

# Health Inequities in Selected African Countries: Review of Evidence and Policy Implications

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## Abstract

Inequality and ill-health are intertwined. Unequal access to health services according to income group, rural/urban location, and gender, results in lower health outcomes for disadvantaged groups. This study uses bivariate analysis of demographic health survey data to identify the main sources of inequities in accessing health care in selected African countries. Findings show that large inequities in accessing health care due to income differences and rural/urban location exist in all countries in varying degrees. Overall the results of this study indicate that specific policies aimed at improving both geographical and financial access to health care are essential. Scaling up of strategies that are pro-poor and increased health services provision in under-served areas is crucial.

**Keywords:** Health inequities, access to health services, health policies, Africa

## 1. Introduction

Recent assessments of Africa's progress towards the health MDG shows that some progress has been achieved. However the rate of progress has been too slow to reach the health targets by 2015 (ECA 2007). Inequities in health have been advanced as one of the factors explaining this outcome. Health

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inequities are unfair systematic differences in accessing and utilising health services between different socioeconomic groups. Governments in Africa have repeatedly highlighted the importance of bridging health inequities by improving access to health for all. The most recent affirmation of their commitment was made at the Third Ordinary Session of the Ministers for Health of the African Union (AU). It was held in April 2007 in Johannesburg, South Africa. In the declaration issued at the end of the meeting, the ministers renewed their commitment to strengthen health systems for equitable health outcomes. They specifically committed to develop social protection systems, particularly for the poor and vulnerable groups in society, aimed at promoting greater access to health care services and protecting families from debt traps due to health emergencies.

Many African governments are grappling with the challenge of how to devise health policies and health care systems that can ensure equity of access to adequate health care. Available empirical evidence shows glaring intra-country differences in access and utilisation of health care and health status based on income, gender, rural/urban residency and between dominant and marginalised ethnic groups (Carr 2004; Wirth *et al.* 2006a; Wirth *et al.* 2006b; Boutayeb 2006; Fotso 2006). Translating the commitments of African leaders on realising equitable health outcomes into reality requires not only effective formulation of policies and strategies that can act on these inequities, but also information explaining the incidence and the extent of the inequities.

The objective of this paper is to empirically identify the main sources of health inequities in selected African countries and suggest policy implications in order to achieve equitable access to health care. The remainder of the paper is structured into four sections. Section 2 presents data and methods. Section 3 highlights the main sources of health inequities in selected African countries. Section 4 presents a summary discussion of results. Section 5 discusses the policy implications.

## 2. Data and Methods

### *Data and selected case study countries*

The analysis in this paper is based on data from the demographic and health surveys (DHS) of 10 African countries. DHS are nationally-representative household surveys with large sample sizes (usually between 5,000 and 30,000 households). They provide data for a wide range of monitoring and impact evaluation indicators in the areas of population, health, and nutrition. Typically, DHS surveys are conducted every five years, to allow comparisons over time. Ten countries were selected to represent each sub-region (East, West, South, North, and Central Africa), and also to bring out as much diversity as possible in health policies, existing initiatives to

**Table 1. Basic country indicators**

Country	Population (millions) (2006) <sup>a</sup>	GDP per capita (constant 2000 US\$) 2006 <sup>b</sup>	Per capita Health Expenditure (current US\$) (2005) <sup>a</sup>	Life expectancy (years) (2006) <sup>a</sup>	Infant mortality rate per 1000 live birth (2006) <sup>a</sup>	Adult HIV prevalence rate (2005) <sup>c</sup>	Immunisation, measles (% of children ages 12-23 months) (2005) <sup>c</sup>
Cameroon	18.1	688.3	14	51	87	5.4	68
Chad	10.5	266.5	9	46	124	3.5	23
Egypt	74.2	1724.1	30	68	29	0.1	98
Morocco	30.8	1667.3	33	72	34	0.1	97
Ethiopia	81.0	146.4	4	56	77	4.4	59
Kenya	36.6	440.1	11	53	79	6.1	69
Ghana	23.0	293.8	12	57	76	2.3	83
Senegal	12.0	499.2	12	59	60	0.9	74
Zambia	11.6	371.3	17	43	102	17.0	84
Malawi	13.6	144.6	14	50	76	14.1	82

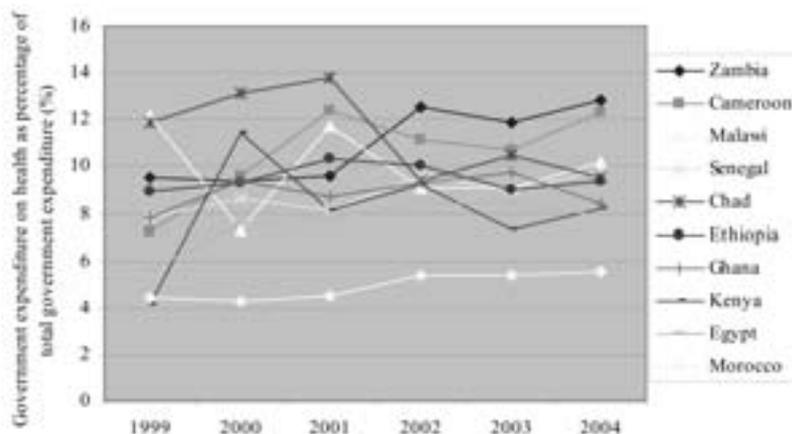
Source: <sup>a</sup> WHO (2008), <sup>b</sup> World Bank (2006), <sup>c</sup> UNSD (2008).

address health inequities, and differences in population and standards of living. The selection of the countries was determined mostly by availability of at least two years of DHS data from the 27 countries that were applicable at that time. The selected countries were Ethiopia (2000 and 2005 DHS data), Kenya (1998 and 2003 DHS data), Ghana (1998 and 2003 DHS data), Senegal (1997 and 2005 DHS data), Zambia (1996 and 2002 DHS data), Malawi (2000 and 2004 DHS data), Egypt (2000 and 2005 DHS data), Morocco (1992 and 2004 DHS data), Chad (1998 and 2004 DHS data), and Cameroon (1998 and 2004 DHS data). It is important to note that these countries may not be fully representative of their sub-regions.

Table 1 and figure 1 provide a quick glance of health status and resource allocation to health among the study countries. As can be observed, the countries display a wide diversity in socio-economic indicators. Two countries – Egypt and Morocco – stand out to have better socio-economic indicators, followed by Cameroon and Senegal. They have higher per capita income and health expenditure, and lower infant mortality rates, except for Cameroon. Amongst the study countries, Zambia and Malawi record high HIV and AIDS prevalence rates followed by Cameroon and Kenya.

Public expenditure on health as a percentage of total expenditure in the sector has been low in the study countries. They have all failed to meet the target of allocating at least 15 percent of their annual budgets to the health sector as pledged by African Heads of State and Government at the Summit on HIV and AIDS, Tuberculosis and Other Related Infectious Diseases in Abuja, in 2001 (*see Figure 1*). Out-of-pocket expenditure in the private provision of health is predominant. It has been considered as one of the most inequitable financing mechanisms of health delivery (Makinen *et al.* 2000).

**Figure 1. Government expenditure on health as percentage of total government expenditure**



Source: WHO 2007

Overall, all countries, except Malawi and Kenya, experienced an increase in public expenditure to the health sector over the period 1999 to 2004.

The Millennium Project report suggests that in low-income countries, the current levels of expenditure on health would need to increase to US\$24 per capita in 2010 and US\$34 per capita by 2015 (UN Millennium project 2005). In per capita terms, the countries that are allocating higher amounts (greater than US\$25 per capita) to health are Morocco and Egypt (*see Table I*). Actual expenditure on health in the rest of the study countries, ranging from US\$4 per capita in Ethiopia to US\$17 per capita in Zambia, falls far short of the costs of a package of minimum necessary health services as estimated by the UN Millennium Project. This has profound implications for addressing health inequities and achieving the health MDGs in Africa. Two countries, in particular, have public health expenditure that is lower than US\$10 per capita. They are Chad (US\$9) and Ethiopia (US\$4). It is important for all countries, and for these two in particular, to improve public spending on health as agreed at the Abuja Summit. All indications are that increased public spending is strongly associated with improvements in health outcomes and equity in low income countries (Gupta *et al.* 2001, Victora *et al.* 2004). However, the increased spending should be well targeted to address the major sources of inequities in access to health care, namely improving health infrastructure for the rural population and targeting the needs of the poor.

### Methods

The two standardised methods adopted for this study are: (a) Simple stratification (bivariate analysis) of selected health indicators with selected

stratifiers; and (b) Construction of concentration indices and concentration curves using DHS data to analyse health inequities in the study countries (See Wirth *et al.* 2006a, Wirth *et al.* 2006b, Gwatkin 2001, Gwatkin *et al.* 2000). DHS data is focused mostly on women due to the nature of the survey. Simple stratification involved classifying the health indicators by wealth and by rural urban residency to determine inequities. The health indicators used in the study were those that reflected access and utilisation in health care as captured by DHS data. These included use of modern contraceptive methods; women receiving delivery assistance from skilled health worker; prenatal care services; immunisation coverage rates; children with acute respiratory infection taken to a health facility; and children with diarrhoea, who were taken to a health facility. On wealth stratification, this study used the already constructed DHS wealth quintiles based on a household wealth index. The details of constructing the DHS wealth quintiles are provided in Annex 1.

Quantitative summary measures of inequalities in access to health, being concentration curves and the concentration indices<sup>1</sup>, were calculated for the health access and utilisation indicators. A concentration curve plots the cumulative proportion of the individuals under consideration ranked by wealth, beginning with the poorest and ending with the richest (x-axis), against the cumulative proportion of the health care variable (y-axis) being measured (e.g. access to health centre, prevalence and treatment of diarrhoea). If everyone has exactly the same value of the health variable irrespective of his or her living standards, the concentration curve will be a 45-degree line, known as a line of equality. If, by contrast, the health variable takes higher (lower) values among poorer people, the concentration curve will lie above (below) the line of equality (O'Donnell *et al.* 2008).

The value of a concentration index ranges from -1.0, which would occur if access to health for an indicator (for example immunisation) covers all in the poorest population, to +1.0, which would occur if access to health for an indicator covers all in the wealthiest quintile. Where there is no income-related inequality, the concentration index is zero.

Following Kakwani *et al.* (1997), concentration index can be computed from a grouped data in a spreadsheet program using the following formula:

$$C = (p_1L_2 - p_2L_1) + (p_2L_3 - p_3L_2) + \dots + (p_{T-1}L_T - p_TL_{T-1}) \quad (1)$$

In this calculation,  $p$  is the cumulative percent of the sample ranked by economic status.  $L(p)$  is the corresponding concentration curve ordinate, and  $T$  is the number of socioeconomic groups. To test for the statistical significance of the concentration index, standard errors can be computed using the formula given in Kakwani *et al.* (1997).

1. The concentration index is analogous to the Gini coefficient for income distribution.

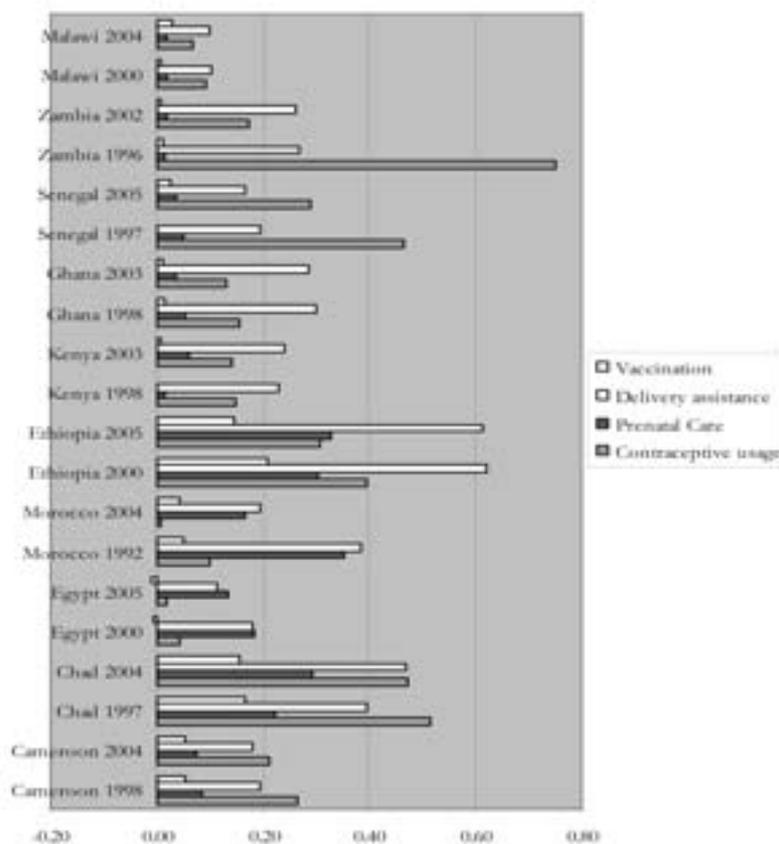
In addition, to add to the dynamic nature of the study, two DHS data points were used to identify the trend in inequity for all the study countries.

### 3. Inequities in Access to and Utilisation of Health Care

#### 3.1. Evidence of health inequities for all health indicators by wealth

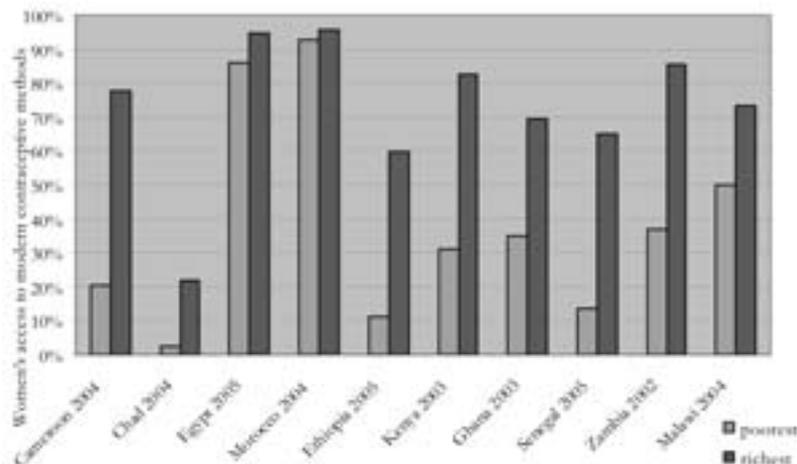
Income differentials in access to health are observed in different magnitudes in all countries and across all health variables analysed. Figure 2 shows the concentration indices for all health indicators in all the countries (Annex 2 also shows concentration curves for all the indicators for the latest year). Comparison of access to health indicators reveals that in all countries, contra-

Figure 2. Concentration indices for selected access to health variables



Source: Authors' calculations using DHS data

**Figure 3. Women's access to modern contraceptive methods by richest and poorest groups**



Source: Authors' calculations using DHS data

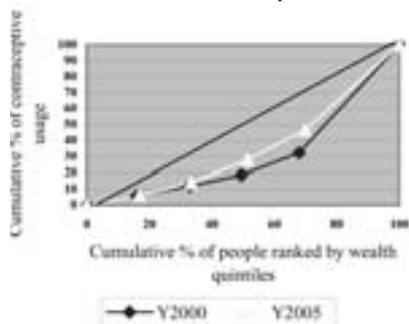
ceptive use has the greatest inequity value due to wealth differences, followed by delivery assistance. An equitable distribution for these indicators is a concentration index of 0.0. Although access to immunisation and prenatal care services appear closer to equity (closer to 0.0) in Zambia, Malawi, Ghana, Senegal, and Kenya, huge disparities are evident in Ethiopia and Chad (see figure 2 and annex 2).

Overall, the presence of inequities due to wealth differences implies the need for policies that can address the rich-poor source of inequities, particularly for delivery assistance and contraceptive use. The next four sub-sections discuss the findings on health inequities due to wealth differences.

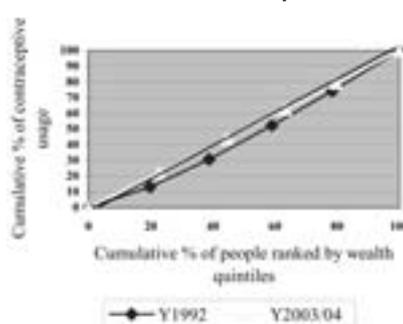
#### *Women's access to modern contraceptive methods*

Modern contraceptive methods, some of which include voluntary sterilisation, oral contraceptives, intrauterine devices, condoms, and injectables, have proved to be effective. Stratification of women's access to modern contraceptive methods by wealth shows wide disparities between the rich and the poor. Annex 3 has details of all access to health indicators stratified by wealth. The distinct pattern emerging across all countries is that women's access to modern contraceptives improves with increasing level of wealth. Comparing the richest and poorest quintiles provides more information on the extent of inequity between the two groups as presented in Figure 3. Women in the richest quintile in all study countries have better access to modern contraceptive methods than the poorest quintile. The countries with the greatest inequity include Cameroon (57.1 percentage points), Kenya (51.7 points), Senegal (51.5 points), Ethiopia (48.6 points), and Zambia

**Figure 4. Ethiopia concentration curves over time for women's access to modern contraceptives**



**Figure 5. Morocco concentration curves over time for women's access to modern contraceptives**



Source: Authors' calculations using DHS data

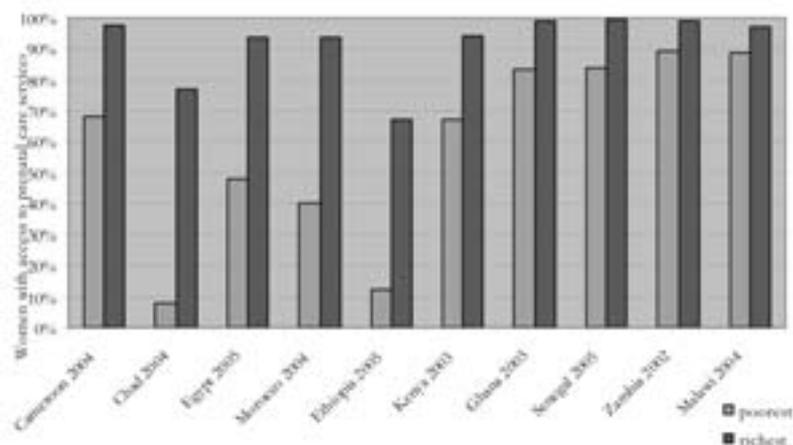
(48.5 points). The large inequities between the rich and the poor in these countries may reflect the disparities in accessing family planning services as well as differences in the demand for contraceptives. The poorest groups in these countries do not use modern contraceptive methods due to possible asymmetric access to this information. There is also a high possibility that poorer groups are less educated and thus their demand for modern contraceptive methods is low.

Two DHS data points were chosen for each country studied to observe trends irrespective of policy changes, and determined solely by DHS surveys years. The data over two time periods reveal that women's access to modern contraceptive methods has improved in all countries. However, these improvements have not been able to close the gaps in equity between the rich and the poor (see Annex 3). The change over time can be demonstrated by using concentration curves for Ethiopia, for instance, that shows that improvements were made but not enough to close the inequity gap (see Figure 4). Over a longer time period (1992 to 2003/04), Morocco has made considerable progress (see Figure 5).

#### Access to prenatal care services

Modern prenatal care services in the DHS are those that have been provided by health professionals to women who gave birth in the three to five years preceding the survey. Access to and utilisation of prenatal care services can help in addressing some of the causes of health care complications and mortalities associated with pregnancy. Data on women who have access to prenatal care services by wealth quintiles show that the disparities are much less in Malawi, Zambia, Senegal, and Ghana, where more than 80 percent of the population in all the quintiles have access to prenatal care services. However, comparison of the richest and poorest quintiles reveals striking disparities

**Figure 6. Women with access to prenatal care services by richest and poorest quintiles**



Source: Authors' calculations using DHS data

between the two socio-economic groups in Chad (68.8 percentage points), Ethiopia (54.8 points), and Morocco (53.7 points) as illustrated in Figure 6.

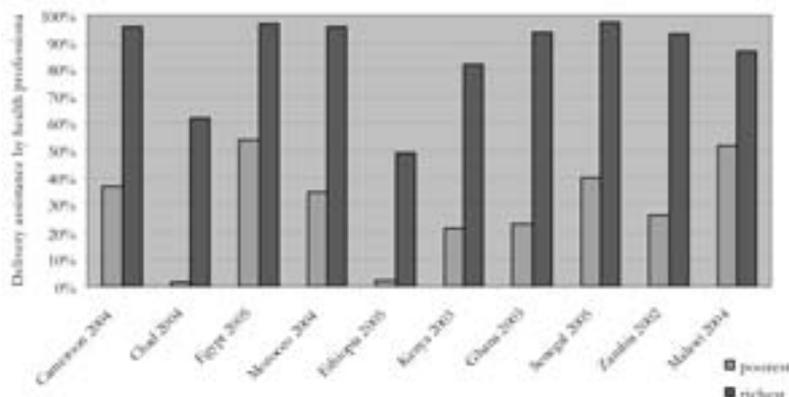
The data over two DHS time periods reveal that some countries, notably Cameroon, Egypt, Morocco, Ghana, and Senegal, have made some progress in addressing the inequity gap. However, the progress was not large enough to close the gap. On the other hand, some countries (Chad, Ethiopia, and Kenya) have experienced reduction in access to prenatal care services among the poorest group (*see Annex 3*), thereby recording a widening inequity gap.

#### *Delivery assistance by health professional*

Delivery attendance services in DHS are those that were provided by health professionals, such as doctor, nurse/midwife, auxiliary midwife, clinical officer, health assistant or any other country specific health professional. Only those women who gave birth in the three to five years preceding the survey were considered. Professional assistance at delivery is critical since a number of serious pregnancy-related complications cannot be predicted in advance.

Stratification of the delivery assistance indicator by wealth reveals striking evidence on inequities. Women in the richest wealth quintile have greater access to delivery assistance by a health professional when compared to the poorer groups in all the study countries (*see Figure 7 and Annex 3*). Ethiopia and Chad, which have the lowest figures overall of women receiving delivery assistance from a health professional, also show wide disparities between the richest and the poorest. Less than three percent of the poorest wealth quintile are able to access delivery assistance from a health professional compared to

**Figure 7. Women with access to delivery assistance by richest and poorest wealth quintiles**



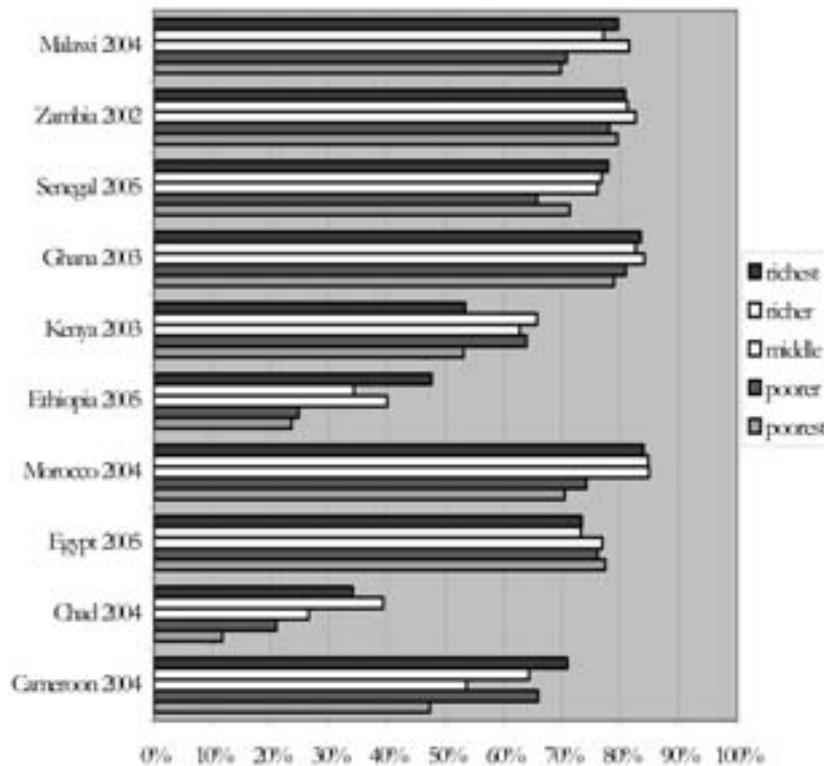
Source: Authors' calculations using DHS data

almost 50 percent and 60 percent of those from the richest group in the two countries respectively.

It is important to note that improvements in equitable health outcomes of delivery assistance result also in an overall progress towards achieving the maternal mortality goals. In fact, delivery assistance by health professionals is a vital indicator in progress towards attaining the maternal health goal of decreasing maternal mortality by 75 percent by 2015. In sub-Saharan Africa in 1990, health professionals covered only 42 percent of deliveries. This increased to only 46 percent by 2004. On the other hand, North Africa, which had an initial 40 percent coverage by health professionals in 1990, experienced a significant rise in this indicator to 71 percent by 2004 (UN 2006). Egypt and Morocco are the two countries that made some significant progress in improving delivery assistance of the poorest groups, even though the gaps in inequities had not been fully addressed. Overall, all the other countries need to work towards addressing the huge inequity gaps between the wealth groups in accessing delivery assistance from a health professional.

One of the discernible characteristics shown by the data is that countries starting from a low level of equity need a large ground to cover. Progress towards closing the wealth gaps in such countries is limited. For example in Cameroon, the delivery assistance of the poorest quintile was 31.4 percent in 1998 and improved to 36.7 percent in 2004, while that of the richest improved from 89.4 percent to 95.8 percent over the same period. So in Cameroon, the improvement for the poorest quintile was higher than the richest but the overall ratio of inequity did not change much.

**Figure 8. Immunisation of children by wealth quintiles**



Source: Authors' calculations using DHS data

### Access to immunisation

Immunisation rates have been on the increase in Africa. In fact, due to extensive vaccination campaigns between 1990 and 2005, measles cases have dropped on average by 75 percent (UN 2007). However, immunisation rates still suffer from inequities. Figure 8 shows the immunisation rates stratified by income groups, and as can be seen, equity considerations by income seem to be less of a problem in the study countries, except for Ethiopia and Chad.

There has been a marked improvement in equitable vaccination delivery over time in some of the countries studied (*see Annex 3*). For example, the poorest quintile in Ethiopia had immunisation coverage of 20.6 percent in 2000. It improved to 23.6 percent in 2005, and the overall difference between richest and poorest quintiles dropped from 0.210 to 0.146 over the five-year period. On the other hand, Egypt, one of the best performers in the country studies, had an overall difference that was -0.01 (pro-poor) in 2000, and remained at the same level in 2005.

### **3.2. Evidence of health inequities for all health indicators by rural-urban location**

Although income differentials are important prerequisites to access and utilisation of health services, location is even more inequitable. The urban-rural divide cuts across all health variables with the rural population severely under-served as indicated in Table 2.

#### *Modern contraceptive use*

Equity in accessing modern contraceptive methods by geographical area of residence reveals inequities in women's access to modern contraceptive methods between the rural and urban populations. Women in urban areas have better access to modern contraceptives than women in rural areas in all countries except Morocco and Egypt, where the difference between urban and rural areas is five percentage points or less as shown in Figure 9. Countries with the greatest inequities include Ethiopia (43 points), Senegal (31 points), Zambia (29 points), and Cameroon (20 points).

Developments over time show an improvement in women's access to modern contraceptive methods in both rural and urban areas in Cameroon, Morocco, Egypt, Ghana, and Senegal. However, the improvements were not big enough to close the rural urban disparities. In other countries, the rural urban disparities either widened (as in Chad, Kenya, and Zambia) or did not change (as in Malawi).

#### *Access to pre-natal care*

The access to prenatal care services indicator in rural and urban areas also reveals wide disparities between the two locations as shown in Table 2. The disparities were widest in Ethiopia (51 percentage points), Chad (46 points), and Morocco (37 points). In Kenya, Senegal, Zambia Malawi, and Ghana, the disparities were not as huge, and generally in these countries, access to prenatal services was high (greater than 80 percent) for both rural and urban populations during the period under survey. Trends in access to prenatal care services in urban and rural areas reveal that some countries, notably Egypt and Morocco, made some efforts to close the rural-urban inequity gap.

#### *Delivery assistance*

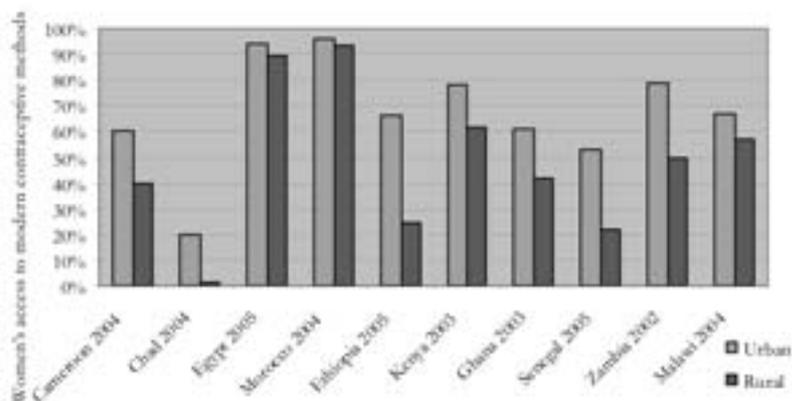
Stratification of delivery assistance by place of residence also reveals huge disparities between urban and rural areas (*see Figure 10*). Women resident in urban areas have a much higher chance of getting delivery assistance from a health professional than those in rural areas. The biggest disparities are in Ethiopia (57 points), Chad (50 points), Ghana (49 points), and Zambia (47 points). Over time, the countries that have made significant progress to address the inequities are Egypt, Morocco, and Senegal.

**Table 2. Health variables stratified by place of residence (percent)**

Country	DHS Year	Women's access to modern contraceptive methods			Prenatal care services			Delivery assistance by health professional			Immunisation coverage		
		Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total
Cameroon	1998	53	24	38	93	75	82	87	50	65	60	53	56
	2004	60	40	49	95	78	85	89	54	69	65	55	59
Chad	1996/97	12	1	6	72	31	47	53	9	26	42	24	31
	2004	20	1	10	74	28	49	57	7	29	35	23	28
Egypt	2000	91	83	87	73	47	58	85	54	67	71	76	74
	2005	94	89	91	85	62	71	90	68	77	74	77	76
Morocco	1992	86	62	73	64	22	38	69	19	38	73	62	65
	2003/04	96	93	95	85	48	65	87	46	65	85	73	79
Ethiopia	2000	66	15	28	74	23	32	57	4	13	58	24	30
	2005	67	24	34	75	24	32	62	5	14	55	30	33
Kenya	1998	70	52	55	97	93	93	72	40	44	43	59	56
	2003	78	62	66	92	83	86	75	42	51	52	61	59
Ghana	1998	52	36	41	95	85	87	79	34	44	78	76	77
	2003	61	42	48	98	88	91	83	34	49	85	80	81
Senegal	1997	43	8	19	97	83	87	91	47	59	-	-	-
	2005	53	22	34	98	90	93	92	59	70	75	72	73
Zambia	1996	60	29	42	99	95	97	82	34	50	82	82	82
	2001/02	79	50	60	98	91	93	82	35	48	83	80	80
Malawi	2000	61	46	49	98	91	92	85	58	63	79	83	82
	2004	67	57	58	97	91	92	87	59	62	73	76	76

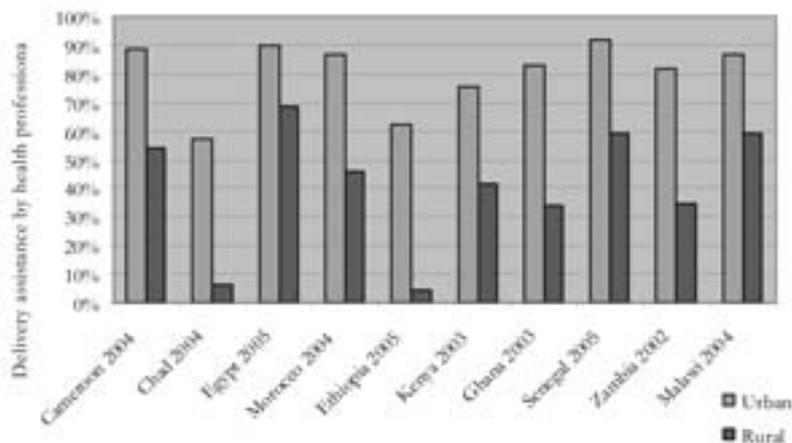
Source: Authors' calculations using DHS data

**Figure 9. Women's access to modern contraceptive methods stratified by urban and rural geographical residence**



Source: Authors' calculations using DHS data

**Figure 10. Women with access to delivery assistance by urban and rural residence**

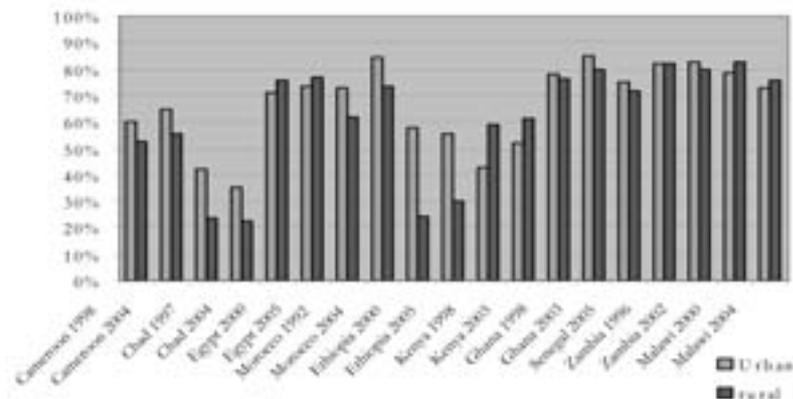


Source: Authors' calculations using DHS data

### Immunisation

As shown in the Figure 11, the rural-urban dichotomy portrays inequity in access to and utilisation of immunisation services. A clearly evident observation is that in a dynamic perspective, the countries with initial rural inequity in access to immunisation have remained inequitable, notwithstanding average increases in overall immunisation rates.

**Figure 11. Immunisation of children by rural-urban location**



Source: Authors' calculations using DHS data

An interesting feature to note is that Malawi, Kenya, and Egypt have higher immunisation coverage in rural areas, both in the early and later data points. This is probably due to the particular geography of the countries. Immunisation campaigns in these countries did not have large logistical problems of delivery. Further, the high coverage could have been the result of the higher proportion of rural populations in these countries.

**Children with acute respiratory infection taken to a health facility**

Transport and infrastructure are important factors in the rural/urban dichotomy. In the 10 countries under study, an average of 55 percent of the children with acute respiratory infection (ARI) are taken to a health facility in urban areas, compared to the average of 39 percent of children with ARI, who are taken to a health facility in the rural areas (see Figure 12a).

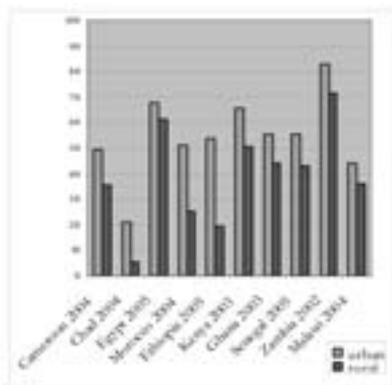
Figure 12b presents children with ARI taken to a health facility as stratified by gender. From this figure, it can be seen that overall, the pattern of male and female children with ARI, who are taken to a health facility, is equitable in all countries. On average, in the 10 countries being studied, the percentage of male children with ARI taken to a health facility is about 43.4 percent. This is marginally higher than the average rate for female children, which is 42.9 percent.

**Children with diarrhoea taken to a health facility**

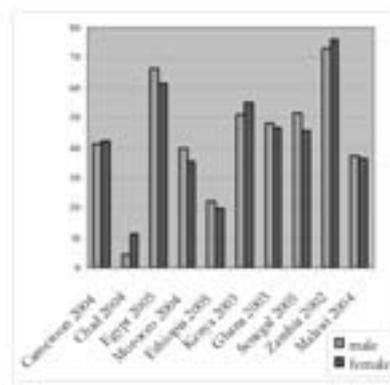
The indicator – children with diarrhoea who were taken to a health facility – refers to children under five years, who had diarrhoea in the two weeks preceding the survey. Figure 13a and 13b show stratification of the indicator by place of residence and by the sex of the child. Figure 13a

**Figure 12. Percentage of children with acute respiratory infection (ARI) taken to a health facility**

**Figure 12a. By place of residence**



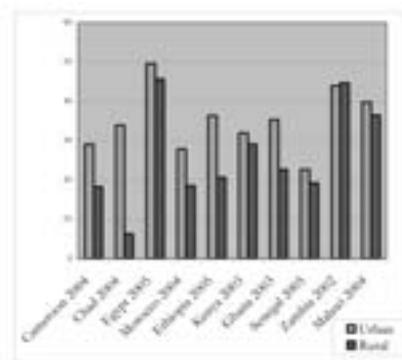
**Figure 12b. By gender**



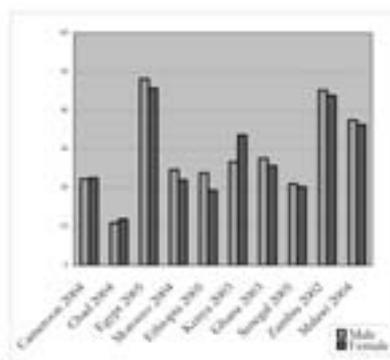
Source: Authors' calculations using DHS data

**Figure 13. Percentage of children with diarrhoea taken to a health facility**

**Figure 13a. By rural and urban residence**



**Figure 13b. By male and female**



Source: Authors' calculations using DHS data

shows that there are urban and rural inequities in children with diarrhoea accessing a health facility. The rural-urban disparities were greatest in Cameroon, Chad, Ethiopia, Morocco, and Ghana. Stratification by sex reveals no major difference between male and female children accessing health services.

#### 4. Summary of Results and Discussion

The findings show that health equity is a serious issue in the countries studied. However, there are some variations between countries. In all study countries, women from the poorest quintiles are less likely than those in better off quintiles to use basic health services such as prenatal care, modern contraceptives, delivery assistance by a health professional, and immunisation. The health indicator with the greatest inequity due to economic reasons is delivery assistance by health professionals. The findings also show striking evidence of rural-urban disparities in accessing health services in all countries. Rural-urban inequities are most extreme for delivery assistance and children with ARI and diarrhoea taken to a health facility. This has important repercussions for achieving the MDGs.

Overall, the existence of health inequities in accessing and utilising health services takes a toll on the health outcomes of those excluded, which has a negative impact on the achievement of the targets of the health MDGs. This heightens the need for governments to find mechanisms to provide and stimulate demand for health services to the disadvantaged groups. Health interventions need to reach the poor and those who are located far away from the health services.

Stratification by sex did not reveal major differences in accessing health care for immunisation and for children with ARI and diarrhoea taken to a health facility. This is because the access to health care by children is determined by their mothers, who as the data shows, do not differentiate by the sex of the child. However, at an older age, available literature<sup>2</sup> indicates disparities in the patterns of accessing health in women and men. Women have greater needs for health services that stem from their higher morbidity related to reproductive health, higher risk to diseases such as HIV and AIDS, and their vulnerability to gender-based violence. Women are also overrepresented among the poor, and have less access to remuneration for accessing health services. In most households in Africa, women have little influence in health-related decisions, which are made by husbands (UNICEF 2007). All these economic, social, and cultural obstacles may limit the access to health care by women more often than men from the same social group.

In Ethiopia and Chad, overall access to all health indicators is low, yet inequities by wealth and rural-urban differences are present. There is need for policies and strategies that can improve the overall level of access to health, while at the same time addressing inequities.

It is important to note that the findings reveal health inequities to be lowest for immunisation. In some countries immunization coverage was higher in rural areas than urban areas. This was partly due to extensive vaccination campaigns, reflecting the commitment of the government and

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2. UNICEF (2007), WHO (1998).

development stakeholders. The drive adopted for closing inequities in accessing immunisation, should be replicated to the other health indicators.

Results reveal that over the two time periods, some countries have made some progress in closing the inequity gap. Morocco and Egypt, for instance, have made substantial progress in addressing the inequities due to wealth differences. Marginal progress was made in Ghana, Malawi, Senegal, and Cameroon. The countries that have made substantial progress in addressing the rural-urban inequities include Morocco, Egypt, Senegal, and Ghana. Cameroon has made marginal progress.

The amount of financial resources allocated to the health sector in all countries studied is rather low. The two countries (Egypt and Morocco) that have experienced significant positive equity impacts over health variables and over time have the largest public expenditure per capita on health allocation. All the countries studied have not reached the Abuja Declaration of committing 15 percent of total government expenditure to health.

The identified inequities between urban and rural areas in the utilisation of health services for all the health variables studied reflect differences in the socio-economic conditions at household and community levels. As noted earlier, some countries have poorer socio-economic indicators, such as high infant mortality rate, lower per capita income and high prevalence of HIV and AIDS. Addressing underlying socio-economic factors requires actions beyond the health sector, to include water and sanitation, decent housing, food security, transport, education, and others. This calls for mainstreaming of health equity in the overall national development plans and poverty reduction strategies to achieve policy and cost synergies across all sectors towards health equity.

The variation in progress towards equitable access and utilisation of health deliverables across countries demonstrates that starting from an initial equitable status is an advantage. Therefore, overall progress towards equity needs to be placed within overall progress towards health outcomes. Secondly, the four countries that have made the most progress, namely Morocco, Egypt, Senegal, and Ghana, have prioritised health delivery across location and socio-economic gradient. They have done this through a series of public interventions and institutional arrangements aimed at improving both geographical and financial access to health services. In Morocco, there are localised offices, which provide citizens with access to health and related information. In Egypt, equitable health deliverables are a part of institutional interventions being pursued to protect the poor, such as food subsidies, employment of graduates, and health.

## 5. Policy Recommendations

### • Improving resources allocated to health

The rate of improvements in the amount of resources allocated to the health sector in all countries studied is rather low. All the countries studied have not reached the Abuja declaration of committing 15 percent of total government expenditure to health. The pace of change in addressing health inequities is dependent not only on the specific health policies, but also whether these are supported by adequate resources. The two countries (Morocco and Egypt) that have experienced the greatest positive equity impacts over health variables and over time have the largest public expenditure per capita on health allocation. Governments need to increase resources allocated to health to help the sector implement equity promoting strategies. Once improvements in allocations to health have been achieved, there is need to ensure that the resources are utilised efficiently and effectively.

### • Scaling-up of equity oriented interventions

Health policies should promote scaling up of strategies that improve geographical and financial access. They should also address socio-cultural barriers and gender inequity issues that deny women access to health care. Equity oriented interventions that need scaling up include basic or essential health packages, expansion of the health services to remote areas, expansion and integration of community level health services, targeted fee exemptions at public facilities, free health services, expansion of national health insurance, promotion of community-based health insurance, and financial decentralisation.

### • Emulating the immunisation campaign

Immunisation displayed the least inequities. It is important that countries emulate the strategies adopted in others to improve immunisation coverage.

## 6. Conclusion

This paper used a simple bi-variate analysis, concentration indices, and curves on DHS data to empirically identify some evidence on health inequities in 10 selected African countries. The evidence shows that inequities in accessing health care are present. In all the study countries, women from the poorest quintiles are less likely than those in better off quintiles to use basic health services such as prenatal care, modern contraceptives, delivery assistance by a health professional, and immunisation. The health indicators with the greatest inequity due to economic reasons are contraceptive use and delivery assistance by health professionals. Immunisation, on the other hand, is the most equitable service provided in all the countries studied in terms of both income and rural/urban residency.

Important policy implications include scaling up resources to the health sector, scaling up interventions that address financial and geographical sources of inequities, and emulating the strategies being used by other countries in improving equity in immunisation.

The distinctive policies by the countries studied require further analysis. The DHS data with a simple bi-variate analysis of certain health variables across socio-economic groups and location provided the empirical evidence of health inequities. Further research on the countries studied would allow a more thorough analysis of the causes of progress or lack of progress observed. It will reveal in more detail, the policy responses that countries are adopting to address the demand and supply side factors that were not addressed in this study, such as social and cultural factors, and lack of education and information.

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### **Annex 1. Construction of the DHS Wealth Index**

There are several steps to the construction of the DHS wealth index. They are the determination of indicator variables, dichotomisation, calculation of indicator weights and the index value, and calculation of distribution cut points.

#### **Indicator Variables**

Generally, any item that will reflect economic status is used in calculating the DHS wealth index. These include household assets and utility services data collected in the questionnaire (such as household's ownership of a number of consumer items such as a television and car; dwelling characteristics, such as flooring or roofing material; type of drinking water source; toilet facilities etc.).

#### **Construction of the Index**

There are various ways to assign weighting values to the indicator variables. Ad hoc weights, such as assigning "1" for a bicycle, "3" for a motorcycle, and "5" for a car or truck, work to a certain extent. They are however arbitrary and subjective according to the researcher, and are difficult to assign when the wealth ordering is not readily apparent. For this reason, Filmer and Pritchett recommended using principal components analysis (PCA) to assign the indicator weights. It is the procedure that is used for the DHS wealth index. DHS uses the SPSS factor analysis procedure, which first standardises the indicator variables (calculating z-scores) before the factor coefficient scores (factor loadings) are calculated. Finally, for each household, the indicator values are multiplied by the loadings and summed to produce the household's index value. In this process, only the first of the factors produced is used to represent the wealth index. The resulting sum is itself a standardised score with a mean of zero and a standard deviation of one.

#### **Construction of Quintiles**

For tabular analysis with the DHS wealth index, quintiles are used. These quintiles are based on the distribution of the household population rather than on the distribution of households. The distribution is population based because it is thought that most analyses are concerned with poor people rather than poor households. Quintiles are used instead of other percentiles as a compromise between limiting the number of categories to be tabulated and adequately representing the relationship between wealth and the phenomenon of interest. The cut points in the wealth index at which to form the quintiles are calculated by obtaining a weighted frequency distribution of households, the weight being the product of the number of *de jure* members of the household and the sampling weight of the household. Thus, the distribution represents the national household population, where each member is given the wealth index score of his or her household. They are

then ordered by the score, and the distribution is divided at the points that form the five 20-percent sections. The household score is then recoded into the quintile variable so that each member of a household also receives that household's quintile category.

Source: Rutsein S. O, K. Johnson, 2004, *DHS Comparative Reports No. 6: The DHS Wealth Index*, Measure DHS and Macro, Calverton, USA.

### Annex 2. Concentration curve across health indicators for selected countries

Fig 1. Cameroon: concentration curves across indicators, DHS 2004

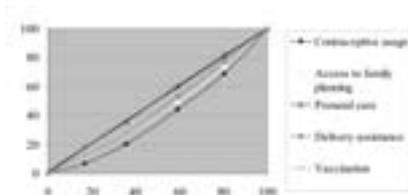


Fig 2. Chad: concentration curves across indicators, DHS 2004

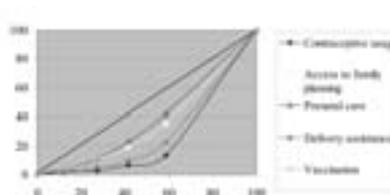


Fig 3. Egypt: concentration curves across indicators, DHS 2005

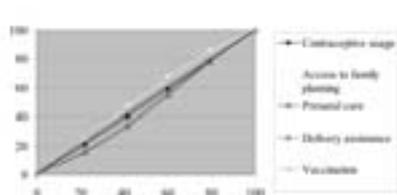


Fig 4. Morocco: concentration curves across indicators, DHS 2003/04

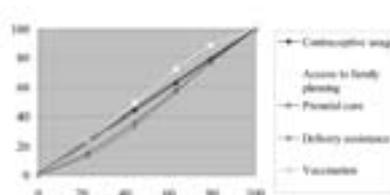


Fig 5. Ethiopia: concentration curves across indicators, DHS 2005

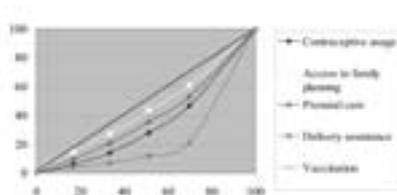
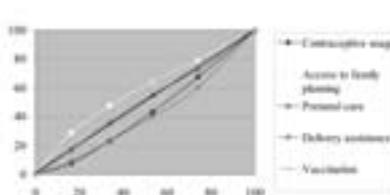
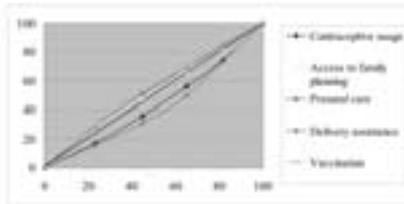


Fig 6. Kenya: concentration curves across indicators, DHS 2003

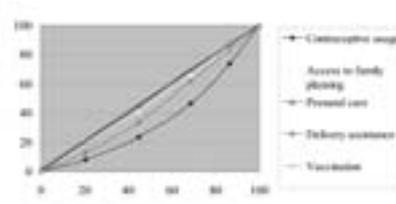


**Annex 2. Concentration curve across health indicators for selected countries (cont.)**

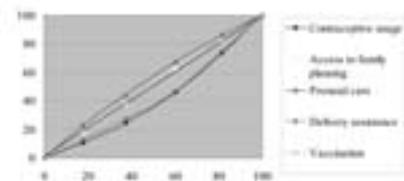
**Fig 7. Ghana: concentration curves across indicators, DHS 200 3**



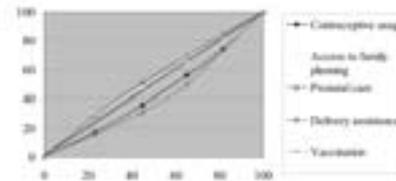
**Fig 8. Senegal: concentration curves across indicators, DHS 2005**



**Fig 9. Zambia: concentration curves across indicators, DHS 200 1/02**



**Fig 10. Malawi: concentration curves across indicators, DHS 2004**



Source: Authors' calculations using DHS data

**Annex 3. Stratification of health variables by wealth quintiles (%)**

	Indicator	DHS Year	poorest	poorer	middle	richer	richest	Low-High Diff.*	Conc. Index Value	C.I. Std Error	
CENTRAL AFRICA SUB-REGION	<b>Cameroon</b>										
	Women's access to modern contraceptives	1998	13.7	16.5	27.9	48.3	59.8	46.1	0.266	0.022	
		2004	20.6	35.2	49.8	57.0	77.7	57.1	0.211	0.013	
	Women's access to family planning services	1998	11.1	14.1	22.5	24.7	29.7	18.6	0.178	0.018	
		2004	8.7	13.9	17.6	20.5	24.4	15.7	0.180	0.014	
	Prenatal care services	1998	61.4	70.7	86.4	94.2	94.8	33.4	0.086	0.006	
		2004	67.9	77.7	89.2	95.8	97.5	29.6	0.073	0.003	
	Delivery assistance by health professional	1998	31.4	43.0	67.6	86.0	89.4	58	0.194	0.01	
		2004	36.7	53.5	75.5	90.2	95.8	59.1	0.180	0.005	
	Immunisation coverage	1998	51.2	51.1	51.4	57.4	66.4	15.2	0.054	0.019	
		2004	47.3	65.9	53.6	64.3	70.9	23.6	0.053	0.017	
	<b>Chad</b>										
	Women's access to modern contraceptives	1996/97	1.1	.0	2.7	2.8	14.2	13.1	0.515	0.046	
		2004	2.3	.0	3.0	4.0	21.7	19.4	0.473	0.038	
	Women's access to family planning services	1996/97	3.8	5.4	6.0	11.2	22.0	18.2	0.340	0.019	
		2004	1.0	5.4	6.1	8.8	16.8	15.8	0.354	0.002	
	Prenatal care services	1996/97	21.7	33.2	32.7	49.1	75.2	53.5	0.224	0.008	
		2004	7.9	27.1	41.6	53.7	76.7	68.8	0.294	0.009	
Delivery assistance by health professional	1996/97	6.6	9.9	11.6	23.9	54.9	48.3	0.395	0.01		
	2004	1.5	7.3	10.3	21.0	61.7	60.2	0.468	0.011		
Immunisation coverage	1996/97	21.0	18.6	25.2	38.6	41.4	20.4	0.168	0.024		
	2004	11.7	21.0	26.5	39.3	34.1	22.4	0.156	0.027		

	Indicator	DHS Year	poorest	poorer	middle	richer	richest	Low-High Diff.*	Conc. Index Value	C.I. Std Error	
CENTRAL AFRICA SUB-REGION	<b>Egypt</b>										
	Women's access to modern contraceptives	2000	73.5	84.1	88.1	92.7	93.1	19.6	0.042	0.002	
		2005	86.0	90.0	91.7	94.7	94.5	8.5	0.020	0.002	
	Women's access to family planning services	2000	12.5	14.3	14.6	11.9	7.2	-5.3	-0.10	0.012	
		2005	21.3	20.7	19.2	17.2	13.0	-8.3	-0.09	0.009	
	Prenatal care services	2000	33.0	43.4	55.1	70.0	86.2	53.2	0.183	0.005	
		2005	47.6	61.8	74.6	86.9	93.6	46	0.133	0.004	
	Delivery assistance by health professional	2000	35.9	50.9	67.4	81.4	95.6	59.7	0.179	0.005	
		2005	53.7	69.5	81.6	90.0	96.7	43	0.113	0.003	
	Immunisation coverage	2000	71.1	76.0	78.3	77.7	65.5	-5.6	-0.01	0.008	
		2005	77.4	76.1	76.9	73.2	73.4	-4	-0.01	0.006	
	<b>Morocco</b>										
	Women's access to modern contraceptives	1992	47.8	68.2	78.1	82.1	86.8	39	0.101	0.007	
		2003/04	92.6	94.0	95.3	95.9	95.8	3.2	0.007	0.002	
	Women's access to family planning services	1992	-	-	-	-	-	-	-	-	
		2003/04	12.9	14.5	14.6	12.4	7.6	-5.3	-0.073	0.015	
	Prenatal care services	1992	10.7	20.4	36.4	58.8	77.5	66.8	0.352	0.011	
		2003/04	39.7	56.8	70.5	85.7	93.4	53.7	0.167	0.006	
Delivery assistance by health professional	1992	8.2	18.6	35.0	61.9	80.7	72.5	0.386	0.011		
	2003/04	34.2	55.3	73.7	87.4	95.8	61.6	0.194	0.006		
Immunisation coverage	1992	54.1	66.1	69.7	76.3	66.4	12.3	0.051	0.013		
	2003/04	70.4	74.2	84.9	84.8	84.0	13.6	0.041	0.009		

	Indicator	DHS Year	poorest	poorer	middle	richer	richest	Low-High Diff.*	Conc. Index Value	C.I. Std Error	
CENTRAL AFRICA SUB-REGION	<b>Ethiopia</b>										
	Women's access to modern contraceptives	2000	9.1	11.0	11.7	20.5	59.6	50.5	0.395	0.014	
		2005	11.3	16.5	26.1	33.6	59.9	48.6	0.306	0.012	
	Women's access to family planning services	2000	10.4	10.1	9.3	14.9	24.9	14.5	0.209	0.014	
		2005	8.4	10.3	13.5	15.7	20.7	12.3	0.188	0.015	
	Prenatal care services	2000	15.5	17.4	22.3	28.8	66.8	51.3	0.305	0.009	
		2005	12.3	20.1	26.6	33.1	67.1	54.8	0.328	0.009	
	Delivery assistance by health professional	2000	1.6	1.9	3.4	5.0	46.9	45.3	0.622	0.011	
		2005	2.3	2.1	3.6	7.7	48.8	46.5	0.612	0.012	
	Immunisation coverage	2000	20.6	19.6	21.2	31.4	51.3	30.7	0.210	0.02	
		2005	23.6	24.8	40.0	34.3	47.6	24	0.146	0.027	
	<b>Kenya</b>										
	Women's access to modern contraceptives	1998	33.3	48.2	55.5	65.1	76.4	43.1	0.150	0.01	
		2003	30.9	57.6	68.9	77.2	82.6	51.7	0.141	0.009	
	Women's access to family planning services	1998	19.2	20.1	20.3	22.7	28.8	9.6	0.077	0.015	
		2003	7.2	5.5	4.9	4.4	3.8	-3.4	-0.132	0.035	
Prenatal care services	1998	90.1	92.3	93.7	96.2	95.9	5.8	0.014	0.003		
	2003	67.2	85.7	91.0	92.1	94.0	26.8	0.059	0.004		
Delivery assistance by health professional	1998	22.8	34.9	42.1	57.1	79.0	56.2	0.230	0.011		
	2003	21.4	39.0	47.2	62.0	81.6	60.2	0.240	0.008		
Immunisation coverage	1998	52.6	56.3	65.1	59.9	46.2	-6.4	-0.001	0.015		
	2003	53.1	63.9	62.7	65.7	53.4	0.3	0.008	0.015		

	Indicator	DHS Year	poorest	poorer	middle	richer	richest	Low-High Diff.*	Conc. Index Value	C.I. Std Error	
CENTRAL AFRICA SUB-REGION	<b>Ghana</b>										
	Women's access to modern contraceptives	1998	26.4	35.3	39.0	49.3	57.4	31	0.156	0.019	
		2003	35.1	41.8	48.1	52.5	69.3	34.2	0.129	0.016	
	Women's access to family planning services	1998	-	-	-	-	-	-	-	-	
		2003	32.2	30.0	32.3	30.9	31.8	-0.4	-0.002	0.014	
	Prenatal care services	1998	76.2	85.8	93.5	96.1	98.1	21.9	0.055	0.005	
		2003	83.2	90.9	94.2	95.9	98.9	15.7	0.035	0.003	
	Delivery assistance by health professional	1998	20.4	28.9	52.8	68.2	88.5	68.1	0.299	0.012	
		2003	23.1	36.2	49.9	77.6	93.6	70.5	0.284	0.01	
	Immunisation coverage	1998	73.5	75.2	83.9	75.2	78.8	5.3	0.015	0.012	
		2003	78.9	80.9	84.1	82.6	83.5	24	0.013	0.01	
	<b>Senegal</b>										
	Women's access to modern contraceptives	1997	3.2	6.8	12.8	31.5	51.5	48.3	0.467	0.022	
		2005	13.4	21.7	33.5	52.9	64.9	51.5	0.288	0.016	
	Women's access to family planning services	1997	-	-	-	-	-	-	-	-	
		2005	13.8	13.4	14.8	17.2	17.6	3.8	0.054	0.013	
	Prenatal care services	1997	77.3	80.4	90.5	96.5	97.6	20.3	0.052	0.003	
		2005	83.5	90.2	95.9	98.9	99.6	16.1	0.035	0.002	
	Delivery assistance by health professional	1997	36.7	42.9	64.5	82.9	93.0	56.3	0.195	0.007	
		2005	39.8	59.5	80.2	94.9	97.3	57.5	0.168	0.004	
Immunisation coverage	1997	-	-	-	-	-	-	-	-		
	2005	71.3	65.7	76.1	76.8	77.9	6.6	0.024	0.013		

	Indicator	DHS Year	poorest	poorer	middle	richer	richest	Low-High Diff.*	Conc. Index Value	C.I. Std Error	
CENTRAL AFRICA SUB-REGION	<b>Zambia</b>										
	Women's access to modern contraceptives	1996	19.2	31.5	32.6	53.1	73.5	54.3	0.750	0.017	
		2001/02	36.7	41.7	56.5	77.2	85.2	48.5	0.173	0.011	
	Women's access to family planning services	1996	68.4	69.1	69.2	69.1	79.2	10.8	0.020	0.005	
		2001/02	23.4	26.9	29.7	31.1	34.4	11	0.070	0.013	
	Prenatal care services	1996	93.2	96.4	96.3	99.4	99.7	6.5	0.014	0.002	
		2001/02	89.0	91.1	92.8	95.6	99.0	10	0.019	0.002	
	Delivery assistance by health professional	1996	26.5	31.6	45.3	75.6	93.0	66.5	0.268	0.008	
		2001/02	26.2	30.5	41.1	73.4	93.1	66.9	0.263	0.008	
	Immunisation coverage	1996	79.5	83.1	81.4	82.7	84.6	5.1	0.010	0.007	
		2001/02	79.5	78.1	82.6	81.2	80.8	1.3	0.007	0.008	
	<b>Malawi</b>										
	Women's access to modern contraceptives	2000	36.8	46.0	45.4	49.1	63.0	26.2	0.093	0.01	
		2004	50.2	53.4	55.3	59.1	73.1	22.9	0.066	0.008	
	Women's access to family planning services	2000	41.2	44.9	46.8	48.1	49.6	8.4	0.034	0.006	
		2004	37.8	41.6	43.3	44.8	46.2	8.4	0.033	0.007	
	Prenatal care services	2000	87.9	90.0	93.6	92.7	96.3	8.4	0.017	0.002	
		2004	88.9	89.9	90.5	94.7	97.2	8.3	0.017	0.002	
Delivery assistance by health professional	2000	47.1	55.6	63.5	64.1	82.0	34.9	0.102	0.005		
	2004	51.7	53.3	56.8	68.6	86.5	34.8	0.099	0.005		
Immunisation coverage	2000	79.3	80.9	82.9	86.8	79.7	0.4	0.007	0.006		
	2004	69.8	70.8	81.5	77.1	79.6	9.8	0.028	0.007		

\* Absolute difference between the richest and poorest quintiles  
 Source: Authors' calculations using DHS data