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Longitudinal study on the health status of children in a rural Tanzanian community: comparison of community-based clinical examinations, the diseases seen at village health posts and the perception of health problems by the population

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Summary

Standardised household interviews among adults and children, open-ended questionnaires, and clinical examinations administered during cross-sectional health status surveys, as well as the registers of village health posts (VHP), were used to assess the pattern of health problems of a rural community in southeastern Tanzania, and their results compared.

All four approaches gave very similar results for the two major health problems (fever/malaria and abdominal pain or discomfort) which were mentioned by both children and adults. The parasitological data from the cross-sectional surveys also revealed hyperendemic *P. falciparum* malaria and a high prevalence and incidence for infections with hookworm *(N. americanus)*, *Strongyloides*, and *G. lamblia*. However besides consistently revealing the two major health problems, each approach showed a distinct pattern for the additional health problems: household interviews and open-ended questionnaires resulted in a higher ranking of problems that had not yet been solved by the health care facilities available in the community at the time of the interview. This view was further biased by the fact that the interviews were done by people representing the health professionals. The statistics from the registers of VHP clearly reflected the types of treatment provided by this service. Malnutrition and various eye problems only became evident during the clinical examination of the population. However, the clinical examination did not identify the importance of the abdominal problems in the community.

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The cross-sectional survey (questionnaires, clinical examination) chiefly showed the health problems affecting the population around the time of the surveys (end of the dry season). Interestingly, the registers of the VHP did not show marked seasonal variations in the morbidity statistics for this community.

Both questionnaire approaches and the registers of VHP showed a change in both the morbidity and the disease perception pattern that may reflect the effects of interventions launched at community level (activities of village health workers, mass-treatment against hookworm and *G. lamblia*). The study indicated that the individual ranking of the major health problems matched with data from health status surveys. It also pointed to the possibility that disease perception patterns could become a tool for community diagnosis and for the monitoring of health care programs.

Introduction

International and national health circles supporting the strategy of "Health for All by the Year 2000" have in recent years identified the elements of "bottom-up planning", and "community participation" as prerequisites for "primary health care" (PHC). These elements are strongly interlinked. The "health for all" strategy is rooted in the priorities of a community and should direct the PHC approach either comprehensively (WHO, 1978) or selectively (Walsh and Warren, 1979, 1986). The priorities may change from one area to another and even from village to village, depending on the ethnological, socio-economic and political background. Furthermore, the priorities of the communities do not always match with the views of the professionals who plan and implement development programmes.

In the context of community development, health care constitutes only one aspect of community priorities, often not ranking as high as is expected by the planners involved. Transitional societies in developing countries are characterized by pluralistic health systems. The selection of the source of care in the event of illness is made from a wide range of therapeutic options (de Zoysa et al., 1984). Several social researchers have shown that the perceived cause of illness is a major determinant in the choice of source of treatment (Mwabu, 1986; Hielscher and Sommerfeld, 1985; de Zoysa et al., 1984). Disease entities can be defined in physiological or biological terms, but understanding illness strongly depends on cultural factors. This explains why the action taken by sick people in response to illness may not conform to health workers' expectations and the health intervention envisaged by health professionals, who base their action on disease prevalence, may not fulfill the expectations of the communities.

Community diagnosis is conducted to identify the needs and concerns of a community and to collect baseline data as requested by health planners. This usually implies extensive surveys by large teams to cover all aspects. This makes community diagnosis time-consuming and expensive, and consequently it cannot be repeated frequently nor carried out in many areas. Thus, health professionals often base their plans on a variety of assumptions about what they consider as being the health problems of a particular community. Health priorities have been mainly assessed either by health professionals, by social scientists or by development workers, but very rarely through an interdisciplinary approach.

The present paper describes the results of clinical examinations by health-professionals performed as part of yearly surveys undertaken to monitor the health status of children within a large rural community, Kikwawila village (Kilombero District, southeastern Tanzania) (Tanner et al., 1987b). As these surveys were a cornerstone of an applied research project within a PHC programme (STIFL/DHO, 1985), and included a study on behavioural factors associated with schistosomiasis transmission (Lwihula, 1985), a comparative analysis was made to appreciate better the child health problems of the community of Kikwawila. The results are compared with the disease pattern seen at village health posts (VHP).

Population, Material and Methods

Study area

The study was undertaken in the Kapolo and Kikwawila sectors of Kikwawila village (Kilombero District, Morogoro Region) which is situated in the Kilombero riverplain, southeastern Tanzania. The study area is described in detail by Tanner et al. (1987a).

Study population

The present study focuses on health problems determined by clinical surveys and as perceived by the population of Kapolo and Kikwawila according to the following approaches.

A. *Standardized household interviews* covering 244 households (out of 260) and 1148 people (out of about 1200 according to Tanner et al., 1987a). A complete description of these household interviews has been presented (Lwihula, 1985). All the interviews were conducted between September 1983 and July 1984. Questions concerning attitudes to health and health problems were asked only among villagers over six years of age; they represented about 70% of the population interviewed.

B. *Reasons for attendance,* recorded in the registers of the village health posts (VHPs). Since July 1982, two VHPs were functioning in Kikwawila village, one in the Kapolo sector and the other in the Kikwawila sector. The VHPs were run by two village health workers (VHWs) who had been given a two-week basic training course by the team of the District Medical Officer; their training was up-graded every six months by short courses of 5–10 days. A first evaluation of this Primary Health Care Programme has been prepared (STIFL/DHO, 1985). The data evaluated in this paper cover the years 1983 and 1984. Adults and children could not be separated for this evaluation since the VHP records often lacked indications of the age of the patients. Average attendance per villager and year was about 10 times. An average of 20 to 30 attendances per day per VHP was recorded from the registers.

C. *Standardized open-ended questionnaires,* as the first part of the repeated cross-sectional surveys performed in October 1982, 1983 and 1984. The methodology of these health status surveys is

described in detail by Tanner et al. (1987a, b). All children from 1 month to 15 years of age from Kapolo and Kikwawila underwent comprehensive examinations (between 550 and 600 each year). Based on the census data of 1982 (Tanner et al., 1987a), the estimated compliance rate was always over 90%. A cohort of 170 of these children could be followed for three consecutive years.

D. *Standardized clinical examinations* performed on the same children from Kapolo and Kikwawila and during the same repeated cross-sectional surveys as mentioned above (Tanner et al., 1987b).

Study design

A. *Standardized household interviews* were planned and supervised by one of the authors (GKL) and performed by two local women specifically trained for this purpose. The interviews constituted of open-ended and closed questions on village health problems, water contact behaviour, sanitation, and knowledge about schistosomiasis. The questionnaire was first designed in English and then translated into Swahili. It was tested by group interviews before starting the survey. Questions concerning health problems were all open-ended and designed to evaluate the perception of the health problems at personal and village levels. A detailed description of these interviews and an example of the questionnaires are presented in Lwihula (1985).

B. *Reasons for attendance* at VHPs were recorded daily in a special register by the VHW in charge of the consultations. All VHWs received the same training and up-grading, as well as fort-nightly supervision visits by a medical doctor. In each VHP, they were alternately in charge of the consultations but not with the same rhythm. During the whole period of study, they had only 8 drugs and dressing materials at their disposal. This set allowed them to treat malaria, "fever", headache, abdominal pains, diarrhoea and cough, and to look after small wounds. Severe cases and patients with other complaints had to be referred to the nearest dispensary at Kibaoni (2–8 km) or the District Hospital in Ifakara (15–21 km). The symptoms reported in the register of the VHP concern almost exclusively those for which therapeutic material was available. "Fever" and malaria, as well as abdominal pain and diarrhoea where not well differentiated by the VHWs and hence were grouped together in the evaluation.

C. *Standardized questionnaires* forming the first part of repeated cross-sectional health status surveys were filled in by medical assistant (MA) students assisted by local staff and VHW, asking each child or the mother/guardian for those under five years of age. The same group of MA students carried out these interviews during one survey, but there were different groups of MA students each year. Only one standardized open-ended question was asked in Swahili, and related to the last important health problem or disease episode. Around 80% of the children who had recent health problems mentioned only one. This question was part of the history taken from each child which also related to MCH attendance, immunization status (from the MCH card) and schistosomiasis related morbidity (haematuria, dysuria).

D. *Standardized clinical examinations* were performed by a medical doctor assisted by an MA. The results of these brief clinical examinations, lasting 3 to 4 minutes per child, were recorded on a precoded protocol. Both clinical examiners were always present, one examining the children and the other filling in the protocol. The whole team was not present at all surveys. Only one medical officer (EB) and the epidemiologist (MT) were present during all three surveys.

Health interventions

From 1982 to 1984 different interventions (sanitation campaign and mass treatment) and activities occurred in Kikwawila as an integral part of the project. They are described in detail elsewhere (Tanner et al., 1987a, b, this volume). PHC activities (mainly VHW and sanitation) covered the whole period of the study and were steadily improved (STIFL/DHO, 1985). Before 1982, the village had no health care facilities, and the patients had to go to the dispensary in Kibaoni (2–8 km west of the village) or the District Hospital in Ifakara (15–21 km). A latrine campaign was launched in 1983 which improved the situation in the village temporarily. The campaign was relaunched in the second half of 1984.

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Mass treatment with ornidazole (for intestinal protozoa) in Kapolo sector and with ornidazole and albendazole (for intestinal helminths) in Kikwawila sector only was offered to the population in April 1983. The impact of these interventions on the prevalence of related parasitic infections was mainly transient (Tanner et al., 1987b) but might have influenced disease perception. Several activities concerning schistosomiasis epidemiology and control occurred during the study period which focused the attention of the community on this disease and its symptomatology. These activities included regular snail surveys at potential transmission sites (Marti et al., 1985; Suter, 1986), human water contact studies (Lwihula, 1985) and transmission control activities in the Kikwawila sector (Suter et al., 1986; Suter, 1986).

Results and Discussion

The top five health problems reported in each of the four approaches performed in 1984 are ranked in Table 1. They are compared with the ranked prevalences of parasitic infections measured during the corresponding health status survey (Tanner et al., 1987b). Malnutrition, teeth caries, skin and eye problems were identified only by the clinical examinations.

In the statistics of attendance for all governmental health services of the Kilombero District (STIFL/DHO, 1985), the five top health problems were: malaria, respiratory tract infections, gastroenteritis, eye diseases, and skin diseases. Schistosomiasis was in the eleventh position, and malnutrition was not mentioned.

A. *The household interviews* revealed that health care, with a reported frequency of 4%, ranked only third among all village priorities, after tap water (68%) and latrines (11%). Among the health problems hookworm, diarrhoea/dysentery, and measles were mentioned as village priorities by adults and occupied the first three positions with a reported frequency of 20 to 28%. Malaria/fever was only reported as a major problem by 6% of the adults, and schistosomiasis by 7%. In contrast, the individual ranking of health problems revealed a different pattern among children and adults; fever/malaria, headache, and abdominal problems being of highest priority (Table 1, A).

As the interviews were conducted in Swahili, no attempt was made to see whether there was a different perception of health problems among the various ethnic groups present in this village (Tanner et al., 1987a). Furthermore, the role of traditional medicine was not investigated in this survey. The interviewers were probably already too familiar with, and too closely associated with, the official Tanzanian health care policy, which is essentially based on Western medicine. Some symptoms like joint pain, diffuse body pain, neuro-psychiatric disturbances, infertility or even diarrhoea would probably not have been reported because they are usually self-cured or treated by traditional healers as indicated by a recent study in Kenya (Mwabu, 1986).

B. *The pattern of symptoms of the patients frequenting the village health post* of Kapolo and Kikwawila in 1982, 1983 and 1984 is presented in Fig. 1. Fig. 2 (Kapolo) and Fig. 3 (Kikwawila) show the monthly variations (1983/84) of reported complaints of headache and fever/malaria.

Table 1. Summary table ranking the top five health problems encountered in the Kikwawila and Kapolo sectors in 1984: comparison of four different approaches (A–D) for their evaluation and comparison with parasitological data (E)

Rank	Approach							
	A Household interviews on individual health problems	B VHP registers		C Standardized question on individual health problems		D Clinical examinations	E Parasitological examinations 1984*	P (%)
	Kikwawila and Kapolo	Kikwawila	Kapolo	Kikwawila	Kapolo	Kikwawila and Kapolo	Kikwawila and Kapolo	
1	Fever/malaria	Fever/malaria	Headache	Abdominal problems	Abdominal problems	Splenomegaly	Malaria	77
2	Headache	Wound	Fever/malaria	Fever/malaria	Fever/malaria	Teeth caries	Hookworm	66
3	Abdominal problems	Headache	Wound	Schisto-somiasis	Headache	Skin infections	Schistosomiasis	58
4	Other health problems	Abdominal problems	Abdominal problems	Headache	Cough	Signs of malnutrition (skin, hair)	Strongyloidosis	25
5	Schisto-somiasis	Cough/chest	Cough	Cough	Schisto-somiasis	Eye problems	Giardiasis	17

A   among people >6 years of age
B   as recorded by village health workers at the village health posts (VHP)
C
D   } data from the cross-sectional health status survey among children in 1984 (cf. also Tanner et al., 1987a, b, this volume)
E
*   rank based on prevalence (P) among all 588 children attending the survey in 1984
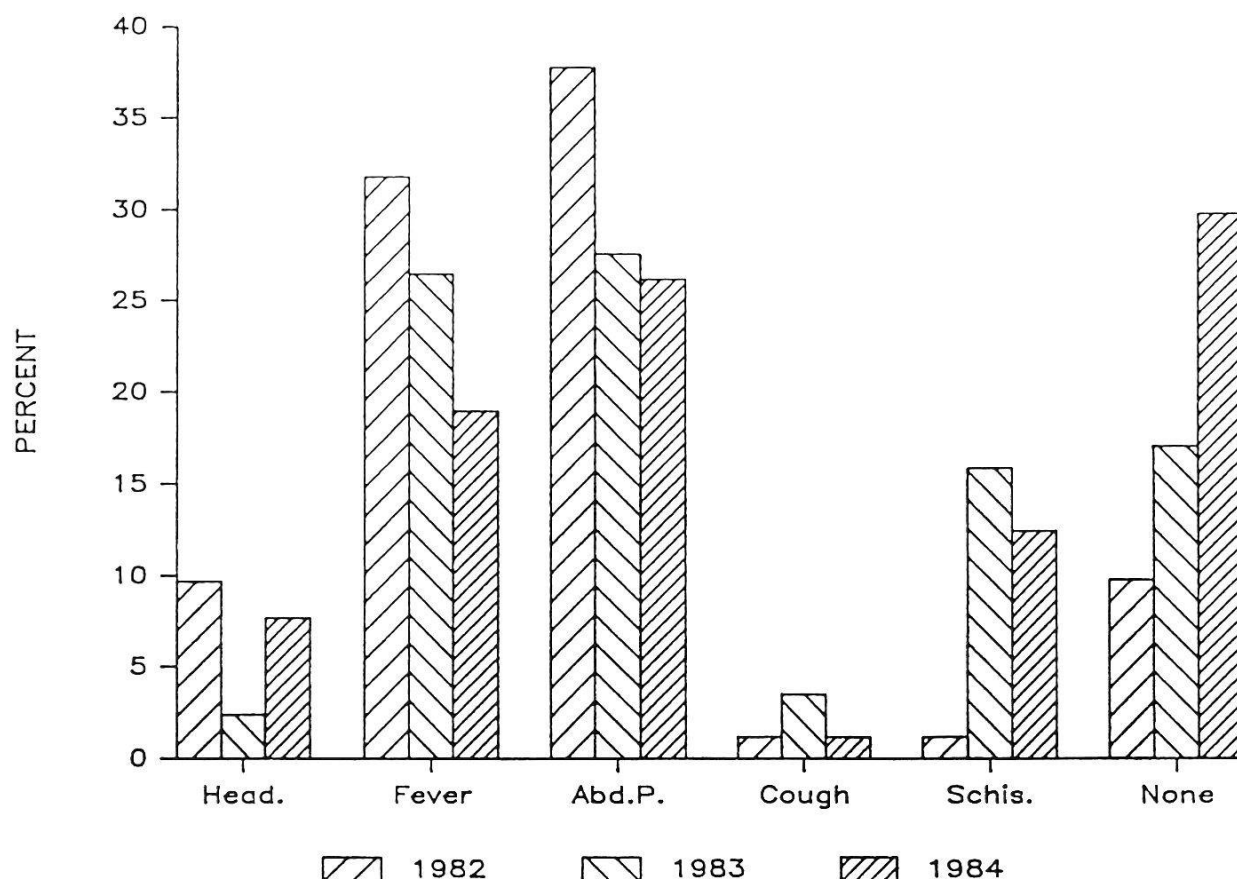
Fig. 1. Frequency of the symptoms recorded at the village health posts of Kikwawila and Kapolo in 1982, 1983 and 1984 (Head. = headache; Abd. P. = abdominal problems; Schis. = urinary schistosomiasis).

One fourth to nearly one third of all VHP consultations occurred because of small wounds. This curative service has definitely strengthened community participation and satisfaction. The inhabitants no longer had to lose half or whole working days (field work) by going to the next dispensary (2 to 8 km) or the district hospital in Ifakara (15 km). As this need was satisfied by VHP one could understand why wounds and skin infections were seldom recorded as a problem in the questionnaire of the health status surveys (see Table 2).

The fever/headache/malaria complex clearly dominated the pattern of complaints seen at both VHPs. However, VHWs faced great difficulties in differentiating between malaria and other diseases causing fever/headache, in order to allocate properly the drugs chloroquine and aspirin. During the regular supervisory visits to the VHPs, attempts were made to standardize the treatment, and teach VHWs the distinction between malaria and other causes of fever. This differentiation was hardly possible, on the one hand because the villagers and VHWs did not have a uniform conceptualization of signs and symptoms, and on the other hand, because VHWs did not have or take enough time to establish a diagnosis by thoroughly questioning the patients. In view of this problem, and of the fact that malaria was hyperendemic (Tanner et al.,
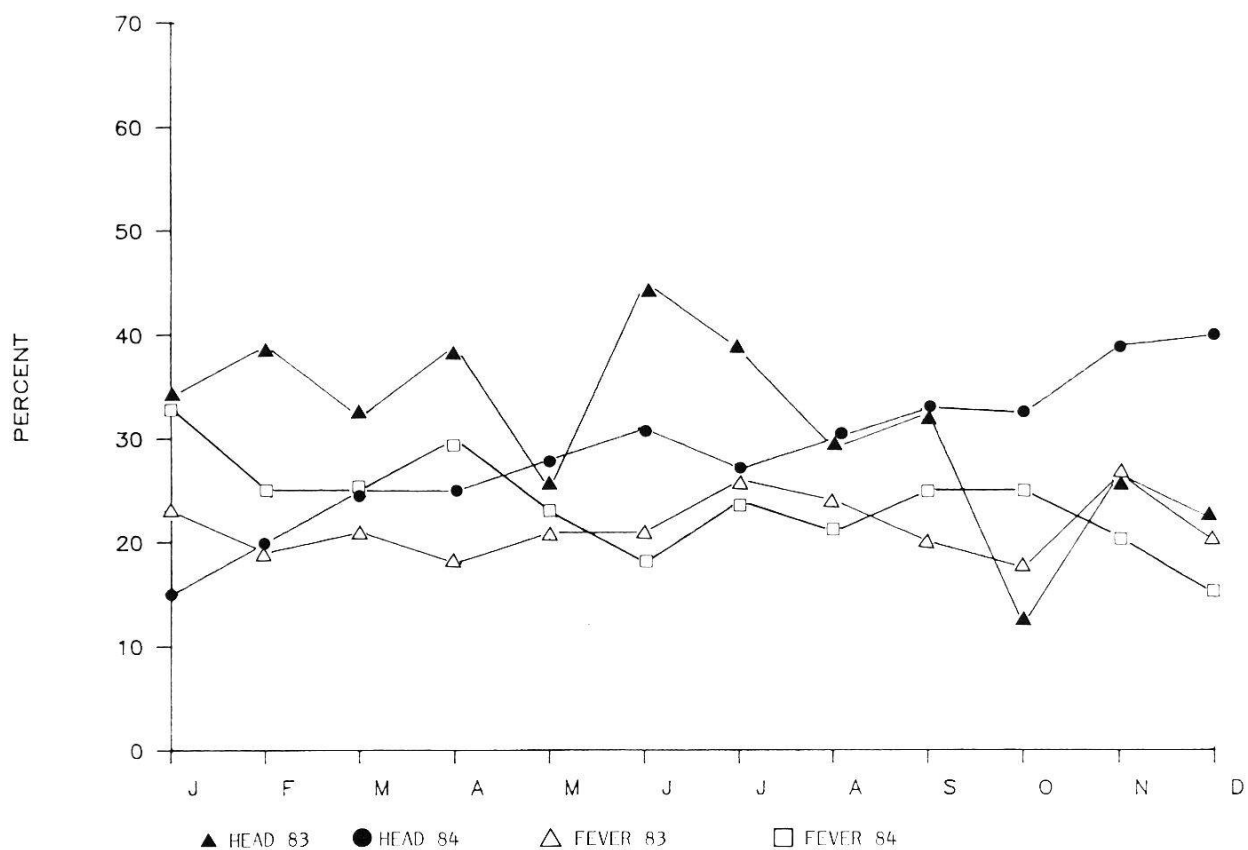
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Fig. 2. Monthly variations of headache (Head) and fever complaints registered at the village health post of Kapolo in 1983–1984.
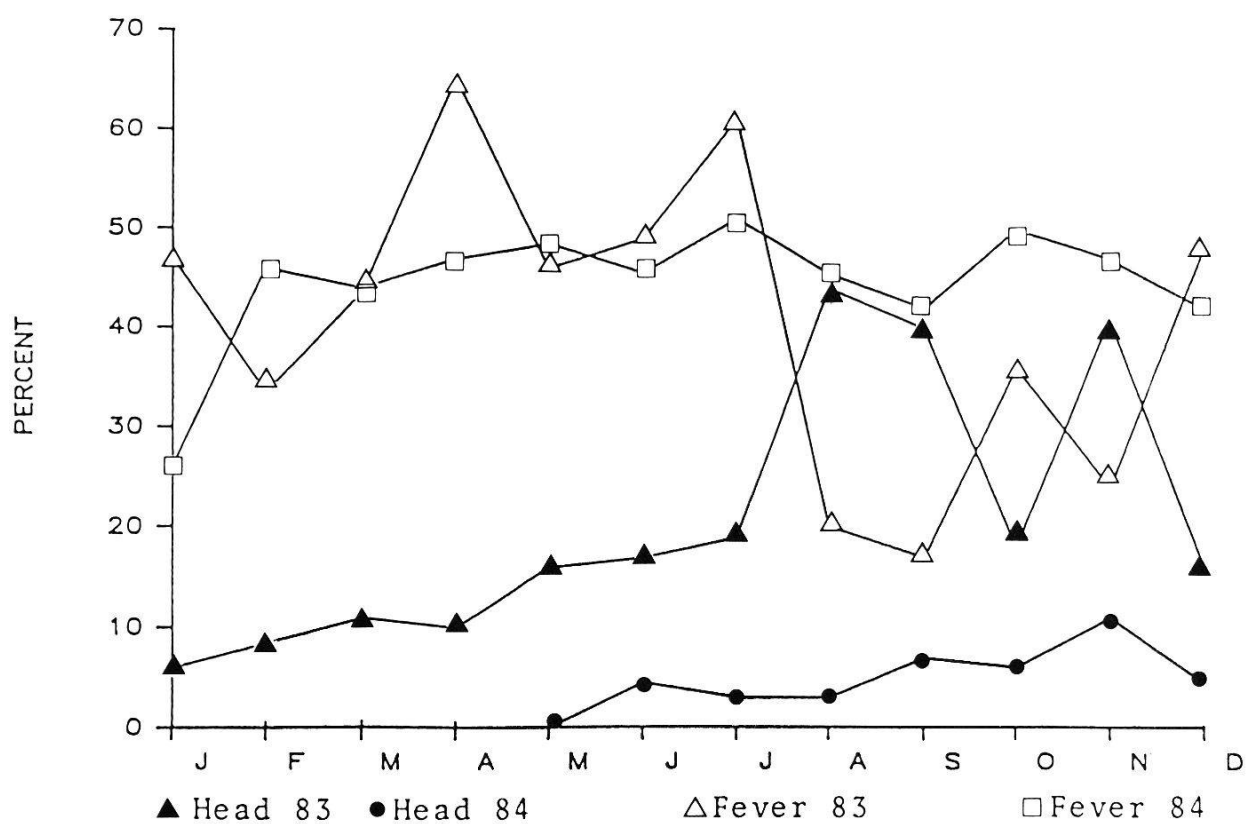

Fig. 3. Monthly variations of headache (Head) and fever complaints registered at the village health post of Kikwawila in 1983–1984.

1987b), the VHWs were trained during their up-grading course in June 1984 to use chloroquine mainly for feverish children under 10 years of age. This could explain the increase in frequency of headaches registered from July 1984 (see Fig. 2 and Fig. 3). Since headache, even more than fever (Jackson, 1985), is a prominent complaint in malaria attacks, confusion certainly occurred between these two symptoms, especially with older children and adults.

From July to December 1983, headache and fever frequencies varied in opposite directions in Kikwawila, reflecting the duty periods of the two VHWs in charge of the consultations; one obviously overestimated headache, while the other was quick to diagnose malaria (see Fig. 3). Such fluctuations in the interpretation of signs and symptoms of the fever/headache/malaria complex were not observed in Kapolo. There, a high frequency of headache and a surprisingly low frequency of malaria/fever was always registered compared to Kikwawila (see Fig. 1). No differences in major healths problems between Kikwawila and Kapolo were found when fever and headache were combined (see Table 1). This is consistent with the clinical and parasitological findings which did not reveal a difference in malaria transmission between the two village sectors.

Complaints of diarrhoea were never reported by more than 1 to 2% of those attending the VHP. Till June 1984, some diarrhoeal episodes were definitely registered as abdominal pain, due to the lack of specific inquiries and a common therapy management. Sulfadimidine, a drug included in the VHW programme of the Ministry of Health, was for a long time the only drug or remedy used against all kind of abdominal disorders at the VHP level. During the up-grading course of June 1984 an attempt was made to rationalize the management of intestinal problems by VHWs. Signs and symptoms of diarrhoea and abdominal pains were reviewed and guidelines established which recommended the treatment of abdominal pain with sulfadimidine and diarrhoea by oral rehydration therapy (ORT). The frequency of recorded diarrhoeal episodes remained very low during the whole period of study. One cannot exclude the possibility that diarrhoeal cases were not seen by VHW because patients preferred to use indigenous remedies.

The evaluation of the VHP registers did not show any relevant seasonal variations of the health problems (Figs. 2 and 3). An interruption in drug supply (September 1983) reduced the number of attendances, but did not change the pattern of symptoms recorded. An evaluation conducted in 1984 showed that an average of 5–10 patients per month (out of 500–600 attendances) were referred from each VHP to the next dispensary or the hospital. The main reasons for referrals were: abdominal pain; fever not responding to treatment; wounds not healing; severe diarrhoea; eye and skin problems; persistant cough (STIFL/DHO, 1985). Most referrals were justified. This confirms that the pattern of attendance at the health posts reflected the therapeutic possibilities available to the VHW (i. e. the drugs they had at their disposal) and the acceptability of VHW to the community.
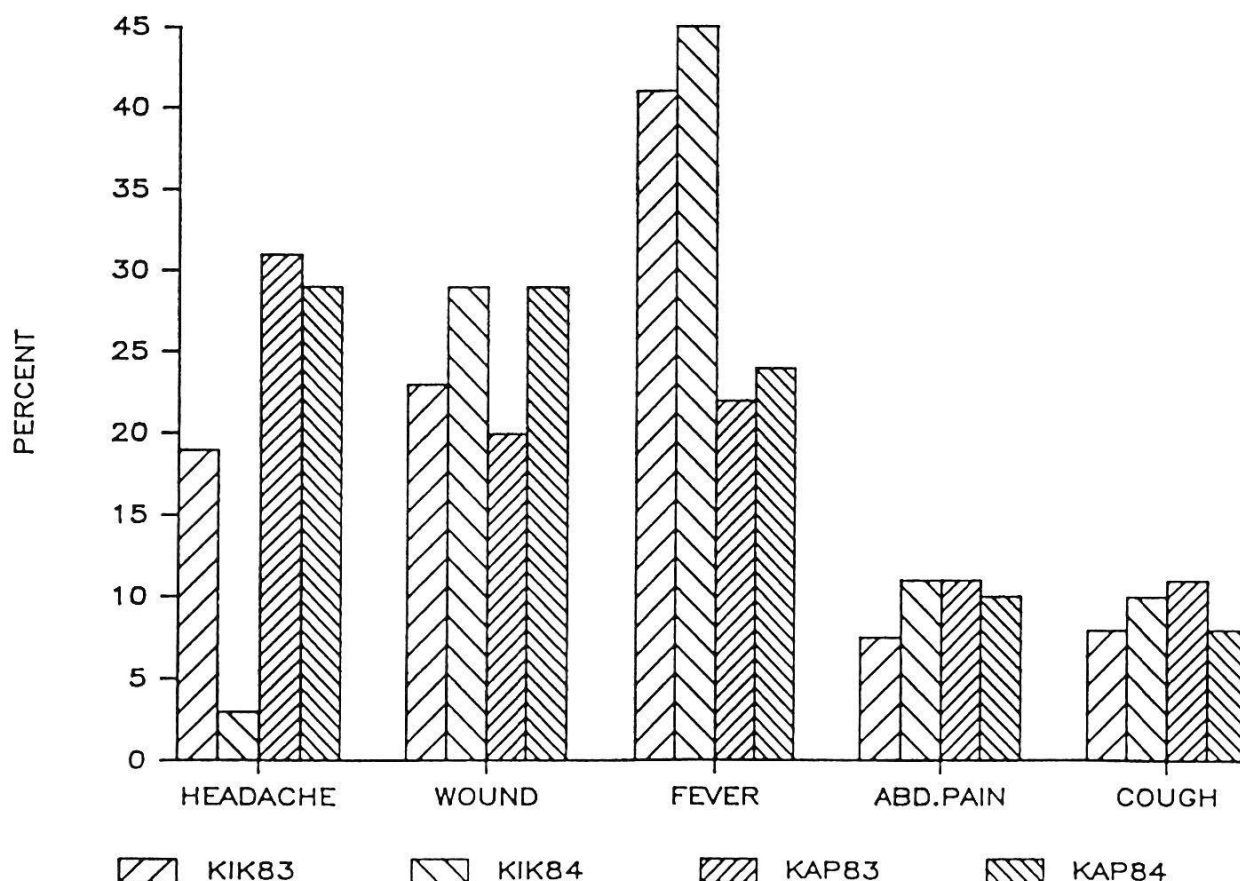
Fig. 4. Frequency of health problems as recorded by a standardized question addressed to 170 children of Kapolo (KAP) and Kikwawila (KIK) sector followed for three consecutive years (1982, 1983, 1984).

C. *The frequency of health problems* (Fig. 4) reported by the children of Kapolo and Kikwawila answering standardized open-ended questions as part of the health status surveys (1982–83–84) is shown in Table 2. There were few differences between health problems reported in the Kapolo and Kikwawila sectors. Abdominal problems, including in a small proportion diarrhoea, always occupied the first rank followed by fever/malaria and headache. Diarrhoea was either not mentioned (1984) or at a very low frequency (0,5 to 2%) as at VHP level. The answer to the question on "the number of stools passed yesterday", revealed that 15% (1983) and 25% (1982 and 1984) of the children answered that they had > 3 stools. If one looks at those reporting > 4 stools, the frequency dropped to 1% (1983) and 8% (1982 and 1984). There was a trend showing a slight decrease of the frequency of reported abdominal problems from 1982 to 1983 (Table 2); 1984 was still lower than 1982. It remains to be established if this reflects an effect of the interventions carried out in early 1983 (latrine campaign and mass treatment again intestinal parasites). The decrease of diarrhoea in October 1983 and the reversion in October 1984, estimated by the number of stools passed the day before the survey, could be related to a short-term effect of the mass treatment with ornidazole. A corresponding pat-

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Table 2. Frequency of individual health problems reported by a standardized open-ended question as part of repeated cross-sectional surveys in Kikwawila (KIK) and Kapolo (KAP) sectors*

Symptoms and signs	1982		1983		1984	
	KIK	KAP	KIK	KAP	KIK	KAP
N interviewed	336	220	338	213	375	213
Headache	7.7%	8.6%	2.4%	7.5%	6.4%	8.5%
Wound	0.3%	0.5%	0 %	0.5%	0 %	0 %
Fever/malaria	28.8%	32 %	26.6%	21.6%	17.9%	5.6%
Fever and abd. pain	5.1%	5.9%	2.4%	9.9%	0.5%	1.9%
Abdominal problem	36.6%	35 %	27 %	22.5%	31.7%	24.4%
Cough/chest	1.5%	1.8%	2.4%	1.4%	0.3%	3.8%
Schistosomiasis	1.5%	2.7%	18 %	14.1%	13.6%	2.8%
Other problems	8.1%	4 %	5.2%	3.7%	6.1%	2.3%
None	10.4%	9.5%	16 %	18.8%	23.5%	50.7%

* Standardized question: "What is your main health problem?"

tern was also observed in the evaluation of the parasitological and anthropo-metrical data (Tanner et al., 1987b, this volume). Major trends observed in Table 2 also concern fever/malaria which was gradually less reported from 1982 to 1984. There was also a steady increase of children with no health problems from 1982 to 1984.

Schistosomiasis was not recorded as a health problem in 1982, but was reported in 1983 and 1984 mainly among children from Kikwawila. This reflects clearly the research activities on schistosomiasis which covered the whole village in 1982 and 1983 but focused mainly on the Kikwawila sector in 1984 (Marti et al., 1985; Suter et al., 1986; Tanner et al., 1987a). When asked whether they often passed blood in their urine, between 23% and 37% of the children answered positively.

The similar trends and observations as seen with the cross-sectional data described in Table 2, applied to the cohort of 170 children which could be followed for three consecutive years. Only three children had no problems in any of the three surveys, and only 12 (8%) were without problems in 1983 and 1984.

None of the health problems mentioned related to a specific age or sex group, except for fever, which was more often reported among under-fives. This was paralleled by the malariometric findings, which showed a higher parasite rate and intensity among children who reported fever as their major health problem (cf. Tanner et al., 1987b).

D. *The clinical signs observed among the children* of the Kikwawila and Kapolo sectors during the repeated health status surveys were not significantly different from one sector to another. There was also no difference between the

Table 3. Frequency of clinical signs observed in a cohort of 170 children of Kikwawila and Kapolo during repeated cross-sectional surveys

Clinical signs		1982	1983	1984
Altered general status		7.0	6.5	0
Hair depigmentation		10.9	5.9	15.1
Skin:	xerosis/depigmentation	10.3	1.2	13.0
	infections	14.0	13.6	21.6
Eyes:	pallor	3.0	3.6	0.7
	infections	7.2	1.0	5.0
	scars	3.0	0	5.0
Tongue:	pallor	4.9	0	1.4
	glossitis	8.5	5.9	0.7
Teeth caries		24.8	24.6	23.1
Lymphadenopathies		3.6	2.4	11.6
Hepatomegaly		3.6	1.8	2.2
Splenomegaly		67.3	65.7	50.4

cross-sectional data from each year and those from the cohort of 170 children followed for three consecutive ones. The frequency of the most important clinical signs among this cohort of children is presented in Table 3. All children examined had at least one clinical sign related to a stated health problem. Compared to 1982, the clinical signs of malnutrition (skin and hair changes) were less frequent in 1983 but the situation reverted in 1984. This is consistent with the evaluation of the anthropometrical parameters (Tanner et al., 1987b). There was an association between hair depigmentation and skin depigmentation and/or xerosis (chi-square $p < 0.01$) and between hair depigmentation and stunting (chi-square $p < 0.01$) in 1982 and 1983. This association was no longer seen in 1984.

The decrease of the spleen rates in the cohort followed from 1982 to 1984 is probably related to the development of malaria semi-immunity with age. However, a trend of decreasing spleen and parasite rates was also observed in the cross-sectional evaluation and in all age groups. Fever/malaria was also reported as a health problem on standardized open-ended questionnaires (see Table 2). According to the registers of drug prescriptions at VHP, the average consumption of chloroquine per capita and per year in Kapolo and Kikwawila was very high; 40 tablets (150 mg base) in 1982 and 1983 and 32 tablets in 1984 (STIFL/DHO, 1985). As resistance to chloroquine is not yet predominant in this village (Tanner et al., in prep.), its widespread utilisation by the community could have had an influence on malaria transmission and, more important, on malaria morbidity. However, this drug pressure may also favor the development of chloroquine resistant *P. falciparum*. Consequently, attempts were made to reduce the prescription of chloroquine by better guidelines for fever

management (see above) during up-grading courses for VHWs from 1984 onwards.

Clinical signs of malnutrition and eye infections were more frequently recorded among under-fives. Eye scars were more frequent among older children. No pathognomonic trachoma lesions were detected, but the frequency of acute and chronic eye infections reached 10% in 1982 and 1984 (Table 3). Interestingly, in 1983 the frequency of eye infections in the Kapolo and Kikwawila sectors was only 1%, which could indicate that climatic conditions may have governed these problems. This differs from the findings of Berger and Salehe (1986) who found among schoolchildren of central regions of Tanzania that 21% were suffering from trachoma and less than 2% from various other eye infections.

The skin infections observed were mainly infected wounds, impetigo and skin ulcers (8 to 10%). Fungus and scabies, both around 3%, ranked second; scabies alone showed a decrease in frequency (0,2%) in 1983. In the central part of Tanzania, where water supply is more critical than in Kilombero district, the frequency of scabies among schoolchildren reached 7.1% (Berger and Salehe, 1986).

Conclusions

The present study compared four different approaches to recognizing and rating health problems within a community; two were part of repeated health status surveys (clinical examinations and standardized questionnaires), one involved the evaluation of the registers of village health posts (VHP) and a further one was based on interviews at household level. Each approach has its own biases which partly explains the discrepancies observed between them.

Diagnoses registered at VHPs reflect the therapeutic spectrum of this health service. For the standard questionnaires and the household interview, people were also influenced in their answers, particularly those concerning schistosomiasis, by the interests and activities of health professionals they were aware of behind the interviewers. Clinical examinations were the only approach which could underline the importance of chronic malnutrition and eye infections, but they failed to identify abdominal problems which were stated as a major concern to the community.

During interviews at household level or for surveys questionnaires, people certainly give a higher priority rank to problems which are not yet solved, or not satisfactorily, by the available health facilities. This could explain the first rank occupied by abdominal problems in standardized questionnaires, and the different ranking observed when priorities are evaluated at the village level rather than at the personal level of perception. On the other hand, it is assumed that in such interviews people most probably fail to mention, or underestimate, the problems they usually solve by self-care or traditional medicine, or which they

feel would not be well cared for by official health services (e. g. arthritis, diffuse body pain, neuro-psychological disorders). This might also apply to diarrhoea, which was reported with a low frequency during the whole period of study in spite of the inadequate water supply of the village. However, in Zambia (Warupa et al., 1985) and in Zimbabwe (de Zoysa et al., 1984), where gastroenteritis prevalence was high and indigenous remedies were often used, people mentioned this problem to interviewers. Furthermore, a low frequency of reported diarrhoea comparable to our study was found in central regions of Tanzania where water was even less available than in Kikwawila village (Berger and Salehe, 1986).

Health status surveys were always performed in October/November. Thus, their findings reflected only the health problems at this period of the year, which corresponds to the start of the short rainy season. Seasonal variations could therefore not be assessed, and the pattern could have been different if the surveys had been carried out at different periods. However, the analysis of VHP registers did not show any seasonal variations. This may have been because the diagnoses established by VHWs were not precise enough. Consistently, except for sporadic epidemics of measles, cholera and bacterial gastroenteritis, the disease pattern as recorded in the district hospital also showed no substantial variations from one season to another in the Kilombero district (St. Francis Hospital, 1984).

Health interventions, which included the activities of VHW, were launched during the initial phase of the project (Tanner et al., 1987a, b). The mass treatment against *Giardiasis* and hookworm infections were planned considering the results of the first health status survey. These interventions were appropriate because the health problems identified by health professionals were also perceived by villagers. Furthermore, sanitation campaigns and a gravity water supply project were launched as a long term intervention and as an answer to the overall village priorities. This may strengthen community participation in the future.

It is noteworthy that, even if only a slight improvement could be expected from these interventions in such a short period of time (18 months post intervention), the evaluation of VHP registers and questionnaires reflected a corresponding change of the pattern of disease perception by the community.

Despite the bias and constraints of each approach (and if one considers that most of the headaches reported at VHP were related to the fever/malaria complex), the four approaches gave almost identical results for the two top health problems (namely fever/malaria and abdominal problems). This applies also to parasitological examinations if one considers that hookworm, *Strongyloides* and *Giardia* infections are causing abdominal problems (Table 1).

As illness is a cultural conceptualization of disease and discomfort (Kleinman et al., 1978), the sensitivity of our approaches to evaluating health problems is certainly not optimal. A significant improvement could be expected by

studying in detail the perception of disease symptoms and signs among the indigenous people. This includes in-depth studies, in order to unravel for each tribe symptoms and signs of diseases. Haerdi (1964) collected many local names for diseases and symptoms used in the Ifakara region. Some, such as diarrhoea or arthritis, are missing. Others have various indigenous names which sometimes are very specific and describe the stage of the disease very precisely. Collaborative work with local ethnologists, anthropologists and traditional healers would most probably provide VHWs and other levels of the health services with much better diagnostic possibilities. These, in turn, could then be used to evaluate more accurately the communities' priorities (Cochrane, 1979). Such an approach would complement the picture of the health problems encountered in a community obtained by evaluating VHP registers and standardized household interviews performed by VHWs. Morever, in comparison to large cross-sectional surveys, the expectations of a village would be better reflected, the microcosms surrounding each VHP would be better assessed and the changes occurring in disease/illness perception among these communities during their development might be discovered.

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