studies have yielded mixed findings regarding the association between infection and growth, in part because of variation in the severity and duration of illness,^{17,22} as well as frequent reliance on cross-sectional rather than longitudinal data.²³

Life table calculations based on all episodes of diarrhoea beginning in the calendar period ($N = 550$) indicate that the median duration is equal to 5.3 days, a value which lies in the range 3–7 days found in other developing countries.⁴ Differences in duration by whether or not children are stunted are not statistically significant.

Seriousness

Since the EGSF asked mothers to determine whether their child's illness was serious (and to specify the days on which it was serious), we can compare these reports with characteristics of the illness to determine the basis on which mothers assessed severity. The first column of Table 4 indicates the frequency with which diarrhoeal episodes have different types and numbers of accompanying symptoms. For example, almost one-third of episodes are accompanied by at least one respiratory symptom and a similar proportion by fever. The likelihood that a diarrhoeal episode was assessed as serious (i.e. contains at least 1 day in which the mother felt that the symptoms were serious) varies both by the nature of accompanying symptoms and by the number of these symptoms. Almost 70% of diarrhoeal episodes that include additional gastrointestinal symptoms (primarily vomiting) were considered serious in contrast to about half of episodes that include respiratory symptoms. The association between reported severity and the total number of accompanying symptoms is strong and monotonic: for example, whereas less than one-third of diarrhoeal episodes with no additional

Table 4 Proportion of diarrhoeal episodes assessed as serious, by type of accompanying symptom and by number of symptoms reported, Guatemalan Survey of Family Health (EGSF) (1995)^a

	No. (proportion) of episodes ^c	Proportion of episodes considered serious
Type of accompanying symptom^b		
Respiratory	244 (0.34)	0.52
Gastrointestinal	132 (0.18)	0.69
Skin	24 (0.03)	0.54
Fever	235 (0.33)	0.60
Other	187 (0.26)	0.60
No. of accompanying symptoms		
0	273 (0.38)	0.30
1	175 (0.24)	0.46
2	125 (0.17)	0.50
3	73 (0.10)	0.59
4	40 (0.06)	0.63
5	24 (0.03)	0.79
6	12 (0.02)	0.92
Total	722	0.45

^a Based on episodes for children ages 0–5 years.^b Respiratory symptoms include cough, rattling chest, wheezing, measles, bronchitis, cold, flu, allergy, sneezing, and ear and throat problems. Gastrointestinal problems include vomiting, blood in stools, 'empacho', worms, swelling of the stomach, stomach ache, weakness of the stomach, dengue fever, colic, and nausea. Skin symptoms include rash and redness. Other symptoms primarily include weakness, headache, eye problems, fainting, inability to eat, and toothache.^c An episode of diarrhoea may be classified according to more than one type of symptom and may have more than one accompanying symptom of a particular type. Only symptoms that fall within the episode of diarrhoea are included.

symptoms were reported as serious, half of those with two additional symptoms and more than 90% of those with six additional symptoms were classified as such. Tabulations (not shown here) indicate that stunted children were significantly more likely to have their diarrhoeal episode assessed as serious than non-stunted children (48% versus 37%, $P < 0.01$). Life table estimates (also not shown here) indicate no significant difference in overall duration by whether or not the mother reported the episode as serious.

Treatment

Although this analysis focuses on a description of diarrhoeal illness, a brief examination of treatment behaviour demonstrates that the benefits of the EGSF data collection strategy extend to the study of treatment as much as to the assessment of the characteristics of illness. Unlike many other health interview surveys, the EGSF recognizes that treatment encompasses a wide range of providers (i.e. people who offer traditional, popular and biomedical treatments), as well as advice sought from friends and relatives, and treatments administered at home (often by the mother) or elsewhere.²⁴ For example, as shown in the Appendix, Ana's mother consulted with her husband and administered three different types of medicine (specified later in the questionnaire) and a steam bath (temescal) to help cure Ana.

Table 5 Descriptive statistics for treatment behaviour during diarrhoeal episodes,^a Guatemalan Survey of Family Health (EGSF) (1995)

	Mean no.	Maximum no.	Per cent with at least one	Mean day first person sought/treatment used
People from whom advice sought	1.0	4	77.9	2.0
Providers seen	0.4	2	37.4	3.2
Treatments administered	1.9	6	92.0	2.4

^a Based on episodes of duration greater than 3 days, beginning in the 2-week period.

Table 5 presents several summary measures of treatment behaviour for the entire sample of diarrhoeal episodes; since treatment is likely to vary by the duration of the episode, this table is restricted to episodes lasting more than 3 days. The measures indicate that, on average, mothers sought advice from one other person (such as a family member, friend or neighbour) and 0.4 providers during the episode. Whereas only about one-third saw any provider, more than three-quarters of mothers sought advice from a relative or friend. Virtually all children received some form of treatment (from the mother or from another person), and on average they received about two treatments during the course of the episode. On average, providers were seen on the third day of the episode, later than the administration of the first treatment or the seeking of advice from another source.

Discussion

The analysis of diarrhoeal illness highlights the main advantages of the calendar approach for the study of child illness. One notable benefit that has received little attention in the past is that a calendar permits the analyst to assess the quality of the resulting data in several respects: (1) evaluation of patterns of reporting (such as the extent of heaping of responses on particular days); (2) comparison of estimates with outside sources that provide information on illness frequency in the past 24 hours, week or 2-week period (or other short periods); and (3) calculation of internal checks of consistency. For example, estimates of prevalence from the EGSF for sub-periods within the 2-week calendar suggest that reporting is more complete for days closer to the time of interview. Although a 2-week recall period is recommended by most epidemiologists for interview reports of child illness, this analysis and other studies indicate that memory lapses may occur within this relatively short time span.²⁵ In contrast to information ascertained from fixed recall periods, the calendar approach permits the analyst to alter the reference period for estimates (e.g. by focusing on the last week rather than the last 2 weeks) subsequent to data collection.

An equally important advantage of the calendar is that it provides a much richer description of illness (and treatment behaviour) than is possible with many other types of questionnaires. While results from longitudinal studies demonstrate the frequent recurrence and overlapping of different illnesses or symptoms,²⁰ cross-sectional surveys have typically presented a very oversimplified description of illness. The Demographic and Health Surveys, for example, present separate results for the frequency of diarrhoeal and respiratory illnesses for a given child, without explicitly recognizing that these symptoms often overlap. Results from the EGSF demonstrate that the definition of

(an episode of) illness is complex and that classification of illnesses into distinct categories (such as diarrhoeal versus respiratory), with the corresponding starting and ending dates, may not constitute the most meaningful strategy for understanding child illness. Such classification schemes become even more unsatisfactory when the analyst attempts to ascribe reports of illness causation, seriousness, and treatment to particular symptoms or episodes.

The survey design implemented in the EGSF is not without its drawbacks. As suggested above, memory problems are likely to persist in any health survey that obtains information retrospectively, even those that incorporate a short recall period. One apparent limitation of the EGSF is the tediousness of obtaining detailed illness histories from more than one child in the family. Estimates (not presented here) indicate that this repetition probably led to underreporting in the EGSF: the frequency of reported illness is lower for the penultimate as compared with the last child, even when age, birth order and other relevant characteristics are controlled. While the redundancy could have been eliminated by restricting questions to a randomly selected child born during the relevant period (January, 1990 to interview date),²⁶ this strategy precludes any analysis of family effects related to illness and treatment—an important objective of the EGSF and of other epidemiological and social science investigations.

In spite of these problems, the analysis presented here indicates the usefulness of calendar formats for measuring child illness. Conventional estimates pertaining to diarrhoea—such as prevalence in the past 2 weeks, age patterns and average duration—can be readily derived from the calendar format. These estimates for the EGSF appear to be of high quality, e.g. they are consistent with those obtained from other sources in Guatemala and elsewhere. At the same time, the calendar format provides much more information about illnesses and treatment behaviour than do more conventional instruments, such as the questionnaires for the Demographic and Health Survey project which have been used in over 50 developing countries during the past decade. Since epidemiologists are relying to a greater extent than in previous years on single-round household interviews, rather than more costly longitudinal investigations and field surveys, additional implementation and evaluation of calendar formats is warranted to provide the most useful and accurate data possible at relatively low cost.

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Appendix
SECTION E CHILD HEALTH

ASK FOR THE YOUNGEST CHILD (IF BORN SINCE JANUARY '90 AND LIVING IN HOUSEHOLD). FILL IN EACH COLUMN BEFORE CONTINUING WITH THE NEXT COLUMN.														
NAME OF YOUNGEST CHILD <u>Ana</u> ORDER (FROM C11a, p.10-12) <u>2</u>														
Now I would like for us to talk about the health of (NAME OF YOUNGEST CHILD) in the last 15 days.														
In the last 15 days, did he/she have (SYMPTOM IN E1 - E8):														
E1 Constant cough (Tos necea)	E2 Boiling of the chest (Hervor de pecho)	E3 Panting/ wheezing/ difficult breathing (Cecido/ pito/ fatiga)	E4 High fever (Calentura)	E5 Weakness/ apathy/ lethargy (Debilidad/ cansancio/ desgano)	E6 Diarrhea more than 3 times a day (Asientos más de 3 veces al día)	E7 Blood in stools (Sangre en el popó)	E8 Vomiting (Arrojadera, vómitos)	E9 ANY 'YES' IN E1 - E8 YES 1 - NO 3 E38	WAR N-ING I	E10 Did he/she have any other problem? IF SO, what?	E11 Did you think that (SYMPTOMS) were serious?	E12 Husband? Family member? Neighbor? Someone else? Who?	E13 Someone in the health post/center? The midwife? The doctor? The pharmacist? Someone else? Who?	E14 What medicine, home remedies or treatments did the child receive or were done for him/her? PROBE: medicine, oral rehydration, herbs, baths, change of diet
Yes ①	No 3	Yes ①	No 3	Yes ①	No 3	Yes ①	No 3	Yes ①	No 3	Yes ①	No 3	Yes ①	No 3	
When did (SYMPTOM IN E1 - E8, E10) begin?														
days ago 1	1	1	1	1	1	1	1	1	1	1	1	1	1	
weeks ago 3	3	3	3	3	3	3	3	3	3	3	3	3	3	
During which days (he/she had other problem/serious symptom/ saw someone/did something)?														
NOTE CODE IN EACH DAY WITH PROBLEM														
NOTE 'X' IN EACH DAY SERIOUS														
NOTE CODE IN EACH DAY FOR EACH PERSON (UP TO 2 PER DAY) OR TREATMENT (UP TO 3 PER DAY)														
PERSONS PROVIDERS TREATMENTS														
How long or how many days did (SYMPTOM IN E1 - E8) last? Does (NAME) still have (SYMPTOM IN E1 - E8)?														
NOTE 'X' IN EACH DAY WITH SYMPTOM														
OR NOTE 'X' IN THE FIRST AND LAST DAY WITH SYMPTOM AND CONNECT THEM WITH A LINE														

	E1 Constant cough	E2 Boiling of the chest	E3 Pant- ing	E4 High fever	E5 Weakness	E6 Dia- rrhea	E7 Blood in stools	E8 Vomit- ing		E10 Other prob- lem	E11 Serious symp- toms	E12 Persons	E13 Providers	E14 Treatments
14 days ago	X								14 days ago					
13									13					
12									12					
11									11					
10									10					
9								X	9			1		9
8				X				X	8					9
7								X	7					9
6									6					13 29
5									5					13 29
4						X			4					39
3				X		X			3					39
2									2					
1									1					
Today 0	X								Today 0					

E10 CODES	E12 CODES	E13 CODES	E14 CODES
01. Rash 02. Redness 03. Headache 04. Empacho 05. Swelling 06. Worms 07. Eye problem 08. Ear problem 09. Throat problem 10. Lung problem 11. Dizziness/fainting 12. Mucus, sneezing 13. Didn't eat 14. Didn't sleep 15. Susto 16. Other, (specify)	01. Husband 02. Mother 03. Mother-in-law 04. Sister 05. Sister-in-law 06. Other female relative 07. Male relative 08. Other (specify)	01. Traditional midwife 02. Trained midwife 03. Private doctor 04. Private nurse 05. Someone in the health post/center 06. Curer 07. Injectionist 08. Masseuse/bonesetter 09. Herbalist 10. Pharmacist 11. Witch/spiritist 12. Promotor 13. Other (specify)	01. Apply heat 02. Change of diet 03. Set bones 04. Treat wounds/burns 05. Herbs/herbal teas 06. Other home remedies 07. Injection 08. Raise the fontanelles 09. Medicine 10. Prayer/special ceremony 11. Oral rehydration (packets) 12. Massage 13. Steambath/ bath 14. Ointments 15. Other, (specify) 21. Second traditional midwife 22. Second trained midwife 23. Second private doctor 24. Second private nurse 25. Second person in the health post/center 26. Second curer 27. Second injectionist 28. Second masseuse/bonesetter 29. Second herbalist 30. Second pharmacist 31. Second witch/spiritist 32. Second promotor 26. Second other home remedies 36. Third other home remedies 46. Fourth other home remedies 56. Fifth other home remedies 66. Sixth other home remedies 76. Seventh other home remedies 86. Eighth other home remedies 29. Second medicine 39. Third medicine 49. Fourth medicine 59. Fifth medicine 69. Sixth medicine 79. Seventh medicine 89. Eighth medicine