

Impact of Integrated Management of Childhood Illness on inequalities in child health in rural Tanzania

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We examined the impact of the Integrated Management of Childhood Illness (IMCI) strategy on the equality of health outcomes and access across socioeconomic gradients in rural Tanzania, by comparing changes in inequities between 1999 and 2002 in two districts with IMCI (Morogoro Rural and Rufiji) and two without (Kilombero and Ulanga).

Equity differentials for six child health indicators (underweight, stunting, measles immunization, access to treated and untreated nets, treatment of fever with antimalarial) improved significantly in IMCI districts compared with comparison districts ($p < 0.05$), while four indicators (wasting, DPT coverage, caretakers' knowledge of danger signs and appropriate careseeking) improved significantly in comparison districts compared with IMCI districts ($p < 0.05$). The largest improvements were observed for stunting among children between 24–59 months of age. The concentration index improved from -0.102 in 1999 to -0.032 in 2002 for IMCI, while it remained almost unchanged -0.122 to -0.133 in comparison districts. IMCI was associated with improved equity for measles vaccine coverage, whereas the opposite was observed for DPT antigens.

This study has shown how equity assessments can be incorporated in impact evaluation at relatively little additional cost, and how this may point to specific interventions that need to be reinforced. The introduction of IMCI led to improvements in child health that did not occur at the expense of equity.

Key words: child survival, socioeconomic factors, child health, equity, IMCI

Introduction

Very few studies have assessed trends in socioeconomic inequities in health, particularly in low- and middle-income countries (Victora et al. 2000). Of these, most studies have addressed cross-sectional status of inequalities in child health and access to interventions (Gwatkin et al. 2000). Earlier publications in Tanzania described inequities in child nutritional status, health careseeking and utilization (Armstrong Schellenberg et al. 2003; Mwageni et al. 2005)

This study is part of the Multi-Country Evaluation of the Integrated Management of Childhood Illness (IMCI) strategy. IMCI combines prevention and treatment of common childhood illnesses into simple guidelines and messages for use in first-level health facilities and communities. Primary care alone may not be sufficient for improving health equity (Bishai et al. 2005). Policies that emphasize a primary health care strategy can potentially worsen health inequalities temporarily, mainly because new public health interventions and programmes tend to reach those of higher socioeconomic status first

and later those of lower socioeconomic status (Victora et al. 2000). In addition to assessing the overall impact of IMCI (Armstrong Schellenberg et al. 2004a), the Multi-Country Evaluation also aimed to assess the impact of IMCI on health equity.

In this paper we examine the impact of the IMCI strategy on the equality of health outcomes and access across the socioeconomic gradient in rural Tanzania, by comparing changes in inequities between 1999 and 2002 in two districts with IMCI (Morogoro Rural and Rufiji) and two comparison districts (Kilombero and Ulanga).

Methods

A population-based survey was carried out between July and August 1999 in rural areas of the four study districts in South East Tanzania. The study area has been described in detail elsewhere (INDEPTH Network 2002; Armstrong Schellenberg et al. 2003). The districts are located at $6-8^{\circ}$ south, $36-39^{\circ}$ east and had a total population in 2002 of approximately 1.2 million people

(Government of Tanzania 2003). The details of the design of the study are described elsewhere (Armstrong Schellenberg et al. 2004a).

Briefly, a probability cluster sample of approximately 2300 households was selected from the four districts. Thirty rural clusters, each of 20 households, were chosen from three of the four districts and 25 clusters were chosen from Kilombero District. Villages were selected with probability proportional to estimated population size, and one *kitongoji* (sub-village, with approximately 100 households) was chosen at random from each selected village. Twenty households were chosen from each *kitongoji* using a modified EPI-type sampling scheme (Bennett et al. 1991) that ensured an equal probability of selection for every household in the sub-village. Ten additional peri-urban clusters in Ifakara town (in Kilombero District) have been omitted from the analysis described here so that all results refer to rural areas. Fieldwork was carried out in July and August 1999, and a second survey using exactly the same methodology was carried out in July and August 2002. Households were selected from the same villages (clusters) as in 1999. The chance of visiting the same household was small: in each village, a single sub-village (*kitongoji*) was randomly chosen and 20 households included. No survey staff visited a village that they had worked in during the 1999 survey. Quality control measures are reported elsewhere (Armstrong Schellenberg et al. 2004a).

A modular questionnaire about the health of all children under 5 years of age was administered to consenting heads of households. We obtained information for proxy markers of household socioeconomic status such as household ownership of assets, housing characteristics, education and occupation of the household head, household head and mother or caretaker's source of income. Caretakers of all children under 5 years of age were asked about their level of education and any reported child illness during the 2 weeks before the survey, including action taken. We also collected indicators for morbidity (2 week period prevalence of history of fever), nutritional measurements (weight and length or height), coverage of interventions [DPT (diphtheria, pertussis and tetanus), measles and polio vaccines both registered and informed, children sleeping under nets treated with insecticide in the last 6 months, and children sleeping under any net], caretaker knowledge of careseeking (knowledge of at least two child health danger signs and knowledge of feeding during illness) and home management of illness (children with fever receiving appropriate treatment). Additional information on indicators is available elsewhere (website on the Multi-Country Evaluation: [<http://www.who.int/imci-mce>]).

Children were weighed on digital scales (Seca Vogel & Halke GmbH & Co, Hamburg, Germany) and their height (≥ 2 years) or length (< 2 years old) was measured using locally-made instruments. For convenience, both length and height will be referred to as height. Weight for age and weight for height z-scores were calculated with

reference to the US National Centers for Health Statistics (NCHS) standards using the EPINUT module of EPI-Info v6.0 (CDC Atlanta, Georgia, US). Underweight, stunting and wasting were defined respectively as weight-for-age, height-for-age and weight-for-height z-scores of less than -2 , excluding outliers (z-score of < -5 or > 3). Because stunting is most prevalent at ages 24–59 months, and wasting at 12–23 months, analyses were carried out for these subgroups (WHO 1995).

Data sets from the 1999 and 2002 surveys were double entered and checked for consistency in Foxpro for Windows. They were then transferred to STATA 8.0 for statistical analysis. Variables from the two data sets were individually coded, recoded and labelled appropriately. All analyses took into account the clustered nature of the data by employing *svy* procedures in Stata.

We created an index of household wealth for each survey based on household characteristics, ownership of assets, household head and maternal income, and educational level of the head. Household level characteristics included ownership of the house and type of roofing. Household assets comprised ownership of radio, bicycle, nets, animals such as cows, goats, sheep, donkeys, and chicken and ducks. Household head and maternal income variables included whether they had income from any activities apart from farming such as masonry, petty business, fishing, driving or employment in other formal sectors. The numbers of years of schooling for both the head and mother or caretaker were categorized as none, one to seven for primary and eight or more for secondary education and above. The household wealth index was the weighted sum of household characteristics, different consumer durables owned by the household, income and number of years of schooling. The weights for the variables in the index were generated by Principal Components Analysis (PCA) on the correlation matrix (Filmer and Pritchett 2001). In each survey, households were categorized into one of five equal sized groups from the most poor to the least poor.

To assess whether the implementation of IMCI had reduced inequalities, we calculated concentration indices (Wagstaff et al. 1991; Kakwani et al. 1997) for a selected list of key coverage interventions and nutritional status, and present all indicators as positive measures. The outcomes included anthropometric measures (not underweight, not stunted and not wasted) and vaccine coverage, caretaker knowledge, careseeking, mosquito net use and home management of illness. Ninety-five per cent confidence intervals for concentration indices are also presented. Differences between two concentration indices were tested using a t-test (World Bank, undated).

Concentration indices take values between -1 and 1 . A value of zero indicates that the health variable is equitably distributed across all wealth groups. A negative value indicates disproportionate concentration of the health variable among the poor. Health variables can be 'goods', such as intervention coverage, or 'bads', such as

mortality or malnutrition. Hence a negative concentration index is pro-poor in terms of intervention coverage, or pro-rich in terms of undesirable health outcomes.

Results

In 1999, data were available from 2006 children under 5 years of age living in 1321 households with children of this age-group in the 120 rural clusters. These represented 93% of eligible households: residents of 137 (6%) were away at the time of the survey and 21 (1%) refused to take part. In the 2002 survey, 1932 children under 5 years of age, living in 1341 households of the same villages, were identified. These represented 94% of eligible households: residents of 142 (6%) were away and 9 (0.4%) households refused to take part. The age and sex distribution for these children was similar in the two surveys (Table 1).

Table 1. Age and sex distribution in 1999 and 2002 surveys

Characteristic	Year of survey	
	1999 (n = 2006)	2002 (n = 1924)
Sex		
Boys	1008 (50%)	980 (51%)
Girls	998 (50%)	944 (49%)
Age in years		
<1	489 (24%)	405 (21%)
1–2	401 (20%)	389 (20%)
2–3	385 (19%)	413 (21%)
3–4	390 (19%)	372 (19%)
4–5	341 (17%)	344 (18%)

Table 2 shows asset ownership in wealth quintiles in the two surveys. There were consistent patterns of assets ownership and socioeconomic gradients between IMCI and comparison districts.

Table 3 shows the equity results. Six child health indicators (underweight, stunting, measles immunization, access to treated and untreated nets, treatment of fever with antimalarial) improved significantly in IMCI districts ($p < 0.05$) in relation to comparison districts, while four indicators (wasting, DPT coverage, caretakers' knowledge of danger signs and appropriate careseeking) improved significantly in the comparison districts relative to IMCI districts.

Most concentration indices for the anthropometric variables were negative, showing that the poorest were more likely to be malnourished. For underweight and stunting, inequities declined more markedly in IMCI districts than in comparison districts, that is, concentration indices were less negative in 2002 than in 1999 (Figure 1 and Table 3). The largest improvement was observed for stunting among children between 24–59 months of age; the concentration index improved from -0.102 in 1999 to -0.032 in 2002 in IMCI districts, while it remained nearly unchanged (-0.122 to -0.133) in comparison districts. These improvements can be observed in Figure 1, where the gap between the lines representing IMCI and non-IMCI districts increases over time.

The prevalence of wasting was considerably lower than that of either underweight or stunting, and because the analyses were restricted to the children aged 12–23

Table 2. Asset ownership for households in IMCI and comparison districts 1999 and 2002

Year	SES quintile	No. of households (%)	Mean asset score	Assets, education, household and maternal income										
				Rented house (%)	Head's education (%)	Mother's education (%)	Household income (%)	Bicycle (%)	Radio (%)	Net (%)	Animals (%)	Fowls (%)	Roof (%)	Mother's income (%)
IMCI														
1999	Poorest	132 (22.3)	−1.61	0	44	39	2	8	6	2	9	37	0	0
	Very poor	105 (17.7)	−1.01	0	67	62	4	19	26	7	20	70	4	3
	Poor	119 (20.1)	−0.32	2	76	65	24	41	53	14	10	52	8	7
	Less poor	119 (20.1)	0.59	3	83	79	52	36	61	35	14	58	31	18
	Least poor	117 (19.8)	2.45	29	92	83	74	68	77	74	19	55	71	35
2002	Poorest	139 (20.1)	−1.84	0	30	29	2	16	12	9	6	42	3	0
	Very poor	139 (20.1)	−0.88	4	65	53	9	24	35	24	13	56	11	5
	Poor	137 (19.8)	−0.15	1	80	72	16	31	64	49	13	68	18	3
	Less poor	138 (20.0)	0.72	7	81	72	41	47	75	70	11	65	41	11
	Least poor	138 (20.0)	2.18	16	97	91	72	54	86	82	14	59	67	48
Non IMCI														
1999	Poorest	123 (20.2)	−1.88	0	68	56	2	3	5	11	2	15	1	0
	Very poor	144 (23.8)	−0.92	1	94	81	8	16	15	49	3	63	2	0
	Poor	98 (16.1)	−0.22	4	91	78	22	40	41	59	8	60	18	5
	Less poor	123 (20.3)	0.69	9	94	90	40	52	59	81	7	54	28	14
	Least poor	120 (19.7)	2.51	27	98	97	73	68	77	88	10	59	86	39
2002	Poorest	139 (22.8)	−1.88	0	73	57	1	6	3	49	4	40	1	1
	Very poor	109 (17.9)	−0.90	1	92	84	15	16	24	69	4	61	10	6
	Poor	119 (19.5)	−0.13	3	96	88	22	45	43	84	6	62	29	9
	Less poor	135 (22.1)	0.80	5	96	96	23	70	73	94	5	87	50	19
	Least poor	108 (17.7)	2.46	43	98	98	71	67	88	89	11	67	90	54

Table 3. Selected outcomes according to socioeconomic quintiles and corresponding concentration indices in 1999 and 2002 for IMCI and comparison districts

Indicator or outcome measure	IMCI	Year	% of children by socioeconomic quintiles						Concentration index (95% confidence interval)
			Poorest	Very poor	Poor	Less poor	Least poor	Overall	
Anthropometric status									
Low weight for age for 0–59 months (underweight)	No IMCI	1999	38	29	28	23	18	27	−0.136 (−0.144, −0.129)
		2002	30	21	15	17	13	19	−0.166 (−0.175, −0.157)
	IMCI	1999	31	36	33	29	20	30	−0.071 (−0.080, −0.063)
		2002	28	18	24	26	16	23	−0.057 (−0.066, −0.048)
Low height for age prevalence in children 24–59 months (stunting)	No IMCI	1999	65	64	50	46	36	51	−0.122 (−0.130, −0.114)
		2002	50	43	43	45	18	40	−0.133 (−0.152, −0.115)
	IMCI	1999	69	70	63	50	41	59	−0.102 (−0.110, −0.094)
		2002	43	49	46	44	33	43	−0.032 (−0.040, −0.024)
Low weight for height prevalence in children 12–23 months (wasting)	No IMCI	1999	10	15	11	8	12	11	−0.022 (−0.061, 0.017)
		2002	0	8	6	3	9	5	0.217 (0.128, 0.305)
	IMCI	1999	14	19	13	14	7	13	−0.105 (−0.154, −0.056)
		2002	10	7	6	5	9	7	−0.053 (−0.112, 0.007)
Coverage of preventive interventions									
Measles vaccination (informed or registered)	No IMCI	1999	86	89	90	88	93	89	0.012 (0.006, 0.017)
		2002	94	88	91	98	94	93	0.008 (0.003, 0.013)
	IMCI	1999	90	76	91	88	93	88	0.015 (0.008, 0.023)
		2002	91	91	87	88	86	89	−0.012 (−0.016, −0.007)
DPT vaccination (informed or registered)	No IMCI	1999	74	81	93	90	89	86	0.034 (0.025, 0.042)
		2002	97	92	100	95	91	95	−0.011 (−0.015, −0.007)
	IMCI	1999	90	86	76	90	93	87	0.011 (0.003, 0.019)
		2002	74	88	82	86	89	83	0.030 (0.022, 0.038)
Child sleeps under a treated net in the last 6 months	No IMCI	1999	3	3	6	3	13	6	0.302 (0.283, 0.320)
		2002	5	14	11	14	24	14	0.247 (0.231, 0.263)
	IMCI	1999	1	0.6	5	5	8	4	0.399 (0.380, 0.420)
		2002	5	11	9	19	20	12	0.260 (0.248, 0.271)
Child sleeps under a net	No IMCI	1999	24	27	44	46	65	42	0.197 (0.189, 0.205)
		2002	48	64	66	73	82	67	0.098 (0.092, 0.103)
	IMCI	1999	11	5	23	29	39	21	0.294 (0.281, 0.306)
		2002	25	31	38	54	63	41	0.192 (0.185, 0.198)
Caretaker knows at least two danger signs	No IMCI	1999	17	21	20	32	24	23	0.067 (0.057, 0.077)
		2002	33	33	36	31	37	34	0.018 (0.011, 0.024)
	IMCI	1999	22	25	17	20	23	22	−0.011 (−0.02, −0.001)
		2002	29	28	30	30	29	29	0.005 (−0.001, 0.106)
Caretaker’s knowledge of feeding during illness	No IMCI	1999	14	21	26	29	23	23	0.058 (0.046, 0.071)
		2002	22	26	24	32	32	28	0.078 (0.071, 0.085)
	IMCI	1999	31	28	22	22	27	26	−0.040 (−0.05, −0.031)
		2002	32	29	33	27	28	30	−0.029 (−0.034, −0.023)
Management of illness at home or at the facility									
Child with fever receives appropriate treatment	No IMCI	1999	27	40	39	53	64	45	0.148 (0.135, 0.160)
		2002	18	29	21	30	45	28	0.158 (0.136, 0.179)
	IMCI	1999	31	40	33	36	53	38	0.074 (0.058, 0.090)
		2002	24	31	27	25	32	27	0.029 (0.015, 0.043)
Careseeking									
Appropriate careseeking	No IMCI	1999	31	39	37	49	56	43	0.108 (0.010, 0.117)
		2002	31	35	34	31	30	32	−0.016 (−0.026, −0.005)
	IMCI	1999	35	44	32	46	45	40	0.047 (0.039, 0.056)
		2002	31	42	35	46	41	39	0.055 (0.045, 0.064)

months, sample sizes were considerably smaller with fewer than 100 children per cell (Table 3). During the study period, wasting prevalence decreased among the poorest in the comparison districts; no cases were observed in the poorest quintile in 2002, and the concentration index became positive. Equity also appeared to improve slightly in the IMCI districts.

Table 3 presents the time trends in inequities in preventive indicators. Unlike the indicators of malnutrition, equity for these outcomes improved when concentration indices

were reduced between 1999 and 2002. Measles and DPT vaccine coverage were already fairly equitable in IMCI and comparison districts in 1999, with all concentration indices being very close to zero. Inequity in measles vaccine coverage in comparison districts showed little change (from 0.012 to 0.008), but in IMCI districts the concentration indices changed from 0.015 (slightly pro-rich) to −0.012 (slightly pro-poor).

On the other hand, the overall coverage of DPT in IMCI districts fell from 87% to 83%, while it increased

from 86% to 95% in the comparison districts (Table 3). The reduction in IMCI districts mostly affected the poorest quintile (among whom coverage fell from 90% to 74%) and as a consequence the concentration index increased from 0.011 to 0.030. In comparison districts, equity improved (from 0.034 to -0.011) and in fact DPT coverage became slightly pro-poor.

There were significant improvements in the equity of coverage of mosquito nets in both IMCI and comparison districts between 1999 and 2002 (Table 3). The increase was for both treated and untreated nets.

Results on caretaker knowledge are also shown in Table 3. In comparison districts, equity in the proportion of caretakers who knew two or more danger signs and required urgent health care improved, but no change was observed in IMCI districts, where the concentration indices were already virtually zero and therefore highly equitable. Regarding knowledge on the need to continue feeding the child during an illness, there were no significant changes in equity in either set of districts.

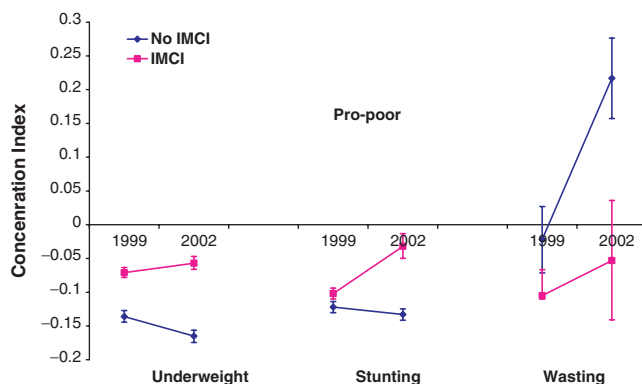


Figure 1. Concentration indices and confidence intervals for nutritional indicators

In terms of case management, appropriate treatment with antimalarials for children with fever fell between 1999 and 2002 in both IMCI and comparison districts (Table 3). In the former, but not in the latter, equity improved during the study period. The concentration index decreased significantly from 0.074 to 0.029.

Lastly, equity in appropriate careseeking improved significantly in the comparison districts, but the overall careseeking rate fell from 43% to 32% in the period. In the IMCI districts, where careseeking rates were more stable, there was a slight but non-significant increase in inequity, from a concentration index of 0.047 to 0.055 (Table 3).

Table 4 summarizes the equity findings by showing the change in concentration indices (expressed by the difference between the 2002 and 1999 indices) in IMCI and non-IMCI districts, as well as the difference between these two differences. Negative values of the difference in differences – indicating greater improvement in equity in IMCI than in non-IMCI districts – were observed for underweight, stunting, measles vaccine, mosquito nets and fever treatment.

Discussion

We have used concentration indices based on asset quintiles to measure inequities in childhood health indicators from two independent child health surveys in South East Tanzania. Previous studies have shown that an asset index generated from household assets is a robust proxy measure of wealth (Filmer and Pritchett 2001), and these are now being widely used in the equity literature (Victora et al. 2003).

The main results of the Tanzania MCE-IMCI are presented elsewhere (Armstrong Schellenberg et al. 2004a). There was an improvement in the quality of care

Table 4. Concentration indices: difference in differences in IMCI and non-IMCI districts

Indicator	Concentration indices		
	After – before difference (2002 minus 1999)		Difference in differences* (IMCI minus no IMCI)
	IMCI	No IMCI	
Underweight	-0.029	0.014	0.044
Stunting (24–59 months)	-0.011	0.070	-0.081
Wasting (12–23 months)	0.239	0.052	0.187
Measles coverage	-0.027	-0.004	-0.023
DPT coverage	0.019	-0.045	0.064
Child sleeps under a treated net	-0.139	-0.055	-0.084
Child sleeps under a net	-0.102	-0.099	-0.003
Caretaker knows at least two danger signs	0.016	-0.050	0.066
Caretaker knowledge of feeding during illness	0.020	0.011	-0.009
Child with fever received appropriate treatment	-0.045	0.010	-0.056
Appropriate careseeking	0.008	-0.124	0.132

*Negative values – indicating greater improvement in equity in IMCI than in non-IMCI districts – are highlighted in bold.

provided in first-level facilities, improvements in some but not all coverage indicators, and a significant reduction in stunting in the IMCI districts compared with comparison districts. Under-five mortality was assessed through demographic surveillance in delimited areas within each district; baseline levels were similar in IMCI and comparison districts, but after 2 years, mortality was 13% lower in the IMCI districts, a difference that did not quite reach statistical significance.

In a previous analysis of the 1999 survey data, we showed that there were important baseline inequities in nutritional status and in the coverage of key interventions within all four districts (Armstrong Schellenberg et al. 2003). The question addressed in this paper was whether or not the effects of IMCI mentioned above were associated with higher or lower levels of inequity in short term follow-up.

Stunting is a key indicator because it reflects the cumulative effects of nutritional and infectious factors (WHO 1995). Both stunting and underweight prevalence showed strong inverse associations with the wealth index, as would be expected. Wasting prevalence, on the other hand, tended to be much lower, as observed in other African settings (Victora 1992), and the association with wealth was modest.

Stunting prevalence declined faster in IMCI than comparison districts, and equity improved more markedly in the former. There were also positive changes with IMCI in terms of underweight. For wasting, baseline inequities were not so marked, and improvement was significantly greater in comparison ($p = 0.002$) than in IMCI districts, particularly due to low prevalence among the poorest in these two districts. The possibility of survival bias cannot be ruled out, with wasted children in the poorest families showing high mortality in the non-IMCI districts where death rates were higher. Overall, it seems that IMCI had a beneficial impact on equity in nutritional status.

Results on vaccine coverage were mixed. IMCI was associated with improved equity for measles vaccine, whereas the opposite was observed for DPT. A potential caveat is that we relied both on information recorded on a vaccination card as well as on doses reported by the mother; nevertheless, the same procedure was used both in IMCI and non-IMCI districts. These results concur with earlier findings (Armstrong Schellenberg et al. 2004a): the introduction of IMCI was associated with a drop in DPT coverage of a few percentage points, of statistical rather than public health significance. Nevertheless, these disparities highlight the need to reach the poorest children with this vaccine.

In terms of mosquito nets, equity improved in all districts. The decline in inequity of coverage for children sleeping under a treated net was faster in IMCI districts than in comparison districts. It should be noted that the two

comparison districts (Kilombero and Ulanga) were covered by a social marketing programme of treated nets that started 2 years earlier than in the IMCI districts (Nathan et al. 2004).

For indicators on caretaker knowledge and careseeking behaviours, the picture was also mixed. IMCI districts did better in terms of the proportion of caretakers who knew child health danger signs and in management of fever with antimalarials. On the other hand, equity improvements were greater in comparison districts for careseeking rates, but this was largely due to a reduction in appropriate careseeking rates in the two upper quintiles in these districts, rather than an improvement among the poor. Reasons for these reductions are unclear, although they may be due in part to the change of first-line antimalarial drug from chloroquine, which was both popular and easily available, to the rather less popular sulphadoxine-pyrimethamine, which was less widely available.

This study has shown how equity assessments can be incorporated in impact evaluations at relatively little additional cost, and how these may point to specific interventions that need to be reinforced. For example, whereas vaccine coverage is reasonably high and equitable, there remain important inequities in mosquito net coverage and in treatment of fever with antimalarials.

In the study districts, IMCI consisted mainly of the training of health workers, in a context of support to district management by the Tanzania Essential Health Intervention Package (Armstrong Schellenberg et al. 2004b). One might fear that the absence of a strong community component for promoting IMCI at household and family level might lead to increased inequities, because access to health facilities was already inequitable when IMCI was introduced (Armstrong Schellenberg et al. 2003). Such apprehension was not confirmed by our data. Therefore, IMCI introduction led to improvements that did not occur at the expense of equity. These findings should be interpreted in the light of two important characteristics of rural Tanzania: the relatively high rates of utilization of government facilities (Victora et al. 2005) and the fact that no user fees are charged in the two districts implementing IMCI (Manzi et al. 2005).

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