



## INFLUENCE OF PERSONAL AND HEALTH-BASED FACTORS ON THE IMMUNIZATION UPTAKE OF CHILDREN UNDER FIVE BY MOTHERS IN KALAGALA SUB-COUNTY

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### ABSTRACT

The article aims to describe the influence of Personal and Health-Based Factors on the Immunization uptake of children under five. The article is informed from the study that was done on factors related to the immunization uptake of children under five in Kalagala Sub-County Luweero District. A correlational research design was used during the study. Structured questionnaire was administered to 317 mothers as a sample of the study. Therefore, the article sums up that marital status, perceived safety of vaccine and time taken for the mother to be attended to by the health worker at the facility were significant predictors for immunization uptake by mothers ( $p < 0.05$ ). Therefore, it is clear that perceived safety of the vaccine by the mothers was among the main factors influencing uptake of the immunization.

**Key words:** *personal factors; health-based factors, immunization uptake*

### INTRODUCTION

The World Health Organization (WHO), argues that over 1.5 million children under 5 years of age (approximately 20% of overall childhood mortality) continue to die annually from diseases that are preventable via the administration of vaccines, such as pneumonia and diarrhea. A substantial number of children worldwide do not complete immunization schedules because neither health services nor conventional communication mechanisms regularly reach their communities. In some communities, low immunization rates are associated with families living a long distance from health services, having little access or exposure to large-scale or local media, and low doctor- and nurse-patient ratios (Antai, 2009).

In the African population life expectancy seems to be below 50 years with unacceptable rates of maternal and child mortality due to certain disease, such as HIV and poor access to health services (Franco, 2012). The World Health Organization (WHO) had realized that about half of all under 5-year deaths in the world occur in Africa, and over 70% of these deaths occur within the first year of life. In recent years, new vaccines have been introduced to East Africa and developing countries around the world to protect children from the two biggest child diseases killers: pneumonia (PCV) and diarrhea (Rotavirus vaccine). In Uganda according to Mbabazi (2013) the immunization declined from 9.4% to 4.3% over the last five years. Mbabazi further notes that despite universal childhood immunization program, poor child health is still persisting. This is contrary to the fact that the Ministry of health had introduced in 2010 the 24 system of quality as treatment of diarrhea, pneumonia and malaria closer to communities, using Village Health Team (VHT) members and community health workers. Malaria, pneumonia and diarrhea

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remain the three leading causes of under-five years old children mortality in Uganda, contributing to more than 140,000 deaths per year (Mbonye, 2016).

According to the 2011 Uganda Demographic and Health survey, the shortage of health staff and poor adherence to vaccination schedules are some of the reasons for declining immunization levels in Uganda, which experts say threatens efforts to reduce preventable deaths among children. The main challenge has been establishing an immunization program that can function smoothly year after year as part of solid primary health care systems. Nearly half of children under age five "are un-immunized or under-immunized- meaning they start immunization but do not complete the schedule (Irin, 2013).

This article therefore affirms that the government's efforts to improve the uptake of immunization services in all parts of Uganda have not materialized. For instance, Kalagala Sub County registered a low coverage of 46% in 2012 through 2016. These rates are far lower than the national immunization program target of 90% and above. Parents are either not taking children for immunization or are not completing the immunization schedule. Therefore, this article sums up the facts behind the low rates.

Uganda is one of the countries with higher rate of procreation and fertility rate of 7 children per women. The studies show that among developed countries, despite universal childhood immunization program, poor child health still persisting. Although Uganda government is trying to achieve the set target from the national development plan to reduce children mortality rate (78 per 1000 live births), the Ministry of health had introduced in 2010 the 24 system of quality as treatment of diarrhea, pneumonia and malaria closer to communities, using Village Health Team (VHT) members and community health workers. Malaria, pneumonia and diarrhea remain the three leading causes of under-five years old children mortality in Uganda, contributing to more than 140,000 deaths per year. Malaria itself-killing 42 children per day, pneumonia 52 children per day and diarrhea 3 children per day (Mbonye, 2016).

The major challenges affecting the delivery of immunization services and leading to low immunization coverage include: No district has reached the full immunization coverage of 80% for children below one year. This leaves the children exposed to the risk of vaccine preventable diseases. The proportion of children who are fully immunized has been dropping since 1995 from 47% in 1995, to 37% in 2001; rising to 44% in 2006 and finally to 52% in 2011 which is far below the national target of 80% coverage for all vaccine. The percentage of Ministry of Health budget for EPI decreased from 7.7% in 2006/7 to 3.6% in 2009/10 and it was found that education affects many aspects of life, including individual demographics and health behaviors. It is strongly associated with contraceptive use, fertility, general status, morbidity and mortality of children (Bbaale, 2013).

According to the 2011 Uganda Demographic and Health survey, The shortage of health staff, and poor adherence to vaccination schedules are some of the reasons for declining immunization levels in Uganda, which experts say threatens efforts to reduce preventable deaths among children .The main challenge has been establishing an immunization program that can function smoothly year after year as part of solid primary health care systems , Eva Kabwongera, a technical officer with UNICEF in Uganda, said, according to the news service. Nearly half of children under age five "are un-immunized or under-immunized meaning they start immunization but do not complete the schedule (Irin, 2013).



Despite government 's efforts to improve the uptake of immunization services in all parts of Uganda, Luweero district, where Kalagala sub county is located, registered a low coverage of 46% in 2012. District statistics of 2014 showed that BCG was 39%, Measles 11%, OPV 36% and DPT 44%. These rates are far lower than the national immunization program target of 90% and above. There are 64 health units in Luweero district all together and all these health facilities offer immunization services free of charge and under good physical infrastructure. Kalagala sub county immunization coverage was only 29% in 2012, 24 and 2016 (statistic Luweero District 2017). Parents are either not taking children for immunization or are not completing the immunization schedule. The reason for this low coverage below expected target of 90% is not known.

### **LITERATURE REVIEW**

Under this variable literature has been reviewed on personal factors characteristics of parent / guardians that might have an influence on vaccine drop out. Researchers such as Chidiebere, et al (2014) argue that uptake of vaccines with multiple dosing schedules dropped with each successive dose and that decreased likelihood for full immunization was seen in mothers less than 18 years old as reported with odds ratio of 0.53 and confidence interval of 0.34 - 0.84).

Harmsen, et al (2012) found that many mothers don't come regularly for vaccination of their children. As a result, they miss the due date of vaccination. Low literacy level of mothers is a matter of worry. Some of them don't know about the diseases for which their child is being immunized although many mothers don't know the timings of vaccination. According to Chidiebere et al (2014), Increased likelihood for full immunization was seen in mothers with higher educational level with odds ratio of 3.77 and confidence interval of 1.52 - 9.32. Nankabirwa et al(2010) observed that only 46% of the infants whose mothers' had 5-7 years of primary education had been fully vaccinated compared to 65% of the infants whose mothers' had some secondary education.

The behavior change may create some barriers. Garcia et al (2014) shows that there are six barriers to vaccination: parent education, lower maternal age, lower income, female gender of child, traditional religion and large family size. The insufficient knowledge of the people requires sincere effort on the part of the health professionals and policy maker to plan and execute the information, education and communication" initiatives. He concludes that the knowledge of studied mothers about vaccination is not completely adequate. Certain religions and belief systems promote alternative perspectives toward vaccination. Lack of information and understanding about importance of immunization may lead to failure.

Tsawe (2015) found that mothers who have six or more children are less likely to be immunized than those who have 1-2 children. They utilize maternal health services less frequently as compared to those who have less than three children. When family increases in number, successive children are less likely to be vaccinated as the increasing family responsibilities demand more and more time and detract from health care decisions. Single parent families are especially at risk since the increased demands of family support and maintenance may impede health care decisions for the single parent who has no partner with whom to share responsibility Birth order and size of family (PMC 2016).

According to Nankabirwa et al (2010), increased likelihood for full immunization was seen in mothers from middle and rich classes' odds ratio of 1.26 with confidence interval of 1.03 - 1.66 and odds ratio of 1.69 with confidence interval of 1.27 - 2.25



respectively. Low vaccine coverage was associated with socioeconomic inequities that still prevail in the Brazilian Amazon. Short and long-term strategies must be taken to update child vaccines and increase vaccine coverage in the Amazon (Branco, et al. 2014)

Marital status has also been linked to vaccination uptake. Families who live in temporary housing, or who migrate between jobs are especially at risk of failing to complete immunization schedules. Moving to a new area immediately after birth raises the probability that a child will not be immunized or that vaccination will not be completed. Individuals with no prior history of contact with the health care system, or families with any previous experience with vaccinations are not unlikely to have relevant knowledge of the need for immunization, nor do they pursue it (Koruki et al (2013)

On the assessment of knowledge regarding vaccines among mothers of under-five children, Mereena& Sujatha (2014) found that more than half of the mothers (61.3%) had good knowledge regarding vaccines. But the findings show that 99% of the mothers were ignorant about the disease for which BCG is used. 86.33% of the mothers knew that vaccine that prevents whooping cough is DPT. Only 26(8.66%) mothers were knowledgeable about the measures that can be done if the child has not been given DPT. From the study, it was concluded that Mothers need education on importance of National Immunization Schedule and adherence to the timings in the given immunization card. Educational campaigns will help to reduce the incidence of Vaccine- Preventable Diseases. Kapoor & Vyas (2010) from the finding of the study on awareness and knowledge of mothers of under five children regarding immunization in Ahmedabad, found that majority (85 %) knew about Poliomyelitis. Measles and Tuberculosis was known to 40% of respondents.

Religious objections to vaccines are based generally on the ethical dilemmas associated with using human tissue cells to create vaccines, and beliefs that the body is sacred, should not receive certain chemicals or blood or tissues from animals, and should be healed by God or natural means. Fetuses Christian Scientists do not have a formal policy against vaccines, but rely generally on prayer for healing. The belief that medical interventions, which could include vaccines, are unnecessary (College of physicians of Philadelphia, 2014).

Personal wealth assessment of the mothers was found to be an important factor that influenced full immunization status of their children as mothers who assessed themselves to be rich were more likely to have fully immunized their children compared with women who assessed themselves to be either poor or average. Financial autonomy of a woman gives her a greater opportunity to fund and do all necessary things that are required to get best health care services for her children as a primary caregiver (Oyefara, 2014). Smith (2011) indicated that refusal and delay are associated with vaccine hesitancy. His study shows many parents who refuse vaccines were significantly more likely to say that the reason for delaying and refusing was because there were too many shots and others reported that the reason was due to concerns about autism, vaccine effectiveness, and vaccine side effects, or because their heard or read negative things about vaccines in the media.

Vaccination decisions are influenced by participants' lifestyle, perception of health, beliefs about childhood diseases, perception about the risks of diseases, perception about vaccine effectiveness and vaccine components, and trust in institutions. Parents indicated that they felt a need for more information. Sufficient references should be provided to sources containing more information about childhood vaccination, especially about the



effectiveness of vaccines and vaccine components and the risks, such as possible side effects and benefits of vaccination (Harmsen et al. 2013).

Many mothers don't come regularly for vaccination of their children. As a result, they miss the due date of vaccination. Low literacy level of mothers is a matter of worry. Some of them don't know about the diseases for which their child is being immunized. Although many mothers don't know the timings of vaccination but some of them follow the immunization card and come accordingly. So there is a dire need to arrange for health education program sessions for mothers of under five children with main emphasis on importance of vaccination & vaccine preventable diseases (Kappoor, & Vyas, 2010)

Lack of information and understanding about importance of immunization may lead to failure. Harmsen et al (2012) found that many mothers don't come regularly for vaccination of their children. As a result, they miss the due date of vaccination. Low literacy level of mothers is a matter of worry. Some of them don't know about the diseases for which their child is being immunized although many mothers don't know the timings of vaccination.

Reviews of related literature reveal that inaccessibility of services is an important cause of partial or under-vaccination of children. Abdulrahee et al (2011) showed that the long-distance walking, poor staff attitude and high cost of transportation are limiting factors for mothers in completing immunization schedules for their children. In countries with strong health systems and infrastructure, Bud (2012) stated that mothers were usually educated and actively informed on different issues on immunization for example safety, benefits, and age appropriate for administration among others. Knowledge on immunization acts as a motivating factor for completing immunization schedule. However, while studies had made an important contribution on the influence of vaccination knowledge and perception on health seeking behavior they had contextual gaps to know what are the factors that are barriers for uptake of children for immunization.

## METHODS

The study applied quantitative research method in which correlational research design was used. The design was used for purpose of establishing factors that influence immunization uptake. The targeted population was composed with the mothers of those children at Kalagala Sub-county. The sample size of the study was 317 mothers who visited the health facilities for the immunization of their children under five years. Three health centres participated in the study. The simple random sampling was applied for the households having children under five years old from three health centers in Kalagala Sub County and in all accessible sites for the health zone. The study used a questionnaire to collect data from the respondents. The main purpose of the instrument was to collect information about immunization practices of children under five years and mother's awareness. Logistic regression was used to examine the influence of independent variables on dependents variables.

## RESULTS AND DISCUSSION

### Results and discussion

The mothers' personal factors associated with the immunization uptake of children under five by mothers was a found based on the results from the study that informs the article.



**Table 1:** Personal Factors Associated with the Immunization Uptake

Items Rated	Frequency	Percent
<b>Age of the respondent</b>		
15-20 years	6	1.9
21-30 years	113	35.6
30 and above	198	62.5
<b>Educational attainment of the respondent</b>		
Never been to school	46	14.5
Primary	121	38.2
Secondary	112	35.3
Tertiary	38	12.0
<b>Monthly income</b>		
Less than 100,000/-	101	31.9
101,000-150,000/=	160	50.5
151,000-200,000/=	41	12.9
Above 200,000/=	15	4.7
<b>Marital status</b>		
Married	134	42.3
Single	135	42.6
Divorced	25	7.9
Widow	23	7.3
<b>Mother awareness on safety of immunization for children</b>		
Not safe	41	12.9
Somehow safe	126	39.7
Safe	93	29.3
Very safe	57	18.1
<b>Decision Making</b>		
Never	47	14.8
Sometimes	106	33.4
Always	99	31.2
Frequently	65	20.5
<b>Source of Information</b>		
Radio	20	6.3
TV	51	16.1
News paper	58	18.3
Antenatal Care	78	24.6
<b>Transport Available</b>		
None	106	33.4
Public Transport	197	62.1
Personal Motorcycle	11	3.5
Personal Moto vehicle	3	9
<b>Period of birth</b>		
1 month	27	8.5
4 months	28	8.8
5 months	33	10.4

*n* = 317



It was found out that 198(62.5%) aged 30 years and above, 113(35.6%) aged between 21-29 years and 6(1.9%) less than 20 years would participate in immunization uptake of their children under five years.

Those who participated in the immunization of their children under five years of age were mothers whereby 121(38.2%) had attained primary education, followed by 112(35.3%) had secondary education, 46(14.5%) had never gone to school and 38(12%) had tertiary education. This implies that majority 233(73.5%) of the surveyed mothers with low education took their children for immunization as compared to the educated ones. However, it should be noted here that majority of the rural people in Kalagala have low education.

Another aspect that was found to be a factor was income earned by the family on monthly basis, whereby 160(50.5%) of the surveyed mothers their family earned between 101,000-150,000/=, followed by 101(31.9%) who earned less than 100,000/=, 41(12.9%) earned between 151,000-200,000/= and 15(4.7%) earned above 200,000/=. Therefore, it is clear that mothers with moderate income took their children for immunization as compared to those with very low income. Based on the findings, Nankabirwa et al (2010) argues that increased likelihood for full immunization was seen in mothers from middle and rich classes.

In relation to the marital status, it was found out that 135(42.6%) were single, followed by 134(42.3%) were married, 25(7.9%) were divorced and 23(7.3%) were widows. This therefore means that on average single and married mothers took their children for immunization as compared to other categories. Single parent families are especially at risk since the increased demands of family support and maintenance may impede health care decisions for the single parent who has no partner with whom to share responsibility Birth order and size of family (PMC 2016). Garcia et al (2014) shows that there are six barriers to vaccination: parent education, lower maternal age, lower income, and female gender of child, traditional religion and large family size.

In ascertaining the safety of vaccine for immunization the findings in Table 2 indicated that 126(39.7%) of the surveyed mothers said it was somehow safe, 93(29.3%) noted that it was safe, 57(18.1%) said it was very safe and 41(12.9%) noted that it was not safe. The findings imply that 276(87.1%) of the respondents agreed that the vaccine for immunization was fairly safe.

In relation to whether mothers consult for decision making on issues of health of the children, the findings in table 2 revealed that 106 (33.4%) of mothers noted that sometimes they consulted, 99 (31.2%) always consulted, 65 (20.5%) frequently consulted and 47(14.8%) never consult. Based on the findings, majority 270 (85.1%) of the mothers fairly agreed that they consulted their spouse on issues concerning the health of their children. This clearly shows that there was somehow engagement of spouses towards children health care.

As pertains to the sources of information on immunization were 110 (34.7%) through health workers, 78 (24.6%) through health center during antenatal care, 58 (18.3%) through newspapers, 51(16.1%) through TV and 20 (6.3%) through the radio. In relation to the finding's majority 188 (59.3%) of the surveyed mothers noted that health workers were the major source for the information about immunization of their children during the antenatal care. Most mothers get information through the health workers more during the antenatal and prenatal care periods.

Regarding transport availability 197(62.1%) of the mothers surveyed used public transport to take their children for immunization, 106 (33.4%) had no way to take their



children (used physical fitness), 11(3.5%) used personal motorcycle and 3 (9%) had personal motor vehicle. Since most of the people surveyed were in the rural setting and their income is low the public transport is the major means of transport.

Furthermore, 102 (32.2%) of the mothers had given birth in eight months and above, 76 (24%) had given birth 7 months ago, 51(16.1%) had given birth 6 months ago, 33(10.4%) had given birth 5 months ago, 28(8.8%) had given birth 4 months ago and 27(8.5%) had given birth 1 month ago. The findings imply that majority 178(56.2%) of the respondents had given birth 7 months and above earlier. If one did not delivery from a healthy facility then it calls for such an individual to receive the first and second rounds of immunization during the first visit.

Influence of Personal and Health-Based Factors on the Immunization, before data was analyzed using logistic linear regression analysis, Chi-square analysis was performed. Only variables that were significantly associated were analyzed in the logistic linear regression. The immunizable diseases mentioned below both are lungs diseases caused by bacteria and virus. Results are arranged based on the different measures of uptake of the immunizable diseases considered. WHO and Ministry of Health (MOH) recommends, 1<sup>st</sup> dose (6<sup>th</sup> week), 2<sup>nd</sup> dose (10th week), 3<sup>rd</sup> (14<sup>th</sup> week) for Diphtheria, Tetanus, Pertussis, Haemophilus Influenza type B, Hepatitis B, Polio, Pneumococcal. For BCG it is administered once at birth, Rotavirus twice as 1<sup>st</sup> dose (6<sup>th</sup> week), 2<sup>nd</sup> dose (10th week) and measles once after 09 months.

**Table 2:**

*Influence of personal and Health –Based Factors on the immunization*

Predictors	Immunization Uptake		Immunizable Diseases	
	Did not	Completed		
			<b>Tuberculosis</b>	
			UOR (CI 95%)	AOR (CI 95%)
<b>Marital Status</b>				
Un-married	116 (63.4)	67 (36.6)	1	
Married	17 (12.7)	117 (87.3)	3.98 (2.20 – 7.18)**	3.68 (2.02 – 6.71)**
<b>Perceived Safety</b>				
Safe	29 (17.4)	138 (82.6)	1	
Un safe	55 (36.7)	95 (63.3)	0.36 (0.22 – 0.61)**	0.40 (0.23 – 0.68)**
			<b>Pneumonia</b>	
			UOR (CI 95%)	AOR (CI 95%)
<b>Perceived Safety</b>				
Un safe	151 (90.4)	16 (9.6)	1	
Safe	27 (18.0)	123 (82.0)	2.07 (1.07 – 4.02)*	2.37 (1.21 – 4.66)*
<b>Service Time taken</b>				
< 1 hour	104 (93.7)	7 (6.3)	1	
> 1 hour	170 (82.5)	36 (17.5)	0.33 (0.14 – 0.74)**	0.28 (0.12 – 0.67)**
			<b>Whooping Cough</b>	
			UOR (CI 95%)	AOR (CI 95%)
<b>Benefits Awareness</b>				
Not Aware	173 (83.6)	34 (16.4)	1	
Aware	82 (74.5)	28 (25.5)	1.74 (0.99 – 3.06)*	

n = 317





## **Tuberculosis**

According to the logistic linear regression analysis and based on the p-values, only marital status, perceived safety of vaccine and time taken for the mother to be attended to by the health worker at the facility were significant predictors for immunization uptake by mothers ( $p < 0.05$ ). Other factors considered in the study were not significant predictors ( $p > 0.05$ ).

## **Marital Status**

It was found out that the fewer married women (12.7 percent) did not complete the immunization schedule than a big majority (87.3 percent) who completed the immunization schedule. According to linear regression analysis, marital status of the mothers was a significant predictor of the children immunization completion status. The unadjusted odds (UOR = 3.98\*\*) indicated that mothers who were married were about 4 times more likely to complete the immunization schedule of their children for tuberculosis and adjusted odds (AOR = 3.68\*\*) for controlling perceived safety of the vaccine by mothers show more less the same likelihood of completion. The findings aligned with the results of PMC, stating that children are less likely to be vaccinated, as the increasing family responsibilities demand more and health care decisions from responsible parents (PMC, 2016). Further, it was indicated from the same study that single parents with families are especially at risk since the increased demands of family support and maintenance may impede health care decisions for the single parents who have no partners with whom to share responsibilities.

## **Perceived Safety**

The more women (82.6 percent) who perceived the vaccine safe completed the immunization schedule than very few (17.4 percent) who did not complete the immunization schedule. According to linear regression analysis, perceived safety of the vaccine by mothers was a significant predictor of the children immunization completion status.

The unadjusted odds (UOR = 0.36\*\*) suggest that mothers who perceived the immunization vaccine unsafe for the health of their babies were 4 times less likely to complete the tuberculosis vaccines. The adjusted odds (AOR = 0.40\*\*) indicated that controlling for marital status of the mothers show more less the same likelihood of completion of tuberculosis vaccines. According to Nankabirwa et al (2010), increased likelihood for full immunization was seen in mothers from middle and rich classes and low vaccine coverage was associated with socioeconomic inequities.

## **Pneumonia**

Based on the logistic linear regression analysis and the p values, only perceived safety of vaccine and time taken for the mother to be attended to by the health worker at the facility were significant predictors for immunization uptake by mothers ( $p < 0.05$ ). Other factors considered in the study were not significant predictors ( $p > 0.05$ ).

## **Perceived Safety**

Similarly, the more women (90.4 percent) who perceived the vaccine unsafe did not complete the immunization schedule than very few (17.4 percent) that did complete. According to linear regression analysis, perceived safety of the vaccine by mothers was a significant predictor of the children immunization completion status. The unadjusted odds (UOR = 2.07\*) suggest that mothers who perceived the immunization vaccine safe for the health of their babies were 2 times more likely to complete the pneumonia vaccines.

About the same likelihood (AOR = 2.37 \*) of completion, controlling for perceived time taken by mothers to be attended to by health worker at the health facility. This means



that parent saw safe to take their children for immunization. It implies that parents know the importance of pneumonia vaccines to protect health of their children. Yasgur (2014) findings support these results by indicating that the fear of parents may have effects on the young child, trying to balance their fear of committing harm against their fear of omitting health care to take their children for immunization and worry about the potential side effects of vaccines and the number of injections their child will receive in a single visit.

#### **Time taken to get Health Service**

Also, the more women (82.5 %) who reported that they could take more than an hour to be attended to by the health workers at the health facility did not complete the immunization schedule compared with (17.5 percent) who completed. According to linear regression analysis, time taken to attend to on as perceived by mothers was a significant predictor of the children immunization completion status. The unadjusted odds ratio of waiting time (UOR = 0.33\*) and the adjusted odds ratio (AOR= 0.28\*\*) suggest that mothers who perceived the time to be more than one hour and those taken less than one hour were 3 times less likely to complete the vaccination dose of pneumonia.

This may imply that time taken to get services may not necessary translate in to incompleteness of the vaccination. According to Amin (2013) there are other key determinants to the success of vaccination effort which include health workers attitude towards patients, aspects of services organization, adequate supply of vaccine and care givers basic knowledge about immunization. These can seriously damage the interaction between the staff and clients and the program.

#### **Whooping Cough**

According to the logistic linear regression analysis and based on the p values, only benefit awareness of child immunization for whooping cough was insignificant predictor for immunization uptake by mothers ( $p < 0.05$ ). Other factors considered in the study were not significant predictors ( $p > 0.05$ ).

#### **Benefit Awareness**

Results show that, more women (83.6 percent) who were not aware of the benefits of immunizing their children against Whooping Cough disease did not complete the immunization schedule compared with (74.5% ) who were aware did not complete the schedule. The linear regression analysis shows that being aware of the benefits of the immunization against Whooping Cough disease by mothers was a significant predictor of completing the children immunization schedule. The unadjusted odds (UOR = 1.74 \*) suggest that mothers who were aware of benefit of vaccine were about 2 times more likely to complete the dose of whooping Cough vaccines. This implies that mothers aware of the importance of the vaccines pushed to take their children for Whooping Cough vaccines. The findings are also supported by the WHO, UNICEF and World Bank (2010) reports that many communities still do not actively seek immunization. Low demand persists due to poor understanding about benefits of vaccines safety.

### **Conclusion**

The article concludes that older mothers were willing to take their children for immunization as compared to the young mothers. Furthermore, education level was an important part in the immunization of the children among the mothers. This implies that the insufficient knowledge of the people requires sincere effort on the part of the health professionals and policy maker to plan and execute the information, education and communication" initiatives. Income had also a bearing on the immunization of children



under five years. It was found that the mothers could access information about immunization of their children mainly during the antenatal and prenatal care periods, which they could not attend fully due to lack of transportation and long distance to reach the health facilities.

It can be concluded that the three immunization vaccines showed that personal and health based factors were predicting for the mother to take their children for immunization, perceived safety of vaccine and time taken for the mother to be attended to by the health workers at the facility were significant predictors for Pneumonia immunization uptake by mothers, benefit awareness of child immunization for whooping cough was significant predictors for immunization uptake by mothers. Mothers who perceived the immunization vaccine safe for the health of their babies were about 2 times more likely to complete the dose of whooping Cough vaccines. This means that mothers knowing the importance of the vaccines pushed to take their children for Whooping Cough vaccines.

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