Medical care-seeking behaviour and child health in sub-Saharan Africa: The role of maternal age and socio-economic status

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Introduction

One of the targets of the Millennium Development Goals (MDGs) is to reduce under-five mortality by two-thirds by the year 2015 (United Nations 2007). But the progress toward achieving that target has been slow in low-income countries in general and in sub-Saharan Africa in particular where the under-five mortality rate still stands at 185 deaths per 1,000 live births (World Bank 2004; 2006; United Nations 2007). Within the low-income countries, improvements in child mortality have been disproportionately greater among the wealthiest than among the poorest segments of the population (World Bank 2004; United Nations 2007). It is also the case that over two-thirds of under-five deaths reportedly result from (a combination of) preventable diseases such as acute respiratory infections, diarrhoea, measles and malaria as well as from malnutrition (World Bank 2004). This implies that reducing child mortality requires a combination of interventions such as raising incomes for the poor, increasing public spending on health services, and ensuring that the poor have access to health care and other public services e.g. safe water, sanitation facilities, and good infrastructure.

Nonetheless, the ability of mothers to seek treatment for their sick children is another component of health care accessibility that is crucial for reducing child mortality. Health-seeking behaviour of the mother has, for instance, been found to be associated with reductions in infant and child mortality in Mali (Uchudi 2001). Yet, with the exception of the Demographic and Health Surveys (DHS) reports, there are no systematic

studies of health-seeking behaviour for child health in sub-Saharan Africa. Does, for instance, the physical availability of health facilities lead to increased usage of health services or do the socio-economic status (SES) and socio-demographic characteristics of the mother also play a role? Evidence from the DHS indicates that in much of sub-Saharan Africa, the use of health services is greater in the urban than in the rural areas. This can be partly attributed to the fact that health facilities are disproportionately located in the urban compared to the rural areas. But it could also be due to the fact that urban residents tend to be better off socio-economically compared to their rural counterparts.

There are reasons to believe that SES might matter for health-seeking behaviour for child health over and above the physical availability of health facilities. First, it has been observed that the use of health services in a number of developing countries declined after the introduction of user fees in health facilities under the structural adjustment programs (SAPs) initiated by the World Bank and the International Monetary Fund (IMF) from the late 1980s (McGrow 1995). The consequence of this was a reversal of some of the gains in child mortality improvements in some countries. Second, studies show that the disproportionate location of health services in urban areas in sub-Saharan Africa does not benefit the urban poor as much as the non-poor (APHRC 2002; Magadi et al. 2003). The urban poor have, for instance, been found to fair worse than the rural residents in such child health outcomes as post-neonatal, infant, and child mortality (APHRC 2002). Third, studies have found a strong correlation between maternal education and child survival. One of the explanations for the existence of the strong correlation is the potential for enhanced use of health services by educated mothers (Desai and Alva 1998; Kravdal 2004).

In addition to SES, the socio-demographic characteristics of the mother e.g. age and marital status might also be relevant for health-seeking behaviour for child health for two reasons. First, in circumstances where health services are not tailored to meet the needs of young mothers, they might feel alienated from the health facilities due to perceived negative attitudes of the health service providers (*cf*. Zabin and Kiragu 1998). Studies in some sub-Saharan African countries (e.g. Huntington et al 1990; Kim et al. 1997) have, for example, shown that young single mothers are not only treated with less respect at health facilities but are also given less information. Second, a plethora of studies have examined the association between maternal age at birth on the one hand and reproductive health outcomes such as birth outcomes (e.g. Alam, 2000; Jimenez et al. 2000; Tsai et al. 2001; Smith and Pell 2001; Wasunna and Mohammed, 2002) and the use of antenatal (e.g. Abou-Zahr and Wardlaw 2003; Magadi et al. 2007a) as well as delivery care services (e.g. Magadi et al. 2007b) on the other. Some of these studies have found unfavourable reproductive health outcomes for younger compared to older mothers. But whether this is a function of their young age or of other factors e.g. the orientation of the health services or their socio-economic status that impacts on their ability to seek care for themselves and for their children is still subject to debate.

The foregoing suggests that maternal socio-demographic and socio-economic characteristics might also be relevant for care-seeking behaviour for child health. In this paper, we examine medical care-seeking behaviour for child health in sub-Saharan Africa during the first decade of the 21st century. We focus on the roles of maternal age, education and household economic condition. We begin by examining the variations in child morbidity experiences and care-seeking behaviour by these characteristics in

individual countries and between countries. Child morbidity in this context refers to whether the child experienced diarrhoea, fever or acute respiratory infection (ARI: cough accompanied by short rapid breath) in the two weeks preceding the survey. Medical care-seeking behaviour, on the other hand, refers to whether those children who had diarrhoea, fever or ARI in the two weeks preceding the survey received medical treatment. We then explore whether maternal age and socio-economic status (maternal education and household economic condition) are significantly associated with the likelihood of receiving medical treatment among sick children, again in individual countries after controlling for other characteristics of the mother and the child.

Data and methods

The data for this study come from the Demographic and Health Surveys for 23 countries of sub-Saharan Africa conducted since the year 2000 with the most recent available survey being in 2006. For countries with two or more surveys within that period, only the most recent one was used. The DHS collects information on complete birth histories from nationally-representative samples of women of reproductive age (15-49 years). However, detailed information on child health and nutrition is only provided for births in the last three to five years preceding the survey to minimize recall errors. In all the survey data used for the present analysis, information was collected on births in the five years prior to the survey. This study is therefore based on data for these births but is limited to only single births within that period. The percent distribution of these births by maternal age in the countries considered shows that about one-fifth (in Rwanda) to two-fifths (in Gabon

and Malawi) of the births were to mothers aged less than 25 years at the time of the survey (Table 1).

<Table 1 about here>

In the first part of the analysis, we compare and contrast child morbidity experiences and care-seeking behaviour between countries. We also compare child morbidity experiences of children of younger (maternal age less than 25 years) and older (maternal age 25 years and above) mothers, between mothers with less than secondary education and those with secondary and above education, and between mothers in the richest quintile of the household wealth index (the indicator of household economic condition) and the rest 80%. We test whether the observed differences by these characteristics are statistically significant. The household wealth index was computed using principal component analysis based on household amenities and durable goods (Filmer and Pritchett 2001). For comparability across countries, only those household items that were common to the datasets were used in computing the index for each country.

Our next step involves estimating logistic regression models for individual countries with *care-seeking behaviour* as the dependent variable. This is a dichotomous variable coded 1 if the child received medical treatment and 0 otherwise. The independent variables of interest are *maternal age* (less than 25 years versus 25 years and above), *maternal education* (secondary above education versus less than secondary), and *household wealth index* (richest 20% versus others). The models control for *urban-rural residence* to account for the disproportionate location of health facilities in the urban areas. Other characteristics which might be relevant for the care-seeking behaviour of the

mother and which are also included in the models are the woman's *marital status*, *parity*, the *place of delivery*, as well as the *child's age and sex*.

Results

Variations in child morbidity and care-seeking behaviour

Figures 1 and 2 present the comparisons of child morbidity experiences and care-seeking behaviour between countries of sub-Saharan Africa. They show that as expected, there are disparities in child morbidity experiences and care-seeking behaviour between the countries. The lowest percentage (less than a quarter) of children who had diarrhoea, fever or ARI in the two weeks preceding the survey is, surprisingly, observed in Zimbabwe (Figure 1) despite the economic hardships the country is currently facing.[1] In contrast, about half or more of the children in Chad, Kenya (50% each), Malawi (52%), Zambia (53%) and Uganda (55%) experienced at least one of the morbidity conditions considered. But these variations could, however, be distorted by an outbreak of diarrhoea, ARI or fever in the period leading up to the survey. It could therefore be that certain regions of countries reporting high rates of childhood morbidity might have experienced such outbreaks.

What is of particular interest is, for instance, the fact that a country like Chad with about half of the births experiencing at least one of the morbidity conditions considered also had the lowest percentage (22%) of children who received medical treatment for those conditions. In contrast, though Uganda recorded the highest percentage of children who had at least one of the morbidity conditions (Figure 1), nearly two-thirds (64%) of

[1] Despite Zimbabwe reporting the lowest percentage of children who had at least one of the morbidity conditions considered, the patterns in child health in the country reveal worsening trends over time (CSO and Macro International Inc. 2007).

them received medical treatment (Figure 2). What might account for the different care-seeking experiences between Chad and Uganda? Estimates by the World Bank (2002; 2006) show that the two countries had similar levels of health care expenditure per capita of 16 USD (US Dollars) prior to the survey year. The difference in the gross national income per capita between the two countries was also small (50 USD). These two contextual factors may not therefore explain the different care-seeking experiences in the two countries. One potential explanation is therefore the higher female literacy levels in Uganda (55%) compared to Chad (32%). This might imply greater use of health services by the mothers in Uganda compared to those in Chad.

<Figures 1 and 2 about here>

The results of the comparisons of child morbidity experiences by maternal age and education are presented in Table 2. Differences by maternal age show that the percentage of children of younger mothers who experienced at least one of the morbidity conditions considered was significantly higher than that of children of older mothers in nearly half of the countries. Variations by maternal education show that in more than half of the countries considered, a significantly higher percentage of children who had diarrhoea, fever or ARI were of mothers with less than secondary education than of mothers with secondary and above education. This could, perhaps, be attributed to the fact that more educated mothers are likely to provide better nutrition for their children and to live in more hygienic environments than their less educated counterparts (Kravdal 2004). In Gabon, however, the opposite is the case. In most cases, variations by the household wealth index mirror those by maternal education (results not shown).

<Table 2 about here>

Maternal age, socio-economic status, and care-seeking behaviour

Table 3 presents the odds ratios of receiving medical treatment among children who had ARI, fever or diarrhoea in the two weeks preceding the survey by maternal age, education and household economic condition. As would be expected, children of younger mothers were less likely to receive medical treatment compared to those of older mothers in about three-quarters of the countries considered. The likelihood of receiving medical treatment among children of younger mothers in these countries was lower than that of children of older mothers by 31% in Zimbabwe at one extreme and by only 1% in Ghana at the other extreme. Significant differences are, however, observed in Cameroon, Kenya, Namibia, Senegal, and Zimbabwe. In the remaining one-quarter of the countries, the likelihood of receiving medical treatment among children of younger mothers was higher than those of older mothers by 2% in Guinea and Malawi at the low end and by 19% in Rwanda at the high end. But none of the differences is statistically significant.

The likelihood of receiving medical treatment by maternal education also conforms to expectations in nearly all the countries. With the exception of Benin, Ghana, Kenya, and Zimbabwe, children of mothers with at least secondary education in the other countries were more likely to receive medical treatment compared to those of mothers with less than secondary education. The likelihood of receiving medical treatment among children of mothers with at least secondary education in these countries is higher than those of mothers with less than secondary education by 12% in Namibia at the low end and by 94% in Mali at the high end. In a fifth of these countries, however, the difference in the likelihood of receiving medical treatment by maternal education is not statistically

significant. The same applies to the four countries where children whose mothers had at least secondary education were less likely to receive medical treatment compared to those whose mothers had less than secondary education.

<Table 3 about here>

With respect to household socio-economic condition, it is only in Lesotho and Zambia that we find a negative association with seeking medical treatment though this is not statistically significant. In the remaining countries, children who were sick and whose mothers were in the richest wealth quintile were more likely to receive medical compared to those whose mothers were in the other wealth quintiles. The likelihood of receiving medical treatment between children of mothers in the richest wealth quintile was higher than that of children of mothers in the other wealth quintiles by 2% in Malawi at the low end and by over 100% in Zimbabwe at the high end with significant differences being noted in more than half of these countries.

Discussion

The objective of this paper was to examine care-seeking behaviour for child health in 23 countries of sub-Saharan Africa during the first decade of the 21st century with specific focus on the role of maternal age, education, and household wealth. We began by examining variations in child morbidity experiences and care-seeking behaviour between countries and by these maternal characteristics. The results show marked variations between countries in the percentage of children born in the five years prior to the survey who had diarrhoea, fever or acute respiratory infection (ARI). What is particularly

interesting is the fact that in a country such as Chad, about half of the children experienced any of the morbidity conditions but less than a quarter of these received medical treatment. In contrast, more than half of the children in Uganda had diarrhoea, fever or ARI and nearly two-thirds of them received medical treatment.

What might account for these variations in care-seeking behaviour between countries? We speculate that the difference between Uganda and Chad, for instance, could be due to the difference in female literacy levels between the two countries. This might imply greater use of health services in Uganda than in Chad given that maternal education is associated with increased use of health services (Desai and Alva 1998; Kravdal 2004). Female literacy level is a potential explanation because estimates by the World Bank (2002; 2006) show that the two countries had similar levels of health care expenditure per capita and more or less similar level of gross national income per capita--the two other contextual factors that could imply variations in investments in health between the two countries. Furthermore, variations in care-seeking behaviour by maternal education also show that a significantly higher proportion of children of mothers with at least secondary education compared to those of mothers with less than secondary education received medical treatment in nearly all the countries considered. Of course other contextual factors not considered in the present study, such as child health programs, could also be part of the explanation for the difference between countries.

The results further show that as would be expected, (i) children of younger mothers were less likely to receive medical treatment than those of older mothers in more than half of the countries considered, (ii) children of mothers with at least secondary education in nearly all countries were more likely to receive medical treatment compared

to those of mothers with less than secondary education, and (iii) children of mothers in the richest wealth quintile were more likely to receive medical compared to those whose mothers were in the other wealth quintiles in nearly all the countries. These results are consistent with the existing literature (e.g. Huntington et al 1990; Kim et al. 1997; Magadi et al. 2007a; 2007b) that suggest that mothers who are young or of low socio-economic status continue to be disadvantaged in terms of access to maternal and child health services in the region.

It is worth noting, however, that as the variations in morbidity experiences and care-seeking behaviour suggest, contextual (country-level) factors might also help explain the differences in care-seeking behaviour for child health in the sub-Saharan African region. Our next step in this paper will therefore be to examine if such factors as the gross national income (GNI) per capita, health care expenditure per capita, and the proportion of women aged 15 years and above who are literate at the country-level are also associated with medical care-seeking behaviour for child health. This is to be achieved through multilevel analysis using pooled datasets for the 23 countries considered. The contextual factors do capture the average socio-economic status in a country that may determine not only the physical availability of health facilities but also the mother's ability to seek and afford treatment for sick children.

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Table 1: Percentage of single births in the last five years before the survey whose mothers were young (aged less than 25 years) at the time of the survey, sub-Saharan Africa, DHS 2000-06

Country/ Year of survey	Percent	Number of children
Benin (2001)	26.1	5,052
Burkina Faso (2003)	29.0	10,319
Cameroon (2004)	37.6	7,777
Chad (2004)	32.5	5,501
Congo Brazzaville (2005)	37.3	4,651
Ethiopia (2005)	25.6	9,683
Gabon (2000)	42.1	4,221
Ghana (2005)	22.4	3,691
Guinea (2005)	26.4	6,032
Kenya (2003)	34.6	5,748
Lesotho (2004)	39.0	3,598
Madagascar (2003-04)	33.3	5,320
Malawi (2004)	40.4	10,547
Mali (2001)	31.8	14,126
Mozambique (2003)	37.2	9,937
Namibia (2000)	30.0	3,871
Nigeria (2003)	29.0	5,783
Rwanda (2005)	19.6	8,426
Senegal (2005)	28.7	10,555
Tanzania (2004)	32.8	8,212
Uganda (2000-01)	36.1	6,922
Zambia (2001-02)	38.8	6,658
Zimbabwe (2005-06)	39.4	5,080

Notes: Percentages are weighted; Number of children- single births in the five years preceding the survey; DHS- Demographic and Health Surveys.

Table 2: Percentage of children who had acute respiratory infection (ARI), fever or diarrhoea in the two weeks preceding the survey by maternal age and education, sub-Saharan Africa, DHS 2000-06

	Maternal age			Maternal education		
Country/ Year of survey	<25 yrs	25+ yrs	Sig.[a]	<Sec	Sec+	Sig.[a]
Benin (2001)	49.4	47.9	ns	49.4	36.0	***
Burkina Faso (2003)	45.4	45.1	ns	45.4	41.0	*
Cameroon (2004)	37.9	36.7	ns	36.6	38.4	ns
Chad (2004)	53.0	48.9	***	49.9	51.7	ns
Congo Brazzaville (2005)	33.9	32.4	ns	35.2	31.3	***
Ethiopia (2005)	30.7	31.2	ns	31.4	23.8	***
Gabon (2000)	43.2	41.3	ns	40.7	43.3	*
Ghana (2005)	32.8	33.0	ns	33.2	32.5	ns
Guinea (2005)	41.8	39.0	*	39.9	37.5	ns
Kenya (2003)	53.3	48.2	***	50.8	46.7	**
Lesotho (2004)	35.8	34.3	ns	37.2	30.3	***
Madagascar (2003-04)	27.4	27.8	ns	28.9	23.2	***
Malawi (2004)	54.5	49.5	***	52.2	45.9	***
Mali (2001)	38.7	37.8	ns	37.7	37.8	ns
Mozambique (2003)	37.6	35.7	*	36.4	36.7	ns
Namibia (2000)	32.6	32.9	ns	34.4	31.2	**
Nigeria (2003)	44.5	39.8	***	44.2	32.5	***
Rwanda (2005)	40.3	35.9	***	37.3	30.8	***
Senegal (2005)	44.7	42.8	*	43.4	42.2	ns
Tanzania (2004)	31.9	31.3	ns	31.3	34.9	ns
Uganda (2000-01)	54.7	55.1	ns	56.0	47.2	***
Zambia (2001-02)	55.3	51.7	***	55.2	45.6	***
Zimbabwe (2005-06)	25.2	22.9	*	26.5	22.0	***

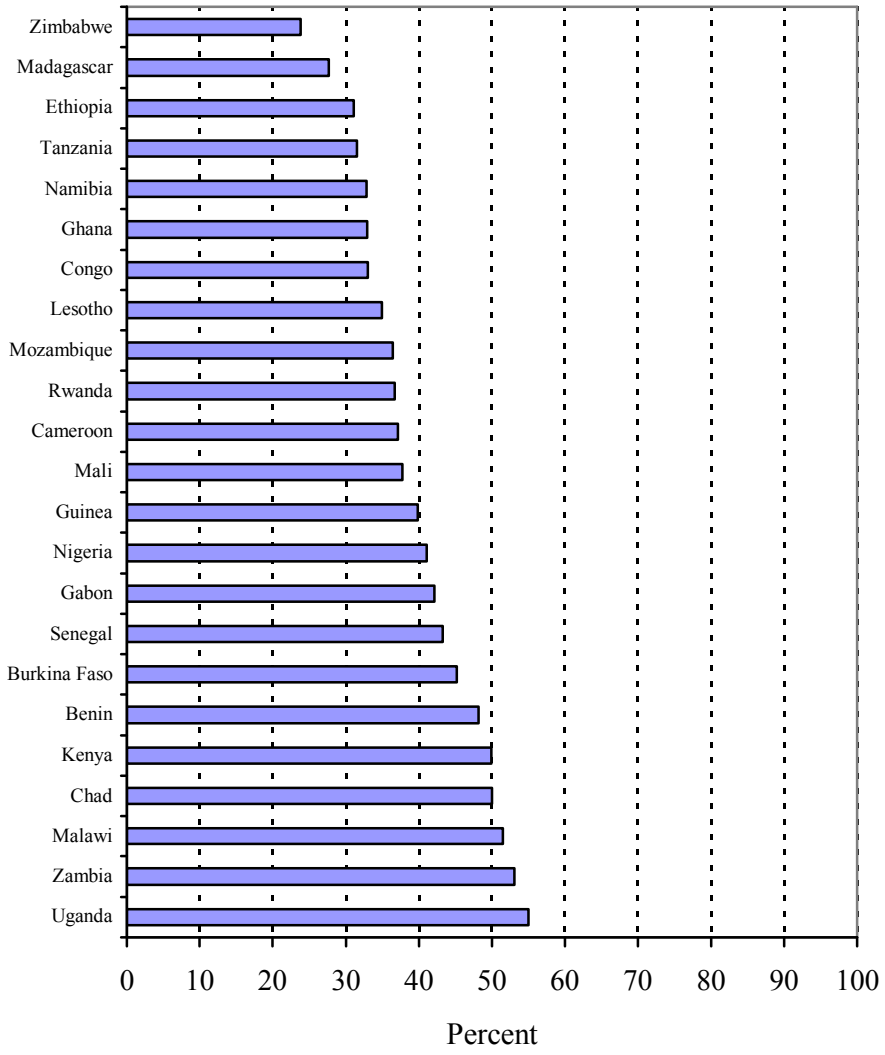
Notes: [a]Significance tests of proportions: *p<0.10; **p<0.05, ***p<0.01, ns-not significant; Percentages are weighted; Number of children- single births in the five years preceding the survey; ARI- acute respiratory infection: cough accompanied by short rapid breathing; yrs- years; <Sec- less than secondary education; Sec+- secondary above; DHS- Demographic and Health Surveys.

Table 3: Odds ratios of receiving medical treatment among children who had acute respiratory infection (ARI), fever or diarrhoea in the two weeks preceding the survey by maternal age, education and household wealth index, sub-Saharan Africa, DHS 2000-06

Country/ Year of survey	Maternal age	Maternal education	Household wealth	Number of children
Benin (2001)	0.94 [0.14]	0.86 [0.18]	1.38** [0.22]	2,208
Burkina Faso (2003)	0.87 [0.10]	1.70*** [0.35]	1.48*** [0.18]	4,106
Cameroon (2004)	0.81* [0.10]	1.28** [0.16]	1.00 [0.14]	2,600
Chad (2004)	0.78 [0.13]	1.41* [0.28]	1.50** [0.25]	2,091
Congo Brazzaville (2005)	0.88 [0.12]	1.24* [0.15]	1.49** [0.26]	1,403
Ethiopia (2005)	0.90 [0.13]	1.27 [0.33]	1.44 [0.37]	2,557
Gabon (2000)	0.80 [0.14]	1.35** [0.17]	1.73** [0.29]	1,241
Ghana (2005)	0.99 [0.19]	0.95 [0.15]	1.98*** [0.48]	1,150
Guinea (2005)	1.02 [0.15]	1.90*** [0.46]	1.54** [0.31]	2,007
Kenya (2003)	0.72*** [0.09]	0.85 [0.09]	1.50*** [0.22]	2,631
Lesotho (2004)	0.84 [0.14]	1.17 [0.17]	0.95 [0.18]	1,161
Madagascar (2003-04)	1.07 [0.17]	1.50** [0.25]	1.63** [0.36]	1,363
Malawi (2004)	1.02 [0.11]	1.63*** [0.21]	1.02 [0.13]	3,768
Mali (2001)	0.87 [0.10]	1.94*** [0.37]	1.19 [0.13]	4,308
Mozambique (2003)	1.10 [0.11]	1.33 [0.24]	1.04 [0.12]	3,082
Namibia (2000)	0.71** [0.11]	1.12 [0.15]	1.13 [0.25]	1,190
Nigeria (2003)	0.89 [0.14]	1.50*** [0.22]	1.98*** [0.32]	1,983
Rwanda (2005)	1.19 [0.16]	1.67*** [0.26]	1.31** [0.61]	2,756
Senegal (2005)	0.80** [0.08]	1.37** [0.22]	1.23 [0.16]	4,003
Tanzania (2004)	1.06 [0.13]	1.62*** [0.30]	1.50*** [0.23]	2,548
Uganda (2000-01)	1.09 [0.12]	1.29* [0.18]	1.25 [0.17]	3,250
Zambia (2001-02)	1.05 [0.11]	1.19 [0.15]	0.98 [0.17]	3,101
Zimbabwe (2005-06)	0.69** [0.13]	0.80 [01.3]	2.08** [0.65]	1,172

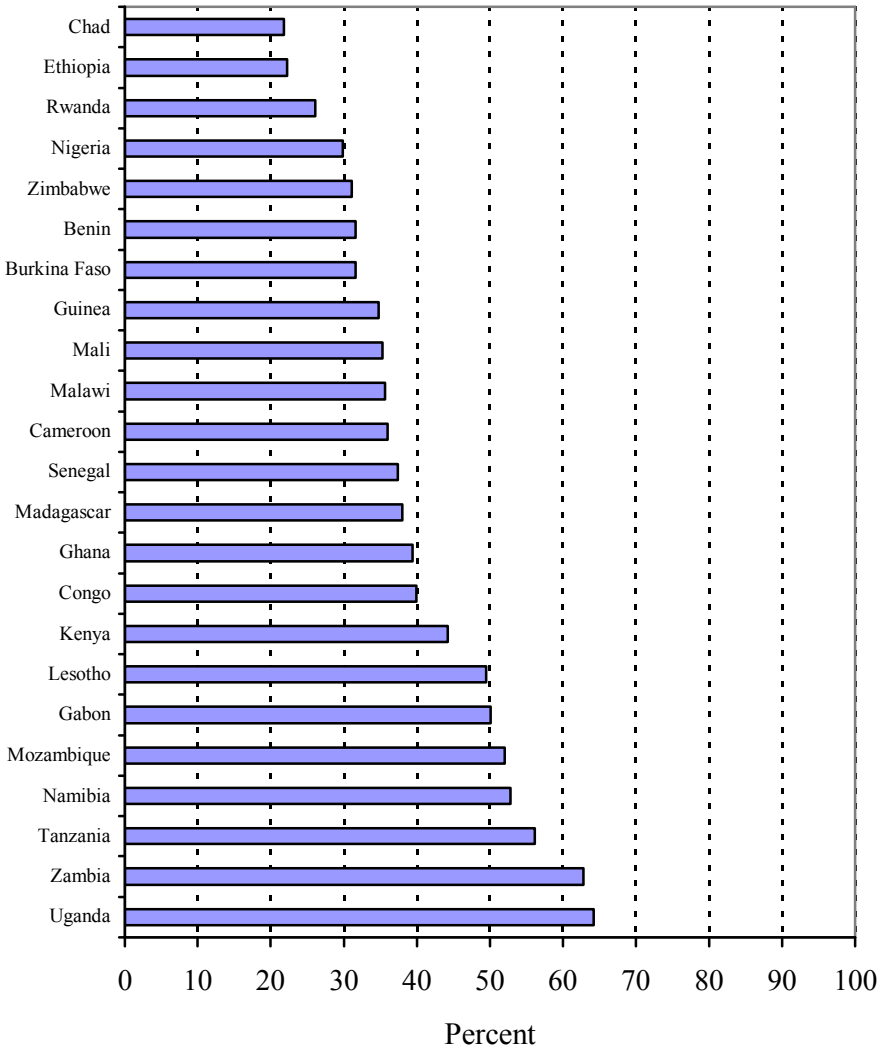
Notes: Standard errors adjusted for clustering within DHS clusters are in brackets; Number of children- single births who had ARI/fever/diarrhoea in the two weeks preceding the survey; ARI- acute respiratory infection: cough accompanied by short rapid breathing; The models controlled for urban-rural residence, marital status of the mother, parity, place of delivery and the child's age and sex; DHS- Demographic and Health Surveys; *p<0.10; **p<0.05; ***p<0.01.

Figure 1: Percentage of children who had acute respiratory infection (ARI), fever or diarrhoea in the two weeks preceding the survey by country, sub-Saharan Africa, DHS 2000-06



Notes: Percentages are weighted; Acute respiratory infection (ARI): cough accompanied by short rapid Breathing; DHS- Demographic and Health Surveys.

Figure 2: Percentage of children who had acute respiratory infection (ARI), fever or diarrhoea and who received medical treatment by country, sub-Saharan Africa, DHS 2000-06



Notes: Percentages are weighted; Acute respiratory infection (ARI): cough accompanied by short rapid breathing; DHS- Demographic and Health Surveys.