

Determinants of pregnant mothers to bypass primary health facilities and directly seek postnatal care in hospitals in Dar es Salaam region – A Community health needs assessment, Cross Sectional Study

Joseph Christopher Hokororo (✉ drhokororo@gmail.com)

Ministry of Health - Tanzania

Eliudi S. Eliakimu

Ministry of Health

Ruth Ngowi

Ministry of Health

Mohammed A. Mohammed

Ministry of Hokororo

Hamisi M. Malebo

UNESCO National Commission of the United Republic of Tanzania

Sehyeon Kim

Medipeace

Nyambuli Jigabha

Medipeace

Jackline Makupa

Medipeace

Fatuma Salimu

Medipeace

Pauline Mtesigwa

Medipeace

Sukyung Kim

Medipeace

Daniel Nkungu

Mwananyamala Regional Referral Hospital

Akili Mawazo

Muhimbili University of Health and Allied Sciences

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Abstract

Introduction Dar es Salaam is the region with a large number of Primary healthcare facilities (dispensaries and health centres) outnumber the available hospitals. Although policies on referral system are available, there is a gap in terms of compliance and adherence to the governance system. Hospitals are overwhelmed with patients as compared to primary healthcare facilities, leading to poor quality of the healthcare services. The aim was to assess the needs of community members for primary healthcare services, as well as, to identify the reasons and determinants that influence mothers to bypass primary healthcare facilities.

Methodology A cross-sectional study that assessed the determinants associated with pregnant mothers to bypass primary healthcare facilities in their healthcare needs. The study was conducted in Kinondoni, Ilala, Kigamboni, Temeke and Ubungo healthcare facilities in Dar es Salaam region. It targeted all postnatal women. A consecutive sampling procedure was used and a total of 544 of respondents were involved in the study. A structured questionnaire was used to collect information on: social demographic; Clinical factors of the mother; Health services; and provider's factors that might contribute to the observed bypass. Data were analysed in levels of univariate, bivariate and multivariate using SPSS statistical package number 20.

Results A total of 544 respondents were interviewed. Mothers who bypassed the primary healthcare facilities were 94%. After adjustment it was found that, those with income more than 1USD a day were (OR=4.27, CI=1.8- 15.4, P=0.01) more likely to bypass the primary facilities and go straight to the upper levels of healthcare facilities.

Conclusions This study has found postnatal women in Dar es Salaam region are at high chance of going straight to the secondary and tertiary Hospitals without passing at primary healthcare facilities. Nine in every ten postnatal women were found to have by passed the primary healthcare facilities. Findings from this study reveals a strong and urgent need to strengthen primary healthcare facilities and as well implement the referral guidelines on all clients who seek health care to reduce the bypass.

1.0 Background And Rationale

Maternal mortality is one of the global concerns as it is unacceptably high. World Health Organisation (WHO) estimates about 830 women pass away from pregnancy or childbirth related complications around the world every day. Almost all maternal deaths (99%) occur in developing countries and more than half of these deaths occur in sub-Saharan Africa. The maternal mortality ratio in developing countries was 239 per 100,000 live births versus 12 per 100,000 live births in developed countries 2015. Large disparities exist between countries, and within countries; between women with high and low income and those women living in rural versus urban areas [1] This alarming number of maternal mortalities has made it to be among the international agenda in the Millennium Development Goals (MDGs) and now in the Sustainable Development Goals (SDGs), adopted by the United Nations General Assembly [2]

One of the means to attain universal access to reproductive health was to make sure the antenatal care coverage is worldwide [3,4] Tanzania aligned with the WHO's ambition of ensuring universal access of health care services to all by establishing Primary Health Service Development Programme (2007–2017), which aimed "at promoting access to basic health care for all as well as empowering and involving the community in the provision of health services". Planned under the programme was construction of dispensaries in every village and health centre in each ward [5] The number of health facilities has been increasing substantially- in fiscal year (FY)–2012/2013, there were a total of 5,052 health facilities; in FY–2013/2014, there were 6,270 health facilities [6] and in FY–2018/2019 there were about 8,000 facilities [7]. The facilities are widely spread in the country in which the percentage of population that is living within 5 kilometres has been increasing progressively from 2009 (48%), in 2010 (50.6%) and in 2012 (71.9%). [6] Dar es Salaam has the shorter distance due to large number of facilities in the region. The expectation of Tanzanian Government was to see patients and clients receiving health services from those primary health facilities (PHFs) while the specialised and complicated cases are referred to the hospitals for advanced and specialised care. Further to that, Kante, *et al* [8] explained that in the Tanzanian health system, women are expected to first visit their nearest primary health facility for normal delivery and other uncomplicated health care services which is not happening. As a result of bypassing PHFs, hospitals are overcrowded which compromises, the quality of services and care of pregnancy and childbirth leading to maternal and new-born deaths.

Summary of literature

Tanzania is among the countries in Sub Saharan Africa with high maternal mortality ratio(MMR) and high neonatal mortality rate(NMR). According to Tanzania One Plan II of 2015, the country is facing a MMR of 410 per 100,000 live births. This number is incredibly high in a country with health facilities around 8,000. The high mortality ratio might be due to the bypass of lower facilities to go to higher facilities leading to compromised quality of services at high levels. The extent of bypassing lower facilities is alarming. In Kenya, Audo, *et al* [9] found that at least half of the women bypass their closest facility (often the lowest level government facilities) for antenatal care (ANC), immunisation and treatment of their children; and Escamilla, *et al* [10], found that 88.0% of women bypassed for delivery services, 83.9% bypassed for facility-based contraceptive use, and 84.2% bypassed for child health visits. Also, Cohen, *et al* [11] noted that some patients in periurban areas of Nairobi bypassed public owned facilities despite of being free and went to private facilities seeking for high quality care. Likewise, in Ghana Yafee, *et al* [12] established that, 33.9% was the total rate of bypassing a local facility and in Sudan, Ahmed, *et al* [13] found that primary health facility bypass was very high at 87% to secondary hospitals. In India, it has been reported that decision by women to bypass nearby health facility is contributed to inadequate capacity of primary health care facilities in impoverished states to provide basic delivery and newborn services, and preference of women for quality care [14]; and in two other studies in Gujarat and Madhya Pradesh, the bypass was reported to be 37.7% [15] and 38% [16] respectively. Yao and Agadjanian have reported on bypass in Mozambique, in which they found that perception on service quality and individual characteristics such as economic condition of household, age, and HIV status contribute to decision to bypass nearest facility. [17] Also, in Nepal 55% of women bypassed the nearest birthing facility to go to a hospital. [18] In Sierra Leone, about 87% of women in an urban area would bypass their nearest inpatient care facility to a government hospital where there is low-cost and comprehensive care. [19] Also, Perera and Weerasinghe have reported reasons for

bypass in Sri Lanka to include availability of better facilities and expectation of good quality of services.[20] In Uganda, a study in a rural district found that out of 589 women who bypassed, 425 (72.16%) went to the district hospital.[21]

Tanzania experiences the same as what has been found elsewhere in the world. There is overcrowding in the secondary and tertiary hospitals. The overcrowding is too much in some of the facilities such that mothers who give birth, sleep on the floor. The situation was proved by the Legal and Human Rights Commission (LHRC) report of 2015[22] and Kante, *et al*, [8]2016 that, 75.4% bypassed the primary facilities in rural Tanzania. In a rural district in western Tanzania, 44% of women who delivered in a health facility bypassed their nearest facility[23] and in Pwani region, 41.8% of women who delivered in health facility were bypassers[24].

People who bypass the primary facilities and go to the hospitals have several reasons to do so. Visser, *et al*, (2015) at Letaba Hospital in South Africa confirmed that the three most common reasons indicated by participants for bypassing their local clinics were: (1) to see a doctor (31.1%); (2) to see a dentist (24.2%); and (3) for a termination of pregnancy (10.9%). He also established that, other people bypassed the primary facilities were between the ages of 20 and 40 years, 173 (59.05%) (Mean age: 29.39 years; 95% CI: 27.63–31.15); secondary or tertiary education and more 186 (63.48%).[25] In Kenya, the reason for bypass were perceived quality of care in the facilities [9] and mothers looking for high quality care[11]. In India, bypass is contributed by functional capacity of facilities and women preference for quality care[14,15]. In Nepal, the reason for bypass included "lack of operation, video x-ray and blood test facilities".[18] In Sri Lanka - availability of better facilities in a hospital, dissatisfaction with quality of care during a previous visit to a different facility, and expectation of good quality at a hospital were the reasons for bypassing primary health facilities.[20].

Other reasons of mothers and others to bypass the primary facilities to go to the higher facilities were found to be having complications of previous pregnancy, hence the mothers tend to prefer to seek the higher levels of the health care straight way[8] It was further found out that mothers who reported a complication during their current pregnancy had 1.88 higher odds of bypassing their nearest facility for childbirth than those who did not (adjusted odds ratio [AOR] 1.88, 95% confidence interval [CI]: 1.22–2.90)[8]. Ahmed, *et al* (2015) in Sudan identified the reasons for bypassing the closest public health facilities, which were unavailability of doctors, lack of health insurance services and higher cost of services. [13]

The extent of bypass as well as determinants for bypass is not clear in Dar es Salaam, although policy guidelines on health system and referral system are available, there is a gap in terms of adherence to that system. Despite having a large number of primary facilities, it appears that the hospitals are more overwhelmed with patients compared to the lower facilities. Study by Simba, *et al*, (2008) has demonstrated that up to 72.5% of patients admitted at the Muhimbili National Hospital (MNH) were self referrals with "more than 70 requiring admission but not necessarily at tertiary level" hospital, hence, limiting the role of providing specialised services and compromised the provision of quality services. [26] Overcrowding of patients in the hospital has been shown to be a potential cause of Health Care Associated Infections (HAIs) spread[27]. HAIs have bad consequences not only to the hospitals but also to the patients, health care workers, owners of the facilities (private and public) as well as resulting to an increase in antimicrobial resistance[28]. Furthermore, causes prolonged stays of patients in the hospitals, increases the use of hospital resources and increase risk of mortality[29]. Therefore, there existed a need to carry out an assessment to define the extent of bypass as well as factors for bypass at Dar es Salaam.

The aim of this study was to assess the prevalence and identify associated determinants of pregnant mothers' bypass of primary health facilities (dispensaries and health centres) and prefer going directly to the hospitals. Specifically, to assess the prevalence of mother who give birth at public hospitals at council or regional level in five (5) Municipal Councils of Dar es Salaam region without referral; to identify the determinants of pregnant mother's bypass of primary health facilities; and to establish the associated determinants of pregnant mothers' bypass as demonstrated in figure 1.

The findings from this study may also be useful to reinforce the existing guidelines; complement the existing body of knowledge; and may be used to generate the mechanism of implementing the policy that can build capacity of primary health facilities in Dar es Salaam region. The information also can be used as the basis for further studies.

Figure 1: Conceptual Framework

2.0 Methodology

A cross-sectional study was conducted in early November, 2018, on assessment of the associated determinants of pregnant mothers to bypass primary health care facilities and prefer going directly to hospitals in Dar es Salaam region. Five Municipal Councils in Dar es Salaam, Tanzania; Ilala, Kigamboni, Kinondoni, Temeke and Ubungu were involved. The estimated population of Dar es Salaam is 4,364,541 according to census of 2012. Every Municipality had a hospital that serves as a district hospital and have regional referral hospitals (RRHs); Ilala-Amana RRH, Kinondoni-Mwananyamala RRH, Temeke-Temeke RRH at level two while Kigamboni and Ubungu have level one hospitals. According to the health system of Tanzania, these Hospitals are supposed to handle only referral cases from Primary health facilities.

The target population was all postnatal women in catchment population of the district and regional referral hospitals. Those who attended Dar es Salaam regional and district hospitals during the study period and consented to participate in the study were involved. Participants with critical condition or unable to communicate were excluded. A consecutive sampling procedure was used for all postnatal women who met selection criteria.

Sample were estimated by the following formula: $n' = [z_{1-\alpha/2}^2 * p(1-p)]/d^2$; assuming $Z_{1-\alpha/2}$ is the standard normal value at the 95% CI is 1.96 and Z_{β} is the standard normal value corresponding to (1-power) is (-0.84) at the 95% CI level. 'N' is the sample size, 'p' is expected proportion of reported mothers who bypassed the primary facility levels and preferred to go to hospitals for giving birth in the population based on previous study, d is the absolute error or precision of 5%. Using 41.8% found in Pwani region of Tanzania by Kruk, *et al*, (2014)[24] and substituting the values in the formula:

$$[1.96^2 * 0.42(1-0.42)]/0.05^2$$

Estimated minimum sample size of by passers of PHCFs namely dispensaries and health centres who preferred going directly to hospitals in Dar es Salaam region is 375. However, in this study the sample size was 544, which is the number of sampled cases based on the ratio of the population in the councils. Kinondoni is 929,681, Ilala is 1,220,611, Temeke is 1,205,949, Ubungo is 845,368 and Kigamboni is 162,932 (2012 census). Kigamboni district, oversampling was conducted to have more reliable result of the study.

Measurements of determinants and potential Confounders included social demographic factors of the mother: age, marital status, residence, education level, income level, religion, and occupation. Health service factors: ANC attendance and care, no health care workers, no privacy, and use of abusive language. Clinical factors: any infection, e.g., Malaria, Syphilis, Rh factor, CD4, HIV stage; parity; spacing; BMI; NCDs (Hypertension, Diabetes Mellitus, others); previous adverse birth outcome history; history of multiple pregnancy(ies); on ARV; and HB level during pregnancy. These were compared to outcome variable of mothers who bypassed the primary level of care.

Structured questionnaires were developed in English later translated into Kiswahili language. The questionnaires were pre-tested and used to collect quantitative information. Ten (10) research assistants were trained on the fundamentals of research data management and the tool. The researchers interviewed the consented postnatal women at postnatal ward; checked for completeness of the data; cleaned, edited, coded and double entered the data in EPIDATA and then exported to SPSS for analysis. Filled questionnaires was stored in a safe place. Confidentiality of the collected data were assured and presented without participant identifier.

Three levels of analysis were employed. Level one: univariate analysis; histograms or pie chart were used to display the data. Frequencies and percentages were used to calculate for categorical variables as well as ratio of mothers who bypassed the primary facilities. Level two: bivariate analysis; to determine (associated determinants) various independent determinants as the potential confounder for pregnant mothers to bypass PHCFs (dispensaries and health centres) and prefer going directly to hospitals in Dar es Salaam region and the outcome variable (Primary level health facilities bypass). Continuous variables were categorised and some of the variables were analysed using Chi square test or Fischer's exact test. A significance level of $P < 0.05$ was considered significant. Odds ratios (OR) were used to measure association at confidence intervals (95% CI). Level three: multivariate analysis; used to assess for confounding of the independent variables among all factors. A factor with a difference of at least 10% between the adjusted odds ratios (AOR) and the crude OR was considered confounding. Factors with p-value 0.2 or less at bivariate analysis was selected for further multivariate analysis. Logistic regression model for analysis was used to explain association amongst factors of pregnant mothers' bypass of PHCFs and prefer going directly to hospitals in Dar es Salaam region.

3.0 Results

3.1 Demographic characteristic of the study respondents

A total of 544 responded were interviewed. Out of those respondents, 536(99%) had the age of 18 and above. Of those respondents, 398(73%) were married and 146(27%) were single. The study demonstrated that, 282(60.3%) respondents had secondary education and above, 331 (60%) of the spouse were unemployed and the daily income of above one USD was 298(92.5%) among respondents. The bypass by the respondents of the PHFs was higher 402(94%) and only 27(6%) had referral to the higher facilities (hospitals).

3.2 Factors related to Health Facilities services

The visited PHFs and type of health facilities were asked and it was found that, out of 429 respondents, 320(74%) of respondents visited public health facilities and only 109 (25.40%) other health facilities. Those who reported getting treatment with courtesy by nurses and clinician were, 418(85%) and 83% respectively. The respondents were also let to rate the level of cleanliness of health facilities they have visited, it was showed that, 405 (88%) of the respondent rated the facilities were clean and 56 (12%) reported unclean.

Other health factors included enough providers; patient discussion time at secondary and tertiary health facilities; availability of medication at primary facilities; and easy to access secondary and tertiary health facilities (HF) were reported above 84% by respondents. It was also found that, the respondents had difficulties to obtained health information from PHFs demonstrated by 424(91.6%) of respondent. See table 1(a) and 1(b) for more details.

Table 1(a): Health facilities factors and respondent views

Variable description	Respondent Rating	Views Number (n=429)	Percentage %
Enough provider patient discussion time at secondary and tertiary health facilities	Yes	424	91.60%
	No	39	8.40%
No access to health information in primary facilities	Yes	405	87.40%
	No	57	12.60%
Availability of medication at primary facilities	Yes	417	84.00%
	No	41	16.00%
Easy to access secondary and tertiary HFs	Yes	417	91.00%
	No	41	9.00%

Table 1(b): Health facilities factors and respondent views

Variable description	Respondent views	Number (N)	Percentage %
No quality health care services at primary facilities	Yes	383	85.00%
	No	69	14.00%
No Privacy at PHF	Yes	434	95.00%
	No	22	5.00%
No sufficient equipment at PHF	Yes	422	92.00%
	No	36	8.00%
No diagnostic test at PHFs	Yes	361	79.00%

3.3 Clinical factors of respondent

The antenatal attendance and frequency were assessed among respondents, this study found that, out of 428 respondents, 422(98.6%) had visited ANC, only 149(34.8%) had attended four times or more during the pregnancy period. The mode of delivery and history of infection during pregnancy period are shown in figure 2 and 3 respectively.



Figure 2: Showing mode of delivery



Figure 3: showing history of infection during pregnancy

The study showed that, the history of infection during pregnancy occurred in 218(40%) of respondents. Other factors affecting respondents health to bypass the PHFs are showed in table 2(a) and (b).

Table 2(a): Proportional of Clinical factors among respondents

Variable description	Response	Number (%)
Name of infections (n=219)	UTI or Malaria	164 (74.9%)
	Others	55(25.10%)
NCDs (Hypertension and DM) (n=544)	Yes	29 (5.30%)
	No	515(94.70%)
Previous birth complications (n=539)	Yes	44(8.00%)
	No	495(92.00%)
STDs (n=539)	Yes	12(2.20%)
	No	527(97.80%)
Normal Hb level during pregnancy (n=544)	Yes	318(58.50%)
	No	226(41.50%)

The utilization of the family planning was also assessed. Out of 539 respondents, 226(41.9%) had the first child and 313(58.1%) were not coming for the first child. Time between the pregnancy of most of the respondents were two years and above revealed by 305(75.5%) of the respondents. It was also found that, out of 544 respondents 27(5%) had multiple pregnancy.

Table 2(b): Clinical factors

Variable description	Response	Number (%)
History of admission during pregnancy	Yes	81 (15%)
	No	459 (85%)
Weight loss during pregnancy	Yes	82 (15.3%)
	No	459 (84.7%)
Number of pregnancies in the past	1-time	228 (41.9%)
	2- times and above	316(58.1%)
Time between pregnancy	2-years and less	99(24.5%)
	2-years and above	305(75.5%)

Association between Independent Variables and bypass of PHFs

Bivariate analysis was done to establish association between independent variables as potential confounders with respect to the outcome variable (bypass of the PHFs). Bivariate analysis between sociodemographic and bypass of primary level of healthcare.

At bivariate analysis for sociodemographic, it was found that, those aged 18 and above were (OR = 2.9, CI = 0.3- 24.7, P Value = 0.3) more likely to bypass primary level facilities and go straight to the hospitals. Women living in urban areas were (OR = 1.47, CI 0.3–5.9, P value 0.4) more likely to bypass the primary facilities than those who were living in rural areas. A mother married to a man with education of secondary and above (OR = 1.47, CI = 0.65–3.31, P value 0.3) were more likely to bypass the primary level of education than those married to a man with maximum of primary education. Mothers with education of secondary and above (OR = 1.49, CI 0.6–3.3, P = 0.2) were more likely to bypass the primary level of healthcare than those with maximum of primary education. The detail of association between demographic and bypass of the PHFs is shown in table (4c).

Bivariate analysis between factors related to Primary Health Care Services and bypass of primary facilities (N = 544)

At bivariate analysis for factors related to Primary Health Care Services, it was found that women who admitted nurses at primary facilities treat patients well were (OR = 1.5, CI = 0.5- 4.1, P = 0.2) likely to by-pass the primary facilities than those who did not admit. Those who said primary facilities were clean were (OR = 1.2, CI = 0.3- 4.0, P = 0.5) more likely to by-pass those facilities than those who did not. Women who acknowledged that, medicines were available at primary health facilities were (OR = 1.3, CI = 0.3–4.5, P = 0.4) more likely to bypass the primary facilities and go straight to secondary and tertiary health facilities than those who did not acknowledge. The detail of the bivariate analysis for factors related to primary health facilities are shown in tables 2d and 2e.

Table 2(c): Association between demographic factors and bypass of the PHFs

Variable	Reasons for mothers to bypass primary health facilities		OR	CL	P value
	No, n (%)	Yes n (%)			
Courtesy Treatment by Nurses at primary facilities					
Yes	385(94.4%)	23(5.6%)	1		
No	56(91.8%)	5(8.2%)	1.5	0.5- 4.1	0.2
Courtesy Treatment by Clinicians at primary facilities					
Yes	381(94.4%)	23(5.6%)			
No	51(92.7%)	4(7.3%)	1.3	0. 4-3.9	0.4
PHF cleanliness					
Yes	386(94.1%)	24(5.9%)			
No	42(93.3%)	3 (6.7%)	1.2	0.3- 4.0	0.5
Enough provider patient discussion time at secondary and tertiary health facilities					
Yes	383(94.6%)	22(5.4%)			
No	52(91.2%)	5(8.8%)	1.7	0.6-4.6	0.2
No access to health information in primary facilities					
Yes	400(94.3%)	24 (5.7%)			
No	36(92.3%)	3(7.7%)	1.4	0.3-4.9	0.4
Availability of Medication at primary facilities					
Yes	362(93.8%)	24(6.2%)			
No	71(95.9%)	3(4.1%)	0.6	0.6-4.1	0.3
Easy to Access secondary and tertiary HF					
Yes	393(94.2%)	24(5.8%)			

No 38(92.7%) 3(7.3%) 1.3 0.3 – 4.5 0.4

Bivariate analysis between factors related to Primary Health Care Services and bypass of primary facilities (N = 544)

Women who admitted that there is a low-quality health care service at primary facilities were (OR = 0.7, CI = 0.1–2.3, P = 0.3) less likely to bypass the primary facilities than those who did not admit. Those who admitted that, at primary facilities had no privacy were (OR = 3.9, CI = 1.2–12.7, P value = 0.03) likely to bypass directly to the hospitals than those who did not. Those who said there was corruption at primary facilities were (OR = 3.9, CI = 1.2–12.7, P = 0.03) more likely to bypass the primary health facilities and go to the secondary and tertiary level than those who did not. Those who said there are no equipment at primary health facility were (OR = 1.5, CI = 0.4–5.3, P value = 0.3) more likely to bypass the primary health facilities than those who did not. Details are found in table 2d below

Table 2d: Association between factors related to Primary Health Care Services and bypass of primary facilities

Variable	Reasons for mothers to bypass primary health facilities		OR	CL	P value
	Yes, n (%)	No n (%)			
Quality Health care services at primary facilities					
Yes	359(93.7%)	24(6.3%)			
No	66(95.7%)	3 (4.3%)	0.7	0.1-2.3	0.3
No Privacy at PHF					
Yes	411(94.7%)	23(5.3%)			
No	18(81.8%)	4(18.4%)	3.9	1.2-12.7	0.03
No Sufficient equipment's at PHF					
Yes	398(94.3%)	24(5.7%)	1		
No	33(91.7%)	3(8.3%)	1.5	0.4-5.3	0.3
No Diagnostic test at PHFs					
Yes	339(93.9%)	22(6.1%)			
No	90(94.7%)	5(5.3%)	0.9	0.3-2.3	0.4

Bivariate analysis between Clinical factors and bypass of primary facilities (N = 544)

Women attended antenatal clinic 4 times and above were (OR = 0.94, CI = 0.9–0.96, P Value = 0.07) less likely to by-pass the primary facilities than those who attended less than 4 times. Those who got infection during pregnancy were (OR = 1.5, CI = 0.6–3.3, P value = 0.2) more likely to by-pass the primary facilities than those who did not have the infection. Those who had Non-Communicable Disease during pregnancy were (OR = 1.6, CI = 0.2–11.8, P value = 0.5). Those who had birth complication in the previous pregnancies were (OR = 1.2, CI = 0.2–5.1, P = 0.5) more likely to by-pass the primary facilities than those who had no complication in the previous pregnancies. More information is given in the table 2e.

Table 2e: Association between Clinical factors and bypass of primary facilities

Variable	Reasons for mothers to bypass primary health facilities		OR	CI	P value
	Yes n (%)	No n (%)			
Attended ANC at PHF					
4 and more times	264(94.3%)	27(6.4%)			
Less than 4 times	138(92.6%)	0(0.0%)	0.94	0.9-0.96	0.07
Mode of Delivery					
Vaginal Delivery	438(94.4%)	16(5.6%)			
C/S	78(97.5%)	11(2,5%)	1.3	0.5 – 2.9	0.3
Infection during pregnancy					
Yes	209(95.9%)	9(4.1%)			
No	302(94.1%)	19(5.9%)	1.5	0.6-3.3	0.2
Name of infections					
UTI and Malaria	159(97%)	5(3%)			
Others	51(92.7%)	4(7.3%)	2.5	0.6-9.5	0.1
NCDs (hypertension and DM)					
Yes	28(96.6%)	1(3.4%)			
No	488(94.8%)	27(5.2%)	1.6	0.2-11.8	0.5
Previous Birth complications					
Yes	42(95.5%)	2(4.5%)			

No	469(94.7%)	26(5.3%)	1.2	0.2-5.1	0.5
STDs					
Yes	10(83.3%)	2(16.7%)			
No	501(95.1%)	26(4.9%)	0.3	0.1-1.3	0.1
Normal HB level during pregnancy					
Yes	304(95.6%)	14(4.4%)			
No	212(93.8%)	14(6.2%)	1.4	0.6-3.1	0.2
History of Multiple pregnancies					
No	27(100%)	0(0.0%)			
Yes	489(94.6%)	28(5.4%)	1.05	1.04-1.08	0.2

E. Bivariate analysis between Clinical factors and bypass of primary facilities (N = 544)

Women who had first pregnancy were (OR = 1.12, CI = 0.5–2.4, P value = 0.4) more likely to bypass the primary facilities than those who had the second or above pregnancy. Those who had admitted during pregnancy were (OR = 0.45, CI = 0.1–1.1, P = 0.06) more likely to go straight to the hospitals than those who had no history of being admitted. Those who had shorter space between pregnancies, less than two years were (OR = 0.6, CI = 0.2–1.5, P = 0.2). Details are shown in table 3

Table 3: Association between Clinical factors and bypass of primary facilities

Variable	Reasons for mothers to bypass primary health facilities		OR	CI	P value
	Yes n (%)	No n (%)			
History of Admission during pregnancy					
yes	78(90.7%)	8(9.3)			
No	434(95.6%)	20(4.4%)	0.45	0.1-1.1	0.06
Weight loss during pregnancy					
No	80(96.4%)	3(3.6%)			
Yes	434(94.6%)	25(5.4%)	1.54	0.4-5.2	0.3
Number of pregnancies in the past					
One Time	217(95.2%)	11(4.8%)			
Two and above	299(94.6%)	17(5.4%)	1.12	0.5-2.4	0.4
Time between pregnancies					
2 years and less	91(91.9%)	8(8.1%)			
Above 2yers	289(94.8%)	16(5.2%)	0.6	0.2-1.5	0.2

Multivariate Analysis

Variables considered for multivariate were those with a p-value of 0.2 and below. They included marital status, education of the mother, occupation of the spouse, daily income, courtesy treatment of the nurses, courtesy treatment of clinicians, enough time to discuss with health providers, history of infection during pregnancy, type of infection, history of STDs, Hb level during pregnancy, history of multiple pregnancy, first pregnancy, rhesus factor, history of admission during pregnancy, duration between pregnancy and ANC attendance. Amongst those predictors, only one was statistically significant. That variable was 'earning more than 1USD a day' those who earned more than 1USD a day were (OR = 4.27, CI = 1.8- 15.4 P = 0.01) more likely to by-pass the primary facilities than those who earned less than 1USD.

4.0 Discussion

Dar es Salaam is the Tanzanian region with majority of health facilities 1,103 as per HFR on 1st/April/2019 than any other region in the country [7]. Most of those health facilities were primary facilities (72 health centers and 667 dispensaries). This study gives data on determinants and associated factors for pregnant mothers to bypass primary healthcare facilities and going directly to the hospitals. The overall proportion of determinants and associated factors for pregnant mothers to bypass primary healthcare facilities and going directly to the hospitals in Dar es Salaam region Tanzania was high as in every 10 postnatal women, at least nine (9) were bypassing the primary healthcare facilities.

These results were in keeping with other studies conducted in Sharg-Alneel Locality in Khartoum State Sudan by Ahmed, *et al* (2015) found primary healthcare facility bypass was very high at 87% of them pursued healthcare for their children directly from secondary hospitals [13]. Kante, *et al*, (2016) on the other side also established that more than 75.4% bypassed the primary facilities in rural Tanzania which is lower than this study has established [8]. The reason of this discrepancy can be explained by the difference between the residences of the two populations where the samples were drawn. Ours was from the urban area and the study by Kante *et al* [8] was from rural area. The rural population doesn't have so many options of choosing facilities, which are near to where they live. Majority of healthcare facilities at rural areas are the primary facilities, which probably explain the little bit of small proportion of clients who bypass the primary facilities.

Associated Demographic Determinants for Women to bypass Primary Facilities and went straight to the hospitals

Bivariate associations between potential demographic determinants of bypassing primary facilities were not significantly different from women who were given referral at their nearest facility in terms of age, socio-economic status, education, etc., except income of the family. Clients who avoid the primary facilities and go straight to the hospitals have numerous reasons to do so. In this study different reasons have been explored to find out which determinants real explained the causes of bypass of primary facilities in Dar es Salaam.

The study has also established some demographic factors of women that bypassed the primary facilities. Number one was those who are above 18 were the majority (99%) and out of whom (95%) bypassed the primary facilities. This explains that those who are free to make decision do prefer going directly to the higher levels of healthcare provision. This study findings was in keeping with the study by Visser, *et al*, (2015) at Letaba Hospital South Africa in which they found that women between the ages of 20 and 40 years were 173 (59.05%) (Mean age: 29.39 years; 95% CI: 27.63–31.15,) though in our study it was not statically significant [25].

The second demographic factor that was explored was marital status of the women. Our study demonstrates that those who were married (94%) did not go to the primary facilities and instead they went directly to the secondary or tertiary level. Probably the husbands have the influence to their wives to bypass the primary facilities. The main reason of this overestimate might be explained again with the difference in geographical and residence of the population. The latter was carried out in rural north east of Tanzania.

The third demographic reason was level of education for both mother and the spouse. Our study established that the level of education of women, and/or spouse were more likely to influence bypass the primary facilities. In urban area like Dar es Salaam, it is likely that majority are having education at least that of secondary level and hence tend to choose healthcare services at secondary and above levels. This is also echoed by the study done by Visser *et al* (2015) at Letaba Hospital South Africa which found that 186 (63.48%) women/spouse with secondary or tertiary education and more bypassed the primary facility [25].

Other demographic factors that were explored are occupation of the spouse and daily income of the family. It was found that (92%) of those who had income of more than 1USD a day was bypassing the primary facilities. This is the only variable which was statistically significant ($p = 0.002$). This can be explained by those who are financially capable of bypassing the primary facilities because they can afford cost of healthcare at any level.

Primary Healthcare Services Associated Determinants for Women to bypass Primary Facilities and go straight to the hospitals

Generally, factors related to healthcare services determine the quality of the healthcare services. Majority of those who were interviewed admitted that those were not the reasons for them to bypass. The factors were: treatment with courtesy by clinicians/nurses, cleanliness of the facility, enough time for provider - patient interaction, access to information, availability of medicines, easy access to secondary/tertiary facilities, quality of healthcare services in general, availability of equipment and availability of diagnostic tests. These factors were not statistically significant except for those who said there was no privacy in primary facilities. The privacy in many of primary facilities is not at the expected standard level. This is because of inadequate buildings to cater for all services provided at the facility. Some of the services are provided in one room. There is lack of screens, and the rooms are not sound proof. In addition, because of the small building and space, everyone at the facility is likely to hear what is going on more for the mothers who gives birth. Other studies have shown unavailability of these standard measures lead clients to bypass those facilities. We need all measures of quality to be attained in all levels so as to minimise the tendency of our clients to bypass the primary level.

Associated Clinical Services Associated Determinants for Women to bypass Primary Facilities and go straight to the hospitals.

Clinical Services are key in safe healthcare services and if healthcare facilities are not providing the quality clinical services people might abandon the use of those facilities. Those reasons led this study to explore the parameters that pertain to clinical services. The parameters which were explored are: attendance to the antenatal care; mode of delivery; history of infection, name of infection, history of NCDs, previous pregnancy complication; STDs; History of admission during pregnancy; weight loss during pregnancy; number of pregnancies in the past; duration between pregnancies. Even though the majority have experienced one or more of those parameters, none of them were statistically significant. However, in other studies these factors were found significant. The explanation for these factors to be non-significant may be because of small sample size. For example, the findings from the study by Kante, *et al* conducted at rural Tanzania in 2016, [8] he found out that mothers who reported a complication during their current pregnancy had 1.88 higher odds of bypassing their nearest facility for childbirth than those who did not (adjusted odds ratio [AOR] 1.88, 95% confidence interval [CI]: 1.22–2.90).

Limitations of the Study

Selection bias could have affected the accuracy of the data collected as the participants were sampled from hospital. This might have led to overestimation of the proportion of mothers who had bypassed primary facilities and go straight to the secondary and tertiary facilities as majority of mothers are serviced in lower levels of healthcare delivery and many delivers at home. Improved data collection with use of knowledgeable trained research assistants and follow up of research assistants through regular meetings, and supervision may have helped on the validity of collected data. Despite of these limitations, our findings are valid to be generalized to the target population

Conclusions

This study has found postnatal women in Dar es Salaam region at high chance of going straight to the secondary and tertiary healthcare facilities without passing at primary facilities. Nine in every ten postnatal women have by-passed the primary facilities. Further, postnatal women of Dar es Salaam Region from families that earn more than 1USD a day are four times more likely to get to the upper facilities without referral from primary facilities.

Abbreviations

AIDS Acquired Immune Deficiency Syndrome ANC Antenatal Care AOR Adjusted Odds Ratio ARV Antiretroviral BMI Body Mass Index BSHFs Basic Standards for Healthcare Facilities HAIs Healthcare Associated Infections Hb level Haemoglobin level HFR Health Facility Registry HIV Human Immunodeficiency Virus IRB Institutional Review Board LHRCLegal and Human Rights Centre MDGs Millennium Development Goals MNHMuhimbili National Hospital MoH CDGEC Ministry of Health, Community Development, Gender, Elderly and Children MoHSW Ministry of Health and Social Welfare NCD Non-Communicable Diseases NGO Non-Governmental Organisation NIMR National Institute for Medical Research OR Odds Ratio PHC Primary Health Care PHCFs Primary Health Care Facilities PHSDPP Primary Health Services Development Programme PIs Principal Investigators Rh factor Rhesus factor RRHs Regional Referral Hospitals SDGs Sustainable Development Goals UNGA United Nations General Assembly UN United Nations WHO World Health Organisation

Declarations

Ethics approval and consent to participate

Ethical consideration

To ensure ethically sound research and “safeguard the dignity, rights, safety and well-being of research participants”, an Institutional Review Board (IRB) approval by Medical Research Coordinate Committee of the National Institute for Medical Research (NIMR) was obtained prior to initiation of the study. The entire research team including PI, Co PIs, researchers and study coordinators completed training for human subject research for research ethics, which was provided as part of survey, or training before study begins.

Informed consent form and written information sheet

Informed consent form and written information sheet were used to make sure that the participants are fully aware of the nature of the study. An informed consent form along with written information was provided during the recruitment of study participants. In case the potential participants do not agree to sign the informed consent form, they were excluded from the study. Participants had opportunity to withdraw from the study at any point in time. For the post-natal women below 15 years old, the team requested for special permission to treat them as emancipated minors so as they could consent by themselves. The written information sheet includes the purpose of the study, procedure, any risks or harms, benefits and details about confidentiality written in simple, understandable language.

Consent for publication—Optional

In Tanzania, the clearance from the Review Board (IRB) approval by Medical Research Coordinate Committee of the National Institute for Medical Research (NIMR) is enough to disseminate to various stakeholders including peer review journals.

Availability of data and material

Data and all materials used during the study are submitted with this manuscript

Competing interests

There were no competing interests amongst the authors.

Funding

Total estimated expenses for the study were USD 3,925. The funds were used for personnel costs, travel costs, meeting cost, printing and stationary costs, and IRB application fee. Funding sources were donated funds to Medipeace Tanzania from individual donors and corporations. The funds were planned and used as per the budgeted items as shown in the table with justification for each budget item.

Category	Items	Item total (TZS)	Justification
Personnel costs	Principal investigator	-	A PI will supervise, design, plan, manage and initiate the overall study. Since this research work is aligned with PI's job responsibilities at employed organization, no additional funding will be allocated for PI's personnel cost.
	Co-Principal investigators (3 person)	-	Co-PIs will supervise and coordinate the overall study activities, including reviewing study design, data collection tool, and analysed data results. Since this research work is aligned with Co-PIs' job responsibilities at employed organization, no additional funding will be allocated for Co-PIs' personnel cost.
	Researchers (3 person)	-	Researchers will be responsible for assisting design, planning, managing and analysing the overall study. Since this research work is aligned with Researchers' job responsibilities at employed organization, no additional funding will be allocated for Medipeace researcher's personnel cost.
	Research Coordinators (4 person)	-	Research coordinators will be responsible for coordinating overall research work, including recruiting and training surveyors, preparing survey sheets, and communicating with stake holders for smooth implementation of the research. Since this research work is aligned with Research coordinators' job responsibilities at employed organization, no additional funding will be allocated for research coordinators' personnel cost.
	Consultant (\$50 for survey design validation/time)	500,000	A professional data consultant with previous experience in survey design will review the overall study design and sampling technique.
	Surveyors (3 surveyors per survey site, total 15 surveyors for 5 sites \$ 11/day/person)	2,625,000	Fifteen surveyors will be recruited and trained to implement the research. \$ 11 of compensation will be paid per day per surveyor, including meal & transportation fee. Expected survey duration is 7 days
Travel costs	Travel occurred by research work	1,400,000	Transportation for research coordinators to visit five survey sites for the study period will be provided. \$ 90 per day. Expected survey duration is 7 days.
Meeting cost	Meeting cost including food & drink	600,000	Meetings to assess validity & reliability of developed survey sheet and to discuss research implementation details will be conducted for 3 times (\$ 90/meeting)
Printing & Stationary costs	Survey sheet printing, stationaries including pen and files	840,000	\$ 0.5 per printing of survey sheet, 600 set of survey sheet will be printed in total. Pen and files will be purchased for the amount of \$ 76.
IRB application	IRB application	400,000	Application fee (TZS 100,000 = \$ 45) Ethical Clearance (TZS 300,000 = \$ 140)
Total		6,365,000	

Authors' contributions

The PI had initiated, designed, planned, managed and supervised the overall study. The Co-PIs had collaborated with the PI to coordinate and supervise the overall study activities, including reviewing study design, data collection tool, and analysed data results. Researchers were responsible for assisting design, planning, managing and analysing the overall study.

Research coordinators were responsible for coordinating overall research work, including recruiting and training surveyors, preparing survey sheets, and communicating with stakeholders for smooth implementation of the research.

A professional data consultant with previous experience in survey design reviewed the overall study design and sampling technique. Surveyors or research assistants collected the data from the health facilities.

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Authors' information (optional)

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Figures

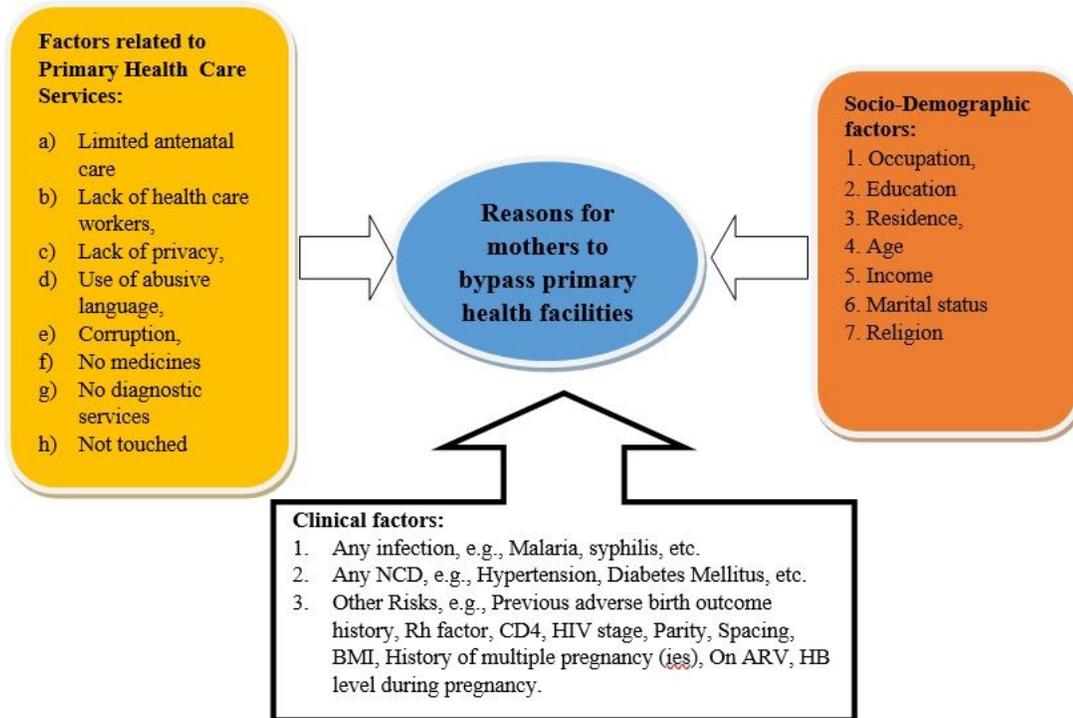


Figure 1

Conceptual Framework

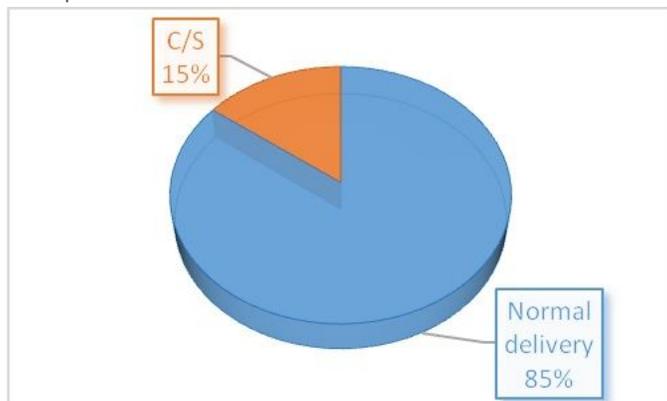


Figure 2

Showing mode of delivery

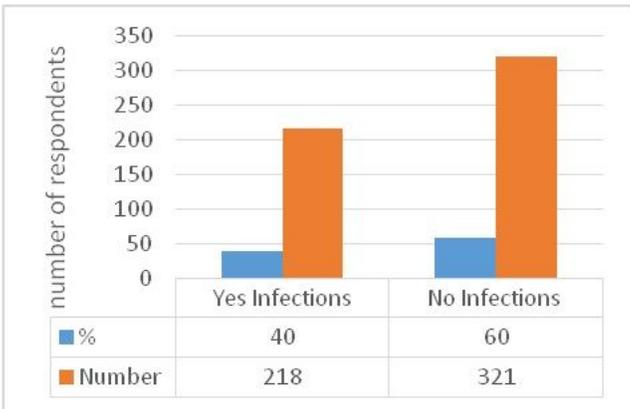


Figure 3

showing history of infection during pregnancy