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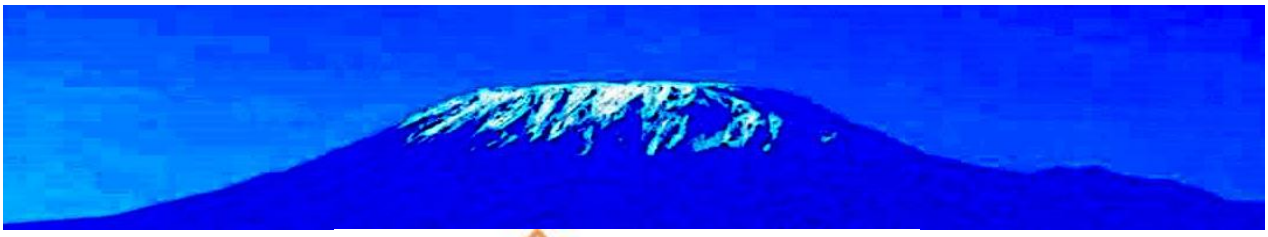

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Households' Socio-demographic, Health-related Characteristics and Progress towards Attainment of Universal Health Coverage in Kilimanjaro, Tanzania

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Abstract

Households' characteristics should not hinder the progress toward attaining Universal Health Coverage (UHC). UHC attainment progress in Kilimanjaro Region involved assessing perceived differences between households' characteristics and UHC factors (accessibility, affordability, and service delivery quality). The study employed a cross-sectional design involving 384 households and 30 health facilities selected through multi-stage and purposive sampling approaches, respectively. Data were collected through survey questionnaires. Through IBM-SPSS household-based data were analysed using Kruskal Wallis H and Mann Whitney U tests. Health facilities-based data were analysed through Geometric mean computation using MS-Excel to obtain UHC service coverage index. Results indicated: Occupation (p=0.012), general household health condition (GHHC) (p=0.039), health insurance membership (HIM) (p=0.039), and presence of non-communicable disease (p=0.032); GHHC (p=0.041); income (p=0.000), occupation (p= 0.000), education (p=0.004), health check-up frequency (p=0.001), and HIM (p=0.000) were significantly different in health services delivery quality, accessibility, and affordability, respectively. UHC service coverage index was 69.9%, which is fairly good about the WHO recommendation of 80%. Therefore, households' characteristics can impair health services access and, consequently, impair progress towards UHC attainment. To improve UHC attainment progress, service providers, LGAs and MoH should work towards improving the service domains, which scored below threshold and promotion of universal health insurance.

Introduction

The attainment of universal health coverage (UHC) entails sustainable access and quality delivery of healthcare services to all persons without being deprived financially (Hogan *et al.*, 2018; Odoch *et al.*, 2021). The continual realisation of UHC has been one of the UN's agenda for Sustainable Development Goals (SGDs - Target 13.8), whereby nations and international institutions have prioritised UHC as a policy concern (Kieny *et al.*, 2017). UHC refers to an on-going process involving the improvement of people's ability to access healthcare services in different contexts without experiencing financial hardship (Abiiro and De Allegri, 2015; Lozano *et al.*, 2020; Ranabhat *et al.*, 2020). The progress towards UHC attainment (in this context) is defined by health services accessibility, affordability, and quality of health services delivery

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(WHO, 2022; WHO and World Bank, 2017). Health services accessibility implies the situation where all those in need of health services can access the needed services without constraints in terms of geographical location, age, sex, economic status, education level, or insurance membership (Kieny *et al.*, 2017). For the population in a given area to access the needed health services, there should be healthcare personnel, friendly infrastructure, equipment, and medicines available in the health facilities (Okech, 2016; Sambo and Kirigia, 2014; Verma and Dash, 2021). Health services affordability involves the reduction of healthcare costs sharing and fees while increasing pooled funds in terms of healthcare insurance for all. Health insurance for all is one of the mechanisms for making health services affordable to the population in the formal and informal sectors (Bintabara *et al.*, 2018), thus a move towards UHC attainment.

Focusing on UHC attainment, the government of Tanzania (GOT) introduced health insurance. Community Health Fund (CHF) was introduced in 1996 and its subsequent modification to the improved CHF in 2001 while the National Health Insurance Fund (NHIF) was established in 2001. CHF and NHIF cover only about 24% and 9% of the country's population, respectively (Malale *et al.*, 2020). As the GOT pushes for universal health insurance, the current health insurance contributes 7% of the total health budget (MoHCDGEC, 2021). Health services delivery quality is defined by the time/duration health facilities are open for services provision. Moreover, the duration that a patient can wait before being attended for service, and the duration that a patient can be attended by healthcare personnel are indicators that can measure health services delivery quality. These indicators are closely linked with healthcare seekers' services utilisation (Abaerei *et al.*, 2017). Health services utilisation (the extent to which healthcare seekers make use of health facilities for service consumption) is important in determining perceptions of health service delivery quality. Increased health services utilization stimulates improvement of health service delivery quality, which in turn improves people's health.

Health is a foundation for human capital, and a resource for social and economic development because healthy children can thrive in school and healthy adults can thrive in production (Kimario *et al.*, 2020; Muhanga and Malungo, 2019; Muhanga and Malungo, 2018). Allocating resources for healthcare implies investing in human capital (Ranabhat *et al.*, 2020; Muhanga and Mapoma, 2019). The government of Tanzania, in collaboration with other stakeholders in the health sector, has been working hard to improve health services delivery quality to the community members at an affordable cost and accessible environment. Some of the efforts, among others, include improving the provision of primary healthcare which is easily accessible, affordable, sustainable, and gender considerate (URT, 2017). The efforts have been emphasised in the National Health Policy of 2017, the Health Sector Strategic Plan IV (HSSP IV) 2015-2020, HSSP V 2021-2026, the Tanzania Development Vision 2025, and the Five-Year Development Plan III (FYDP III) 2022-2026 (URT, 2017; URT, 2021). The efforts aim at increasing progress towards UHC attainment.

The efforts by the GOT like the Five-Years Development Plan III and the Development Vision 2025 emphasise improving households' socio-economic and health-related conditions so that they do not become obstacles in increasing to the needed health services and UHC attainment. However, it is a fact that epidemiological profiles do change as fertility changes, incomes increase or decrease, populations age and urbanization expands (Eregata *et al.*, 2019). Moreover, non-communicable illnesses, accidents, and other external factors account for the increased burden of illness. Consequently, certain population subgroups fail to access and afford the needed health services due to disparities in UHC that exist among or within nations (WHO, 2022). This necessitates assessing the perceived progress toward UHC attainment considering disparities associated with households' socio-demographic and health-related characteristics in the study area.

Theoretical Framework

The study was guided by Penchansky and Thomas's theory of service access. According to Penchansky and Thomas (1981), access to services is a multidimensional aspect that involves five dimensions which include service availability, accessibility, affordability, accommodation, and acceptability. "Access in health care may be defined as a measure of potential and actual entry for a given population into the health system" (Giedion *et al.*, 2013). As an outcome that defines an interplay between the healthcare providers and the users, access cannot be separated from UHC attainment. This is because, UHC as a wider goal to be achieved in the health system is intertwined with the components of health services accessibility, affordability, acceptability, availability and accommodation, which are the key dimensions of healthcare access. The theory assumes that access should be defined by the five dimensions. Saurman (2015) revealed that different authors have defined the term access using some of the dimensions mentioned by Penchansky and Thomas to suite their contexts. However, Saurman (2015) went further to add a sixth dimension, which is awareness. He defines awareness as a sustained communication and information sharing between healthcare seekers and providers.

This theory was applied by Otieno *et al.* (2020), Sieck *et al.* (2021), and Feng *et al.* (2020) in their studies related to service access and did measure access partly using some of the five dimensions. Penchansky and Thomas's theory of access has guided this study using three dimensions of service affordability, accessibility, and service delivery quality as components assessing the progress toward UHC in the study area. The dimensions of accommodation and acceptability were partly captured in the health services delivery quality (Appendix 2). The progress towards attaining UHC was thus assessed by determining whether there was any perceived linkage between households' socio-demographic, health-related characteristics and UHC factors (accessibility, affordability, and services delivery quality).

Materials and Methods

Research Design

The study employed a cross-sectional household survey through which data were collected at once from different sources in the selected study area. A health facilities survey was also used to collect data for determining the level of UHC in the study area. The design facilitates the collection of a body of quantitative data about two or more variables, examined to detect patterns of association (Kumar, 2011; Spector, 2019). The design was appropriate because the study intended to provide a snapshot of the perceived linkages among households' socio-demographic, health-related characteristics and factors for UHC attainment in the study area.

Study setting

The study was conducted in four (out of seven) district/municipal councils of Kilimanjaro region. The region was selected based on its health system strength (highest out of 26 regions of Tanzania mainland with z score of 3.8, measured in terms of healthcare infrastructure, health services utilization, health workers, and quality) (Kumalija *et al.*, 2015) and cultural similarity. Moreover, Kilimanjaro has been a region with the highest human development index (0.75) in Tanzania based on the human development report of 2017. Four councils (Rombo, Moshi, Hai District councils, and Moshi Municipal council) were selected based on the presence PPP contracted health facility (with an active service level agreement) during data collection.

Sample size and sampling procedure

To detect an association between the household's socio-demographic, health-related characteristics and UHC factors using non-parametric tests (with a combination of continuous and categorical variables), Cochran's formula was used to obtain a sample size of 384 participants (Cochran, 1977; Adam, 2020). The number of households in the four selected councils was 90,196 (URT, 2013). In determining the sample size, a z-value of 1.96, a p-value of 0.5, and a d-value of 5% (which is equivalent to 0.05) were used. 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 of cluster sampling (Amu *et al.*, 2021; Taherdoost, 2016) were 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 were 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 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). The 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 this study.

Measurement of variables

The dependent variable for this study was UHC, and the independent variables were the households' socio-demographic and health-related characteristics. Measurement of the factors of the dependent variable was customized from various authors (Hanefeld *et al.*, 2017; Otieno *et al.*, 2020; Wambiya *et al.*, 2021; Das *et al.*, 2018; Penchansky and Thomas, 1981), who assessed services access in terms of availability, affordability, accessibility, accommodation, and acceptability. However, this paper considered three UHC factors which are health services accessibility (including components for service availability), affordability, and quality of health services delivery (including components for accommodation and acceptability). The three factors were measured based on 5, 4, and 9 statements respectively, adapted from different studies (Penchansky and Thomas, 1981; Das *et al.*, 2018; Hanefeld *et al.*, 2017; WHO, 2016; Otieno *et al.*, 2020). For those statements, the respondents were required to respond strongly disagree (1 point) …to… strongly agree (5 points) refer (Appendix 2). The scores were later used as inputs in the Kruskal Wallis H Test and Mann-Whitney U test and mean ranks were used for comparison because the distribution of scores for each independent variable had different shapes and variability. For this study, the factors for the dependent variable were measured at an ordinal scale (using a five-points Likert scale). The reliability and validity of data collected as per the constructs were checked. Cronbach's Alpha was used to check data reliability (found to be >0.7 thresholds) and factor loadings for all items were above 0.7 ranging from 0.705 to 0.967. Validity was checked using composite reliability (found to be >0.6 thresholds) and average variance extracted (found to be >0.5 thresholds).

The socio-demographic and health-related characteristics involved were measured as follows: age (ratio), average monthly income (ratio), household size (ratio), education level (ordinal), occupation (nominal/categorical), and health insurance membership (dummy). Health check-up frequency (ordinal - categorised based on the WHO's recommended number of health check-up visits per

person per year, considering 5 visits as a threshold). Presence of non-communicable diseases/illnesses (dummy), and general household health conditions (GHHC - ordinal). The GHHC was categorised into three categories: fair, good, and very good. Fair (if a household had a patient suffering from an illness at the time of the household visit). Good (if a household had no patient at the time of household visit but has had any who had recovered from an illness in the past three months). Very good (if a household had no patient and had not suffered from any illness in the past three months).

Data collection techniques and tools

Quantitative data were collected through household-based and health facilities-based survey questionnaires. Data collection was conducted between June 2020 and February 2021. 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 the household level, the household head or a representative of the household head (above 17 years old) was interviewed to provide information on the socio-demographic and health-related characteristics. Other information collected at the household level included perceptions on health services delivery quality and affordability in health facilities where they happen to access healthcare in 12 months prior to data collection.

A health facility-based questionnaire was adapted from Tanzania's heath facilities registry questionnaire and the WHO's Service availability and readiness assessment (SARA) tool (MoHSW, 2013; WHO, 2015). Through the questionnaire, data for estimating the level of UHC service coverage were collected from the selected health facilities' management. The data collected involved four domains and 13 tracer indicators as presented in Figure 1.

Data analysis

The first objective involved determining the association between socio-demographic, health-related variables, and UHC factors in the study area. Through IBM-SPSS, the Kruskal-Wallis H-Test (an alternative for ANOVA in parametric analysis) was used to determine differences in UHC factors between different categories of household's sociodemographic and health-related characteristics. Moreover, Dunn's post hoc test was done with the Bonferroni correction for the predictor variables found with a statistically significant differences. The Kruskal-Wallis H-test was chosen because One-Way ANOVA was inappropriate for this study due to violation of two assumptions: the assumptions of normality of data (using Shapiro-Wilk Test) and the assumption of homogeneity of data/equal variance (using Levene's Test). A Mann-Whitney U test was also used to show the differences between dichotomous health-related characteristics and UHC factors, which were measured at an ordinal scale. Moreover, Kruskal-Wallis H and Mann-Whitney U tests are appropriate for a dependent variable measured at ordinal or ratio scales (Abu-Bader, 2021).

The second objective involved determining the level of UHC service coverage in the study area. To achieve this, data collected from health facilities were entered into Microsoft Excel and the percentages scored from the availability of the 13 tracer items were obtained as inputs for computing the geometric mean. An approach for tracking progress toward UHC attainment, as adopted by (Eregata *et al.*, 2019) and (Hogan *et al.*, 2018), from (WHO and World Bank, 2017) was applied with some adjustments. The approach as in Figure 1 involved computation of the UHC coverage index, derived from geometric means (GM) of the tracer items grouped into four domains. The GM was preferred in this context because of its ability to tolerate extreme values (Eregata *et al.*, 2019).

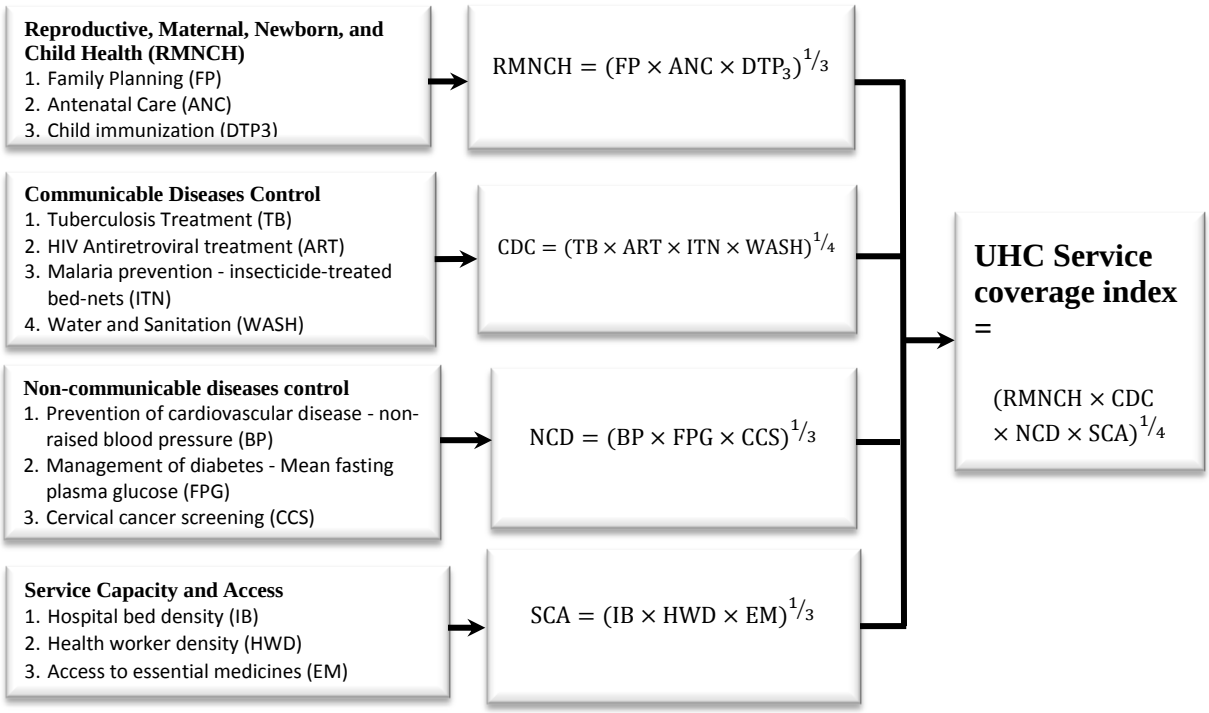

Figure 1: Framework for computing UHC service coverage index *(WHO and World Bank, 2017)*

Results and discussion

Households' socio-demographic and health-related characteristics

Table 1 presents the households' socio-demographic characteristics and health-related characteristics

Table 1: Households' Socio-demographic and health-related characteristics (n = 384)

Characteristic	Category	F	%	Characteristic	Category	F	%
Socio-demographic characteristics							
Age of Household head[a]	18 - 24	6	1.6	Household size	4 or less	167	43.5
	25 - 54	220	57.3		5 to 8	196	51.0
	55 - 64	79	20.6		9 +	21	5.5
	65 +	79	20.6	Household head's Income level [b]	Low	231	60.2
Household head education level	Non-Formal	5	1.3		Middle	139	36.2
	Primary	241	62.8		High	14	3.6
	Secondary	107	27.9	Household head's occupation	Agriculture	227	59.1

	Post-Secondary	31	8.1		Trade	116	30.2
					Salary/Waged	41	10.7
Health-related characteristics							
Health check-up frequency (per year)	Once	6	1.6	General household's health condition	fair	64	16.7
	2 to 3 times	47	12.2				
	4 to 6 times	31	8.1		good	205	53.4
	Only when sick	300	78.1		very good	115	29.9
Presence of NCD	No	271	70.6	Health insurance membership	No	242	63.0
	Yes	113	29.4		Yes	142	37.0

a - Early Working Age (18 - 24); **Prime Working Age** (25 - 54); **Mature Working Age** (55 - 64); **Elderly** (≥65) (URT, 2014).
b - Monthly income levels in (TZS[1]): **Low** (less or 250 000.0); **Middle** (250 001.0 – 850 000.0); **High** (above 850 000.0).
[1]TZS **is Tanzanian Shilling. USD 1 was equivalent to TZS 2 310 at the time of data collection for the research.**
F = **Frequency;** NCD = **Non-Communicable Disease.**

Association between Household Socio-Demographic, Health-Related Features, and UHC Factors

Results from the Kruskal-Wallis H-test and Man-Whitney U-test are presented in Table 2. The association between households' socio-demographic, health-related characteristics, and the factors for UHC attainment are presented and discussed below.

Health services accessibility
As seen in Table 2, there was a statistically significant difference in health services accessibility among households with a perceived fair, good, and very good general health condition [H (2) = 6.368, p = 0.041], with a mean rank accessibility score of 161.08 for fair, 198.44 for good, and 199.4 for a very good household health condition. The Dunn's post-hoc test with Bonferroni correction (Table 3) revealed significant differences between fair and good, p = 0.017, and between fair and very good household health condition, p = 0. 024. Household health condition was found to be associated with health services accessibility. The results imply that households with good or very good health condition had a higher probability to access health services than those with a fair health condition. A related study revealed that persons with chronic illnesses (in this case, a fair health condition) were less likely to access the needed health services due to the high costs of regular health check-ups and treatment (Barasa *et al.*, 2017).

Health services affordability
Results in Table 2 indicate that there was a statistically significant difference in health services affordability between different categories of household's monthly income [H (2) = 17.345, p = 0.000], with a mean rank affordability score of 177.19 for low income (≤ TZS. 250 000), 208.66 for middle income (TZS 250,001 – 850 000) and 284.64 for high income (above TZS 850 000).

Dunn's pairwise tests adjusted using the Bonferroni correction (Table 3) depicted significant differences between all three pairs of income categories: low and middle incomes, p = 0.008, low and high incomes, p = 0.000, and middle and high incomes, p = 0.014. The results imply that the pairs of lower income (Mean = 177, p = 0.008) and middle income (Mean = 208, p = 0.000) had a lower probability to afford health services than those with higher income. The finding echoes those of a study in India that household wealth (income being part of it) was one of the strong predictors of maternal healthcare affordability, thus, its utilization (Paul and Chouhan, 2020).

Moreover, Table 2 shows that there was a statistically significant difference in health services affordability between different categories of occupation of the respondent households [H (2) = 35.197, p = 0.000], with a mean rank affordability score of 183.8 for agriculture, 175.74 for trade and 288.12 for salaried/waged occupation. A pairwise Dunn's test with Bonferroni correction (Table 3) indicated significant differences between trade and salaried/waged occupation, p = 0.000, and agriculture and salaried/waged, p = 0.000). Having a salaried/waged occupation was more associated with health services affordability than other occupation categories. This is because most of the salaried/waged household heads were assured of monthly income and/or were members of a health insurance scheme. The findings can be linked with those of Appiah (2015) who found that occupation was associated with having health insurance, thus, more likely to afford health services.

Table 2: Association between household socio-demographic, health-related features, and UHC factors (n = 384)

Variable and Category	Socio-demographic features (Kruskal-Wallis H-test results)					
	Accessibility		**Affordability**		**Services delivery quality**	
	Mean Rank	**H test (p-value)**	**Mean Rank**	**H test (p-value)**	**Mean Rank**	**H test (p-value)**
Occupation						
Agriculture	183.27	4.210	183.8	35.197	179.31	8.843
Trade	203.28	(0.122)	175.74	(0.000)***	216.69	(0.012)**
Salary/Waged	213.07		288.12		197.12	
Education level						
No Formal education	169.30	1.735 (0.629)	210.80	13.142 (0.004)***	235.00	4.786 (0.188)
Primary education	188.45		184.86		183.37	
Secondary education	197.06		189.26		208.21	
Post-Sec. education	212.02		260.11		202.44	
Average monthly income						
Low (less or 250 000)	187.27	1.343 (0.511)	177.19	17.345 (0.000)***	185.27	2.475 (0.290)
Middle (250 001 – 850 000)	200.08		208.66		203.55	
High (Above 850 000)	203.5		284.64		201.96	
Health-related features (Kruskal-Wallis H-test results)						
General household health condition						
Fair	161.08	6.368	199.14	0.693	161.80	6.493

Good	198.44	(0.041)*	194.13	(0.707)	195.12	(0.039)*
Very good	199.40		185.90		204.92	
Health check-up frequency						
Once	98.00	7.325	219.83	16.227	162.67	3.135
Two to three times	205.90	(0.062)	196.66	(0.001)***	206.73	(0.371)
Four to six times	219.48		265.97		165.21	
Only when I feel sick	189.50		183.71		193.69	
Health-related features (Man-Whitney U-test results)						
	Mean Rank	**U test (p-value)**	**Mean Rank**	**U test (p-value)**	**Mean Rank**	**U test (p-value)**
Health insurance membership						
No	190.82	17588.0	154.37	26409.0	201.42	15024.0
Yes	195.36	(0.694)	257.48	(0.000)***	177.31	(0.039)*
Presence of non-communicable disease						
No	196.73	14166.5	187.07	13840.0	200.32	13192.0
Yes	182.37	(0.240)	205.52	(0.134)	173.74	(0.032)*

*** Association was significant at the 0.001 level (2-tailed)
** Association was significant at the 0.01 level (2-tailed)

Table 3: Dunn's Pairwise Test Results (adjusted with Bonferroni correction) (n = 384)

Variable and Category	Accessibility	Affordability	Services delivery quality
	p-value	**p-value**	**p-value**
Occupation			
Agriculture Vs Salaried/Waged		0.000***	
Trade Vs Salaried/Waged		0.000***	
Agriculture Vs Trade			0.003**
General household health condition			
Fair Vs Good	0.017*		0.035*
Fair Vs Very Good	0.024*		0.012*
Education level			
Primary Vs Post-secondary education		0.000***	
Secondary Vs Post-secondary education		0.002**	
Income			
Low Vs Middle Income		0.008**	
Low Vs High Income		0.000***	
Middle Vs High Income		0.014*	
Health check-up frequency			
Two to three times Vs Four to six times		0.006**	
Only when sick Vs Four to six times		0.000***	

*** Association was significant at the 0.001 level (2-tailed)
** Association was significant at the 0.01 level (2-tailed)

There was a statistically significant difference in health services affordability among households whose heads had different education levels [H (3) = 13.142, p = 0.004], with a mean rank

service affordability score of 210.8 for no formal education, 184.84 for primary education, 189.26 for secondary education, and 260.11 for post-secondary education. Dunn's post-hoc test with Bonferroni correction (Table 3) revealed statistically significant differences between pairs of primary and post-secondary education, p = 0.000, and between pairs of secondary and post-secondary education, p = 0.002. Concerning the household head education level, the results imply that the higher the household's head level of education the higher the association with health services affordability at the household level. This is because, more educated individuals are more likely to secure employment or employ themselves, thus, capable of affording healthcare than the less educated individuals. The studies by Badu *et al.* (2018) and Ebu (2018) also found that education was strongly associated with financial coverage, which enhances health services affordability.

Furthermore, there was a statistically significant difference in affordability scores between different categories of health check-up frequency by respondents [H (3) = 16.227, p = 0.001]. The mean rank service affordability score was 219.83 for those who could go for a health check-up once, 196.66 for two to three times, 265.97 for four to six times, and 183.71 for those who could go for health check-ups only when they feel sick. A pairwise comparison using Dunn's post-hoc test (Table 3) indicated significant differences between pairs of "only when I feel sick" and four to six times, p = 0.000, and between two to three times and four to six times, p = 0.006. It implies that household members who could go for a health check-up at least once a year were more likely to afford the cost of health services than those who could go for a health check-up only when feeling sick. Similar studies indicate that frequent health check-up implies health services affordability by the health care users (Gill and Majeed, 2018; Wambiya *et al.*, 2021).

Results in Table 2 indicate that health perceived services affordability was significantly higher for households with health insurance (Mean Rank = 257.48) than for households without health insurance (Mean Rank = 154.37), [U = 26409.0, p = 0.000]. It can be inferred from the results that participants with no health insurance were less likely to afford the cost of health services than those with health insurance due to the effect of out-of-pocket payments. Other studies Abaerei *et al.* (2017) and Bintabara *et al.* (2018) found that having medical insurance was associated with healthcare-seeking because it makes insurance members access the needed health services more conveniently.

Health services delivery quality

There was a statistically significant difference in health services delivery quality among different occupation categories of the households (Table 2) [H (2) = 8.843, p = 0.012], with a mean rank service delivery quality score of 179.31 for agriculture, 216.69 for trade and 197.12 for salaried/waged. From a pairwise comparison using Dunn's post-hoc test (Table 3), a combination involving agriculture and trade was significant, p = 0.003. However, there was no evidence of a difference between the other two pairs. The association between health services delivery quality and household head occupation implies that households involved in trade and salaried occupation were more likely to perceive good health services delivery quality because of their better financial status. The better financial status could enable them to receive services of better quality.

Moreover, from Table 2 there was a statistically significant difference in services delivery quality between different categories of general household health condition [H (2) = 6.493, p = 0.039], with a mean rank service delivery quality score of 161.8 for fair, 195.12 for good, and 204.92 for very good perception on services delivery quality among households. The Dunn's post-hoc test (Table 3) depicted significant differences between the pair of fair and good household health conditions, p = 0.035, and that of fair and very good household health condition, p = 0.012.

Households with a very good health condition were more likely to rate higher the health services delivery quality than those with a good or fair health condition. Perception of good health condition was associated with good health-seeking behaviour (Abuduxike *et al.*, 2020).

Furthermore, results in Table 2 depict that perception of high perceived health services delivery quality was statistically significantly differently with households with no health insurance (Mean Rank = 201.42) than for households with health insurance (Mean Rank = 177.31), [U = 15024.0, p = 0.039]. For the case of health insurance membership, there were occasions in some of the health facilities where clients who paid for services in cash were well served than those with health insurance, thus, perceived to have been served well. In the study area, most of the respondents were members of the Community Health Fund or improved Community Health Fund through which they could access a limited range of health services due to low annual premiums paid. This underlines the observation in another study that the use of health insurance in service access is associated with poor service provision by healthcare providers (Alhassan *et al.*, 2016).

Besides, **Error! Reference source not found.**Table 2 shows that perceived health services delivery quality was significantly higher for households without non-communicable diseases (Mean Rank = 200.32) than for households with non-communicable diseases (Mean Rank = 173.74), [U = 13192.0, p = 0.032]. Households without non-communicable diseases were more likely to perceive health service delivery quality as good. This is because they may have been served well in their rare occasions of attending a health facility for healthcare while those with chronic illnesses were more likely to encounter shortcomings in healthcare delivery quality due to more frequency of seeking healthcare. Not suffering from chronic illness implies fewer visits for health check-ups (Bhat and Kumar, 2017), thus, less knowledge and experience about the shortcomings or strengths in health services delivery quality in health facilities.

The level/extent of universal health coverage

Based on the geometric mean computation (derived from Figure 1), the score for the Reproductive, Maternal, Newborn and Child Health (RMNCH) domain was 94% and for Communicable Diseases Control, (CDC) domain was 81.5% above the WHO's recommended threshold of 80% score. The score for the Non-Communicable Diseases Control (NCDC) domain was 57.1% and for Services Capacity and Access (SCA) domain was 54.7% below the WHO's recommended threshold of 80% score. Therefore, considering the scores from the four domains, the UHC service coverage index for the study area was found to be 69.9%.

This score implies that the selected health facilities in the four districts of Kilimanjaro Region had a coverage level of about 70% in health services provision. This score was highly contributed by the first two domains (Reproductive, Maternal, Newborn, and Child Health domain and Communicable Diseases Control domain) because it involves services provided in most of the health facilities, including in the health centres. The reproductive, maternal, newborn, and child health services are highly subsidized by the government in both government and private (especially faith-based) health facilities. For child immunization services, for example, the score was 100%, implying that the services were available at the required level in all the health facilities in the study area. This can be evidenced by the findings of a survey carried out in 2015/2016 in Tanzania indicating that Kilimanjaro Region was the leading region by 93% in Tanzania on the provision of all basic vaccines to children aged 12-23 months (MoHCDGEC *et al.*, 2016).

The 69.9% score, though measured based on selected health facilities in Kilimanjaro Region, was higher than the overall score of the UHC service coverage index for Tanzania in 2017

which was 43% (Sachs *et al.*, 2021) compared to the minimum standard of 80% recommended by the WHO (AHO and WHO, 2018). A study measuring effective UHC coverage in 124 countries in 2019 using 23 effective coverage indicators, indicated an improvement in the level of UHC coverage index for Tanzania to be 55% compared to that of 2017, which was 43% (Lozano *et al.*, 2020). From the same study, it was found (similar to the current study) that the Reproductive, Maternal, Newborn, and Child Health domains and the Communicable Diseases Control domains performed better than the other domains (Lozano *et al.*, 2020).

Conclusions and Recommendations

Conclusions

Some of the households' socio-demographic and health-related characteristics were found to be significantly different in health services accessibility and affordability. Thus, improvement of the household's head level of education, and income may likely trigger improvement of the other household characteristics including occupation and health insurance membership. If these are improved, it is also very likely that there will be an improvement in health check-ups and general household health conditions and the ability to deal with non-communicable diseases.

The level of UHC service coverage was found to be a little bit closer to the minimum threshold recommended by the WHO but higher than the previously estimated national level. The four domains for assessing the level of UHC were based on the selected health facilities' capability to provide the needed services based on the four domains. Although, the score was highly contributed by the domain comprising reproductive, maternal, newborn, and child health as well as some components in the communicable diseases control domain, the level of UHC in the study area is good.

Recommendations

The Local Government Authorities (LGAs) should put in place enabling by-laws and conducive infrastructure for all people at the local level to access and utilise income-generating opportunities. This would improve households' social welfare and eventually improve their levels of health services accessibility and affordability.

To improve progress towards attainment of UHC in the study area, the government, through the LGAs and Ministry of Health should stick to the set policy implementation. Mechanisms for improvement could be, among others, employing a more competent health workforce in the health facilities. Others could be to increase the availability of modern medical equipment and improve health facilities' infrastructure. Moreover, enhance awareness creation and education on the preventive measures of non-communicable illnesses and the provision of universal health insurance for all household members.

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Appendix 1: Health facilities selected from the four councils

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

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

Appendix 2: Measurement of dependent variable (UHC)

Variable	Strongly disagree (1 point), Disagree (2 points), Undecided (3 points), Agree (4 points), and strongly agree (5 points)
Health Services Accessibility	
(1) Health facility capacity (range of services offered by a health facility)	The health facility nearest my residence cannot sufficiently cater for the essential health care services.
(2) Distance to a health facility (approximate time taken from home to a health facility)	It is only a less than 30 minutes walking distance to the nearest health facility.
(3) Friendliness of health facilities' infrastructure	Health facilities' infrastructure are generally friendly for all healthcare seekers.
(4) Presence of different health facilities near household's residence	There are different health facilities located near my residence where I can access healthcare services.
(5) Health facilities' working hours	Services can be accessed throughout the day, all week days.
Health Services Affordability	
(1) Cost of drugs prescribed (prescribed drugs to be paid from out-of-pocket payment)	There are times I/we do not take drugs prescribed by a doctor because of their costs.
(2) Cost of health check-up (Costs of health check-up paid through out-of-pocket payment)	There are times I/we find it difficult to go for health check-up in a health facility because of the costs.
(3) Health insurance cover (A pre-paid health insurance covering member's healthcare costs)	I/we have paid for health insurance which covers all the medical and laboratory expenses.
(4) Health insurance type/category (determines the level of health facilities where members can use health insurance to access health services)	I/we can use the health insurance to access health services at all health facilities levels.
Health Services Delivery Quality	
(1) Health workers' attention to patient's needs (right of patients to be listened and attended to)	I received enough attention from the health service providers, taking into account my preferences and aspirations.
(2) Health workers' openness to patients (they should know their health concern before	The whole process and procedures for my treatment were well explained to me.

treatment)	
(3) Waiting time to see a physician (the expected time is at least 3 hrs and more than 3 with reasons from the health workers)	The waiting time at the facility before seeing a doctor is more than three hours.
	The waiting time at the facility before seeing a doctor is more than three hours and without any explanation.
(4) Physician's duration to attend to a patient (the expected time is at least 15 minutes)	Physicians cannot attend/listen to you for fifteen minutes.
(5) Responsiveness/promptness (Health worker's response to emergency cases)	In cases of emergency in the facility one can wait for more than 30 minutes before being seen by a qualified health personnel.
	In cases of emergency, one can be admitted to the facility and wait for more than 15 minutes without any treatment.
(6) Interpersonal relationships (Health worker's interpersonal relationship with patients)	There exist good interpersonal relations (trust, respect, confidentiality, responsiveness, empathy, and communication) between the health providers and the patients.
(7) Equity in service provision (provision of health services without segregation)	Equity is highly observed by the health care providers during health services provision.
(8) Guidance in decision making (patients to make informed decisions for their treatment)	Assistance is provided towards making an informed choice on the type and nature of treatment/health service I am to receive.
(9) Patient's safety (safety while in the health facility's environment)	The patient's safety is highly ensured by the health care providers.

Policy Brief

Households' Socio-demographic, Health-related Characteristics and Progress towards Attainment of Universal Health Coverage in Kilimanjaro, Tanzania

Households' socio-demographic and health-related characteristics are not expected to hinder progress toward attaining Universal Health Coverage (UHC). The government of Tanzania, in collaboration with other stakeholders in the health sector, has been working hard to improve health services delivery to community members at an affordable cost and accessible environment. Some of the efforts, among others, include improving provision of primary healthcare which is easily accessible, affordable, sustainable, and gender considerate. The efforts have been emphasised in the National Health Policy of 2017 and other policy documents. Several studies in Tanzania have assessed the influence and/association of social, economic and demographic characteristics on healthcare financing, access to specific healthcare services, health insurance membership, among others. However, there is paucity of empirical knowledge depicting differences between categories of households' socio-demographic characteristics and UHC attainment in Kilimanjaro Region. Hence, perceived progress towards attaining UHC in the study area was determined by assessing perceived differences between households' socio-demographic, health-related characteristics, and UHC factors (accessibility, affordability, and service delivery quality). The study employed a cross-sectional design involving 384 households and 30 health facilities selected through multi-stage and purposive sampling approaches, respectively. Data from households and health facilities were collected through survey questionnaires.

UHC and universal access do not mean exactly the same thing but UHC cannot be attained without universal access to health services. It is a norm that households' socio-demographic

and health-related characteristics should not be a hindrance to services access and, thus, to UHC. However, it was shown from the results of this study that households were likely not able to access health services due to falling into certain categories of socio-demographic and health-related characteristics. The households' heads, especially those with low average monthly income and mostly involved in subsistence agriculture, those with no or with low level of education, those without health insurance, and those with non-communicable illnesses were more likely to be deprived of access to the needed healthcare services. Moreover, health check-up behaviour was found to be low among households as most of them sought medical check-up only when they felt sick. High cost of regular health check-up and health insurance non-membership were among the reasons for poor health check-up. In this case, it becomes difficult to diagnose and control non-communicable diseases.

Moreover, results indicated that the level of UHC service coverage in the study area was 69.9% about the WHO's threshold of 80%. This score implies that the selected health facilities in the four districts of Kilimanjaro Region had a coverage level of about 70% of health services provision. This score was highly contributed by the domains (Reproductive, Maternal, Newborn, and Child Health domain (RMNCH) and Communicable Diseases Control) which scored above 80%. The reason is that these two domains involve services provided in most of the health facilities, including health centres. The RMNCH services are highly subsidized by the government in both government and private (especially faith-based) health facilities. For child immunization services, for example, the score was 100%, implying that the services were available at the required level in all the health facilities in the study area. The other two domains (Non-Communicable Diseases Control domain and Services Capacity and Access domain) scored below the WHO's recommended threshold of 80% where most of them scored low in the health centres. This is because most of the services falling under the non-communicable diseases control domain were mostly attended to in hospitals which had more healthcare personnel, medical equipment, drugs, and technology.

The Five-Years Development Plan III and the Development Vision 2025 emphasise improving households' socio-economic and health-related conditions so that they do not become obstacles toward accessing the needed health services. Thus, household members, especially those with low average monthly incomes and a predominance of subsistence farming, should be encouraged to diversify their economic activities, which are their primary sources of income. Local government leaders and personnel (including community development officers, social workers, and health/public health personnel) should continuously provide innovative education and organise for awareness campaigns on different alternatives to income-generating activities. In the long run, this would increase the social welfare of households and improve accessibility and affordability of healthcare services. To improve health check-up behaviour, health services providers (as part of policy makers) should enhance sensitisation campaigns on the importance of regular health check-up. This should be accompanied by the increased government efforts in the promotion of affordable health insurance for all to strengthen health services accessibility and affordability.

To improve the level of UHC service coverage in the study area, the government, through LGAs and Ministry of Health in collaboration with other stakeholders in the health sector should stick to the set policy implementation. Mechanisms for improvement could be, among others, employing more and competent health workforce in the health facilities. Others could be to increase availability of modern medical equipment, and improve health facilities infrastructure. These would improve the four domains for UHC service coverage which are RMNCH, communicable disease control, non-communicable diseases control, and service capacity and access. Moreover, both private and public health facilities management should enhance more awareness creation and education on the preventive measures of non-communicable illnesses.