©NIJSES Publications

Open Access

NEWPORT INTERNATIONAL JOURNAL OF SCIENTIFIC AND EXPERIMENTAL SCIENCES (NIJSES)

Volume 3 Issue 2 2023

Infant Mortality Rate and Medical Care in Kaliro District, Uganda

Nabeeta Zephaniah

Faculty of Economics and Management Sciences Kampala International University Uganda.

ABSTRACT

The purpose of the study was to examine the impact of medical care on the infant mortality rate in the Kaliro district. The study was majorly quantitative in nature. The longitudinal/cross-sectional design was used based on secondary data on infant mortality rates and indicators of medical care. Trend analysis (scatter graphs with fitted linear lines) was used to identify the mortality rate trend; Pearson's correlation coefficient (r) was used to identify relationships among the variables; regression analysis was adopted to identify the significance and likelihood effects of the different medical care constructs. Based on the findings, the study concluded that the infant mortality rate has been declining. Medical care access has a significant impact on the infant mortality rate. The constructs of maternal care, labor, and delivery care access, access to health services, and immunization coverage significantly influence the infant mortality rate; that is to say, reduce the likelihood of infant mortality rate. The study recommended that; there is a need for district health officers to carry out massive sensitization among pregnant mothers to attend antenatal and postnatal health care services to ensure safe delivery. On the other hand, health practitioners at health centers should encourage pregnant mothers to practice effective family planning while those diagnosed with HIV/AIDs should be encouraged to take ART treatment. Government and other stakeholders such as Nongovernmental organizations should put up more health facilities to ensure that there is even access to medical care and health care. Secondly, Health practitioners should monitor and supervise pregnant mothers to ensure safe delivery at the health centers. This would serve to reduce the infant mortality rate. Thirdly there is a need to ensure that infants receive full doses of immunization for BCG, DPT, and measles by health actors in the district.

Keywords: Infant mortality, Maternal care, Delivery care, Health services, Immunization.

INTRODUCTION

Globally, infant mortality rates have been halved over the last few decades, an indicator of developmental success. Nevertheless, progress has been uneven, and in recent years, infant mortality rates have increased in some countries [1]. Governments in both developed and developing countries alike have continuously promoted the health of their populations by subsidizing healthcare services [2, 3]. Common reasons for this subsidization underlie the belief that externalities arise from a healthy population, or that government is the guarantor of the right of health to its citizens. The same has been done by many multilateral developmental agencies, and private voluntary organizations have focused on strengthening developing countries' institutional capacities to provide health care [4, 5]. A review of literature from previous studies reveals that there is still limited research work and studies done to identify factors that are responsible for infant mortality rate, especially in developing countries in particular Uganda. Some of the statistics available on the indicators of infant mortality rate and medical care can be drawn from the national health statistics conducted by national censuses and demographic health surveys (DHS) that are quite taken at longer

intervals in developing countries. However, drawing from a review of the global trends on the infant mortality rate, some of the causal factors of the infant mortality rate can be identified. For example, in the U.S., the decline in the infant mortality rate during the early 20th century has been attributed to improvements in milk supplies and sanitation, and to the discovery and availability of antibiotics [6]. Additionally, during the 1970s, 1980s, and 1990s, the infant mortality rate in the U.S declined due to improvements in medical technology and practice in the obstetric and neonatal fields, high-frequency ventilation, surfactant, postnatal steroid use, thermoregulation, improved nutrition and advances in respiratory management [7-9]. Besides this improvement in the medical sector, however, disparities still existed among the states of the U.S. due to uneven access to medical care as well as health insurance access. This implies that without even access to health care services, infant mortality would remain a challenge.

While the infant mortality rate has been declining from 186 deaths per 1000 in 1990 to 135 in 2008, Uganda has not been on track to reduce the infant mortality rate as expected according to the Ministry of Health-Uganda [10]. In addition, the national figure for infant mortality rate is said to have reduced from 87 per 1000 live birth in 2002 to 53 [11]. In Kaliro district, the infant mortality rate is said to be higher than the national figure according to the recent statistics from the Uganda Bureau of Statistics ([12], standing at 70 per 1000 live birth compared to 53 per 1000 live birth in the national figure for the infant mortality rate. However, there is no common agreement about the factors that are responsible for the high infant mortality rate in the district. Some of the sources of available literature indicate that the low standards of health care access, uneven distribution of health facilities, and poor sanitation among other factors contribute to the infant mortality rate in the district [13]. Based on the above, the current study intended to find out the impact of medical care on the infant mortality rate in Kaliro District.

METHODOLOGY

Research Design

The study was purely quantitative. The study employed longitudinal/cross-sectional be based on secondary data on infant mortality rates and indicators of medical care. It was a non-experimental investigation that seeks to examine the relationship between medical care and infant mortality rate in the Kaliro district. The longitudinal/cross-sectional design was used because the researcher used panel data/longitudinal data on the indicators of infant mortality rate and medical care across a period of 9 years (2006-2014) for the Kaliro district.

Area of Study

The study was conducted in the Kaliro district based on the infant mortality rate statistics per 1000 live births. Kaliro district is located in the South Eastern region of Uganda. It borders Kamuli district in the West, Iganga in the South, Palisa district in the North East, and Lake Nakuwa and Palisa in the North.

Research population

According to the 2002 census DHS report, Kaliro district has a birth rate of 9.5 percent. The study is based on the data about infant mortality rate and medical care indicators obtained from the Demographic Health Surveys of Kaliro district from 2006 to 2015.

Data Collection

The study mainly used secondary data on infant mortality rate and medical care obtained from the district statistical abstracts and Uganda Bureau of Statistics District profiling databases (http://www.ubos.org/publications/statistical-abstract/). The main indicators of medical care that were utilized include immunization coverage, accessibility to health care and staffing level in health centers, maternal health, labor, and delivery care). The study was purely quantitative. The study mainly used secondary data. Secondary data was used because it is readily available from other sources and may already have been used in previous research, making it easier to carry out further research. Further still, administrative data and census data 10th cover both larger and much smaller samples of the population in detail. Information collected by the government also covered parts of the population that may be less likely to respond to the census. Secondary data provided a baseline for primary research to compare the collected primary data results to and it was also helpful in research design.

Data analysis

Analysis of data is a process of inspecting, cleaning, transforming, and modeling data with the goal of discovering useful information, suggesting conclusions, and supporting decision-making. The methodology for data analysis was quantitative. Trend analysis (scatter graphs with fitted linear lines) was used to identify the mortality rate trend; Pearson's correlation coefficient (r) was used to identify relationships among the variables; regression analysis was adopted to identify the significance and likelihood effects of the different medical care constructs.

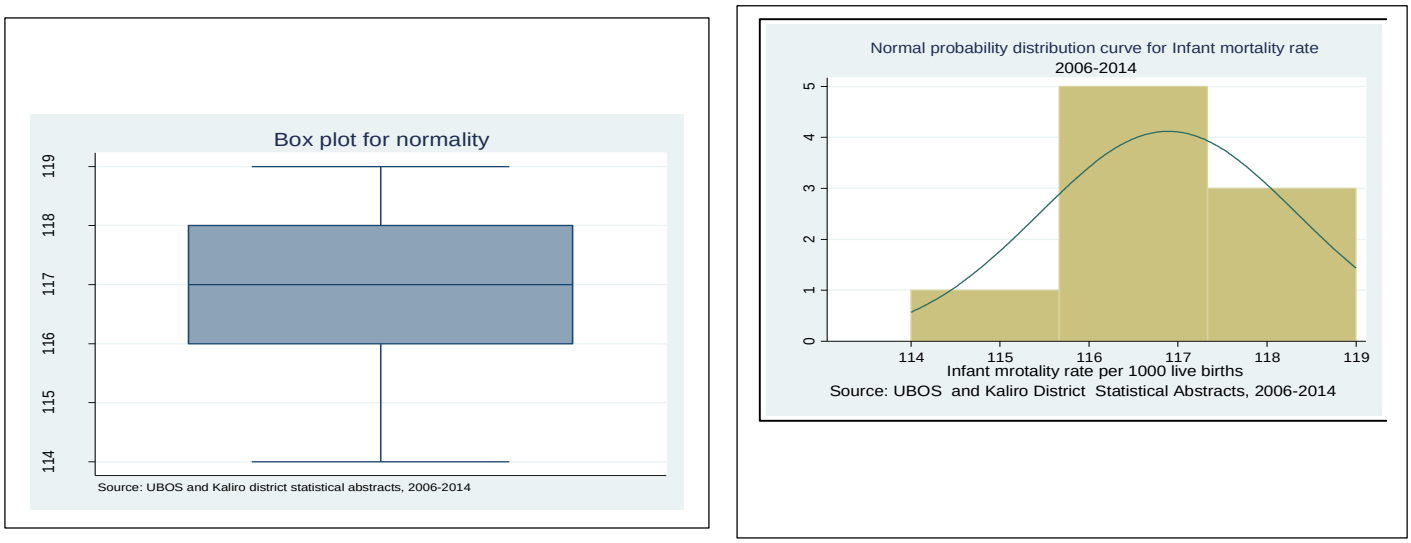
Ethical considerations

The researcher sought permission from the College of Economics and Management Sciences allowing him to conduct the study. The data obtained from the district statistical abstracts was reviewed to ensure that there are limited cases of missing data.

RESULTS

Trend of Infant mortality rate

The first objective of the study aimed at establishing the trend of infant mortality rate from 2006 to 2014. The data was first tested for normality using the Shapiro-Wilk W test for normality and normal graphs generated by STATA as shown in Figure 2. The normality test indicated that the data was normally distributed across the period from 2006 to 2014. In order to identify the trend of infant mortality rate, a trend line was fitted for the data as shown in Figure 2.

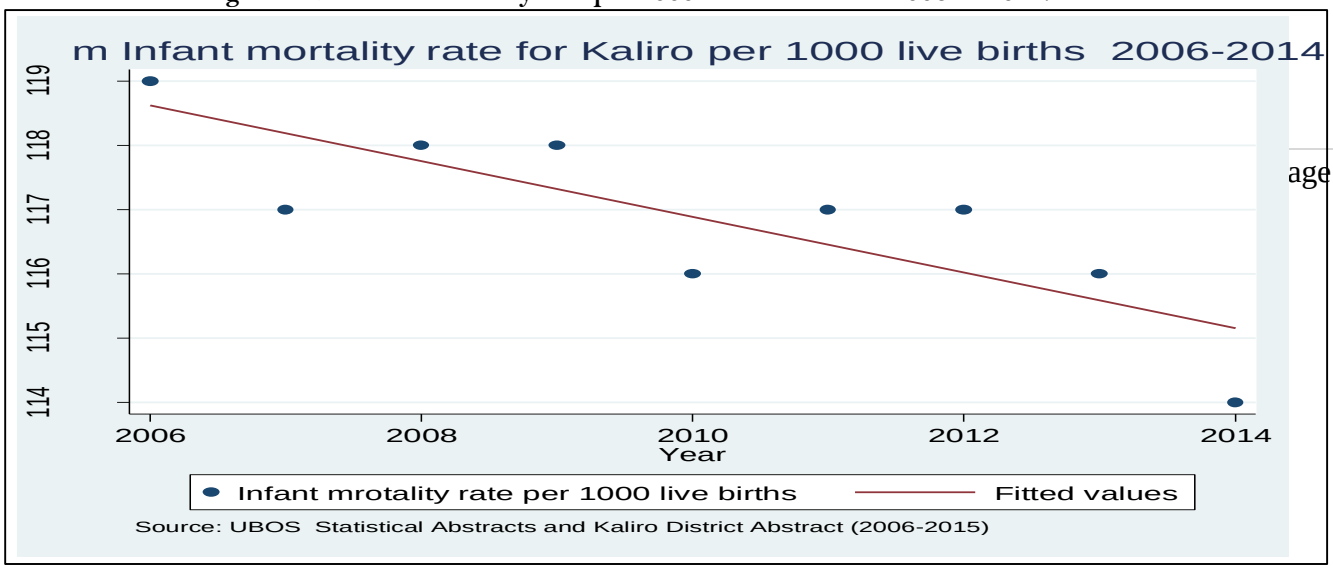


Normality test for Infant Mortality rate data

Figure 1: Normality test for Infant Mortality rate data

In Figure 1, both the box plot and normal probability curve for the data for infant mortality rate indicate that the data was normally distributed across the period 2006-2014. This implies that it is good enough to perform statistical tests to answer the study objectives.

Figure 2: Trend of mortality rate per 1000 live births from 2006 to 2014.



As indicated in Figure 1, the trend line for the data shows that the infant mortality rate has been declining over the given period (2006-2014). However, the Figure indicates that the rate declines at a low rate. The same finding has been identified in a report compiled by Kaliro district health profiling 2014. According to this report, it was indicated that the infant mortality rate in the district has been declining on average by 70 per 1000 live births. The current study as indicated by the trend line of the infant mortality rate found that the infant mortality rate has been declining over the period between 2006 and 2014.

Relationship between the constructs of medical care and infant mortality rate

The second study objective was to establish the relationship between infant mortality rate and selected constructs of medical care. Pearson's correlation coefficient value was computed for each indicator to identify the relationships. The findings were summarized in the correlation matrix Table 1.

Table 1: Pearson's correlation coefficient for the relationship between the constructs of medical care and infant mortality rate

Indicators		Infant mortality rate
Maternal health care		
The number of pregnant mothers who received ART	Pearson Correlation	-.529*
	Sig. (2-tailed)	.044
Number of pregnant mothers practicing family planning	Pearson Correlation	-.578*
	Sig. (2-tailed)	.041
Number of pregnant mothers received antenatal and postnatal care	Pearson Correlation	-.767*
	Sig. (2-tailed)	.016
Labor and delivery care		
HIV/AIDS service availability	Pearson Correlation	-.674*
	Sig. (2-tailed)	.047
Pregnant mothers receiving 2nd dose of Fansidar for IPT	Pearson Correlation	-.552*
	Sig. (2-tailed)	.036
Number of supervised deliveries in health centers	Pearson Correlation	-.544*
	Sig. (2-tailed)	.031
Access to healthcare		
Number of health facilities	Pearson Correlation	-.685*
	Sig. (2-tailed)	.042
Number of health workers in health centers	Pearson Correlation	-.725*
	Sig. (2-tailed)	.027
Immunization		
Immunization rates for BCG	Pearson Correlation	-.685*
	Sig. (2-tailed)	.040
Immunization rates for measles	Pearson Correlation	-.585*
	Sig. (2-tailed)	.033
Immunization rates for DTP3	Pearson Correlation	-.770*
	Sig. (2-tailed)	.042

*. Correlation is significant at the 0.05 level (2-tailed).

Source: STATA 12 Computations from secondary data (2016)

The medical care factors that were correlated with infant mortality rate included: maternal health care, labor and delivery care, access to medical care, and immunization. In regard to maternal health care, the findings reveal that

there is a significant inverse correlation between the number of mothers who received ART, the number of mothers practicing family planning, the number of pregnant mothers who received antenatal and postnatal care (r= -0.529; p=0.044), (r= -0.578; p=0.041) and (r= -0.767; p=0.016) respectively. This implies that an increase in the number of mothers who receive ART, the number of mothers practicing family planning, number of mothers who receive antenatal and post-natal care, reduces infant mortality rate. Regarding labor and delivery care, it was also revealed that HIV/AIDs service availability, the number of pregnant mothers who received 2nd dose of Fansidar for IPT, and the number of supervised deliveries in health centers have a significant negative relationship with an infant mortality rate (r=--0.674; p=0.047), (r= -0.552; p= 0.036), (r= -0.554; p=0.036) respectively. This implies that as the number of pregnant mothers receiving 2nd dose of Fansidar for IPT, the number of supervised deliveries in health centers, and the number of mothers accessing HIV/AIDS services increase, the infant mortality rate decreases. On the other hand, in terms of access to health care, the findings indicate that there is a significant negative correlation between the number of health facilities, number of health workers in health centers, and infant mortality rate (r=-0.685; p=0.0.042) and (r=-0.725; p=0.027) respectively. The findings imply that as the number of health facilities and the number of health workers in health centers increase, the infant mortality rate decreases. Thus access to health care is an important factor in reducing the infant mortality rate. Findings in regard to immunization coverage indicate that immunization rates for BCG, measles, and DPT3 have a significant inverse relationship with infant mortality rate (r= -0.685; p=0.040); (r= -0.585; p=0.033) and (r= -0.770; p=0.042) respectively. This also implies that immunization coverage against BCG, measles, and DPT3 reduces infant mortality.

Factors that influence infant mortality rate

The third objective of the study aimed at establishing the factors that influence infant mortality based on the selected indicators of medical care which include: maternal health care, labor and delivery care, access to medical care, and immunization of children. The Forward regression analysis was conducted to establish the significant factors that influence the infant mortality rate. The insignificant factors were HIV/AIDS service availability and the number of health facilities.

Table 2: Foward Regression analysis to establish factors that are significant on infant mortality rate

	Standardized Coefficients	Sig.
	Beta	
(Constant)		**.000**
Number of pregnant mothers received antenatal and postnatal care	-.686	.001
Number of pregnant mothers received ART	-.576	0.003
Number of pregnant mothers practicing family planning	-.654	0.004
Number of health workers in health centers	-.540	.002
Number of supervised deliveries in health centers	-.632	.005
Pregnant mothers receiving 2nd dose Fansidar for IPT	-.712	.007
Immunization rate for BCG	-.968	.006
Immunization rates for DTP3	-.896	.001
Immunization coverage for Measles	-.673	.007

Source: STATA 12 Computations from secondary data (2016)

As indicated in Table 2, a unit increase in the number of pregnant mothers who received antenatal and postnatal care, those who received ART treatment, and those practicing family planning have a significant relationship with an infant mortality rate (β=-0.686, p=0.001); (β = -0.576, p = 0.003) and (β= -0.654, p = 0.004) respectively. The

coefficient for the indicators is negative implying that an increase in the number of mothers who receive antenatal and post-natal care, ART, and those who practice family planning reduces the likelihood of infant mortality rate. Similarly, the coefficients for the number of workers in health centers, the number of supervised deliveries, and pregnant mothers receiving second dose Fansidar for IPT is (β -0.540, p=0.002); (β= -0.632, p=0.005) and (β = -0.712, p=0.007) respectively. The coefficients are negative while the p values are less than 0.05 the level of significance. The coefficients imply that the likelihood of infant mortality rate reduces as the number of health centers, the number of pregnant mothers receiving the second dose of Fansidar for IPT, and the number of supervised deliveries increase by a unit. The coefficients and the p values for immunization rates of BCG, DPT3, and Measles are (β= - 0.968, p=0.006); (β= - 0.896, p=0.001) and (β = -0.673, p=0.007) respectively. The coefficients are negative indicating that immunization coverage for BCG, DPT3, and measles reduces the likelihood of infant mortality rate.

DISCUSSIONS

The first objective intended to establish the trend of infant mortality rate. The study established that the trend of infant mortality rate has been declining. However, the rate has been declining at a lower rate. This is supported by a report on the health status statistics of the Kaliro district (UBOS, 2018). The report indicated that the infant mortality rate has been declining. The second objective of the study aimed at establishing the relationship between infant mortality rate and the constructs of medical care. The study found that maternal care, labor, and delivery care access, access to health services, and immunization coverage have a significant influence on infant mortality rate. This corroborates the findings of previous authors [14-16]. The third objective of the study aimed at establishing the causes of infant mortality rate using panel data of Kaliro district for the period 2006 and 2014. The study established that an increase in the number of pregnant mothers who receive antenatal and postnatal care, a reduction in the number of health workers in health centers, and an increase in immunization rates for measles among infants would reduce the infant mortality rate. Previous studies also confirm the same findings as obtained in the study. Zakir and Wunnava [17] in their study establish the causes of infant mortality in Washington for 2009-2011. Infant mortality is associated with poor maternal health, poor quality of and access to medical care and preventive services, and low socioeconomic position [18-20]. Al-Kabir [21] also assessed the effects of distances to hospitals, government dispensaries, family planning clinics, qualified doctors, other doctors, and traditional birth attendants on neonatal, post-neonatal, and child mortality in Bangladesh (Bangladesh Fertility Survey Data 1975-76). Bivariate associations between these variables and mortality are consistent with the hypothesis that proximity to care decreases mortality.

CONCLUSION

The study investigated the impact of medical care on the infant mortality rate. Based on the findings, the study concluded that the infant mortality rate has been declining and that Medical care access has a significant impact on the infant mortality rate. The constructs of maternal care, labor, and delivery care access, access to health services, and immunization coverage had a significant influence on the infant mortality rate; that is to say, reduces the likelihood of infant mortality rate.

RECOMMENDATIONS

There is a need for district health officers to carry out massive sensitization among pregnant mothers to attend antenatal and postnatal health care services to ensure safe delivery. Government and other stakeholders should put up more health facilities to ensure that there is even access to medical care and health care. There is a need to ensure that infants receive full doses of immunization by health actors in the district.

REFERENCES

1. Claeson M, Waldman RJ. The evolution of child health programmes in developing countries: from targeting diseases to targeting people. Bull World Health Organ. 2000;78 (10):1234-45.
2. Hassan, H. A., Musoke, M., Mohamed, F. A., & Sumil, N. R. Relationship between Fiscal Decentralization and Primary Health Care Services Delivery in Mbale District. *International Research Journal of Innovations in Engineering and Technology*, 2022a; *6*(6), 149.
3. Hassan, H. A., Sumil, N. R., & Musoke, M. Primary Health Care Services Delivery (PHCSD) Under Revenue Autonomy: Proposed Innovative Options Within Own Source Revenue. *International Research Journal of Innovations in Engineering and Technology*, 2022b;*6*(6): 126-134.
4. Frankenberg, R. Growing up White: Feminism, Racism and the Social Geography of Childhood. Feminist Review, 1993; 45(1), 51–84.

5. Ibebuike, J. E., Nwokike, G. I., Kor, R., Nwagu, S. A., Agu, G. C., Ezenwuba, C. O., ... & Nwanjo, H. U. Factors that influence health care givers' 2016 effective implementation of infant immunization in Calabar Cross River state, Nigeria. *Int. J. Curr. Res. Biol. Med*, 2017; *2*(7), 38-44.
6. National Center for Health Statistics. Health, United States, 2012: With Special Feature on Emergency Care. Hyattsville, MD. 2013.
7. Ambrose, B. M., GO Mauti, M Nansunga, EM Mauti, BM Mabeya, GR Neel. To determine the serostatus and frequency of HIV exposed infants in Ishaka Adventist Hospital. Journal of Pharmacy and Nutrition Sciences, 2016; 6(2), 72-77.
8. Obeagu, E. I., Neema, B. G., Getrude Obeagu, G. U., Alum. E. U. and Ugwu, O. P. C. A Review of Incidence and Clinical Outcomes of Neonate with False Tooth Extraction. IAA Journal of Scientific Research, 2023a; 10(1):25-27.
9. Obeagu, E. I., Nimo, O. M., Bunu, U. M., Ugwu, O. P.C. and Alum, E.U. Anaemia in children under five years: African perspectives. Int. J. Curr. Res. Biol. Med., 2023b; (1): 1-7.
10. Ministry of Health: Situation analysis of newborn health in Uganda: current status and opportunities to improve care and survival, Kampala: Government of Uganda, Save the Children. UNICEF, WHO, 2008.
11. Nabongo, P., Verver, S., Nangobi, E. *et al.* Two year mortality and associated factors in a cohort of children from rural Uganda. *BMC Public Health*, 2014; **14**, 314.
12. UBOS and ICF. Uganda Demographic and Health Survey 2016. Uganda Bureau of Statistics (UBOS) and ICF. Kampala, Uganda, and Rockville, Maryland, USA, 2018.
13. Uganda Bureau of Statistics. Statistical Abstract. Statistics House Plot 9, Colville Street P.O Box 7186, Kampala, 2008.
14. Kizito, D., Tweyongyere, R., Namatovu, A., Webb, E. L., Muhangi, L., Lule, S. A., ... & Elliott, A. M. Factors affecting the infant antibody response to measles immunisation in Entebbe-Uganda. *BMC public health*, 2013; *13*, 1-9.
15. Hertel, P. M., Hawthorne, K., Kim, S., Finegold, M. J., Shneider, B. L., Squires, J. E., ... & Sokol, R. J. (2021). Presentation and outcomes of infants with idiopathic cholestasis: a multicenter prospective study. *Journal of Pediatric Gastroenterology and Nutrition*, *73*(4), 478.
16. Mbina, S. A., Magaji, G., Fanuel, A., Pius, T., Gorret, A., Mavine, A. N., ... & Stellamaris, K. (2021). Breastfeeding Practices Among Infants and Young Children in Bushenyi, Uganda: Influence of Maternal Knowledge and Occupation. *Journal of Family Medicine and Health Care*, *7*(4), 90-97.
17. Zakir, M. & Wunnava, P. "Factors affecting infant mortality rates: evidence from cross-sectional data," Applied Economics Letters, Taylor & Francis Journals, 1999; 6(5), 271-273.
18. Obeagu, E. I., Ochei, K. C., Oshim, I. O., & Obeagu, G. U. Evaluation of changes in some haematological indices of malnourished infants in Umuahia. *International Journal of Current Research in Biology and Medicine*, 2017;*2*, 14-20.
19. Misrach Z. L., Vempati P., Vulli V. R., Suberu S. A. The Effect of Fenugreek Seed powder in Augmenting Expressed Breast Milk Volume from Mothers of Preterm Infants at Tikur Anbessa Neonatal Intensive Care Unit. Global Journal for Research Analysis, 2018; 7 (3)
20. Obeagu, E. I., Babar, Q., Vincent, C. C. N., & Anyanwu, C. O. INFANTS IMMUNIZATION: CHALLENGES OF OTHER VACCINES DUE TO COVID-19 PANDEMIC. *Journal of Bioinnovation*, 2021;*10*(4), 1056-1066.
21. Al-Kabir A. *Effects of community factors on infant and child mortality in rural Bangladesh.* World Fertility Survey Scientific Report [Report No. 56]. Voorburg: International Statistical Institute; 1984.

Nabeeta Zephaniah (2023). Infant Mortality Rate and Medical Care in Kaliro District, Uganda. NEWPORT *INTERNATIONAL JOURNAL OF SCIENTIFIC AND EXPERIMENTAL SCIENCES (NIJSES) 3 (2) 1-9.*