@ Inequities among the very poor: health care for children in rural southern Tanzania

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Summary

Background Few studies have been done to assess socioeconomic inequities in health in African countries. We sought evidence of inequities in health care by sex and socioeconomic status for young children living in a poor rural area of southern Tanzania.

Methods In a baseline household survey in Tanzania early in the implementation phase of integrated management of childhood illness (IMCI), we included cluster samples of 2006 children younger than 5 years in four rural districts. Questions focused on the extent to which carers' knowledge of illness, care-seeking outside the home, and care in health facilities were consistent with IMCI guidelines and messages. We used principal components analysis to develop a relative index of household socioeconomic status, with weighted scores of information on income sources, education of the household head, and household assets.

Findings 1026 (52%) of 1968 children reported having been ill in the 2 weeks before the survey. Carers of 415 (41%) of 1014 of these children had sought care first from an appropriate provider. 71 (26%) carers from families in the wealthiest quintile knew ⩾2 danger signs compared with 48 (20%) of those from the poorest (p=0·03 for linear trend across quintiles) and wealthier families were more likely to bring their sick children to a health facility (p=0·02). Their children were more likely than poorer children to have received antimalarials, and antibiotics for pneumonia (p=0·0001 and 0·0048, respectively).

Interpretation Care-seeking behaviour is worse in poorer than in relatively rich families, even within a rural society that might easily be assumed to be uniformly poor.

Introduction

Health inequities occur at many levels: between regions of the world, between countries in regions, between provinces or states in countries, between districts, towns, or cities in provinces, and between social groups. Sub-Saharan Africa has the poorest overall health indicators of any region of the world.[1] Its estimated under-5-year mortality rate of 173 per thousand live births is almost twice that of south Asia, the second-highest mortality region, and nearly 30 times higher than the rate in developed countries.[2] Furthermore, uniquely among world regions, child mortality rates in sub-Saharan Africa seem to be increasing, partly because of AIDS, but also because of other diseases.[3]

In spite of this disturbing picture, few studies have been done to assess socioeconomic inequities in health in African countries. Such studies have important policy and programme implications. We searched Medline and found only 102 articles on equity or inequity in Africa, compared with 1151 in the Americas. Of these articles, virtually all had to do with equity issues relevant to health-sector reform and financing, or with inequities in South Africa, especially between ethnic groups. None of the studies described inequities in health outcomes or care-seeking behaviour in rural child populations. We use the term care-seeking following the usual convention, for what might better be termed care-obtaining: the part of health-seeking behaviour that is successful in obtaining the help that is sought.

The World Bank's health, nutrition, and population programme has supported re-analysis, focused on inequities, of the results of demographic and health surveys in several African countries.[4] These analyses include urban and rural populations, often showing important differentials between richer and poorer households in mortality, nutrition, and care-seeking behaviour. The results, however, have not been widely disseminated to a public health audience. The apparent lack of interest on equity issues in Africa by health researchers might arise from the erroneous perception that families living in rural villages are fairly homogeneous with respect to socioeconomic status. In rural Africa, signs of social or economic stratification are often hard for outsiders to recognise. For example, most houses are fairly simple constructions and inequalities in land tenure are not obvious.

Health inequity refers to health inequalities that are unjust according to some theory of social justice. Thus, the study of health equity involves a value judgment.[5] Awareness is increasing of the importance of development efforts that not only improve the overall burden of disease, but also measure the proportion of this burden borne by poor people and the difference in burden between rich and poor. The aim of these efforts is to work towards keeping inequity to a minimum while health problems are tackled through new initiatives.

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Baseline community surveys of families with young children are being done in three countries as part of the multicountry evaluation of the integrated management of childhood illnesses (IMCI) strategy.[6] IMCI combines prevention and treatment of the most common childhood illnesses into simple guidelines and messages for use in health facilities and households. Countries adapt these guidelines to meet their needs, and use them to train health workers, improve supervision, ensure essential drugs are available, and mobilise families and communities in support of child health. In a household survey in Tanzania of children younger than 5 years, we aimed to assess inequalities in the use of child health-care services with respect to sex and socioeconomic status in two districts in the early phase of IMCI implementation and in two others without this programme.

Methods

Study area

Kilombero, Morogoro Rural, Rufiji, and Ulanga Districts are in southern Tanzania (6–8° south, 36–39° east) and have a total population of about 1·2 million people.[7] Kilombero and Rufiji are low-lying (<300 m above sea level) and much of the land is in the fertile flood plain of the Kilombero and Rufiji rivers; Morogoro Rural and Ulanga have mountainous areas as well as low-lying plains. There are two main rainy seasons, October–December and February–May. There is a broad mix of ethnic groups: Swahili, the national language, is widely spoken. Most people are subsistence farmers whose farms are often located some distance from the family home and rely on periodically flooded alluvial soils. Major crops include rice, maize, cassava, millet, sesame, coconut, and cashew nuts. Most houses have wood-framed mud walls with thatched or corrugated roofs. Common water supplies are communal boreholes, natural spring or river water, and hand-dug wells. Most rural roads are unpaved and transport is difficult in the rainy season.

The public health system is a network of hospitals, health centres, and dispensaries, with 3300–7000 people served by each facility. More than 80% of health facilities are government-owned, although about half the facilities in Kilombero and Ulanga are provided by Roman Catholic and Lutheran missions. Over-the-counter drugs, including chloroquine, are widely available from private shops and kiosks. Many people also use traditional healers. Malaria, pneumonia, and waterborne diseases such as cholera and diarrhoea are the main health problems reported by health services and perceived by local people. At the time of the study, the policy for first-line malaria treatment was to give chloroquine to fever patients.

For Tanzania as a whole, in 1999–2000, expenditure on health per person was US$11·37, including private, out-of-pocket expenses.[8] The Gini coefficient, a measure of inequality in income ranging from 0 (equality) to 1 (total inequality), is 0·381, and the share of income of the lowest 20% is 6·9%.[9] 26% of Tanzanians lived on less than $1 per day during 1990–96.[10] Income data, however, can be difficult to interpret since a large proportion of families are involved in subsistence farming. In Kilombero and Ulanga, the median value of monthly household consumption and expenditure in 1997 in a sample of local households was under $100—of which about 75% was for food.[11]

We obtained a representative cluster sample of 2500 households from the four districts in July–August, 1999. 30 clusters were chosen from each of three of the districts and 35 clusters from Kilombero District. Villages were selected with probability proportional to size, and one kitongoji (subvillage, with about 100 households) was chosen at random from each selected village. Within each district therefore, every household had an equal chance of inclusion in the survey. We chose 20 households from each kitongoji using a modified EPI (expanded programme of immunisation) type scheme[12] that ensured an equal probability of selection for every household in the subvillage. The town of Ifakara in Kilombero District is the largest periurban area in the survey: the ten clusters in Ifakara have been omitted from the analysis so that all results refer to rural areas.

The study received ethics approval from the institutional review board of the Ifakara Health Research and Development Centre (IHRDC) and the national Tanzanian Medical Research Co-ordinating Committee.

Procedures

We administered a one-to-one modular questionnaire about the health of all children under 5 years to household heads who had given oral consent. We obtained information for proxy markers of household socioeconomic status such as household ownership of a radio, a tin roof, a bicycle, and the education and occupation of the household head. Carers of all children under 5 years were asked about their level of education and any illness the child had had during the 2 weeks before the survey, including what action had been taken. We defined ten key symptoms: fever, cough, diarrhoea, fast breathing, difficult breathing, convulsions, drowsiness, vomiting all ingested material, inability to drink or breastfeed, and difficulty drinking. For children who had been sick, further modules elicited information about use of appropriate (non-traditional) health-care providers such as village health workers, dispensaries, health centres, hospitals, or private doctors. We also asked about the care the child had received at each provider visited, and any other treatments the child had taken. We paid special attention to the care received by children with danger signs: fast breathing, difficult breathing, fits or convulsions, very sleepy, vomiting all ingested material, or inability to drink or breastfeed.[13] Carers were also asked whether or not they had regarded the child's episode as severe. A cough with fast or difficult breathing was classed as "probable pneumonia". "Severe diarrhoea" was used to describe diarrhoea accompanied by one or more of: fever; many watery stools; repeated vomiting; marked thirst; not eating or drinking well; blood in the stools; or child not getting better, getting more sick, or very sick. The questionnaire is available from the authors.

Fieldwork was undertaken by four teams of three interviewers, a supervisor, and a driver in July and August, 1999. Each team spent 2 weeks working in each district. The questionnaire was translated to Swahili, back-translated, pre-tested, and pilot-tested during fieldstaff training. Each supervisor accompanied one or two interviews each day.

Statistical analysis

FoxPro databases for each module of the questionnaire were linked, and selected data transferred to STATA (version 6) for analysis; the analytical plan was agreed by the investigators before analysis commenced. We adjusted for clustering using standard STATA commands for analysis of survey data, such as svymean and svylogit.[14–16] We repeated the analysis for one child younger than 5 years randomly selected from each household and found similar results to those found for all children (data not

	Categories	Number (%) (n=2006)
Sex	Boys	1008 (50%)
Age (years)	<1	489 (24%)
	1	401 (20%)
	2	385 (19%)
	3–4	731 (36%)
Socioeconomic status score*	Most poor	356 (20%)
	Very poor	369 (20%)
	Poor	355 (20%)
	Less poor	360 (20%)
	Least poor	373 (21%)

*Data missing for 193 children (10%), therefore denominator contains 1813 children.

Table 1: **Distribution of children by age, sex, and socioeconomic status**

shown). Few carers were able to estimate the distance travelled to reach a health facility—most responded by giving a time for their journey. Because these data showed a large amount of digit preference at 60 and 120 min, we chose a cut-off of 90 min for the analysis. The analysis was not restricted to children with complete data for all variables, but done separately for each variable. As a result, the number of children with missing data varies throughout the results.

To construct a relative index of socioeconomic status we combined household-level information on assets, income sources, and education. The main difficulty in constructing this type of index is the choice of appropriate weight for each item. We used principal components analysis to define these weights.[17] The index is the first principal component, since it summarises the largest amount of information common to the asset, income source, and education variables. The socioeconomic status score could only be calculated for children with complete data for all the components; therefore children with missing data for any component of the score had a missing score.

The survey included questions on dichotomous indicators of socioeconomic status: ownership of chickens or ducks (54% of households had one or more), a radio (41%), a bicycle (35%), a tin roof (23%), or other animals (11%); living in a rented rather than owner-occupied house (7%); whether the household head had an income apart from farming (29%); and whether the carer had an income apart from farming (10%). Additionally, the following variables were measured on a scale ranging from 0 to 2: number of mosquito nets owned (20% had one net and 23% had two or more) and education of the head of the household (22% had had 1–6 years of education and 57% had had 7 or more years).

The first principal component explained 22% of the variability in the ten variables and gave greatest weight to ownership of a tin roof (0·44), the household head having an income apart from farming (0·40), ownership of mosquito nets (0·40), ownership of a bicycle or radio (each had a weight of 0·34), renting a house (0·32), and the carer having an income apart from farming (0·30). The remaining three variables had smaller weights. The first three eigenvalues were 2·19, 1·37, and 1·05 and accounted for 22%, 14%, and 11% of the variation, respectively. Further details are available from the authors. We cross-validated the approach using ordinary least-squares regression to relate height-for-age (strongly related to socioeconomic status)[18] to the socioeconomic status score. The score explained 3% of the variation in height-for-age (r=0·1625, p<0·0001), and was a better predictor of height-for-age than were any of the individual components of the score. Equity was assessed by dividing the first principal component into quintiles, so that each household was classified as most poor, very poor, poor, less poor, or least poor in terms of socioeconomic status, with mean score (ie, first principal component) of –1·68, –1·01, –0·29, 0·61, and 2·30, respectively.

Role of the funding source

The sponsors of the study had no role in study design, data collection, data analysis, data interpretation, writing of the report, or in the decision to submit the paper for publication.

Results

The survey included 2246 households in 115 rural clusters in four districts: 21 households (1%) refused to take part, a further 137 (6%) were unavailable for interview. 1321 (63%) of the remaining 2088 households had one or more children under 5 years. 2006 children were included in the main analysis, of whom 1008 (50%) were boys and 489 (24%) were infants (table 1). The sample of children was broadly representative of the population[7] with regard to age and sex (data not shown).

In the 2 weeks before the survey, more than half the children reported an illness episode (1026/1968 [52%], data missing for 38 children), with a median duration of 3 days (table 2). Two-thirds of the children had had more than one of the ten key symptoms. There was no association between sex and reported prevalence of any symptom (table 3). Fever was the most common symptom, reported for 714 (36%, 95% CI 33–39) children in the previous 2 weeks. 180 children (9%, 8–11) had had diarrhoea in the previous 2 weeks; carers reported most episodes as severe. Probable pneumonia was reported in 84 (4%, 3–5) children. 199 of 1966 children (10%, 8–12) had been admitted to hospital in the year before the survey; admissions were more than twice as common in 1-year-old children (70/394 [18%]) than in 3–4-year olds (48/706 [7%]; p<0·0001).

Frequency of use of the formal health sector was higher than expected; 415 of 1014 children (41%, 37–45) who had been sick in the previous 2 weeks had been taken to an appropriate provider of care (table 3). We included subsequent visits in the analysis and the rate rose by 1% (data not shown). If only completed episodes were analysed, the rate of care-seeking increased to 50%, but the denominator was half its previous size (data not shown). The longer the duration of illness, or higher the number of symptoms, the more likely children were to

	Duration of illness (days) (n=985)					Number of key symptoms (n=905)			
	1	2	3	>4	p*	1	2	⩾3	p*
Number (%) of children	144 (15%)	176 (18%)	219 (22%)	446 (45%)	..	311 (34%)	304 (34%)	290 (32%)	..
Number (%) of ill children whose carers had sought care from an appropriate provider	19 (13%)	59 (34%)	85 (39%)	251 (56%)	<0·0001	84 (27%)	123 (40%)	190 (66%)	<0·0001

*F test for linear trend in proportions, using logistic regression with adjustment for clustering.

Table 2: **Care-seeking behaviour by number and duration of symptoms**

	Number (%) of children			
	n	Boys	Girls	p*
Morbidity and admission to hospital				
Fever in previous 2 weeks	1968	379 (38%)	335 (34%)	0·09
Diarrhoea in previous 2 weeks	1968	98 (10%)	82 (8%)	0·26
Severe diarrhoea in previous 2 weeks	1968	85 (9%)	67 (7%)	0·15
Pneumonia in previous 2 weeks	1968	44 (4%)	40 (4%)	0·71
All-cause hospital admission in previous year	1966	106 (11%)	93 (10%)	0·47
Care-seeking (seeking an appropriate provider)				
For fever without cough or diarrhoea	212	40 (34%)	33 (34%)	0·99
For diarrhoea	180	50 (51%)	51 (62%)	0·16
For severe diarrhoea	163	50 (56%)	48 (66%)	0·21
For cough	622	154 (49%)	146 (48%)	0·77
For probable pneumonia	83	32 (73%)	28 (72%)	0·94
For children with danger signs	309	100 (64%)	86 (57%)	0·21
For episodes perceived as severe	744	176 (47%)	176 (48%)	0·75
First source of care from an appropriate provider	1014	213 (41%)	202 (41%)	0·91
Case management				
ORS use in children with diarrhoea	180	18 (18%)	13 (16%)	0·66
Antibiotic use in children with probable pneumonia	84	9 (20%)	7 (18%)	0·73
Child with fever received appropriate treatment†	714	159 (42%)	145 (43%)	0·73
Compliance				
Compliance with recommended follow-up, referral, or treatment	446	180 (78%)	164 (77%)	0·84

*F test for heterogeneity, with adjustment for clustering. †This indicator includes all antimalarials, not only those prescribed by an appropriate provider.

Table 3: **Differences by sex in morbidity and care-seeking behaviour**

have been taken to an appropriate provider (table 2; p<0·0001, both variables).

Around a third of children with fever and no cough or diarrhoea and more than half the children with diarrhoea had been taken to an appropriate health-care provider. About half the children with cough and three-quarters of those with probable pneumonia had been taken to an appropriate provider. Among children with danger signs, 186 (60%, 54–66) had been taken to an appropriate provider, as had almost half the children whose carers thought their children had had a severe illness.

Appropriate case-management at health facilities was reported infrequently, with only about a fifth of children with diarrhoea having received oral rehydration salts (ORS) or those with probable pneumonia having received an antibiotic (table 3). Of children with a history of fever, 304 (43%, 38–47) had received antimalarials. Overall, children were referred at only nine of the 447 contacts with an appropriate provider (2%, 1–4) and were asked to return for a follow-up visit at 63 of 450 such contacts (14%, 11–18). Carers' reports of compliance with recommended follow-up, referral, or treatment suggested

	n	Socioeconomic status quintiles					
		Most poor	Very poor	Poor	Less poor	Least poor	p*
Morbidity and admission to hospital							
Fever in previous 2 weeks	1777	124 (36%)	131 (36%)	128 (37%)	134 (38%)	136 (40%)	0·65
Diarrhoea in previous 2 weeks	1777	34 (10%)	30 (8%)	33 (10%)	30 (8%)	32 (9%)	0·67
Severe diarrhoea in previous 2 weeks	1777	29 (8%)	27 (7%)	29 (8%)	22 (6%)	27 (7%)	0·46
Pneumonia in previous 2 weeks	1777	13 (4%)	8 (2%)	22 (6%)	18 (5%)	18 (5%)	0·11
All-cause hospital admission in previous year	1775	27 (8%)	30 (8%)	33 (10%)	43 (12%)	52 (14%)	0·0093
Carer's knowledge of care-seeking							
Knows $\geqslant 2$ signs for seeking care immediately	1218	48 (20%)	49 (20%)	52 (23%)	54 (24%)	71 (26%)	0·03
Number (mean, SD) of danger signs known of 12	1216	2·1 (1·05)	2·2 (1·16)	2·3 (1·28)	2·4 (1·24)	2·4 (1·18)	0·0005
Accessibility of health facilities							
Children travelling <90 min to attend a health facility	412	45 (60%)	39 (55%)	53 (65%)	51 (68%)	84 (77%)	0·02
Case management							
ORS use for children with diarrhoea	159	8 (24%)	5 (17%)	3 (9%)	3 (10%)	7 (22%)	0·69
ORS use in diarrhoea cases who attended a health facility	89	8 (50%)	5 (33%)	3 (16%)	2 (13%)	5 (21%)	0·03
ORS use in diarrhoea cases who had not attended a health facility	70	0	0	0	1 (7%)	2 (22%)	0·03
Antibiotic use in children with probable pneumonia	79	0	1 (13%)	4 (18%)	3 (17%)	7 (39%)	0·0048
Child with fever received appropriate treatment†	653	39 (31%)	43 (33%)	63 (49%)	47 (35%)	84 (62%)	0·0001
Compliance							
Compliance with recommended follow-up, referral, or treatment	407	60 (80%)	51 (75%)	66 (81%)	57 (76%)	79 (73%)	0·37

Data are number (%) unless otherwise indicated. *F test for linear trend in proportions, using logistic regression with adjustment for clustering. †This indicator includes all antimalarials, not only those prescribed by an appropriate provider.

Table 4: **Socioeconomic differences in morbidity and care-seeking behaviour**

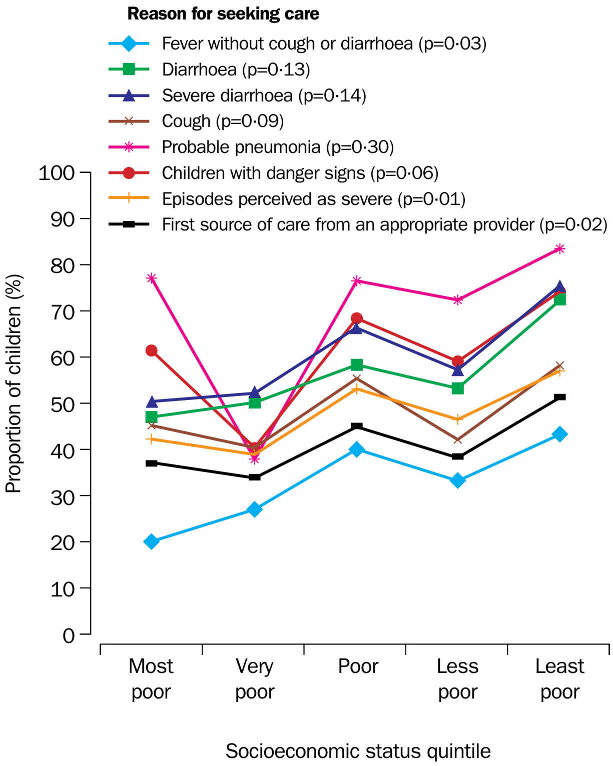
that more than three-quarters of children had followed the recommendations of the health-care provider.

There was no association between sex and any indicator of morbidity, care-seeking, case-management, or compliance with treatment or follow-up instructions, suggesting that boys and girls were treated similarly by carers and health workers.

Table 4 shows the results of analyses of inequities on the basis of socioeconomic status. There were no significant associations between socioeconomic status and reported prevalence of fever, diarrhoea, severe diarrhoea, or pneumonia. However, the rate of hospital admissions in the lowest socioeconomic status quintile was almost half that of the highest (test for trend p=0·0093). We repeated this analysis for hospital admissions for all causes except pneumonia, and obtained the same result (data not shown).

Carers' knowledge of which signs were dangerous was poor in all groups, but improved slightly with higher socioeconomic status. Two-thirds of children (301/452 [67%], 59–73) were reported to have travelled for less than 90 min to reach a health facility. Sick children with low socioeconomic status were a quarter less likely to have travelled less than 90 min to a health facility than those in the highest socioeconomic group.

There were positive associations between socioeconomic status and seeking care from an appropriate provider for fever without cough or diarrhoea (p=0·03), for episodes perceived as being severe (p=0·01), and for seeking care from an appropriate provider as the first source of care (figure; p=0·02; test for trend). In each case, the poorest group was at least a quarter less likely to have sought care than the least poor group. The associations between socioeconomic status and care-seeking for cough (p=0·09) and episodes with danger signs (p=0·06) were not significant, possibly because there were few children in each category. We restricted the analysis to episodes in the past 2 weeks that had already finished, and obtained similar results (data not shown).



Socioeconomic differences in care-seeking behaviour

Low socioeconomic status children who had attended a health facility were more than twice as likely to have been given ORS than high socioeconomic status children (table 4). Conversely, for children with diarrhoea who did not attend a health facility, the frequency of ORS use was higher in the least poor children than among the poorest. The frequency of antibiotic use for probable pneumonia in the children with lowest socioeconomic status was less than half that of the least poor. With respect to fever management, children in the lowest socioeconomic group were half as likely to have been given antimalarials as those in the highest category (p<0·0001). There were no associations between socioeconomic status and reported compliance with follow-up or treatment, and too few children were referred to allow subgroup analyses (data not shown). When the three compliance indicators were pooled, the lack of association with socioeconomic status persisted (table 4).

Discussion

In a very poor area of rural Tanzania, with high morbidity and mortality rates, our results suggest that the main difference between the poorest children and those who are better off is not in the likelihood of falling ill, but in the probability of obtaining suitable treatment once ill. Carers of children from wealthier families had better knowledge about danger signs, were more likely to bring their children to a health facility when ill, and were more likely to have had a shorter journey to the health facility than poorer families. Their children were more likely to have received antimalarials and antibiotics for pneumonia, and were more frequently admitted to a hospital. Only a few indicators were not affected by socioeconomic status: reported compliance with advice provided by a health worker and overall use of ORS. Children from poorer families were more likely to be prescribed ORS at a health facility than children from richer families. We did not find any evidence of differences between sexes in reported morbidity or in care-seeking behaviour. These findings accord with those of Gwatkin and colleagues.[4]

The frequency of disease was high; 52% of the children were reported as having been ill in the previous 2 weeks, which accords with the high mortality rates in the area.

The rates of use of formal health-care providers were considerably above those in other countries in sub-Saharan Africa; care had been sought for 41% of all children who had been sick. A non-traditional health-care provider had been sought for 55% of all cases of diarrhoea. The median care-seeking rate for diarrhoea was 29% in 34 demographic and health surveys in sub-Saharan Africa.[19] The three highest rates were noted in the 1992 Namibia demographic and health survey (67%) and the two Tanzanian surveys: 61% in 1992 and 56% in 1996, which accords with our finding that care-seeking is more frequent in Tanzania than in most other African countries.

Household surveys can help assess the performance of health systems. The low rate of use of ORS for children with diarrhoea who attended a health facility, and the low rate of use of antibiotics for those attending with probable pneumonia, indicate difficulties either with the performance of health-care workers, with drug availability, or both. Thus, case-management should be improved for diarrhoea and pneumonia.

Carers' reported compliance with recommended follow-up, referral, or treatment was very high; more than three-quarters of the children were reported to have followed the recommendations of the health-care provider. This rate is likely to be an overestimate of true compliance, since carers were asked whether they complied with their own recollection of health workers' instructions, rather than with what they had actually been told to do by health workers.

We assessed socioeconomic status using a wealth index based on a weighted sum of household assets, income sources, and level of education reached. This information was relatively easy to obtain, and the index showed surprisingly good discriminant power to reveal inequalities in health indicators, even in a small area with generally low socioeconomic status. We emphasise that this approach gives a relative measure of socioeconomic status within the area assessed. The resulting score cannot easily be compared directly with more conventional approaches to assessment of poverty or wealth by income or expenditure surveys. However, results of validation studies in Indonesia, Pakistan, and Nepal showed that principal components analysis provided an index that was at least as good in predicting school enrolment differentials as more conventional approaches based on expenditure.[17]

We have shown that care-seeking behaviour is worse among poorer families than among the relatively rich, even within a rural Tanzanian society that might easily be assumed to be uniformly poor. Such evidence for health inequities should inform programmes aimed at reducing overall average burden of disease, so that they include strategic components aimed specifically at simultaneously improving health equity.

Contributors

All authors contributed to the study conception and design.
J Armstrong Schellenberg coordinated fieldwork and supervised field data collection with A Mushi. D Schellenberg wrote the data management routines. J Armstrong Schellenberg analysed data, and wrote the first draft of the article with C Victora. J Armstrong Schellenberg, C Victora, A Mushi, D de Savigny, D Schellenberg, H Mshinda, and J Bryce critically revised the first draft for content and contributed to the final draft.

Other members of the Tanzania IMCI MCE baseline household survey study group

Conrad Mbuya and Leslie Mgalula (study design and training of field staff), Benedict Ngakuka (study design, staff training, and field supervisor), and Kesheni Senkoro (data manager).

Conflict of interest statement

None declared.

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