Social-Economic Determinants and Outcomes among Teenage-Pregnancies

In Machakos County

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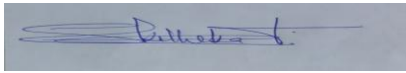
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Declaration

This study is my original work and has not been presented for examination or award of a degree in any other institution of higher learning.

Signature _____   Date   : <u>13th April 2022</u>

Stephen Katia Kitheka MD.

I have approved the submission of this thesis for examination as the university supervisor.

Signature _____   Date   <u>11-11-2022</u>

Professor Tabitha Kiriti-Nganga

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Abstract

The main aim of this research project is to investigate the socioeconomic disparities and outcomes among teenage pregnancies in Machakos County. Further, the study examined how these socioeconomic disparities influence the occurrence of teenage pregnancies in the county and at the same time investigated the socio-economic outcomes of these teenage pregnancies.

The study employed a cross-sectional descriptive study structure. The research was conducted in five select sub counties (20 households per Sub County), four level 4 hospitals and the Machakos County Referral Hospital all in Machakos County.

Research participants were teenagers aged 13-19. A self/assistant administered questionnaire was used as the primary data collection tool. Participants were sampled using simple random sampling method.

Data collected was analyzed using Stata Statistical software. The econometric model used was a multivariate regression model.

The study results showed that 90% teenage pregnancies occurred between 15-19 years. Seventy eight percent of the pregnant teenagers were single. Further, the major socioeconomic determinants of teenage pregnancy were found to be mode of schooling with an odd ratio (OR) of 3.03; household income 2.84; fathers' education level with OR of 2.99; and favors for sex with OR of 2.56. In conclusion, the studied socioeconomic determinants didn't have significant influence on teenage pregnancies' outcomes on marital status, financial dependence and schooling outcomes. The study recommends developing means and methods that economically empower parents and girls from low socioeconomic backgrounds; strengthening policies that address support for pregnant teenage girls and the dynamics facing teenage girls in day secondary schools.

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LIST OF ABBREVIATIONS

WHO   World Health Organization

KDHS   Kenya Demographic Health Survey

UNICEF   United Nations Children's Fund

NCPD   National Council for Population and Development

ARHS   Adolescent Reproductive Health Services

UNPD   United Nations Populations Division

UNFPA   United Nations Population Fund

CHAPTER ONE: INTRODUCTION

1.1 Background information

Teenage pregnancy is defined as pregnancy in persons aged 13-19 years. The term teenager is sometimes used interchangeably with the term adolescent. However, adolescent strictly refers to a phase when one enters puberty. This can happen earlier than 13 years of age and go beyond twenty years. On the other hand, teenager refers strictly to those aged 13-19 years. The World Health Organization (WHO) estimates that close to 90% of people aged 10 to 19 years old live among the developing countries which Kenya is part of (WHO, 2011). Globally, the population of those aged between 10-19 years makes 16% of the world population.

The United Nations Population Fund (UNFPA) estimates that on average 16 million girls between the ages 15-19 years, and 2 million girls below 15 years of age become pregnant globally each year. This figure is higher in low-income countries than high-income countries. For instance, in 2010, teenage pregnancies for ages 15 to 19 years were four times in low-income countries than in high income countries (UNFPA, 2015).

 On average, about 16 million girls aged 15-19 years and 2.5 million girls below 15 years give birth each year in developing countries (WHO, 2019). In addition, half of pregnancies in the 15-19 age bracket in developing countries are unintended (Darroch, 2016). The Kenya Demographic and Health survey (KDHS) data shows that, 50% of women aged 20-49 had had their sexual debut by 18 years. Those who become pregnant in the 15-19 years age bracket, 59% are unintended pregnancies and 45% of the adolescents develop severe abortion complications.(KDHS, 2014).Moreover, the Kenya National Council for Population and Development (NCPD) estimates that 1 out of 5 school going teenager girls get pregnant before they attain the age of 20 years. UNFPA report shows that Kenya recorded 378,397 adolescent and teenager pregnancies for girls aged 10-19 years between July 2016 and June 2017. Further, NCPD approximates the Kenya national teenage pregnancy to be 18% with an annual school drop out of over 13,000 teenage girls because of pregnancy. Machakos County has teenage pregnancy rate of 14% (NCPD, 2018).

Prospects data of the world obtained from the United Nations Population Division (UNPD) shows the information presented in tables and graphs regarding female teenagers. Table 1 has

data of the world, Sub-Saharan Africa and Kenya of the total female population in clusters of ages 10-14 and 15-19.

Table 1 : Population of females aged 10-19 years in the World, Sub Saharan Africa and Kenya in thousands.

Location	Sex	Age	2005	2010	2015	2020
World	Female	10-14	293 769	292 351	297 197	309 770
World	Female	15-19	302 955	291 785	290 910	295 554
Sub-Saharan Africa	Female	10-14	45 005	51 356	58 908	67 249
Sub-Saharan Africa	Female	15-19	39 413	44 336	50 674	58 264
Kenya	Female	10-14	2 266	2 654	3 002	3 341
Kenya	Female	15-19	2 138	2 242	2 638	2 989

Source; WorldBank (2020)

Figure 1 gives a comparison of the teenager population for the 15-19 years age bracket for Kenya, Sub- Saharan Africa and the World in absolute numbers. Kenya, as well as Sub Saharan Africa's' population for this age group has been rising while the worlds' population has remained steady.

Figure 1. World, Sub Saharan Africa and Kenya female population for age 15-19 in thousands.
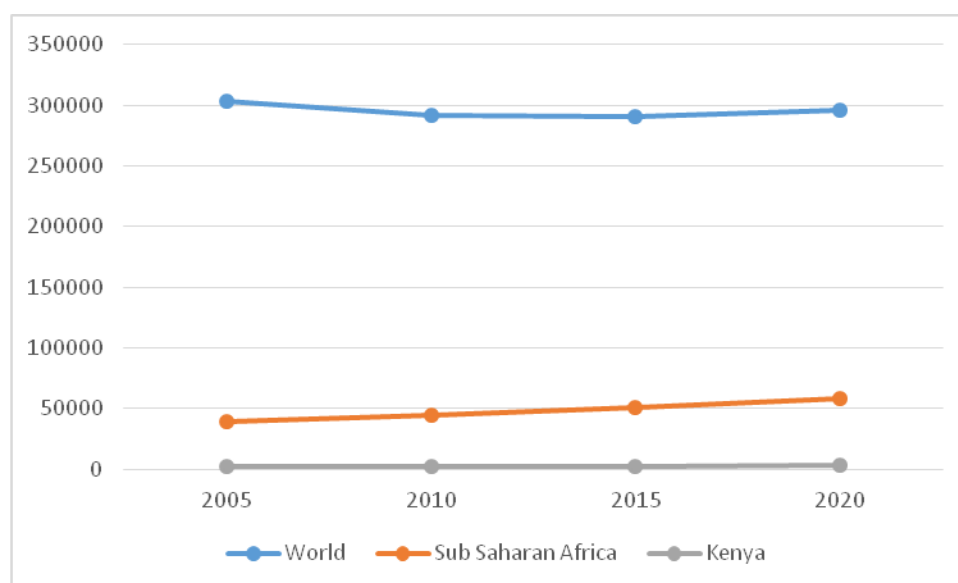
Note. Data from the WorldBank(2020)

Worldwide population prospects on female teenagers shows that Kenya still has a higher percentage of female teenagers per 100 female population compared to Sub Saharan Africa and the World. Due to this high proportion of female teenagers in Kenya, teenage pregnancy still remains an important socioeconomic and health challenge. This information is summarized in Table 2 and Figure 2.

Table 2 : Proportion of female teenagers per 100 female population

Location	2005	2010	2015	2020
World	13.0	11.8	11.2	10.8
Sub-Saharan Africa	15.5	15.2	15.2	15.3
Kenya	16.3	15.4	15.8	15.9

Note. Data from the (WorldBank, 2020)

Figure 2 Proportion of Female population by broad age groups (per 100 female population).
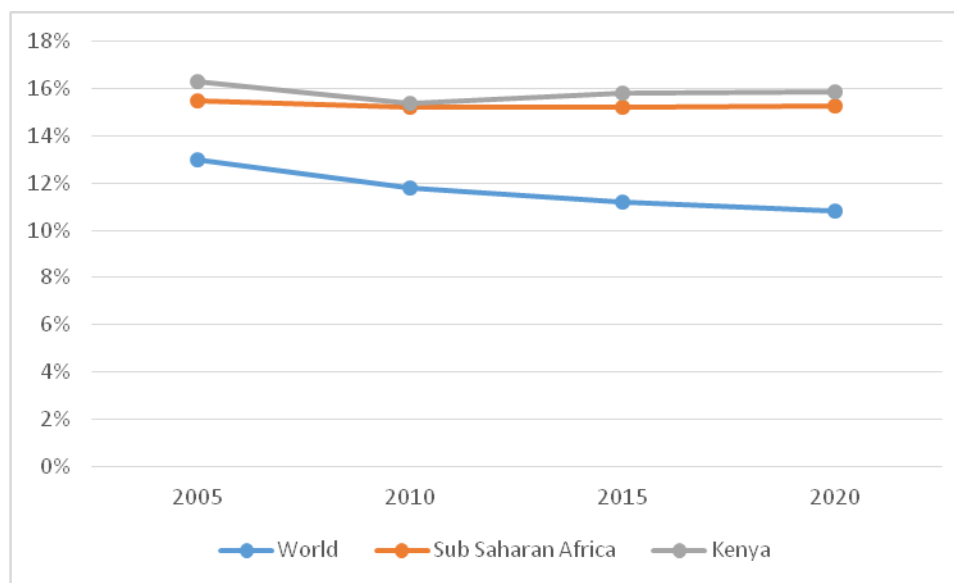
Note. Data from the WorldBank (2020)

From the year 2005 to 2020, there has been a steep decline of the worlds' adolescent fertility rate for teenagers in the 15-19 years age bracket. In 2005, there was 49 births per 1000 dropping to about 42 births per 1000 by the year 2020. This data is presented in table 3.

Table 3: Fertility rates of 15-19 year olds for Kenya, Sub Saharan Africa and the World

Location	Age	2005 - 2010	2010 - 2015	2015 – 2020
World	15-19	49.2	46.7	42.5
Sub-Saharan Africa	15-19	120.2	113.2	104.4
Kenya	15-19	97.1	86.2	75.1

Note. Data from the WorldBank(2020)

Although Kenya has a lower teenager fertility rate compared to Sub Saharan Africa as a region, fertility rates of up to 75 births per 1000 is still high. Table 4 shows the number of births among mothers aged 15-19 years. From the data, the number of births has not significantly changed over the last 15 years. This means research on effective interventions that will reduce pregnancy of girls below twenty years is still required.

Table 4 : A table showing the number of births among teenagers aged 15-19 for three period years

Location	Age	2005 - 2010	2010 - 2015	2015 – 2020
World	15-19	73 124	68 032	62 366
Sub-Saharan Africa	15-19	25 174	26 896	28 444
Kenya	15-19	1 063	1 051	1 056

Note. Data from the WorldBank (2020)

During the teenage years, teenagers experience adolescent changes. These changes include psychological, physical maturation of all body systems and other life changing transformations. Firstly, after the onset of puberty, hormones produced primarily in each gender trigger a sequence of physical body changes. Example is the distribution of body hair, increased physical body strength and vigor in men while females acquire feminine traits like menarche, feminine hair and body shape characteristics (Guyton, 2006). In addition, under the influence of puberty hormones, neuro-developmental changes take place.

Teenagers increase their cognitive abilities and change roles to more responsible persons with abilities to make own decisions (WHO, 2019). It is during the teenage period that teenagers make decisions about their sexual orientation, social values on what is right and wrong, forming a personal identity and making personal relationship choices. It is during this time that teenagers try out romantic relationships and engage in explorative behavior including sexual activities. These romantic relationships and sexual activities may lead to among others, teenage pregnancies, sexually transmitted infections, conflict with parents and early marriages.

Teenage pregnancy has multidimensional impacts on a girl's health, life and future. Medically, teenage pregnancies are associated with complications like; pre-eclampsia, post-partum mental illness, fetal genetic defects, cephalo-pelvic disproportion, uterine inertia and unsafe abortions, which affect adversely on maternal morbidity and mortality. Teenage pregnancies, alter a girl's safe and successful transition from childhood to adulthood. Denied rights to education, stigma or rejection by parents and peers, unmet emotional/psychological needs and premature adult responsibilities are among socioeconomic consequences of adolescent pregnancies (UNFPA, 2015).

Socioeconomic disparities are imbalances related to differences in education achievement, income, occupational background, social class, educational achievement and neighborhood deprivation. It contains structured and repetitive patterns of unequal distribution of goods, wealth, opportunities and punishments (Ashley, 2019).

Growth from childhood through teenage and adolescence has an impact on change of disease burden to somewhere between childhood and adulthood. For this reason, teenagers are more likely to have unmet health needs than children and adults although they do not make up most of the outpatient visits. Among the diseases with major impacts on teens and adolescent's health are unintended pregnancy, sexually transmitted diseases, mental disorders, injuries and substance use and abuse (Kliegman, 2007).

In evaluating the universal health coverage program for adolescents, the WHO identifies a number of inequalities present in adolescents and subsequently teenagers that adversely impact their health. Firstly, they may find public health services unacceptable to them due to lack of respect, privacy and imposition of moral values by healthcare providers. Secondly, inability to meet out of pocket costs and lack of health insurance worsen their ability to access services

independent of their parents. Thirdly, access to health is made worse by adolescents having to seek permission from parents and guardians to seek medical care (WHO, 2019). This presents a major social inequality in access to healthcare among youths.

The Kenyan government in efforts to curb school dropouts due to teenage pregnancies, it has increased efforts to have teenage mothers continue with their education. In the year 2019, the education cabinet secretary, Professor George Magoha, issued a directive to all education officials that no pupil should be discriminated against in joining form one due to pregnancy. Again, parents who had married off their daughters after they got pregnant were also required to be repatriated back to their homes awaiting form one admission. Those who get pregnant while in secondary schools are required to unconditionally re-admit the students after giving birth or during the start of the academic calendar year (Daily Nation, 2019).

Machakos county youthful population below 15 years is 39 % of the total population and those between 10-19 years is 24 %. KDHIS for the year 2020 shows Machakos has a record of 3,940 pregnancies for the months of January to May and ranks 15th in the country. This population ratio is significant especially in sexual and reproductive health in adolescent, which is a main area of concern in Kenya. It is for this reason that this study intents to investigate the socio-economic disparities and socioeconomic outcomes among teenage pregnancies in Machakos County.

1.2 Statement of the research problem

Teenage pregnancy is not only a health concern but also a persistent global socio-economic issue. The World Bank projects Kenya's female teenage population at 13%. The KDHS 2014 gives a high a high teenage pregnancy rate of 18%. Teenage mothers develop more adverse perinatal complications than adult *primigravida* mothers do. They include low birth weight, preterm delivery, and small for gestational age, stillbirths, and neonatal deaths (Mukhopadhay, 2010). In addition, teenage mothers have l[1]ow schooling which in turn results to low earnings.

The WHO (2011) came up with prevention of early pregnancy and poor reproductive health outcomes among adolescents (including teenagers) in developing countries guidelines. Despite the adoption of these guidelines in Kenya and the subsequent formulation of the Kenya national

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[1] *Primi gravida*; a woman who is pregnant for the first time.

adolescent and reproductive health policy in 2015, the World Bank (2020) data for two-five-year periods years from 2010-2015 and 2015-2020 shows a low reduction rate in teenage pregnancies of 1.12% and 0.48% respectively.

Were (Were, 2007) and Franklin (Franklin, 2016) have done studies on determinants of teenage pregnancies in Busia and Narok Counties respectively. Both studies have not focused on socioeconomic background as a determinant that influence teenage pregnancies and the socioeconomic outcomes associated with the teenage pregnancies. Our study will aim to bridge this gap in knowledge.

1.3 Research question

The broad research question for this study is: what are the socioeconomic determinants and outcomes among teen pregnancies in Machakos County? The following are the guiding specific research questions.

a) What are the socioeconomic determinants of teenage pregnancies in Machakos County?

b) To what extent do the existing socioeconomic determinants influence the occurrence of teenage pregnancy?

c) What are the socioeconomic outcomes among the teenager pregnancies in Machakos County?

d) What is the influence of the existing socioeconomic determinants on teenage pregnancy outcomes in Machakos County?

1.4 Research objectives

This study seeks to investigate the socioeconomic determinants and outcomes among adolescent pregnancies in Machakos County. The study will specifically seek to:

a) To investigate the socioeconomic determinants of teenage pregnancies in Machakos County.

b) To investigate the extent to which the existing socio-economic determinants influence the occurrence of teenage pregnancy.

c) To determine the socio-economic outcomes of teen pregnancies in Machakos County.

d) To investigate the influence of the existing socioeconomic determinants on teenage pregnancy outcomes in Machakos County.

1.5 Justification of the study

The Kenya Teen Sexual and Procreative Health Management has several objectives; To promote positive legal constitutional and socio-cultural environment for provision of sensual and reproductive health data and services for teens; To improve unbiased access to high quality, active and practical Adolescent friendly Reproductive Health Services (ARHS) and establish inter-sectoral strategy and networking, cooperation's and community participation in teen sexual and reproductive health policy". Teenagers fall under this category. This study will specifically seek to address issues around socio cultural environment regarding teenage sexuality, provide insights on elimination of inequities in access to teenage sexual and reproductive services and insights into inter-sectoral interplay in teenage pregnancies.

The study will benefit Kenya health policy experts in education, sexual and reproductive health care. Results from the study will be used to fill gaps in the formulation of socioeconomic solutions/policy to the challenge of teenage pregnancies.

1.6 Organization of the study

There are five chapters in this study proposal. Chapter one is the introduction to the study. The Introduction includes basic definitions, the aim of the study, research questions, statement of the research problem, and the pretext of carrying out the research. Chapter two comprises the literature review; both analytical and factual literature reviews. Chapter three consists of the research methods, including the study design, target population, sample size calculation, sampling methods, data compilation procedures and analysis techniques. The fourth chapter will focus on data results, presentation, analysis and discussion of the research results. Chapter five will include the study summary, conclusions and recommendations based on the research the findings.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

This chapter presents a theoretical literature and the empirical reviews. The theoretical literature review presents a theoretical perspective of how social and economic factors influence an individual's behavior and their process in making a decision. Specifically, it narrows down to how these factors influence a teenager's reproductive health decision. The study reviews the empirical literature on the circumstances that surround teenage pregnancies. Analysis of the literature review is provided at the end with the literature gaps identified.

2.2 Theoretical literature

Theoretical literature covers the relevant theories that informed this research. The theories included the social action theory as proposed by Max Weber, the theory of speculative action designed by Fishben and Ajzen and the functionalist theory.

2.2.1   Social action theory

Max Weber (1864-1920) established the social action theory. The theory draws a distinction between things that happen to a person and the things a person makes happen (Rashmi, 2020). The theory has assertions that every action a person does is a product of the dynamic and controlling forces affecting that person. The forces include the past, present or future actions, behaviors and attitude of others. Weber concludes his work by identifying the four forms or types of motivations of social action namely; Value rational action, evaluative action, emotional action and traditional actions.

Value rational social action are actions that are influenced by a conscious assumption in intrinsic value of a type of conduct. Evaluative social behaviors are actions carried out to arrive at a specific objective, performed because they lead to a certain outcome. Emotional or compelling social conduct is an action that is defined by ones' definite devotion and hysterical state without considering the attached consequences. Lastly, traditional social behaviors are actions defined by tradition (how things are done) and cultural expectations.

Therefore, the social action theory applies to this study by demonstrating how a society influences teenage behavior. This is true especially how culture, religion and family customary

law influence a person's age of marriage, initiation of sexual activity and consequences of pregnancy outside marriage. Furthermore, the theory explains the difference seen among individuals. For example, among a group of female teenagers who engage in sex, motives may vary from seeking pleasure to desire to be valued, desire for intimate relationship, showing care and as a way of expressing affection. However, the theory ignores powers and resource distribution in society and how these play a role in shaping people's behavior.

2.2.2 The Theory of Reasoned Action (TRA)

Fishben and Ajzen (1975) suggested the Theory of Reasoned Action (TRA). The theory postulates that an individual health behavior is dogged by their willingness to behave and in return, this willingness is a function of their emotion towards the act, and subject measure regarding the behavior. The TRA anticipates behavioral motive, an accord between controlling an attitude forecast and actually predicting an act. A modification of TRA was developed by Ajzen (1985) as the theory of planned behavior (TPB) which suggests that the possibility of a person taking part in a health behavior is corresponded with the strength of their motive to engage in the behavior. A conduct motive represents' a person's willingness to behave and is itself as a result of merging various variables.

Ogden (2003) argues that the two theories have constructs that are not specific and therefore cannot be precisely tested. Also, the importance of emotions, subject measure and approach of behavioral discipline for the prediction of intentions is expected to differ from conduct to conduct and populace to populace according to Ajzen (2003).

These theories apply when predicting a teenager's desire to postpone unwanted teenage pregnancy and the actual intention of engaging in unprotected sex that risk them to being pregnant.

2.2.3 Functionalist theory

One of the major sociology theoretical perspectives is the functionalist theory developed by Hebert Spenser (1820-1903). This theory states that a society is made up of social institutions, which serve given roles. Each social institution serves its given roles in the society during its existence but its existence is no more necessary if it no longer serves those roles (Crossman,

2020).This perspective holds that when one section of the social structure is flowed, it alters other social institutions and creates social problems, prompting social change. The social change could be adjusting to achieve stability or parts of the society adapting to produce order. Deviant behavior therefore leads to change. Functionalism has weaknesses because it views agitation for social change as undesirable even when this social change may benefit the society. The study borrows from the functionalist theory how a society preexisting socio-economic norms and order pre-determine a teenager's moral standards, education and literacy levels, religious expectations and adherence or non-adherence to cultural and traditional morals. Further, this may influence a community's teenage pregnancy prevalence, views on expected teen's behavior, and perspectives in teenage marriages and women empowerment.

2.3 Empirical literature review

In this section, a review of general studies and specific literature from previous research on teen pregnancies is presented.

Teenage pregnancies occur in high-, middle-and low-income nations. A literature review on socioeconomic effects on teen childbearing by Penman (2013) concluded that unfavorable socioeconomic settings experienced in the society and family levels contribute to the rise in teenagers birth rate in the U.S (Penman-Aquilar, 2013). Family disadvantage has been shown to be a precursor of teenage pregnancies. Smith (1999), while studying the impact of socioeconomic elements on attaining objective for reducing adolescent pregnancies found that deprived areas had higher teenage pregnancy rates compared to affluent areas (Smith, 1999).

Early marriages expose teenagers to early pregnancies. Across the globe, nine out of ten of teenagers' pregnancy for years 15-19 years occur in marriage. According to UNICEF (2016), Kenya has the 20th highest absolute number of child brides in the world at 527,000 and 23% of girls in Kenya are married by 18 years. In the African context, early marriages still form a significant part of teenage pregnancies despite the changing trends with abandonment of these retrogressive cultural practices. Gender inequalities and preference of boys to girls are some of the drivers of child marriages. A study by UNICEF in 2016 showed that some girls are seen as assets and can fetch their families' money, goats, cattle, and camels in bride prices when they are married (UNICEF, 2016). Coerced and pre-arranged marriages, home escape from strict

controlling parents and related dysfunctional families are part of contributors of early marriages. This study will investigate the socioeconomic determinants at family levels among pregnant teenagers and seek to understand how each determinant plays a role in a teenager getting pregnant.

Individual person's characteristics, e.g., sexual debut, awareness of risks associated with unprotected sex and spirit of adventure common in teenagers may influence a teen's decision to engage in sex. A matched case control research in Jamaica by Joy et al 2009, demonstrated that a great proportion of 54% pregnant youths reported having sexual debut by the age 14 compared to their never pregnant peers (Joy et al, 2009). Further, this study found that a third of the participants stated they had been persuaded or coerced to engage in their first sexual encounter. In this study, a focus will be narrowed to gender power Vis a Vis forced sexual experience.

Studies by Plan international (Plan International, 2012) and (Radhika, 2018) agree that teenage pregnancies are associated with lower levels of education. A Plan International report showed that a girl who dropped out of school for any reason in Kenya would more likely get married (Plan International, 2012) . Once married, girls take up the role of a wife and gets pregnant. A study in India sought to define the factors that determined girls' education achievement. Among the factors listed include socio-economic, socio-cultural, educational level of parents and distance from school. (Radhika, 2018). Our study will narrow down on the inequalities in access to education and how they are linked to teenage pregnancies. We will also seek to understand in the patterns in school drops outs following pregnancy and education level attainments among pregnant teens.

Samiksha in a study in Nepal India, found that teenage pregnancy was significantly higher among women from middle and lower household wealth index with an odd ratio of 2.19 and 2.37 respectively (Samikshya, 2018). Adolescents from low economic backgrounds are likely to exchange sex for pocket money and favors from powerful people in society. It is common for girls in various parts of sub-Saharan Africa to receive money or gifts in exchange for sex (Nkol, 1997). Further the percentage for transactional sex was reported by Nkol (1997) to be as high as 14% in Kenya and 31% in Uganda for adolescent between 15-19 years.

Knowledge on the use of contraception has an influence on prevention of unwanted adolescent pregnancies. Layu et al 2018, assessed the sources of data on sexual and reproductive health

among adolescent pregnant respondents. Among the respondent's', 80% had a source of information on sex and sexuality and 98% on contraception use. (Layu, 2018). Reyna in a study on sociodemographic aspects linked to knowledge and use of contraception found that 94 % of the respondents had received the necessary sexuality education and contraception use (Reyna, 2019). Our study will seek to establish what health barrier with respect to use of contraception exist among the adolescent pregnant population.

When teenage pregnancies occur, they are associated with considerable adverse socioeconomic outcomes. They include, stigma, discrimination and increased dependency in the provision for the needs of the teenager, the newborn and subsequent school drop outs. According to World Bank, school drop outs results in low human capital development and inability to acquire job competence and meaningful employment conveniences in the labor market (World Bank, 2017).Further child marriages reduce a girl's future earning by an approximate 9%. Owing to close to a quarter of Sub Saharans population being composed of teenagers and a high-country prevalence of adolescent pregnancy rate in Kenya at 18%, the economic impact of these adolescent pregnancies is of great socioeconomic concern to the country.

Parents and partner support have positive outcomes to the mother. This is especially important for those who choose not to marry their sexual partners. Shah et al (2013), studying the impacts of partner support on teen pregnancies birth outcomes, found out that; women with supportive partners had a 63% chance less likely to have a low birth weight. The objective is to examine how the differences in socioeconomic status background of teenagers influence the patterns in teen pregnancies and the results of what happens to the teenage mothers in Machakos County.

CHAPTER THREE: METHODOLOGY

3.1 Introduction

This chapter describes the theoretical framework, the conceptual framework, econometric model and specification, data collection methods, sampling frame and ethical considerations.

3.2 Theoretical Framework

The theory of reasoned action as suggested by Fishben and Ajzen (1975) is based on the assumption that a person's health conduct is controlled by their desire to act and in return, the intention becomes the function of their frame of mind towards the behavior and subject rules regarding the behavior.

Therefore, a person's attitude towards performing a healthy behavior and subject norms for that behavior are informed by a number of factors. In the case of a teenagers, the desire either to prevent conception or not through engaging in risky sexual behavior is affected by socioeconomic factors affecting the teenager. The socioeconomic factors include the level of education attainment, marital status, parent's occupation, household income level, household size, parent's marital status, education attainment of parents and subsequent sexual debut. A rational person will choose a healthy behavior. For a teenager, a healthy sexual behavior would be expected to be one that leads to prevention of teenage pregnancy. This includes abstaining or delayed sexual debut and the use of contraception. A teenager would be expected to be rational in choosing whether to engage in sexual behavior that would not lead to teenage pregnancy.

A teenager choosing to engage in risky sexual behavior that would lead to teenage pregnancy achieves a level of utility. This utility is the form of seeking pleasure, desire to be valued, desire for intimate relationship, showing care and as a way of expressing affection. A teenager therefore achieves utility **(EUS)** if she engages in a risky sexual behavior and does not achieve any utility if she fails to engage in a risky behavior **(EUSn)**. Analysis of the impact of changes in the independent variables on the difference between the expected utility of engaging in sexual behavior (EUS-EUSn) give the following results.

Scenario 1: No difference (EUS=EUSn), implying that the teenager will be indifferent in engaging in sexual behavior.

Scenario 2, Positive difference (EUS> EUSn), implying that the teenager will want to engage in sexual behavior.

Scenario 3, Negative difference (EUS < EUSn), implying that the teenager will not choose to engage in sexual behavior.

A univariate linear regression equation for expected utility (Y_U) expressed as a function of vector of its attributes (X_1) and a vector of an individual teenagers' socioeconomic background factors **(R)**can be stated in equation 1 with **e** being the error term

$Y_u= X_1*R+ e$ …………………………………………….. **equation 1**

Subsequently, the utility of a teenager engaging or not engaging in sexual behavior that leads to pregnancy can be derived using a probit model. The probit model applies when the dependent variable can take only two values. In this case 1 if a teenager gets pregnant and 0 if the teenager does not get pregnant. The probability of a teenager engaging in sexual behavior that results to teenage pregnancy can then be expressed as:

Prob $(y=1/X) = \Phi (X^1\beta)$ ……………………………………….. **equation 2**

Where **Φ** is the cumulative density function of the standard normal distribution, X^1 consists of vectors specific to the teenager's socioeconomic background and **β** is the coefficient of these vectors.

Using the probit model with a reference category of 0 for no teenage pregnancy and 1 when a teenage pregnancy occurs, a matrix for the probability of y would be:

$$Y= \begin{cases} 0 \text{ if } y \leq 0 \\ 1 \text{ if } y > 0 \end{cases}$$

………………………………………………… **equation 3**

In probit model, the error term **e** is assumed to be normally distributed.

The functionalist theory states that each social institution serves its given roles in the society during its existence. However, its existence is no more necessary if it no longer serves those roles (Crossman, 2020). Further, when one part of the social system is dysfunctional, it affects other social institutions and creates social problems, prompting social change. At teenage, the social norms is that she would be in school and under care of her parents. When a teenager gets

pregnant and subsequently becomes a mother her position in the society changes to that of caregiver. If she was in school, she may have to drop out to care for the baby, find means to provide for the baby either through employment, getting married or being dependent on her relatives and well-wishers. The probability of occurrence of these outcomes following teenage pregnancy can be predicted against a teenager's socioeconomic background characteristic. A logistic regression model analysis will be used to find out the probability of occurrence of a studied outcome following teenage pregnancy.

Logit p= Log (p/1-P) being the odds of occurrence of a given outcome.

To model the relationship between a teenagers socioeconomic background and outcome a binary logistic model can be used with **Y** being the binary outcome variable.

$Y_1 = 1$ if outcome is present

$Y_1 = 0$ if the trait is not present.

3.2   Conceptual framework

The conceptual framework for the variables in the study is presented in figure 3. The variables included are the domains included in various methods used in measuring socio economic status. Hollingshead Four-Factor Index of Socioeconomic Status uses four domains to measure the social status of an individual. The domains include marital status, employment status, educational attainment and occupational prestige. MacArthur status scale uses the domains of education, net family income and occupational status and wealth (Cirino, 2002). Since adolescents are dependent on their parents, a combination of socio economic variables for parents and the teenager will be used. Figure 3 is an illustration of the conceptual framework for the study.

In the conceptual framework, the occurrence of a teenage pregnancy is the dependent variable. Social factors, household economic factors and parent's social factors are the independent variables. Further, socioeconomic outcomes are dependent variables to teenage factors, household economic factors and parent's social factors being independent variables, in this case, the occurrence of teenage pregnancy becomes an intermediating variable.

Table 5 describes the study variables, their operational definition and units of measurement for the variables.

Figure 3 : Conceptual framework

Teenager Social determinants

Age
Education attainment
Marital status
Sexual debut
Favors for sex

Household economic determinants

Occupation
Household income level

Parents social determinants.

Marital status
Household size
Education level/Attainment

Teenage pregnancy.

(Occurrence of teenage pregnancy)

Socioeconomic outcomes.
1. School outcomes
2. Marital outcomes
3. Dependency outcomes

Table 5 Variables and operational definitions

Name of the Variable	Variable Definition	Measurement.	Expected sign
1. Independent variable			
a) Age at pregnancy	Amount of time lived when one became pregnant.	1= 11-14 2= 15-19	Negative Positive
b) Age at sexual debut	Amount of time lived when one engaged in sex for the first time	Age in years	Negative
c) Level of literacy	Ability to read and write	0= Cannot read or write 1= Can read only 2=Can write only 3= Can read and write	Negative Positive Positive Positive
d) Education attainment	Highest degree of education an individual has completed	0= No formal education 1= Elementary school 2= Some primary school 3= Primary school 4= Some secondary school 5= Secondary school certificate 6= College/University diploma 7= University degree	Negative Negative Negative Positive Positive Positive Positive Positive
e) Marital status	A persons relationship with a significant other	1= Single, never married 2=Married 3=Separated 4= Divorced 5= Widowed	Negative Positive Positive Positive Positive
f) Mode of schooling	Whether a student attended school from home every day or boarded at school	0= Never attended school 1= Day Scholar 2= Went to a boarding school	Positive Positive Negative
g) Occupation	Job or profession	0= Unemployed 1= Student 2= casual/crafts and small scale business 3=middle size business owners, semiprofessional, small scale farmers 4=administrators, minor	Positive Negative Negative Negative

		professionals 5= Major professionals, higher executives and large business proprietors	
h) Household income level	Gross income of all members of a household, defined as a group of people living together per month.	1=Above 350,000 2=100,000- 385,000 3=50,000- 100000 4=10,000-50,000 5= Below 10,000	Negative Negative Negative Positive Positive
i) Favors for sex	Received favor from a sexual partner in exchange for sex	0 = No 1 = Yes	Negative Positive
j) Household size	Number of persons living together in one house	Number specified	Negative
2. **Dependent variable.**			3.
a) Teenage pregnancy	Pregnancy at the age of 13-19 years	0= Never been pregnant 1= Teenage pregnancy	Negative Positive
4. **Pregnancy outcomes**		5.	
a) School outcomes	Effects of pregnancy on schooling.	0= Dropped out of school 1= Continued with school	
b) Marital outcomes	Effects of being pregnant on marital status	0= Remained single/Didn't get married 1= Got married	
c) Financial Dependency outcomes	State of relying on someone else financially	The teen will state whom they depended on financially to care for them, the baby and healthcare after the pregnancy 0 = Not dependent/got employed/ Dependent on husband or boyfriend 1 = Dependent on a family member or others.	

5.3   Econometric model

The probability of a teenager getting pregnant is affected by teenager's individual characteristics. These characteristics included in the study as independent variables which are: Teenager factors, parent's factors and household factors. In addition, the study will regress how individual characteristics are linked to a teenagers pregnancy outcomes.

A two variable regression model for each teenage characteristic can be expressed in equation 4.

$$y = \beta_0 + \beta_1 X_{1} + \mu \quad \text{…………………………………………………………..…equation 4}$$

Where β_0 is a constant, β_1 a coefficient of a given teenager characteristic and μ a stochastic error term. Y is the dependent variable that a teenager gets pregnant and X is a given teenager independent variable.

A multivariate regression model can be expressed to show the probability of a teenager getting pregnant in equation 5. The expected sign for each independent variable is as shown in table 5.

$$y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X + \text{………} \beta_n X_{n} + \mu \quad \text{………………..equation 5}$$

Where X_2, to X_n represents a specific variable i.e. specific teenage characteristics.

From the probit model, an equation for the probability of a teenager getting pregnant can be expressed with **y=1** for a teenager who gets pregnant and **y= 0** for a teenager who doesn't get pregnant. If the log of a teenager getting pregnant is expressed as a function of the specific teenagers' characteristics, and the teenager characteristics given as E_t = Teenagers education attainment, **Ms**= Teenagers Marital status, Op= Parents occupation, **Scm** = Schooling mode H_i= Household income level, **Msp**= Parents Marital status, **Hs**=Household size, **Ep**=Parents education level, S_d= Sexual debut, **Sf**= Favors for sexual behavior. The following equation 6 will fulfill the socio-economic factors that determine a teenager's probability to get pregnant expressed as the log of y.

$$\text{Log } y = \beta_0 + \beta_1 Et + \beta_2 Ms + \beta_3 Op + \beta_3 Scm + \beta_5 Hi + \beta_6 Msp + \beta_7 Hs + \beta_8 Ep + \beta S_d + \beta Sf + \mu$$
$$\text{…………………………………………………………………………..…equation 6}$$

Analysis of the pregnancy outcomes.

Descriptive statistic for the pregnancy outcomes will be calculated.

The unconditional expected values of each studied pregnancy outcome following the occurrence of a teenage pregnancy is given by the simple equation/expression 7.

E (Y)……………………………………………………………………………. equation 7

A simple regression equation involving two variables can be expressed in equation 8 where Y1 is the binary outcome variable, X1 is the explanatory variable and u the error term.

$$Y_1 = \beta_0 + \beta X_1 + u \text{ ……………………………………………………………………equation 8}$$

The three studied pregnancy outcomes will be classified further to binary outcomes as follows.

a) School outcomes   0 = Did not drop out of school 1 = Dropped out of school

b) Marital outcomes   0= Did not get married, 1= Got married

c) Dependency outcomes 0= Not dependent/got employed/ Dependent on husband or boyfriend 1 = Dependent on a family member or others.

The simple logistic regression for any two variables would be presented in equation 9 where p is the probability of occurrence of the outcome and x is the explanatory variable being the socioeconomic background characteristic of the teenager.

$$p = \frac{\exp(\beta 0 + \beta 1 x)}{1 + \exp(\beta 0 + \beta 1 x)} \text{ …………………………………………………………………. equation 9}$$

Because the study has multiple socioeconomic determinants as explanatory variables, multiple logistic regression equation 10 will be used for the analysis of the outcomes.

$$p = \frac{\exp(\beta 0 + \beta 1\, Et + \beta 2\, Ms + \beta 3\, Op + \beta 3\, Scm + \beta 5\, Hi + \beta 6\, Msp + \beta 7 Hs + \beta 8 Ep + \beta Sf)}{1 + \exp(\beta 0 + \beta 1\, Et + \beta 2\, Ms + \beta 3\, Op + \beta 3\, Scm + \beta 5\, Hi + \beta 6\, Msp + \beta 7 Hs + \beta 8 Ep + \beta Sf)}$$

$$\text{………………………………………………………………………………equation 10}$$

Where p = the probability of occurrence of the outcome, E_t = Teenager's education attainment, **Ms**= Teenagers Marital status, **Op** = Parents occupation, **Scm** = Schooling mode **H$_i$**= Household income level, **Msp**= Parents Marital status, **Hs**=Household size, **Ep**=Parents education level. **Sf**= Favors for sexual behavior.

5.4   Research design

This study will use a cross sectional study design. The study will include a descriptive component of the prevalent socio-economic disparities among teenage pregnancies and their

outcomes in Machakos County. In addition, a multivariate regression analysis will be done. The snapshot of these socioeconomic disparities in the study range to a year preceding the study period. The socio-economic factors will be measured to describe the existing inequalities. The challenges that are expected in this study being a cross sectional study design include: Since exposure-being the socioeconomic disparities and outcome-being occurrence of teenage pregnancy, it is generally difficult to derive a causal relationship from the data analysis. Secondly, cross sectional data is prone to bias. The expected bias in this study is non response and social acceptability in discussing teenagers' sexuality, we expect to brief our clients and guardians well about the purpose of the study in addition to treating the collected data with confidentiality and safeguard their privacy.

3.5 Study population

The study population will be female teenagers aged 13-19 years. There will be two clusters. Teenage girls aged 13-19 who have never been pregnant and teenage girls aged 13-19 who have ever been pregnant. In addition, teenagers above the age of 20 years at the time of the study who became pregnant before attaining this age will also be included.

Teenage girls who have never been pregnant will be selected using a combination of a two-stage stratified cluster sampling and simple random sampling described in sampling frame subtopic. Teenagers who became pregnant during their teenage will be selected from clients attending antenatal clinics, labor wards, post-natal clinics and those attending post abortion care services (both inpatient and outpatient) for the selected hospitals. The researcher will obtain an informed consent from teenager's guardians or parents at households or accompanying the teenagers at the hospital. If the parent or guardians consents to have their daughter participate in the study, consent will then be sought from the teenager. If the teenager declines to participate in the study with the guardian's consent, the teenager will be deemed to have declined to participate in the study. Similarly, if the teenagers' parent/guardian declines having their daughters participate in the study, the teenager will not be recruited to participate in the study. Teenagers attending hospital services for pregnancy related services not in parents/ guardians' company will be treated as emancipated minors and consent will be sought directly from them. Those who decline consent will be excluded from the study. Mothers attending sick baby clinics will not be

included. In addition, pregnant teenagers in Machakos County Referral Hospital referred from any of the level 4 hospitals, will be excluded from the study to avoid double entry.

3.6 Sampling frame

A mix of convenient, simple random sampling technique and stratified cluster sampling will be employed to select the health facilities, enumeration area and participants. Teenagers who became pregnant will be selected from among patients attending antenatal clinics, labor wards, post-natal clinics and those attending post abortion services in selected health facilities. Convenient sampling will be used to select the health facilities. The four level 4 hospitals and the Machakos County level 5 hospital will be selected owing to their broad catchment areas across the county. These are; Machakos County referral hospital, Kangundo Level 4 hospital, Kathiani level 4 hospital, Matuu level 4 hospital and Mwala level 4 hospital. Two random weeks will be assigned to each hospital and two weeks for each selected geographical unit. All pregnant teenagers attending antenatal clinics, in labor wards, newborn units and post-natal well baby clinics at a selected health facility on that particular week, will be selected to participate in the study.

A two-stage stratified cluster sampling method will be used to select teenagers who never became pregnant. In the first stage, geographical units with convenient number of dwelling/household units within the catchment areas served by the selected hospitals will be sampled. One female teenager will be selected per household. In households with more than one female teenager, the oldest teenager will be selected. 20 households per selected geographic unit area will be selected with equal probability systematic selection per geographic unit.

3.7 Sample size calculation

To determine the sample size, a modified Cochran formulae for sample size using a confidence interval of 95% and width of 10% for the unknown population standard deviation will be used. The proportion of female teenagers in Kenya is 16% (KDHS, 2014).

$$no = \frac{Z^{2pq}}{e^2}$$

Where

- z is the z value from z tables. A 95 % confidence level gives us Z values of 1.96.
- e is the desired level of precision.
- p is the estimated proportion of the population which has the characteristic in question being the Machakos county teenage pregnancy rate of 16% (KDHS, 2014).
- q is given by 1-p

Calculating the sample size

Z^2 is 1.96, p is 0.16 and q is 0.84

$(1.96/0.05)^2$ = 1536.56

0.16*0.84   = 0.1344

0.1344 * 1536.56 = 206.51

Sample *n* = 206 teenagers.

Stratification of the sample population will be disproportionate by dividing *n* into two equal strata. First stratum of 103 never pregnant teenagers and second stratum of 103 teenagers who became pregnant. The assumption is that each strata follows a normal distribution for the observed determinant characteristics for comparison purposes during data analysis.

3.8 Data management

Collection of data will be done through two methods. One will be primary data collection from participants using both a self-administered questionnaire for the literate and interviewer administered questionnaire for those who do not know how to read and write. There will be one research assistant at each facility and two research assistants for each geographical unit. The research assistants will be drawn from diploma clinical medicine students already exposed to basics of research. In addition, the researcher will train them on how to administer the

questionnaire (see appendix 1). The second method will be secondary data obtained from the KDHS on teen pregnancies statistics during the period of study. The questionnaires' will be piloted to test for reliability before the actual study. Reliability will be measured using the Cronbach's alpha reliability coefficient of the independent variable and the dependent variable (the occurrence of a pregnancy). Validity of methods has been ensured by appropriate sampling technique, consistent inclusion of what consists of socioeconomic disparities and correct measurement of the specific independent variable ranges.

3.9 Quality Assurance

To ensure care and control with which this research will be been conducted, the following guidelines and protocol will be followed. The principal investigator will solely be responsible to ensure quality data is collected. The research assistants will be selected from diploma clinical medicine and nursing already exposed to research. The research assistants will further be trained on what this research study is about, how to conduct themselves during data collection and on the actual data collection process. There are no measurements or equipment's to be used in the study. All research records/ questionnaires will be kept by the principle investigator in a locked file cabinet to ensure confidentiality. The principle investigator will supervise the filling in of questionnaires to prevent falsification and fabrication of data (Cooking of data).

3.10 Ethical Considerations.

Ethical approval will be sought from the KNH-UoN ERC as well as the National Commission for Science, Technology and Innovation (NACOSTI). Permission to carry out the study will be sought from the Machakos County, department of Emergency and Health Services. Informed consent and assent from minors' guardians and parents will be obtained as well as consent from the teenager girl participant. The nature and purpose of the study will be explained clearly to each participant before beginning of the study. No participants' identity will be disclosed during data collection, analysis or presentation of the results obtained from the study. Participant codes will be used as participant identifiers to keep their data confidential. Because of the sensitivity of the topic of study, we shall refer and link to clinical psychologists within the select hospitals for clients who may exhibit psychological distress during the study period. Psychological distress may arise from questions on sexual behavior characteristics that may have resulted from abuse, following abortion and family rejection following the occurrence of pregnancy. In addition, if the

clients continue exhibiting psychological distress, she shall be discontinued from being a research participant. To ensure safety and well-being of the research team and respondents in the study during COVID 19 pandemic, the principal investigator will ensure adherence to the following; the research team will wear masks and we shall provide masks to participants and their guardians and parents if they do not have one. The research team will be screened daily for COVID 19 symptoms before going to data collections sites. In addition, the research team will maintain social distancing, practice proper hand hygiene including hand washing with soap and use of alcohol-based sanitizers.

CHAPTER FOUR: DATA ANALYSIS, INTERPRETATION AND DISCUSSION

4.1 Introduction

This chapter presents the study findings according to the study objectives. The findings are presented in simple tables and cross tabulations. Further inferential statistics including correlations between the dependent and the independent variables as well as logit models for the three factors are presented separately and combined.

4.2 Descriptive statistics

Table 6 summarizes the age groups of the respondent's teenagers who become pregnant and participated in the study. The teenagers were grouped into two groups, Ages 11-14 and 15-19 years groups. This is presented in a pie chart in figure 4.

Table 6 Age of respodents at the time of pregnancy.

Age of respondent's at the time of occurrence of pregnancy		Frequency	Percent
Pregnant teenagers	15 - 19 years	90	44.6
	11 - 14 years	10	5.0
	No Pregnancy occurence	100	49.5
Total		202	100.0

Table 6 shows the teenager pregnancy age distribution of the study respondents, 44.6% total, equivalent to 89.2 % of teenagers with occurrence of teenage pregnancy were between 15-19 years and 10% were aged 11-14 years.

Figure 4 is a pie chart showing the percentage of ages at the time of pregnancy occurrence.

Figure 4 Age at the time of pregnancy occurrence
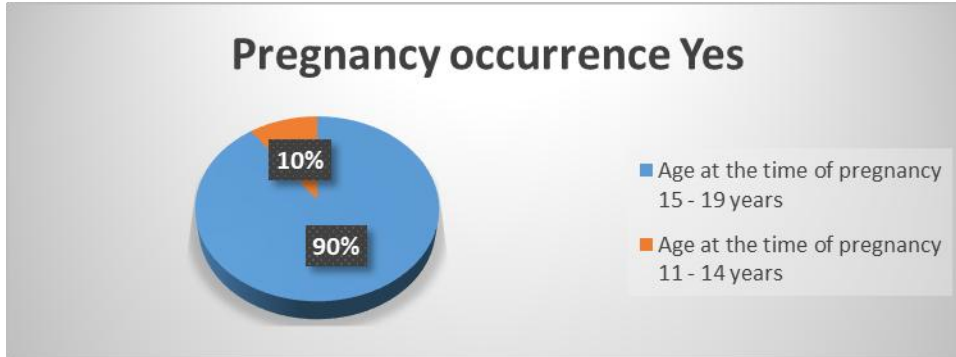
The study had 206 total respondents. The respondents were divided into two groups, 50% of the teenagers had ever been pregnant and 50% had never been pregnant. Of the teenagers who had ever been pregnant, 90% were in the 15-19 year age bracket while 10% were in the 11-14 years bracket.

Figure 5 is a pie chart showing the respondents marital status at the time of pregnancy occurrence in percentage.

Figure 5 Marital status at the time of pregnancy occurrence
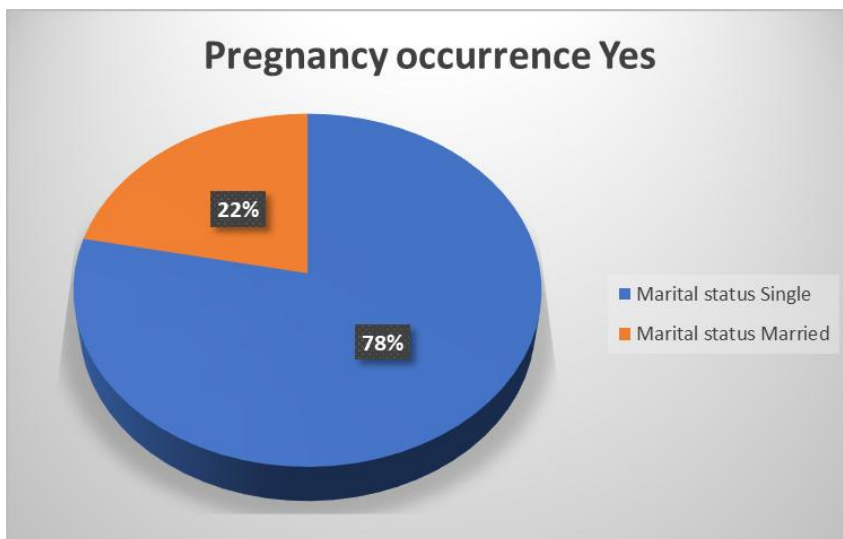
The respondents who had ever been pregnant were asked to state their marital status prior to being pregnant. The results showed that 78% of the teenagers had not been married and 22% of teenagers were married prior to being pregnant.

Figure 6 is a bar graph showing the respondent's teenager's highest level of education in percentage. The table compares teenagers who didn't have pregnancy occurrence and those who had occurrence of teenage pregnancy.

Figure 6 Respondent's highest level of education and occurrence of pregnancy.
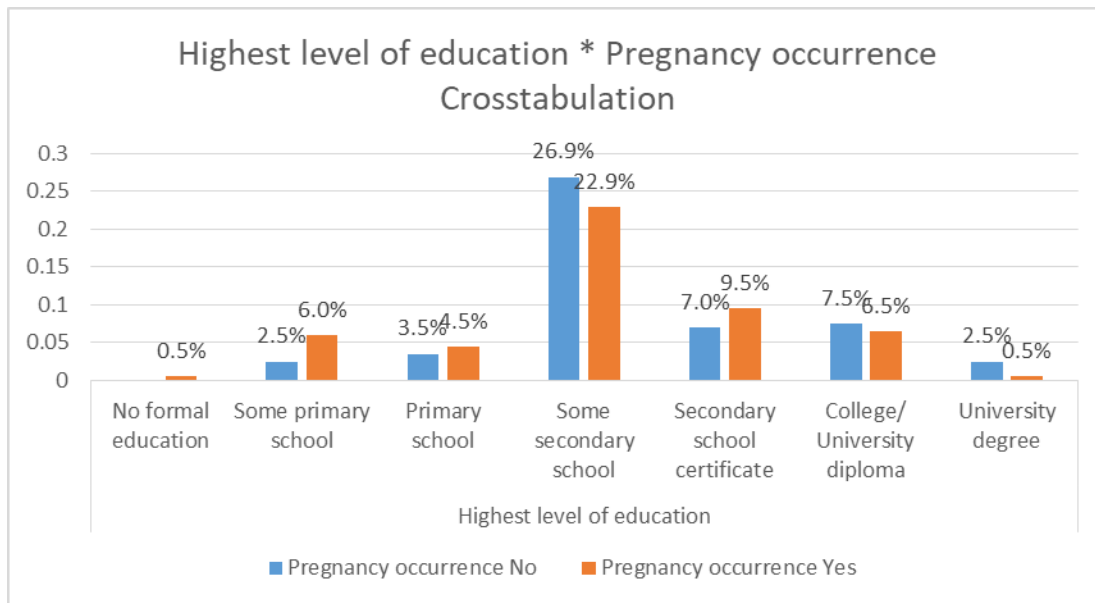
The findings show that respondents who participated in the study had their highest level of education being 26.9% for the teenage girls who had never been pregnant and 22.9% for the teenagers who had been pregnant. These respondents were majorly high school students. More teenagers who had attained higher education levels with a cumulative of 10% had never been pregnant compared to 7% who had ever been pregnant as shown in figure 6.

Figure 7 is a bar graph showing the respondent teenager's mode of schooling. The bar graph compares teenagers who had occurrence of pregnancy and those who didn't.

Figure 7 Respondent's mode of schooling and occurrence of pregnancy.
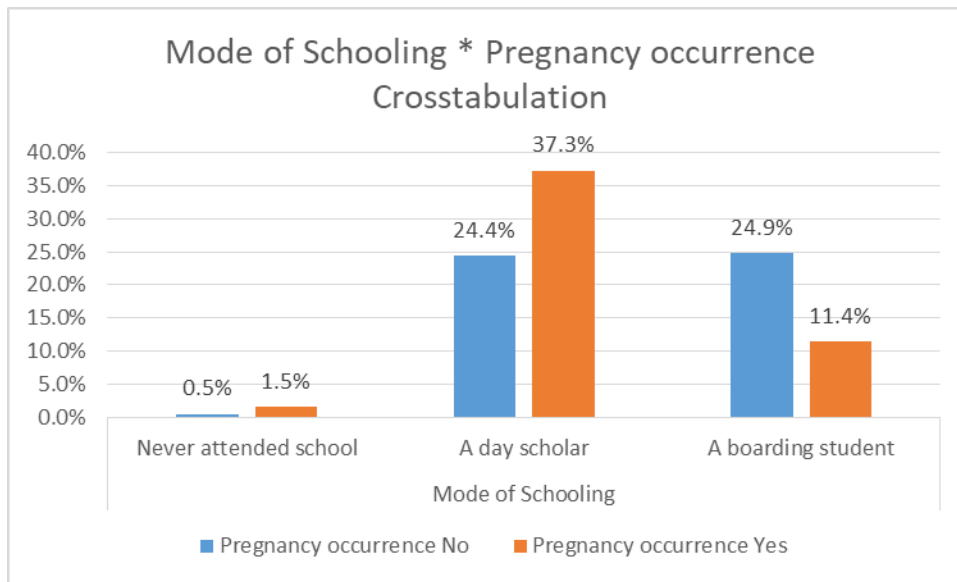
Comparing the participant's mode of schooling and pregnancy occurrence, more teenage girls at 37.3%, attending day school got pregnant compared to 24.4% of teenage girls who didn't get pregnant attending day school. Also, few teenage girls 11.4%, attending boarding school got pregnant compared to 24.9% who didn't get pregnant as shown in figure 7.

Table 7 is a table showing results in percentage of teenagers who had received favors in exchange for sex.

Table 7 Percentage of teenagers who had received favors in exchange for sex

Favors in exchange for sex	Pregnancy occurrence (Percentage %)		Total (Percentage %)
	No	Yes	
No	42.3	24.4	66.7
Yes	7.5	25.9	33.3
Total	49.8	50.2	100

Table 7 shows results of teenagers who had received favors in exchange for sex. Cumulatively, 33.3% of all teenagers participating in the study admitted receiving some form of sexual favors in exchange for sex while 66.7% denied exchanging sex for any favors. Out of the teenagers who

received favors in exchange for sex, a higher percentage of 25.9% became pregnant compared to 7.5% who didn't become pregnant.

Further, Table 8 shows cumulative responses of all teenage girls' response to whether they had ever engaged in sex for money.

Table 8 Teenagers who had had sex for money

Response	Frequency	Percentage (%)
No	154	76.2
Yes	47	23.3
System non response	1	0.01
Total	202	99.51

Table 8 shows cumulative percentage of teenage girls who admitted receiving money in exchange for sex. 23.3% of all teenage girls participating in the study admitted ever receiving money in exchange for sex. A cumulative 76.2% of all participants denied receiving money in exchange for sex.

Table 9 shows an outline of respondents' teenagers' parents marital status compared to their pregnancy outcomes.

Table 9 Teenagers parents marital status and pregnancy outcomes.

		Pregnancy occurrence		
		No	Yes	Total
Parents Marital status	Married	70	68	138
	Separated	4	11	15
	Divorced	4	2	6
	Single parent	20	10	30
	Orphaned	2	9	11
Total		100	100	200

The table 10 shows that an almost equal number of 70 and 68 of teenagers from both cohorts came from families that had both parents living together. However, of the total orphaned teenagers who participated in the study, more of them became pregnant. This is 9 out 11 orphaned teenagers became pregnant. More teenagers who didn't become pregnant stood at 28 came from broken families compared to 23 who became pregnant.

Figure 8 shows respondent's mothers' highest level of education compared with their pregnancy occurrence.

Figure 8 Table of mother's highest level of education and pregnancy occurrence.
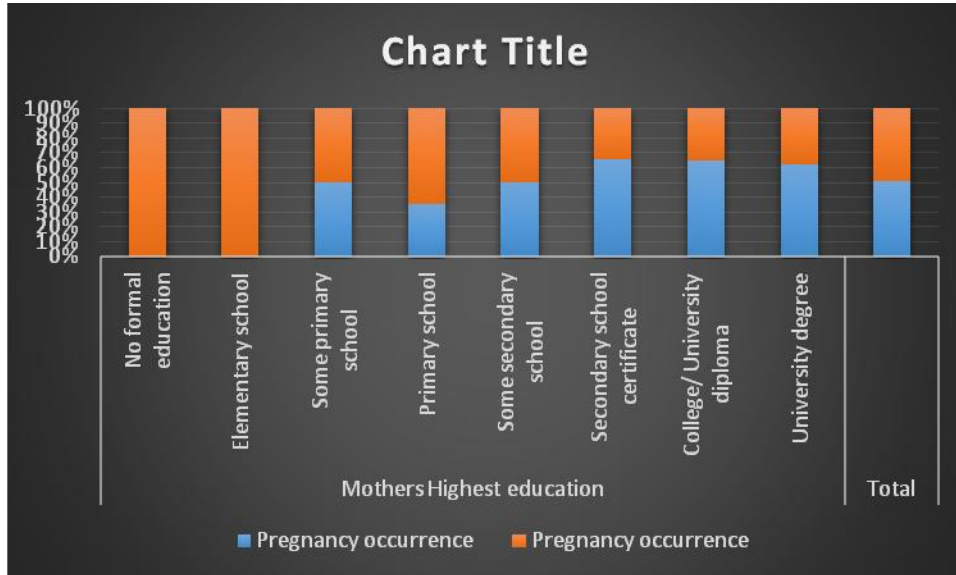
Figure 8 shows the respondent's mother's highest level of education. Most of the mothers had attained secondary school certificate.

Table 10 shows respondent's fathers' highest level of education compared with their pregnancy occurrences.

Table 10 Fathers' highest level of education and pregnancy occurrence

		Pregnancy occurrence		
		No	Yes	Total
Fathers highest education	No formal education	0	2	2
	Elementary school	0	2	2
	Some primary school	5	9	14
	Primary school	10	20	30
	Some secondary school	12	13	25
	Secondary school certificate	27	27	54
	College/ University diploma	27	8	35
	University degree	6	6	12
Total		87	87	174

Table 10 shows that majority of the respondents' fathers at 54 total count had attained secondary school certificate. The minimum was 2 for both no formal education and elementary school. Further, fathers whose respondent's had highest level of education below some secondary school education had more pregnancy occurrences.

Table 11 shows measures of central tendency descriptive statistics for household size and age at sexual debut of teenager respondents.

Table 11 Descriptive statistics for household size and age at sexual debut of respondents.

Descriptive Statistics for household size and age at sexual debut					
	N	Minimum	Maximum	Mean	Std. Deviation
Household size	192	2	13	5.84	2.183
Age at sexual debut	160	6	19	16.01	2.345

The descriptive statistics show that the respondents maximum household sizes in Machakos county is 13 and an average of 6 persons per household. In addition the maximum age at sexual debut of teenagers who responded to this question was 19 years and a minimum of 6 years and an average of 16 years. The rest of the respondent's denied having sexual debut or declined to answer this question.

Table 12 is a table showing frequencies of respondent's household incomes.

Table 12 Frequencies of household incomes

Household income			
		Frequency	Percent
Valid	Below 10,000	82	40.6
	10,000-50,000	90	44.6
	50,000- 100000	24	11.9
	100,000- 350,000	4	2.0
	Above 350,000	1	0.5
	Total	201	99.5
Missing	System	1	0.5
Total		202	100.0

Table 12 shows that most of the households from where the respondents came from had incomes of below Kenya shillings 10000 at 40.6% and between Kenya shillings 10000 and 50000 at

44.6%. This total of 85.2 % shows that most of Machakos teenagers come from low socioeconomic background.

Figure 9 shows the marital status outcomes frequencies following pregnancy occurrence.

Figure 9 Marital status outcome after pregnancy occurrence
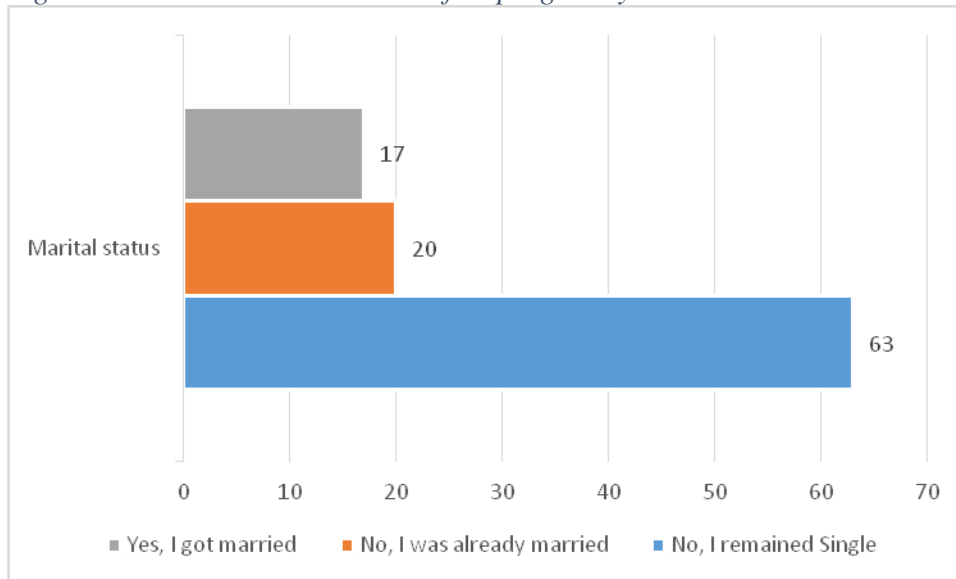
Figure 9 shows the marital status of the respondent's after getting pregnant. The results are that most of the teenage girls, 63% remained single and didn't get married. Only 17 of the respondents got married after getting pregnant.

Table 14 shows the source of emotional and financial support of teenagers who got pregnant.

Table 13 Source of emotional and financial support for pregnant teenagers.

Source of Emotional and financial support	Frequency	Percentage %
Boyfriend	13	6.4
Husband	31	15.3
Others (Rescue center)	1	0.5
Parent	50	24.8
Self	1	0.5
Sibling	4	2.9

Following their pregnancy, majority of teenagers at 24.8% indicated that their parents were their source of emotional and financial support. This was followed by husband at 15.3% and boyfriend at 6.4%. The least source of emotional and financial were the teenagers themselves and others (rescue centers) at 0.5% for both as shown in Table 14.

Figure 10 is a pie chart showing schooling outcomes in teenager's who became pregnant.

Figure 10 Schooling outcomes after teenage pregnancy occurrence
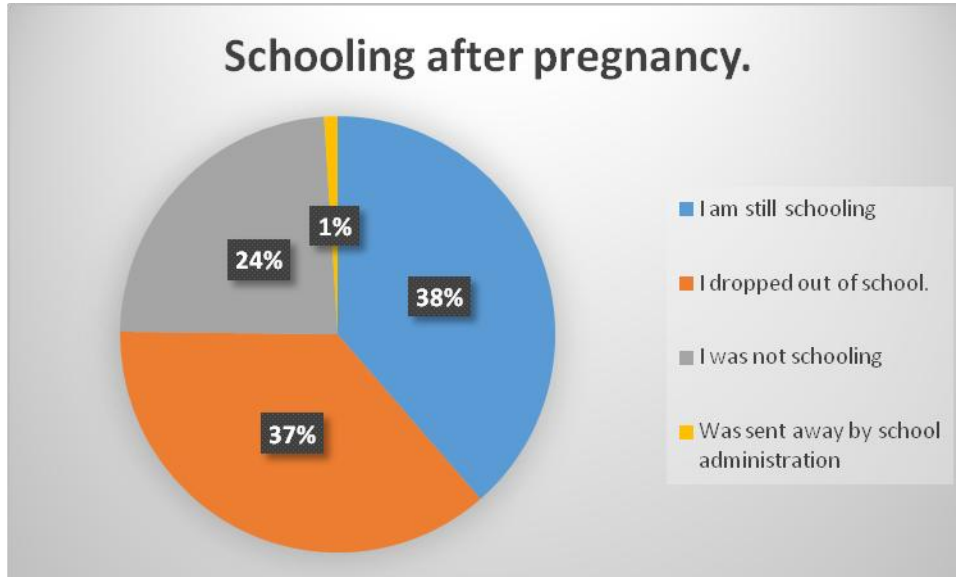
A very large percentage of 37% of teenagers who got pregnant in the study dropped out of school or had already stopped schooling at 24%. This is a total of 61% of teenager's girls who had become pregnant and are not schooling as shown in figure 10.

4.3 Results for logit model

In the research study, the dependent variable was the occurrence of a teenage pregnancy. The independent variables were the teenager's socio-economic background characteristics. These characteristics were: education attainment, marital status prior to becoming pregnant, parents' occupation, mode of schooling, household income level, parents marital status, household size, parents' education level, age at sexual debut and receipt of favors for sexual relations. The dependent variable was regressed against these independent variables.

Table 15 shows the dummies used for the various respective models containing columns for variable names and the measurement used. All independent variables were dummies except household and age at sex debut which were analyzed by measures of central tendency.

Table 14 Dummies used for various models

Variable name	Measurement
Pregnancy occurrence	Dummy: 0 no; 1 yes
Literacy level	Dummy: 1 read or write; 0 cannot read or write
Marital status	Dummy: 1 single; 0 married
Education	Dummy, formal 1; 0 informal
Highest level of education	Dummy: primary 1; 0 secondary
Mode of schooling	Dummy: 1 day scholar; 0 boarding student
Parents marital status	Dummy: 1 married; 0 not married
Mother level of education	Dummy: primary 1; 0 secondary
Father level of education	Dummy: primary 1; 0 secondary
Parents Occupation	Dummy: 0 No; 1 yes
Favors for sex	Dummy: 0 No; 1 yes
Age at sexual debut	Continuous:
Sex for money	Dummy: 0 No; 1 yes
Household income	Dummy: 1 Below 10000; 0 Above 10001
Dependence outcome	Dummy: dependency outcome (0 Not dependent/got employed/Dependent on husband or boyfriend); 1 Dependent on a family member or others.
School outcome	Dummy: schooling outcome (0 Dropped out of school; 1 Continued with school)
Marital status outcome	Dummy: 1 single; 0 married

4.3.1 Evaluating the influence of socio-economic determinants on the occurrence of teenage pregnancy.

To evaluate the influence of socio-economic determinants on the occurrence of teenage pregnancy, the study deployed a logit regression model that was defined by the following equation.

Logistic Model:

The logit model equation for the research is equation 6.

Log y = β₀+ β₁ Et + β₂ Ms + β₃ Op + β₃ Scm + β₅ Hi + β₆ Msp + β₇Hs + β₈Ep + βS_d + βSf + μ

…………………………………………………………………………..…equation 6

Where $y = \begin{cases} 1 = \text{Pregnancy occurrence} - \text{Yes} \\ 0 = \text{Pregnancy occurrence} - \text{No} \end{cases}$

Table 16 presents the results for logit model for pregnancy occurrence.

Table 15 Model Summary, Results for logit model for Pregnancy occurrence.

Model summary

Model Summary				
Step	Number of obs	LR chi2(6)	Prob	Pseudo R squared
1	131	24.74	0.0059	0.142

The *Model Summary* as shown above provides the log likely hood (LL) and pseudo-R^2 values for the full model. The model is statistically significant (LL = 24.74, p < 0.05) even though the pseudo R^2 suggests that the model explains roughly 14.28% of the variations in the outcome and 83.2% is due to unexplained variations.

Table 17 presents the results for logit model. The columns contain the ODDs Ratios, standard error and the significance of each independent variables used in the model. The rows have socioeconomic determinant variables under study.

Table 16 Results for logit model

Pregnancy occurrence	ODDs Ratio	Std. Err	z		P>|z|	[95% Conf. Interval]	
Teenagers	0.9782	0.5901	-	0.0400	0.9710	0.2999	3.1911
Parents Occupation	0.3715	0.2698	-	1.3600	0.1730	0.0895	1.5423
School mode	3.0325	1.4251		2.3600	0.0180	1.2072	7.6177
Householdincome	2.8495	1.4190		2.1000	0.0350	1.0737	7.5622
parental marital status	2.1711	1.0802		1.5600	0.1190	0.8188	5.7566
Household size	0.9867	0.0991	-	0.1300	0.8940	0.8105	1.2014
Mother educ	0.5672	0.3203	-	1.0000	0.3150	0.1875	1.7153

Father educ	2.9974	1.8723	1.7600	0.0790	0.8811	10.1965
Ageatsexualdebut	1.0510	0.1104	0.4700	0.6360	0.8555	1.2912
Favorsforsex	2.5689	1.1560	2.1000	0.0360	1.0635	6.2055
Constant	0.1096	0.2116	- 1.1500	0.2520	0.0025	4.8214

Teenagers' social determinants

Table 17 shows the regression coefficients that were used to predict the likelihood of pregnancy occurrence. The coefficient of favors for sex is positive and significant (OR = 2.57, p < 0.05). This tells us that the odds of pregnancy occurrence for teenagers who accept money or any favors for sex is 3 times that of teenagers who do not accept or extend any favors for sex holding other factors constant.

The results show that pregnancy occurrence for teenagers who were day scholars was 3 times that of boarding students holding other factors constant. The coefficient was statistically significant at $5\% \ (p \ < \ 0.05)$.

Further analysis revealed that pregnancy occurrence for teenagers who engaged in sex in exchange for financial support, money or other favors was $exp \ (-0.9768) \ = \ 0.3765$ times lower than those who did not holding other factors constant.

Parent's social determinants

For parent's social determinants, Table 17 shows that only fathers' level of education significantly explains the likelihood of pregnancy occurrence. The ODDs ratio is 2.99 and significant.. This tells us that the odds of pregnancy occurrence for girls whose fathers have only primary education is almost equal to that of girls whose fathers have only secondary education holding other factors constant. Other parents' social determinants included in the study including parents marital status, household size, and mothers education level had an odds ratio of less than one and not significant. (ODDS Ratio < 1.0, p > 0.05)

Household economic determinants

The findings show that only household income was a significant factor in determining pregnancy occurrence. The odds ratio was 2.84 which means that pregnancy occurrence for households with

income below KSH. 10, 000 is 2.84 times likely to occur than whose income is above Ksh.10000, holding other factors constant.

4.3.2 Evaluating the influence of the socioeconomic determinants on teenage pregnancy outcomes

The second objective of the study was to evaluate the influence of socioeconomic determinants on teenage pregnancy.

Table 18 shows the logit model results for marital status outcomes following the occurrence of teenage pregnancy.

Table 17 Model summary, results for logit model, marital status outcomes

Model summary

Model Summary				
Step	Number of obs	LR chi2(6)	Prob	Pseudo R squared
1	80	0.57	0.4489	0.0055

The influence of the socioeconomic determinants on teenage pregnancy was assessed using a logit model of predicted pregnancy outcome against marital status. Table 18 shows the loglikehood (LL) and pseudo-R^2 values for the full model. The model is not statistically significant $(LL = 0.57, p > 0.05)$ and the pseudo R^2 suggests that the model explains roughly 0.5% of the variation in the marital status outcome and 99.5% is due to unexplained variations.

Table 19 presents the results for logit model for marital status outcomes. The columns contains the ODDs Ratios, standard error and the significance of each independent variables used in the model. Pregnancy occurrence is the independent variable.

Table 18 Results for logit model, marital status outcomes

Marital status	ODDs Ratio	Std. Err	z	P>|z|	[95% Conf. Interval]	
preg_occurence	0.974052	1.295237	0.75	0.452	-1.56457	3.512671
_cons	-1.25188	0.949201	-1.32	0.187	-3.11228	0.60852

The results also show that the predicted pregnancy occurrence on pregnancy outcome was not significant. This shows that the influence of socioeconomic determinants on marital status was not significant as shown in table 19.

Table 20 shows the logit model results for financial dependence following the occurrence of teenage pregnancy.

Table 19 Model Summary, results for logit model, financial dependence outcomes following pregnancy occurrence

Model summary

Model Summary				
Step	Number of obs	LR chi2(6)	Prob	Pseudo R squared
1	80	0.28	0.5957	0.0025

Table 20 shows the loglikehood (LL) and pseudo-R^2 values for the full model. The model is not statistically significant $(LL = 0.28, p > 0.05)$ and the pseudo R^2 suggests that the model explains roughly 0.25% of the variation in the dependence outcome and 99.75% is due to unexplained variations.

Table 21 presents the results for logit model for financial dependence outcomes. It shows the ODDs ratios, standard error and the significance of each independent variable used in the model. The socioeconomic determinant variable is teenage pregnancy occurrence.

Table 20 Results for logit model, financial dependence outcomes following pregnancy occurrence.

Dependence_outcome	ODDs Ratio	Std. Err	z	P>|z|	[95% Conf. Interval]	
preg_occurence	-0.65356	1.23471	-0.53	0.597	-3.07355	1.766424
_cons	0.609064	0.896515	0.68	0.497	-1.14807	2.366202

The findings also show that the predicted pregnancy occurrence was not significant. This shows that a teenager's influence of socioeconomic determinants on financial dependence outcome following pregnancy occurrence was not significant as shown in Table 21.

Table 22 shows the model summary for logit model results for schooling outcomes following teenage pregnancy occurrence.

Table 21 Model summary, results for logit model, schooling outcomes

Model summary

Model Summary

Step	Number of obs	LR chi2(6)	Prob	Pseudo R squared
1	80	0.01	0.9167	0.0001

Table 22 shows the loglikehood (LL) and pseudo-R^2 values for the full model. The model is not statistically significant $(LL = 0.01, p > 0.05)$ and the pseudo R^2 suggests that the model explains roughly 0.01% of the variation in the school outcome outcome and 99.99% is due to unexplained variations.

Table 23 presents the results for logit model for schooling. It contains the ODDs ratios, standard error and the significance of each independent variable used in the model. The socioeconomic determinant variable is pregnancy occurrence.

Table 22 Results for logit model, schooling outcomes

School_outcome	ODDs Ratio	Std. Err	z	P>|z|	[95% Conf. Interval]	
preg_occurence	-0.13146	1.256026	-0.1	0.917	-2.59323	2.330305
_cons	-0.36573	0.908806	-0.4	0.687	-2.14696	1.415495

The findings also show that the predicted pregnancy occurrence was not significant. This shows that the influence of socioeconomic determinants on school outcome was not significance as shown in Table 23.

4.4 Discussion of Findings

In the study, majority of the teenage girls participating in the study had their highest level of education as follows for the majority of the patients: Completed primary school 8%, some secondary school 49.8% and completed secondary school as 16.5%. This is cumulatively 74.3% of all participants and this distribution therefore interpreted that most teenager girls are at peri-secondary school level. The study found out that girls who had teenage pregnancy, participating in the study, 78% had not been married prior to their becoming pregnant while 22% had been married prior to becoming pregnant.

The study found that among the studied socioeconomic determinants of pregnancy, the following had significant influence and increased the likelihood of occurrence of teenage pregnancy; Receiving favors and money in exchange for sex, teenagers attending day school, father's highest education level and household income level. The study found other socioeconomic

determinants studied including; teenagers level of education, literacy level, age at sexual debut, household size, mothers highest education level and parents marital status each with a an ODDS Ratio of 1.0 (rounded off to one decimal place) had no significant influence on occurrence of a teenager pregnancy holding other factors constant.

The study found out that socioeconomic determinants didn't have statistically significant influence on the three socio-economic outcomes following a teenager pregnancy occurrence. Each of the studied outcome (marital status, financial and emotional dependence and schooling) had a p value > 0.05.

The study found that 22% of the teenager girls who had pregnancy occurrence were married before occurrence of pregnancy. This is similar to a UNICEF (2016) report that gave a percentage of 23% of Kenyan girls being married by 18 years. However, all the married teenage girls participating in this study reported that they willingly got married. This contradicts the UNICEF 2016 report which shows that girls are viewed as assets at least in Machakos County.

In this study, young or increasing age at sexual debut had an ODDs ratio of 1 and was found not to be significant as a determinant of occurrence of teenage pregnancy. This is in contrast to a match case control research by Joy, et al (2009) in Jamaica that demonstrated that 54% pregnant youths reported having sexual debut by the age 14 compared to their never pregnant peers.

The study found that level of education and literacy were not a significant determinants of occurrence of teenage pregnancy. However, attending a day school was a great determinant in occurrence of teenage pregnancy. Teenagers attending day's school were three times more likely to get pregnant compared to their counterparts attending boarding school. However, this study did not find reasons or explanations for this disparity. However these findings are contrary to Plan international report (2012) and an India Study by Radhika (Radhika, 2018) which concluded that teenage pregnancies are associated with lower levels of education. However both studies did not explore the influence of the mode of schooling on occurrence of pregnancy. There is potential for future research to explain why this discrepancy exists. A teenager's socioeconomic background was found not to be significant in school outcomes, whether a teenager dropped out or continued schooling following the occurrence of pregnancy.

Among the economic determinants of occurrence of teenage pregnancy, household income was found to be the most significant. Teenagers from household with income below Ksh. 10000 monthly which is a low income band in Kenya had odds ratio of 2.84 of becoming pregnant. This

compares to the India study by Samikshya which found teenagers from lower income households had an odds ratio of 2.37 becoming pregnant (Samikshya, 2018).

Nkol (1997) concluded that it was common for girls in sub-Saharan Africa to receive money and other favors in exchange for sex. This study found out that the percentage of transactional sex for money in Machakos County among teenage girls is 23.3% which is higher than 15% reported by Nkol (1997). In addition, 33.3% of all girls participating in the study received other forms of favors for sex. Furthermore, the study found that transactional sex was strongly associated with occurrence of teenage pregnancy. Teenagers receiving general favors for sex had an Odds ratio of 5.65 of becoming pregnant compared with those who didn't receive any favors. The Odds ratio of becoming pregnant for teenagers who received money was 0.23 and significant compared to teenagers who didn't receive money for sex.

Although teenagers from families which parents were not married had odds ratio of 2.12 of getting pregnant compared to those whose parents were married, this was not statistically significant in this study. Nevertheless this correlates with increased teenage pregnancy among dysfunctional families. Fathers' level of education was found to be a significant determinant in the occurrence of a teenager pregnancy. Teenagers whose fathers level of education was primary school and below had odds ratio of 3.22 of becoming pregnant. This is true because learned fathers are able to get better jobs and earn more income, being the primary breadwinners in most Machakos homes. Lower levels of education among fathers translate to casual jobs and low income hence unfavorable teenagers family socioeconomic settings. A study by Pinnman-Aquilar (-, 2013) agrees with these findings that they lead to a rise in teenagers' birthrate. A study by Smith (1999) also found that teenagers from deprived areas had higher teenage pregnancy rates compared to those from affluent areas.

The study findings that mothers' level of education, household size and parent's occupation are not significant determinants in occurrence of teenage pregnancy are unexpected findings. This is because these variables are strongly linked to household income that was found to have a strong association in the occurrence of teenage pregnancy. Therefore, this is a potential area for future research.

A teenager's socioeconomic determinants were found not to be associated with teenage pregnancy outcomes. This means that according to this study, the decisions to drop out of school or continue schooling, get married or remain single and whom they become dependent on

financially and emotionally were not associated with teenage pregnancy. These findings leave a potential for future research on what determines these outcomes following the occurrence of a pregnancy.

CHAPTER FIVE: SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This last chapter is a summary of the research study and findings. Also included in the chapter are conclusions drawn from the study findings, recommendations and policy implications derived from the study. Finally included in the chapter are areas identified as potential for future research following the findings of this study.

5.2 Summary

This research study sought to find out the existing socioeconomic determinants and outcomes among teenage pregnancies in Machakos County. Further, the study sought to find out the strength of association between these socioeconomic determinants and occurrence of teenage pregnancies. Lastly, the study sought to find how these socioeconomic determinants influence social outcomes following the occurrence of a teenage pregnancy.

The socioeconomic determinants were divided into three categories; Teenagers social economic background characteristics which included age, marital status, literacy and education level, mode of schooling, age at sexual debut and receipt of favors in exchange for sex. Category two included teenagers' parent's social economic background characteristics including parent's marital status, household size and parent's education level attainment. The third category studied teenager's family economic background which included parent's occupation and total household income per month. The social-economic outcomes following the occurrence of pregnancy included in the study included marital status, schooling, financial and emotional dependence.

Primary data was collected from two cohorts of teenagers. Cohort one consisted of girls who had ever been pregnant during their teenage years. It is this cohort whose study of how socioeconomic determinants influenced pregnancy outcomes was done. The second cohort included teenager girls who had never been pregnant their sexual activity notwithstanding.

This was a cross-sectional descriptive study involving teenagers between 13 and 19 years in Machakos County. Descriptive characteristics of study findings have been represented. A multivariate regression model was used to determine a teenager's probability of becoming pregnant using the socio-economic determinants as the independent variables and occurrence of a pregnancy as the dependent variable. Similarly, a multiple logistic regression model was used

to analyze the association of a teenager's socioeconomic background characteristics and the occurrence of the pregnancy outcomes studied. The teenager's socioeconomic characteristics were regressed against each studied pregnancy outcome.

5.3 Conclusions

The results from the study show that the favors and receipt of money in exchange for sex, mode of schooling, fathers level of education and a teenagers household income had a significant effect in determining the likelihood of occurrence of a teenage pregnancy. The study showed that students who attended day school, teenagers from households with household income of Ksh.10000 or below and whose fathers had their highest level of education as primary school or below were more likely to become pregnant.

In this study, age at sexual debut, literacy level and teenagers education level, parents marital status, household size and mothers education were found not to have any significant effect in teenage pregnancy. Analysis of socioeconomic background as determinants of teenage pregnancy outcomes showed no significant effect.

5.4 Policy implications and Recommendations

The National and the County government of Machakos should take into account the variations and dynamics in the circumstances facing girls in day schools and boarding schools when developing policy to curb teenage pregnancy. Again, the Machakos County government should look for means and methods to economically empower teenagers and their parents from low socioeconomic backgrounds. This will deter teenagers from engaging in transactional sex and the increased risk for teenage pregnancies associated with it. Community based organizations in Machakos County need to continue strengthening community education on the need for continuum of care for teenagers who get pregnant.

5.5 Areas for further research

From the findings of these study, there is need to conduct research and find out what other reasons cause early teenage marriage besides culture. Also, there is need for research to find out why discrepancy in teenage pregnancy among day scholars and boarding student exists and how the current government policy on prevention of teenage pregnancy can be strengthened. Lastly,

there is need for research to establish sustainable girl empowerment programs besides the existing legal frameworks to enable girls bargain for safe sex to avoid early pregnancy. Following statistically insignificant findings on effect of socioeconomic determinants on pregnancy outcomes in this study, this remains a potential area of research.

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Appendix one

Study Participant Information, Consent and Assent Form

Study Title: *"Social-economic determinants and outcomes among teenage pregnancies in Machakos County."*
Principal Investigator: Kitheka Stephen Katia

Introduction:
The objective of this consent form is to give you a know-how of all the details you might need concerning your daughter's participation in the study before you give your consent. You are free to enquire on the objective of the study, what will happen if your daughter takes part in the study, the likely benefits and risks, the daughter rights as a volunteer and any other detail you would wish to know about the study. Once your questions have been answered to your satisfaction, you are free to consent your daughter's participation, or decline. In case you agree that your daughter participates in the study, you will be requested to give out your details and sign this form. The primary principles that apply to all participants in medical research will also apply to your daughter that;
 is) Your daughters' decision to take part in the study is entirely voluntarily
 ii) Your daughter is free to withdraw her participation anytime she wishes to.
 iii) Declining participation in the research will have no effect on service delivery to your daughter in any of Machakos County health facilities.
Would you allow me to continue? YES/NO
For all girls below 18 years of age, the information about the study will only be given to their parents or guardian. Before the participation consent is given, we will have to go through this information. Only after one has understood will be allowed to consent. Once you permit your daughter to participate in the study, I will go over the information with her and she will also need to agree or decline taking part in the study.

The Purpose of the Study.
My name is Kitheka Stephen, a student at the University of Nairobi pursuing a degree in Masters of Science Health Economics and Policy. I am conducting a study on *"Socioeconomic determinants and outcomes among teenage pregnancies in Machakos County"* which is a necessity for the awards of the degree and contribution to research. Participants in the study will be asked random questions on their socioeconomic background, sexual behavior characteristics and impacts of being pregnant if they have ever been pregnant. The participants in this study will selected randomly. I am requesting for your consent to consider your daughter to take part in this research. I am also seeking your daughter's assent to participate in the study.

What will happen if you permit your daughter to participate in this study?

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Your daughter will be given a questionnaire to fill, if you give consent. In case she is unable to read or has difficulty understanding the question, the research assistant will help her read and translate/explain any difficult terms to her. Filling the questionnaire will take approximately less than 10 minutes. Your contacts will be needed just in case. The contact information will be used only by me to clarify answers that may not be clear (the principal investigator) and will not be shared with anyone else.

The risks, damage and discomforts associated with this study.
Just like it is with other medical studies, there is a probability that this research might arise some psychological, social, emotional and substantial issues. We have put in place some measures to ensure that the risks will be minimal and they will not affect their well-being. All the shared information same to your identities will be kept confidential, only code numbers will be used to represent each participant in our database which we assure our participants that it will be protected with passwords and all our hard copies of the study will be kept locked in a file cabinet.

In addition, answering some of the questions in the questionnaire may not be comfortable for our participants. In case you find the questions hard or tricky for you to answer, you can always skip the question. Also, questions relating to sexual behavior characteristic where sexual abuse may have taken place or post abortion maybe distressing psychologically, I will link participants to a qualified psychological counselor at our select facilities and/or discontinue the filling of the questionnaire should the questions cause such distress.

What are the benefits of being in this study?
There is no direct benefit to your daughter for taking part in the research. However, the information she will give will be of importance for this study. We will be better placed to understand teenage girl's socioeconomic background. In addition, this information is a major contribution to generation of scientific knowledge. Participating in the study is free and out of good will.

How can you reach us?
In case of questions, concerns or clarity about your daughter's participation, please feel free call or send a text message to the study principal investigator *Stephen Katia Kitheka* through **0712833966**, or *Prof. Tabitha Kiriti- Nganga* the research lead supervisor *via 0721757665*. For more details about your daughter's rights as a research participant, feel free to contact Kenyatta National Hospital-University of Nairobi Ethics and Research Committee Secretary/Chairperson via Telephone No. 2726300 Ext. 44102 email uonknh_erc@uonbi.ac.ke.

Your expenses for the call will catered for, by the study staff, only if the call is related to the study.

Do you have other choices?
It's your right as a parent/guardian to decide whether your daughter should take part in the study. Taking part in the study is also voluntary. It's your right to decline your daughter's participation,

or withdraw from the study anytime through the research assistant and without any injustice. You do not have to give reasons for withdrawing your daughter if you do not wish to do so. Your daughters is still assured of health services from this health facility or any other health facility whether she takes part in the study or not.

Consent Form (Statement of Consent)

We are considering your daughter for our study, and we request your consent for her participation as her parent/guardian since she is not yet 18 years of age.

Parent/guardian statement

Having taken my time to read the consent form, discussed the details of the study with the assistant researcher, and raised my concerns and questions about the study, I am willingly giving my consent for my daughter to take part in the study. It is also clear to me that our participation in the study is voluntary and that we will get to keep a copy of the consent once we have signed. It's also clear that we can always pull out if we decide not to participate in the study.

Having been assured that our identity will be kept confidential, I believe that I will not be giving up my child's legal rights as a participant in this research study by signing this consent form.

I willingly allow my daughter to voluntarily take part in this research study: Yes/No

Parent/Guardian signature: _____ Date _____

Participant's signature (For those who are pregnant/have a child or are married): _____ Date _____

Researcher's statement

I, the undersigned, having explained in details the objective of this study to both the parent/guardian, and the participant named above, I believe they have understood and have willingly given their consent.

Printed Name: _____ **Date**: _____

Signature: _____

Appendix two

Facility code;   _____
Entry Number;   _____
Date   _____
Phone number (Patients)   _____
Location   _____   Constituency; _____
Research assistants name;   _____

Please do not write your name or other contact details in this questionnaire. Please select one best response for each question.

Social factors.

1. Have you ever been pregnant? If no, proceed to question 4.
a) Yes
b) No
2. What was your age at the time of pregnancy?   a) 11-14 years
                                                      b) 15-19 years
3. Were you married at the time of the pregnancy or not?
a) Yes
b) No
   (If yes, were you forced or was it a personal decision? Please tick as appropriate)
o I was forced to get married.
o I willingly got married.
   Other (Specify) _____
4. How would you describe your literacy level? Circle as appropriate.
a) I can read and write
b) I can only read
c) I can only write
d) I cannot read or write
5. What is your highest level of education? Please circle the best response.

    0= No formal education

    1= Elementary school

    2= Some primary school

    3= Primary school

    4= Some secondary school

    5= Secondary school certificate

    6= College/University diploma

    7= Graduate

6. What was your age during your first sexual encounter? _____

7. Did your sexual partner give you money or extend any favors to you for sex before you became expectant? (Please tick as appropriate)

   a) Yes

   b) No
8. How would you describe your mode of schooling?
a) Never attended school
b) A day scholar
c) A boarding student
9. Have you ever engaged in sex in exchange for financial support, money or other favors from men (Including your sexual partner)? _____.

Parents social factors.
1. How would you describe you parent's marital status? (Please circle as appropriate)
a) Single parent
b) Separated
c) Still married
d) Divorced
e) Orphaned
f) Others (specify)
2. How many people are there in your household, inclusive of you? (I.e., this includes your parents, siblings and persons who are financially dependent on them). _____.
3. What are your parents' highest education attainment?

Mother	Father
0. No formal education	0. No formal education
1. Elementary school	1. Elementary school
2. Some primary school	2. Some primary school
3. Primary school	3. Primary school
4. Some secondary school	4. Some secondary school
5. Secondary school certificate	5. Secondary school certificate
6. College/University diploma	6. College/University diploma
7. University degree	7. University degree

Household economic factors.
Please tick the appropriate choice.
1. What category of occupation from those listed below would you classify your parent?
   0= Unemployed
   1= Student
   2= casual/crafts and small-scale business
   3=middle size business owners, semiprofessional, small scale farmers
   4=administrators, minor professionals
   5= Major professionals, higher executives and large business proprietors

2. From the table below, select your families/household estimated income.

	Tick	Net income level (KSh)
		Above 350,000
		100,000- 385,000
		50,000- 100000
		10,000-50,000
		Below 10,000

Pregnancy socioeconomic outcomes.
  Please pick one that aligns with your experiences after you became pregnant. (If you have never been pregnant, ignore this section).

1. Did your marital status change after you got pregnant?
a) No, I was already married
b) No, I remained single
c) Yes, I got married

2. Who has been supporting you emotionally and financially after you became pregnant?
a) Parent(s)
b) Siblings
c) Boyfriend
d) Husband
e) Others. Please be specific. _____

3. How was your schooling after pregnancy?
a) I am still schooling
b) I was sent away from school by the administration.
c) I dropped out of school.
d) I was not schooling.

Appendix Three

Letters of Introduction

     i.   **KNH-UoN ERC Approval**
    ii.   **Research permit NACOSTI**
   iii.   **University of Nairobi Introductory letter**
   iv.   **Machakos letter research approval letter**

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8th September, 2021

Stephen Katia Kitheka
Reg. No. X53/12898/2018
School of Economics
College of Humanities and Social Sciences
University of Nairobi

APPROVED
08 SEP 2021
KNH/UoN-ERC

Dear Stephen,

RESEARCH PROPOSAL: SOCIAL-ECONOMIC DETERMINANTS AND OUTCOMES AMONG TEENAGER-PREGNANCIES IN MACHAKOS COUNTY   (P103/02/2021)

This is to inform you that the KNH- UoN Ethics & Research Committee (KNH-UoN ERC) has reviewed and **approved** your above research proposal. The approval period is 8th September 2021 – 7th September 2022.

This approval is subject to compliance with the following requirements:

i.   Only approved documents (informed consents, study instruments, advertising materials etc) will be used.
ii.   All changes (amendments, deviations, violations etc.) are submitted for review and approval by KNH-UoN ERC before implementation.
iii.   Death and life threatening problems and serious adverse events (SAEs) or unexpected adverse events whether related or unrelated to the study must be reported to the KNH-UoN ERC within 72 hours of notification.
iv.   Any changes, anticipated or otherwise that may increase the risks or affect safety or welfare of study participants and others or affect the integrity of the research must be reported to KNH- UoN ERC within 72 hours.
v.   Clearance for export of biological specimens must be obtained from KNH- UoN ERC for each batch of shipment.
vi.   Submission of a request for renewal of approval at least 60 days prior to expiry of the approval period. (Attach a comprehensive progress report to support the renewal).
vii.   Submission of an executive summary report within 90 days upon completion of the study.

Protect to discover

This information will form part of the data base that will be consulted in future when processing related research studies so as to minimize chances of study duplication and/ or plagiarism.

For more details consult the KNH- UoN ERC website **http://www.erc.uonbi.ac.ke**

Yours sincerely,

PROF. M.L. CHINDIA
SECRETARY, KNH- UoN ERC

c.c.   The Principal, College of Health Sciences, UoN
         The Senior Director, CS, KNH
         The Chair, KNH- UoN ERC
         The Assistant Director, Health Information, KNH
         The Director, School of Economics, UoN
         Supervisor: Prof. Tabitha Kiriti-Nganga, School of Economics, UoN

REPUBLIC OF KENYA

NATIONAL COMMISSION FOR
SCIENCE, TECHNOLOGY & INNOVATION

Ref No: **385226**

Date of Issue: **24/September2021**

RESEARCH LICENSE

This is to Certify that Dr.. stephen Katia Kitheka of University of Nairobi, has been licensed to conduct research the topic: Social-Economic Determinants and Outcomes among Teenager-Pregnancies In Machakos County for the : 24/September2022.

License No: **NACOSTI/P/21/13062**

385226

Applicant Identification Number

Director General
NATIONAL COMMISSION FOR
SCIENCE, TECHNOLOGY &
INNOVATION

Verification QR Code

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THE SCIENCE, TECHNOLOGY AND INNOVATION ACT, 2013

The Grant of Research Licenses is Guided by the Science, Technology and Innovation (Research Licensing) Regulations, 2014

CONDITIONS

1. The License is valid for the proposed research, location and specified period
2. The License any rights thereunder are non-transferable
3. The Licensee shall inform the relevant County Director of Education, County Commissioner and County Governor before commencement of the research
4. Excavation, filming and collection of specimens are subject to further necessary clearence from relevant Government Agencies
5. The License does not give authority to tranfer research materials
6. NACOSTI may monitor and evaluate the licensed research project
7. The Licensee shall submit one hard copy and upload a soft copy of their final report (thesis) within one year of completion of the research
8. NACOSTI reserves the right to modify the conditions of the License including cancellation without prior notice

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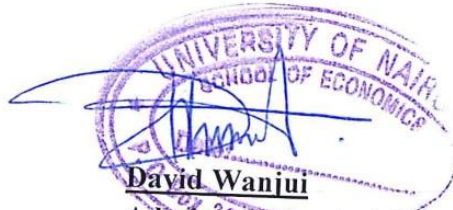Gandhi Wing, Room GW 210
NAIROBI, KENYA

4th February 2021

TO WHOM IT MAY BE CONCERN

RE: KITHEKA STEPHEN- REG. X53/12898/2018

This is to confirm that the above named is a Master of Science in Health Economics Policy student in the School of Economics, University of Nairobi.

He has completed his coursework and currently working on his project ti *Socioeconomics determinants and outcomes among teeneager pregnancies in Machd County"* He needs to collect secondary and primary data for the project to be satisfacto completed.

We therefore request your kind consideration in providing him with any assistance he r require.

David Wanjui
Administrative Assistant,
School of Economics

AW/mm

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