

# Predictors of modern contraceptive use among women in Meru and Arusha districts in Northern Tanzania

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## Research

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## Abstract

**Background:** Contraceptive use reported to avert more than 1 million maternal deaths in Sub-Saharan Africa due to decline in fertility rate and thus help to achieve MDG 4 and 5. Therefore, this study aims to determine the prevalence of modern contraceptive use, describe common methods used, source of methods and factors that predict contraceptive use among women of reproductive age (WRA) in Arusha City and Meru District Council (DC) in northern Tanzania.

**Methodology:** The study is based on data from a cross-sectional survey conducted from January – May 2018. The study enrolled women aged 16-44 years from five selected wards in each district. Interviews were conducted at participant's homes using electronic data collection system. Descriptive and analytical statistics were used to analyze the data.

**Results:** A total of 3,938 women were enrolled, of whom 3,658 were sexually active at the time of survey. The mean age of 3,658 women was 30.5 (SD 7.3) years. The prevalence of modern contraceptive use (mCPR) was 47%, with no significant difference between Arusha City (47%) and Meru DC (44%). Implants (26.9%), injectables (21.5%) and pills (13.0%) were three of the common contraceptives currently used among the users. Public health facilities were the main source (72.6%) of contraceptive methods. Married/cohabiting women were significantly using modern method of contraceptives compared to single women (Adjusted Prevalence Ratio [aPR] = 2.1) as were women with two or more children than others (aPR=1.5). Cost, distance, and time due to busy schedules were key challenges to access family planning (FP) services as reported by the women.

**Conclusion:** Nearly half of WRA in the two districts were using modern contraceptives. Implants have become the most common method of contraceptives than injectables and pills. Health management teams in the two districts will need to come with strategies for improving use of other modern FP methods and improving community-based availability of contraceptive services to contribute in improving mCPR to the 60% target.

## Introduction

Use of modern contraceptives have contributed to the reductions in unintended pregnancies, unsafe abortions, and in maternal deaths, and in improving newborn, infant and child survival, and contributing to women's empowerment [1–8]. Worldwide, around 85 million unplanned pregnancies are estimated to occur annually with the rates of unplanned pregnancies being higher in sub-Saharan Africa (SSA) than in other continents [7, 9]. In Tanzania, 31% of pregnancies are unintended, and maternal (556 per 100,000 live births), newborn (25 per 1,000 births) and child (67 per 1,000 live births) deaths are still unacceptably high and far from the country's 2020 goals [10, 11].

The proportion of women using modern contraceptives have increased in all regions of the world [12]. However, use of modern contraceptives is still low in sub-Saharan Africa, despite increasing awareness and knowledge about contraceptives and increased availability of methods [12–14]. The contraceptive prevalence rate (CPR) is 28% in SSA compared to 68% in Asia and 73% in Latin America and Caribbean, respectively [9, 17]. Unmet need for family planning is also higher in SSA (24%) compared to 10% and 11% in Asia and Latin America & Caribbean, respectively [12]. Women in SSA, therefore, experience high level of unintended pregnancies, either mistimed or unwanted (ranging from 30% – 50%) and high number of unsafe abortions (4.7 million every year), putting women at increased risk of maternal deaths and morbidities [7, 9, 10, 19].

According to the most recent Tanzania Demographic and Health Survey, CPR for any method has increased from 34% in 2010 to 38% in 2015-16 among currently married or in union women and modern contraceptive prevalence rate (mCPR) increased from 27% in 2010 to 32% in 2015-16 (8, 20). However, these trends in contraceptive use have shown wide variation between regions in Tanzania as some regions have shown declining trends in modern contraceptive use while others were stagnant. For example, from 2010 to 2015-16 modern contraceptive use declined in Arusha region from 35–32% and in Kilimanjaro region from 50–48%. In the same timeframe, modern contraceptive use increased in Lindi (39–52%) and Mtwara region (37% to 50%), respectively [10]. Cultural background, desired number of children, health infrastructure at regional level, contraceptive logistics and delivery system, provider training and proactive local programs in family planning (FP) may all lead to regional differences in trends of mCPR [10, 21, 22]. This trend highlights the importance of community-specific data in informing levels of modern contraceptives use and associated factors.

This study was conducted in 2018, as part of the baseline assessment before implementation of a community-based reproductive health program under Willows International in Arusha region. It offered a unique opportunity due to the limited district/ward level data available in northern Tanzania to estimate the levels of contraceptive use among women of reproductive age in Arusha region, northern Tanzania. The objective of the study was to determine the prevalence of modern contraceptive use among sexually active women aged 16–44 years, to describe the types of contraceptive methods used, describe source of methods and to determine individual factors associated with modern contraceptive in two districts in Arusha region.

## Methods

### Study design and site

This study is based on a community-based cross-sectional survey conducted from December 2017 to May 2018 at Arusha City Council and Meru District Council (DC), two of the seven districts in Arusha region, northern Tanzania.

### Study population, sampling and data collection procedures

The sampling process has been described in detail in two previous publications (23, 24). This analysis consisted of women age 16–44 years and residing in the selected wards in Arusha City and Meru DC. Women who were not sexually active were excluded from the analysis. Figure 1 depicts the number of women

interviewed and analyzed. A total of 3,938 women were interviewed, out of these 3,658 were sexually active and included in the analysis. Of the 3,658 analyzed participants, 1866 were from Meru DC and the rest 1792 were from Arusha City

### **Measures**

The primary outcome of interest was the current use of modern contraceptives (yes or no). For the purposes of this analysis, modern contraceptive methods included were oral contraceptive pills, male condoms, Injectables, IUCD, Implant, female sterilization or vasectomy. The traditional methods considered in this analysis (the rhythm method, withdrawal, or standard days method) were classified as currently not using modern methods.

Demographic characteristics of women included were age in years, marital status (never married/ lived with a partner, currently married/ living with a partner or formerly married), education level (none, primary, secondary and higher level), employment status (working or not), age of sexual debut (years), age at first birth (years) and parity. Women currently using contraceptive methods were asked of their main source of contraceptive methods (government, private, pharmacy/drug outlet or community outreach). Women were also to select the challenges they encountered from a predetermined list of questions about the challenges that they encounter in accessing the family planning healthcare for themselves (yes or no).

### **Data Analysis**

Data cleaning and analysis was done using Stata 15. Categorical variables were summarized into frequency and percentages; while continuous variables were summarized using the respective measure of central tendency and its associated measure of dispersion. Clustering of observations was accounted for using robust standard errors. Prevalence ratios were estimated using modified Poisson regression analysis, to determine the predictors associated of current modern contraceptive use.

## **Results**

### **Background characteristics of the participants**

Table 1 shows the socio-economic and demographic characteristics of women. The mean age of participants was 30.5 years. Most participants were married and/or cohabiting (71%), had primary education (58%), and were working at the time of interview (62%). The mean age at sexual debut was 18.8 years, and 9% reported sexual debut before age 16 years. The parity of the participants ranged from 0 to 7 children.

Table 1  
Background characteristics of the participants (N = 3,658)

	Total	Arusha City	Meru DC
	n (%)	n (%)	n (%)
Woman age (years)			
Below 20	154 (4.9)	74 (4.9)	80 (5.0)
20–29	1582 (42.1)	779 (41.6)	803 (43.6)
30–39	1436 (38.9)	704 (39.0)	732 (38.5)
40 and above	484 (14.1)	233 (14.5)	251 (13.0)
Marital status			
Never married	571 (18.0)	262 (17.0)	309 (21.4)
Married/Cohabiting	2688 (70.8)	1342 (72.3)	1346 (66.3)
Divorced/widowed/separated	398 (11.1)	187 (10.8)	211 (12.3)
Education level			
None	107 (3.2)	66 (3.4)	44 (2.5)
Primary	2114 (57.6)	1061 (58.9)	1053 (53.3)
Secondary/Higher	1435 (39.2)	664 (37.7)	771 (44.2)
Currently employed			
Yes	2356 (62.3)	1092 (60.2)	1264 (69.1)
No	1287 (37.7)	693 (39.8)	594 (30.9)
Age of sexual debut (years)			
Below 16	324 (9.4)	151 (9.2)	173 (10.0)
16–18	1498 (43.6)	729 (44.0)	769 (42.5)
19 and above	1657 (47.0)	821 (46.9)	836 (47.5)
Age at first birth (years)			
Below 18	349 (11.2)	176 (11.3)	173 (10.7)
18–20	1211 (38.0)	590 (38.0)	621 (38.1)
21 and above	1624 (50.8)	799 (50.6)	825 (51.2)
Parity			
0	658(19.4)	314(18.4)	344(22.7)
1	794(20.7)	373(20.2)	421(22.4)
2	879(21.7)	418(21.3)	461(23.1)
3 and above	1327(38.2)	687(40.1)	640(31.9)
*% is the weighted percent			

### Contraceptive use

Nearly all of the participants (99%) had ever heard about modern contraceptive methods. The current use of modern contraceptives was 47% with no significant difference between Arusha City (47%) and Meru DC (44%) (Table 2). Duration of contraceptive method use ranged from less than a year to 29 years, with women who have used contraceptive for a year now being most prevalent.

Table 2  
Awareness and use of modern contraceptive methods (N = 3,658)

	Total	Arusha	Meru DC
	n (%)	n (%)	n (%)
Ever heard modern contraception			
No	23 (0.6)	9 (0.5)	14 (0.8)
Yes	3635 (99.4)	1783 (99.5)	1852 (99.2)
Current use modern Contraceptive			
No	1,880 (52.9)	912 (52.2)	968 (55.2)
Yes	1,764 (46.7)	874 (47.4)	890 (44.3)
Missing	14 (0.4)	6 (0.4)	8 (0.5)
Duration of using a method (years) (N = 1,764)			
< 1	139 (7.9)	56 (6.4)	83 (9.3)
1	682 (38.7)	326 (37.3)	356 (40.0)
2	298 (16.9)	149 (17.1)	149 (16.7)
3	180 (10.2)	82 (9.4)	98 (11.0)
4 and above	300 (17.0)	163 (18.7)	137 (15.4)
Missing	165 (9.4)	98 (11.2)	67 (7.5)

The most common modern contraceptive method among users was implants (27%), followed by injectables (22%) and pills (13%) (Fig. 2). Use of IUCD (5%) and female sterilization (4%) was low.

#### Factors associated with current modern contraceptives use

Table 3 depicts the factors associated with current modern contraceptive use among women in the sample. Marital status and parity were significantly associated with current modern contraceptive use, controlling for other factors. Married or cohabiting women were about twice as likely to be currently using a modern method compared to women who were never married. Likewise, women with two or more children were twice as likely to use modern methods compared to those who didn't have a child.

Table 3  
Factors associated with modern contraceptives use among women in Arusha region

	Crude Prevalence Ratio	Adjusted Prevalence Ratio
	95% CI	95% CI
Woman age (years)		
Below 20	Ref	Ref
20–29	3.6 (2.3–5.8) *	1.4 (0.8–2.3)
30–39	3.6 (2.2–5.8) *	1.1 (0.7–1.8)
40 and above	2.8 (1.7–4.6) *	0.9 (0.5–1.5)
Marital status		
Never married	Ref	Ref
Married/Cohabiting	2.9 (2.3–3.6) *	1.9 (1.4–2.5) *
Divorced/widowed/separated	1.8 (1.3–2.4) *	1.4 (1.0–1.9) **
Education level		
None/ Primary	Ref	Ref
Secondary/Higher	0.8 (0.8–0.9) *	0.9 (0.9–1.0)
Currently working		
Yes	Ref	Ref
No	1.1 (0.9–1.2)	1.0 (0.9–1.1)
Residence		
Meru	Ref	Ref
Arusha	1.1 (1.0–1.2)	1.0 (0.9–1.1)
Age of Debut (years)		
Below 16	Ref	Ref
16–18	1.1 (0.8–1.3)	1.1 (0.9–1.3)
19 and above	1.0 (0.9–1.2)	1.0 (0.8–1.2)
Age at first birth (years)		
Below 18	Ref	Ref
18–20	1.1 (0.9–1.3)	1.1 (0.9–1.3)
21 and above	1.0 (0.9–1.2)	1.0 (0.9–1.2)
Parity		
0	Ref	Ref
1	3.0 (2.3–3.8) *	1.8 (1.2–2.6) *
2	3.5 (2.7–4.5) *	2.1 (1.5–3.0) *
3 and above	3.4 (2.6–4.3) *	2.3 (1.6–3.3) *
* $p < 0.001$ ; ** $p < 0.05$		

#### Source of Family planning methods

Among women using contraceptives, government health facilities i.e. dispensaries, health centers and hospitals were the main source (70%) of the modern contraceptives (Fig. 3). Pharmacies and drug outlets contributed to 14%, with < 1% receiving methods from outreach or community educator.

#### Challenges in accessing family planning methods

Women who were not using family planning methods were asked about their challenges associated with accessing family planning methods, given that family planning services are free in Tanzania at all public facilities. The most common obstacle for obtaining family planning methods was money needed for

transportation or hospital administration costs (28%), followed by lack of time to obtain methods (17%), distance to health facilities (16%) and lack of a person to take care of children at home (15%) (Fig. 4).

## Discussion

The study aimed to determine the prevalence of modern contraceptive use, describe methods used as well as factors associated with use among women aged 16–44 years in two districts in Arusha region. The results of the study showed that 47% of women in Arusha region were using modern contraceptive methods, without significant difference between Arusha City and Meru DC districts. These districts have reached the national goal of FP coverage of 45% by 2020 (22).

Wide availability of methods at health facilities in Arusha, offering services five days a week, the introduction of immediate postpartum long term FP program and wide community information and education of family planning and adequate spacing that was undertaken from 2015 might have all contributed to the high contraceptive use [10, 25, 26]. In Northern zone (Arusha one of the regions) there was intensive training of health providers in long term methods in 2016–2017. The training coupled with introduction of immediate postpartum long-term family planning (LTFP) program in Tanzania since 2015 might have influenced improvement in modern contraceptive use in Arusha (29). Efforts and strategies are still needed though, to increase mCPR to meet the 60% target by 2020 stipulated in National Health Sector Strategic Plan IV (22, 28).

Implants, injectables, and pills were the most common modern methods used by women in our study. The DHS also showed injections, implants and pills to be three of the common contraceptives used by WRA nationally [29]. Use of IUCD is still low in Arusha both in this study and in the study by Yusuf et al (2020) [29]. According to the TDHS and other studies, knowledge on IUCD and implants among women is high in Tanzania (80%) [10, 30]. Availability of these long-acting reversible methods (LTFPM) is similarly high at health facilities offering FP services in country [10, 25, 27, 30], but service availability and readiness assessment (SARA) survey showed higher availability of implants at health facilities than IUCD (27). Studies have shown that limited skills among providers in inserting IUCD is a key bottleneck in many SSA countries including Tanzania [28, 30]. It is possible that provider's skills in IUCD influences the availability of this method to clients. Qualitative studies could look into why women prefer implants to other methods in order to help in designing counseling.

Similar to previous DHS survey results, in Arusha, 7 in 10 women who use modern contraceptive methods, obtain their methods from the government health facilities [10]. The government has been working with private partners to improve provision of FP services in Tanzania. As such, we note that pharmacies are also a major source of methods, being reported by approximately 13% of the women who use modern methods in this study. Pharmacies are opened for longer hours than outpatient departments in most health facilities, thus they become a preferred source of methods for women who are out of stock or need emergency contraceptives [31]. Pharmacies and drug stores can be important potential sites in improving availability and access of methods especially emergency methods, after taking into consideration regulatory and training issues [31–33].

In this study, women cited time to attend health facilities while leaving income generating activities, lack of childcare, and hospital administration fees as common challenges in going to health facilities for FP services. Community distribution of modern contraceptives like oral contraceptive pills, condoms and emergency methods by trained community health workers (CHWs), may be a strong complementary strategy in improving uptake and use of methods given the challenges reported by women in this study. CHWs may also contribute in improving contraceptive use in the area, given the four common methods mostly used by the women must be accessed in facilities. CHWs may help to identify women who have unmet need i.e. need the contraceptive method but are not using and refer them to the nearest health facilities for counseling and services for implants and injectables as shown in Malawi, Democratic Republic of Congo and Burkina Faso [34, 35]. CHWs may also help to address myths and misconceptions of using modern contraception [36]. Use of community providers to improve CPR is one of the strategies in reproductive, maternal, newborn, child and adolescent health (RMNCAH) strategic plan of 2016–2020 in Tanzania, but there is a need for regions and districts to develop local specific strategies on how to operationalize and implement this strategy including outreach services.

Marital status and parity were independently associated with modern contraceptive use. TDHS and other studies have also observed a higher proportion of married women using modern contraceptives than single women (7, 12, 14, 16). Analyses from multiple countries have shown that married/ cohabiting women tend to use long-term reversible contraceptives (LTRCs) than single women (14). Women in stable partnership maybe in a better position to plan when they want another child compared to single women hence higher prevalence of contraceptive use (14, 15).

The strength of this study lies in the fact it was a community-based study, utilizing the random selection of participants and low refusal rate. This may increase generalizability of the results in northern zone, which has similar characteristics to Arusha region. Cross sectional design limits inference of temporal relationship in the observed associations.

To conclude mCPR among WRA in Arusha is at 47% and can be improved. Strategies to expand use of modern contraceptives using community channels like Community Health Workers and existing groups need to be improved. Public-Private Partnership need to be strengthened and engage private health facilities and others like pharmacies in provision of family planning services. Further, there is a need to understand what drives women to lean on certain type of methods and not others while they are equally available at service delivery points.

## Declarations

### Ethical considerations

The Ethical approval was obtained from the Kilimanjaro Christian Medical University College (KCMUC) Research Ethical Committee (No 1085) and from Tanzania National Institute for Medical Research (NIMR/ HR/ R.8a/ Vol.IX/ 2703). Permission to conduct the study was also granted by President's Office

Regional Administration and Local Government (PO-RALG), by the Regional Medical Officer of Arusha region and the District Medical Officers of Arusha City and Meru DC respectively. The study was also approved by the Institutional Review Board (IRB) of the Harvard T.H. Chan School of Public Health (IRB17-1794). All the study participants gave a consent to participation before study initiation.

### Consent for publication

This manuscript does not contain any individual person's data in the form of image or video. Hence consent for publication is not applicable.

### Availability of data and material

The datasets during and/or analysed during the current study available from the corresponding author on reasonable request.

### Competing interests

The authors declare that they have no competing interests

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### Authors' contributions

BE, SEM and IS designed the study. All authors collected data. CA, and MJM conducted data analysis. SEM, CA and MJM drafted the manuscript. CA RM MJM BE SEM AM AF and IS contributed to the final draft of the manuscript. All authors reviewed and gave their final approval to the manuscript.

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## Figures

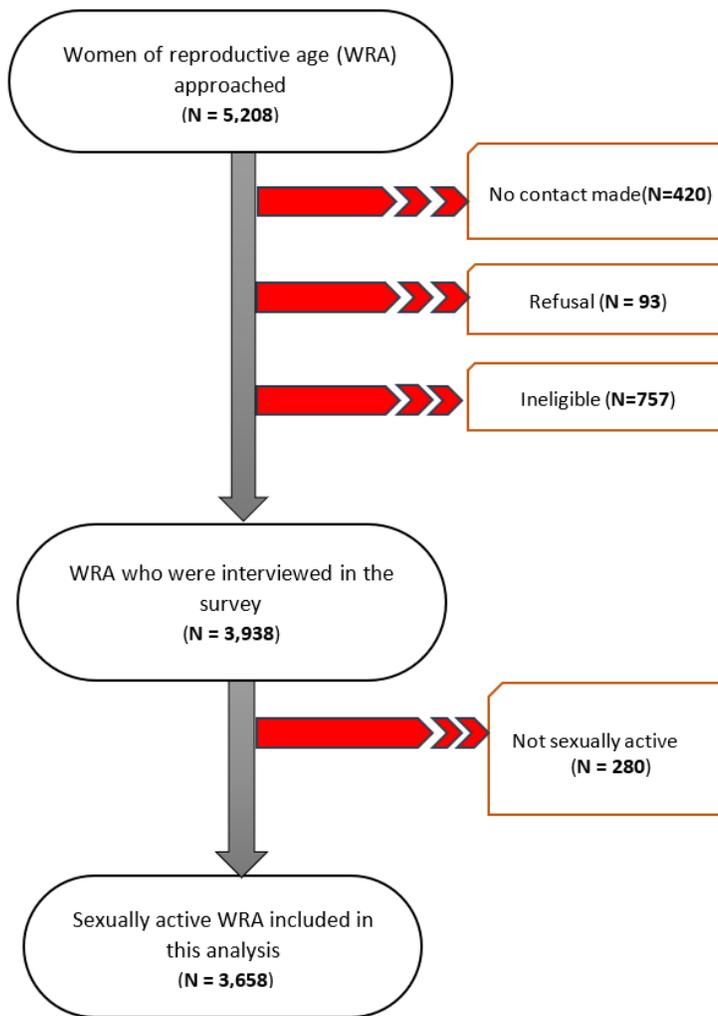


Figure 1

Flowchart of the sample selection to be included in this analysis

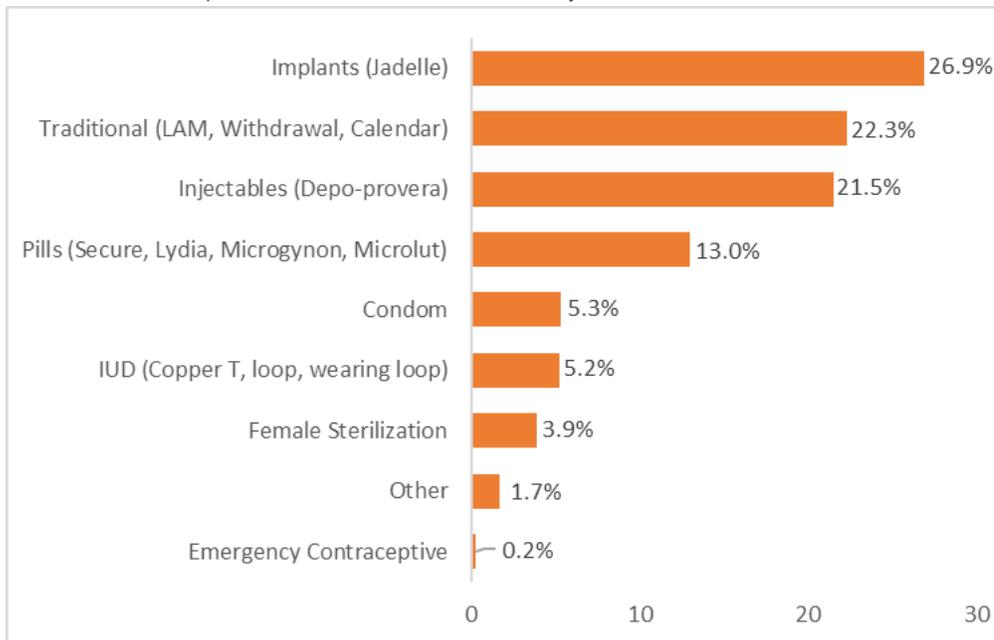
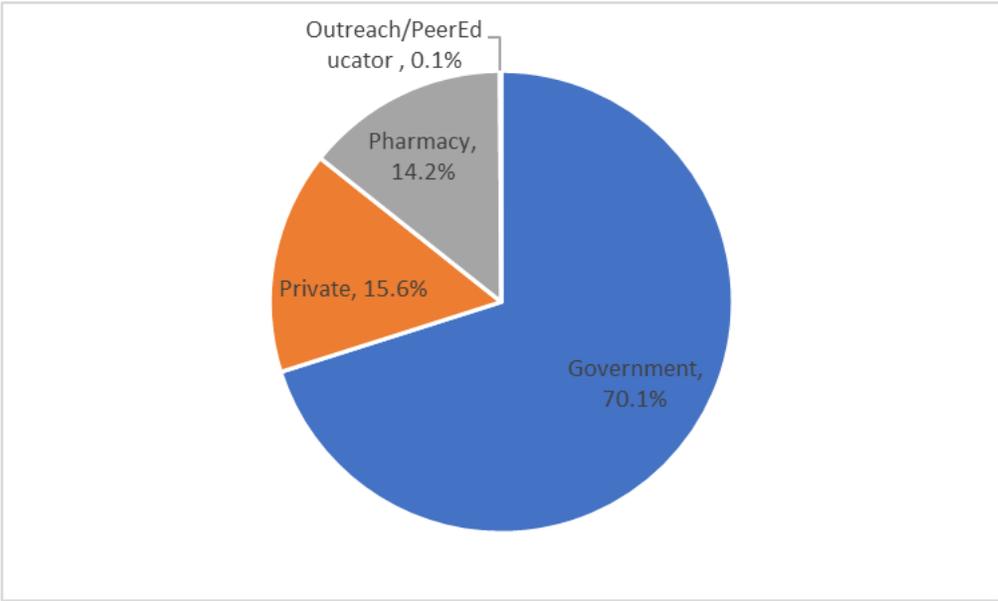


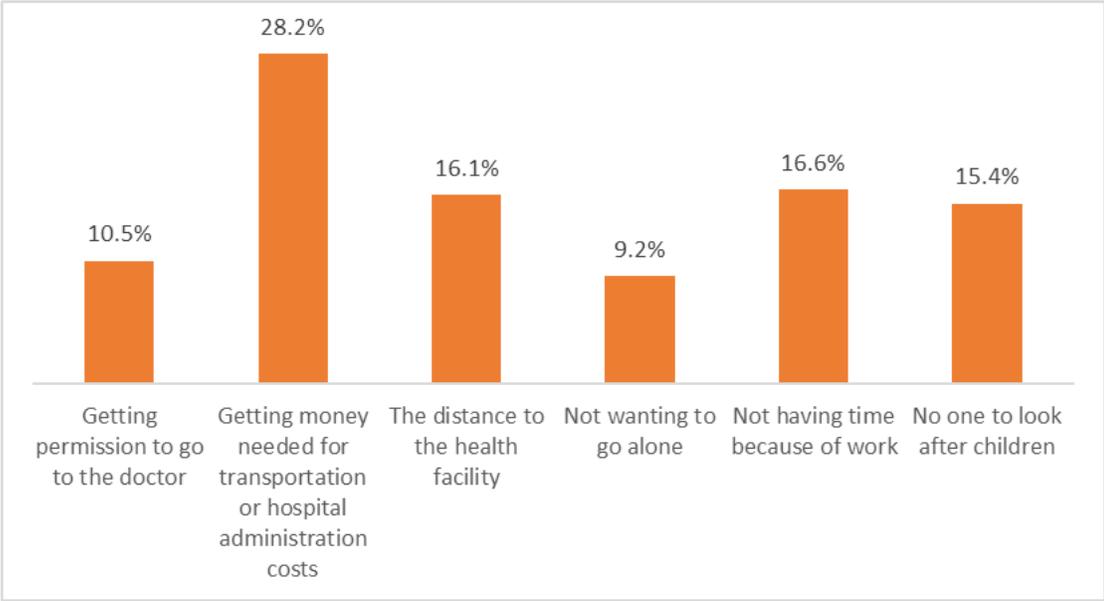
Figure 2

Types of modern contraceptive methods currently used by users in Arusha region, Tanzania (N= 2,236)



**Figure 3**

Source of modern contraceptive methods among women in Arusha (N=1,764)



**Figure 4**

Challenges in accessing FP methods among women in Arusha (N=1,880)