

# Preferences for Treatment of Diarrhoea and Dysentery in Kaengkhroi District, Saraburi Province, Thailand

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## ABSTRACT

To estimate the proportion of cases missed in a passive surveillance study of diarrhoea and dysentery at health centres and hospitals in Kaengkhroi district, Saraburi province, Thailand, a community-based cluster survey of treatment-seeking behaviours was conducted during 21-23 June 2002. Interviews were conducted at 224 households among a study population of 78,744. The respondents reported where they sought care for diarrhoea and dysentery in children aged less than five years and adults aged over 15 years. Health centres or hospitals were the first treatment choice for 78% of children with dysentery (95% confidence interval [CI] 63-94%), 64% of children with diarrhoea (95% CI 54-74%), 61% of adults with dysentery (95% CI 40-82%), and 35% of adults with diarrhoea (95% CI 17-54%). A high degree of heterogeneity in responses resulted in a relatively large design effect ( $D=3.9$ ) and poor intra-cluster correlation ( $\rho=0.3$ ). The community survey suggests that passive surveillance estimates of disease incidence will need to be interpreted with caution, since this method will miss nearly a quarter of dysentery cases in children and nearly two-thirds of diarrhoea cases in adults.

**Key words:** Diarrhoea; Dysentery; Cluster survey; Passive surveillance; Healthcare-seeking behaviour; Thailand

## INTRODUCTION

An understanding of preferences of patients for treatment is useful in various biomedical studies. One example is surveillance studies that depend on passive health facility-based surveillance. Passive surveillance makes use of the existing healthcare structures and detects

episodes of diarrhoea which lead the patient or care-taker to a request for treatment. In contrast, during active community-based surveillance, each eligible individual in the catchment population is asked at daily or weekly intervals whether he or she had diarrhoea during the preceding interval. Rates of diarrhoea estimated through active surveillance tend to be higher than rates detected by passive surveillance, since many episodes of diarrhoea are not severe enough to require treatment or are treated outside the surveillance system. A recent study in Viet Nam found that the rate of incidence of diarrhoea in children aged less than five years detected by active surveillance was about twice as high as the rate detected by passive surveillance (1). Once the percentage of disease

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episodes captured by passive surveillance has been estimated, a more accurate interpretation of incidence rates derived from such surveillance becomes feasible.

Knowledge about the patient's choice of provider is also essential background information for studies that measure the cost of illness. To compare the costs of a specific disease borne by the government with the costs of that disease borne by society as a whole, one has to know how many patients use governmental institutions and how many seek treatment from other healthcare providers, such as private practitioners, traditional healers, or private pharmacies. Finally, policy studies concerning the best allocation of resources for specific diseases require information about where patients seek care.

In preparation for large studies of diarrhoeal diseases due to *Shigella* in six Asian countries, the International Vaccine Institute has developed a rapid community-based survey to estimate the proportion of diarrhoea and dysentery patients in the catchment area who could be missed by passive surveillance. The rapid survey was tested in Kaengkhoi district, Saraburi province, Thailand, in conjunction with a three-year passive surveillance study for shigellosis which is based on a previously-published generic protocol (2). We carried out the community-based survey to estimate preferences of patients for treatment of diarrhoea and dysentery in the catchment area of the passive surveillance study.

## MATERIALS AND METHODS

### Study population

The catchment area for the shigellosis surveillance study is located in Kaengkhoi district, Saraburi province, Thailand, approximately 100 km north of Bangkok. The area includes a small city surrounded by rural villages that depend on agriculture for income. Data from the 2002 census maintained by government healthcare officers show a total population of 78,744 in the catchment area, including 5,006 (6.4%) children aged less than 60 months. The residents live in 19,786 households (mean household size 4 persons).

The healthcare system in Kaengkhoi district of Saraburi province has three tiers. The first contact with the healthcare system is the community health centre, a free-standing structure staffed by one or more nurse(s)

who provide basic health services, stabilize emergency patients for transport elsewhere, and perform uncomplicated deliveries. The community health centre is not intended to admit patients overnight. There are 20 community health centres in the catchment area of the shigellosis surveillance study.

Patients who cannot be adequately cared for at the community health centre are transferred to the next, second level at the district hospital in Kaengkhoi, which is staffed by internists, paediatricians, and surgeons. Patients who require sub-specialty services or therapies not available in the district hospital are transferred to a third tier, the provincial hospital located near Kaengkhoi.

Some doctors working in the government hospitals earn extra income by seeing patients at their private clinics in the evenings. A survey conducted in 2000 found 16 private clinics in the study area. Not all patients seek care at public or private clinics; some patients treat themselves with biomedical or traditional products.

Biomedical self-treatment consists of medication purchased from a drug vendor or leftover from a previous visit to the community health centre. Traditional self-treatment for diarrhoeal diseases consists of locally-collected 'herbs', such as guava leaves or tree bark from which infusions are prepared.

In the catchment area, there are numerous drugstores, shops, and market stalls selling medications: we refer to these collectively as 'drug vendors'.

Following the change of government in 2001, a single user fee of 30 Baht (US\$ 0.75 based on the January 2003 exchange rate) was introduced for each contact with the government healthcare system. The first visit must occur at the community health centre where the resident is registered. If patients seek care at a community health centre where they are not registered or from a hospital without a referral from their community health centre, the user fee is several times higher. Because of this scheme, the first contact with the government healthcare system in the catchment area is nearly always with the community health centre where the patient is registered. All community health centres, the district hospital, and the provincial hospital are participating in the ongoing passive surveillance study; for the purpose of our

survey, these were classified as study treatment centres. Private practitioners do not participate in the 30 Baht scheme, but are usually compensated by state or private insurance.

### Survey method

Our survey, conducted during 21-23 June 2002, was based on a simplified 2-stage cluster sampling method (3,4). We defined 22 clusters as primary sampling units based on the catchment area for the 20 community health centres and the two hospitals participating in the passive surveillance study. In each of the clusters, 10 households were randomly selected; except for one cluster in which 14 households were selected. A household was defined as the group of people which make use of one kitchen. Kaengkhoi district is mostly rural, and few households share a dwelling. Either the household head or their representative was interviewed in each household.

### Questionnaire

The questionnaire used in this study has been described previously (5). The survey questionnaire was designed to address several hypotheses: first, we hypothesized that the use of the healthcare system would differ for children compared with adults; second, we hypothesized that the use of the healthcare system would differ for individuals with diarrhoea compared with individuals with dysentery. A case of diarrhoea was defined as an individual with 3 or more bowel movements during a 24-hour period. A case of dysentery was defined as an individual with any loose bowel movements containing visible blood. To test our hypotheses, the same questions regarding the sequence of healthcare were asked for a child with diarrhoea, an adult with diarrhoea, a child with dysentery, and an adult with dysentery. In the absence of an actual diarrhoea case in the household, the respondent was asked about their potential behaviour in hypothetical situations. Respondents who did not mention the study treatment centre as their care provider of choice were asked to explain why.

### Analysis

The questionnaire data were double-entered into FoxPro (Microsoft, USA), and the data were cleaned. The means were calculated for each cluster and then weighted according to the cluster population. Confidence intervals were calculated for weighted cluster

means (4). Stata 7 (Stata Corporation, USA) and Excel spreadsheets (Microsoft, USA) were used for data analysis.

### Ethics

Verbal consent was obtained from each participant following receipt of information about the purpose of the questionnaire. The study received approval from the Ethics Committee of the Ministry of Health, Thailand, and from the Secretariat Committee for Research Involving Human Subjects, World Health Organization, Geneva, Switzerland.

## RESULTS

In total, 224 household heads or their representatives approached agreed to answer the study questions. The respondents included 109 (49%) household heads, 59 (26%) sons or daughters of the household head; 52 (23%) cousins of the household head, and 4 (2%) parents of the household head. More than two-thirds of the respondents (154/224; 69%) were male.

The majority of the respondents stated that their first choice for treatment for diarrhoea or dysentery was a study treatment centre (Fig.). However, the responses differed by age of patient and severity of illness. The study treatment centre was the treatment option of choice for 78% of children with dysentery (95% confidence interval [CI] 63-94%), 64% of children with diarrhoea (95% CI 54-74%), 61% of adults with dysentery (95% CI 40-82%), and 35% of adults with diarrhoea (95% CI 17-54%). Purchase of biomedical drugs from a vendor was the second most frequent treatment option, and this also varied by age of patient and severity of illness: 47% of adults with diarrhoea (95% CI 22-72%); 23% of adults with dysentery (95% CI 10-36%); 18% of children with diarrhoea (95% CI 10%-27%); and 9% of children with dysentery (95% CI 2-15%). The third most frequent treatment option was self-treatment. Only a small proportion of the respondents stated they would seek care from private practitioners, use traditional self-treatments, or seek care from other healthcare providers, such as hospitals outside the catchment area. There were no significant differences in replies provided by male respondents compared to female respondents. The treatment-seeking behaviour was highly variable between clusters. The high degree of heterogeneity in responses resulted in a relatively large

design effect ( $D=3.9$ , not weighted) and poor intra-cluster correlation ( $\rho=0.3$ , not weighted).

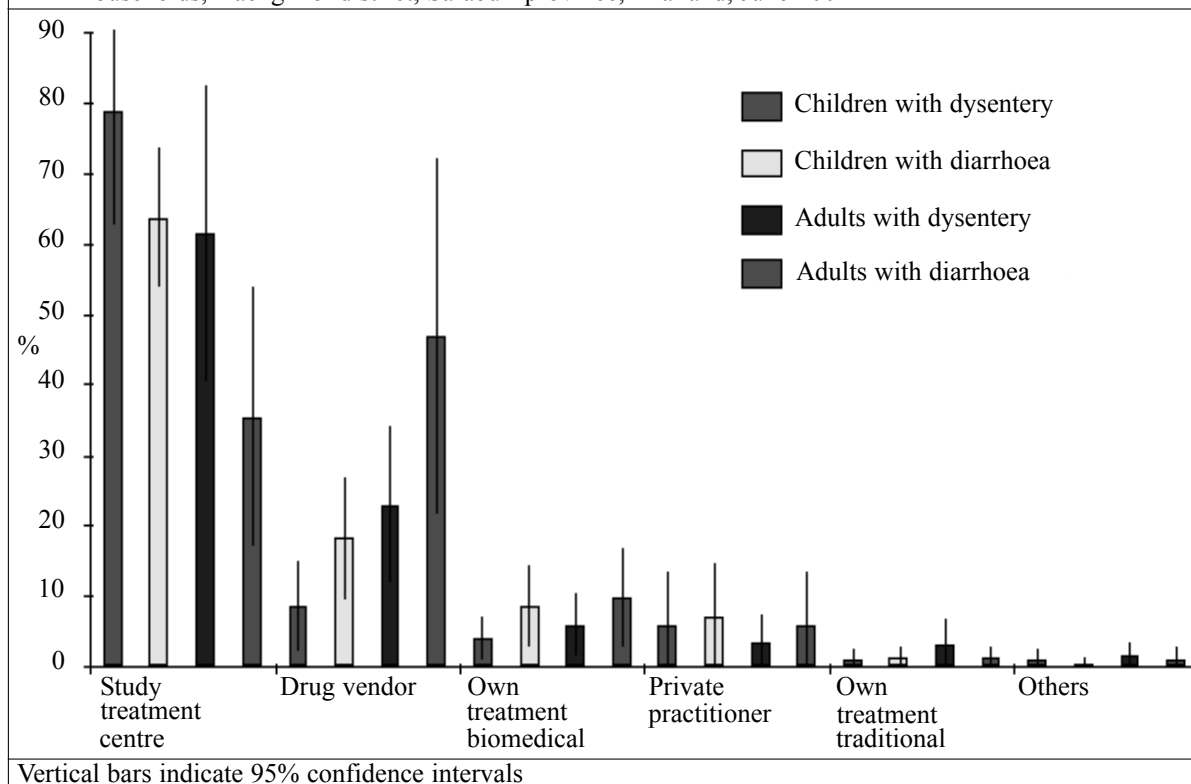
Of the 224 households interviewed, the number of households in which there was a patient in the previous four weeks was 7 (3%) for a child with diarrhoea, 1 for a child with dysentery, 37 (17%) for an adult with diarrhoea, and 7 (3%) for an adult with dysentery. Of the 37 adults who had diarrhoea, 16 (43%; 95% CI 27-61%) purchased drugs from a drug vendor, 11 (30%; 95% CI 16-47%) attended a study treatment centre, and 10 indicated other treatment choices. The 95% CIs for responses concerning actual patients overlapped the 95% CIs of responses concerning hypothetical adult patients with diarrhoea, indicating no significant differences in the responses.

stated that it was too time-consuming to attend a study treatment centre; 10 (12%) stated that they had medication at home; 5 (6%) indicated that they had insurance coverage that does not pay for a study treatment centre visit but pays for a visit to a private practitioner; 4 (5%) stated that the quality of care at the study treatment centre was not satisfactory; and 2 (2%) stated that cost was the reason for not attending the study treatment centre.

## DISCUSSION

Several surveys from Thailand have reported health-care-seeking behaviour for diarrhoea. These studies were mostly concerned with children aged less than five years. A large-scale cross-sectional survey conducted in

**Fig.** Treatment choice of head of household for children and adults with diarrhoea or dysentery, survey of 220 households, Kaengkhroi district, Saraburi province, Thailand, June 2002



If a study treatment centre was not mentioned as the first choice, the respondent was asked to explain why. Of 85 respondents who provided a reason, 36 (42%) stated that there was no need for treatment because the disease was not severe enough; 15 (18%) stated that a study treatment centre was too far away; 13 (15%)

1989 in Nakhon Sawan province, a rural area of northern Thailand, found that when children, aged less than five years, had diarrhoea, 66% of their mothers sought help from health providers, 25% used drugs bought from vendors, and 2% used herbal treatments [6]. A longitudinal study conducted in a low-income community

in urban Bangkok during 1988-1989 found that 52% of mothers sought treatment for their children from the study team, hospitals, or health centres, 18% obtained treatment from drugstores, 17% used self-treatment, and 13% made use of private clinics (7). A large-scale survey conducted in 1987 reported that 59% of mothers did not seek treatment outside the home for children with diarrhoea (8). Healthcare use is likely to change from a rural to an urban setting and over time. Additional factors, including age of patient and severity of disease, seem to influence treatment-seeking behaviour. Our survey found that, depending on the severity of illness and age of patient, 35-78% of the respondents would first seek care at a community health centre or a hospital participating in the passive surveillance system. Because some patients visit multiple healthcare providers, the passive surveillance system may eventually capture a higher percentage of diarrhoea and dysentery patients, although microbiological detection of *Shigella* spp. may no longer be possible due to pre-medication.

A gradient in uptake of treatment provided at the study treatment centres was observed. The highest uptake was observed for children with dysentery (78%), with lower uptake for children with diarrhoea (64%) and adults with dysentery (61%), and low uptake for adults with diarrhoea (35%). This gradient is perhaps best explained by the perceived severity of the disease and the perceived vulnerability of patients (9). Blood in a bowel movement can be an alarming finding, triggering a more energetic response in seeking treatment than uncomplicated diarrhoea. Dysentery in a child may cause greater concern than finding dysentery in an adult. The survey respondents indicated that they would be more likely to bring a child than an adult with dysentery to a study treatment centre.

Respondents who do not indicate a study treatment centre as their treatment centre of choice were likely to purchase treatment from a drug vendor. Popular over-the-counter drugs sold by drug vendors include anti-motility drugs, such as loperamide, kaolin, and opiates; antibiotics, such as norfloxacin; and combination drugs, containing antibiotics and anti-motility agents. Oral rehydration solution (ORS) sachets are available for less than US\$ 0.10, but in contrast to antibiotics and anti-motility drugs, ORS sachets are not actively promoted by the vendors. While the purchase of medication is not necessarily cheaper than the fee at a community health centre, the time required to purchase drugs

is likely to be shorter. One would expect that self-treatment requires the least time, but this approach was only reported by 5-14% of the respondents depending on the scenario. Self-treatment tended to be more frequently used for diarrhoea than dysentery, which is consistent with the perceived severity of the disease.

One limitation of the study is the reliance on hypothetical cases, not real cases. We, therefore, compared the responses from actual patients with the responses to hypothetical scenarios. The only group with a reasonable number of real cases was adult patients with diarrhoea. Some 43% of the respondents with a recent adult diarrhoea case in the household indicated that the patient would buy medication from a drug vendor, which was not significantly different from the response for a hypothetical adult patient with diarrhoea. It is reassuring to see that when a comparison between hypothetical and actual treatment-seeking behaviour was possible, the hypothetical responses did not diverge from responses to actual cases.

The high degree of heterogeneity in responses between clusters resulted in wide confidence intervals. Future surveys in this population should take the design effect (3.9) into consideration for sample-size calculations. The proposed sample size would need to be multiplied by the design effect to produce a variance equal to that for a random sample. This finding may also be of interest to other research groups planning cluster surveys to assess the use of health services for diarrhoea. For example, the World Health Organization has recently published a protocol for a cluster sample survey to assess severe diarrhoea in children (10).

This survey suggests that surveillance based entirely on capture of cases in community health centres and hospitals in Kaengkhroi district will miss up to one-quarter of children with dysentery and nearly two-thirds of adults with diarrhoea. These limitations will need to be taken into consideration when rates of incidence of diarrhoea or dysentery in this part of Thailand are estimated using passive surveillance.

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