ESI Preprints **Not Peer-reviewed**

Benefit Incidence Analysis for Maternal and Child Health Services in Kenya

Geofrey Mwalo
Urbanus Mutuku Kioko
Department of Economics and Development Studies,
University of Nairobi, Kenya

Approved: 18 March 2026
Posted: 20 March 2026

Cite As:
Mwalo, G. & Kioko, U.M. (2026). *Benefit Incidence Analysis for Maternal and Child Health Services in Kenya.* ESI Preprints. https://doi.org/10.19044/esipreprint.3.2026.p537

Abstract

Background: Financing maternal and child healthcare services is a common practice in most countries and the method of administration lies fundamentally on the distributional issues, that is, the health sector specific equity objectives such as equal treatment for equal need. The subsidies therefore should be target efficient such that only the poor 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 general public spending on healthcare services is pro-poor. The overall aim of the study was to establish the benefit incidence of the maternal and child health services in Kenya.

Methods: The benefit incidence analysis approach employed in this study assessed the accrued benefits of maternal and child health care subsidies across various socioeconomic segments in Kenya. The research utilized the Kenya demographic health survey data (2013/14) and the national health account data (2013/14) to establish the per capita subsidy of maternal and child healthcare utilization across population in relation to their wealth index.

Results: The study results indicated income related inequality in maternal and child health care utilization in Kenya and the pattern differed across wealth quantiles in different geographical areas. The distribution of the total subsidy was pro-poor, however, when the results were expressed as

a proportion of household total expenditure, the results indicated that the rich received a subsidy that was a larger proportion of their expenditure compared to that received by the poorest population

Conclusion: Significant pro-poor inequality was observed in urban and private facilities indicating that more effective targeting of maternal and child care is necessary. Eliminating financial and non-financial barriers for the poor and higher need group in rural areas would make a key contribution in reducing pro-rich inequality in outpatient maternal and childcare utilization.

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

Introduction

Governments usually subsidize services that the market will not provide, or will provide inadequately, for example, pure public goods, where the marginal cost of additional utilization is zero (Svensson & Bjorkman, 2009). Subsidization can also be justified as a response to the collapse of related markets. Governments are consequently required to subsidize some of these services to ensure effectiveness (Filmer, Hammer, & Pritchett, 1998). Public health expenditure on maternal and child health in sub-Saharan Africa is largely poorly targeted and less progressive to poor households, and indeed favors those who are better off (Castro-Leal, Dayton, Demery, & Mehra, 2000). The end 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 more public subsidies on primary health care (22%) than the poorest, who received only 14% of the subsidies (Kenya National Health Accounts, 2013).

Achieving universal health coverage dominates the global health debates. Health systems are required to provide “key promotive, preventive, curative and rehabilitative health interventions for all at an affordable cost, thereby achieving equity in access”. Equity issues in distribution of economic benefits from public financing of maternal and child health care in Kenya are vital because of the substantial poverty and inequalities in access to health care services. Understanding the scope of distribution of maternal and child health care benefits on the need basis is thus an important policy question which health systems should focus in addressing. 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 2013/2014, 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 provision of maternal and child healthcare in year 2013/2014. The households out of pocket expenditures (OOPs) on health remains the biggest contributors of healthcare financing, the dependency on donor funding particularly for the priority disease interventions and the high out of pocket expenditure by families' raises concerns on supporting the investments in the health sector and 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 need across the socio-economic groups. Means of financing health care have been identified as a critical barrier to accessing the health care (6). In Kenya, the government introduced free maternal and child health services in all public health facilities to move 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 the services. Direct out of pocket payments therefore still forms 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 priority agenda of the government health care policy, this study focused at determining the distribution of benefits of maternal and child healthcare service provision across the different socioeconomic 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. Benefits Incidence Analysis approach has the capacity to look at how successful the government has the capacity to organize their constrained resources towards the needs of the poorest groups of the population.

Methods

The research design was a descriptive cross sectional study. BIA included estimating the value, in monetary terms, of health care benefits that accrued to individuals in various socio-economic groups, this enabled

establishing of the adequacy of targeting of government services and the equity implications of the utilization of maternal and child health services in Kenya.

Data Sources

The study utilized two sets of data, the utilization data which was obtained from the Kenya demographic health survey 2013/14, while the data on public expenditure on maternal and child health services was obtained from the national health account 2013/14. The unit utilization was primarily based on the morbidity rates per quantiles. Data on wealth quantiles, utilization of the health care by function i.e. inpatient and outpatient, utilization of maternal and child healthcare by provider level and information on area of residence was extracted from the KDHS 2013/14. Five wealth quantiles were identified namely: poorest, poorer, middle, richer and richest. Utilization of maternal and child healthcare by providers were grouped into six levels namely: government hospital, government health center, government dispensary, private hospital/clinic, faith-based / church facility and nursing / maternity home. Data on budget allocation to maternal and child health was obtained from the Kenya National Health Accounts 2013/2014.

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 healthcare service 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 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 mean subsidy on maternal and child health services and the utilization of these services.

Descriptive Statistics

The poorest households were the majority accounting for 31.31% of the total households, the richest accounted for the least at 12.29 percent.

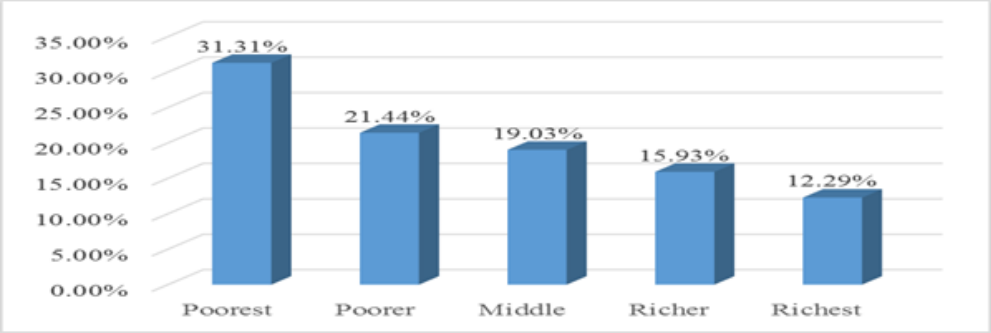

Figure 1: Population Wealth Index Quantiles

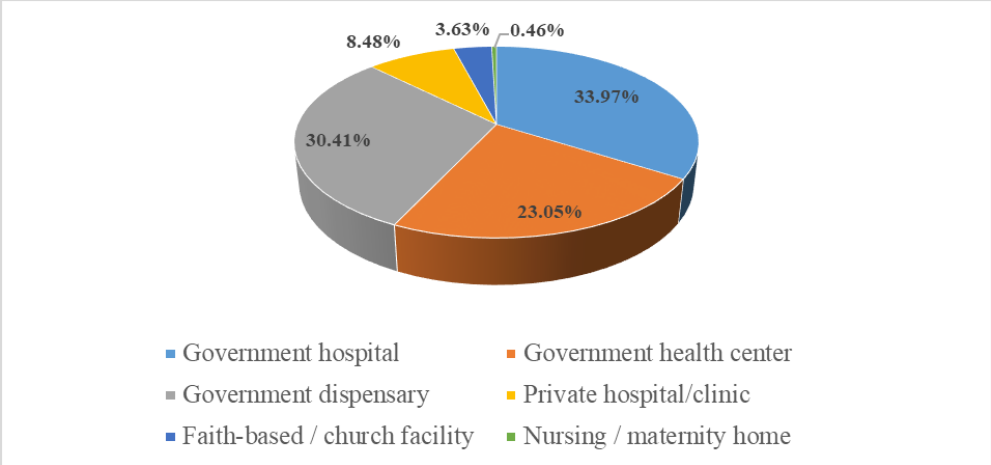

Figure 2: Summary of Maternal and Child health care providers

Table 1: Summary of the area of residence

	Frequency	**Percent**	**Cumulative**
Urban Residence	25,261	30.22%	30.22%
Rural Residence	58,330	69.76%	100
Total	**83,591**	**100**	

Results

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

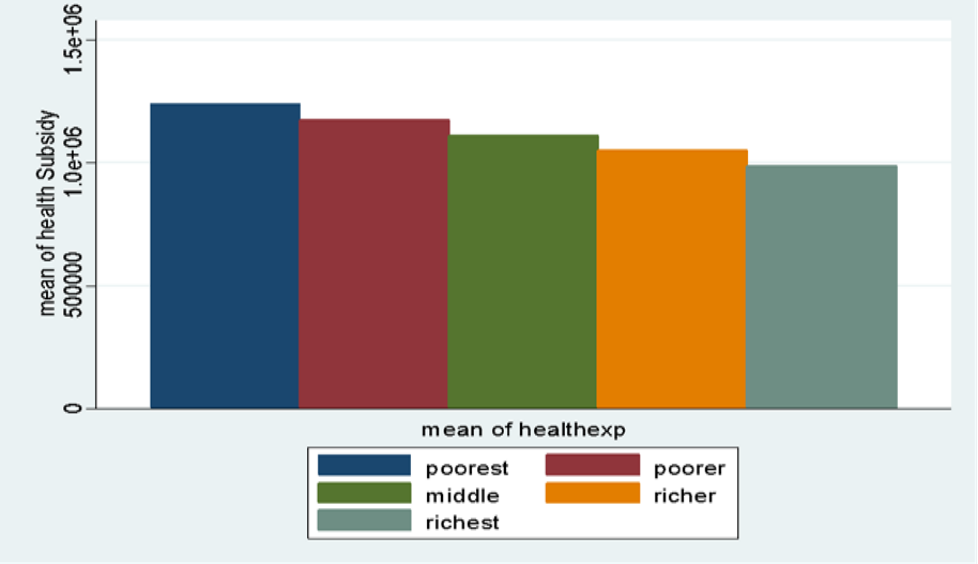

Figure 3: Summary of the mean health subsidy by wealth quantiles

The poorest had the largest share of the mean inpatient services across the wealth quantiles followed consecutively as per the order of the wealth quantiles. The richest had the least mean subsidy (Figure 4).

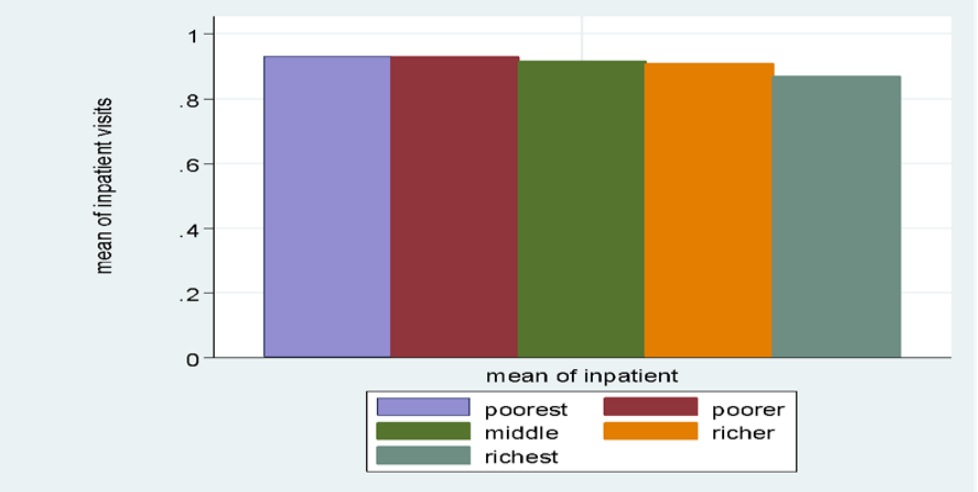

Figure 4: Mean inpatient visits across the wealth quantiles

With regard to mean outpatient services across the wealth quantiles, the richest had the largest share followed consecutively as per the order of the wealth quantiles. The poorest had the least mean subsidy (Figure 5).

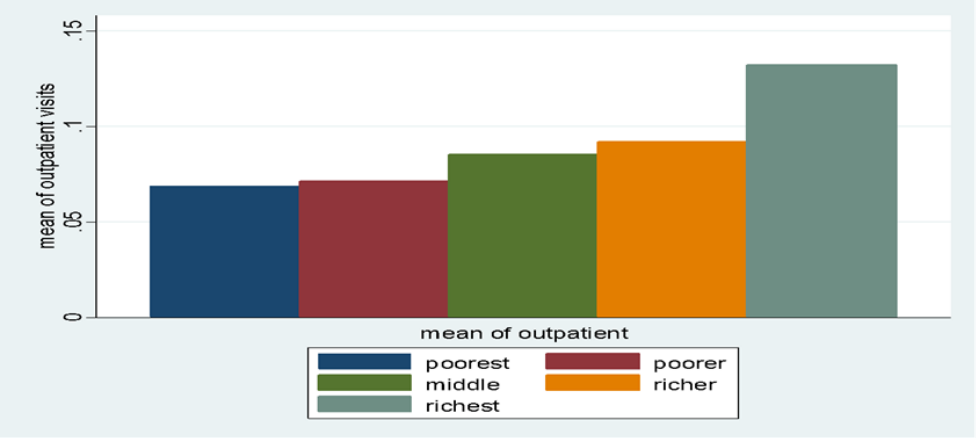

Figure 5: Mean outpatient visits across wealth quantiles

Mean health subsidy across areas of residence

The distribution of the inpatient services was higher for the rural residence as compared to the urban residents however, the distribution of the outpatient services was higher for the urban residence as compared to the rural residents.

Concentration Indices

The cumulative shares of the maternal and child health care by inpatient and outpatient services were analyzed within the wealth index. The concertation index for inpatient had a negative sign for test of dominance against the 45degree line of equality. This implied that the inpatient services for maternal and child health care was pro- poor. However, on the other hand the outpatient services for maternal and child health cares were pro – rich.

Table 2: Concentration indices for Health care utilization by health care Function across wealth quantiles

	Health care utilization by health care Function	
Cumulative Shares	Inpatients	Outpatients
Poorest 20% (Standard errors)	**31.82%** (0.4658)	**25.70%** (0.4370)
Poorer 40%	**53.55%** (0.4125)	**43.88%** (0.3857)
Middle 60%	**72.58%** (0.3923)	**63.24%** (0.3952)
Richer 80%	**88.36%** (0.3647)	**80.68%** (0.3795)
Richest 100%	**100.00%** (0.3207)	**100.00%** (0.3948)
Test of dominance against 45^0 Line	-	+
Concentration index (Robust Standard error)	-0.0106 [0.0025]	0.1152 [0.0035]

The concentration indices for the maternal and child care providers on the wealth quantile indicated that the utilization of the health care from government hospitals, government health centers, government dispensaries are pro – poor (Table 3). However, results indicated that utilization of maternal and child health care services from private clinics/ hospital, faith based organizations and nursing / maternity facilities are pro – rich.

Table 3: Concentration indices for Health care utilization by health care Provider across wealth quantiles

	Health care utilization by health care Provider					
Cumulative Shares	Government hospital	Government health center	Government dispensary	Private hospital/clinic	FBO	Nursing / maternity home
Poorest 20% (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
Poorer 40%	**34.64%** (0.3730)	**53.96%** 0.4273	**64.46%** 0.4390	**26.35%** 0.3557	**39.63%** 0.3308	**9.78%** 0.2497
Middle 60%	**53.07%** (0.3878)	**73.61%** 0.3975	**83.19%** 0.3902	**41.01%** 0.3540	**56.56%** 0.3756	**25.91%** 0.3739
Richer 80%	**75.95%** (0.4201)	**89.54%** 0.3661	**95.35%** 0.3270	**61.95%** 0.4073	**75.41%** 0.3917	**45.26%** 0.4016
Richest 100%	**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 45^0 Line	-	-	-	+	+	+
Concentration index	0.1729	0.0793	0.2150	0.3264	0.0985	0.5423
(Robust Standard error)	[0.0139]	[0.0293]	[0.0299]	[0.0921]	[0.0668]	[0.1859]

Analysis of the distribution of the utilization of maternal and child healthcare by region of residence clearly demonstrated that inpatient services were pro – rural, however, outpatient services utilization were pro – urban. The results of utilization of maternal and child health care providers on the area of residence indicated that the utilization of the health cares from government hospitals, government health centers, government dispensaries are pro – rural, however, results indicated that utilization of maternal and child health care services from private clinics/ hospital, faith based organizations and nursing / maternity facilities are pro – urban.

Concentration Curves

In order to demonstrate the inequality in the subsidy in maternal and child health care provision, a comparison of the concentration curve against Lorenz curve was made. The individual concentration curves for the respective wealth quantile were generated. Further all the concentration

curves were combined in one graph for comparison purposes (Figure 6). From the comparison, it was evident that the concentration curves for the poorest and the poorer had the least dispersion from the line of equality and concentration curves for the richest had the largest dispersion from the line of equality compared to all other concentration curve. This implied that the subsidy for maternal and child health care provision is pro – poor and less pro – rich.

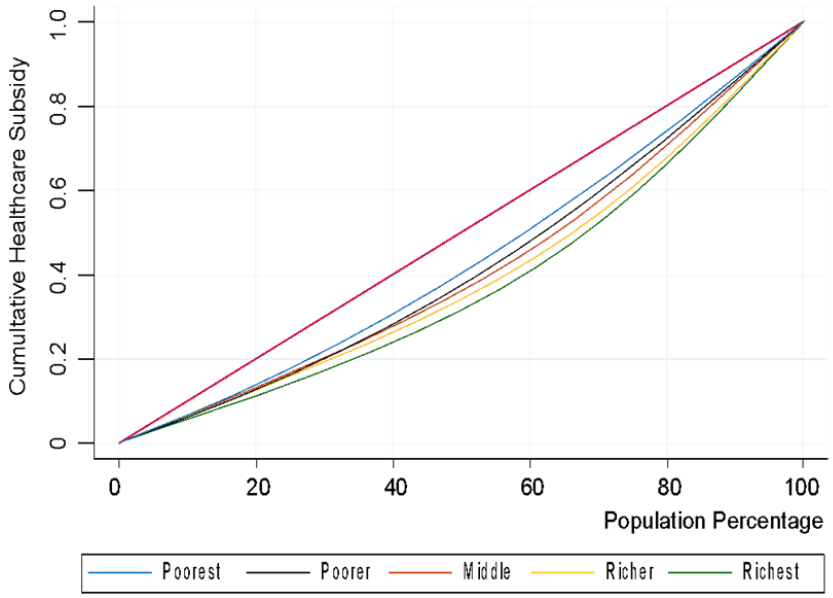

Figure 6: Composite concertation curves for distribution of health subsidy across the wealth index

The concentration curves for urban residences as well as for the rural residences were generated, the results indicated that the concentration curves for the rural residence had the least dispersion from the line of equality compared to the concentration curves for the urban residence. This affirms the conclusion that subsidy to maternal and child health care provision was pro – rural and less pro – urban (Figure 7).

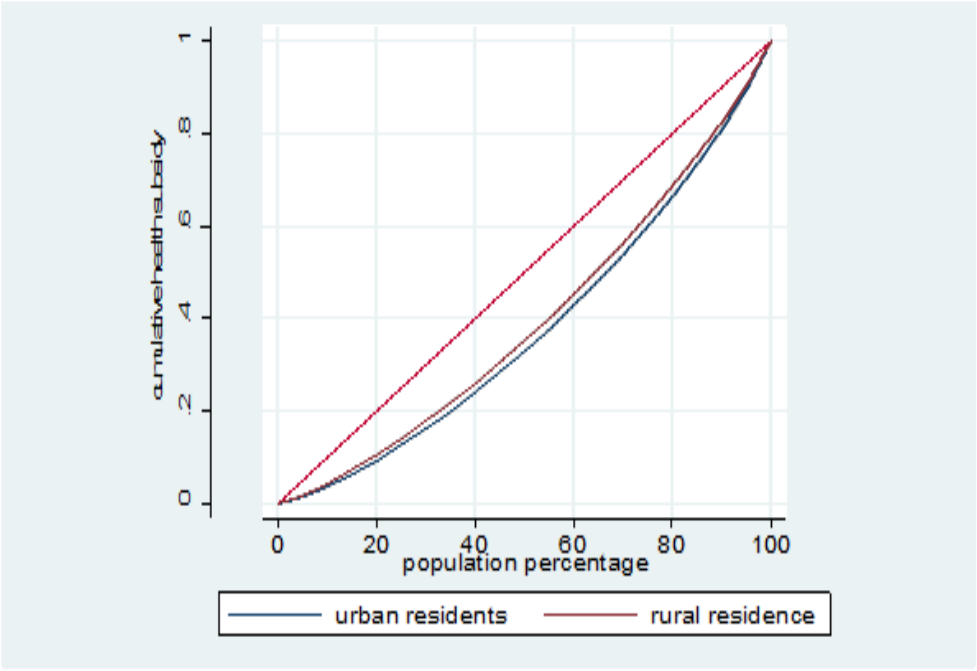

Figure 7: Composite concertation curves for distribution of health subsidy across the area of residence

Discussion

Utilization of maternal and child health services subsidies across different socio-economics segments: The results from the study indicated that costs associated with utilization of maternal and child health care was significant, for instance, the inpatient maternal and child health services in the government facilities in rural areas were high indicating that the utilization was concentrated among the poor, however, it was pro rich in the private facilities indicating that the higher income group were more likely to use inpatient maternal and child health care services in private facilities because they could afford the associated costs. The benefits were distributed on the basis of ability to pay and not the need for care, these results are consistent with the study carried out by Chuma *et al.,* 2012 who assessed the distribution of health care benefits in Kenya, the results indicated wide disparities for inpatient services compared to outpatient services at the hospital level, however, primary level healthcare were pro-poor.

The outpatient services utilization, was significant in government 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 the lower income group. There was greater pro-poor distribution of maternal and child health services in the government dispensaries and health centers as compared to the hospitals and private for

profit, this could be attributed to the user fee reduction policy introduced in government dispensaries and health centers. This results mirrors the findings of Castro-Leal *et al*., 2000 and O'Donnell *et al*., 2007 who found out that the poorest populations in the middle income countries tend to use primary healthcare facilities more than the rich. This indicates that the location effect is significant in the incidence of public spending on maternal child health services in Kenya.

This study expressed a pro-rich outpatient services compared to inpatient services in public and private for profit facilities. These findings agree with the results of Chuma *et al.,* 2012 however, it differs with findings of Ataguba *et al.,* 2009 who reported a more pro-rich distribution of inpatient services compared to outpatient services. The rich received over half of the outpatient benefits with almost a third of inpatient benefits. Since most of the healthcare resources in Kenya are directed to the hospitals and tertiary level healthcare which benefits the rich more than the poor as demonstrated by these findings, the government therefore needs to target their subsidies towards the poor.

Extent to which maternal and child health care benefits are distributed relative to need across the various socio-economic segments in Kenya: The results in this paper revealed mixed scenarios, the findings showed that the rich benefit more than the poor for outpatient care at all levels of public health care, though the outpatient care is more evenly distributed at the primary level the benefits are still pro-rich. The poor segments of the population gained more than the rich when it comes to inpatient care at government health facilities, however, private inpatient care was pro-rich and pro-urban. This revealed an inverse distribution of benefits and needs. When the subsidies were expressed as a proportion of the household total expenditure, the results indicated that the rich (28%) received a larger proportion of their expenditure 34% compared to the poor (53%) who received 14% of the benefits. Similar results were echoed by Chuma *et al,* 2012 and Filmer *et al.,* 2004 where, the rich 20% received 26% of the total government subsidies in most of the Sub Saharan Africa compared to 16% received by the poorest 20%

Conclusion

Targeting of benefits from government spending on maternal and child health services in Kenya were pro-poor, this was evidenced by the concentration curves for the poorer segments of the population least dispersed from the 45-degree line of equality while the concentration curves for the richer segments of the population had 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 household total

expenditure, the results indicated that the rich received a subsidy that was a larger proportion of their expenditure compared to that received by the poorest population. The subsidy was therefore not progressive. Understanding the extent to which health care benefits are distributed on the need for care is therefore an important policy question which health system should aim to address.

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.

References:

1. Castro-Leal, F Dayton J, Demery, L Mehra K. Public Spending on health care in Africa: do the poor benefit? Bull WHO 2000; 78:66-78.
2. Chu, K., Davoodi, H. and Gupta, S. (2000) 'Income distribution and tax and government social spending policies in developing countries', Working paper Fiscal Affairs Department, Washington DC: International Monetary Fund.
3. Davoodi, Hamid R.; Tiongson, Erwin R.; and Asawanuchit, Sawitree Sachjapinan (2010) "Benefit Incidence of Public Education and Health Spending Worldwide: Evidence From a New Database," Poverty & Public Policy: Vol. 2: Iss. 2, Article 2.
4. Demery, Lionel. 2000. Benefit Incidence: A Practitioner's Guide. TheWorld Bank. Washington, D.C.
5. Filmer, Deon, Jeffrey Hammer and Lant Pritchett (1998) Health Policy in Poor Countries: Weak Links in the Chain World Bank Policy Research Working Paper Number 1874 (January)
6. Jane Chuma, Thomas Maina and John Ataguba (2012): Does the distribution of health care benefits in Kenya meets the principles of universal coverage? BMC Public Health
7. Kenya National Health Accounts 2012/2013
8. Kenya Demographic and Health Survey (KHDS) 2013-2014
9. Lekha Chakraborty, Yadawendra Singh, Jannet Farida Jacob (2012), Public Expenditure Benefit Incidence on Health: Selective Evidence from India. Working Paper No. 2012-111
10. O'Donnell, Owen, Eddy van Doorslaer, Adam Wagstaff, and Magnus Lindelow. 2007. Analyzing Health Equity Using Household Survey Data: A Guide to Techniques and their Implementation. Washington, DC: The World Bank.

11. Svensson, J. & Bjorkman, M. (2009). Efficiency and Demand for Health Services: Survey Evidence on Public and Private Providers of Primary Health Care in Uganda. The World Bank.
12. Wagstaff, Adam. 2010. Benefit Incidence Analysis, Are Government Health Expenditures More Pro-Rich Than We Think? Policy Research Working Paper 5234, Washington, DC: The World Bank