

## **Public-Private Partnership Supported Health Facilities and Progress towards Attainment of Universal Health Coverage in Kilimanjaro, Tanzania**

Kimario Kanti<sup>1\*2</sup>, Kayunze Kim<sup>1</sup>, Muhanga Mikidadi<sup>1</sup>

<sup>1</sup>*Department of Development and Strategic Studies, College of Social Science and Humanities, Sokoine University of Agriculture, Morogoro, Tanzania, United Republic of*

<sup>2</sup>*Community Development and Gender, Moshi Co-operative University, Moshi, Kilimanjaro, Tanzania, United Republic of*

**\*Corresponding author:** Kimario Kanti. Department of Development and Strategic Studies, College of Social Science and Humanities, Sokoine University of Agriculture, Morogoro, Tanzania, United Republic of. Email: kantkim2011@gmail.com, kanti.kimario@mocu.ac.tz

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### **Abstract**

#### **Background**

Public-Private-Partnership-supported health facilities have been operational in Tanzania, and specifically, in Kilimanjaro since 1990s. This study provides a snapshot of the contribution of PPP-supported health facilities' operations towards attainment of Universal Health Coverage (UHC) in Kilimanjaro region.

#### **Methods**

Adopting a cross-sectional research design, samples of 384 households and 30 health facilities were selected through a multi-stage and purposive sampling approaches, respectively. Questionnaires and key informant interviews (KIIs) were administered (June 2020 - February 2021). Using IBM-SPSS v.23, chi-square was used to compare PPP-supported and government health facilities' service delivery quality and affordability. Content analysis was done on KIIs.

#### **Results**

With PPP-support unweighted mean index score for service availability (SA) was 46.59% and 29.14% without PPP-supported health facilities. With PPP-support, the GSR index score was 87% while it was 82% without PPP-support. This implies, with PPP-support, progress towards UHC attainment can be accelerated. There was no significant association between accessing services in PPP-supported or government health facilities by perceived service delivery quality and service affordability.

#### **Conclusion**

PPP-supported and government health facilities co-existence is essential at hastening the progress towards UHC in the study area. The government should strengthen policies and regulations to promote more PPPs in improving health facilities' operations.

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**Keywords:** Public-Private Partnership, health facilities, services availability & readiness, services affordability & delivery quality, and universal health coverage

## Introduction

Progress towards attaining universal health coverage (UHC) in Tanzania, as in many other developing countries, is still a challenge despite the efforts by the government and non-governmental stakeholders in the health system.[1] UHC refers to a situation where all in need of health services can access and afford to pay for them without being dragged into financial deprivation.[2,3] The general service availability index for Tanzania by 2015, for example, was 69% and the mean availability of items for offering specific services was 54%,[4] implying a moderate score. In the same year, the overall score of UHC service coverage index for Tanzania was 39% and that of 2017 was 43% (less than the World Health Organisation's minimum standard of 80%) implying insufficient progress towards attaining UHC.[5,6] Among other reasons, this can be attributed to inadequate budget allocations in the health sector by the Government of Tanzania, whereby over 10 years (2008/09 – 2017/18) health budget allocations averaged 8.9% of the total annual budget, which is less than the recommended Abuja Declaration target of allocating 15%.[7]

Universal and continuous delivery of health services to the world's population has been one of the most urgent challenges to the international community. Among the challenges to the attainment of UHC include, varying epidemiological and demographic features, changes in climatic conditions, diseases outbreaks (communicable and non-communicable), and socio-economic inequalities within nations.[8] To deal with the challenges most of the countries, globally, have involved different stakeholders in the health sector through Public-Private Partnerships (PPP). [9] Stakeholders' involvement brings in PPP where the government contracts a private entity (private-for-profit or private-not-for-profit) for health services provision. This facilitates collective resources mobilization and reallocation for improved health, equity, and social wellbeing.

The emerging PPPs have the potential to cater for a variety of health system needs – “from construction of facilities, to provision of medical equipment or supplies, to delivery of healthcare services”.[9]

In most countries, the private sector is the key, and sometimes the dominant provider of adequate healthcare.[10,11] In Tanzania, PPPs in health services have helped improve availability and access to healthcare services by reducing the distance from healthcare seekers' homes to the health facility and increased the type of healthcare services delivered to older people, and reduced medical fees.[12-15] A study from Tanzania asserts that through PPP service agreements, Maternal Child Health (MCH) services were provided free of charge.[16] Furthermore, most health services to the general population were to be subsidized by the government through the contracted health facilities providing the services.

Health facilities' (both PPP and non-PPP) role of services provision is directly linked with the availability of health infrastructure, health services utilization, and health workforce.[17,18] In Tanzania, there has been more involvement of PPP-supported health facilities in health services provision since 1990s. Despite the presence of PPP-supported health facilities in Kilimanjaro region for the past three decades, their contribution to the progress towards UHC attainment is not well known. Thus, this study reports findings on the contribution of PPP-supported health facilities' operations to the progress towards UHC attainment in the study area. This has been achieved by determining the level of health services availability, general services readiness, as well as assessing households' perception on health services affordability, and health services delivery quality.

## Methods

### Research design

This was a cross-sectional study, in which both quantitative and qualitative methods for data collection and analysis were employed. Quantitative methods intended to obtain quantifiable information for descriptive and simple inferential analysis. Qualitative methods aimed at obtaining textual information for content analysis of perceptions on health services delivery quality and affordability.

### Study setting

The study was conducted in four (out of seven) district councils of Kilimanjaro region. The region was selected based on its health system strength (highest out of 26 regions of Tanzania mainland with a z score of 3.8) [19] and cultural similarity. Four councils (Rombo, Moshi, Hai District councils and Moshi Municipal council) were selected based on the presence of an active PPP contracted health facility (operating as a Council Designated Hospital or a Voluntary Agency Hospital) during data collection.

### Sample size determination

For random sampling, Cochran formula,[20] as cited in another study [21] was used to obtain a sample size of 384 households. The number of households in the four selected councils was summed up to be 90,196 (based on Tanzania housing and population census of 2012).[22] The formula considered a Z-value of 1.96, a p-value of 0.5, and a d-value of 5% (which is equivalent to 0.05). This sample size is considered to be large enough based on the fact that “too large a sample implies a waste of resources, and too small a sample diminishes the utility of the results”.[23,21] Out of 384 households, proportionate random sampling was estimated, first, from each council, second, from each ward selected from the council, and third, from each village of a selected ward. Thus, three stages clustering was involved before applying systematic random sampling to obtain households to participate in the survey at the village level.

Moreover, a total of 30 health facilities was selected from the four councils.

### Sampling techniques

The study employed purposive sampling to select the region, as already explained, and the four councils, simple random sampling to select the wards, and systematic random sampling to select the households from all the villages in each selected ward. The health facilities were purposefully selected. Out of the 30 health facilities selected, 20 were Health Centres and 10 were Council and Council Designated Hospitals distributed by ownership (either government or Faith-Based Organisations' health facilities). Distribution of the health facilities selected is documented in (Appendix 1). Since the study considered health facilities offering both in-patient and outpatient services, dispensaries and clinics were left out because the range and types of health services they offered could not suffice for the purpose of this study. Key informant interviewees were purposely selected considering their understanding of PPP operations in the health facilities and at the council level in general. A total of 12 key informants were interviewed.

### Data collection techniques and tools

Data collection was done through survey, key informant interviews (KII), and observation. A household-based questionnaire was administered by the researcher (with the help of four research assistants, trained specifically on data collection for the research). At household level, household head or a representative of household head (at least 18 years of age) was interviewed to provide information on the socio-demographic characteristics such as household head age, level of education, average monthly income, occupation, general household health condition, health insurance status, among others. Other information collected at household level include perceptions on health services delivery quality and affordability in health facilities where they happen to access for healthcare in a 12 months period prior data collection.

A health facility-based questionnaire was adapted from the WHO's service availability and readiness assessment (SARA) tool. [24,25] The questionnaire assesses health service availability and readiness in health facilities. It was adapted to suit a sampled proportion of 30 health facilities in the study area. However, Tanzania national master health facilities list was accessed from the Ministry of Health's official website to obtain the total number of health facilities for the study area. The total number of health facilities was used to determine the health facilities' density for the area. The health facilities-based questionnaire and KIIs were administered and moderated by the researcher to the selected health facilities' administration and key informants, respectively. Through these research techniques, quantitative and qualitative data for the research were collected from primary sources, while secondary sources were accessed through documentary review. Data obtained through documentary review include, among others, number of patients served per month, health facilities' annual financial budgets, and records of PPP health facilities' service agreements).

To measure the constructs' reliability (the internal consistency) of data, Cronbach's Alpha ( $\alpha$ ) was used. It was found that the Cronbach's alpha coefficients for the items (under health services delivery quality and affordability), ranged from 0.705 to 0.966, indicating an acceptable level of reliability. Moreover, convergent validity was measured by looking at the Composite Reliability (CR) and the Average Variance Extracted (AVE). It was found that the CR was above 0.6 and the AVE was above 0.5. These imply that there was accuracy in measurement questions, and each measurement question reflected appropriately the features of research variable.

### Measurement of variables

Socio-demographic variables were measured as follows: Age (ratio), average monthly income (ratio), household size (ratio), education level (ordinal),

residence (nominal/categorical), economic activity (nominal/categorical), health insurance membership (dummy), sex (nominal/categorical), household members' distribution by age (ordinal). However, variables such as age, income, and household size had to be categorised (Table 1) for ease of data presentation and discussion.

Health services affordability and health services delivery quality were measured based on four and nine statements customised from different literature. [1,26,27] Each of the statements was rated from 1 for strongly disagree to 5 for strongly agree as choices for answers from the respondents. The scores for each respondent in each item were summed up to form an index score. The summated index scores were converted into percentages ranging from 0 to 100%. Taking the median as the cut-off point the percentages were categorised into percentiles. Thus, for health services delivery quality the 25<sup>th</sup>, 50<sup>th</sup>, and 75<sup>th</sup> percentiles represent scores for poor, moderate and good health services delivery quality, respectively. For health services affordability the 25<sup>th</sup>, 50<sup>th</sup>, and 75<sup>th</sup> percentiles represent scores for less affordable, affordable, and very affordable health services, respectively.

Health Services Availability (SA) index was computed using three domains. First, health infrastructure comprising of three indicators: (1) Health Facilities density – defined as number of available health facilities in an area per 10,000 population; (2) Inpatient Beds density – defined as number of inpatient beds in health facilities per 10,000 population; (3) Maternity Beds density – defined as number of maternity beds per 1,000 pregnant women per year). Second, Core Health Workers – defined as number of health workers (medical and assistant medical doctor, clinicians and assistant clinicians, registered nurses and midwives, pharmacists and laboratory technicians) per 10,000 population. Third, Health Services Utilisation comprised of two indicators:

(1) Outpatient service utilisation – defined as number of outpatient visits per person per year and (2) Inpatient service utilisation – defined as number of hospital discharges per 100 population per year). Thus, SA index is a composite mean of HI, CHW, and SU expressed in percentage.[5,28-30]

### **Data management and analysis**

Quantitative data collected through household survey questionnaire were cleaned, coded, entered into the IBM Statistical Package for Social Sciences (SPSS) software version 23 for analysis. Through SPSS, index summated scales were computed from scores of Likert scale responses for assessing the level of perceived health services delivery quality and affordability among household respondents. Scores from the index summated scales were converted into percentages, which helped to rate perceived health services affordability into Less affordable ( $\leq 45\%$ ), Affordable (45.1-65%), and Very affordable ( $>65\%$ ). Likewise, health services delivery quality was rated into Poor ( $<78.2\%$ ); Moderate (78.2-87.3%); Good ( $>87.3\%$ ).

Moreover, Microsoft Excel (with data from health facilities, collected through health facilities' questionnaire, entered into SPSS and then exported to Microsoft Excel) was used to score indices for health services availability (HSA) and general services readiness (GSR) for the 30 selected health facilities (HCs, CHs, and CDHs) in the four councils. To obtain the GSR index, five general health service domains involving basic amenities, basic equipment, standard precautions for infection prevention, diagnostic services, and essential medicines were used. Considering the number of components available, scores for each domain were obtained before computing the composite mean of the scores of the five domains for the aggregate GSR index. [29] Based on previous studies,[31,32] the general service readiness scores were compared with the benchmark of 70%, where facilities/areas scoring above were considered to be ready to provide the services.

Besides, the Chi-square test (based on the likelihood ratio) was done. It was used to check for association between perceived health services delivery quality or perceived health services affordability and household access to PPP-supported or government health facilities and services.

Qualitative data collected through key informant interviews were analysed through content analysis. The process of content analysis involved coding field notes through the identification and naming of segments about the study topics. Then, the meaningful segments from field notes were marked and labelled descriptively. Thereafter, categories and patterns were identified and organised coherently within context. Selective scanning of all the identified codes for comparison, contrast, and linkage to the study topic was finally undertaken. The codes were ultimately evaluated for their relevance to the study topic. The related codes were categorised as per the study objective. Moreover, striking information was presented with quotation marks and then interpreted in connection with results from the quantitative data.

### **Ethical Approval**

Ethical clearance for undertaking this study was obtained from the Postgraduate studies directorate ethics committee of Sokoine University of Agriculture and through the office of the Vice Chancellor. This was before seeking further clearance from the local government authorities at the regional level, district level, ward and village levels. Moreover, informed oral consent was sought from the household respondents before administering the questionnaire and were free to stop or proceed with the interview any time they wanted. Ethical clearance was also sought from the District Medical Officer before administering the health facilities-based questionnaire involving the health facilities' administration.

## Results

### Demographic and socio-economic characteristics of household respondents

As presented in Table 1, out of 384 households, the average household size was 5 members, and almost three-quarter (71.0%) of the households had members with ages ranging from 3 – 60 years.

More than three quarter 291(75.8%) of the households were located in rural areas due to the fact that out of four councils selected, three were rural district councils. Almost three-quarter 275(71.6%) of the household heads were males

**Table 1. Households’ Socio-economic and Demographic characteristics**

Characteristic	Category	n	%	Characteristic	Category	N	%
Residence	Urban	93	24.2	Household size (in 12 months period)	4 or less	167	43.5
	Rural	291	75.8		5 to 8	196	51.0
Sex of household head	Male	275	71.6		9 +	21	5.5
	Female	109	28.4	Age of Household head <sup>a</sup>	18 - 24	6	1.6
Household head education level	Non-Formal	5	1.3		25 - 54	220	57.3
	Primary	241	62.8		55 - 64	79	20.6
	Secondary	107	27.9		65 +	79	20.6
	Post-Secondary	31	8.1	Household head’s Income level <sup>b</sup>	Low	231	60.2
Health insurance status	No	242	63.0		Middle	139	36.2
	Yes	142	37.0		High	14	3.6
Presence of NCD	No	271	70.6	Household’s economic activity	Agriculture	227	59.1
	Yes	113	29.4		Trade	116	30.2
Health check-up frequency	Once	6	1.6	Salary/Waged	41	10.7	
	Twice to Thrice	47	12.2	General household’s health condition	fair	64	16.7
	Four to six times	31	8.1		good	205	53.4
	Only when sick	300	78.1		very good	115	29.9
Household Members’ Distribution by Age	< 3 years	112	11.5				
	3 - 17 years	315	32.4				
	18 - 60 years	376	38.6				
	> 60 years	170	17.5				

Key: Non-Communicable Diseases

a Early Working Age (18 - 24); Prime Working Age (25 - 54); Mature Working Age (55 - 64); Elderly (≥65).

b Income levels in (TZS): Low (less or 250,000); Middle (250,001 – 850,000); High (above 850,000)

In assessing the general household health condition, most of the households 205(53%) perceived their health condition to be good. This implied that they were not suffering from any illness during field visit but any of the members may have suffered from illness in the past four months. More than half of the household heads 241(62.8%) had primary education followed by 107(27.8%) with secondary education.

The mean household head age was 52 years with more than half 220(57.3%) falling in the prime working age category. The main economic activity of more than half 227(59.1%) of the household heads was agriculture followed by trading 116(30.2%). More than half 242(63.0%) of the respondent households were not members of any health insurance scheme. The mean household income per month was TZs. 283,977.

More than half 231 (60.2%) of the households fell under low income, that is, earning less than TZs.250,000 while more than one third of the households fell under middle income category earning between TZs. 250,001 and 850,000.

**Health services availability**

Service availability refers to the physical presence of health infrastructure, core health workers, aspects of service use (including outpatient visits) and health facility discharges and/or admissions.[30] Table 2 presents the target for each indicator as recommended by the WHO,[29,30,33] and by the Tanzania Ministry of Health and Social Welfare.[24,34]

The table also presents the coverage ratio and the percentage score, derived from the coverage ratio in comparison with the target. The values for the indicators and their respective ratios and indices were compared based on PPP-supported and government health facilities. With PPP-support the unweighted mean index score of service availability (SA) was 46.59%. This score indicated low availability of health services, which was highly contributed to by very low scores in Services Utilization (35.34%) and Health Workers (43.68%) in the study area. Without the PPP-support, the scores dropped further below (Table 2).

**Table 2. Service availability index**

Indicator	HF density	HI Index			SU Index		HW Index
		IB density	MB density	OV	HD	CHW density	
<b>Value (n)</b>	FBO	10	1116	33	289800	54000	319
	Public	242	703	38	349560	19800	912
	FBO and Public	252	1819	71	639360	73800	1231
<b>Population (P)</b>			1225206	35506			1225206
<b>Coverage Ratio (CR)</b>	FBO	0.08	9.11	0.93	0.24	4.41	2.60
	Public	1.98	5.74	1.07	0.29	1.62	7.44
	FBO and Public	2.06	14.85	2.00	0.52	6.02	10.05
<b>Target (T)*</b>		2	25	10	5	10	23
<b>Score = (CR ÷ T) (%) (Max. = 100)</b>	FBO	4.08	36.43	9.29	4.73	44.07	11.32
	Public	98.76	22.95	10.70	5.71	16.16	32.36
	FBO and Public	102.84	59.39	20.00	10.44	60.23	43.68
<b>Service Availability Indicator Score (%)</b>	FBO			16.60		24.40	11.32
	Public			44.14		10.93	32.36
	FBO and Public			60.74		35.34	43.68
<b>SA Index (%)</b>	FBO						<b>17.44</b>
	Public						<b>29.14</b>
	FBO and Public						<b>46.59</b>

KEY: Health facility (HF) density = (number per 10,000 population); Inpatient beds (IB) density = (number per 10,000 population); Maternity beds (MB) density = (number per 1,000 pregnant women); Outpatient service utilization = (outpatient visits (OV) per capita per year); Inpatient service utilization = (hospital discharges (HD) per 100 population, excluding deliveries); Core health workforce (CHW) density = (number per 10,000 population). Health infrastructure (HI) index = (average of HF density, IB density and MB density scores in %); Service utilization (SU) index = (average of OV and HD scores in %); Health workforce (HW) index = (CHW score in %); Service Availability (SA) Index = (Unweighted mean of HI index, SU index and HW index) [29,30].

FBO – Faith-Based Organisation (PPP-supported health facility)

\*The scores as presented in the table were compared with standard targets for each indicator [29]

### Health infrastructure index

The health infrastructure index was obtained from a mean score of the percentage scores on HF, IB, and MB density. With PPP-support, the HF ratio was 2.06 (>100% compared to the target by 0.06 involving 252 core HFs in the study area). The IB ratio was 14.85 (59.39% and below the target by 10.15 beds involving the selected 30 HF) both per 10,000 population. The MB ratio was 2.00 (20% and below the target by 8.00 beds involving the selected 30 HF) per 1,000 pregnant women per year. In calculating this index, only health centres, and hospitals were involved as they had both out-patient and in-patient service departments where the needed data could be obtained. Considering the combination of PPP-supported (FBO) HFs and public HFs (Table 2), the mean score from HF (102.84%), IB (59.39%) and MB (20%) is 60.74% implying moderate availability of health infrastructure in the study area. The mean score dropped to 44.14% when the PPP-supported (FBO) HFs were excluded. A key informant said:

*“The general condition of health care infrastructure is not so appealing, especially in the government health facilities, (where most of them are health centres) due to inadequate budget allocations from the government for infrastructure development... so, the presence of private (FBO) facilities help in filling the general infrastructure gap in the district...”*

### Service utilization index

Before obtaining the SU index, OV and HD ratios were computed. Based on the scores from a combination of the selected PPP-supported (FBO) and government health facilities (Table 2), the OV ratio was 0.52 (10.44% and below the target by 4.48 visits per person per year), and the HD ratio was 6.02 (60.23% and below the target by 3.98 discharges per 100 population). Health SU index was the mean of the two indicators' percentage scores which were OV (10.44%) and HD (60.23%) involving all the selected (30) health facilities, giving the mean score of 35.34% far below the recommended 70% score.

A key informant reported:

*“...majority of the community members around the hospital come to hospital mainly when suffering from illnesses. There is a very poor tendency of voluntary frequent health check-ups...”*

Another key informant reported: *“Most of the clients who come for health check-up more regularly are those who have health insurance membership because they are assured of being attended without out-of-pocket payments”*.

The findings on service utilisation can be linked with the findings obtained from the household respondents where most indicated to go for health check-ups only when they felt sick, implying poor health-seeking behaviour. Those who visited a health facility for check-up only when they felt sick were 78.1% (300); those who visited four to six times were 8.1% (31); those who visited two to three times were 12.2% (47) and those who visited once were 1.6% (6) of the total respondents.

A key informant stated:

*“...those who visited health facilities more often for health check-up were those with non-communicable (long-term) illnesses such as diabetes, asthma, low/high blood pressure, among others, because they have special clinics to attend...”*

### Health workers' index

The health workforce is important in enhancing health services delivery at health facilities. In this study, the core health workers density was computed based on the number of core health workers (medical and assistant medical officers, clinical and assistant clinical officers, nurses/midwives, medical attendants, pharmacists, and laboratory technologists) working in the selected health facilities. The target was 23 health workers per 10,000 population as indicated in Table 2. From the table, with PPP involvement, the HW ratio was 10.05 (43.68% and below the target by 12.95 workers),

and without PPP involvement the score was 32.36%, whereby this percentage score involved the seconded health workers working in the PPP-supported (FBO) health facilities but paid by the government.

**Perceived health services delivery quality**

As presented in Table 3, there was a slightly varied perception in health services delivery quality for PPP-supported (FBO) and government health facilities. It can be noted that 54.7% of the household respondents had access to only PPP-supported (FBO) health facilities and services. While 24.5% accessed government health facilities and services, 20.8% accessed both PPP and government health facilities and services.

For most of those who accessed services only in PPP-supported health facilities, 38.5% (81) perceived the quality of health services delivery to be moderate. However, those who accessed services only in the government health facilities and those who accessed both PPP-supported & government health facilities 42.5% (40) and 40% (32) respectively, perceived the quality of health services delivery to be good. Considering the respondent households' perceptions, there was no significant association ( $\chi^2 = 5.445, p > 0.05$ ) between health services delivery quality and services being accessed in only PPP-supported or government health facilities and services.

**Table 3. Perceived health services delivery quality**

Access to PPP or public health facilities/services	n/%	Health Services Delivery Quality Levels			Total (n=384)	Chi-square Test	
		Poor	Moderate	Good		Chi <sup>2</sup>	p-value
Accessed Public*	n	27	27	40	94	5.445	0.245
	%	23.5	20.4	29.2	24.5		
Accessed both PPP and Public	n	24	24	32	80		
	%	20.9	18.2	23.4	20.8		
Accessed only PPP	n	64	81	65	210		
	%	55.6	61.4	47.4	54.7		
Total	n	115	132	137	384		
	%	100.0	100.0	100.0	100.0		

KEY: \*Public here implies government health facilities ; Poor = <78.2%; Moderate = 78.2-87.3%; Good = >87.3%

**Perceived health services affordability by households**

Table 4 presents results of cross-tabulation between perceived health services affordability and the respondent households' access to PPP-supported (FBO) or government health facilities and services. As seen in (Table 4), majority of the respondent households 54.7% (210) accessed health services in the PPP-supported health facilities only. It follows that 23.2% (26) of those who accessed services from public health facilities and 58% (65) of those who accessed only PPP-supported facilities perceived the cost of services offered to be affordable. However, 46.8% (44) of those who perceived the cost of health services not to be affordable,

had accessed government health facilities. Moreover, 38.7% (31) of those who perceived the cost of health services to be very affordable, had accessed both PPP-supported and government health facilities. Generally, looking at the maximum likelihood ratio (Table 4) from the chi-square test ( $\chi^2 = 3.837; p > 0.05$ ), there was no significant association between accessing health services in a PPP-supported or government health facilities and health services affordability. A key informant reported:

*"... most of the prices for healthcare services and commodities under the service agreements are set and moderated by the government, but with compensation through subsidies..."*

**Table 4. Perceived Health Services Affordability**

Access to PPP or Public health facilities/ services	n/%	Healthcare Services Affordability Levels			Total (n=384)	Chi-square Test	
		Less Affordable	Affordable	Very Affordable		Chi <sup>2</sup>	p-value
Accessed Public*	n	44	26	24	94	3.837	0.429
	%	29.2	23.2	19.8	24.5		
Accessed both PPP and Public	n	28	21	31	80		
	%	18.5	18.8	25.6	20.8		
Accessed only PPP	n	79	65	66	210		
	%	52.3	58.0	54.6	54.7		
<b>Total</b>	n	151	112	121	384		
	%	100.0	100.0	100.0	100.0		

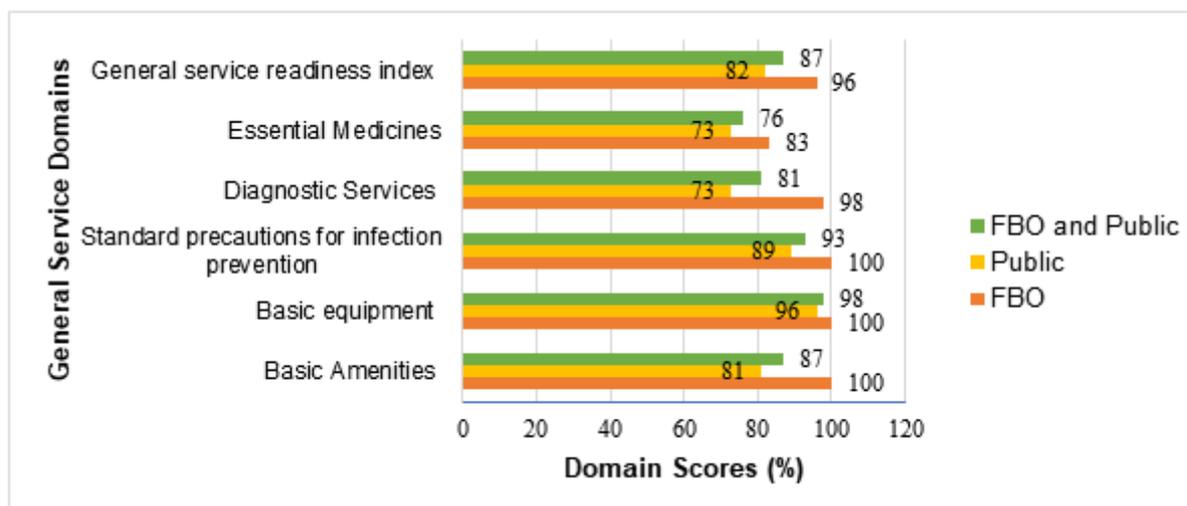
KEY: \*Public here implies government health facilities; Less affordable = ≤45%;

Affordable = 45.1-65%; Very affordable = >65%

**Health facilities’ general service readiness for health services delivery**

From Figure 1, the GSR Index for the provision of basic health services by all the selected health facilities was 87%, indicating a high readiness capacity for services delivery.

The overall readiness score was partly contributed by the PPP-supported health facilities that scored 96%, indicating very high readiness capacity for service provision. The PPP-supported health facilities also scored higher in all the five general service domains (with 100% scores in basic amenities, basic equipment, and standard precautions for infection control).



Public – implies government health facility; FBO – implies PPP-supported health facility

Figure 1. General Services Readiness (GSR) per health facility ownership

## Discussion

### Health services availability

With exception of the score in health facilities density, which scored 100%, other components for health infrastructure and the other two domains (service utilization and core health workers) scored below 50%, implying inadequate general service availability. Given that health services availability index score was higher in PPP-supported health facilities, it implies that PPPs in the health system have the potential to enhance health services availability considering the number of health facilities they own and range of services they offer. A literature review-based study found that PPPs have the potential to facilitate access to health services even to the most remote areas while considering the local needs and contexts.[35] Thus, the presence and operation of PPP-supported health facilities can accelerate progress towards attaining universal health coverage in the study area.

### Health infrastructure index

It can be inferred from the HI index score that PPP involvement complements the available scarce resources to support the government to build/construct the needed health infrastructure to adequately serve the entire population. A study in Ghana found that collaborative efforts between public and private (FBO) health providers is essential for attaining UHC considering the comparative strengths and resources that can be drawn from the Faith-Based-Not-for-Profit health providers.[36]

### Service utilization index

The results indicate that there was a very low rate of visits in the health facilities' outpatient department. This could be due to, among others, poor health-seeking behaviour from the clients, and failure to meet costs of health services considering most of the clients paid for health services through out-of-pocket payments. It can be inferred that most of those who had more than one visit had some long-term illnesses which required more regular visits.

The fact that most of the health check-up visits took place in PPP-supported health facilities by 54.7% (210) was because most of the PPP-supported health facilities were hospitals at the district level with more health services available than health centres. A study from Kenya found similar results that majority of the respondents preferred private health facilities for health check-up.[37] Moreover, a study in South Africa reported a decrease in the number of health check-ups in the public health facilities due to poor quality of service provision.[38]

### Health workers' index

Based on the WHO's recommendation on the minimum number of health workers per certain population, the findings of this study imply that there was an inadequate number of health workers to serve the population in the study area. Despite the adequate number of health facilities present, health services may not sufficiently be provided due to a shortage of health workers. The finding is in line with a report which involved 47 member states of the WHO Africa Region in which there was an average of more than three-fold lower density of health workers than the global average.[39]

### Perceived health services delivery quality

The results show that service delivery standards, according to the service agreements, were well adhered to in both PPP-supported (FBO) and government health facilities. This finding corroborates the observation of a study that compared PPP-supported and government health facilities in terms of quality and access,[11] and found that private (PPP-supported) health facilities can provide health services of an acceptable quality and standard as the public service providers. However, the findings are different from those in a study from Lesotho [40] which found that PPP-managed network offered better services than the government-managed network of health facilities.

### **Perceived health services affordability by households**

This study has revealed that there was no significant association between accessing health services in a PPP-supported or government health facilities and health services affordability. This result implies that the pricing of health services and medicines provided in the PPP and public facilities is guided and regulated by the government through the MoHCDGEC and Local Government Authorities (LGAs). Moreover, health services offered in the PPP-supported health facilities are subsidised by the government as per the service agreements. This finding is in line with what was reported by other researchers [13-15] in Tanzania who found that health services costs are subsidised by the government. However, it was found in another study,[41] on the role of health service delivery networks (PPP involved) in achieving UHC in Africa, that at times PPP-supported health services providers tend to deliver subsidised health services to their clients (even more than those itemised in the service agreement).

### **Health facilities' general service readiness for health services delivery**

With reference from previous studies assessing health facilities' readiness in services delivery, 70% GSR score was considered to be the cut-off point, where facilities that scored 70% or higher were considered to be ready to offer the expected health services. [31,32,42,43] In this study, the GSR index of 87%, is above the threshold, implying that the health facilities in the study area are generally ready for health services delivery. A report from the Ministry of Health [24] on service availability and readiness assessment conducted in 27 districts of Tanzania found that the private facilities including faith-based ones, had higher scores on the GSR index than the government facilities. Moreover, another study also found that private health facilities scored more highly on the GSR index than government health facilities.[18]

The PPP complementarity role in terms of resources, expertise, and technology for health services provision is paramount.

For the current study, much better performance may be attributed to the fact that PPP-supported health facilities involved had signed service agreements with their respective LAGs, thus, enabling them more capability to provide health services due to benefits accrued from PPP.

Considering the five domains used to compute the GSR index, the PPP-supported FBO health facilities scored more highly in every aspect as indicated in Figure 1. A study on readiness of health facilities for the outpatient management of non-communicable diseases in Tanzania found higher scores in service readiness among private health facilities.[44] Based on this study, although the GSR score for the government health facilities was below that of PPP-supported health facilities only by 14%, the contribution of PPP in the health services provision and, thus, to the progress towards attaining UHC in the study area cannot be underestimated.

### **Conclusions**

Since the GSA index measures the ability of health facilities in availing health services to healthcare seekers, it was noted that PPP in health services provision is necessary because without PPP-support the GSA mean index score could have been even lower. PPP involvement complements the available scarce resources to support the government to build/construct the needed health infrastructure, and employ more and better qualified health workers to adequately serve the entire population for better health services utilization. Thus, PPP-supported and government health facilities co-existence is essential at hastening the progress towards attainment of UHC.

Considering the perceived health services delivery quality, it was noted that service delivery quality standards are perceived to be similar in both PPP-supported health facilities and the government health facilities.

Given that the perceived health services delivery quality in the study area is generally good, it follows that PPP-supported health facilities' operations have been well-aligned with the LGAs and the Ministry of Health (MoH) operations in health services provision.

The general perception of health services affordability was that the costs of health services were affordable. Most of health services costs were perceived to be alike in both PPP-supported and government health facilities. This indicates the importance of government intervention in regulating the health services and prices of commodities in the PPP-supported health facilities through services agreements.

The GSR index score for the selected health facilities in the study area was above the target suggesting that most of the health facilities' readiness capability was good enough for health services provision. However, higher GSR index score for this study was, to a certain extent, contributed by the presence of PPP-supported health facilities (most of them being hospitals) required to provide a wider range of health services. Moreover, a high GSR index score was not enough to enhance a better progress to the attainment of UHC if other components such as the indicators for GSA are not good enough. Therefore, to make a better progress towards attaining UHC, a combination of factors for improving health facilities' operations such as health services availability, quality of delivery, and affordable cost of services offered is important. This can be achieved through increased collaborative efforts between private healthcare providers and the government in form of public-private partnerships.

### **Recommendations**

To improve the general health services availability, the LGAs should strengthen the level of collaboration with the FBO and other private health services providers through formal contractual agreements. This will enhance improvement of the available health infrastructures, employment, and retention of qualified health workers, among others.

Moreover, health facilities should work closely with the community health workers to educate and sensitise communities on the need to improve their health-seeking behaviour. This should be through regular visits to health facilities for health check-up. When service utilization improves, there will be an increased demand for healthcare improvement by the community from the government and other healthcare providers. The government, through LGAs and the MoH, should increase healthcare budgets from the current allocation of 8 - 9% (at least to reflect the 15% allocation of the national annual budget as recommended in the Abuja Declaration of 2015). This will enable health facilities increase the range of services subsidised by the government in both PPP-supported and government health facilities. Moreover, the increase of health care budgets will facilitate the improvement of health centres (majority being under the LGAs) to provide more and better health services closer to the communities.

### **Study limitations**

The study was limited to four district councils of Kilimanjaro region which had PPP-supported health facilities (having service contracts with the LGAs) in determining the contribution of PPP-supported health facilities to the progress towards attaining UHC in the study area. Thus, generalization of the findings should be taken with caution. However, this study was an important undertaking because at the regional level, the results could inform policy makers on the need to strengthen formal collaborations between the government and private healthcare providers in terms PPP at different levels. The WHO's service availability and readiness assessment tool was adapted for data collection in the selected health facilities. With the presence of enough resources in terms of time and finance, the study can be conducted in a wider geographical scope, involving more PPP-supported health facilities in comparison with the government health facilities at all levels.

### Conflict of interest declaration

The authors declare that they have no any conflict of interest related to the presentation of this manuscript.

### Authors' Contributions

K.A.K came up with the research idea, wrote the research proposal, participated in formulating the data collection tools, organised and lead the research team in data collection, analysed the data, and wrote the research report as well as all versions of this manuscript. K. A. K. and M. I. M. participated in guidance, reading and commenting on the study from conceptualisation stage to the final version of this manuscript.

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**Appendix 1: Health Facilities Selected from the Four Councils**

<b>Council</b>	<b>Health Facility Level</b>	<b>Health Facility Ownership</b>			<b>Total</b>
		<b>FBO</b>	<b>Public-LGA</b>	<b>Parastatal</b>	
<b>Moshi MC</b>	Council Hospital	2	0	0	2
	Health Centre	1	2	0	3
	<b>Total</b>	<b>3</b>	<b>2</b>	<b>0</b>	<b>5</b>
<b>Moshi DC</b>	Council Hospital	3	0	1	4
	Health Centre	1	6	0	7
	<b>Total</b>	<b>4</b>	<b>6</b>	<b>1</b>	<b>11</b>
<b>Rombo DC</b>	Council Hospital	2	0	0	2
	Health Centre	0	5	0	5
	<b>Total</b>	<b>2</b>	<b>5</b>	<b>0</b>	<b>7</b>
<b>Hai DC</b>	Council Hospital	1	1	0	2
	Health Centre	0	5	0	5
	<b>Total</b>	<b>1</b>	<b>6</b>	<b>0</b>	<b>7</b>
<b>Grand Total</b>		<b>10</b>	<b>19</b>	<b>1</b>	<b>30</b>

**FBO** – Faith-Based Organization; **LGA** – Local Government Authority; **MC** – Municipal Council; **DC** – District Council