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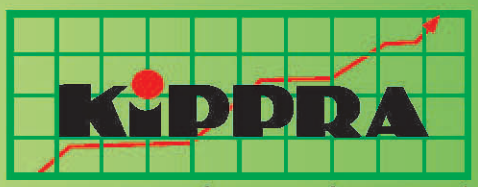

The KENYA INSTITUTE for PUBLIC POLICY RESEARCH and ANALYSIS

An Assessment of the Effect of Devolution on the Healthcare Service Delivery in ASAL Counties of Kenya

Wilkista Lore and Susan Thuo

DP/316/2023

THE KENYA INSTITUTE FOR PUBLIC POLICY RESEARCH AND ANALYSIS (KIPPRA)

YOUNG PROFESSIONALS (YPs) TRAINING PROGRAMME

An Assessment of the Effect of Devolution on the Healthcare Service Delivery in ASAL Counties of Kenya

Wilkista Lore and Susan Thuo

Kenya Institute for Public Policy Research and Analysis

KIPPRA Discussion Paper No. 316
2023

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Published 2023

Bishops Garden Towers, Bishops Road
PO Box 56445-00200 Nairobi, Kenya
tel: +254 20 2719933/4; fax: +254 20 2719951
email: admin@kippra.or.ke
website: http://www.kippra.org

ISBN 978 9914 738 41 4

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Abstract

Kenya ushered a devolved system of governance in 2013 leading to the formulation of two levels of governance, one national government and 47 county governments 27 of which are classified as ASALs. A total of 14 functions were devolved inclusive of healthcare. This study assessed the effect of devolution on the healthcare service delivery in the ASAL counties. This was achieved through a comparison of selected indicators of healthcare access before and after devolution. Wilcoxon signed-rank test is also applied to the data to help understand whether a significant change was experienced after devolution. Results indicate a significant increase in the number of health professionals, number of beds, and number of hospitals. However, individuals covered longer distances, drug unavailability in public health facilities increased, and there were higher incidences of catastrophic health expenditure. The number of patients satisfied with the privacy in outpatient and inpatient care also reduced significantly after devolution. Counties are encouraged to pass the facility improvement fund bill and embrace the digitalization of healthcare as a means of raising funds and reducing the distance to the health facilities. In addition, it is important to educate healthcare workers on the importance of maintaining patient confidentiality to improve acceptability. Also educate the masses on the importance of preventive healthcare to help curb the burden of catastrophic health expenditure.

Abbreviations and Acronyms

ASALs	Arid and Semi-Arid Lands
HIV	Human Immunodeficiency Virus
IP	Inpatient
KHHEUS	Kenya Household and Health Expenditure Utilization Survey
Kms	Kilometres
Ksh	Kenya Shilling
MoH	Ministry of Health
NGO	Non-Governmental Organizations
OP	Outpatient
SSA	Sub-Saharan African
UHC	Universal Health Coverage
WHO	World Health Organization

Table of Contents

Abstract ii
Abbreviations and Acronyms iii
List of Tables iv
List of Figures v
1 Introduction 1
3. Literature Review 5
3.1 Theoretical Literature- Conceptual Framework 5
3.2 Empirical Literature 6
4. Methodology 7
1.1 Accessibility, Availability, Acceptability and Quality (AAAQ) of Healthcare 7
1.2 Wilcoxon-signed rank test 8
2 Results and Discussions 12
3 Conclusion and Policy Recommendations 23
3.1 Conclusion 23
3.2 Policy Recommendations 23
References 25

List of Tables

Table 3.1 Description of variables 12
Table 4.1 Accessibility 13
Table 4.2: Availability 16
Table 4.3: Acceptability 19
Table 4.4: Quality 20

List of Figures

Figure 2.1: Levels of healthcare facility 4
Figure 4.1: Choice of OP and IP care by type of facility 14
Figure 4.2: Reasons for bypassing a health facility 14
Figure 4.3: Distribution of beds and facilities by county in 2013 17
Figure 4.4: Distribution of beds and facilities in ASALs by county in 2018 18
Figure 4.5: Average number of equipment per 10,000,000 population in 2013 and 2018 21

1. Introduction

The Constitution of Kenya created a devolved system of government which saw power, resources, and representation moved to the local level. Article 174(c) and (f) of the Constitution of Kenya outlines that among the objectives of devolution is to enhance public participation of the people in the issues affecting them and to make services easily accessible throughout the country respectively. When citizens are involved in the decision-making process, they are deemed to have achieved the highest level of public participation.

The 14 functions were devolved namely, agriculture, county health services, control of pollution, cultural activities, county transportation, animal control, trade development, county planning and development, pre-primary education and polytechnics, implementation of specific national policies, county public works, firefighting services, control of drugs and pornography and coordinating the participation of communities.

Of these 14 devolved functions this study will focus on assessing how devolution has impacted the health sector since it is one of the functions that was greatly devolved to the counties including human resource and staffing, planning, budgeting, acquisition of drugs and medical supplies to county referral hospitals, health centres, dispensaries, and community units. The national government was only mandated with the control of the national referral hospitals and the formation of policies governing the health sector. The healthcare sector is also important because improvement in health has been associated with an increase in the productivity level of individuals and the economic growth of economies (World Bank Group, 2022).

Before devolution, Kenya was under a centralized system of governance characterized by unbalanced regional resource allocation, limited involvement of the people in the governance process, and marginalization of some communities, especially ASALs Wanyande & Mboya, (2016). The devolved system of governance is thus expected to aid in the improvement of service delivery, improvement in the public participation process, and a reduction in marginalization among the various regions of the country Pietrzyk et al. (2018). In Kenya, the devolved system of governance was adopted in 2013 after the promulgation of the 2010 constitution.

Data from the 2018 Kenya Household Health Expenditure Utilization survey (KHHEUS) indicates that 19 per cent of the people travelled over 10 kilometres to seek health services, a 6 per cent increase from 2013. In addition, the Out-of-Pocket expenditure in the healthcare sector increased by 90 per cent indicating that devolving healthcare to the counties had not made it more affordable. Four years into devolved governance in Kenya, Khaunya et al. (2015) found that counties were still not experiencing notable improvement in service delivery at the county level as they were marred with challenges of corruption, non-payment of staff salaries, and duplication of roles.

It is against this backdrop that this study seeks to analyze the effect of devolution for the period 2013-2023 on the service delivery of ASALs in Kenya specifically the health sector. The study seeks to consider what areas of devolution have worked

well, and what areas could be improved by comparing the current performance against the set international standards and targets.

This study aims to analyze the progress that has been made in the healthcare sector and challenges encountered in Kenya since it was devolved. Specific objectives include:

(i) To assess the contribution of devolution to service delivery in the healthcare sector of the ASAL counties.

(ii) To identify areas of improvement in county healthcare delivery by analysis of the existing gaps based on the recommendations of WHO and MOH.

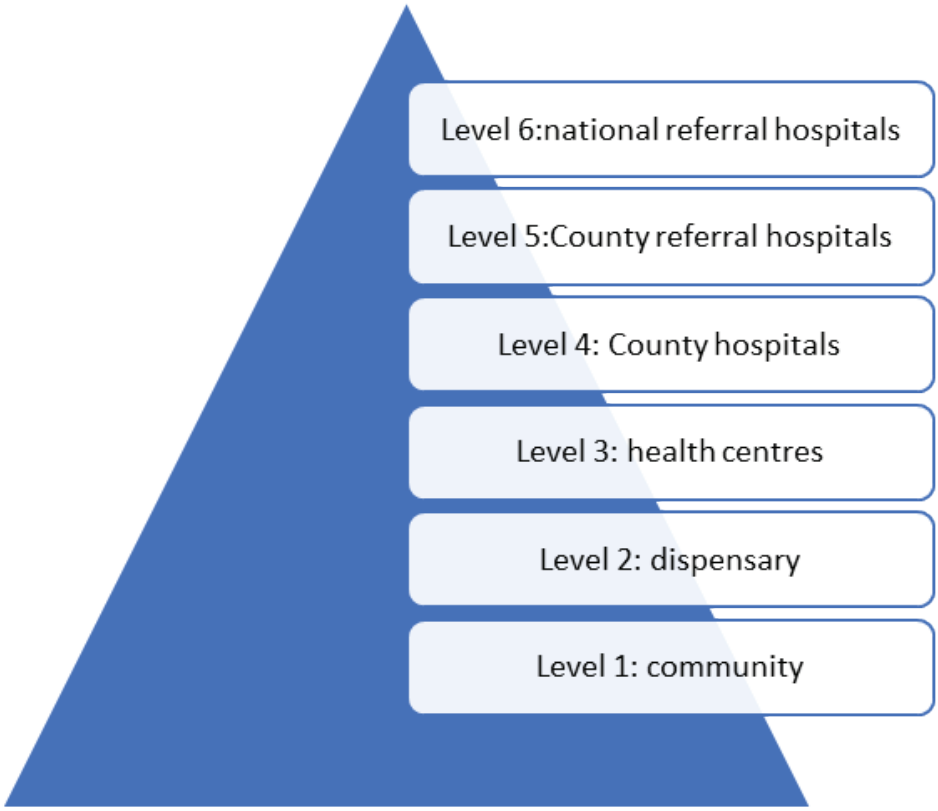
The rest of the paper is organized as follows; Section 2 discusses the stylized facts and literature review, methodology is discussed in section 3, Section 4 discusses empirical findings and results and finally Section 5 outlines conclusions and policy recommendations.

2. The Journey of Devolution of Healthcare Function

Kenya's healthcare sector has been evolving towards decentralization since the 1960s, long before the 2010 constitution formalized the process. Early steps included the formation of District Health Boards and decentralized units within the Ministry of Health. These efforts laid the groundwork for a significant transformation under the new constitution, aiming to overcome previous challenges such as access disparities, resource limitations, and inefficiencies. The goal is a more accessible, equitable, and community-driven healthcare system in Kenya.

The health sector was highly devolved, and the responsibilities shifted to the county governments included budgeting, planning, and financial management, human resource management, provision of emergency medicine and medical supplies, service delivery focusing on disease prevention and health promotion, management and operation of county hospitals, dispensaries, and health centres, and ambulance facilities.

Figure 2.1: Levels of health care facility



The national government was left in charge of policy creation, quality assurance, and the management of the national referral hospitals including Kenyatta National Hospital, Moi Teaching and Referral Hospital, National Spinal Injury Hospital, Mathari National Teaching and Referral Hospital, and Kenyatta University Teaching and referral hospital. The hospitals being managed by the counties are divided into three tiers with the county referral hospitals forming the third tier, the second tier is composed of health centres, dispensaries, and nursing homes, while the first tier is made up of community units. Medicine procurement in county-managed hospitals is achieved through the county pharmacist who consolidates all the medicine requirements from all health facilities and submits it to the county treasury for purchase. Before devolution, the district health management team oversaw these purchases. Although the adoption of obtaining medicine through the county treasury was aimed at making the process more efficient, it ended up slowing the process and many counties soon ran out of stock RESSYT (2016).

Another significant change that occurred in the healthcare system was that hospitals no longer received funds directly from the national government and had to rely on user fees and county government accounts. These changes among many others affected the service delivery in the county health system. The ability of the hospitals to respond to emergencies, provide quality medicine and services, procure essentials, and motivate staff was affected. The tier-one healthcare facilities were even more hard hit because, at the onset of devolution, the president announced free maternity services in these facilities greatly reducing their user fees.

The national government introduced conditional grants to the county healthcare facilities to help in funding them. Examples of conditional allocations in health disbursed through Treasury is the level 5 grant which sought to assist counties with level 5 hospitals and User Fees foregone conditional grant. The Equalization Fund is an example of conditional grant which was established by the constitution. At the onset of devolution, 14 counties were identified as marginalized including Turkana, Mandera, Wajir, Marsabit, Samburu, West Pokot, Tana River, Narok, Kwale, Garissa, Kilifi, Taita Taveta, Isiolo, and Lamu. To fast track the integration of these counties into the economic and social activities of the county, equalization fund was established in chapter 12 of the constitution. This stipulates that 0.5 per cent of all revenue collected by the national government be used to provide basic amenities like roads, health facilities and electricity to marginalized areas.

In the first three years of devolution 2011/2012 to 2013/2014, no allocations were made since there were delays in allocation of equalization fund with non-existence of a criteria defining how the fund should be shared among the marginalized areas (Government of Kenya, 2022). Between 2015 and 2017, Ksh 10.3 billion was allocated to 14 counties that had been identified as marginalized. In the second policy on marginalization, however, 20 more counties were included leading to a total of 34 counties. Of the projects implemented in the first disbursement, 23 per cent were in the health sector, 23 per cent in infrastructure, 7 per cent were in irrigation, 36.3 per cent in water and sanitation, 5 per cent in energy, 2.8 per cent in early learning and the remainder in vocational training across the marginalized counties. The completion rate for the health projects was at 10 per cent with counties citing inadequate funding as the reason for non-completion.

3. Literature Review

This section focuses on the status of devolved healthcare and an empirical literature review of devolved healthcare at local and international level.

3.1 Theoretical Literature- Conceptual Framework

Decentralization theorem

This theorem was brought forward by Wallace Oates in 1972. The theorem states that provision of local public goods and service delivery could be made more efficient when left to lower levels of government. He argues that the local government has a more superior understanding of the preferences and wants of its members and so the central government is unable to match policies and goods to the regions where they are needed most. Decentralization is thus argued as one way of matching public goods and services to the local needs while reducing costs. The factors put forward in this study when deciding which functions to decentralize include economies of scale in the production of public goods, the potential of interregional transfer of goods, and heterogeneity of households across the different regions. Devolution enables healthcare services to be more responsive to local health issues, and social determinants of health. Local governments can tailor healthcare services to the specific needs and demographics of their populations. This flexibility allows for more responsive and targeted healthcare interventions This responsiveness can lead to more effective public health interventions.

Principal-Agent theory

According to this approach, the principal has defined objectives to be met. The agents are the means through which these objectives are achieved. However, the agents also have their self-interests and may have more information compared to the principals. They may thus end up pursuing their interests secondary to those of the principal. The principal is aware of the limitations of the agent and may seek to obtain more information from the agent, but this comes with higher cost implications. The principal thus may resort to alternative means of gaining information from the agent including close monitoring and punishment. In devolution of health. The Ministry of Health which is mandated on behalf of the citizens, is the principal whose objective is promoting equity, efficiency, and affordability in the healthcare sector whereas the localized health facilities in the counties are the agents through which the principal meets these objectives (Bossert ,1998).

3.2 Empirical Literature

The effect of devolution on healthcare access is not a one-size-fits-all all but rather differs across countries and counties within the same country. According to Abimbola et al., (2019), this depends on various institutional, socioeconomic, and geographical factors like the availability of quality health infrastructure

and services, the level of economic development of a region, and the degree of autonomy of the local governments. They outline that devolution is likely to improve healthcare access if individuals can choose the facility that best suits their needs, when local governments tailor health interventions to the needs of their population, and when a strong civil society exists to hold the local government accountable for their actions.

Wanzala & Oloo (2019) in a study on the role of devolution in healthcare service delivery and health workforce in Kenya, opine that devolution may improve citizen participation, monitoring, and delegation of roles in the healthcare sector, and accountability. However, human resource deficiency and interference from the central government are identified as some of the elements that currently slow down the healthcare sector in Kenya. In the study, ways of increasing the effect of devolution like ensuring transparency and accountability and creating ethical standards to be followed are identified. Hémet et al., (2023) also examine how healthcare services in Kenya changed after devolution and find that the use of public health facilities especially clinics, increased after devolution. However, they outline the strong role played by homogeneity in the counties as services became more affordable and accessible for the dominant ethnic group in the county. This study also acknowledges the role played by devolution in making local governments more responsive to the needs of the people. Similarly, Makokha & Amis (2017) also found that devolution improved healthcare delivery in Makueni and Kisumu counties of Kenya. The channels identified in this study include reduced bureaucracy in the procurement of healthcare facilities and bringing services closer to the people.

Although different countries usually have different levels and types of decentralization and devolution, McCollum et al., (2018)conducted a comparative study on how devolution affected ten selected counties in Kenya and one district in Indonesia. Key informants' interviews and focus group discussions methods used in obtaining the data. Similarities that arose in the two countries regarding the effect of devolution include a lack of clear guidance on how to implement devolution, limited capacity of decision-makers, and prioritization of curative health services in place of preventive measures. Differences were identified in the healthcare structure of these two countries in that whereas in Kenya only the policy formulation was left at the national level, in Indonesia, policy formulation and regulation were left at the central and provincial governments.

Differently, Kairu et al., (2021) examined how health facilities in Kenya were financed after devolution. The results revealed that planning and budgeting were not standardized across counties, and that led to public hospitals and health centres relying on donor funds and user fees for running the facilities. Recurrent expenditures more so staff salaries were found to take a larger portion of the expenditure, and this limited the amounts available for infrastructure development and purchase of drugs and equipment.

4. Methodology

This section presents the estimation methodology and describes the data used.

AAAQ Framework

Health service delivery is analysed based on the AAAQ framework set by the WHO on assessing the right to health. These include Accessibility, Availability, Acceptability, and Quality of healthcare in the ASAL counties. This framework is chosen because it is commonly used in describing health care delivery.

Accessibility

Accessibility of health services is determined by the ability of a health system to ensure health services are available to all. Accessibility of healthcare can be categorized in terms of physical and economic access.

Physical accessibility means that the healthcare facilities are within a reachable distance which has been set by the WHO at a 5km radius. When healthcare facilities are physically accessible, health service delivery is likely to increase. For this study, physical accessibility of healthcare was analyzed based on the distance covered by a patient in reaching both inpatient and outpatient health facilities in 2013 and 2018 categorized by ownership since this determines the speed at which one reaches a health institution during medical emergencies. The mean distance from a health facility per county is calculated and comparisons made to determine whether they have increased or decreased.

Economic accessibility involves an analysis of catastrophic health expenditure per county. Healthcare expenses are defined as catastrophic when the amount spent on health exceeds 40 per cent of the total amount spent on non-food items or 10 per cent of the total expenditure (Maina, 2015) . The study calculates catastrophic health expenditure per county based on the 40 per cent expenditure on non-food items threshold. Comparisons are then made for the period before and after devolution to determine whether catastrophic health expenditure has increased or not.

Availability

The availability of healthcare requires that there are enough healthcare facilities and infrastructure for everyone, and they have competencies to match the needs of the population. In the study, the availability of healthcare before and after devolution was indicated by the number of health facilities per 100,000 people per county. The number of beds available in the health facilities before and after devolution is also analysed as it could be indicative of the availability of basic infrastructure in the health facilities. The significance of the change in before and after values is then determined using a rank test. In addition, comparisons

will be made with the WHO recommendations to determine how the counties are performing.

Acceptability

Acceptability of healthcare refers to the extent to which the healthcare provided takes into consideration, privacy, and confidentiality of the patient to preserve human dignity and complies with the existing medical ethics and socio-cultural norms in place. When patients are treated in privacy and dignity, they are likely to develop trust in the healthcare system and so open to the providers regarding their health issues. On the other hand, patients may fail to utilize the services of a health facility that is accessible and available if they feel that their privacy is violated. This implies that privacy is an important aspect of acceptability of health service. In this study, acceptability of healthcare before and after devolution was indicated by the percentage of patients who were satisfied with the outpatient and inpatient care received from both private and public health facilities. The significance of the change in acceptability is the determined using rank test.

Quality

Quality of healthcare involves an assessment of health worker competencies, skills and knowledge which influences the nature of treatment received by the patients from the healthcare workers, and whether it meets the required standards to meet the desired health outcomes. This involves an assessment of the trained personnel in the health facilities, availability of drugs, equipment and infrastructure including MRI, ultrasound, x-ray machines, and ICU beds per county. In the study, the quality of healthcare was analyzed based on the number of trained healthcare personnel per county for the period before and after devolution, percentage of patients who found the drugs prescribed to them at the facility, and the average number of equipment available per county per 10,000 population. An increase in the number of skilled healthcare providers, number of healthcare equipment per 10,000 population, and percentage of patients who find all the medicine prescribed for them could be an indicator of improvement in the quality of healthcare in the counties after devolution.

Wilcoxon-signed rank test

A quantitative approach involving a nonparametric method of analysis, the Wilcoxon signed-rank test was adopted. Nonparametric approaches can be used to analyze data with large variances as they are not constrained by the distribution of the population Scheff (2016). The Wilcoxon-signed rank test is designed for the comparison of two paired samples taken from a population that does not assume normality or near normality in distribution Martín et al., (2016) & Rosner et al., (2006). It is useful in measuring the change in score between two paired samples at different times. This test is preferred because it is parameter free implying

that the underlying assumptions are always met. The samples are related and obtained from the same population for two years 2013 and 2018 indicative of the period before and after devolution respectively. In this study, it was applied to test whether a statistically significant change occurred after devolution.

The Wilcoxon signed-rank test compares two related samples and tests for any difference in their population means ranks Rey & Neuhäuser, (2011) & Scheff (2016). The test is appropriate for repeated tests where the same observation is analyzed under two different conditions in this case before devolution and after devolution.

Let there be two paired samples x_1, x_2, x_3,....., x_n and y_1, y_2, y_3,.....y_n of a sample of size n from a continuous population with probability density function F, and median M.

Then $D_i=x_i-y_i$, i=1,2,3,.....,n which represents the difference between two paired random variables. Where D_i is assumed to be mutually independent, comes from a continuous population with probability function F, and is symmetric about the median M.

The Wilcoxon signed-rank test statistic is

$W=\sum\_(i=1)nR_i$ .signD_i

Where $D_i= X_i- Y_i$, R_i is the rank of $|D_i|$, i=1,2,3,.....,N and sign(D_i) =1 if $D_i>0$ and sign(D_i) =-1 if $D_i<0$

The differences are obtained in their absolute values and assigned ranks from the smallest to the largest. The ranks corresponding to the positive and negative differences are then summed up separately. The total of the rank values corresponding to the positive and negative differences are R_+ andR_- respectively. A difference is ascertained to exist between the two samples if R_+ or R_- values are lower than the critical value w(z) calculated as follows:

W(z)= (n(n+1))/4 -√(z&(n(n+1)(n+2))/24) where z is tabulated based on the level of significance desired. The desired number of n should be greater than 10.

The null hypothesis is that H0:M=0 (The distribution of the differences D_i is symmetric about 0.

The alternative hypothesis is that H_1 M≠ 0

It tests the hypothesis that the median of the various health indicators for availability, quality and accessibility is zero for the period before and after devolution. The outcomes of interest are the number of hospitals per county, the number of beds in the hospitals, the number of qualified health personnel in the counties, the prevalence of malaria, the distance covered to reach a health facility in kilometres, and the time taken to reach a health facility in minutes.

The Wilcoxon signed rank test is implemented in this study in the following steps:

First, the desired observations with values in 2013 and 2018 indicative of the period before and after devolution are presented. Second, the absolute differences between the values for the two periods are obtained and ranked then summed

up to obtain the values of R_+ and R_-. Third, a statistical value of z is obtained for the study which is taken to be 1.96 corresponding to the 95 per cent level of significance. Finally, a value for w(z) is obtained and compared with the R_+ and the R_- values. This is repeated for each indicator using the values for before and after devolution.

Data and Variables

Data for the empirical analysis was collected from Kenya National Bureau of Statistics (KNBS) issues of cross-sectional survey data, KHHEUS 2013 and 2018, and census 2009 and 2019. The data was for two periods 2013 and 2018 representing the period before and after devolution respectively. Although the KHHEUS data was collected for individuals, the data is aggregated into counties before being analyzed.

26 ASAL and 18 non-ASAL counties were included in the study. Three ASAL counties, Mandera, Garissa, and Wajir are not included in the analysis as they were not included in the 2013 KHHEUS data survey. The use of more than one dataset in the analysis was based on the fact that there was no single dataset which had all the indicators for the two time periods. The density of beds and healthcare workers per 10,000 population was not disaggregated by ownership of the facilities per county because of missing data in some counties for the period under consideration.

Table 3.1: Description of variables

Measure of service delivery	Variable Name	Definition and measurement	Source
Accessibility	Distance	The average distance covered when seeking OP health care per county by facility ownership measured in Kms.	KHHEUS 2013 and 2018 survey
		The average distance covered when seeking IP health care per county by facility ownership measured in Kms.	KHHEUS 2013 and 2018 survey

	Cost	Average catastrophic health expenditure per county by facility location measured by percentage of expenditure on health compared to non-food items.	KHHEUS 2013 and 2018 survey
Availability	Hospitals	Facility density per county per 10,000 population by ownership.	Health sector annual performance review report 2020/21
	Beds	Number of beds per hospital measured per 10,000 population.	Health sector annual performance review report 2020/21
Acceptability	Privacy	Percentage of patients per county by ownership who expressed their satisfaction with the privacy of OP services received.	KHHEUS 2013 and 2018 survey
		Percentage of patients per county by ownership who expressed their satisfaction with the privacy of IP services received.	Health sector annual performance review report 2020/21
Quality	Workers	Number of trained health workers in hospitals per 100,000 people.	Health sector annual performance review report 2020/21

	Drug availability	Percentage of patients who found all of the drugs prescribed to them in a health facility by ownership per county.	KHHEUS 2013 and 2018
	Equipment availability	Number of MRI machines per county per 10,000 population	Health sector annual performance review report 2020/21
		Number of CT scans per county per 10,000 population	Health sector annual performance review report 2020/21
		Number of Xray machines per county per 10,000 population	Health sector annual performance review report 2020/21
		Number of Ultrasound machines per county per 10,000 population	Health sector annual performance review report 2020/21
		Number of ICU beds per county per 10,000 population	Health sector annual performance review report 2020/21

4. Results and Discussions

In this section, the results of the mean differences per county for both ASALS and non-ASALS and Wilcoxon signed rank test are presented. The results are presented separately for the different measures of service delivery including accessibility, availability, acceptability, and quality.

The results indicate that on average, people travelled longer distances to seek OP and IP care from private health facilities compared to public in both ASAL and non-ASAL counties. Longer distances were also covered to reach public health facilities after devolution. The distance covered to seek IP services from a private health facility however, reduced in both ASALs and non-ASALs. The average distance covered in counties, however, is higher than the 5km radius that has been recommended by WHO. The average catastrophic health expenditure is higher after devolution compared to before devolution in both rural and urban areas.

The Wilcoxon signed rank test results that test for the significance of the changes to accessibility after devolution indicate that the increase in the average distance covered by patients seeking OP and IP care from public health facilities after devolution was found to be significant in ASAL counties. Although the distance covered to both public and private facilities also increased in the non-ASL areas, the increase was not as significant as compared to ASALs. The incidence of catastrophic health expenditure increased significantly across the counties after devolution in both urban and rural areas. However, incidences of catastrophic health expenditure were higher in ASALs compared to non-ASALs. Results indicate that both physical and economic accessibility have not improved significantly in the first five years as individuals cover longer distances and spend a higher percentage of their income on health compared to non-food items when seeking IP and OP healthcare services.

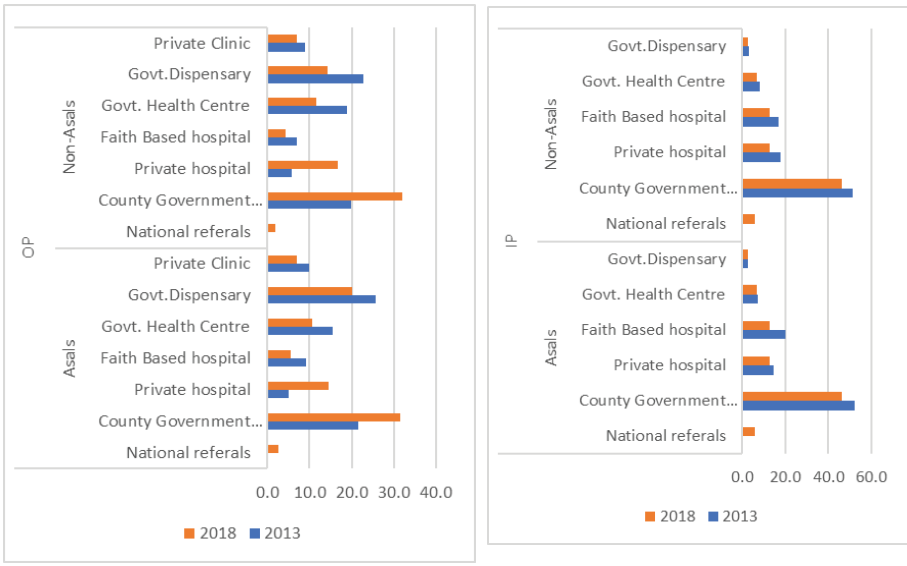
The increase in distance covered to seek OP and IP care after devolution, however, is attributable to the fact that people seek healthcare from their preferred facility which may not necessarily be the nearest facility to them. The preference is influenced by other factors including availability of drugs, health infrastructure and equipment, referrals, and qualified medical personnel. The increase in the incidences of catastrophic health expenditure which was more prevalent in the urban areas compared to rural calls for the need to train individuals on the need for preventive healthcare as opposed to curative health. The national government in a bid to curb these incidences of catastrophic health expenditure in the counties, rolled out the universal healthcare coverage (UHC) pilot in four counties, Isiolo, Kisumu, Nyeri, and Machakos. Conditional grants were given to level 4 and 5 facilities in these counties while households receive treatment at no cost. The UHC policy, however, includes strengthening mandatory pre-paid health sources like NHIF for all households in the country.

Table 4.1: Accessibility

	ASALs				Non-ASALs			
Variable	2013 Mean (Std Dev)	2018 Mean (Std Dev)	Wilcoxon Z statistic	No. of obs	2013 Mean (Std Dev)	2018 Mean (Std Dev)	Wilcoxon Z statistic	No. of obs
Distance to public OP health facility in Kms	7.91 (3.39)	11.26 (6.59)	-2.65**	26	5.88 (1.66)	6.52 (2.68)	-0.61	18
Distance to private OP facility in Kms	11.69 (5.28)	16.08 (8.12)	-2.68**	26	9.49 (4.50)	9.78 (5.46)	-0.19	18
Distance to public IP health facility in kms	14.78 (8.77)	33.30 (20.63)	-3.67***	26	17.71 (11.91)	18 (10.17)	-0.45	18
Distance to private IP health facility in Kms	41.09 (63.72)	35.5 (26.86)	-0.87	26	51.58 (48.62)	19.83 (11.84)	2.63**	18
Catastrophic health expenditure in urban areas	0.77 (0.53)	4.99 (13.23)	-3.97***	26	1.46 (1.15)	1.73 (1.37)	-0.91	18
Catastrophic health expenditure in rural areas	1.42 (0.69)	3.92 (6.52)	-2.94***	26	1.44 (1.30)	2.11 (2.63)	-0.65	18
***, **, * significance at 1, 5, and 10 % respectively								

Source: Authors computation using Stata

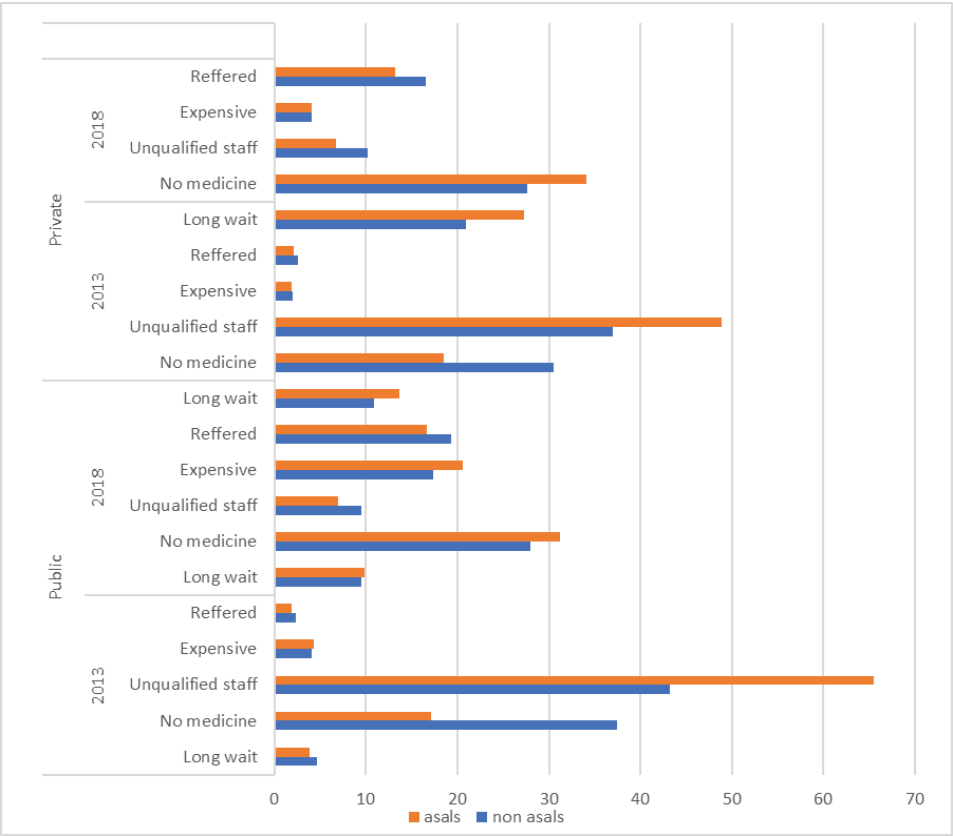
Figure 4.1: Choice of OP and IP care by type of facility



Source of data: KHHEUS survey 2013 and 2018

Figure 4.1 reveals that public health facilities including county government hospitals, government dispensaries, and government health centres were the most preferred by those seeking OP care across all counties followed by private hospitals. For those seeking IP care, the preferred health facilities were the county government hospitals followed by private and faith-based hospitals whose preference varies across the counties. This implies that the preference for public health facilities, especially the county government hospitals is still high for those seeking IP and OP care across the counties.

Figure 4.2: Reasons for bypassing a health facility



Source of data: KHHEUS survey data 2013 and 2018

The main reason for bypassing a nearby health facility in 2013 as revealed in the study is the absence of specialists at the facilities which stood out in both private and public facilities. However, this is not the case in 2018 when medicine unavailability is seen as the main reason for bypassing a health facility. This could be an indication that more specialists and qualified personnel were employed in both private and public health facilities. The higher percentage of people who bypassed a health facility due to medicine unavailability indicates the key role it plays in healthcare access. Being referred to another health facility was also one of the main reasons stated for not getting healthcare access in a nearby facility and this is based largely on the availability of infrastructure and equipment to handle the health issue at hand.

Table 4.2: Availability

	ASALs				Non-ASALs			
Variable	2013 Mean (Std Dev)	2018 Mean (Std Dev)	Wilcoxon Z statistic	No. of obs	2013 Mean (Std Dev)	2018 Mean (Std Dev)	Wilcoxon Z statistic	No. of obs
No. of beds per 10,000 population	18.69 (10.41)	20.95 (14.19)	-2.065**	29	26 (29.49)	32.27 (31.75)	-3.298**	18
Density of total facilities per 10,000	2.25 (0.66)	2.16 (0.61)	0.825	26	1.63 (0.47)	1.72 (0.48)	-1.32	18
Density of public facilities per 10,000	1.32 (0.51)	1.23 (0.45)	1.61	26	0.87 (0.32)	0.92 (0.28)	-1.80	18
Density of private facilities per 10,000	0.93 (0.47)	0.92 (0.49)	-0.48	26	0.76 (0.56)	0.80 (0.50)	-1.41	18
***, **, * significance at 1, 5, and 10 % respectively								

Source: Authors computation using Stata

Results indicate that although the average number of beds per 10,000 population per county has increased in both ASAL and non-ASAL areas, the increase is greater in non-ASALs as compared to ASALs for the periods before and after devolution. The overall facility density indicates an increase in the number of facilities per 10,000 population in the non-ASAL regions but a slight decrease in the density of facilities in the ASAL regions. Based on ownership, the data reveals that more private and public facilities were built in the non-ASAL areas compared to ASALs after devolution.

The Wilcoxon signed rank test results that test for the significance of the changes to the availability of healthcare after devolution indicate that the number of beds per 10,000 population increased significantly in ASAL and non-ASAL counties. However, the overall increase in the number of facilities after devolution was not significant in both ASALs and non-ASAL counties. However, the density of public facilities is higher than that of private facilities in both ASALs and non-ASALs.

An in-depth examination of the total bed count and healthcare facilities in the ASAL counties provides insight into the measures that have been implemented to enhance healthcare accessibility. The distribution of beds and health facilities per 10,000 population for each county is depicted in Figures 4.3 and 4.4 for the years 2013 and 2018, respectively. The World Health Organization's recommended bed and facility density of 25 and 2.2 per 10,000 population, respectively, are represented by red lines.

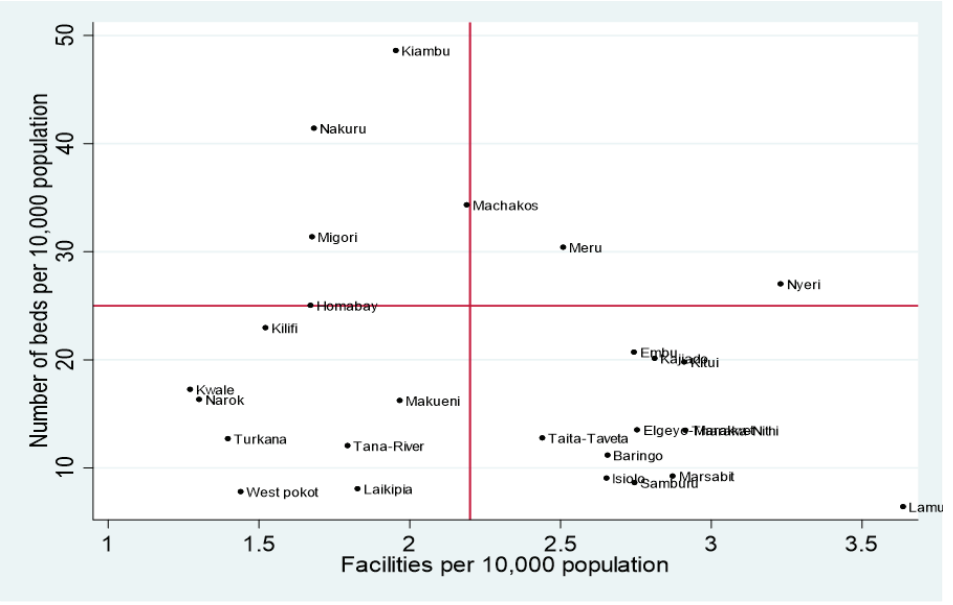
The counties are categorized into four quadrants. The bottom left quadrant represents counties that have not met the recommended bed and facility count. The bottom right quadrant includes counties that have achieved the recommended facility count but not the bed count. Counties that have met both the recommended bed and facility count are in the top right quadrant, while those that have met the bed count but not the facility density per 10,000 population are in the top left quadrant.

This quadrant analysis reveals a decline in healthcare availability in Elgeyo Marakwet, Marsabit, Isiolo, Kwale, and Kilifi counties post-devolution, as evidenced by their shift from the bottom right quadrant in 2013 to the bottom left quadrant in 2018. Conversely, Embu and Makueni counties demonstrated significant improvements in healthcare availability, as indicated by their transition from the bottom right to top right quadrant and bottom left to bottom right quadrant, respectively.

Further, a slight improvement is observed in the number of counties meeting the recommended number of beds and facilities rising from three in 2013 to four in 2018. However, it's important to note that out of the 14 counties identified as marginalized, eight (including Turkana, Marsabit, West Pokot, Tana River, Narok, Kwale, Kilifi, and Isiolo) all fall in bottom left quadrant in 2018 falling short of both the recommended number of beds and facilities per 10,000 population. This suggests that despite the differences among counties, common challenges such as marginalization can hinder healthcare service delivery. In addition, not all counties started at the same level when devolution began. Five years into devolution, marginalized counties continue to trail behind non-marginalized ones.

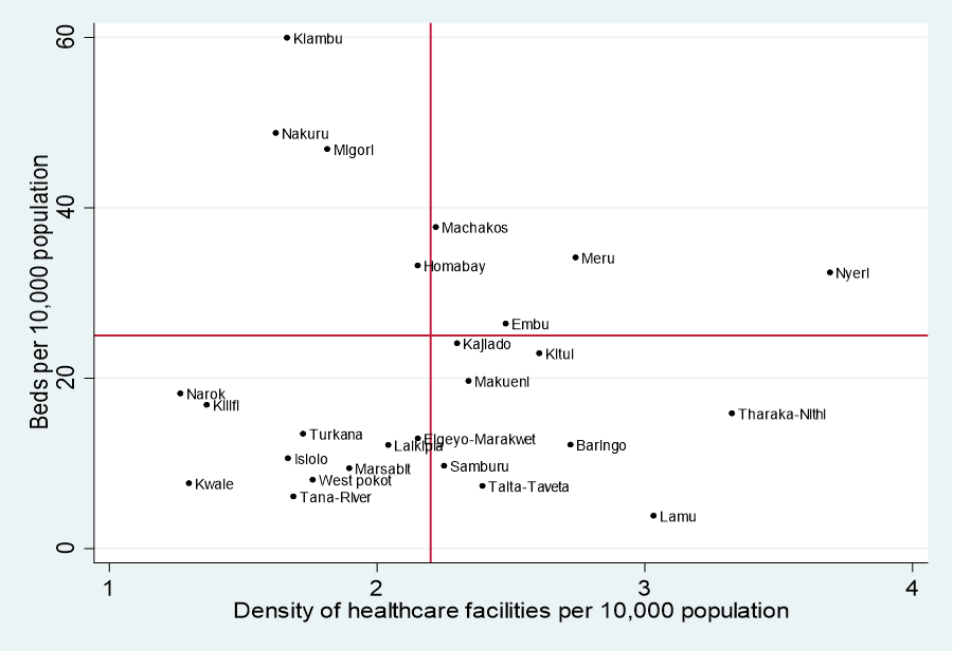
The results also indicate that only four counties, Meru, Machakos, Nyeri, and Embu have achieved the recommended number of beds and facilities while marginalized counties like Turkana, Isiolo, Marsabit, West Pokot, Tana River, Narok, and Kwale have less than the recommended number of beds and facilities. Increased health service availability is observed in Embu and Makueni counties while decreased availability is observed in Elgeyo Marakwet, Marsabit, Isiolo, Kwale, and Kilifi counties. The availability of the recommended number of beds and health facilities services in Meru, Machakos, Nyeri, and Embu counties can be attributed to the presence of level 5 facilities in these counties which qualify them to receive the level 5 conditional grant from the national government since this is an additional fund to these counties. The improvement in Makueni county is attributable to the presence of Makueni care where households contribute Ksh 500 annually and the county retains these funds for providing services to the members and improvement of at the healthcare facilities. Makueni county have also implemented the facility improvement fund which allows public hospitals to retain and use the user collected funds. The reduction in availability in Elgeyo Marakwet, Marsabit, Isiolo, Kwale, and Kilifi counties could be attributed to unavailability of level 5 facilities in these counties implying fewer grants to improve the healthcare sector. Further, Kilifi county had not implemented the facility improvement fund in 2018 in spite of enacting it. Isiolo county on the other hand, had not yet implemented the facility improvement fund and channelled their funds to the county revenue fund for redistribution (Mbuthia et al., 2019).

Figure 4.3: Distribution of beds and facilities by county in 2013



Source of data: Health sector annual performance review report 2020/21

Figure 4.4: Distribution of beds and facilities in ASALs by county in 2018



Source of data: Health sector annual performance review report 2020/21

Results indicate that the percentage of people who expressed satisfaction with

Table 4.3: Acceptability

	ASALs				Non-ASALs			
Variable	2013 Mean (Std Dev)	2018 Mean (Std Dev)	Wilcoxon Z statistic	No. of obs	2013 Mean (Std Dev)	2018 Mean (Std Dev)	Wilcoxon Z statistic	No. of obs
% of people who were satisfied with the privacy in OP care in public facilities	79.15 (7.15)	71.16 (9.21)	2.62**	26	77.91 (6.63)	66.99 (7.60)	3.41**	18
% of people satisfied with privacy in OP care in private facilities	55.20 (15.64)	37.53 (11.73)	4.15***	26	52.18 (14.09)	37.11 (10.53)	3.201**	18
% of people satisfied with privacy in public IP care	71.95 (9.50)	67.69 (14.37)	1.25	26	69.99 (7.87)	60.74 (11.24)	2.86**	18
% of people satisfied with privacy in private IP care	53.39 (13.82)	49.11 (15.27)	1.46	26	53.92 (15.76)	54.62 (10.37)	0.15	18
***, **, * significance at 1, 5, and 10 % respectively								

Source: Authors computation using Stata

the privacy in the OP and IP care from various public and private health facilities areas was higher before devolution compared to after devolution for both ASALs and non-ASALs. The mean satisfaction in the private health facilities was lower than the mean satisfaction in the privacy received when obtaining care in public facilities for both ASALs and non-ASALs.

The Wilcoxon signed rank test results that test for the significance of the changes to the acceptability of healthcare after devolution indicates the existence of a significant decrease in the percentage of people who were satisfied with privacy received while seeking OP care in public and private facilities for both ASALs and non-ASALs. The percentage decrease in the number of people seeking IP care who were satisfied with the privacy received in public and private facilities was insignificant.

A report by the Commission for Constitution Implementation (2015) indicated that privacy in some outpatient facilities in Kitui County was lacking especially for the case of HIV patients who had designated treatment areas and the choice of placement of equipment like condom dispensers in the reception as opposed to the washrooms. This trend when replicated in other counties could discourage people from accessing and utilizing healthcare from these facilities thus exacerbating the percentage of people who were satisfied with the privacy received while seeking healthcare.

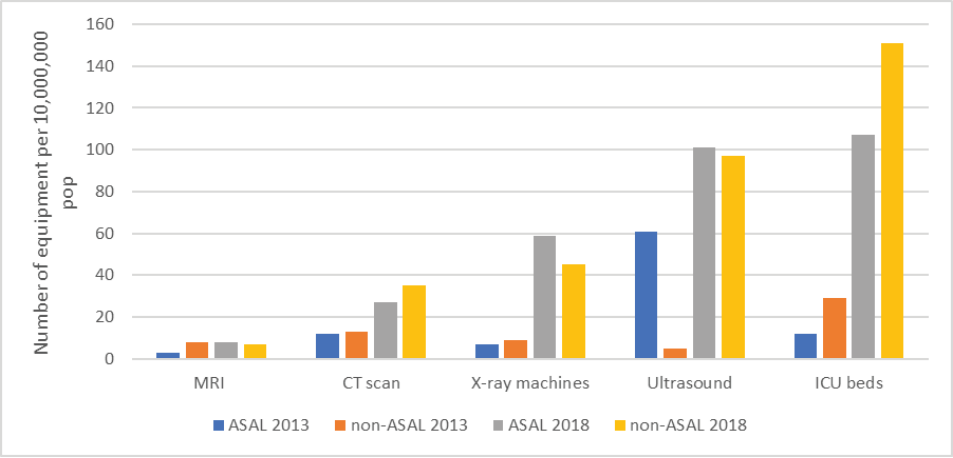
Table 4.4: Quality

	ASALs				Non-ASALs			
Variable	**2013 Mean (Std Dev)**	**2018 Mean (Std Dev)**	**Wilcoxon Z statistic**	**No. of obs**	**2013 Mean (Std Dev)**	**2018 Mean (Std Dev)**	**Wilcoxon Z statistic**	**No. of obs**
Number of MRI machines per 10,000 population	0.003 (0.005)	0.008 (0.017)	-0.89	26	0.008 (0.01)	0.007 (0.008)	0.24	18
Number of CT scan machines per 10,000 population	0.012 (0.019)	0.027 (0.027)	-2.84***	26	0.013 (0.013)	0.035 (0.029)	-2.72***	18
Number of Xray machines per 10,000 population	0.007 (0.01)	0.059 (0.044)	-4.18***	26	0.009 (0.011)	0.045 (0.018)	-3.72***	18
Number of Ultrasound machines per 10,000 population	0.061 (0.044)	0.101 (0.063)	-3.11***	26	0.05 (0.036)	0.097 (0.025)	-2.67**	18
Number of ICU beds per 10,000 population	0.012 (0.019)	0.107 (0.169)	-3.52***	26	0.029 (0.06)	0.151 (0.163)	-3.13***	18
% of people seeking OP care in public facilities who found the drugs needed	87.13 (5.26)	81.51 (6.73)	3.31***	26	83.97 (6.62)	80.04 (7.28)	2.59**	18
% of people seeking OP care in private facilities who found the drugs needed	96.85 (1.78)	96.42 (2.09)	0.62	26	96.85 (1.78)	96.42 (2.09)	0.54	18
Number of health workers per 10,000	13.01 (7.57)	17.30 (7.81)	-4.314***	29	13.22 (8.04)	17.03 (6.70)	-3.158**	18
***, **, * significance at 1, 5, and 10 % respectively								

Source: Authors computation using Stata

Results indicate that on average, there were 3 MRI machines for every 10,000,000 people in the ASAL counties compared to 8 for the non-ASALs in 2013, this number increased to 8 in the ASAL counties and 7 in the non-ASAL counties in 2018. The average number of CT scans per county increased from 12 to 27 per 10,000,000 in 2018 in ASALs and from 13 to 35 per 10,000,000 in non-ASALs. X-ray machines increased from 7 to 59 per 10,000,000 in 2018 in the ASALs and from 9 to 45 in the non-ASAL counties. Similarly, ultrasound machines increased from 61 to 101 per 10,000,000 population in 2018 in ASALs and from 5 to 97 in non-ASAL counties. The number of ICU beds increased from 12 to 107 per 10,000,000 population in the ASALs and from 29 to 121 in the non-ASALs. These are presented in figure

Figure 4.5: Average number of equipment per 10,000,000 population in 2013 and 2018



Source of data: Health sector annual performance review report 2020/21

In both ASALs and non-ASALs, the drug availability rate was higher in private compared to public facilities for both periods 2013 and 2018. The number of health workers per 10,000 population per county also increased from an average of 13 in 2013 to 17 per 10,000 in 2018 for both ASAL and non-ASAL counties.

The Wilcoxon signed rank test results that test for the significance of the changes to the quality of healthcare after devolution indicate that the increase in the number of equipment were all significant after devolution for both ASALs and non-ASALs except for MRI machines which increased marginally. Other aspects of healthcare quality like the availability of drugs based on the percentage of individuals seeking OP healthcare in public health facilities who got all the drugs they needed at the facility reveal a significant decrease in the numbers for the period after devolution. The percentage of drug availability in private health facilities did not experience a significant change in the period after devolution. The number of healthcare workers increased significantly per county for the period under consideration.

The quality of healthcare in the counties has improved indicated by an increase in the number of trained and skilled healthcare professionals and the number of major equipment like MRI scans, x-ray machines, ultrasound machines, and CT scans. This could be because devolution transferred the planning and service delivery function to the counties and thus counties have been able to employ more trained healthcare professionals (Council of Governors, 2017)(Council of Governors, 2017)(Council of Governors, 2017). In 2015, the government entered a Managed Equipment Service (MES) with counties to outsource specialized healthcare equipment including theatre facilities, kidney dialysis machines, x-rays, assorted cancer machines, and ICU machines on behalf of the counties. The equipment was distributed to two hospitals per county and additional health facilities across the country bringing the total list of beneficiaries to 119 facilities. This project was aimed at bringing healthcare closer to the people and reducing overreliance on national referral facilities (Ministry of Health, 2015). A report by IntraHealth International (2015) indicates that between 2013 and 2015, 7,484 health workers were recruited in the counties. On the other hand, many ASAL counties have not been able to achieve the WHO standards of 23 trained health personnel per 10,000 indicative of a gap that still needs to be filled. These findings are supported by a systematic review study by Masaba et al., (2020) who also note that some counties are still understaffed in the WHO-recommended number of doctors and nurses per 10,000 population. The number of major healthcare equipment per county is also still low and more funds could be allocated for the purchase and maintenance of the existing ones. Drug availability shown by the percentage of patients who got all or some of the drugs prescribed to them decreased in the public healthcare facilities across both Asal and non-Asal counties, this could be attributed to drug stockouts Toroitich et al., (2022) due to the dues owed to KEMSA by counties, the main drugs supplier to public health facilities. The availability in the private health facilities was however found to be higher and this could be attributed to the fact that they were not dependent on supply from KEMS.

5. Conclusion

This study aimed to find the effect of devolution on healthcare service delivery across counties. Different counties have shown mixed results with the rate of improvement being slower in ASALs especially the marginalized counties compared to non ASAL counties. Whereas improvements have been observed in various health facilities in terms of an increase in the number of equipment and infrastructure and an increase in the number of healthcare workers, many counties have not achieved the WHO recommended ratios indicating an existing gap that needs to be improved.

5.1 Policy Recommendations

i) Quality

To increase drug availability in the public facilities, there is need to encourage the counties that have not passed the facility improvement fund bill to fast track its adoption. This allows all counties the autonomy to retain locally collected revenue, provide medical supplies, and improve the quality of healthcare. Additionally, counties can implement and strengthen quality programs involving regular assessments, monitoring and evaluation.

ii) Accessibility

To address the issue of catastrophic health expenditure which increased in the period after devolution, there is need for ministry of health and county health department to educate the public on the importance of prioritizing preventive health services. This could contribute to early detection of diseases and bring down the financial burden of curing them. Additionally, counties can utilise ICT innovations as stipulated on eHealth Policy which will enhance access and depart from traditional healthcare delivery.

iii) Acceptability

To address the reduction in the number of people who expressed satisfaction with the healthcare received in public and private facilities, there is need for training health workers in the national and county health facilities on the importance of maintaining highest confidentiality levels when handling patients and keeping their data. In addition, the data collected should be used only for the intended purpose and as outlined in the law.

iv) Availability

To address the limited number of qualified healthcare professionals and bed facilities in some counties and ensure equal access to health across the country, there is a need for these counties to embrace the digitalization of the healthcare

system which includes telemedicine and telehealth. Steps towards achieving this include fast-tracking the implementation of the digital health bill passed by the cabinet in August 2023 which obligates the national and county governments to establish and fully equip e-health centres to accelerate the uptake of e-health. This can be achieved through the partnership of county health departments and digital enablers like Safaricom.

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Appendix

Accessibility

Distance covered to reach an outpatient health facility before and after devolution

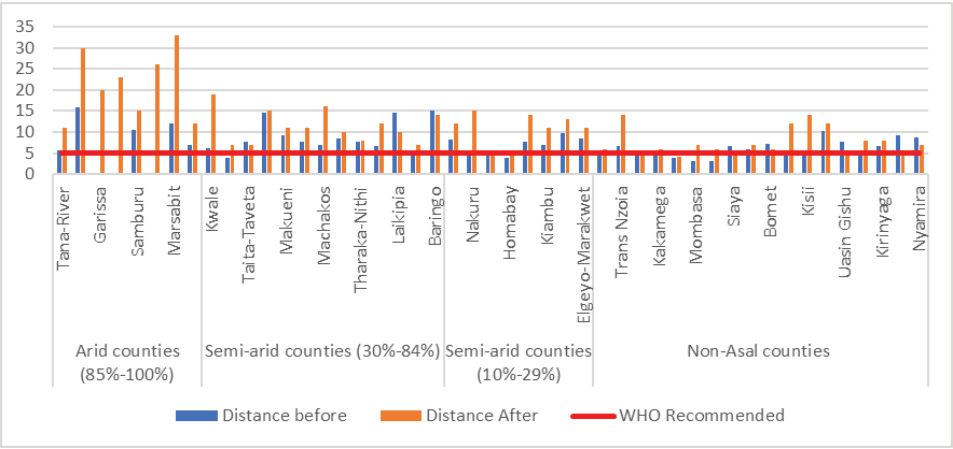
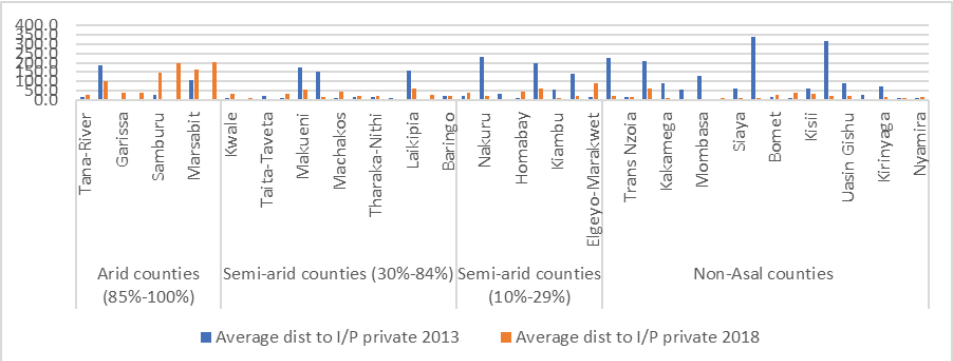


Figure 4.1 shows the average distance in kilometres covered by an individual to reach an outpatient health facility where they seek care from. On average, individuals across the counties covered longer distances in 2018 as compared to 2013 in the exception of Laikipia, Baringo, Siaya, Bomet, Uasin Gishu, and Murang'a counties where the average distance covered after devolution was shorter. However, the recommended distance of 5 kilometres has only been achieved in Uasin Gishu, Migori, Homabay, Busia, and Murang'a in 2018.

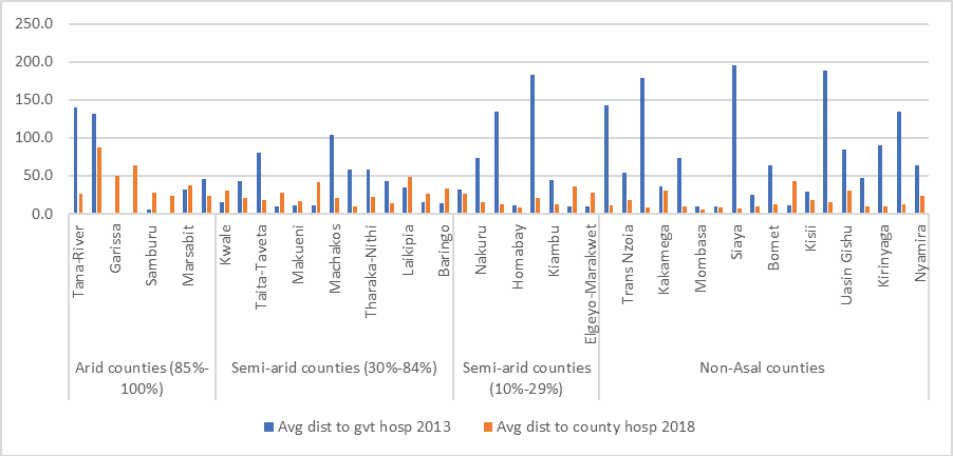
Physical access to inpatient facilities based on facility type

Average distance to an IP private health facility before and after devolution per county

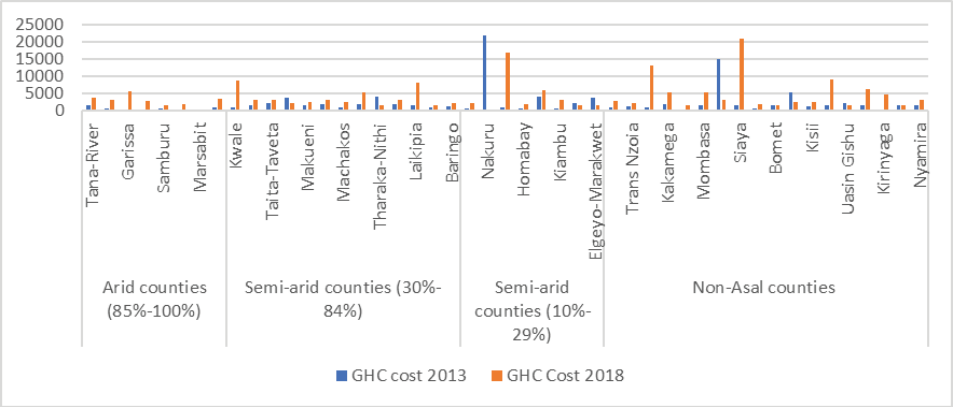
The distance covered to reach an inpatient private health facility increased in most of the arid counties except for Isiolo. In the semi-arid counties however, the distance has reduced.



Average distance to an IP county health facility in 2018 and government facility in 2013



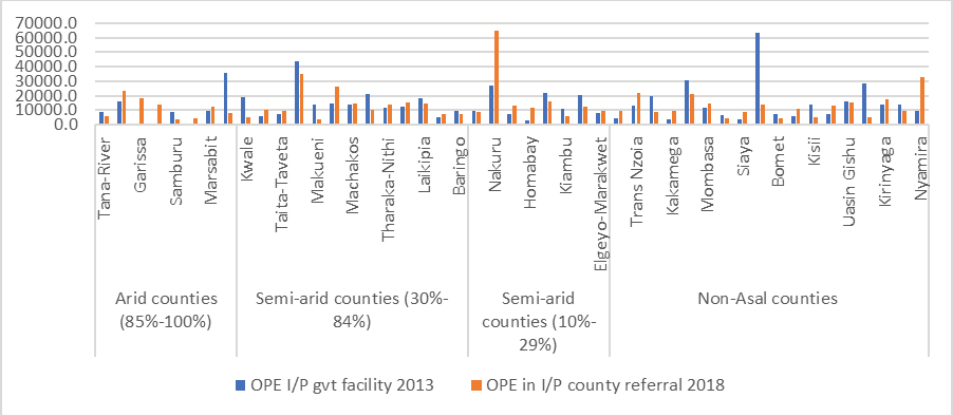
On average, the distance to an inpatient county health facility has reduced across the non-ASAL counties, this is not the case in some of the arid and semi-arid counties including Samburu, Marsabit, Kajiado, Makueni, Kitui, Laikipia, Baringo and Kericho where the average distance to county facilities increased after devolution.



Out of pocket expenditure in a government health centre before and after devolution

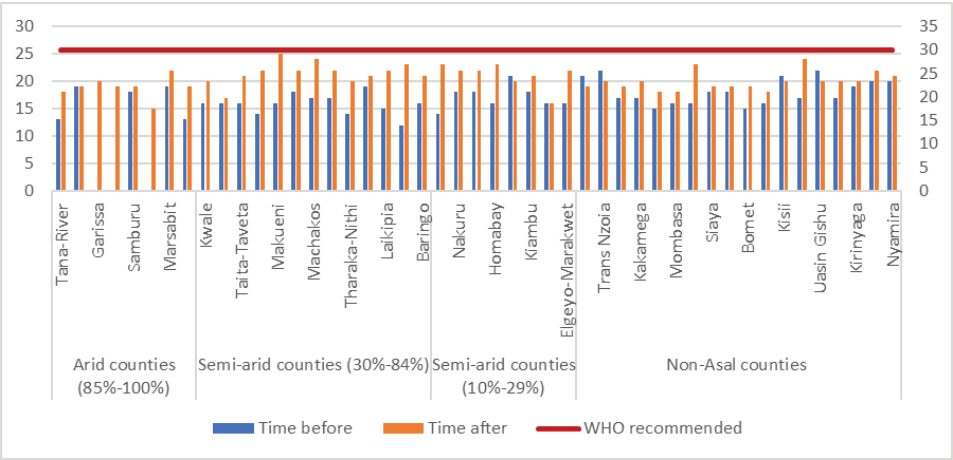
On average, the out-of-pocket expenditure by individuals to access health increased in most of the counties except Uasin Gishu, Tharaka-Nithi, Lamu and Kisumu.

Out of Pocket Expenditure for Accessing healthcare from county referral hospital in 2018 and government hospital in 2013



The out-of-pocket expenditure for the county referral hospitals display mixed results, whereas the cost increased in some counties such as Isiolo, Kajiado, Nakuru, Trans Nzoia, and Nyamira, it decreased in the remaining counties.

Time taken to reach an outpatient health facility of choice per county in minutes

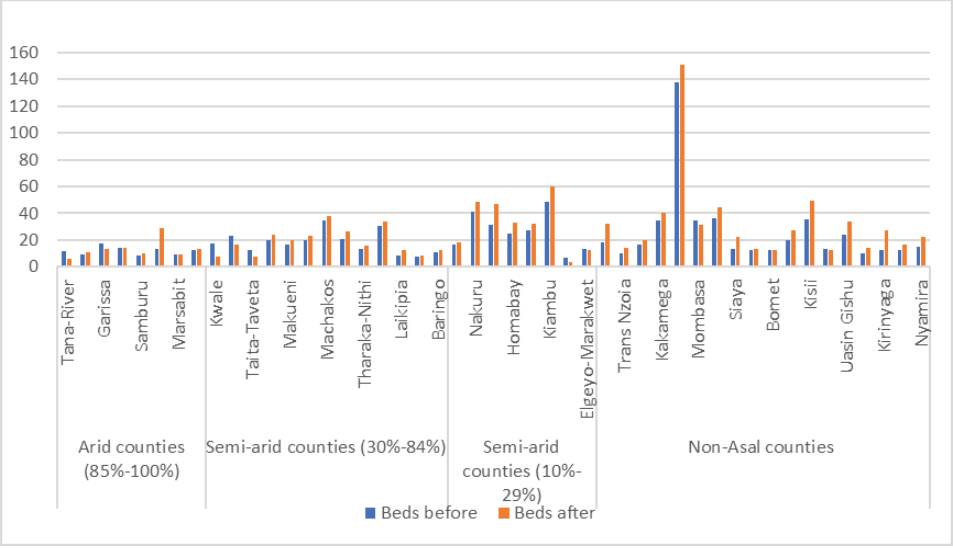


The trend across the counties shows that there has been an increase in the number of minutes taken to reach an outpatient health facility in all counties except for Bungoma. Comparatively, the average time taken to reach health facilities in arid counties is not very different from the average time taken to reach facilities in semi-arid and non-ASAL counties. In all the counties however, the WHO recommended time of 30 minutes has not been exceeded in any of the counties. This is an indication of the increased distribution of the outpatient health facilities

across the counties in a way that they can be reached by patients within 30 minutes regardless of the means of transport used.

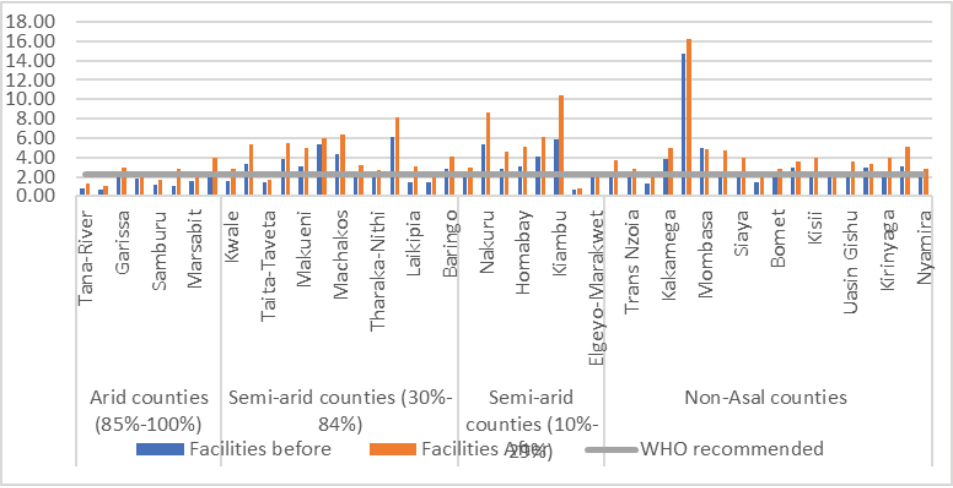
Availability

Number of beds per 10,000 population before and after devolution



On average, there has been an increase in the number of beds in the health facilities in most of the counties except for Tana River, Garissa, Kwale, Kilifi, Taita Taveta and Lamu counties.

Number of operational health facilities per county before and after devolution per 10,000 people



There has been an increase in the number of operational health facilities per county in 2018 as compared to 2013. However, the number of facilities in arid

counties is lower compared to semi-arid and non-ASAL counties.

Acceptability

Appendix Figure 9: Privacy in outpatient facilities before and after devolution

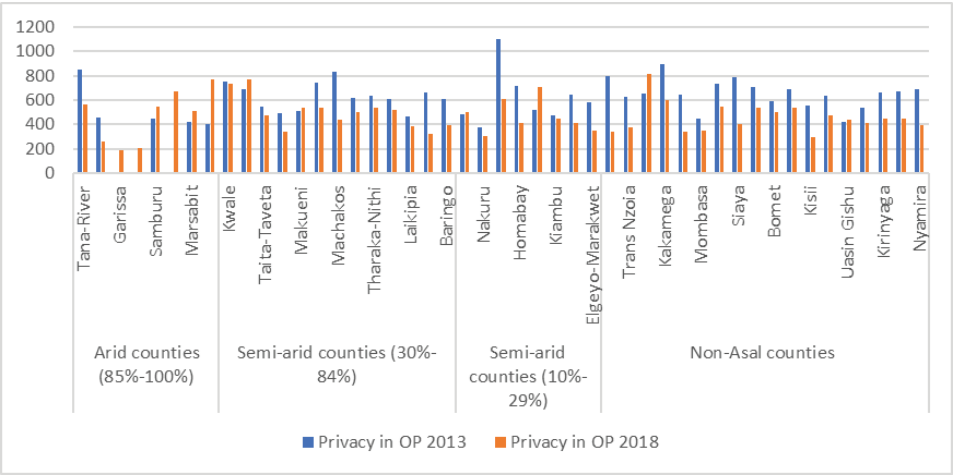
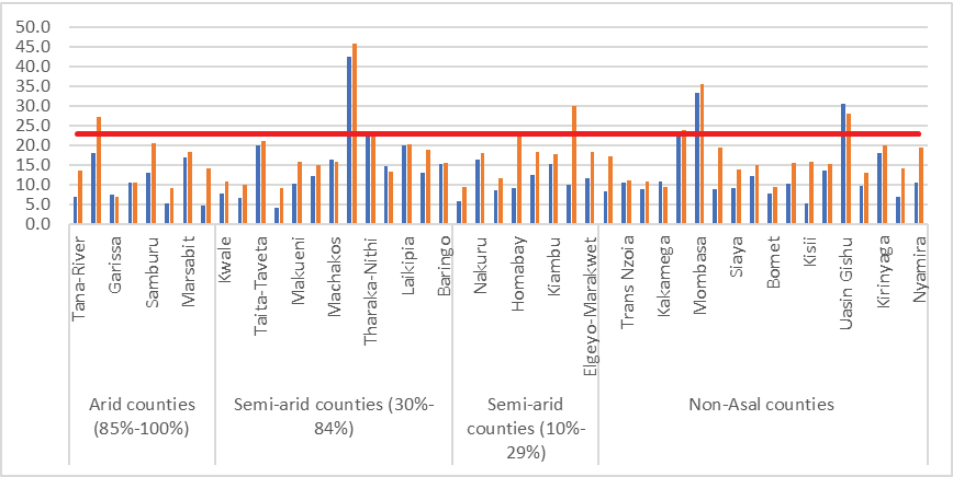


Figure 4.4 shows the average number of people who were satisfied with the level of privacy received in the healthcare facility visited. A decreasing trend is observed across both ASAL and non-ASAL counties for the period after devolution in most of the counties except Samburu, Marsabit, Turkana, Kilifi, Nyeri, Busia, and Uasin Gishu.



Appendix Figure 10: Number of health workers per 10,000 population before and after devolution.

Figure 4.8 shows the number of health workers per 10,000 for every county for the period 2013 and 2018 respectively. Although there has been an increase in the number of health workers in all the counties, only seven counties have achieved

the WHO recommendation of 23 healthcare workers per 10,000 people.

Conditional grants from the national government include Level 5 hospital funds, hospital user fees forgone by county governments, universal health care, free maternal health care, and leasing of medical equipment. Conditional grants have ranged between KES 2 Billion to 23 Billion between the Financial Years 2013/14 and 2021/22, 2021/22 being KES 8 Billion.

ISBN 978 9914 738 41 4

Kenya Institute for Public Policy Research and Analysis
Bishops Garden Towers, Bishops Road
PO Box 56445, Nairobi, Kenya
tel: +254 20 2719933/4, 2714714/5, 2721654, 2721110
fax: +254 20 2719951
email: admin@kippra.or.ke
website: http://www.kippra.org