**UNIVERSITY OF HEALTH AND ALLIED SCIENCES**

**SCHOOL OF ALLIED HEALTH SCIENCES**

****

**PREVALENCE OF GLUCOSE-6-PHOSPHATE DEHYDROGENASE (G6PD) DEFIECIENCY AMONG PREGNANT WOMEN IN HO MUNICIPALITY**

**A PROJECT RESEARCH PROPOSAL**

**BY**

**MACHIESTAY-DZREGAH ELORM BRIAN UHAS20184287**

**DEPARTMENT OF MEDICAL LABORATORY SCIENCES**

**JANUARY, 2022**

P. M. B. 31,

Ho, Volta Region,

Ghana.

January 30, 2022

The Chairman,

Research Ethics Committee (REC),

Research Operations Office, Institute of Health Research

University of Health and Allied Sciences

Dear Sir/Madam,

**LETTER OF INTRODUCTION:**

**MACHIESTAY-DZREGAH ELORM BRIAN (UHAS20184287)**

This is to introduce Mr. Machiestay-Dzregah Elorm Brian, a Medical Laboratory Science student from the Department of Medical Laboratory Sciences in the School of Allied Health Sciences, University of Health and Allied Health Sciences.

As part of his undergraduate study requirement, he shall be conducting a prospective cross-sectional study on the topic **“****Prevalence of Glucose-6-Phosphate Dehydrogenase Deficiency among Pregnant Women in Ho Municipality”**

The study topic is approved by the supervisor, and the attached protocol has been admitted at the departmental review for onward submission to UHAS-REC for ethical review and approval.

We will therefore be most grateful if we are given the necessary assistance to enable us to conduct the proposed research.

Thank you.

Yours faithfully,

**HEAD OF DEPARTMENT SUPERVISOR**

Dr. Huseini W. Alidu Mr. Anold Lutse

Signature…………………… Signature……………………

Date………………………… Date…………………………

P. M. B. 31

Ho, Volta Region Ghana.

January 30, 2022.

The Chairman

Research Ethics committee (REC)

Research Operations Office, Institute of Health Research

University of Health and Allied Sciences

Dear Sir/Madam,

**SUBMISSION OF PROJECT PROTOCOL FOR ETHICAL CLEARANCE:**

**MACHIESTAY-DZREGAH ELORM BRIAN(UHAS20184287)**

I am Appiah Machiestay-Dzregah Elorm Brian, final year Medical Laboratory Science student from the Department of Medical Laboratory Sciences in the School of Allied Health Sciences, University of Health and Allied Sciences.

As part of my undergraduate study requirement, I will be conducting a prospective cross-sectional study on the topic **“Prevalence of Glucose-6-Phosphate Dehydrogenase Deficiency among Pregnant Women in Ho Municipality”**

I will therefore be most grateful if the attached study protocol is ethically approved to enable me conduct this research.

Thank you.

Yours faithfully,

………………………

Machiestay-Dzregah Elorm Brian.

**RESEARCH OPERATIONS OFFICE**

**INSTITUTE OF HEALTH RESEARCH**

**UNIVERSITY OF HEALTH AND ALLIED SCIENCES**

**RESEARCH ETHICS COMMITTEE (REC)**

**NEW PROTOCOL SUBMISSION FORM**

**Requirements:**

1. A new protocol must be submitted to the REC **at least three months before** the proposed commencement date of the research to ensure you have clearance before the proposed start date.
2. All sections of this form must be completed and guidelines for submission strictly followed before the protocol can be considered for review.
3. **16 bound copies** of the application dossier (cover letter, completed protocol submission checklist, completed New Protocol Submission Form, the study protocol, and other documentation) should be submitted at the Institute of Health Research by the submission deadline for the month. Printing should be one-sided.
4. A soft copy of your application dossier (cover letter, completed protocol submission checklist, completed New Protocol Submission Form, the study protocol, and other documentation) **as one pdf file** should be emailed to [*rec@uhas.edu.gh*](mailto:rec@uhas.edu.gh)by the submission deadline for the month.





|  |  |  |
| --- | --- | --- |
| **1.1** **Title of Study:** | **PREVALENCE OF GLUCOSE-6-PHOSPHATE DEHYDROGENASE DEFICIENCY AMONG PREGNANT WOMEN IN HO MUNICIPALITY** | |
| **1.2 Principal Investigator (PI)** | | |
| Full Name  *(Surname First, Title, Qualifications)* | **Machiestay-Dzregah Elorm Brian** | |
| Postal Address: | PMB 31, Ho, Volta Region, Ghana | |
| Institutional Affiliation: | UNIVERSITY OF HEALTH AND ALLIED SCIENCES, UHAS | |
| Phone Number: | 0275549093 | |
| Email Address: | brianmachiestay@gmail.com | |
| **1.3 Co-Investigator(s)** | |  |
| **First Co-Investigator** | |  |
| **Name of 1st Co-Investigator:**  *(Surname First, Title, Qualifications)* | **Arnold Lutse, Mr** | |
| Postal Address: | PMB 31, Ho, Volta Region, Ghana | |
| Institutional Affiliation: | UNIVERSITY OF HEALTH AND ALLIED SCIENCES, UHAS | |
| Phone Number: | 0544545395 | |
| Email Address: | To be added | |
| **1.4 Proposed Study/Research Information** | | |
|  | | |
| Type of Proposal | **☒** Student Research ☐ Grant Application  ☐ Faculty Research | |
| Student Status *(for student applicants only)* | ☒ Undergraduate ☐ Masters ☐ PhD | |
| Type of Research/Study: | ☐ Clinical Trial ☒ Biomedical/Epidemiological Study  ☐ Social Science Research ☐ Others (specify) | |
| Location of Research/Study:  *(Region, District, Towns)* | *Region: Volta Region*  *District(s): Ho Municipal*  *Towns: Ho* | |
| Duration of Research/Study: | Study Start Date: November,2021  End Date: May,2022 | |
| Source(s) of Funding:  *(Name, Postal Address, and Email)* | Department of Medical Laboratory Sciences of University of Health and Allied Sciences | |



*As the Principal Investigator / Co-investigator / Researcher/ Student Investigator on this project, your signature on the proposal confirms that:*

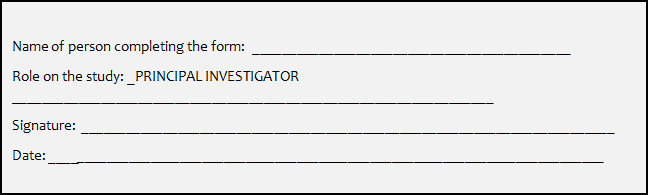
*You will ensure that all procedures performed under the study will be conducted in accordance with all relevant policies and regulations that govern research involving human participants.*

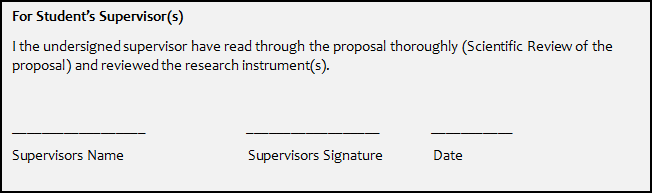
*You understand that if there is any change from the project as originally approved you must submit an amendment to the REC for review and approval prior to its implementation. Where you fail to do so, the amended aspect of the study is invalid.*

*You understand that you will report all serious adverse events associated with the study within seven days verbally and fourteen days in writing.*

*You understand that you will submit progress reports each year for review and renewal. Where you fail to do so, the REC is mandated to terminate the study upon expiry.*

*You agree that you will submit a final report to the REC at the end of the study.*

PP



**UNIVERSITY OF HEALTH AND ALLIED SCIENCES**

**SCHOOL OF ALLIED HEALTH SCIENCES**

**DEPARTMENT OF MEDICAL LABORATORY SCIENCE**



**PREVALENCE OF GLUCOSE-6-PHOSPHATE DEHYDROGENASE DEFICIENCY AMONG PREGNANT WOMEN IN HO MUNICIPALITY**

**BY**

**MACHIESTAY-DZREGAH ELORM BRIAN**

**A PROJECT PROPOSAL SUBMITTED TO THE SCHOOL OF ALLIED HEALTH SCIENCES OF THE UNIVERSITY OF HEALTH AND ALLIED SCIENCES, HO, IN PARTIAL FULFILLMENT OF THE REQUIREMENT FOR THE AWARD OF THE BACHELOR OF MEDICAL LABORATORY SCIENCES DEGREE.**

**JANUARY, 2022**

# 

# DECLARATION

I hereby declare that this research proposal is the result of my original work and that no part has been presented for another degree in this university or elsewhere.

**NAME SIGNATURE DATE**

Machiestay-Dzregah Elorm Brian ……………………. ……………………..

(UHAS20184287)

Mr. Arnold Lutse …………………… .…………………

(Supervisor)

# ABSTRACT

**Background:** Infertility, a condition where couples cannot conceive, continues to be a slow epidemiological sexual and reproductive health challenge. The apparent failure or inability to achieve pregnancy within one year of unprotected sexual intercourse attracts stigmatization on the couples which may result in psychosocial and psychological consequences, and may even lead to suicide. The public health strategies promulgated to prevent and control the sexual and reproductive challenges include public health education on the populance to appreciate infertility as a clinical condition that is treatable and manageable. Lack of baseline information on Ghanaians’ attitudes towards infertility in the Ho municipality makes it very impossible to evaluate the impart of those public health strategies in the Ho municipality. It is therefore essential to conduct a surveillance study on attitudes towards infertility among a cross-section of Ghanaians living in the Ho municipalities. Hence this study is to investigate the attitudes some group of people portray with regards to infertility.

**Aim:** To investigate the attitudes regarding infertility among residents in the Ho municipality regarding infertility**.**

**Methods:** The study is a socio-behavioral surveillance study, designed to cross-sectionally seek information on the participants’ attitudes towards infertility. The Ghanaians living in the Ho municipality shall constitute the study population. Using an online sample size calculator (Raosoft), about 382 study participants shall be recruited on the study through the convenient sampling method. A pretested questionnaire on attitudes shall be used for data collection from consented study participants. A Microsoft basic graphic interphase shall be used for visual data management. The data entry and management entry shall be quality controlled and the clean data shall be exported to STATA software for statistical analysis. The frequency, descriptive and logistic regression statistics shall be used to analyze and report the study outcomes.

**Expected Outcome:** The epidemiological situation on the socio-behavioral attitudes towards infertility among Ghanaians living in the Ho municipality shall be described. Specifically, the socio-demographic and socio-economic trends and predictors of participants attitudes from a scale of poor to excellent attitudes expressed by the participant shall be presented. The implication of the study outcome on policies, programmes and research shall be outlined and discussed. The outcome of this study shall serve as a baseline information on the socio-behavioral attitudes towards infertility among Ghanaians living in the Ho municipality.

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# CHAPTER ONE

# INTRODUCTION

## 1.1 Background

G6PD deficiency (G6PDd) is among the most common human genetic enzyme defects which affects more than 400 million people(Nkhoma et al., 2009). This X-linked genetic condition is characterized by reduced G6PD enzyme activity, which may remain asymptomatic. Red blood cells obtain reduced glutathione (GSH) only from the G6PD/reduced nicotinamide adenine dinucleotide phosphate (NADH) pathway (Williams et al., 2013). The deficiency makes red cells more prone to oxidative hemolysis that can be triggered by certain drugs, such as primaquine (PQ) and other 8-amino quinolone drugs.(Williams et al., 2013).

Over 400million people worldwide are affected by G6PD. The World Health Organization(WHO) recommends population screening in regions where the prevalence of G6PD is 3-5% or higher in males. This has not been the regular practice in many parts of the world because of the lack of infrastructure.

G6PD deficiency contributes to hyperbilirubinemia and jaundice in newborns, which put infants at risk for acute bilirubin encephalopathy in the first few days of life and this may lead to kernicterus spectrum disorder or even death (Lauden et al., 2019). Kernicterus spectrum disorder is characterized by hearing deficits, behavior problems, and neurologic damage.

G6PD deficiency may also cause morbidity in persons receiving antimalarials like dapsone or primaquine, by causing hemoglobinuria and hemolysis. Clearly, these factors mentioned above adds to the public health burden in this condition.

It is reported that G6PD offers partial resistance to malaria in deficient males and heterozygous females, and this explains its higher prevalence in malaria-endemic regions (Lauden et al., 2019). For the above-mentioned reasons, it is necessary to assess the prevalence of Glucose-6-Phosphate Dehydrogenase Deficiency in Blood Donors.

## 1.2 Problem statement

Glucose-6-Phosphate Dehydrogenase Deficiency affects over 400 million people worldwide and the World Health Organization (WHO) recommends population screening in regions where the prevalence is equal to or higher that 3-5% in males. It is also estimated that the prevalence of G6PD deficiency in Africa ranges from 15 to 25%. The WHO also estimates the prevalence of G6PD in Ghana to be 15-26% though appropriate literature of the prevalence in the regions in Ghana is not yet reported.

(Lauden et al., 2019) in a study conducted on “Prevalence of glucose-6-phosphate dehydrogenase deficiency in Cameroonian blood donors” suggested a repetition of the study in other centers and populations to confirm validity as the study was cross-sectional and from a single site.

The high prevalence of red cell pathologies including G6PD suggest that measures should be taken before donation and subsequent transfusion of blood units to individuals who may have also inherited these red cell pathologies. This necessitates the estimation of G6PD in all populations to help determine whether units should be screened before transfusion or not(Adu et al., 2016). For the reasons stated, it is necessary to estimate the prevalence of Glucose-6-Phosphate Dehydrogenase deficiency in Ho, Ghana.

## 1.3 Justification

This study addresses a limitation in the study conducted by (Lauden et al., 2019) on “Prevalence of glucose-6-phosphate dehydrogenase deficiency in Cameroonian blood donors” and so repeats the study in Ghanaian blood donors specifically in Ho.

According to the WHO recommendation to screen for G6PD deficiency in regions where the prevalence has been estimated to be equal to or higher than 3-5% in males, it is necessary to determine the prevalence of G6PD deficiency in Ho to determine whether to do as WHO recommends.

Also an estimate of the prevalence G6PD deficiency in Ho will emphasize the necessity to screen blood for G6PD before donation and subsequent transfusion as individuals who may already have the condition will suffer great risk when transfused.

## 1.4 Aim

To estimate the prevalence of Glucose-6-Phosphate Dehydrogenase Deficiency in male blood donors in Ho.

## 1.5 Specific Objectives:

* To determine the prevalence of G6PD deficiency among male blood donors in Ho
* To determine the relationship between G6PD deficiency and other screening test result
* To be able to determine the catchment population and appropriately choose a sample size

# 

# CHAPTER TWO

# LITERATURE REVIEW

## 2.2 General overview:

Among the most common human genetic enzyme defects, G6PD deficiency (G6PDd) affects more than 400 million people. This X-linked genetic condition is characterized by reduced G6PD enzyme activity, which may remain asymptomatic. Red blood cells obtain reduced glutathione (GSH) only from the G6PD/reduced nicotinamide adenine dinucleotide phosphate (NADH) pathway (Williams et al., 2013). A defect of the G6PD enzyme has several physiologic effects. It results in decrease level of reduced glutathione (GSH) which makes the red blood cells (RBCs) vulnerable to oxidative damage and eventually hemolysis or anemia (Engwa et al., 2017). It has also been reported that a third of children with G6PD deficiency develop neonatal jaundice. Severe neonatal jaundice if not treated could lead to kernicterus, a well-known cause of death (Mohanty et al., 2004). G6PD deficiency makes red cells more susceptible to oxidative hemolysis that could be triggered by certain drugs, such as primaquine (PQ) and other 8-amino quinolone drugs (Amoah et al., 2016).

## 2.3 RBC transfusion from G6PD deficient donors

“RBC storage lesion” refers to biochemical and biophysical changes in RBC physiology that occur during refrigerated storage (Bennett-Guerrero et al., 2007). These include decreased pH, 2,3-diphosphoglycerate and ATP depletion, increased RBC fragility, decreased RBC deformability, increased extracellular lactate and potassium and accumulation of RBC micro vesicles (Rubin et al., 2008), which may contribute to hemolysis *in vivo* and *in vitro*. RBC storage under conventional conditions is considered an oxidative stress for RBCs, as evidenced by increases in reactive oxygen species over time (D’Alessandro et al., 2012), oxidative biomarkers accumulation, including malondialdehyde (Korgun et al., 2001) and oxidation products of human serum albumin (Rael et al., 2009), together with oxidation-dependent alterations of RBC membrane proteins, such as spectrin (Antonelou et al., 2010).

Transfusing RBCs from G6PD-deficient donors have adverse consequences which may vary based on the clinical status of the recipient, as well as on the types of mutations in the donor population. Routine screening of blood donors for G6PD deficiency is not done and blood centers vary in their deferral of donors with known G6PD deficiency; that is, some defer G6PD deficient donor, whereas others do not even have a policy for such donors (Francis *et al.*, 2013).

## 2.4 The attitudes of the victimized couples towards infertility:

It has been found out that the cause of a couple's failure to conceive is actually an equal proportion in the gender. In about 50% of cases can be related to either one of the sexes, but the social burden disproportionally falls on women (WHO, 2010). Men who are not conscious of their infertility sometimes divorce their wives, expel them from their houses and take up another if their culture permits polygamy. (Orji, Kuti & Fasubaa 2002). Between August 2013 and October 2013, the Ghana Statistical Service (GSS) and the Judicial Service jointly compiled data of divorce in the High Courts of the Greater Accra Region. The data confirmed our feeling that people hide behind childlessness situations and come out with other reasons to seek for divorce since infertility is not a good ground for Divorce in Ghana. Nevertheless, these data indirectly indicated that infertility and childlessness are probably the most important reasons for divorce in Ghana. (Osei, 2013).

Some couples also revealed that they were considering relocating from their current communities to reduce the insults, intense pressure, stress and stigma. Also, some women revealed maltreatment from their husbands and in-laws (Ofosu *et al*, 2020). Some are bodily harmed; they sustain bruises and experience other forms of domestic violence from their husbands. In other ways, others stated their husbands disclosed their fertility status to their own family members to avoid these family pressuring these women (Abolfotuh *et al*).

## 2.5 Attitudes of the victimized couples toward infertility treatment:

A study in Jakarta revealed that most participant agreed to treat infertile couples, while one in five participants considered that infertility does not need to be treated in East Sumba (96.0% vs 81.8%). Among those believing that infertility does not need to be treated, many stated that infertility is something genetic and congenital and the cause was attributable to God (Harzif *et al*, 2019). Also, majority of the participants in Jakarta answered with respect to treatment, both husband and wife should be investigated. One third of the participants in East Sumba thought that women should be investigated first. (Harzif *et al*, 2019). Again, in Jakarta, treatment options were given to consult medical doctors, witch doctors, self-medicate, or seek other alternative therapies. 36.4% (the majority), preferred to seek help from other alternatives which was traditional massage in lower abdominal and lower back area and only 1% preferred to consult medical doctors (Harzif *et al* 2019).

With respect to treatment sought by infertile couples, various sources of treatments were mentioned. According to Donkor and Sandall (2012), the study participants in Ghana sought to traditional healing including herbal treatments and spiritual medication (including churches). Others consult fetish and few consult to orthodox biomedicine for medical intervention. Some women are deeply convinced of supernatural causes, and so they patronize the services of traditional and religious healers for spiritual redress (Osei, 2013). At present it is very common in Ghana to see women form majority of attendants at prayer camps and other alternative health care sources in Ghana’s pluralistic health context with the aim of looking for a solution to their infertility (Osei, 2013). Several attitude items were also associated with the desire for treatment including the belief that infertility decreases a man's quality of life and that the condition should be treated (Harzif *et al*, 2019).

A study revealed that up to 50% of infertility cases will involve a male factor, and a male factor is the only identifiable one in approximately 20% of couples. Despite this, men are less likely to seek for services and many men from infertile couples do not undergo a male evaluation but the 1% who are aware of their infertility condition generally have a good attitude towards infertility treatment as majority of them perceive infertility treatment to be the responsibility of both couples (Gerhard, 2014). In Africa, most women sought out to traditional sources and few sought to medical sources for help. Sometimes the few who sought to the prolonged period of medical treatment and perceive less benefits of that treatment frequently stop the medication and either change to another form or stop seeking for any treatment (Yakubu, 2015)

## 2.6 Effect of the negative attitudes towards infertility

Infertility could be disappointing and devastating for couples who desire to have a child. Infertility as a source of stress could threaten the mental health of infertile people (Gerhard, 2014). Infertility has psychosocial impacts on couples especially women. In African settings, Infertility is a socially unacceptable condition; leading most infertile couples on a relentless “quest for conception”. Studies have shown that women not only are harassed by the family members but face various forms of marital instabilities (Fehintola, *et al*, 2017). Also, Psycho-social effects of infertility recorded ranged from depression, low self-esteem, frustration, anxiety, hopelessness to actual suicidal attempt. (Hasanpoor-Azghdy *et al*, 2014). Also due to the negative attitudes the society portray towards infertility, it hinders most women from seeking for medical treatment.

# CHAPTER THREE

# METHODOLOGY

## 3.1 Study design:

The study is a socio-behavioral surveillance, and it is cross-sectionally designed to seek information on expression of poor to excellent attitudes towards infertility among Ghanaians living in Ho municipality

## 3.2 Study site

### 3.2.1 Location and Area

The Ho municipality is located between latitudes 6o 20” N and 6o 55” N and longitudes 0o 12’E and 0o 53'E. The Municipality shares boundaries with Adaklu and Agotime-Ziope Districts to the South, Ho West District to the North and West, and the Republic of Togo to the East. Its total land area is 2,361km2 thus representing 11.5 % of the region’s total land area (GSS, 2010).

## 3.3 Population size, structure, and composition

According to the 2010 Population and Housing Census, the population of the Ho Municipality Census is 177,281 representing 8.4 % of the region's total population. Females constitute 52.7 % and males represent 47.3 %. About 62 % of the population resides in urban localities. The Municipality has a sex ratio (number of males per 100 females) of 89.7. The youthful population (population less than 15 years) in the Municipality accounts for 31 % of the population with a small number of elderly persons (population aged 65 years and older). The total age dependency ratio (dependent population to population in the working-age) for the Municipality is 59.0, the age dependency ratio for males is higher (60.7) than that of females (57.4)(GSS, 2010).

 Source: Ghana Statistical Service

**Marital status**

About one-third (35.8 1%) of the population aged 12 years and older are married, 42.8 percent have never married, by age 45-49years, about seventy percent of females (69.6%) %) are married compared to a little below two-third of males (60.1%). At age 65 and above, widowed females account for as high as 57.8 percent while widowed males account for only 13.9 percent, among the married, 11.9 percent have no education while about 3.1 percent of the never-married have never been to school. About 8 out of 10 of the married population (79.3%)) are employed, 2.9 percent are unemployed6 and 17.8 percent are economically not active. A greater proportion of those who have never married (65.7%) is economically not active with 29.4 percent unemployed(GSS, 2010).

**Fertility, mortality, and migration**

The Total Fertility Rate (TFR) for the Municipality is 2.6. The General Fertility Rate (GFR) is 74.4 births per 1000 women aged 15-49 years for the region. The Crude Birth Rate (CBR) is 20.9 per 1000 population. The Crude Death Rate (CDR) for the Municipality is 8.3 per 1000. The majority of migrants (72.7%) living in the Municipality were born elsewhere in the region in Ghana. For migrants born in another region, those born in Greater Accra (38.3%) form the majority followed by Eastern (24.6%) and Ashanti (12.1 %) regions (GSS, 2010).

**Literacy and education**

Of the population, 11 years and above, 90.3 percent are literate whiles 9.7 percent are not literate. The proportion of literate females is higher (51.3%) than that of males (48.7%). 7 out of 10 people (73.8%) indicated they could read and write both English and a Ghanaian language (s). Of the population aged 3 years and above in the Municipality, 9.3 percent have never attended school, 39.4 percent are currently attending and 51.3 percent have attended school in the past (GSS, 2010).

**Occupation**

Of the employed population, about 21.4 percent are engaged as skilled agricultural, forestry, and fishery workers. 26.8 percent are engaged in service and sales while 22.6 percent are into a craft and related trade, and 15.8 percent are engaged as managers, professionals, and technicians (GSS, 2010).

**Employment status and sector**

Of the population 15 years and older, 58.5 percent are self-employed without employees while employees constitute 27.6 percent. Overall, men constitute the highest proportion in each employment category except self-employed (without employees), contributing family workers, and domestic employees. The private informal sector is the largest employer in the Municipality, employing 76.7 percent of the population followed by the public sector (16.1%) (GSS, 2010).

**Economy**

Although an urban area, agriculture is the mainstay of the Ho Municipality's economy. It employs about 70 percent of the economically active labor force. Nearly every household in the Municipality is engaged in farming or an agricultural-related activity. Farming in the Municipality is largely carried out on a small-scale or subsistence basis. The average acreage cultivated ranges between 4-6 acres for all crops. Despite its importance in the Municipality's economy, much of the agricultural potentials in the Municipality remain unutilized. For instance, out of a total of 62,261 hectares of arable land, only 23,167.6 hectares are currently being utilized. The Municipality's irrigation potential also remains untouched. The Municipality's economy is also characterized by a large number of small-scale commercial and industrial activities. These small-scale enterprises and industrial concerns are concentrated in the city center, making it the business hub of the Municipality. People are in various forms of employment both in the public and private sectors. The public service employs 9 percent of the workforce while the private sector (dominated by the informal sector) employs the remaining 91 percent (GSS, 2010).

## 3.4 Study Population

The communities of formal and non-formal sectors shall constitute the study population. While the formal population will be mainly health workers, educationists, and public servants, the informal population shall include both skilled and non-skilled manual workers in Ho municipality.

## 3.5 Sampling Methods

The sampling techniques and procedures shall include;

1. Stratification of study population into respective sections: Here the study population will be divided into different subgroups or strata based on their occupations, then conveniently select the final subjects proportionally from the different subgroups (column 1, Table2)
2. Determination of sample size per section by Raosoft calculator; the Raosoft calculator will be used to calculate the sample sizes of the respective subgroups before the convenient selection of the final subjects is done (column 2, Table 2).

The selection of potential subjects and administration of the questionnaire shall be done conveniently. Thus, the selection of participants shall not be on a random basis, but who (potential study subject) ever pass the inclusion criteria, and he/she is present at the time of sample collection shall be recruited to participate in the study. This is a surveillance kind of study that is okay to use a non-probability method using convenient sampling to obtain the estimated sample size needed to achieve the desire statistical power.

## 3.6 Sample Sizing:

An online sample size calculator with an inbuilt formula (See figure 1) called Raosoft sample size calculator was used to determine the study sample size. The settings in column *‘expected Input’* in table 1 are readjusted to have a 95% confidence interval, 5% margin of error, 50% response distribution, and a population of 80,458, the minimum sample size will be 383.

X= Z(C/100)2r(100-r)

n= Nx/((N-1)E2+x)

E= Sqrt[(N-n)x/n(N-1)]

**Figure 1:** the inbuilt formulae on which the Raosoft calculator operates. Where N is the population size, r is the fraction of responses that you are interested in, and Z(c/100) is the critical value for the confidence level c.

|  |  |  |
| --- | --- | --- |
| Table1: Raosoft sample size calculator interphase (Raosoft, 2004) | | |
| **Raosoft Elements** | **Expected Input** | **Rationale** |
| What margin of error can you accept? | 5% | i\* |
| What confidence level do you need? | 95% | ii\* |
| What is the population size? | X\* | iii\* |
| What is the response distribution? | 50% | iv\* |
| Minimum recommended sample size? | Y\* | v\* |

**Key**

* *X\* = This is where the population size for the group captured in the second column of Table 2 was entered.*
* *Y\*= This is where the calculated minimum sample size will display after entering the population size was inputted.*
* *i\* = The margin of error is the amount of error that you can tolerate. If 90% of respondents answer yes, while 10% answer no, you may be able to tolerate a larger amount of error than if the respondents are split 50-50 or 45-55. A lower margin of error requires a larger sample size.*
* *\*ii= The confidence level is the amount of uncertainty you can tolerate. Suppose that you have 20 yes-no questions in your survey. With a confidence level of 95%, you would expect that for one of the questions (1 in 20), the percentage of people who answer yes would be more than the margin of error away from the true answer. The true answer is the percentage you would get if you exhaustively interviewed everyone. A higher confidence level requires a larger sample.*
* *\*iii= How many people are there to choose your convenient sample from? The sample size doesn’t change much for populations larger than 66,135..*
* *\*iv= If the sample is skewed highly one way or the other, the population probably is, too. If you don’t know, use 50%, which gives the largest sample size.*
* *\*v= This is the minimum recommended size of the survey.*

## 3.7 Sampling strategy

In a previous pre-tested data, the main socio-economic class, known to drive the ‘*awareness’, ‘perception’, and ‘enlightenment’* on sexual and reproductive health issues in our society include health workers, educationists, spiritualists, skill manual and non-skilled manual, and public servants (Lamisi & Mwini-Nyaledzigbor, 2017)**.** To enable us to do comparative analysis among these sections of our society, the study population shall be stratified into four main groups including group 1(informal society); group 2 (Health care providers), and group 3 (Educationist).

|  |  |  |  |
| --- | --- | --- | --- |
| Table 2: Sample size calculation by sections of the study population for Ho municipal | | | |
| Study groups | Estimated population | Percentage %  population | Sample  size |
| 1. Informal Society |  |  |  |
| 1. Skilled manual | **11077** | **16.75** | **64** |
| 1. Mechanics/fitters/welders | 3719 |  |  |
| 1. Construction | 4445 |  |  |
| 1. Transportation & storage | 2913 |  |  |
| 1. Non-skilled manual | **39735** | **60.08** | **229** |
| 1. Farmers (Agric, forestry fish) | 16267 |  |  |
| 1. Wholesale & Retail | 19,749 |  |  |
| 1. Elementary occupation | 3,719 |  |  |
| 1. Health care providers | **6,525** | **9.86** | **38** |
| 1. Physician | 91 |  |  |
| 1. Nurses | 3700 |  |  |
| 1. Public health | 576 |  |  |
| 1. Others | 2158 |  |  |
| 1. Educationist | **5,495** | **8.31** | **32** |
| 1. Lectures (University) | 116 |  |  |
| 1. Tutors (Secondary) | 163 |  |  |
| 1. Teachers (basic) | 5216 |  |  |
| 1. Social & public security | **3,303** | **5** | **19** |
| 1. Public servants | 1651 |  |  |
| 1. Spiritualist/counselors | 551 |  |  |
| 1. Judiciary & associate s | 1101 |  |  |
| Total | **66,135** | **100** | **382** |

## 3.8 Inclusion and Exclusion Criteria

### 3.8.1 Inclusion

The inclusion criteria shall include, individuals ≥18 years of age who are willing to participate in the study voluntarily. These will include both Formal sector workers (Health workers, educationists, security personnel), and Informal sector workers (Farmers, traders, and drivers, etc.).

### 3.8.2 Exclusion

The following category of people shall not be included in the study; people under 18 years of age, people who do not want to participate voluntarily, and individuals who are 18 years and above but not mentally sound**.**

## 3.9 Data collection/ Procedure

Data will be collected using a pretested and structured questionnaire which will contain parameters such as demographic characteristics, socio-economic parameters, and the knowledge participants have on infertility. It will also include parameters on participants' perceptions and beliefs that drive their attitude and practice respectively towards infertility. The main languages for communication will be English language, Ewe, and Twi in the interview and administration of the questionnaire. However, where necessary, other languages aside those already mentioned will be used in which case help will be sought from the appropriate interpreter.

## 3.10 Ethical considerations

Theresearch study protocol would be submitted for ethical clearance from the Research Ethics Committee (REC) of the University of Health and Allied Sciences. Individual consent would also be sought from each participant. The purpose of the study will be explained to each participant who will be encouraged to ask questions so that they would be able to understand the nature of the study and how findings will be disseminated.

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# WORKING PLANS AND SCHEDULE OF ACTIVITIES

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Activity** | **September–November-2021** | **December–January 2022** | **February 2022** | **March-2022** | **April-2022** |
| Proposal Writing |  |  |  |  |  |
| Data Collection |  |  |  |  |  |
| Data Entry and Analysis |  |  |  |  |  |
| Thesis Writing |  |  |  |  |  |
| Thesis Submission |  |  |  |  |  |

# PROPOSED BUDGET

|  |  |  |  |
| --- | --- | --- | --- |
| **ITEMS** | **COST PER ITEM** | **QUANTITY PER ITEM** | **TOTAL** |
| Questionnaire Printing | GH 0.2 | 1500 | GH 300.00 |
| Transportation to study site | GH 5.00 | 5 | GH 25.00 |
| Feeding of researchers on the field | GH 10.00 | 5 | GH 50.00 |
| Workforce | GH 10.00 | 10 | GH 100.00 |
| Internet service | GH 50.00 | 2 | GH 100.00 |
| Chapter Printing | GH 2.00 | 50 | GH 100 |
| Typing | GH 20.00 | 5 | GH 100 |
| **Total** |  |  | **GH 775** |

# QUESTIONNAIRE

**FORM 1: SURVEY QUESTIONNAIRE**

**A: THE PARTICIPANT'S PERCEPTION THAT DRIVES ATTITUDES TOWARDS INFERTILITY**

**CODES**

1. How many children do you have?

None

1

2-3

>3

**ATDI**

2. What is the sex of your child?

Male

Female

Male & Female

Not applicable

**ATD2**

3. Are you under pressure to have a child or more children again?

Yes

No

**ATD3**

4. Do you know any person(s) who suffers from infertility issue?

Yes

No

**ATD4**

5. If question 4 is 'Yes', what is your relationship?

Family

Friend

Others

**ATD5**

**6. WHICH ONE OF THE FOLLOWING WILL YOU CONSIDER THE MOST RISK FACTOR FOR INFERTILITY?**

***choose one only***

Spiritual/Rituals/Curses

Hereditary

Disease (infection, abnormal organs, etc.)

Life style (smoking, alcoholism, hard drugs, poor nutrition, luck of adequate exercise)

**ATD6**

Exposure of occupational hazard and stress

Marrying under age

History of unprotected sex and unsafe abortions

Having under/overweight partner

**7. WHICH ONE OF THE FOLLOWING WILL YOU CONSIDER A MAJOR PROBLEM ATTRIBUTABLE TO INFERTILITY ISSUE?**

***choose one only***

Societal pressure

Family pressure

Blame game

Stigmatization

**ATD7**

**8. WHICH ONE OF THE FOLLOWING LABELS ON INFERTILITY IS MOST ASSOCIATED WITH YOUR COMMUNITY?**

**choose one only**

Victims are labeled as normal people

Abnormal people

Irresponsible

**ATD8**

Spiritually infectious(witches/wizards)

Wicked/evil incarnates

Cursed and bad luck people

**SEXUAL AND REPRODUCTIVE HEALTH STUDY**

**DEPARTMENT OF MEDICAL LABORATORY SCIENCES-UHAS, HO**



**FORM 2: SURVEY QUESTIONNAIRE**

**B: PARTICIPANT'S BELIEF THAT DRIVES ATTITUDE TOWARDS INFERTILITY**

**CODES**

**9. WHO WILL YOU BLAME FOR INFERTILITY IN YOUR COMMUNITY?**

Women

Men

Both couple

Socio-cultural practices

Other

**ATD8**

**10. WHICH ONE OF THE FOLLOWING WILL YOU CONSIDER A BEST OPTION FOR TREATING INFERTILITY**

***choose one only***

To increase sexual frequency

To ensure productive life style & good nutrition

Spiritual consultation & cleansing

To visit a herbal center for herbal medicine

**ATD10**

To visit hospital for medical attention

Others

**11. WHICH ONE OF THE FOLLOWING WILL YOU CONSIDER A BEST WAY TO MANAGE ISSUES OF INFERTILITY?**

***choose one only***

Polygamy

Divorce

Showing compassion to victims

Isolation and neglect

**ATD11**

Public education

Cultural incarceration before and after death

**SEXUAL AND REPRODUCTIVE HEALTH STUDY**

**THE KNOWLEDGE, ATTITUDES AND PRACTICES TOWARD INFERTILITY AMONG**

**GHANAIAN COMMUNITIES**

**DEPARTMENT OF MEDICAL LABORATORY SCIENCES-UHAS, HO**

***Choose one only***



**FORM 3: SURVEY QUESTIONNAIRE**

**C. SOCIO-ECONOMIC INFORMATION**

***choose only one***

**12. EDUCATION**

None

Basic

Secondary

Tertiary

**EDU**

**13. EMPLOYMENT**

Formal

Informal

Studentship

Not-employed

**EMPL**

***choose one only***

**14. FORMAL EMPLOY**

Civil servant

Public servant

Service/Trainee

**FORM**

**choose one only**

**15.PROFESSION**

Health

Educationist

Scientist

Engineering

Clergy/Imam

Accountancy

Law& order

Others

**PROF**

***choose one only***

**16. OCCUPATION**

Physician

Nursing

Allied Health

Public Health

Researcher

Lecturer

Teacher

Skilled manual

Administrative staff

Accountant & clerk

Sale & services

Unskilled manual & Agric worker

**JOB**

***choose one only***

**17. MARITAL STATUS**

Married

Divorced

Single

Other

**MAR**

**SEXUAL AND REPRODUCTIVE HEALTH STUDY**

**DEPARTMENT OF MEDICAL LABORATORY SCIENCES-UHAS, HO**



Other

**FORM 4: SURVEY QUESTIONNAIRE**

**D. SOCIO-DEMOGRAPHIC INFORMATION**

**CODES**

**18. RESIDENCY**

*(I.e., Name of your permanent dwelling place)*

**RESD**

**19. STUDY LOCATION**

*(i.e., where the questionnaire is being administered)*

**LOCA**

**20. GENDER**

Male

Female

**GEND**

**21. AGE. YEARS**

**AGE**

**22. NATIONALITY**

Ghanaian

Not a Ghanaian

**NATI**

**23. IF GHANAIAN, REGION OF ORIGIN**

**REGI**

**24. TOWN OF ORIGIN**

**TOWN**

**25. COMMUNITY LEVEL**

Rural

Sub urban

Urban

**COMI**

**26. ETHNIC ORIGIN**

Akan

Ewe

Ga- Adangbe

Mole Dagbon

Others

**CULT**

**27. RELIGION**

Islam

Christian

Traditional

Others

**RELIG**

**28.PARTICIPANT'S CONTACT NUMBER**

**FONE**

**29. DATE**

**30. STUDY IDENTIFICATION NUMBER**

SRH

**SEXUAL AND REPRODUCTIVE HEALTH STUDY**

**DEPARTMENT OF MEDICAL LABORATORY SCIENCES-UHAS, HO**

*Note: The contact information is to confirm that the study questionnaire where respondent by*

*a true participant and the information provided is not concocted by the field worker.*

*Therefore, your phone number will not be used for any purpose other than for quality control*



# APPENDIX II: PROTOCOL CONSENT FORM

**RESEARCH OPERATIONS OFFICE**

**INSTITUTE OF HEALTH RESEARCH**

**UNIVERSITY OF HEALTH AND ALLIED SCIENCES**

**RESEARCH ETHICS COMMITTEE (REC)**

**PROTOCOL CONSENT FORM**

Section A- **BACKGROUND INFORMATION**

|  |  |
| --- | --- |
| Title of Study: | **THE ATTITUDES OF GHANAIANS LIVING IN THE HO MUNICIPALITY TOWARDS INFERTILITY: A SOCIO-BEHAVIOURAL SURVILLANCE STUDY** |
| Principal Investigator: | **APPIAH BAFFOE PRISCILLA** |
| Certified Protocol |  |

Section B– **CONSENT TO PARTICIPATE IN RESEARCH**

**General Information about Research**

I am a student investigator from the School of Allied Health Science (SAHS), University of Health and Allied Sciences (UHAS). In partial fulfillment for the award of a bachelor's degree in Medical Laboratory Science. I am conducting a project research on the topic: **The attitudes of Ghanaians living in Ho municipality towards infertility: A socio-behavioural study**.”

The study aim is to ascertain the attitudes of the study participants towards Infertility and the effects of these factors on people suffering from Infertility. It is expected that the outcome of the study shall be added information on the existing public health strategy to control and prevent stigmatization associated with infertility. I shall therefore be most grateful if you will participate in this study.

**Expected duration of participant’s participation:**

It is anticipated that it will take you 15 minutes to answer the questionnaire. Permission for the study has been given by Ho Municipal Health Directorate.

**Questionnaires will be used for data collection by the convenience sampling method**

**Benefits/Risks of Benefits**:

Your participation in this study is voluntary, therefore, there shall be no compensation and financial benefits to you as a participant in the study. However, you have the opportunity of sharing your knowledge, and experience which will help improve our understanding of the knowledge, attitude, and practices towards infertility to improve sexual and reproductive health in Ghana. There is no anticipated risk involved in participating in the research. You have the right to withdraw from the study without penalty.

**Confidentiality**

The information that will be collected from you shall be given unique numbers that no one can know that this information is from you. All information taken from you will be used for the study only. If there is a need to use your information for any other purposes, I will come back to you for permission. I cannot also give your information to anyone without your permission or without the permission of those who ensured that will not cause harm to anyone taking part in this study, known as the Research Ethics Committee. Having completed the study, all documentations including the questionnaires that contain your information shall be kept in a cabinet under key and locked for about 10 years after the study. Only the researchers shall have access to your information. To anonymize your identity, your name and other information traceable to your identity shall be removed from the database. Only a study number that shall be known to only the study team shall be maintained throughout the study processes. All information traceable to you shall be kept under lock and key. This information shall neither be disclosed nor transferred to a third party without prior permission from you.

**Compensation**

There shall be no compensation in this study.

**Withdrawal from the study**

Participation is voluntary and participants may withdraw at any time without penalty. No effect if the participant withdraws from the study. Information will be provided to the legal representation of the respondent if it becomes necessary. If the participant voluntarily discontinues the process or become violent during the cause of administering the questionnaire.

**Contact for Additional Information**

In case of any questions or clarifications on this study, you can contact the principal investigator below,

In case of any questions or clarifications on this study, you can contact the principal investigator below,

1. Appiah Baffoe Priscilla, P.O.Box 194, Koforidua, 0551746930, appiahpriscilla093@gmail.com
2. You can also contact the supervisor, Dr. Hamid .A. Wahab Mawuko, P.O Box 31, University of Health and Allied Sciences, 0549032136, [whamid@uhas.edu.gh](mailto:whamid@uhas.edu.gh)

If you have any questions about your rights as a research participant in this study you may contact the Administrator of the Research Ethics Committee, IHR, University of Health and Allied Sciences at rec@uhas.edu.gh or +233- 362-196-193.

**Participant’s agreement**

I certify that I have read or have had someone read all of the above to me. I have had the opportunity to ask questions about all areas of the study I did not understand and I have received answers to my satisfaction. I am willing to give consent to participate in this study. I understand that I have the right to withdraw myself from the study at any time without my decision affecting me in any way.

Participant’s name: ----------------------------------------------------------------------------------

Telephone no. of participant…………………………………………

Signature/Left thumbprint of participant----------------------------------

Date: --------------------------- [dd /mm /yyyy]