Towards an understanding of regional disparities in social inequities in maternal health in Malawi

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Abstract

Background: Improving maternal health remains a major challenge facing Malawi because at 984 deaths per 100,000 live births, the maternal mortality ratio is among the highest in the world. Although the health status of women in child-bearing age groups is low in all the three regions of Malawi, there are marked regional differences in several health indicators.

Objective: To analyze the degree of socio-economic inequities in maternal health in Malawi both at regional and national levels.

Methods: Using data from a sample of 4,276 women from the Malawi Second Integrated Household Survey of 2004 who reported giving birth up to two years preceding the survey, deliveries attended by skilled health personnel and access to prenatal care services were used to analyze socio-economic inequities in maternal health. Household income, from which household socio-economic status was derived, was proxed by real annual household expenditure. Concentration indices were then calculated for the two indicators for the whole sample, as well as for each of the three regions of Malawi. The proportion of household income that is spent on health was also considered to ascertain whether the poor spend a larger proportion of their income on health than the non-poor.

Results: There is no evidence that the poor spend a higher proportion of their income on health than the non-poor. We found very high rates of utilization of antenatal care services with no income-related inequality in its utilization both at regional and national levels. There are socioeconomic inequalities in the deliveries by skilled health personnel. The pro-rich inequalities in the medically attended deliveries are highest in the central region followed by the north and lowest in the southern region, with traditional birth attendants still playing an important role in handling deliveries.

Conclusions: The free government medical services appear to be effective in ensuring that the poor do not spend a higher proportion of their income on health than the non-poor. However, there is a wide mismatch between utilization of antenatal care services and skilled attendance at childbirth.

Keywords: socio-economic inequities, maternal health, Malawi

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Introduction

Health equity has been an important policy issue since the Alma-Ata Declaration of 1978 where all the member states of the World Health Organization (WHO) committed to achieving health for all by the year 2000. Since then, all countries have been making great strides to reduce health inequities, which are recently seen as impediments to achieving the health-related Millennium Development Goals (MDGs). However, health inequities remain a serious health and development concern in many developing countries in general, and Malawi in particular.

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Equity in health has been a contentious issue among development practitioners and health sciences researchers. There is, however, a growing consensus in literature that health equity is a moral or ethical dimension of health inequality[1], in the sense that health inequity constitutes health inequalities that are unjust, avoidable and unfair[2].

This paper is concerned with social inequities in maternal health in Malawi. These social inequities are defined as avoidable and unfair disparities in maternal health between socioeconomic groups. In the paper, health equity is analyzed at the micro level using three different indicators: equity in the access to prenatal care services, deliveries attended by skilled health personnel and annual health expenditure as a proportion of total household non-food expenditure. These indicators are analyzed for different socioeconomic groups in Malawi. This study is important because although maternal mortality ratios has been falling in Malawi from 1,120 to 984 maternal deaths per 100,000 live births between 2000

and 2004, the ratio remains one of the highest worldwide[3]. As such, a thorough understanding of the extent to which disparities in access and utilization of maternal health services in Malawi are unfair and avoidable would help development practitioners and policymakers to put in place policy options and strategies to reduce them and put Malawi on course for achieving the fifth MDG of reducing maternal mortality by three-fourths.

Although the goal of the Ministry of Health is to raise the level of health status of all Malawians by reducing the incidence of illnesses and occurrence of premature deaths in the population[4], the health sector continues to face serious challenges. As Malawi health indicators show in table 1, high maternal mortality rate is not the only health challenge. Life expectancy at birth is lower, while infant mortality rate and the HIV prevalence rate are higher than the African average. It is, therefore, not surprising that with 52 percent of the population living in poverty in 2004, coupled with the poor health indicators, there is a general perception that the poor are experiencing worse health outcomes than the non-poor in Malawi.

Table 1: Malawi health indicators

Indicator	Year	Malawi	Africa
Life Expectancy at Birth	2004	41 years (Male)	47
		41 years (Female)	49
Infant Mortality Ratio	2004	109	100
Maternal Mortality Rate	2004	1800	910
Proportion of Births Attended by Skilled Health Personnel	2004	61 Percent	47
HIV Prevalence among Adults (15-49) (Percent)	2004	14.2	7.1
Total Expenditure on Health per Capita	2004	$58	-
Total Expenditure on Health as Percent of GDP	2004	13 Percent	-

Source: [13]

The Ministry of Health introduced the Essential Health Package (EHP) as part of the health sector reforms in order to reduce the mismatch between health resources, health needs and demands for health care. The EHP consists of a cluster of cost-effective interventions delivered together in order to reduce the total cost of the interventions by reducing the cost to patients obtaining services as well as the costs of providing the services[4]. The EHP was designed to address the health needs of the poor and disadvantaged populations and the EHP services are provided free of charge at the point of delivery. The EHP consists of 11 services, including vaccines for preventable diseases; malaria prevention and treatment; reproductive health services; prevention and treatment of Tuberculosis; prevention and treatment of acute respiratory infections; prevention and treatment of sexually transmitted diseases and prevention and treatment of acute diarrhea diseases, among others. The extent to which the EHP achieves its objective of improving technical and allocative efficiency in the delivery of health care in Malawi depends, to some extent, on the ability of the poor to utilize such health services. Nevertheless, it is important to examine the role of the EHP in the promotion of maternal health in Malawi.

Further, there are significant regional differences in the health and socio-economic indicators for women in child-bearing age groups in Malawi. The northern region, which comprises 6 districts and covering a total area of 26,931 km², has the best socio-economic and health indicators as indicated in table 2.

Table 2: Regional differences in selected indicators for women in 2004

Variable	Region Northern	Central	Southern
Educational Attainment:			
No education at all	16.3	31.4	32.8
At least secondary school	12.2	8.2	7.4
Literacy (%)	78.2	60.9	59.1
Women occupation – Agriculture (%)	61.9	70	73.1
Total Fertility Rate (15-49 years)	5.6	6.4	5.8
Infant Mortality Rate	82	90	98
Under-five Mortality Rate	120	162	164
Antenatal Care:			
Doctor/Clinical Officer (%)	8.3	11.4	8.9
Nurse/Midwife (%)	87.1	79.5	83.5
Traditional Birth Attendants (%)	0.6	1.7	2.6
Place of Delivery:			
Public Health Facility (%)	46.9	37.2	44.8
Private Health Facility (%)	20	15.3	14.1
Home (%)	23.2	31.9	28.7
Traditional Birth Attendant (%)	8.7	14.3	11.1
Assistance during delivery:			
Professional (%)	66.3	51.3	57.7
TBA (%)	18.8	31.5	23.4

Source: Own compilation from MDHS (2004)[3]

However, the rates are still very low by international standards. The central region, which is made up of 9 districts and is also home to the capital city, has the second best indicators. Most of the indicators are worst for the southern region, which comprises 12 districts, covering a total area of 31,754 km². Despite these regional differences, it is important to examine the degree of socio-economic inequities in maternal health in each of the three regions, in order to identify the regions where access to maternal health care needs to be improved in order to promote equity of access to such services.

Methods
Measuring socio-economic inequity in maternal health
The study uses two indicators of maternal health: deliveries attended by skilled personnel and access to prenatal services to examine if there are any systematic differences in inequities in maternal health between the three regions of Malawi. The sample was categorized into five socio-economic status groups based on household real consumption expenditure. Income-related inequity in maternal health was measured using a concentration index[5]. The concentration index, C, was computed from grouped data in a spreadsheet program as:

$$C = (p_1 L_2 - p_2 L_1) + (p_2 L_3 - p_3 L_2) + ... + (p_{T-1} L_T - p_T L_{T-1}) \quad (1)$$

Where:
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[6]. It should be noted that the concentration index assumes a value between -1 and +1, where a positive value indicates the presence of inequity in the health variable in favour of the non-poor. A negative value indicates that the health variable is higher among the least advantaged socio-economic groups. A concentration index is 0 where there is no income-related inequality. The standard errors for the concentration indices were computed using Kakwani *et al*. formula [7].

An analysis of household real expenditure on health as the proportion of total household non-food real expenditure was also conducted for the households whose members were part of the sampled women. The choice of non-food household expenditure rather than total household expenditure was motivated by the fact that food accounts for a large share of household expenditure in Malawi. In the sample, 70 percent of total household expenditure was devoted to food, on average. Since income elasticity of demand for food

in low-income households is often inelastic, non-food household expenditure appeared to be a better alternative. A one-way analysis of variance was then used to test whether the proportions were statistically different between the wealth quintiles.

Data sources
This study is based on data from the 2004-2005 Malawi Second Integrated Household Survey (IHS2). The IHS2 was a comprehensive socio-economic survey of the living standards of households in Malawi and the dataset has information on 11,280 households spread across 564 communities in all the 27 districts of Malawi. This study only sampled women who had reported giving birth up to 24 months prior to the survey date. Household wealth is proxied by household real consumption expenditure and the wealth groups that are used in the socioeconomic classifications are based on the annual household real expenditure quintiles. The

results are further classified by region to compare how social inequalities in maternal health vary between the three regions of Malawi. Simple bivariate analyses were used in the study and the concentration index was calculated to quantify the degree of income-related inequality in the maternal health variables.

Results
Household out-of-pocket expenditure on health
Table 3 presents the proportions of health expenditure to total household non-food expenditure classified by wealth quintiles for the three regions of Malawi. Out-of-pocket household expenditure on health comprises costs of medical care related to an illness, such as the cost of prescription medicines and non-prescription medicines, as well as expenditures on preventive health care.

Table 3: Proportion of health expenditure to total household non-food expenditure by wealth quintiles (percent) in Malawi, 2004

Region	Poorest	Second	Middle	Fourth	Richest	F-Statistic	Signif
North	2.7	3.8	3.3	3	3.1	0.699	0.593
Centre	4.8	4.2	4.7	5.2	3.3	4.245	0.002
South	1.7	1.6	1.7	1.6	1.8	0.158	0.96
Malawi	4.2	4	4.3	4.4	3.6	1.743	0.138

Source: Own calculation

In general, the figures are very low and for the whole sample, the poorest wealth quintile spent 4.2 percent of their non-food expenditure on health care while the richest group spent an average of 3.6 percent between 2004 and 2005. There is no systematic trend as one moves from the 'poorest' to the 'richest' socio-economic group. Further, the F statistic shows that the differences between the groups are not statistically significant. This result therefore does not seem to support the notion that the poor spend a higher proportion of their income on health than the non-poor.

Similar results are attained when the sample is classified into regions. The proportion of out-of-pocket health expenditure to household non-food expenditure appears to be highest in the central region followed by the northern region and lowest in the southern region. For instance, the 'poorest' wealth group were spending 4.8 percent in the central region compared to 2.7 percent in the north and 1.7 percent in the south. However, there is no clear trend as one moves from the 'poorest to the 'richest' wealth group.

Further, the results are only significant for the central region, implying that the proportions of out-of-pocket expenditure to total household non-food expenditure are statistically not equal across the wealth groups. For this significant case, although the proportion is lowest for the 'richest' group, it is not highest in the 'poorest' group, as one would expect. Rather, there are a lot of fluctuations and any systematic trend cannot be established, with the highest proportion being recorded for the 'fourth' group.

In the case of the north and the south, the F statistic is not significant and therefore we fail to reject the hypothesis that average household expenditure on health as a proportion of total household non-food expenditure are equal across the wealth groups.

Deliveries attended by skilled health personnel
The results of the proportion of births that were attended by skilled health personnel are presented in table 4.

This category encompasses doctor, nurse, clinical officer and midwife in line with the WHO definition of skilled health personnel. According to the WHO, skilled attendance at birth refers to deliveries attended by an accredited health professional such as a doctor, midwife or nurse, who has been educated and trained to proficiency in the skills required to manage uncomplicated pregnancies, childbirth and the immediate postnatal period, and in the identification, management and referral of complications in women and newborns[8].

Table 4: Stratification of medically attended deliveries by wealth quintiles (percent) in Malawi, 2004

Region	Poorest	Second	Middle	Fourth	Richest	Concentration Index (CI)	CI Std. Error
North	57.3	65.2	68.9	66.9	83.3	0.061	0.002
Centre	45.5	44.5	42.6	52.1	61.6	0.068	0.018
South	54.8	59	61.2	67.4	76.9	0.029	0.005
Malawi	52.9	55.3	54.9	60	70	0.057	0.027

Source: Own calculation

For the case of Malawi, the proportion of medically attended deliveries increases across the socio-economic groups. Indeed, about 53 percent of the deliveries were attended by a medical professional in the 'poorest' quintile and the proportion continues to increase until the 'richest' quintile where it is as high as 70 percent. The concentration index value of 0.057 indicates that there is some income-related inequality in access to delivery assistance from a health professional in favour of the non-poor. A similar result was obtained using the Malawi Demographic and Health Survey (MDHS) data of 2004 where the concentration index for delivery assistance was 0.099[9].

Table 4 also shows the differences in medically attended deliveries between the 3 regions of Malawi. The proportions are highest in the northern region followed by the southern region and lowest in the central region. For the 'poorest' wealth group, 57 percent of births were attended by skilled health personnel in the north compared to 55 percent in the south and 46 percent in the centre. These figures rise to 83 percent, 77 percent and 62 percent for the 'richest' group, respectively. The concentration index values range from 0.029 in the south to 0.068 in the centre, indicating that income-related inequity in medically attended deliveries in favour of the non-poor is lowest in the south and highest in the centre.

Access to prenatal services

The proportion of women with access to prenatal services is very high across the wealth groups in Malawi as shown in table 5. Around 94 percent of pregnant women from the "poorest" socio-economic group had access to prenatal services and the proportion is fairly uniform across the different wealth groups.

Table 5: Stratification of prenatal care services by wealth quintiles (percent) in Malawi, 2004

Region	Poorest	Second	Middle	Fourth	Richest	Concentration Index (CI)	CI Std. Error
North	93.9	94.2	95.1	95.9	97.5	0	0.003
Centre	88.1	84.3	84.8	90.2	89.6	0.005	0.014
South	96.1	96.2	95.1	96.7	98.8	0	0.002
Malawi	93.8	92	91	93.5	93.8	0.012	0.006

Source: Own calculation

A similar picture emerges at regional level, although there is a small upward trend across the wealth groups. In particular, access and utilization of prenatal services is highest in the south followed by the north and then the centre. Further, the concentration index for access to prenatal services is very close to equity for the central region and it is 0 in the north and the south indicating that there are no income-related inequities in the access to prenatal care services in the two regions.

Discussion

As the results from table 3 have shown, out-of-pocket health expenditure as a proportion of total household non-food real expenditure is low in Malawi and there is no evidence from the results that the poor are spending a higher proportion of their household income on health than the non-poor. Indeed, the results have shown that there are no statistical differences in the ratio of health expenditure to total household non-food expenditure across the different socio-economic groups in the sample. This result contradicts an earlier finding from the Ministry of Health, which indicated that the poorest households spent between 7.4 percent and 10 percent of their annual consumption on health care in 2001[4]. If out-of-pocket health expenditures were measured as a proportion of total annual household consumption in this study, the proportions would even be less. A plausible explanation is that out-of-pocket expenditure on health has been falling since the introduction of the EHP services. Since the EHP services are being provided free of charge even in otherwise fee-charging mission hospitals, households that are served by such health facilities are now spending less on their health care.

Out-of-pocket expenditures as a proportion of annual household non-food expenditure are very low in Malawi partly because government medical services are largely free of charge at the point of consumption. Although access to health services remains modest in Malawi with 54 percent of the rural population having access to formal health services within a 5 Kilometre radius, equity in access to such services is promoted in most government health facilities because no user fees are levied. However, of the 617 health facilities in Malawi, about 60 percent are government-owned while 25 percent are owned by the Christian Hospitals Association of Malawi (CHAM) where user fees are levied on health services that are not part of the EHP[4]. CHAM is the umbrella body for all Christian hospitals in Malawi. Most of these hospitals are owned and operated by the Roman Catholic Church, the Presbyterian Church and the Seventh Day Adventist Church. They are mostly located in rural areas where government health facilities are lacking. For communities that are served by CHAM hospitals equity of access is compromised, as the poor do not always afford to pay for their medical treatment that falls outside the EHP.

The regional differences in the proportions of health expenditure to total household non-food expenditure appear to be very low and the proportions are not statistically different across the wealth groups in the north and the south. The proportions are highest in the central region partly because there are more private clinics and CHAM health facilities where user fees are levied for services outside the EHP. Further, in communities where members have a choice between a non-paying government health facility and a paying CHAM or private hospital, those that are able to pay end up receiving treatment from a paying facility where services are perceived to be of higher quality. This is likely to be more common in the central region where more private hospitals operate than in the other two regions.

The proportion of births attended by skilled health personnel is an important indicator for monitoring the Millennium Development Goal of improving maternal health. This indicator is of particular importance to Malawi because of its unenviable maternal mortality rate. It is therefore important to understand whether socio-economic equities in maternal health are contributing to this high rate of maternal mortality. The proportion of births attended by skilled health personnel in our sample was 58.8 percent, which is similar to the WHO 2007 official rate of 56.1 percent for Malawi [8]. Although it is slightly lower than the global average of 63.1 percent, it is higher than the African average of 46.5 percent[8].

Stratification of delivery assistance by wealth has revealed evidence of income-related inequities in Malawi. Women in the richest wealth quintile have greater access to delivery assistance by qualified health personnel in Malawi than those in the poorer socioeconomic groups, as shown by the concentration index value of 0.057. This result points to the fact the free reproductive health services that include family planning and safe motherhood services in government health facilities may not be achieving its desired intentions of improving equity

of access to such important services. Indeed, a similar study was able to show that home deliveries have pro-poor orientation as the poor utilize home delivery services excessively compared to the non-poor in Malawi[9]. In our sample, 30 percent of all the deliveries were done at home with no qualified health personnel.

It is important to note that the majority of the births that are not attended by qualified health personnel in Malawi are handled by traditional births attendants (TBA). Traditional Births Attendants are experienced women volunteers who act like midwives at the community level since few communities have access to health facilities. They receive training from the Ministry of Health on how to conduct safe deliveries at home, among others. These were set up to improve the coverage of maternal health services, as advocated by the WHO since the 1970s. The WHO recommended training of TBAs and integrating them in the clinical services as a strategy to reduce maternal and neonatal mortality. The hope was that TBAs would recognize complications or obstructed labour and quickly refer such women to health facilities that can handle such complications[10]. The fact that 19.7 percent of the births in our sample were conducted by TBAs underscores the important role that TBAs continue to play in the provision of maternal health services in Malawi. However, TBAs in Malawi tend to be old and often illiterate women who may not be able to manage the challenges of ensuring that women with complications are referred to relevant health facilities quickly. Indeed, most of the TBAs are poorly connected to health facilities and the referral system quickly breaks down, thereby jeopardizing the lives of the women who develop complications during delivery.

The results have also shown that the central region has the highest disparity in medically attended deliveries in favour of the non-poor. Low levels of women literacy, cultural traditions and the important roles of traditional healers in the communities in the central region are some of the reasons for the regional disparities. According to the results of the MDHS of 2004, 32 percent of deliveries in the central region are done at home while 31 percent are conducted by traditional birth attendants[3].

Access to prenatal care services is very high across the wealth groups in Malawi and it is very close to the equity level. Access to and utilization of prenatal care services ensures that complications and mortalities associated with pregnancy are addressed[11]. At the regional level, the socio-economic inequities with regards to access to prenatal care services remain extremely low in all the three regions. Both the poor and the non-poor are able to access and utilize prenatal care services in all the regions of Malawi. This is important as it helps to minimize the adverse maternal and fetal outcomes of pregnancy[3].

A surprising result is that utilization of prenatal care services does not appear to automatically result in having a delivery assisted by a health professional in any of the three regions of Malawi. Indeed, despite high rates of utilization of prenatal services, deliveries attended by skilled personnel have stagnated in Malawi. Only 55 percent of all deliveries were attended by skilled health professionals in 1992 and 2000, and the rate marginally increased to 57 percent in 2004[3]. Although literature on maternal health indicates that antenatal care coverage can be used as a measure of women's exposure to the health system, such exposure is not translating into increased skilled attendance at childbirth in Malawi. In our sample, about 38 percent of the women who reported attending antenatal care services did not have medically attended deliveries. At the regional level, the rate was 45 percent in the central region, as compared to 29 percent in the north and 36 percent in the south. This relationship between antenatal care and skilled attendance at delivery is far much weaker than the global average where women who have at least four antenatal care visits are about 3.3 times more likely to deliver in a medical facility than other women[12]. Thus, although antenatal care is usually seen as a core component of maternal and child health care, the degree to which the high levels of antenatal care improve health outcomes for Malawian women is very low. Despite high levels of access to antenatal care services, which is also highly equitable across different socio-economic groups, maternal mortality remains one of the highest in the world. If the wide coverage of antenatal care services in Malawi is to be effective in reducing maternal mortality, the content of the services should go beyond prenatal care. Antenatal care should be seen as an important entry point for promoting skilled attendance at childbirth as well as the importance of receiving postpartum care. Antenatal care services in Malawi should incorporate provision of information and effective training on family planning, nutrition, HIV/AIDS and other sexually transmitted infections.

Conclusions

We found no evidence that the poor spend a larger proportion of their income on health than the non-poor. We have also been able to establish that there is a wide coverage of prenatal care services and there are no socio-economic inequities in the access and utilization of such services both at the country and regional levels. However, there is a wide mismatch between utilization of antenatal care services and skilled attendance at childbirth in Malawi.

There is an urgent need to improve the rates of medically attended deliveries since there is growing evidence in literature that the higher the proportion of deliveries attended by skilled attendants in a country, the lower the country's maternal mortality rate.

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