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Factors Influencing Child Immunization in Ishaka Municipality, Bushenyi District, Western Uganda

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ABSTRACT

Globally, approximately 50% of mortality in children under five years of age results from diseases that are preventable and treatable if simple and affordable interventions like a vaccine are utilized. This study aimed at ascertaining the level of child immunization and factors influencing child immunization in Ishaka Municipality, Bushenyi district. A community based cross sectional descriptive and analytic study was conducted. Quantitative data collection methods were employed to collect data from 400 eligible study participants. Simple random sampling technique was used to select the participants. Pretested closed ended questionnaires were used to collect the necessary data which was later entered in epi data, exported to STATA 12.0 and analyzed. The percentage of children that were fully immunized was found to be 56.75%. Comparing the immunization coverage of children between ages 12-23 months in Ishaka municipality, Bushenyi district with that of UDHS 2016, the percent of children fully vaccinated is lower by 0.25%. The significant parent/caretaker factors influencing childimmunization were maternal education, maternal age, and maternal occupation. The maternal health care utilization factors include: Antenatal Care attendance, distance to health facility, possession of immunization card and delivery at the health facility. The result of this study has clearly indicated that mothers in Ishaka municipality have improved on taking their children for immunization. This suggests that immunization uptake in the western Uganda has improved compared to previous reports. Keywords: factors, children, immunization

INTRODUCTION

Immunization is the process by which an individual is injected or vaccinated to receive active protection against a particular illness [1]. In 1974, The World Health Organization (WHO) launched the "Expanded Program on Immunization"(EPI) aiming at reducing the incidence and mortality due to vaccine preventable disease by promoting the expansion of immunization activities around the world [2].

Immunization is an effective public health intervention to reduce morbidity and mortality among infants. It is an important means of controlling diseases, and has been considered the most cost-effective health intervention [1]. Low levels of immunization as a result of failure to complete the immunization schedule, results into a high risk of death from vaccine preventable diseases [3, 4].

Globally, approximately 50% of mortality in

children under five years of age results from diseases that are preventable and treatable if simple and affordable interventions like a vaccine are utilized [5]. WHO estimates that about 2 to 3 million deaths annually that could have resulted from vaccine (VPDs) preventable diseases such as diphtheria, tetanus, pertussis, and measles; and an additional 1.5 million deaths could be avoided if global vaccination coverage improves [6].

In Africa, the biggest number of children remain unvaccinated and under-vaccinated despite the fact that there has been remarkable progress in provision and supporting immunization services [3, 7, 8, 9]. Full childhood immunization coverage varies widely from only 11% of children of ages 12 to 23 Months in Chad to 78% in Zambia in Sub-Saharan Africa [10, 11, 12, 13]. According to [14], vaccine coverage rates

remain well below the WHO goal of 90%, with 82% of the children receiving the measles vaccine and 78% completing the three-dose series of pentava- lent vaccine in the Sub-Saharan African Countries.

In East Africa, childhood full basic vaccination coverage among children aged 12–23 months is 69.21% (95% CI: 69.20, 69.21%), and this varies significantly across countries [15]. This variation may be because of inequalities in access to immunization programs and the views of populations about the value of childhoodimmunization. Kenya with a population of 45 million has 15% (5,939,306 people) below the age of five and reports an overall basic vaccination of 77% of children aged 12-23 months [16, 17].

Study Design

This was a descriptive [19] and analytic cross-sectional study, which employed quantitative Methodologies. A descriptive, cross-sectional research design was conducted describe the child to immunization proportion by the age of 12 months. The descriptive design was preferred because it provided further insights into the research problem by unfolding the variables of interest. estimating, predicting and examining associative relationships.

$$n = \frac{N}{1 + N(e)^2}$$

Study Area

The study was conducted in Ishaka Municipality located in the north of Bushenyi district, south west of Mbarara district.

Study Population

The study population comprised of (1,202) Ishaka Municipality households in Bushenyi District, Uganda. (BDPSA, 2021). It is estimated that about11% (96) of households had children in the age group of 12-18 months (BDPSA, 2021).

Inclusion criteria

All households in Ishaka Town Council with a child aged 12-18 months and whose immunization status are known/ available were included in the study.

Exclusion

Those whose children are aged below 12 months or above 18 months, those with childrenwith unknown immunization status were excluded.

In Uganda, the ministry of health is committed to achieving 90% immunization coverage of all children below 5 years but the trend in most parts of Uganda remains low [18]. Routine immunization coverage for Polio, DPT and Measles in Bushenyi district for children of 12 to 18 months averages 53.3%. The district coverage for Bushenyi-Ishaka, Igara East and Igara West being 69.3%, 67.7% and 69.5% respectively for the 2021 (MOHDR, 2020/1; BDHDR, vear 2020/1). These coverage rates are all below the target score of 80% as per UNEPI Standards and hypothetically attributed to many factors which triggered the researcher to conduct this study.

METHODOLOGY

Sample size calculation

A sample of from 1202 households was calculated using Epi Info Statcalc and applying the following parameters: a 95% level of confidence (5% margin of error); and prevalence of 53% according to UNEPI (2021). Based on the scope of the study, the investigator is targeting a total of 204 households. To cater for non-responses to some of the questions, a 7.5% over-sampling will be applied to give the stated value of 96 households with expected response rate of 99.2%. Sloven formula below is used to calculate the sample size.

Equation 1: Sloven Formula

Where;

n= sample size

e= margin of error

N= considered total target Population of the study population

N= 204,

e= 0.05

n =

 $1 + 204(0.05^2)$

n= 400 respondents Therefore, data will be collected from 400 study participants.

Sampling procedures

In an effort to minimize data collection costs and to ensure precision, the study used a multi- stage sampling technique. At the first stage cluster sampling technique was applied to obtain the enumeration unit. At the second stage, simple random sampling was used to select five (5) administrative units of the municipality. From each of the

five (5) selected administrative units [parishes], the study finally used systematic sampling to select households from the five (5) selected units. The research team established the number of households that have children aged 12-18 months. At the household level, the mother was selected as the respondent. The father or care taker was used only if the mother was unavailable.

Study Procedure

Before entry into the villages to conduct the data collection. the researcher went to the chair persons LC 1 with introductory letters University and from the sought for permission to do data collection in the chosen villages. The researcher explained the purpose of the study to the study participants after which they were given opportunities to ask questions and their questions were answered accordingly. Written consent was sought from the study participants. Those who consented to participate in the study were recruited to participate in the study and they were given to complete the self-administered study questionnaires whereas those who refused to consent were exempted from the study.

Data collection tools

Data was collected using intervieweradministered questionnaires developed according to the research question and the objectives of the study. The thoroughly trained Research Assistants administered the questionnaire in approximately 40 minutes vaccination each. Child status was determined through inspection of the child's immunization card by the study interview. Information on demographic and socioeconomic factors were obtained from selfidentified and reporting by the mother and caretaker.

Data analysis

Data from the paper questionnaires were

entered once into a computer using EpiData software. Data was then exported to Stata (version MP 14.0, Stata Corporation) for cleaning analysis. Frequencies, and percentages of the respondents' characteristics were produced. At а descriptive level, these variables were compared between the entire study samples.

Ethical considerations

In conducting this study, the researcher took care not to infringe on ethical and legal issues. Institutional approval was obtained from the faculty of allied health sciences.

The respondents were adequately informed using the participant's information sheet about all therelevant aspects of the study, including its aim, interview procedures, anticipated benefits and potential hazards before the main data collecting team arrived. The interviewers outlined the scope of the interviews and its approximate length prior to the start of the interviews. The respondents were informed that participation in the study was entirely voluntary [20]. They were also informed that they had the right to do the interview, to abstain from participation and toterminate their participation at any time, whenever they wanted. In this case, the respondents were not to become subjects of the study unless they provided informed consent as stated on the consent form. The consent forms were signed by the respondents who agreed to participate in the study with no pressure or inducements of any kind being applied to encourage them to become subjects of the study.

Caution was maintained to ensure that the identity of respondents from whom the information was obtained was kept strictly confidential and were referred to their words, pseudonyms or invented names which they had chosen.

| Age in Years | Frequency | Percentage (%) | |
|--------------------|-----------|----------------|--|
| 18-25 | 118 | 29.50 | |
| 26-33 | 140 | 35.00 | |
| 34-41 | 88 | 22.00 | |
| 42-49 | 38 | 9.50 | |
| 49 years and above | 16 | 4.00 | |
| Total | 400 | 100 | |

Among the respondents sampled, 29.50% were in the age group of 18-25 years, the highest percentage of 35.00% were from the age group of 26-33 years, 22.00% were from the age group of 34-41 years meanwhile 9.50% were from the age group of 42-49 years then the least percentage of 4% were from the age group of 49 years and above. A majority of our respondents were Catholic Table 2: Table showing the

making up 31% of total respondents, followed by Anglican who made up 25%, Moslems came next with 20% of the total respondents, Meanwhile SDA and Born Again had a distribution of 12% and 10% respectively, then the number of our respondents from other religions with a percentage of 2% of the total respondents.

| Table 2: Table showing the religion of the respondents | | |
|--|-----------|----------------|
| Religion | Frequency | Percentage (%) |
| Catholic | 123 | 30.75 |
| Anglican | 100 | 25.00 |
| Moslem | 81 | 20.25 |
| SDA | 50 | 12.50 |
| Born Again | 40 | 10.00 |
| Other | 06 | 1.50 |
| Total | 400 | 100 |

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Figure 2:A pie chart showing the distribution of the respondents by religion in terms of percentage

| Table 3: showing education of the respondents | | | |
|---|-----------|----------------|--|
| Education | Frequency | Percentage (%) | |
| Primary | 122 | 30.50 | |
| Up to Secondary | 145 | 36.25 | |
| Pre University and Diploma | 71 | 17.75 | |
| Diploma and Graduate | 49 | 12.25 | |
| Post Graduate | 13 | 3.25 | |
| Total | 400 | 100 | |

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The highest number of respondents had a secondary education with a percentage of 36.25% of the total respondents, 30.50% of the total respondents had primary education meanwhile respondents with pre-University and diploma comprised 17.75% of the total

respondents, respondents with diploma and graduate made up 12.25% of the total respondents then the least respondents had post graduate education with a percentage of 3.25% of the total respondents.

| Table 4: showing the type of Family | | | |
|-------------------------------------|-----------|----------------|--|
| Type of Family | Frequency | Percentage (%) | |
| Polygamous | 136 | 34.00 | |
| Nuclear | 264 | 66.00 | |
| Total | 400 | 100 | |

Among the respondents sampled, the highest percentage which was 66% of the total respondents were from nuclear families

meanwhile the remaining 34% of the total respondents were from polygamous families.

| Table 5: showing the area of residence of the Respondents | | | |
|---|-----------|----------------|--|
| Area | Frequency | Percentage (%) | |
| Urban | 230 | 57.50 | |
| Rural | 170 | 42.50 | |
| Total | 400 | 100 | |



Figure 2: A pie chart Showing the Area of Residence

Basing on the area of residence, the highest number of our respondents originated from the urbanareas constituting 57% of the total respondents meanwhile the least number of Table 6: showing occupation of the Respondents

the respondents came from rural areas making up 43% of the total number of the respondents.

| Occupation | Frequency | Percentage (%) |
|----------------------------|-----------|----------------|
| Housewife | 157 | 39.25 |
| Unskilled and Semi-skilled | 108 | 27.00 |
| Middle class officer | 48 | 12.00 |
| Semi Professional | 40 | 10.00 |
| Professional | 47 | 11.75 |
| Total | 400 | 100 |



Figure 3: A bar graph showing occupation of the respondents

The highest number of the respondents were housewives constituting 39.25% of the total population followed by unskilled and semiskilled who comprised 27% of the total population, next were the middle-class officers who made up to 12% of the total respondents meanwhile at 10% of the total respondents were the professionals then the least number of respondents werethe semiprofessionals who only had a 11.75% of the total respondents.

| Table 7: table showing the level BCG | | | |
|--------------------------------------|-----------|----------------|--|
| BCG (At Birth) | Frequency | Percentage (%) | |
| Received | 381 | 95.25 | |
| Not Received | 19 | 4.75 | |
| Total | 400 | 100.00 | |

Out of the 400 respondents sampled, 381 (95.25%) had children who had received the BCG vaccine at birth meanwhile 19 (4.75%)

had children between the age of 12 months to 23 months who had not received the BCG Vaccine.

| Table 8: showing the level of DPT 1 vaccination | | | |
|---|-----------|----------------|--|
| DPT 1 | Frequency | Percentage (%) | |
| Received | 374 | 93.50 | |
| Not Received | 26 | 6.50 | |
| Total | 400 | 100.00 | |



Figure 4: A pie chart showing the level of DPT 1 acceptance

Majority of the parents said their children had received DPT 1, this comprised 94% of the total number of the respondents meanwhile, the minority (6%) gave information indicating that their children had not received the DPT 1 vaccine.

| Table 9: showing the level of DPT 2 vaccination | | | |
|---|-----------|----------------|--|
| DPT 2 | Frequency | Percentage (%) | |
| Received | 335 | 83.75 | |
| Not Received | 65 | 16.25 | |
| Total | 400 | 100.00 | |



Figure 5: A cone Graph showing the level of DPT vaccination

The highest number of the respondents said their children had received DPT Vaccine, the frequency was 335 (65%) meanwhile 83.75 (16,25) respondents were sure that their children hadnot received DPT 2 Vaccine.

| Table 10: showing the level of DPT 3 vaccination | | | |
|--|-----------|----------------|--|
| DPT 3 | Frequency | Percentage (%) | |
| Received | 296 | 74.00 | |
| Not Received | 104 | 26.00 | |
| Total | 400 | 100.00 | |



Figure 6: Pie chart showing the level of DPT 3 Vaccination

According to the data collected from the different divisions in Ishaka municipality, 84% of the total respondents had children

who had received the DPT 3 vaccine whereas 16% of the total respondents had children who had not received DPT 3 Vaccine.

| Table 11: Ta | Table 11: Table showing the frequency and percentage of OPV 0 PV 0 Percentage (%) | | |
|--------------|---|--------|--|
| | incqueiley | | |
| Received | 368 | 92.00 | |
| Not Received | 32 | 8.00 | |
| Total | 400 | 100.00 | |

Out of the 400 respondents, 368 (92%) respondents had children who had been immunized with OPV 0 whereas the minority,

32 (8%) respondents had children who had not been immunized with OPV 0.

| Table 12: A table showing level of OPV 1 acceptance | | |
|---|-----------|----------------|
| OPV 1 | Frequency | Percentage (%) |
| Received | 361 | 90.25 |
| Not Received | 39 | 9.75 |
| Total | 400 | 100.00 |

361(90.25%) of the total respondents had children who had received OPV 0 and this constituted the majority of the respondents meanwhile the minority of the respondents had children whowere not immunized with OPV 1, this comprised of 39(9.75%) respondents.

| Table 13: showing the frequency and percentage of OPV 2 | | | | |
|---|-----------|----------------|--|--|
| OPV 2 | Frequency | Percentage (%) | | |
| Received | 327 | 81.75 | | |
| Not Received | 73 | 18.25 | | |
| Total | 400 | 100.00 | | |

From the total of 400 respondents, 327(81.75) had children who had received OPV 2 but 73(18.25) respondents had

children who had not received the OPV 2 Vaccine.

| Table 14: showing the level OPV 3 vaccination | | | | |
|---|-----------|----------------|--|--|
| OPV 3 | Frequency | Percentage (%) | | |
| Received | 277 | 69.25 | | |
| Not Received | 123 | 30.75 | | |
| Total | 400 | 100.00 | | |



Figure 7: A bar graph showing OPV 3

According to the above bar graph, the majority of the respondents provided information whichshows that their children had received the OPV 3 Vaccine, this

constituted 277 (69.25%) of the total respondents. Whereas 123 (30.75) of the total respondents said their children had not received the OPV 3 Vaccine.

| Table 15: showing the level of Measles vaccination | | | | |
|--|-----------|----------------|--|--|
| Measles | Frequency | Percentage (%) | | |
| Received | 292 | 73.00 | | |
| Not Received | 108 | 27.00 | | |
| Total | 400 | 100.00 | | |



Figure 8: A pie chart showing measles vaccination

From the above pie chart 73% of the respondents had children who had received the Measles vaccine meanwhile the

remaining 27% of the total respondents had children who had notreceived the measles vaccine.

| Status | Frequency | Erequency Percentage (%) | | |
|------------|-----------|--------------------------|--|--|
| Status | riequency | Tercentage (%) | | |
| Complete | 227 | 56.75 | | |
| Incomplete | 173 | 43.25 | | |
| Total | 400 | 100.00 | | |



Figure 9: A cylindrical chart showing measles vaccination

| Table 17: Maternal Health Care | e Utilization Factors Ir | nfluencing Child | Immunization by the |
|--------------------------------|--------------------------|------------------|---------------------|
| Age Of 12 Months in Ishaka Mu | inicipality, Bushenyi I | District | |

| Variable | Category | Frequency (n) | Percentage (%) |
|--|----------------|---------------|----------------|
| Antenatal Care Attendance | Yes | 350 | 87.50 |
| | No | 50 | 12.50 |
| Number of ANC Visits | One | 75 | 21.25 |
| | Two | 85 | 24.08 |
| | Three | 133 | 37.68 |
| | Four | 60 | 17.00 |
| Delivery Within the Facility | Yes | 329 | 82.25 |
| | No | 71 | 17.75 |
| Vaccine Preventable | Malaria | 55 | 13.75 |
| Disease | Flue | 69 | 17.25 |
| | Diphtheria | 178 | 44.50 |
| | Eye diseases | 98 | 24.50 |
| History of child suffering | Yes | 231 | 57.75 |
| side effects of | No | 169 | 42.25 |
| Willingness to leave other Duties to take Child for Immunization | Yes | 166 | 41.50 |
| | No | 234 | 58.50 |
| Parity | Prim parity | 129 | 32.25 |
| | Multiparty | 271 | 67.75 |
| Possession of Child | Yes | 145 | 36.25 |
| Immunization Card | No | 255 | 63.75 |
| Distance to Health Facility | < 1 km | 56 | 14.00 |
| | 1 - 3 km | 100 | 25.00 |
| | 4-6 km | 69 | 17.25 |
| | More than 6 km | 175 | 43.75 |
| Stock out of some Vaccines | Yes | 143 | 35.75 |
| | No | 257 | 64.25 |
| Health Education about | Yes | 140 | 35.00 |
| Immunization | No | 260 | 65.00 |

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|-----|----------|------------|-------------|------------|---------|
| _ | | | | | |

| Refusal by health Workers to Immunize | Yes | 81 | 20.25 |
|---|--------------------------|-----|-------|
| | No | 319 | 79.75 |
| Unavailability of Health Workers on Duty | Yes | 110 | 27.50 |
| | No | 290 | 72.50 |
| Duration of Immunization services | Enough Service Hours | 250 | 62.50 |
| | Limited service Hours | 150 | 37.50 |
| Immunization Outreaches | Yes | 157 | 39.25 |
| | No | 243 | 60.75 |
| Waiting Time at the Facility | <30 minutes | 88 | 22.00 |
| | 30 mins - 1 hour | 144 | 36.00 |
| | More than 1 hour | 168 | 42.00 |
| Follow-up of Routine Immunization Services | Yes | 218 | 54.50 |
| | No | 182 | 45.50 |
| Attitude of Immunization Staff | Positive | 322 | 80.50 |
| | Negative | 78 | 19.50 |

DISCUSSION

The percentage of children that were fully immunized was found to be 56.75%. The coverage of 56.75% fell short below the global immunization goal and strategy (GIVS) recommended target of \geq 90% national immunization coverage set by WHO and UNICE. However, Comparing the immunization coverage of children between ages 12-23 months in Ishaka municipality, Bushenyidistrict with that of [21] (57%), the percent of children fully vaccinated is lower by 0.25%.

In this study, the proportion of children who receiving the BCG vaccine (95.25%) was higher than those receiving the first dose of the polio vaccine (92%). This finding indicates there are still missed opportunities and highlight the challenge of introducing early polio vaccine which should be given within 24 h after birth. In our study, there was a decline in coverage of immunization from BCG at birth (95.25%) to measles (73%). Overall, the dropout rate between BCG vaccine and measles vaccine was around 22.25%.

Our findings corroborate with those in

Nigeria, Guinea, and Uganda [22]. A plausible reason to explain reduction in the proportion of full vaccination coverage when children get older compared to vaccines received after birth may be due to logistical problemsbut also the fact that some mothers may not understand the routine immunization schedule [23] or may not choose to come back after adverse events following the first contact with the immunization system.

In a study in West Africa, factors determining completion of the DTP3/Oral polio vaccine included past experience with vaccination services (short waiting time, not having been turned away or not knowing a child with post vaccine adverse events). The high dropout rate means that difficulties still exist in immunization program utilization specifically the follow-up of children throughout the immunization schedule [23]. There was a strong positive association between maternal education and full immunization. The finding of the present study is in congruence with the results of a community based randomized-controlled

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trial in Karachi, Pakistan by [24] which showed that maternal education had a positive correlation with completion of immunization. Furthermore, theresults of a study by [25] found associations between utilization of immunization services with respondents" level of education. Education helps to improve health seeking behaviour of an individual. The role of maternal education as an important cause of immunization uptake has also been shown by [26, 27]. In contrast, in study conducted in Libya by [28], significant relationship there was no between immunization status and mothers" educational level.

Additionally, result of this study is in agreement with the result of a communitybased prospective cohort study which showed that maternal education is associated with vaccination status of children in Eastern Uganda [29].

The result of this study has clearly indicated that mothers in Ishaka municipality have improved on taking their children for immunization. This suggests that immunization uptake in the westernUganda has improved compared to previous reports. The challenge however is that women without education seem not to still take their children for immunization and this affects the percentage of children fully immunized

- 1. WHO. (2018). Immunization. Geneva Switz. Retrieved January 22, 2021, from http://www.who.int/topics/ immunization/en/
- Landoh, D. E., Ouro-Kavalah, F., Yaya, I., Kahn, A.-L., Wasswa, P., Lacle, A., & Soura, A. B. (2016). Predictors of incomplete immunization coverage among one to five years oldchildren in Togo. *BMC Public Health*, *16*(1), 968.
- Negussie, A., Kassahun, W., Assegid, S., & Hagan, A. K. (2015). Factors associated with incomplete childhood immunization in Arbegona district, southern Ethiopia: a case-control study. *BMC Public Health*, 16(1), 27.
- Ibebuike, J. E., Nwokike, G. I., Kor, R., Nwagu, S. A., Agu, G. C., Ezenwuba, C. O., & Nwanjo, H. U. (2017). Factors that influence health care givers' 2016 effective implementation of infant immunization in Calabar Cross River

Result also showed that there is evidence that ages of mother predicts child immunization. This could be because elder mothers know the effect and the importance of immunization on children than young women. This finding is the same with the study conducted in Sudan by Ibnouf et al., 2007 and also in the study conducted in Nigeria by Babalola 2009. Several studies have found a true relationship between wealth status and vaccination status [30, 31, 32].

Mothers' occupation is another factor that influences vaccination uptake. Occupation can influence mothers' likelihood to seek immunization for their child. This study that mothers' showed occupation (Professional and managers) was significantly associated with higher likelihood of full immunization than people that are not working. Similar findings have been reported in previous studies [33].

CONCLUSION

in Western Uganda. Concerned authorities should ensure that uneducated mothers immunize their children since low coverage will always draw back the efforts of fighting vaccine preventable diseases. This calls for intervention towards helping these categories of mothers in Western Uganda to know the advantage of taking their children tohealth centers for immunization.

REFERENCES

state, Nigeria. Int. J. Curr. Res. Biol. Med, 2(7), 38-44.

- 5. WHO. (2017b). Children: reducing mortality. Geneva Switzerland.
- 6. WHO. (2016). Immunization Coverage. Retrieved February 4, 2021, from http://www.who.int/
- Obeagu, E. I., Scott, G. Y., Amekpor, F., & Njar, V. E. (2023). Current Issues on Monkey pox Infection among immunocompromised patients: African Perspectives. International Journal of Current Research In chemistry and Pharmaceutical Sciences, 10(1):40-7.
- Ibebuike, J. E., Nwokike, G. I., Kor, R., Nwagu, S. A., Agu, G. C., Ezenwuba, C. O., Nwosu, D. C., Akujiobi, A. U., Obeagu, E. I., & Nwanjo, H. U. (2017). Factors that influence health care givers' 2016 effective implementation of infant immunization in Calabar Cross River

state, Nigeria. Int. J. Curr. Res. Biol. Med., 2(7):38-44.

- Viola, N., Nakate, Z., Nuruh, N., & Obeagu, E. I. (2023). Factors Contributing to Low Utilisation of Postnatal Care Services among Postnatal Mothers at Rwekubo HC4 Isingiro District. International Research in Medical and Health Sciences, 4;6(3):1-5.
- 10. Bataringaya, C. K. (2010). Immunization Coverage And Factors Associated With Failure To Complete Childhood Immunization In Kawempe Division, Uganda. A Mini- Thesis submitted in partial fulfillment of the requirements for the degree of Masters in Public Health at the School of Public Health, University of the Western Cape.
- 11. Hassan, A. O., Omojola, T. E., Adeyemo, A. T., & Obeagu, E. I. (2023). An update on Monkeypox in Africa. Int. J. Curr. Res. Med. Sci., 9(2):21-34.
- 12. Hassan, A. O., Oso, O. V., Obeagu, E. I., & Adeyemo, A. T. (2022). Malaria Vaccine: Prospects and Challenges. Madonna University journal of Medicine and Health Sciences, 2(2):22-40.
- 13. Obeagu, E. I. (2023). Factors Contributing to Low Immunization Coverage: A review. Madonna University journal of Medicine and Health Sciences, 3(1):25-31.
- 14. Vonasek, B. J., Bajunirwe, F., Jacobson, L. E., Twesigye, L., Dahm, J., Grant, M. J., & Conway, J. H. (2016). Do maternal and knowledge attitudes towards childhood immunizations in rural Uganda correlate with complete childhood vaccination, PloS One, 11(2), e0150131.
- 15. Tesema, G. A., Tessema, Z. T., Tamirat, K. S., & Teshale, A. B. (2020). Complete basic childhood vaccination and associated factors among children aged 12-23 months in East Africa: a multilevel analysis of recent demographic and health surveys. *BMC Public Health*, 20(1), 1-14. http://doi.org/10.1186/s12889-020-09965-y
- 16. KDHS. (2014). Kenya demographic and health survey key indicators. *Kenya Demographic and Health Survey*.
- 17. Obeagu, E. I. (2022). A Systematic review on childhood immunization among men with infants: Africa perspective. International Journal of Current

Research in Medical Sciences, 8(9):15-24.

- 18. MOH. (2016). Ministry of Health Strengthens efforts in routine immunization coverage. Retrieved Februarv 4. 2021. from https://reliefweb.int/report/uganda/mi nistry-healthstrengthens-effortsroutine-immunization-coverage
- 19. Ugwu, C. N., & Eze, V. H. U. (2023). Qualitative Research. IDOSR Journal of Computer and Applied Sciences 8(1): 20-35. https://www.idosr.org/wpcontent/uploads/2023/01/IDOSR-JCAS-8120-35-2023.docx.pdf
- 20. Ugwu, C. N., Eze, V. H. U., Ugwu, J. N., Ogenyi, F. C., & Ugwu, O. P. C. (2023). Ethical Publication Issues in the Collection and Analysis of Research Data. Newport International Journal of Scientific and Experimental Sciences (NIJSES) 3(2): 132-140. https://nijournals.org/wpcontent/uploads/2023/07/NIJSES-32-132-140-2023.pdf
- 21. Uganda Bureau of Statistics UBOS and ICF. 2018. Uganda Demographic and Health Survey 2016. Kampala, Uganda and Rockville, Maryland, USA: UBOS and ICF.
- 22. Favin, M., Steinglass, R., Fields, R., Banerjee, K., & Sawhney, M. (2012). Why children are not vaccinated: a review of the grey literature. *International Health*, *4*(4), 229–238.
- 23. Rutstein, S., & Rojas, G. (2006). Guide to demographic and health survey (DHS). ORC Macro: Calverton.
- 24. Owais, A., Hanif, B., Siddiqui, A. R., Agha, A., & Zaidi, A. K. M. (2011). Does improving maternal knowledge of vaccines impact infant immunization rates? A community-based randomizedcontrolled trial in Karachi, Pakistan. BMC Public Health, 11(1), 1-8.
- 25. Koskei, P., Janitschke, K., & Feseha, G. (2014). Prevalence of Echinococcus granulosus in some selected sites of Ethiopia. *East African Journal of Public Health*, 8(3), 170-175.
- 26. Onyiriuka, A. N. (2005). Vaccination default rates among children attending a static immunization clinic in Benin City, Nigeria. Journal of Medicine and Biomedical Research, 4(1): 71-77.
- 27. Mahy, M. (2003). Childhood mortality in the developing world: a review of

evidence from the Demographic and Health Surveys. Calverton, MD, Macro International Inc., DHS Comparative Reports, No. 4

- 28. Bofarraj, M. A. M. (2011). Knowledge, Attitude and Practices of Mothers Regarding Immunization of Infants and Preschool Children at AlBeida City, Libya 2008. The Egyptian Journal of Pediatric Allergy and Immunology, 9, 29-34.
- 29. Nankabirwa, V., Tylleskär, T., Tumwine, J. K., & Sommerfelt, H. (2010). Maternal education is associated with vaccination status of infants less than 6 months in Eastern Uganda: a cohort study. *BMC Pediatrics*, *10*(1), 1–9.
- 30. Jamil, K., Bhuiya, A., Streatfield, K., & Chakrabarty. N. (1999).The immunization programme in impressive Bangladesh: gains in coverage, but gaps remain. Health policy 49-58. and planning, 14(1),https://doi.org/10.1093/heapol/14.1.4 g

- 31. Babalola, S., & Fatusi, A. (2009). Determinants of Use of Maternal Health Services in Nigeria—Looking beyond Individual and Household Factors. BMC Pregnancy and Childbirth, 9, 43. http://dx.doi.org/10.1186/1471-2393-9-43
- 32. Ndiritu, M., Cowgill, K. D., Ismail, A. et al. (2006). Immunization coverage and risk factors for failure to immunize within the Expanded Programme on Kenya Immunization in after introduction of new Haemophilus *influenzae* type b and hepatitis b virus antigens. BMC Public Health 6, 132. https://doi.org/10.1186/1471-2458-6-132
- 33. Antai, D. (2009). Faith and Child Survival: The Role of Religion in Childhood Immunization in Nigeria. Journal of Biosocial Science, 41, 57-76. http://dx.doi.org/10.1017/S002193200 8002861

Brian Muhumuza (2023). Factors influencing Child Immunization in Ishaka Municipality, Bushenyi District, Western Uganda. INOSR Experimental Sciences 11(3):1-18.