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# Low immunization coverage and infant Viral/Bacterial disease prevention in Nyakivare and Rukinga Internally Displaced People (IDP) camp, Uganda

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## Abstract

**Background:** Immunisable diseases continue to be highly prevalent and a major cause of morbidity and mortality in Sub Saharan Africa among children less than five years. The immunization coverage of Internally Displaced People camps in Uganda is low and factors associated with the low immunization coverage not clearly defined. **Objective**: To determine the influence of low immunization coverage on the upsurge of topical infections among internally displaced people camps in Uganda. **Methods**: The study design used was community based discriptive cross-sectional study using a structured questionnaire. Data was collected among 210 mothers and care takers of children aged between12 months-23 months in resettlement area in 2 IDP camps in southern Uganda namely Nyakivare camp and Rukinga camps. Data was statistically analyzed by SPSS software. The relationship between the independent factors and the immunization status is analyzed by using chi-square test. **Results**: Almost all of the respondents reported to have access to immunization services in their area and only spent less than 0.2 dollars for transport to reach the health facility. Hardly more than half of the study children had completed up to date immunization doses. There is statistically significant association between health education about immunization and immunization status of the child. Also, availability of health care workers was not significantly associated with immunization status. Immunization failure was due to lack of information and gender issue of having to seek permission from the husband before taking the child for immunization. **Conclusion:** Addition of Hepatitis vaccine was justified. Low immunization coverage impacted on disease outbreak in study area and factors for low immunization include fear of vaccine safety, complication and side effect. **Recommendations**: Interventions against gender imbalance to improve the attitude of the fathers about the immunization should focus on the fathers is recommended.

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***Background***

Billions people worldwide are estimated to have had hepatitis B virus (HBV) infection and there may be millions of chronic carriers of the virus are at high risk of cirrhosis of the liver and primary liver cancer (1). HBV accounts for significant annual deaths worldwide. With a safe and effective vaccine available since 1982, much of this infection and death are preventable. The public health burden of HBV infection in Uganda is unknown, although the country has long been considered to be among the highly endemic countries of sub-Saharan Africa with more than 8% of the population expected to harbor chronic infection. Results from a few Ugandan studies have supported this hypothesis: the prevalence of HBV surface antigen (HBsAg), a marker of chronic HBV infection, ranged from 6 to 15% among blood donors when HBV screening was introduced and in selected populations in Uganda.

Upsurge in vaccine-preventable diseases (VPD), such as measles, whooping cough and haemophilus influenza, mainly in Africa and Asia among children less than 5 years old and

loop holes in vaccination coverage including finding new and innovative ways of reaching children not yet vaccinated in a vaccination success society and new ways of encouraging parents to have their children vaccinated, remain a challenge in developing countries (2, 3). Before 2002, Ugandan children were vaccinated against six "killer" diseases, namely diphtheria, polio, tetanus, tuberculosis, measles and whooping cough. In 2002, government introduced the Hepatitis B and Hib (for H. Influenza) vaccines. This brought the number of immunizable killer diseases to eight. The main rationale for childhood vaccination is that it reduces child mortality significantly and is a cost effective way to improve child health, particularly for poor households located in high-disease burden environments (4-6). Childhood vaccination has previously been linked to reduced morbidity and reductions in stunting and wasting in young children. A report from Philippines states that childhood vaccination has positive persistent health effects and is demonstrated in young teenagers in the form of increased cognitive ability (7). Every year more than 10 million children in low- and middle-income countries die before 15 years because of poor intervention which should have improved their survival (8). Although global immunization coverage has increased during the past decade to 78% for diphtheria–tetanus–pertussis-3 (DTP-3), WHO's African Region has consistently fallen behind, reaching only 69% DTP-3 coverage by 2004 (9-11). Basic immunizations are estimated to prevent more than 2.5 million annual child deaths globally, primarily due to prevention of pertussis, and tetanus and measles. WHO childhood vaccination could have prevented 2.9 million children death in 2007 (6, 12). More than one-third of African region districts did not acquire 50% DTP-3 coverage by the end of 2004. Coverage levels of other routine vaccines, including measles, oral polio, bacillus Calmette Guerin (BCG) and tetanus toxoid also lagged in many of the same areas. Factors holding back routine immunization services in the African region included civil unrest, lack of human resources within health ministries and limited funding for routine immunization services (3, 13, 14). The childhood immunization coverage rate in Somaliland is 37%. The low coverage of the Somaliland childhood immunization is believed to low education level of the mothers, few of the child and maternal health services, and attitudes and beliefs of the mothers. Many of the vaccine preventable diseases are prevalent in Somaliland and are believed to cause many of the deaths in children below five years (7, 15, 16).

Effective ways of vaccine wide coverage remain a challenge because accessibility to hard-to -reach areas continue to make wider coverage a nightmare and children less than ten years continue to die of vaccine preventable disease because of poor coverage. Factors holding back routine immunization services in the African region include civil unrest, lack of human resources within health ministries and limited funding for routine immunization services. In this study we: outlined the current data about the immunization situation in Uganda; we assess the accessibility of immunization services in internally displaced people (IDP) camps in Uganda and established the attitudes and beliefs of the mother that affects the immunization of children in IDP camps in Uganda.

**Material and methods**

Although there is a population of approximately 1.5 million lives in IDP camps in Uganda and an annual growth rate of displaced population of 2.1%, The target population was the children between12 months-23 months in state house resettlement area in IDP camps. The 12-23 month age group was taken for analysis because both international guidelines specify that children should be fully immunized by the time they complete their first year of life (17, 18,). The study design used was community based descriptive cross-sectional study using a structured questionnaire. Data was collected from 2 IDP camps in Isingiro district, Southern Uganda namely Nyakivare camp and Rukinga camps. The sample was estimate by using Leslie and Kish formula which combines the total number of children, with three quantities $p$, $q$ and $d$, together with a multiplier from the normal distribution for the desired confidence level ($\alpha = 0.5$). Including the design effect the sample, of 210 children between 12 months-23 months of age was selected. The required information was collected from the parents accompanying the child, through a predesigned questionnaire.

A 2-stage cluster sampling technique was employed to select the participants in the study. At first, the resettlement area was divided into different clusters. Thirty clusters were then selected by using simple random sampling technique. Seven children between 12-23 months of age were selected from each cluster in the second stage. Trained interviewers visited households and interview with the mothers. They used standardized questionnaires translated in to the local languages commonly used in the IDP camps. The mothers was asked to show the immunization card of the child which indicated the types of vaccination and the date the child had received them. Where the card of the child was missing, the interviewers asked the mother to recall whether the child has received each of the childhood vaccinations included in the childhood immunization schedule. The data was collected by experienced and trained enumerators using a standard questionnaire

When the data was collected, the incomplete questionnaires were eliminated. Data entry and analysis was used for EPIDATA and SPSS. The data is presented in graphs and tables with descriptive at each level. The relationship between the independent factors and the immunization status is analyzed by using chi-square test. With regards to ethical issues, written informed consent to participate in research was obtained from parents of the selected children or the guardians. The researcher ensured that the participants received adequate and appropriate information and also those they understood it to make informed decision. Privacy and confidentiality of study participants was

protected. Authority for this study was sought from the local leaders in the IDP camps.

**Results**

To assess the accessibility of immunization services in state-house resettlements, parents and care takers of the targeted children were asked to answer several questions intended to assess the accessibility of immunization services. From the questions, the following information was obtained: 99.5% of the respondents reported to have health facility which is less than one kilometers from their home to the health facilities in their area. This shows that most of the respondents have accessibility in terms of distance as recommended by the World Health Organization (WHO). The world health organization (WHO) recommends that every member of the community should be accessible to health facilities within 5KM distance. Almost all (99.5%) of the respondents go to the health facility on foot.

Again, 99.5% of the respondents had spent less than 0.2 dollars for transport while going to the health facility and cost of transport was not significantly associated with immunization status; $\chi^2$=768, df2, p = 0.681 and (p>0.05). Majority (47.6%) of the respondents spend 1-2hrs in the health facility. Another large group (37.6%) spends less than 30 minutes in the health facility. Only 14.8% of the respondents reported that they spend more than 2 hours in the health facility. The long time spent in the health facilities is due to either absence of the health care providers or presence of long lines of people which shows that number of staff in the health facility is few compared to the population in the catchment area. Time spent in the health facility was not significantly associated with immunization status; $\chi^2$ =3.113, df4, p = 0.539 and (p>0.05). More than 93% of the respondents reported that they find health workers. Only 13% of them said that they don't find health care providers. However, availability of health care workers was not significantly associated with immunization status, $\chi^2$ =3.105, df2, p = 0.212, (p>0.05).

Majority (90.9%) of the respondents said that they find immunization services at the health facility. Availability of immunization services was significantly associated with immunization status, $\chi^2$ =6.843, df1, *p = 0.009 and* (p<0.05). Majority (85.7%) of the respondents said that they get outreach immunization services. Only 14.3% of them reported that they don't get outreach services. This shows that many outreach immunization campaigns are conducted. These outreach immunization campaigns bring the immunization services closer to the community so that they can easily immunize their babies. Majority (72.4%) of the respondents get health education from the staff at the facility. Another 27.6% don't receive health education. Health education was not significantly associated with immunization status, $\chi^2$=3.196, df2, *p* = 0.202. (p>0.05). Majority (71.2%) of the respondents who immunize their children get permission from their husband to take their child for immunization. Only 27.8% don't get permission from their husband to take their child for immunization. Permission from husbands to take the child for immunization was not significantly associated with immunization status, $\chi^2$ =0.462, df2, *p* = 0.794. (p>0.05).

To determine the relationship between the socio-economic status of the mother and the immunization status of the children in state-house resettlements, the parents of the targeted children were asked to answer several questions intended to determine the relationship between the socio-economic status of the mother and the immunization status of the children. Results shows that majority of the respondents were married 196(93.3%). Twelve (5.7%) and 2 (1%) of the respondents were divorced and widowed. There was statistically significant association between marital status and immunization status of the child. $\chi^2$ =8.060, df4, p=0.89. (p>0.05). Majority of the respondents 151(71.9%) had no education at all. Another 48(22.9%) of them had primary education. Seven 7(3.3%) and 4 (1.9%) of them had intermediate and secondary education respectively. Therefore, the education level of this community is low and correspondents that very few Somali women are sent to school. There is no statistically significant association between marital status and immunization status of the child.$\chi^2$=5.919, df6, p=0.432. (p>0.05).

More than 46% of the fully immunized children had siblings less than 3. There is no statistically significant association between the number of siblings of the child and the immunization status. $\chi^2$=5.336, df6, p=0. 501. (p>0.05). Most of the respondents 71% (N=149) reported that they have the immunization cards. Twenty nine percent (N=61) did not have immunization cards and most of the parents 94.3% (N=198) had reported that they immunized their children at least once. Only 5.7% of the parents said that they have never immunized their children. Majority of the interviewed 88.6 %( N=186) parents reported that their children received BCG. Of those who ever immunized their children, 93.9% of them immunized their children against Tuberculosis. About 98% of those who received BCG were fully immunized, more than half (52.5%) of the study children had completed Polio vaccination doses by receiving four doses. About 29.8% received three doses of Polio vaccine while 13.1% and 3.8% had received two and one dose of Polio respectively. Exactly 60.6% of the children studied have completed DPT vaccine by receiving three doses of DPT. While 23.2% and 12.6% had received two doses and one dose respectively, only 3.6% had never received DPT vaccine. Majority (83.8%) of children received measles vaccination and of those who ever immunized their children, 88.9% had received measles vaccination. Majority (56.7%) of the target population were partially immunized. A large proportion of them (37.6 %) were fully immunized. Only 5.7% were never immunized.

The main reason of immunization failure is reported to be lack of information which is reported by majority (74%) of those who either partially immunized their children or those

who have not immunized their children at all. This include aware of need for immunization, fear of side effects, un aware of the need to return for 2nd or 3rd dose, place and /or time of immunization un known and wrong ideas about contraindications. Another 20% had reported lack of motivation including mother too busy, rumors, cultural and religious reasons, and family problem including illness of the mother and postponed vaccination until another time. Only 5.3% reported obstacles including unavailability of vaccines, place of immunization too far, child ill, vaccinator absent, long waiting time and time of immunization is in convenient as reasons of immunization failure. About 83.3% of those who were not immunized at all and 73.1% of those who were partially immunized have reported lack of information as the main reason of not immunizing their children. Majority (66.5%) receive immunization services from MCH or a public hospital. Another 30.5% get it from both public and private clinics. Only 2% receive it during outreach campaigns. Majority (61.9%) of the respondents get health education about immunization. Another large proportion (38.1%) said that they don't receive any health education about immunizations. There is no statistically significant association between health education about immunization and immunization status of the child. $\chi^2 = 3.196$, df2, $p=0.202$. ($p>0.05$). Out of those who receive health education, 38.9% get health education from health facilities while 29.8%, 19.8%, and 9.9% receive health education from Radios, public gathering and TVs respectively. This means that health facilities and Radios are the main sources of health education.

**Discussion**

*The IDP camps residents are primarily refugees from the Neighboring UN stable countries including Burundi Democratic Republic of Congo, Rwanda, Somalia, South Sudan and Ethiopia. The number of children between 12-23 months in IDP camps is not known. Although the first wave of settlers in this area came in 1991, several groups have continued to arrive in IDP camps making them densely populated. Nyakivare and Rukinga IPD camps have only one mother and child (MCH) centre each. The camps are overcrowded and lives of dwellers are exposed to unsanitary conditions. The families are poor surviving on handouts and some of them get their daily living income through begging others. The accessibility of immunization services in state-house resettlements*

Data has revealed that the community in this area has access to health facilities and immunization services. The major findings include that 99.5% of the respondents reported that the distance between their home and the health facility is less than 1Km and also that 99.5% of the respondents use less than 0.2 dollars for transport to go to the health facility. The National immunization days (NIDs) which is conducted two times in a year throughout the country (15, 16) and focuses on Polio (17, 18), the child health days (CHDs) and reach the settlements and this also adds to the adequate access to the services.

According to SWISS TPH (19) distance to health services is a concern that reduces utilization of immunization services. However in this study it seems not to be an issue. Not expectedly gender issues to do with seeking permission from the husband before going to see the health care provider more prominent among the factors that lower immunization coverage. According to the World Bank (20), gender issues as found in Somaliland, was a setback in achieving those GAVI goals. The relationship between the socio-economic status of the mother and the immunization status of the children in state-house resettlements

Data from this study revealed no relationship between socio-economic status of the parent and the immunization status of the child. Also there no statistically significant association between gender, education level, birth order, place of birth, age of the mother, number of people living in the house, marital status, number of siblings of the child, employment status of the mother, type of work and ownership of TV by the family and the immunization status of the child. This concurs with the study conducted by MOH in 2008 which shows that the educational level of the mothers did not have a significant impact on immunization status of their children but this disagrees with the study conducted (7, 21, 22) which describes that the chance is almost three times higher for the children of mothers with high school or above education than the children of illiterate mothers. Again, the findings of this study disagree with another study which was conducted in Philippines which found that immunization is more common for children with highly educated mothers (4, 23). About the family size and the number of siblings, the study disagrees with a study conducted in DAKA; Bangladesh (24) which showed that children with three or more siblings are less likely to be vaccinated than children with fewer siblings. The mother's age an issue of concern. This finding is supported by a study conducted in South Africa among 2431 children between 12-23 months which showed that mothers' age was associated with completed status with any of the vaccines (24,25) also demonstrated the same finding and clarified that children of mothers aged >30 years had a lower coverage than those whose mothers were aged <30 years.

Again the study disagrees with other researches such as one conducted by NILANJAN (19) in India showed that likelihood of vaccination decreases for children whose mother is non-wage employee but increases for children whose mother is wage employee compared to non-working mothers. Evidence from study done in Indonesia shows that use of health care services, as measured by antenatal visits and visits during the first trimester of pregnancy, is less common among women who have relatively little control over household resources.

According to the study findings, majority of the respondents think that vaccine is safe for children and a few think that vaccine is not safe for the children. This means that respondents have positive attitude on immunization. There is a negative attitude (mothers afraid from vaccination)

significantly affected the immunization status of the child. Majority of the respondents don't fear side effects of the vaccines. Again, this emphasizes that most of the respondents have positive attitude on immunization. Therefore, there is no statistically significant association between fear of side effects and immunization status of the child.

According to Bbaale (26), exposure to the media is significantly associated with childhood immunization. This can be attributed to the sensitization messages that parents receive through media to get their children immunized. The Government and other stakeholders should continuously advertise through media the importance of childhood immunization. In addition, government policy should ensure that various media channels fully penetrate the population as an effective way to disseminate the information. It has been reported (26) that the likelihood of childhood immunization increases with maternal age. This may be attributed to experience accumulated over time on the importance of immunization and also on the fatalities that have occurred to children due to lack of immunization. Mother's occupation and that of her partner are important in the attainment of full childhood immunization. Children whose parents held white-collar jobs were more advantaged compared to those in agriculture, blue-collar jobs, and services/sales. This may be attributed to the ease of accessibility to information that white-collar workers may have. It may also be due to accessibility to health facilities since the majority of white-collar workers are located in urban area.

The study shows that majority of the respondents reported that if they had another baby today, they would have given all the recommended childhood immunizations and this indicates that the respondents are willing to vaccinate their children in the future. The findings of the study also include that majority of the respondents get health education about immunization while another large proportion (38.1%) doesn't receive any health education about immunizations.

**Conclusion**

The study established that the proportion of children fully immunized was small in the target population .The major of the respondents had less than I KM distance between their home and the health facility and actually use less than 0.2 dollars for transport to get to the health facility. This indicates that immunization services are accessible to the community in this area. This study also revealed that there is no significant relationship between the socio-economic status of the mother and the childhood immunization status. Finally, the study revealed that the attitudes and beliefs of the mother which affects the immunization status of the child were vaccine safety, complications caused by vaccines and fear of side effects. The main reason of immunization failure is reported to be lack of information which is reported by majority of those who either partially immunized their children or those who have not immunized their children at all.

*Recommendations*

This study recommends that the time spent in the health facility by the mothers of the children to be reduced by improving on the stuffing levels and making the service more available to the displaced people. There should also be interventions to change this attitude by re-enforcing the medical ethics and the professional conduct and morals. Health education provided by the staff of the health facility plays an important role in encouraging parents to fully vaccinate their children. So, health care providers at the health facilities should be trained with how to provide health education including sessions about the importance of immunization completing the immunization doses. We recommend interventions against gender issues and to improve the attitude of the fathers about the immunization should focus on the fathers.

*Limitations*

A large proportion of our vaccination data depend on mothers' recall, which can bring bias if mothers report vaccinations which their children had not received or if mothers did not report vaccinations which their children had received.


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