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Analysis of contraceptive use among homeless women in Kenya – a case of Nairobi county

Lydia Cheruto Pkaremba[1]*, Martine Odhiambo Oleche[1] and Elizabeth Owiti[1]

Abstract: Many factors influence the utilization of reproductive healthcare services in Kenya. Despite the effort by the government and other stakeholders to improve access and utilization of these services, there remains a major challenge in reaching out to marginalized segments of society. The study aims to examine the factors affecting the utilization of modern contraceptives by homeless women in Nairobi, Kenya, and draw policy recommendations based on the findings. The study utilized the logit model to analyze determinants of contraceptive utilization by homeless women in Nairobi using primary data collected from 196 households within Nairobi. The number of children per woman, age at first birth, living with a partner, drug abuse by the respondent, drug abuse by respondents' partner, poverty, child planning, health facility delivery, neonatal death incidence, knowledge of male sterilization, never attending school, primary school attendance, secondary school attendance, operating of small business and contraceptive spending significantly affect the utilization of modern contraceptives by homeless women in Nairobi, Kenya. The majority of homeless women in Nairobi utilized injectibles (26.63%) and implants (24.07%) as a form of contraception. The government should

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therefore provide a contraceptive mix that incorporates these forms of contraception to ensure maximum utilization.

Subjects: Health & Development; Population & Development; Sustainable Development; Economics and Development; Economic Forecasting

Keywords: health care services; modern contraceptives

JEL Classifications: I12; I14 & I15

1. Introduction

1.1. Demand for contraceptives

Contraceptives have consistently been used all over the world leading to an improvement in contraceptive prevalence (United Nations, Department of Economic and Social Affairs, Population Division, 2015) Contraceptives have been credited to prevent unplanned pregnancies (Barden O'Fallon et al., 2018). However, despite the governments' effort to provide subsidized contraception, many homeless women still do not utilize contraceptives. Hence, the interest in understanding the determinants of contraceptive use among homeless women in Kenya.

Contraceptive use has played a huge role in assisting women to plan the number of children they would want and the spacing they desire. Davanzo et al. (2004) noted that women who had short intervals between pregnancies have a greater risk of pre-eclampsia, premature rupture of membranes, and high blood pressure. Globally, child spacing achieved through the use of modern contraceptives has been found to save the lives of more than 2 million newborns each year (Collumbien et al., 2004). The unmet need for contraception among homeless women should therefore be an area of interest to help reduce mortality and morbidity. Choosing to have smaller families has been found to impact the quality of children (Pailhé et al., 2019). Pailhe' noted that investment per child decreases with an increase in the number of children in a household.

Homeless women also face challenges providing basic needs for their families and majority depend on social assistance to meet their daily needs (Karabanow, 2008). Women with lesser children, therefore, have a chance to provide sustainably for their families than women with larger families. In the labor market, homeless women face few options when it comes to job opportunities (Hossain & Alam, 2016). Homeless women work long hours and are often paid low wages and since they have no formal educations, chances of getting well-paying jobs are slim (Milaney et al., 2020). Early use of contraception improves a woman's human capital investment and changes a woman's career path as chances of unplanned pregnancies are eliminated (Bailey, 2006; Goldin & Katz, 2000). Contraceptive use improves the economic prospects of a woman leading to an increase in overall family income (Canning & Paul Schultz, 2012). Smaller family sizes have also been found to break cycles of poverty and reduce dependency on the government (Wang & Sun, 2016). Wang and Sun (2016) argued that women with smaller families are more capable of caring for their families as they achieve more economic stability. Good spacing and smaller family sizes have also been found to affect the quality of children. Pailhé et al. (2019) argue that income and family time are easily depleted when caring for a large family. Olinto et al. (2013) noted a direct relationship between poverty and household size. The burden of caring for street children mainly lies with the government. The Kenyan government has over the years played an important role in rehabilitating street families (National Authority for the Campaign Against Alcohol and Drug Abuse NACADA, 2017) through the provision of safety nets, shelter, rehabilitation centers, etc (Embleton et al., 2020). The Kenyan government despite running eight rehabilitation centers for wayward kids (Consortium for Street Children, 2011), has also established and gazetted the Street Families Rehabilitation Fund of 2003 which aims at mobilizing funds, rehabilitating, and fertility of homeless women allowing them to care for children they can afford.

Homeless women also face inequality in access and utilization of contraceptives. Street women are characterized by low literacy levels and poor productivity, which leads to lesser social inclusion (OECD, 2013). A study by Grotluschen et al. (2016) noted a link between low literacy and poor social outcomes. Homeless women battle stress and mental health issues that affect their productivity (Glomm & John, 2002) leading to high rates of unemployment (Gould & Williams, 2010). Homeless women do not invest in skill development for their children because of their low income (Heckman & Mosso, 2014) leading to a generation of street children with low productivity and life skills. Subsidized contraceptives will therefore cushion homeless women from the burden of unwanted pregnancies thereby reducing the burden of caring for many children using little resources. Street women have a difficult time getting formal employment. Many are forced to do illegal work or be part of the informal sector (Dachner & Tarasuk, 2002). With economic restructuring from unskilled- to skilled-based labor (Pratschke & Morlicchio, 2012) street women are unable to get employed as they lack legal identification documents, good education, and good housing (Karabanow, 2004).

Homeless women are characterized by unique reproductive health needs which include mistimed pregnancies, abortions and miscarriages, rape, survival sex, etc (Gelberg et al., 2001). Street women who sleep outside risk physical and sexual abuse (Wenzel et al., 2000). Homeless women also engage in sexually exploitative relationships where they have little power to negotiate contraceptive use leading to high incidences of untimed pregnancies (Conde Agudelo et al., 2006). Homeless women like other women need to utilize family planning services to space and time births as well as prevent pregnancies (Kennedy et al., 2014). However, homeless women encounter several barriers in access to reproductive health services (Gelberg et al., 2001). The majority of homeless women rarely visit healthcare centers due to fear of stigmatization by healthcare providers (Ayaya & Esamai, 2001). Homeless women cite a lack of respect and lack of trust in healthcare workers (Gelberg et al., 2004). The majority of women practicing survival sex are often ashamed of discussing their sexual behaviors with healthcare providers (Oliver & Cheff, 2012). Homeless women who abuse drugs often suffer low self-esteem and are unable to keep appointments (Pleace et al., 2000). Healthcare providers have also cited mistrust and lack of sufficient training as major setbacks in providing reproductive health services to homeless women (Dasari et al., 2016). Housing is important for a woman's well-being. Research has shown that housing controls alcohol use and HIV infections as well as improve overall well-being and community functioning (Buchanan et al., 2009). Street women are unable to hold formal employment as they lack adequate and safe housing to operate from (Karabanow et al., 2010).

Housing challenge also affects a street woman's ability to store drugs that need daily administration leading to incidences of stolen or misplaced drugs (Whitney & Glazier, 2004) Contraceptive utilization by homeless women is influenced by several socio-economic and demographic factors. Mass media, for example, is a mode of communication widely used in both developing and developed countries. Viewers are exposed to new information and new ways from different parts of the world. Media exposure has been found to significantly improve a woman's autonomy and reduce overall fertility (Jensen, 2012).

A woman's education also impacts contraceptive utilization. Education is believed to give a woman autonomy which acts as a link between education and contraception (Jejeebhoy & Sathar, 2001). More educated women are more likely to use contraception than the less educated, Studies carried out in Ghana by Achana et al. (2015), collaborates this argument when he discovered that women with secondary or higher levels of education utilize contraception more than women with a primary level of education or lower. Withers et al. (2010) further noted that women from a higher socio-economic background were more likely to utilize contraception than women from poor households. Studies from India have revealed that women who are employed are more likely to utilize contraception than women without employment (Islam et al., 2016). Marital status and number of children have been found to inform contraceptive utilization decisions among women. Studies have shown that single women are more likely to use contraception

than married women as they desire to prevent pregnancy than married women (Agyemang et al., 2019). The quality of children is believed to impact on contraceptive behaviors of women. Economic development has led to greater investments in human capital, therefore shifting societies' focus to quality rather than quantity (Heckman & Mosso, 2014). A drop in fertility in the late 20th century has been attributed to decreased mortality (Meltzer , 1992). Meltzer (1992) noted that a reduction in mortality increases demand for surviving children. In developed nations, social security paid by the young is used to support the older generation. Since the retired are often covered by social security, the young generation may not desire to have more children for future security, therefore, reducing the need for parents to stay with their children (Barr & Diamond, 2006). When intergenerational transfers like public debt and social security payments are to be paid by the younger generation, the cost of having children for the younger generation becomes high. The high cost of children increases the demand for contraception (Lee, 2008).

Globally fertility rates have declined from 3.2 children per woman to 2.5 children per woman. However, Africa continues to lag in fertility management which has led to low savings, low literacy levels, and low foreign direct investments (Cleland & Machiyama, 2017). To speed up Africa's economic development contraceptive utilization should be adopted to reduce fertility (Moultrie et al., 2012). In most regions of the world, contraceptive use has widely been adopted by women of reproductive age to delay births or prevent unwanted pregnancies. In 2017, 78% of women globally had their contraceptive needs met a. However, only 56% of women in need of contraception in Africa had their needs met. In the case of married or in-union women, 63% used contraception globally, while only 36% used contraception in Africa as shown in Figure 1 below. Married women or in-union women utilizing contraception contributed a proportion of 92% of the global contraceptive prevalence (United Nations, Department of Economic and Social Affairs, Population Division, 2017).

Women often have an unmet need for contraception when they desire to stop births for 2 years or more but are unable to access any form of contraception (Machiyama et al., 2017). With 1.9 billion women of reproductive age (15–49 years) globally, 842 million were utilizing modern contraceptives and as of 2019 while 190 million women had an unmet need for contraception as highlighted in Figure 2 below (United Nations, Department of Economic and Social Affairs, Population Division, 2017).

Kenya has made tremendous progress in improving contraceptive access and use. In 2019 contraceptive prevalence in Kenya rose to 59.7% (United Nations, Department of Economic and Social Affairs, Population Division, 2019). Despite this progress, there still exist disparities in contraceptive use across counties in Kenya (Kenya National Bureau of Statistics, 2014). Women living in rural areas and women from poor backgrounds utilize contraception at lower proportions than the rest of the population (Ross & Goldner, 2009). Kenya when compared to the rest of Africa

Figure 1. Contraceptive Prevalence for women between 15–49 Years (Married or in a union).

Source: United Nations, Department of Economic and Social Affairs, Population Division (2017). Model-based estimates and projection of family planning indicators 2017. New York: United Nations

CONTRACEPTIVE PREVALENCE OF MARRIED OR IN UNION WOMEN

■ AFRICA ■ WORLD

Figure 2. Unmet need for contraception among women between 15–49 years.

Source: United Nations, Department of Economic and Social Affairs, Population Division (2017). Model-based estimates and projection of family planning indicators 2017. New York: United Nations
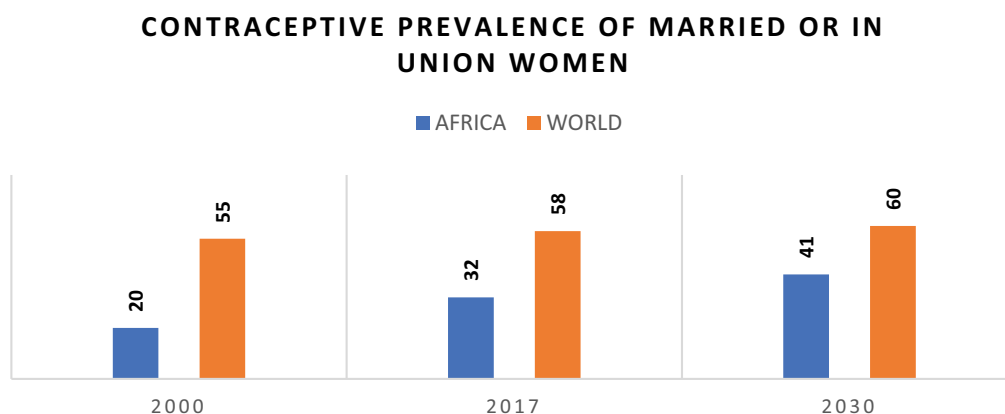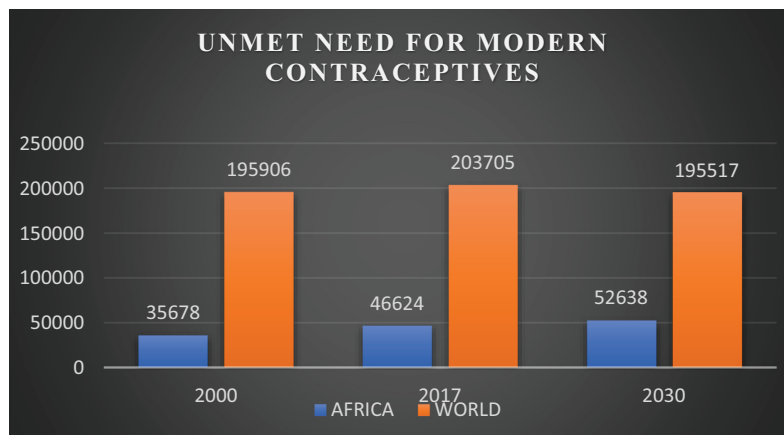

has performed exceedingly well with a gradual but consistent improvement in contraceptive utilization (Kenya National Bureau of Statistics (KNBS) and ICF Macro, 1998, 2003).

Improving access to contraceptives will not only assist the government meet one of its Big four agendas on Universal Health Coverage by 2022 but will also ensure every individual access needed healthcare services without incurring financial hardships (WHO, 2010).

This study, therefore, examined the factors affecting the utilization of modern contraceptives in Nairobi, Kenya. Several policy recommendations can be drawn from the findings of the study on population control of street children in Kenya by ensuring that homeless women can space and delay birth at will thus promote good health for both mothers and their children.

2. Literature review

2.1. Theoretical review

The demand for healthcare theory by Grossman (1972a) was utilized to explain the demand for contraceptives. The Social Capital theory by Bourdieu (1985) was used to explain the importance of social capital in knowledge exchange and information flow within social networks.

2.1.1. New home economics theory

The new home economics theory by Becker was adopted to give insights into how the utility preferences of parents determine fertility (Becker & Barro, 1988). According to this theory, a parent's utility is determined by utility derived from consumption, i.e., having children. In his work, Becker noted that household heads seek to maximize utility subject to the benefits of an additional child in comparison to the cost of raising that child. Becker notes that the cost of raising a child is dependent on the change in interest rates, degree of altruism, time preference, and increase in the net cost between generations. The theory further notes that the economic roles of women and level of education affect their reproductive health behaviors where young adults will tend to reduce births to improve their living standards (Ferber & Birnbaum, 1977)

According to Gary Becker (1960), when positive yields are derived from the net investments in children, the positive psychic income derived has the ability to offset the cost of having an extra child. Becker further noted that if there results a negative cost of children, since children are treated as a production good they will generate monetary returns for their parents in future. The formula developed by Becker to calculate the cost of raising a child is as follows:

Net cost of children = Present value of expected outlays + Inputed value of parent's services - Present value of expected money return + inputed value of child services.

2.1.2. Social capital theory

The social capital theory was first defined by Bourdieu (1985) as a combination of all potential and actual resources that are linked to lasting networks that provide mutual benefits to members and can access social resources available within the network. Access improves decision-making and affects behaviors. Chiu et al. (2006) and Hazen et al. (2016) argue that interactions within a social network led to a standard of acceptable social norms which have an impact on health behaviors, such as substance abuse, alcoholism, prostitution, etc. Social capital enhances access to health-care through lobbying while providing psychosocial support networks important for the physical and mental well-being of members. There exist two elements of social networks

    (a) Social relations (Portes, 1998)

    (b) Quantity and quality of resources available within a network (Bourdieu, 1985)

Kankanhalli et al. (2005) highlight the importance of social capital in the creation of a conducive environment for knowledge exchange and information flow. The latent constructs of social capital can be developed using the principal concept analysis to reduce the set of related variables to a smaller number of underlying components. For example, given a set of j response variables, x (i.e., our proxy variables, like participation in group activities) $1, \ldots, xj$, we can estimate a set of k latent components $z1, \ldots, zk$, where k, that contain similar information, so that $x \in z$. This can be expressed as:

$$E(xij|zi1, zi2, \ldots zik) = \lambda j1zi1 + \lambda j2zi2 + \cdots + \lambda jkzik \tag{1}$$

where λ is the correlation between variable and factor of the *k* latent factors *z* for each individual *i*, derived from *j* number of explanatory variables, *x*. The correlations are represented by:

$$\rho k, k+1 = \sum_{k-1}^{k} \lambda_k \; \lambda_{k+1} \tag{2}$$

The eigenvalue is useful in measuring the variance of all explanatory variables, which is accounted for by that factor (Pugno & Verme, 2011). A factor with the larger eigenvalue is said to have the most variance. To further explore the validity of the factors that emerge from the principal concept analysis (PCA), we consider the impact of some health and well-being measures. The equation can be estimated as follows:

$$H_i = \alpha + \sum_k \beta_k Z_{k,i} + \sum_l \theta_l y_{l,i} + \varepsilon_i \tag{3}$$

where *z* represents each of the k latent factors of social capital

   y are a set of *l* control variables and (ε) is the error term. In this literature, models of individual health status are derived from the Grossman (1972b) model of demand for health capital.

2.2. Empirical literature

Contraceptive use among homeless women is an area of study that is yet to be fully studied. Alkema et al. (2013) in their research on contraceptives found that contraceptive prevalence globally had increased from 54.8% in the early 1990s to about 63.3% by 2010. Alkema et al. (2013) further noted that Central America, parts of Eastern Europe East, North, and Southern Africa had shown an increase in the utilization of contraception. Moreover, the sum of women with unmet needs for family planning had reduced from a high of 15.4% in the early 1990s to 12.3% by 2010. In the United States, United Kingdom, and Canada, it was discovered that 70% of contraceptive preference achieved was consistent with a balanced distribution of modern contraceptives (Biddlecom and Kantorova, 2013). United Nations Department for Economic and

Social Affairs (2019) noted that sub-Saharan Africa had the least contraceptive prevalence at 31% as of 2017.

Arab Countries followed with a contraceptive prevalence of 47%. More developed regions like North America recorded the highest contraceptive prevalence at 76% while Kenya had a contraceptive prevalence of 61% as of 2017.

The United Nations population division (2009) report revealed that the contraceptive prevalence among women living in the sub-Saharan region of Africa ranges from a high of 60.3% (South Africa) to 1.2% in South Sudan. Countries in the Southern parts of Africa recorded high usage of modern family planning than countries in East Africa. The West African and Central African countries reported very low rates of family planning use. Contraceptive use in Africa can be traced to the 1980s when fertility rates began to drop. In the 1970s South Africa recorded a high contraceptive prevalence relative to the rest of Africa (Lucas, 1992)

In Kenya, the contraceptive prevalence was estimated to be around 46% with a fertility rate of 4.6 in 2009. Kenya National Bureau of Statistics (2014) estimated the contraceptive preference among women in Kenya to be around 58% and unmet need was at 17.5%. Between the late 1989s and late 1990s, the proportion of married women using contraceptives increased by over two times. Results from Kenya Demographic and Health Survey suggest that by the year 2014 over 60% of unmarried women were using contraceptives.

Several studies on homeless women, their challenges, and reproductive health have widely been carried out. The street is deemed a place of survival without parental guidance and supervision. Street families rely on the streets for the provision of social, physical, and psychological support (Sorber et al., 2014). However, the streets are not friendly and initiate street families into a hostile environment of sexual abuse, drug, and substance abuse as well as physical injuries. This makes this group of people very vulnerable (Kudrati et al., 2008). The hostile street environment also tends to favor boys than girls. This is because boys are deemed more aggressive and dominate than their female counterparts. Sorber et al. (2014) in their research on street families in Kenya noted that 73% of homeless women were members of a gang, whereas 98% of men in the streets were members of a gang. Male street children, therefore, engage in crimes to get a livelihood whereas the females turn to prostitution putting themselves at a high risk of unplanned pregnancies. It's estimated that female sex workers in Ethiopia had a 28.6% incidence of unplanned pregnancies, whereas 69% of females in Cote d'Ivoire had unplanned pregnancies (Sorber et al., 2014).

A study carried out in the city of Los Angeles reveal that 28% of homeless women were pregnant and 78% of these pregnant women had unplanned pregnancies (Gelberg et al., 2001) Factors contributing to unplanned pregnancies among homeless women practicing prostitution include drug abuse and being unmarried (Kudrati et al., 2008). In Kenya research by Rescue dada, a non-Governmental organization found that 20% of women in the streets engage in commercial sex, whereas the remaining 80% are often raped and abused by other street boys leading to incidences of unwanted pregnancies and HIV and Aids. Apart from the risk of STD's homeless women are often exposed to other dangerous viral infections like Hepatitis A. Research carried out in Iran and Brazil among the youth in the street population revealed that between 80% and 92.2% had hepatitis A virus (Queiróz et al., 1995). In Ethiopia 40% of homeless women live alone while over 35% women abused drugs. 79% of street girls knew about contraceptives and had had coition in the past 12 months while 83% of homeless girls had more than two sexual partners with a mean number of sexual partners being 2.85 (Ababor et al., 2019). A study by Embleton et al. (2018) on causes factors that influence survival and death found that incidences of death were high among those street people above 18 years than those below 18 years. Embleton found that of the deaths recorded in 2018, 37% occurred in the population below 18 years. Of the total deaths, 37% was caused by HIV/Aids, 36% by assault, and 10% was caused by accidents. The education level among homeless women is also very low.

2.3. Data sources

Data collected for the study was primary data from Nairobi CBD alleys and off slum settlements of Kibra, Korogocho, Mathare, Mukuru kwa Reuben, Majengo, Kawangware, and Huruma. The sample size used during the study was determined using Gill et al. (2010) formula of sample size selection based on the desired accuracy with a confidence level of 95%. According to Bartlett et al. (2001), the percentage of occurrence in the primary survey is expected to yield maximum variance and the maximum sample size is estimated to be 50%. The population of homeless women in Nairobi was estimated to be greater than 10,000 and the level of confidence needed was 95% which corresponds to a Z value of 1.96. Using the Gills formula, we estimated the sample size as follows: $n = \frac{P(100-P)Z^2}{\varepsilon^2}$

Where:

n= size of the sample needed for the study

z = standard normal deviate with an expected confidence level of 1.96.

p = Percentage occurrence of a state/heterogeneity of the population.

ε = percentage maximum error required which is at 5%

Therefore $(1.96^2 \times 0.5(0.5)/0.05^2 = 0.9604/0.0025$

= 384.16. Rounding off to the nearest figure = 384

Using this estimate the number of homeless women interviewed was 384 plus an

additional 38 persons from the pilot study. The data collection exercise is expected to be carried out between

the 21st of November 2019 and the 5th of December 2019.

3. Methodology

Grossman (1972b) classifies health as a durable capital stock and a consumer good. Heath, as a consumer good, derives direct utility when one is healthy. Health can be a capital good that can be increased through investment in health. Investment can be done through exercise, eating healthy, and regular medical checkups. Health as a capital stock can also be depreciated with time as one ages and healthy days meant to develop economic resources are decreased. Health can be utilized by an individual as an investment good or consumption good.

3.1. Theoretical framework

A household will seek to maximize its utility subject to a budget constraint and the health production function (Grossman, 1972b). The household utility maximization function is given as

$U = f(F_h, C)$

where;

U: Is the utility of the household

F_h: Family Health

C: The consumption of other market goods.

The budget constraint is stated as:

$$M = P_F F + P_J J + P_C C \tag{4}$$

where:

M: The income of the household

P_F: Cost of using family planning

P_J: Cost of inputs like knowledge of contraceptives

P_C: Cost of other consumption goods consumed by the household

Moreover, the health production function is given as follows:

$$H = f\left(F_p + J_m + C_O\right) \tag{5}$$

where:

H: Health

F_p: Methods of family planning

J_m: Other inputs in the market

C_O: Other household consumption

Using the equations 1 and 2, we form the following Langrage function:

$$L(F, C) = U(F_h, C) + K\left(M - P_f F - P_J J - P_C C\right) \tag{6}$$

Solving equation 4 we shall have the following reduced demand function for the use of family planning:

$$D = f\left(P_f, P_j, P_C, Y, V\right)$$

where:

V: other variables

P_f : Cost of using family planning

P_j: Cost of inputs like knowledge of contraceptives

P_C: Cost of other consumption goods consumed by the household

Y: household income

The household utility function described in *Equation 5* above applies to homeless women. Homeless women like other individuals seek to maximize their utility. To achieve this homeless woman, engage in income generating activities like begging, others, i.e.,, prostitution and small

businesses. Street women work with a budget that is subject to the price of contraception, price of knowledge, and the price of other commodities. *Equation 6* points to the fact that keeping the income constant, an increase in the price of contraception will reduce consumption of contraception or reduced consumption of other goods consumed by a household.

Equation 7 outlines the relevance of family planning on family health and wellbeing. From this equation, underutilization of family planning leads to poor health.

Equation 8 shows that increasing the price of family planning will reduce or increase quantity demand. Moreover, increasing the prices of other household consumables reduces or increases the demand for family planning services.

3.2. Empirical model

3.2.1. Logistic regression model
The logistic model was used since the dependent variable in the study is a binary. The logistic model was therefore used to combine the covariate values and convert them into a probability scale of between 0 and 1.

The logit analysis is an extension of the linear probability regression model that expresses the dependent variable Y as a non-linear function of the explanatory variable X.

$$y = f(x)$$

The general linear regression model is often expressed as follows:

$$Y_i = \beta_0 + \beta_i X_{1i} + \beta_2 X_{2i} + \ldots + \beta_k X_{ki} + \varepsilon_i \tag{7}$$

where;

β_0 is the intercept

β_i 's is the slope between Y and the X_i that is needed

ε is the error term

The linear equation 6 above can be interpreted as the probability that a homeless woman uses contraceptives or not, given the independent variables in the model. The logit model was used to analyze the first objective that estimated factors affecting contraceptive usage among homeless women in Nairobi. The dependent variable takes the form of value 1 if contraceptives are used and 0 if contraceptives are not used. The model is simplified such that:

$$Log\left(\frac{P_i}{1 - P_i}\right) = Logit(P_i) = \beta_0 + \beta_1 AGE + \beta_2 AFB \ldots .\beta_i x_i + \varepsilon \tag{8}$$

where X represents all the explanatory variables in the study (respondent's age, education, age at first birth, drug abuse by the respondent and partner, miscarriage/stillbirth/abortion incidences, living with a partner, child planning, neonatal death incidences, knowledge on female sterilization, knowledge on male sterilization, income source contraceptive spending and visit by a healthcare worker in the past 12 months).

In our example, P_i is the probability of using or not using contraceptives, and x represents the explanatory variables. Therefore, the parameter β_0 gave the log odds of a Street woman having

not used contraceptive (when $x = 0$) and β_1 shows how these odds differ (when $x = 1$) when a street woman was using contraceptives. The study, therefore, describes the model in terms of odds as follows: $\left(\frac{P_i}{1-P_i}\right) = exp\ (\beta_0 + \beta_i x)$ and in terms of the probability of the outcome (e.g., use or not using Contraceptives) occurring as:

$$P_i = exp(\beta_0 + \beta_1 X)/(1 + exp(\beta_0 + \beta_1 X)) \tag{9}$$

4. Results & discussions

4.1. Descriptive statistics
Age was found to be an important explanatory variable in the study and the descriptive statistics indicated the average age of women in the streets to be 27 years. The study also found the average age of childbearing in the streets to be 19 years as shown in Table 1 below. The average number of children per woman in the streets was found to be three children which was slightly lower than the national fertility rate of 3.9 (Kenya National Bureau of Statistics, 2014).

4.2. Demographic analysis of the respondents
A demographic analysis on homeless women in Nairobi county found the average age of a homeless woman in Nairobi county to be 28 years. The study further found that homeless women had an average of two children. Moreover, the average age at first birth for homeless women in Nairobi was found to be 19 years. A qualitative analysis on homeless women has revealed that the majority of homeless women in Nairobi county had walked out of their matrimonial home as a result of domestic violence and others had joined their partners in the search for employment in the city and were either unemployed, beggars, small business owners, casual workers, or generated income from other means not mentioned above. The study found over 10% of homeless women to be beggars and majority small business owners.

The study further found that over 34% of homeless women were born and raised in Nairobi County. The remaining 66%, had emigrated from various counties in Kenya which includes Homabay, Kiambu, Kisumu, Kwale, Machakos, Meru, Moyale, Nyandarua, Siaya, Uasin Gishu, and Wajir. Kakamega recorded the highest level of immigration at 9.84%. The study further noted that 54.87% of homeless women had emigrated from the rural areas while 45.13% had either been born in Nairobi or emigrated from an urban area.

Education attainment among homeless women in Nairobi, Kenya was also analyzed. The study found that majority of homeless women were well educated and a some had tertiary level of education. Majority of these women had attained primary-level education while less than 10% had never attended school. An increase in primary school attainment by homeless women can be attributed to the free primary education introduced in Kenya in 2003 by the National Rainbow Coalition Party (Republic of Kenya ROK, 2003). A higher enrollment in secondary schools is as a result of subsidized secondary school tuition fees (for Day schools) and the introduction of adult education centers. Kenya has continued to position adult education as part of its long-term strategy to bring balanced development across regions of the country (UNESCO, 2007).

5. Discussion
Findings from this study reveals an interesting phenomenon where homeless women behave just like other sheltered women in decision-making and sometimes act differently due to challenging socio-economic and psychological challenges. It is to be noted that homeless women face life challenges quite differently than sheltered women. Homeless women often deal with emotion stress, low self-esteem, violence, drug abuse and rape (Volpi, 2002). Most DHS data estimate the childbearing age of a woman to be between 15 and 49 years. However, the dynamics facing women in the streets is different as their childbearing age can be as low as 13 years. Majority of

Table 1. Descriptive Statistics					
Variable	**Observations**	**Mean Std. Dev.**	**Std. Dev**	**MIN**	**MAX**
AGE	363	27.73829	8.681939	13	50
No of Children	363	2.261708	1.814717	0	9
AFB	295	19.12881	4.09459	1	29
Living with Partner	363	0.661157	0.47397	0	1
Drug use by respondent	361	1.132964	0.498937	1	3
Midwife Assistance	331	0.6827795	0.466099	0	1
Miscarriage/ Abortion/ stillbirth Incidence	360	0.1777778	0.382858	0	1
Child Planned	326	0.5766871	0.494844	0	1
Health facility delivery	320	0.79375	0.405246	0	1
Neonatal death Incidence	328	0.1707317	0.376849	0	1
Knowledge on Female sterilization	363	0.7272727	0.445977	0	1
Ever attended school	363	0.9834711	0.127674	0	1
Knowledge on Male sterilization	363	0.5068871	0.500643	0	1
Knowledge on IUD	363	0.8099174	0.392908	0	1
Knowledge of lactational amenorrhoea	363	0.7217631	0.448749	0	1
Contraceptive spending	363	0.1019284	0.302972	0	1
Education of Respondent	363	8.181818	4.135816	0	14
Unemployed respondent	339	0.339233	0.474149	0	1
Beggars	339	0.1622419	0.369218	0	1
Small Business holders	339	0.3834808	0.486953	0	1

Source: Authors Computation.

street children are emancipated minors who lack parental supervision and are often exposed to the risk of prostitution and sexual abuse earlier in their development (Woan et al., 2013).

As illustrated in table 2, findings from this study revealed that, the more a street woman delays her first birth the more she uses contraception. These results collaborate findings by Sedekia et al. (2017). In their research on contraceptive use among women in southern Tanzania, these researchers found the odd ratio of using contraceptives to be higher among women with higher age at first birth that those who got pregnant earlier.

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	LOGIT	LOGISTIC	MARGINS
Table 2. Estimates of contraceptive use among homeless women in Kenya			
Variable	**Coef.**	**Odd ratio**	**dy/dx**
AGE	−0.021623 (0.052493)	0.978609 (0.05137)	−0.00159 (0.003863)
No of Children	0.1846318 (0.210066)	1.202775 (0.252662)	0.013585 (0.015495)
AFB	−0.1144442** (0.04823)	0.891862** (0.043015)	−0.00842** (0.003599)
Living with Partner	3.502741*** (0.875339)	33.20635*** (29.06683)	0.257721*** (0.058354)
Drug use by respondent	0.4416348 (0.395311)	1.555248 (0.614806)	0.032494 (0.029379)
Midwife assistance	−2.652877** (1.139783)	0.070448** (0.080296)	−0.19519** (0.076993)
MSA Incidence	−1.013127* (0.565214)	0.363082* (0.205219)	−0.07454* (0.039107)
Child Planned	−0.493612 (0.539273)	0.610418 (0.329182)	−0.03632 (0.038495)
Health Facility Delivery	3.259726*** (1.086456)	26.0424** (28.29392)	0.23984*** (0.069286)
Neonatal Death Incidences	0.356435 (0.542734)	1.428229 (0.775148)	0.026225 (0.040396)
Knowledge on Female Sterilization	−0.1563379 (0.780928)	0.85527 (0.667904)	−0.0115 (0.057596)
Ever Attended School	4.818764*** (1.335246)	123.8119*** (165.3195)	0.354549*** (0.098552)
Knowledge on Male Sterilization	0.0532173 (1.156315)	1.054659 (1.219518)	0.003916 (0.084987)
Knowledge on lactational amenorrhea	−2.975759*** (1.00998)	0.051009*** (0.051518)	−0.21895*** (0.06978)
Contraceptive spending	2.99928*** (0.81476)	20.07107*** (16.3531)	0.220678*** (0.065794)
Education by Respondent	−0.0241802 (0.050248)	0.97611 (0.049047)	−0.00178 (0.003781)
Unemployed	−1.667978** (0.850809)	0.188628** (0.160487)	−0.12272* (0.063868)
Beggars	−3.195127*** (0.745177)	0.040961*** (0.030523)	−0.23509*** (0.061659)
Small business holders	−0.7597672 (0.951844)	0.467775 (0.445249)	−0.0559 (0.072255)
_cons	1.42777(1.72448)	4.16939 (7.190028)	
Overall fit of the model	**Number of obs = 268**	**Number of obs = 268 Wald chi2(17)= 71.35 Prob > chi2 =0.0000 Pseudo R2 = 0.4090**	**Number of obs = 268 Wald chi2(17)= 71.35 Prob > chi2 =0.0000 Pseudo R2 = 0.4090**

N/B: ***(1%), **(5%), *(10%)
Source: Authors Own Computation.

Findings from the research has revealed that giving birth in a health facility increases a street woman's predicted probability of contraceptive use by over 20%. These results collaborate findings from research by Lasong et al. (2020) who found that women who give birth in a health facility were 1.73 times more likely to use contraception than women who gave birth away from a health

facility. These findings point to the importance of healthcare facilities as center of reproductive health utilization.

The study further revealed that an additional incidence of miscarriages, abortions, and still births increased the predicted probability of contraceptive use by over 7%. These findings are in line with Singh et al. (2017) who noted that, the use of modern contraceptives in sub-Saharan Africa averted 12.6 million unintended pregnancies with 64% of the unplanned pregnancies averted likely to occur in the southern part of Africa.

The study further found that increasing contraceptive spending by KES 1 increases the predicted probability of contraceptive use by over 2000%. These findings are in line with findings by a number of researchers. Weinberger et al. (2021) noted that the private out of pocket expenditure on family planning in 2019 increased to $2.73 billion in 113 middle- and low-income economies. Of these budgets 29% was mainly used to purchase pills. Brant et al. (2022) further noted that from 2013 to 2016, 38% of women who spent on contraceptives from out of pocket used on average $216. The study further reveals that 98% of women who spent from out of pocket consistently utilized contraceptives.

The research also found that being assisted by a midwife during delivery increases the predicted probability of contraceptive use by over 7%. These results collaborate findings from qualitative research collected during the study A few women gave their view on mistreatment by midwives from public hospitals who look down upon them. *The midwives we meet at the Kibera hospital look down upon us. They say we are dirty and we smell like dogs. They however give us lessons on family planning and sometimes carry some pills as they come (Midred, 31, Kibera off slum settlement)*

The research also found women who had knowledge on contraceptive methods like lactational amenorrhoea to more likely to utilize contraception. These findings collaborate the work of Alemu et al. (2020) who found the odds of contraceptive use among women with knowledge on contraceptive methods like lactational amenorrhea to be 3.9.

The research also found that attending school improved the predicted probability of contraceptive use by over 30%. This collaborates findings by Bbaale and Mpuga (2011) who noted that 16.1% and 24.7% of women with primary and secondary education utilized modern contraceptives, while only 9.7% of women who had never attended school utilized modern contraceptives. Other studies from rural Zambia found that women with secondary school level of education were 7.61 times more likely to use contraception while women with higher level of education where 2.39 times more likely to use contraception than women with secondary school level of education (Lasong et al., 2020)

The study further found that an additional year unemployed or practicing begging reduces contraceptive use. These findings collaborate finding by studies carried out in Ghana in 2008 by Justice and Novignon (2014) who found that women in the richest quantiles of Ghana's economy were 2.6 times more likely to utilize contraception while women in the poorest quantiles were 1.14 times more likely to utilize contraception. These findings reveal that poor women will less likely utilize contraception than richer women.

The study also found that an additional year living with a partner increased the predicted probability of contraceptive use by over 25%. These findings collaborate studies that point to the use of contraceptives for purposes of spacing and delaying births (Zewude et al., 2019). Studies that collaborate these findings include studies by Akoth et al. (2021) who noted that one-fifth of married women in developing countries were using contraceptives due to increased sexual frequency necessitated by living with a partner. They further noted that 0–4% of married women in 52 developing countries lacked knowledge on contraceptives while 20–33% continue contraceptive use despite suffering adverse effects.

The study also found that spending a year as a beggar or as an unemployed person reduced the predicted probability of contraceptive use. The county government in collaboration with the National government can set up a fund to finance business start-ups for homeless women. Business professions can also be recruited to give advice and help street women nurture their businesses into maturity. The National government through the affirmative fund can assist businesses owned by street funding through increased funding to the affirmative fund. The affirmative fund currently caters for the needs of youths, women and people living with disabilities. Homeless women should be included as a special group and be given more allocation in the funds (Lavagna et al., 2019).

Further probing during the interview pointed out the important role the government has played to provide free contraception to all the needy women in society. Some women in the off-slum settlements of Kibera, Mathare, and Mukuru as well as the CBD Alleys pointed to free contraception being offered in public hospitals. *Free contraception was offered at Kibera south hospital but sometimes residents were charged a small fee of $1 (Joan, 27, Kibera)*. More probing on why homeless women choose to use contraceptives pointed out the need to space children or stop childbearing at all costs. Other women desired to offer their children a quality life since life was already hard on them. With homelessness women lacked jobs and sources of income to purchase contraceptives or visit health facilities.

6. Conclusions

The study found homeless women to be rational in decision-making. However, some behavioral and environmental factors affect the way they make some decisions, especially on issues of family health. The research found that even though homeless women utilize contraception when they visit a health clinic during delivery, lessons on family planning done in health centers to benefit only those who can be physically present. More community health volunteers should be recruited and assigned to villages, slums, and the streets to give lessons to women who can't access health facilities during birth. Mobile clinics should also be increased in slum areas and street alleys to reach every homeless woman in need of reproductive health services. The study through qualitative research found that homeless women were reluctant to go back to healthcare facilities after unfair treatment by healthcare workers. The government should ensure that healthcare workers are trained on care for the vulnerable. Furthermore, homeless women were found to be unable to meet their contraceptive needs using out of pocket expenditure. The government is therefore tasked with the responsibility of providing a wide range of free or subsidized contraceptives to all.

The study noted attending school highly increases the odds of contraceptive use. This finding is important since education is expected to impart knowledge on modern contraceptives. Lessons on family planning should therefore be introduced early on in primary and secondary school curricula to reach out to all men and women in that level of education. Bursary funds can also be set up by the county government of Nairobi to aid in education for children residing in the streets. Streets campaigns on family planning should also be introduced to reach out to all homeless women. In agreement with Kenya's government vision 2030 that seeks to provide universal health coverage to all by 2030, homeless women should also have access to reproductive healthcare. Community health workers and outreach programs should expand their jurisdiction to homeless women all over the country such that all women regardless of their socio-economic backgrounds have access to affordable contraception. The government should also offer financial safety nets for the homeless women who are not able to work due to physical disability and offer free rehabilitation to those struggling with substance abuse. Homeless women should also be considered for employment especially casual labor, while those operating small business should be exempted from municipal rates and provided subsidized business premises to boost their businesses.

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