

Benefit Incidence Analysis for Maternal, Newborn and Child Health Services in Kenya

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Abstract

Background: Financing maternal, newborn and child healthcare services is common practice in most countries, and the way such financing is administered rests fundamentally on distributional considerations, that is, on health-sector equity objectives such as equal treatment for equal need. Subsidies should therefore be targeted efficiently to ensure that the poor who need them most, receive them. This study sought to address the questions in public policy strategies, such as, how well public resources are spent on healthcare, to assess if the benefits ultimately reach the poorest segment of the population and whether the public spending on healthcare services is pro-poor. The overall aim of the study was to establish the benefit incidence of the maternal newborn and child health services in Kenya.

Methods: The benefit incidence analysis approach employed in this study assessed the benefits of maternal, newborn and child health care subsidies accruing to different socio-economic segments in Kenya. The study drew on the Kenya Demographic and Health Survey (KDHS) 2013/14 and the Kenya National Health Accounts (NHA) 2013/14 to establish the per capita subsidy for maternal, newborn and child healthcare utilization across the population in relation to the wealth index. Concentration indices and concentration curves were used to summarize the distribution of utilization and of the subsidy.

Results: The study results indicated income-related inequality in maternal, newborn and child health care utilization in Kenya, and the pattern differed across wealth groups in different geographical areas. The distribution of the total subsidy was pro-poor. However, when the results were expressed as a proportion of total household expenditure, the rich received a subsidy that represented a larger proportion of their expenditure than the subsidy received by the poorest population.

Conclusion: Government subsidies for maternal, newborn and child health services in Kenya were pro-poor in absolute terms but were not progressive, and utilization of private and urban facilities was pro-rich. Policymakers should (i) strengthen the targeting of subsidies towards the poorest wealth groups, (ii) reduce the residual out-of-pocket and non-financial barriers facing poor rural households, and (iii) reallocate spending from high-end curative care towards primary-level maternal, newborn and child health services.

Keywords: Benefit Incidence, Financing, Maternal and Child Health Services, Kenya

Introduction

Governments usually subsidize services that the market does not provide, or provides inadequately, such as pure public goods, where the marginal cost of additional utilization is zero (Svensson & Björkman, 2009). Subsidization can also be justified as a response to the failure of related markets. Governments are consequently required to subsidize some of these services for reasons of effectiveness (Filmer, Hammer, & Pritchett, 1998). The distributional consequences of such social spending in developing countries have long been recognized as a central question in public finance (Chu, Davoodi, & Gupta, 2000). Public health expenditure on maternal and child health in sub-Saharan Africa is poorly targeted and insufficiently progressive, and in practice favors those who are better off (Castro-Leal, Dayton, Demery, & Mehra, 2000). The result has been inadequate access to maternal and child health services, poor service delivery, and high maternal and child mortality rates among the poorest segments of the population (Davoodi, Tiongson, & Asawanuchit, 2010). In Kenya, the richest 20% of the population received a larger share of public subsidies on primary health care (22%) than the poorest 20%, who received 14% of the subsidies (Kenya National Health Accounts, 2013/14).

Achieving universal health coverage dominates contemporary global health debate. Health systems are expected to deliver the key promotive, preventive, curative and rehabilitative health interventions that populations need, at a cost that is affordable, thereby achieving equity in access. Equity in

the distribution of the economic benefits of public financing of maternal, newborn and child health care in Kenya matters because of the substantial poverty and the wide inequalities in access to health services. Understanding how maternal, newborn and child health care benefits are distributed relative to need is therefore an important policy question that health systems should address. Benefit Incidence Analysis (BIA) has increasingly become important because it assesses who, in terms of socio-economic groups, receive what benefits from using the health care services.

From the Kenya National Health Accounts 2013/14, the total recurrent expenditure allocated towards reproductive health, mainly maternal and child health care provision, was approximately Ksh. 26,018,950,451. From the institutional units providing financing revenues towards providing this type of health care, out-of-pocket accounted for 40.32%, government came second at 27.33%, with the rest of the world in terms of donors accounting for 18.92%. Contribution by private employers accounted for 7.86% of the total financing of the recurrent expenditure, with parastatals contributing the least at 2.37% in the provision of maternal, newborn and child healthcare in 2013/14, with 3.20% from other sources. Household out-of-pocket expenditures (OOPs) on health remain the largest source of healthcare financing. The dependence on donor funding, particularly for priority disease interventions, together with the high out-of-pocket expenditure borne by families, raises concerns about the sustainability of investment in the health sector and about the improvement of healthcare outcomes in Kenya.

The appropriateness of the distribution of benefits from using maternal and child health services should be assessed relative to the distribution of health care needs across the socio-economic groups. The means of financing health care has been identified as a critical barrier to access. In Kenya, the government introduced free maternal and child health services in all public health facilities as a step towards universal health coverage; however, the new policy lacked clarity on which services were free, leading to instances of service users paying directly out of pocket for those services. Direct out-of-pocket payments therefore still form a greater proportion of the sources of health care financing in Kenya. A more equitable allocation of health expenditure would see increased allocations towards primary health care and proportionately less in favor of high-end curative spending.

Given that maternal and child health services are a priority agenda of the government health care policy, this study focused on determining the distribution of benefits of maternal and child healthcare service provision across the different socio-economic groups and assessed if the benefits are distributed based on the need, in order to identify policy options for promoting equitable access to and use of maternal and child health services in Kenya. The Benefit Incidence Analysis approach makes it possible to assess how

successfully government directs its constrained resources towards the needs of the poorest groups in the population.

Methods

The research design was a descriptive cross-sectional study. Following the approach set out by Demery (2000), BIA involved estimating the value, in monetary terms, of the health care benefits accruing to individuals in different socio-economic groups. This made it possible to establish the adequacy of the targeting of government services and the equity implications of the utilization of maternal, newborn and child health services in Kenya.

Data Sources

The study utilized two sets of data. Utilization data were obtained from the Kenya Demographic and Health Survey (KDHS) 2013/14, while data on public expenditure on maternal, newborn and child health services were obtained from the Kenya National Health Accounts (NHA) 2013/14. Unit utilization was based primarily on morbidity rates by wealth groups. Data on wealth groups, utilization of health care by function i.e., inpatient and outpatient, utilization of maternal and child healthcare by provider level, and information on area of residence were extracted from the KDHS 2013/14. Five wealth groups were identified, namely: poorest, poorer, middle, richer and richest. Utilization of maternal, newborn and child healthcare by provider was grouped into six categories, namely: government hospital, government health center, government dispensary, private hospital/clinic, faith-based facility and nursing/maternity home. Data on budget allocation to maternal, newborn and child health were obtained from the Kenya National Health Accounts 2013/14.

Data Analysis

Benefit incidence analysis combined the mean subsidy in providing maternal and child health services and information on utilization of each type of service by individuals in the households. The following approach was utilized to measure the maternal and child health care benefits accruing to individuals. First, the distribution of utilization in relation to the wealth indices was evaluated; we utilized the per capita consumption expenditure to create quintiles of households as per socio-economic status. Secondly, the unit expenditure of each maternal and child health service was estimated and then the utilization rate for each service was multiplied by the service-specific unit subsidy to acquire the money-related benefit of each service and finally, the distribution of maternal and child health benefits across different socioeconomic groups was assessed. Benefit incidence was computed as the product of the mean subsidy on maternal, newborn and child health services and the utilization of those services. Concentration indices and concentration

curves were used to summarize the distribution of utilization and of the subsidy across the wealth distribution, following O'Donnell, van Doorslaer, Wagstaff, and Lindelow (2007). A negative concentration index indicates a pro-poor distribution and a positive index a pro-rich distribution. Standard errors were estimated using the robust (delta-method) estimator, and differences in the share of benefits across socio-economic groups were tested using a chi-square test of independence. The interpretation of the results follows the standard caveats of benefit incidence analysis, which values benefits at the average unit cost of provision and therefore does not capture differences in the quality of care received by different groups (Wagstaff, 2010).

Descriptive Statistics

The poorest wealth group accounted for the largest share of households (31.31%), while the richest group accounted for the smallest share (12.29%). The corresponding shares for the poorer, middle and richer groups were 21.44%, 19.03% and 15.93%, respectively (Figure 1).

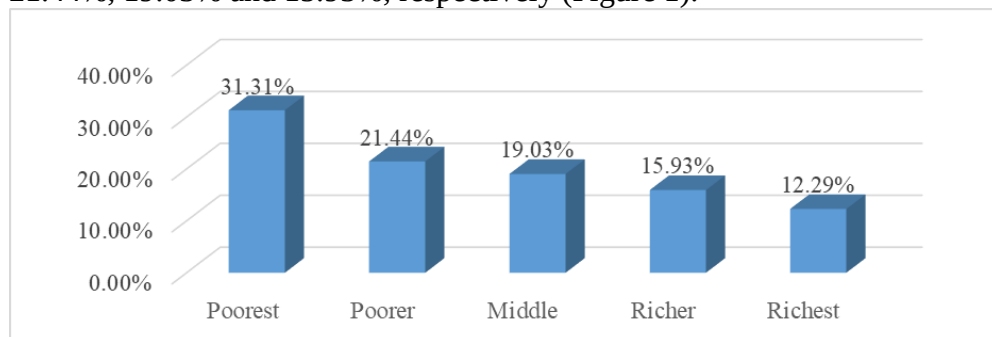


Figure 1: Distribution of households across wealth index groups (%), KDHS 2013/14

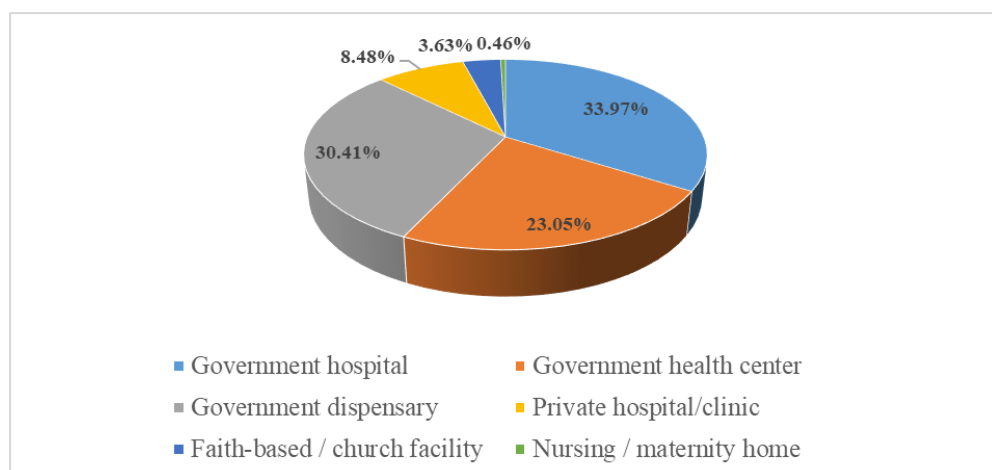


Figure 2: Distribution of maternal, newborn and child health care utilization by provider type (%), KDHS 2013/14

Table 1: Distribution of the sample by area of residence, KDHS 2013/14

	Frequency	Percent	Cumulative
Urban Residence	25,261	30.22%	30.22%
Rural Residence	58,330	69.78%	100
Total	83,591	100	

Results

Maternal, newborn and child health spending incidence was estimated across the wealth groups after subtracting out-of-pocket payments from total benefits. Figure 3 shows the distribution of the subsidy derived from the maternal and childcare spending and the mean per capita subsidy across the wealth groups. The mean maternal, newborn and child health services subsidy was pro-poor, and the differences in the share of benefits received across socio-economic groups were statistically significant ($p < 0.001$). The outpatient care subsidy was mainly pro-rich, whereas the inpatient care subsidy showed a pro-poor pattern.

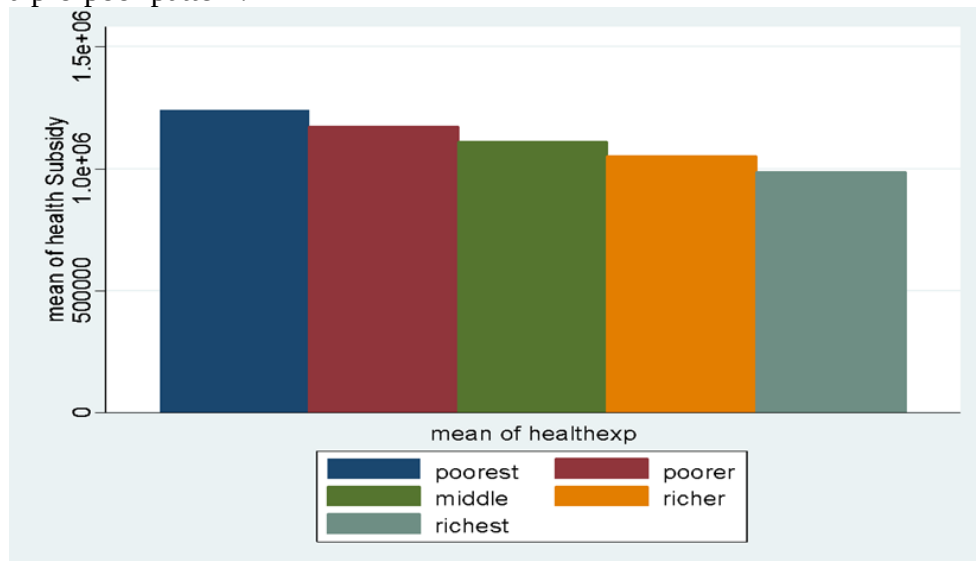


Figure 3: Summary of the mean health subsidy by wealth groups

The poorest group recorded the highest mean number of inpatient visits, and the mean declined consecutively across successive wealth groups, with the richest group recording the lowest (Figure 4).

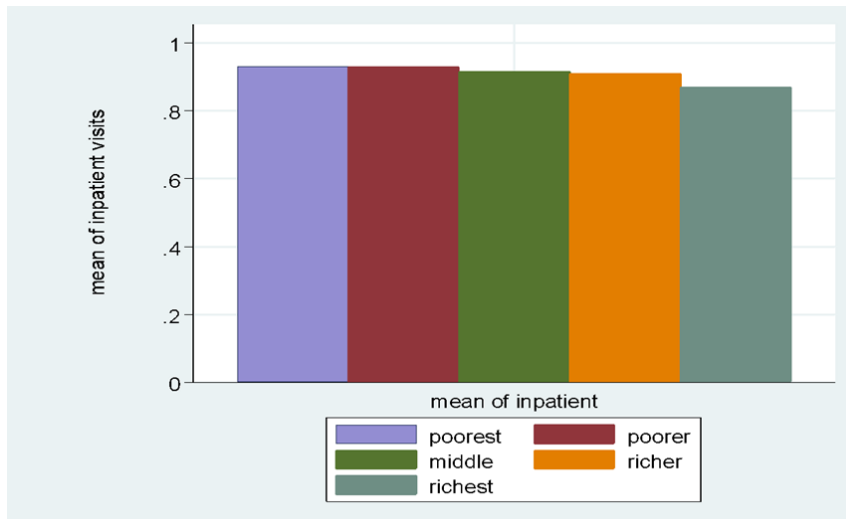


Figure 4: Mean number of inpatient visits by wealth group

The pattern for outpatient services was the reverse: the richest group recorded the highest mean number of outpatient visits and the mean declined across successive groups, with the poorest group recording the lowest (Figure 5).

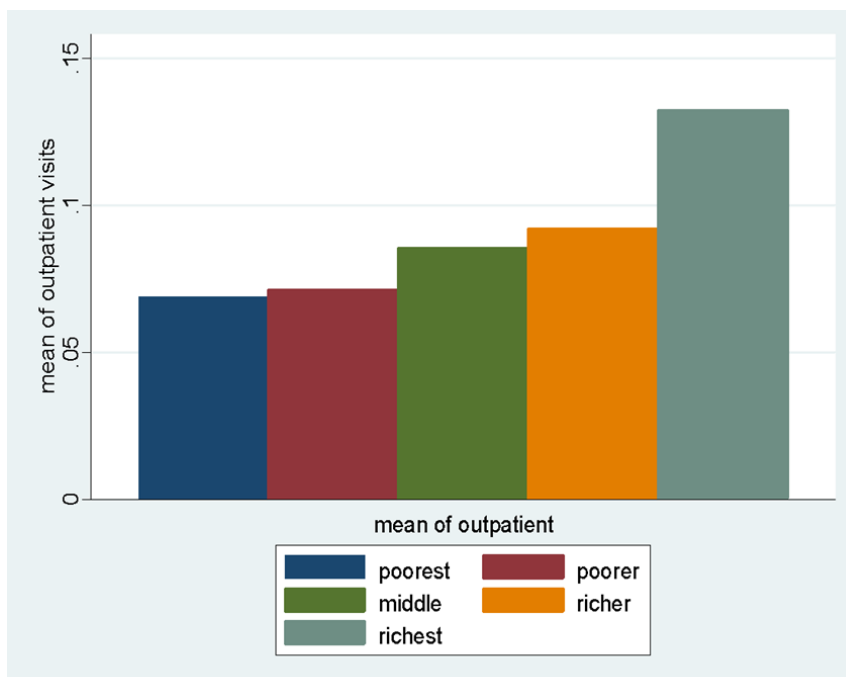


Figure 5: Mean number of outpatient visits by wealth group

Mean health subsidy across areas of residence:

Further, the distribution of inpatient services was obtained by area of residence. The mean inpatient services sought seemed to be higher for rural residents as compared to urban residents, while the mean outpatient services sought seemed to be higher for urban residents as compared to rural residents

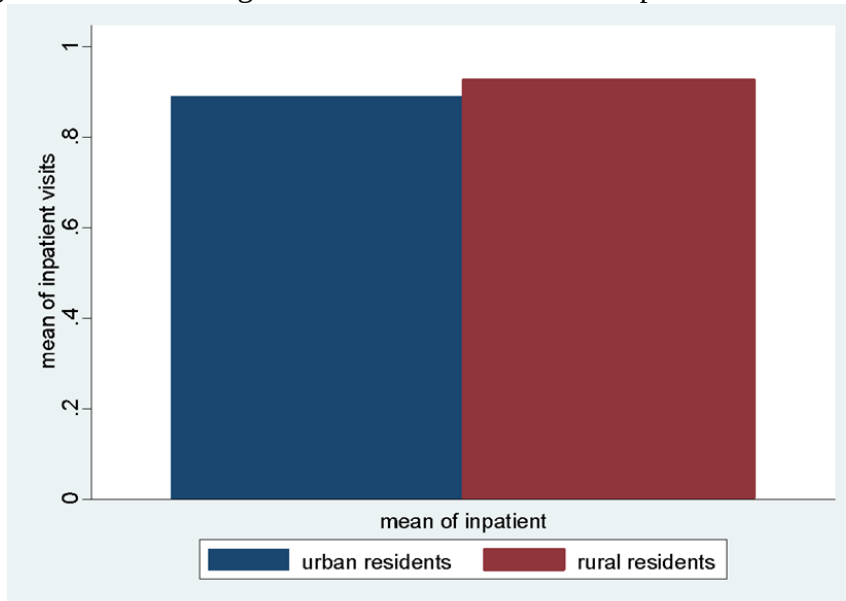


Figure 6: Mean inpatient visits across area of residence

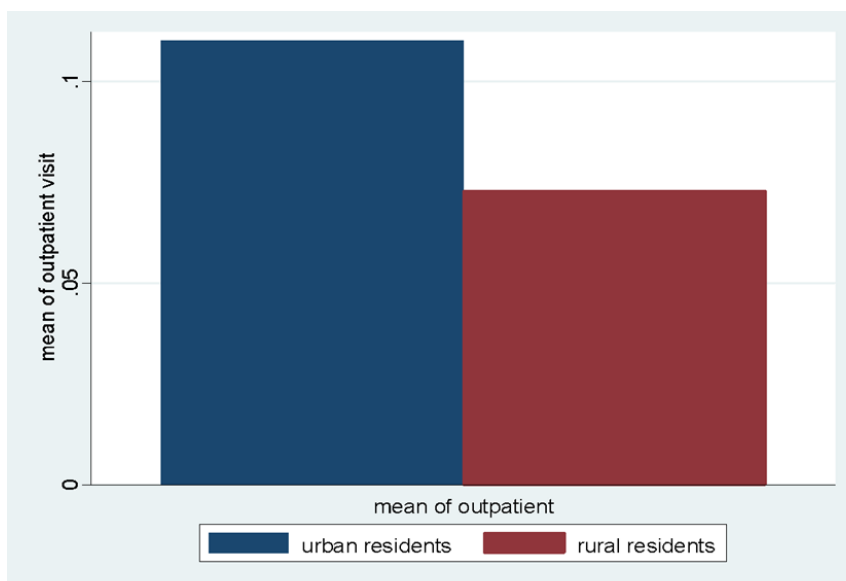


Figure 7: Mean outpatients visit across area of residence

Concentration Indices

The cumulative shares of maternal, newborn and child health care utilization for inpatient and outpatient services were analyzed against the wealth index. The concentration index for inpatient services was negative, and the concentration curve dominated the 45-degree line of equality, implying that inpatient services for maternal, newborn and child health care were pro-poor. The concentration index for outpatient services, by contrast, was positive, implying that outpatient services were pro-rich (Table 2).

Table 2: Cumulative shares and concentration indices for health care utilization, by health care function and wealth group

Cumulative Shares	Health care utilization by health care Function	
	Inpatients	Outpatients
Poorest group (Standard errors)	31.82% (0.4658)	25.70% (0.4370)
Cumulative to poorer	53.55% (0.4125)	43.88% (0.3857)
Cumulative to middle	72.58% (0.3923)	63.24% (0.3952)
Cumulative to richer	88.36% (0.3647)	80.68% (0.3795)
Cumulative to richest	100.00% (0.3207)	100.00% (0.3948)
Test of dominance against the 45-degree line	-	+
Concentration index (Robust Standard error)	-0.0106 [0.0025]	+ 0.1152 [0.0035]

The concentration indices for maternal, newborn and child health care providers across the wealth distribution indicated that utilization of care from government health centers and government dispensaries was pro-poor, with the poorest group accounting for 29.93% and 38.41% of utilization, respectively (Table 3). Utilization of private clinics and hospitals, faith-based facilities and nursing/maternity homes was pro-rich, with the poorest group accounting for only 11.52%, 27.17% and 3.24% of utilization, respectively. Utilization of government hospitals was also pro-rich, with the poorest group accounting for 17.95% of utilization.

Table 3: Cumulative shares and concentration indices for health care utilization, by provider type and wealth group

Cumulative Shares	Health care utilization by health care Provider					
	Government hospital	Government health center	Government dispensary	Private hospital/clinic	FBO	Nursing / maternity home
Poorest group (Standard errors)	17.95% (0.3839)	29.93% 0.4581	38.41% 0.4865	11.52% 0.3195	27.17% 0.4455	3.24% 0.1796
Cumulative to poorer	34.64% (0.3730)	53.96% 0.4273	64.46% 0.4390	26.35% 0.3557	39.63% 0.3308	9.78% 0.2497
Cumulative to middle	53.07% (0.3878)	73.61% 0.3975	83.19% 0.3902	41.01% 0.3540	56.56% 0.3756	25.91% 0.3739
Cumulative to richer	75.95% (0.4201)	89.54% 0.3661	95.35% 0.3270	61.95% 0.4073	75.41% 0.3917	45.26% 0.4016
Cumulative to richest	100.00% (0.4275)	100.00% 0.3063	100.00% 0.2105	100.00% 0.4859	100.00% 0.4314	100.00% 0.5059
Test of dominance against the 45-degree line	+	-	-	+	+	+
Concentration index (Robust Standard error)	+0.1729 [0.0139]	-0.0793 [0.0293]	-0.2150 [0.0299]	+0.3264 [0.0921]	+0.0985 [0.0668]	+0.5423 [0.1859]

Analysis of the distribution of maternal, newborn and child healthcare utilization by area of residence demonstrated that inpatient services were pro-rural, whereas outpatient service utilization was pro-urban. Utilization of government health centers and government dispensaries was pro-rural, whereas utilization of government hospitals, private clinics and hospitals, faith-based organizations and nursing/maternity facilities was pro-urban.

Concentration Curves

To demonstrate inequality in the subsidy for maternal, newborn and child health care provision, the concentration curves were compared against the 45-degree line of equality. Concentration curves were generated for each wealth group and were then combined in a single graph for comparison (Figure 6). The concentration curves for the poorest and poorer groups showed the least dispersion from the line of equality, while the curve for the richest group showed the largest dispersion. This implied that the distribution of the subsidy for maternal, newborn and child health care provision was pro-poor.

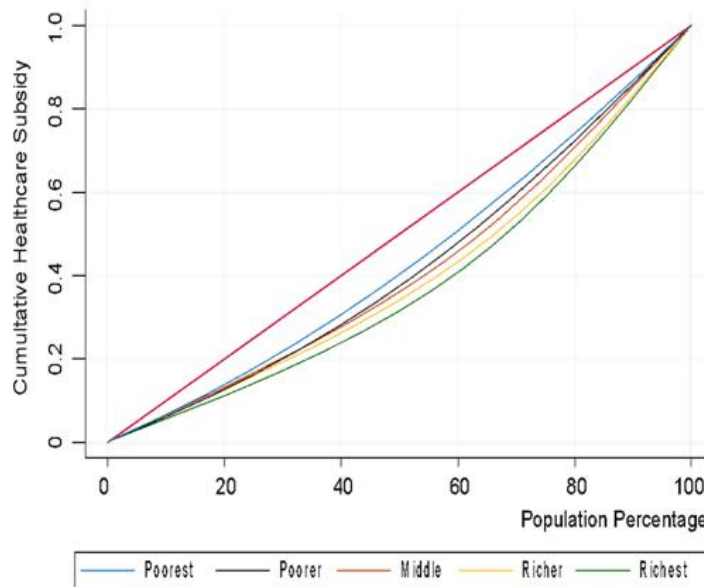


Figure 6: Composite concentration curves for the distribution of the health subsidy across wealth groups

Concentration curves were also generated separately for urban and rural residents. The curve for rural residents showed less dispersion from the line of equality than the curve for urban residents, supporting the conclusion that the subsidy for maternal, newborn and child health care provision was pro-rural (Figure 7).

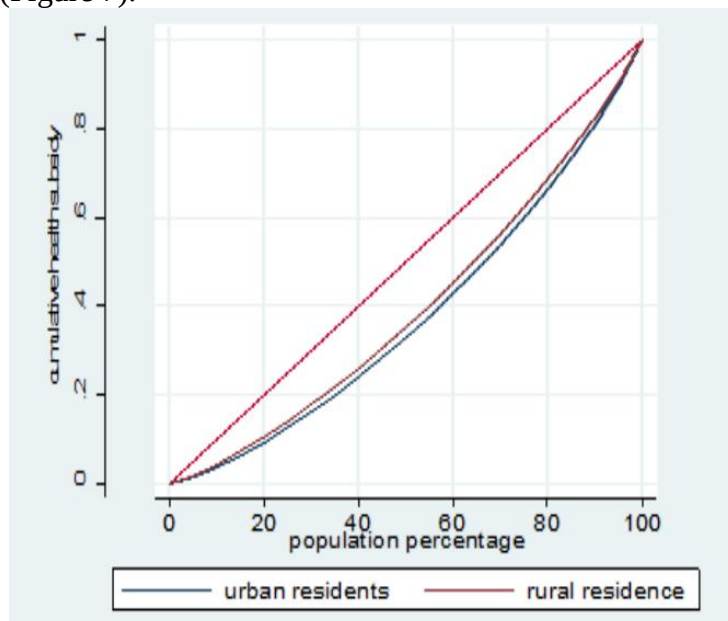


Figure 7: Composite concentration curves for the distribution of the health subsidy by area of residence

Discussion

Utilization of maternal, newborn and child health services subsidies across different socio-economic segments

The results indicated that the costs associated with the utilization of maternal, newborn and child health care were substantial. Utilization of inpatient maternal and child health services in government facilities in rural areas was high, indicating that utilization was concentrated among the poor. In private facilities, by contrast, utilization was pro-rich, indicating that higher-income groups were more likely to use inpatient maternal and child health services in private facilities because they could afford the associated costs. Benefits were therefore distributed on the basis of ability to pay rather than need for care. These results are consistent with the study by Chuma *et al.* (2012), who assessed the distribution of health care benefits in Kenya. Their results indicated wide disparities for inpatient services compared with outpatient services at the hospital level, whereas primary-level health care was pro-poor.

The utilization of outpatient services was concentrated in government hospitals and private facilities in urban areas, indicating that outpatient services were largely pro-urban. Higher-income groups were more likely to use outpatient services than lower-income groups. The distribution of maternal, newborn and child health services was more pro-poor in government dispensaries and health centers than in hospitals and private for-profit facilities. This is plausibly attributable to the user-fee reduction policy introduced in government dispensaries and health centers, which lowered the price barrier at precisely the level of care that poor and rural households use most, and to the wider geographical spread of dispensaries relative to hospitals. These results mirror the findings of Castro-Leal *et al.* (2000) and O'Donnell *et al.* (2007), who found that the poorest populations in middle-income countries tend to use primary healthcare facilities more than the rich. A comparable pattern has been reported for India, where public health spending at the primary level was found to be considerably more pro-poor than spending at higher levels of care (Chakraborty, Singh, & Jacob, 2012). This indicates that the location effect is significant in the incidence of public spending on maternal, newborn and child health services in Kenya.

This study found a more pro-rich distribution of outpatient than of inpatient services in public and private for-profit facilities. These findings agree with the results of Chuma *et al.* (2012) but differ from the findings of Ataguba and McIntyre (2009a), who reported a more pro-rich distribution of inpatient than of outpatient services. Because most healthcare resources in Kenya are directed towards hospitals and tertiary-level care, which, as these findings demonstrate, benefits the rich more than the poor, the government needs to target its subsidies more towards the poor.

Extent to which maternal, newborn and child health care benefits are distributed relative to need across the various socio-economic segments in Kenya

The results in this paper revealed a mixed picture. The rich benefited more than the poor from outpatient care at public hospitals; although outpatient care was more evenly distributed at the primary level, the benefits remained pro-rich in public hospitals but pro-poor in public dispensaries and health centers. The poorer segments of the population gained more than the rich from inpatient care at government health centers and dispensaries, whereas government hospitals and private inpatient care were pro-rich and pro-urban. This revealed an inverse relationship between the distribution of benefits and the distribution of need. When the subsidies were expressed as a proportion of total household expenditure, the richest group received a subsidy equivalent to a larger share of its own total expenditure than the poorest group received of its own; the subsidy was therefore not progressive. Similar patterns have been reported by Chuma *et al.* (2012) for Kenya and, more broadly, across sub-Saharan Africa, where government health subsidies have repeatedly been found to favor better-off households (Castro-Leal *et al.*, 2000; Davoodi *et al.*, 2010).

Conclusion

The targeting of benefits from government spending on maternal, newborn and child health services in Kenya was pro-poor. This was evidenced by the concentration curves for the poorer segments of the population being least dispersed from the 45-degree line of equality, while the concentration curves for the richer segments of the population showed the largest dispersion from the line of equality. Although the distribution of the total subsidy was pro-poor, when the results were expressed as a proportion of total household expenditure, the rich received a subsidy that represented a larger proportion of their expenditure than the subsidy received by the poorest population. The subsidy was therefore pro-poor in absolute terms but not progressive. Understanding the extent to which health care benefits are distributed according to the need for care is an important policy question that health systems should aim to address.

Limitations of the study

This study is subject to a number of limitations, which should be borne in mind when interpreting the results.

Currency of the data. The analysis draws on the KDHS 2013/14 and the Kenya National Health Accounts 2013/14, which were the most recent nationally representative sources linking service utilization to public expenditure on maternal, newborn and child health at the time of analysis.

Kenya's health financing environment has changed materially since then, most notably through the devolution of health service delivery to county governments, the expansion of the free maternity program, and successive reforms to national health insurance. The absolute magnitudes reported here should therefore be read as a baseline for the 2013/14 period rather than as a description of the current position. The distributional patterns identified are, however, driven by structural features of service supply and of household demand that change slowly, and this study provides the benchmark against which more recent data can be compared.

Limitations inherent in benefit incidence analysis. Benefit incidence analysis values the benefit received by a household at the average unit cost of providing the service. It therefore assumes that a visit is worth the same to every user of a given provider type, and it cannot capture differences in the quality, intensity, or clinical appropriateness of the care actually received. If better-off households systematically obtain higher-quality care within the same provider category, the analysis will understate the extent to which spending favors them (Wagstaff, 2010). The approach also attributes benefits at the point of utilization and does not observe how resources are allocated within households (Demery, 2000).

Absence of a qualitative component. The study is exclusively quantitative and therefore observes financial and utilization patterns but not the reasons behind them. Non-financial barriers to access, including distance and transport costs, the opportunity cost of a woman's time, perceived and actual quality of care, provider attitudes, and the degree of autonomy women have over care-seeking decisions, are not measured here, yet they are likely to explain a substantial part of the residual pro-rich pattern in outpatient care and the pro-urban concentration of private and faith-based facility use. A mixed-methods design, combining benefit incidence analysis with qualitative interviews or a discrete choice experiment, would provide a richer account of why benefits do not follow need, and is recommended for future work.

Measurement of socio-economic status and study design. Households were classified using the DHS asset-based wealth index, which proxies long-run economic status but is not equivalent to consumption expenditure and produces groups of unequal size. The design is cross-sectional, so the associations reported here describe the distribution of benefits at a point in time and do not support causal inference about the effect of any particular financing policy.

Policy recommendations

The findings translate into four concrete priorities for policy.

- 1. Protect and expand financing at the primary level.*** Government dispensaries and health centers were the most pro-poor points of

delivery in the whole system. Ring-fencing and increasing the recurrent allocation to these facilities, including commodity supply, staffing norms and maintenance, is the single most reliable way of directing additional maternal, newborn and child health spending towards poor households.

2. *Rebalance the allocation away from hospital and tertiary care.*

Because most resources are directed to hospitals and tertiary care, which this study found to be pro-rich, a defined share of any incremental maternal, newborn and child health budget should be allocated to primary and first-referral level care, with the shift tracked annually in the National Health Accounts.

3. *Address the non-financial barriers facing poor rural households.*

Subsidizing the price of care is not sufficient where distance, transport and time costs remain binding. Priority measures include transport and referral support for obstetric emergencies, strengthened community health services and outreach for antenatal, postnatal and child health contacts, and extended opening hours at dispensaries and health centers.

4. *Institutionalize routine equity monitoring.*

Benefit incidence analysis should be repeated at defined intervals, and concentration indices for maternal, newborn and child health utilization and subsidy should be published alongside the National Health Accounts. This requires that expenditure data be routinely disaggregated in a way that can be linked to household survey utilization data by wealth group and by county, so that the equity consequences of financing decisions can be assessed as they are taken rather than years afterwards.

Conflict of Interest: The authors reported no conflict of interest.

Data Availability: All data are included in the content of the paper.

Funding Statement: The authors did not obtain any funding for this research.

Declaration for Human Participants: Ethics approval and consent to participate: This study analyzed secondary, anonymized, publicly available data from the Kenya Demographic and Health Survey 2013/14 and the Kenya National Health Accounts 2013/14.

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