Introduction

Infant and child mortality rates are basic indicators of a country's socioeconomic situation and quality of life, thereby making the vaccination of children an important part of current preventive measures designed to improve child health and reduce morbidity and mortality from common vaccine-preventable diseases (Edith et al, 2006; Sporton & Francis, 2001; Louise et al, 2004; Magadi, 2007). These diseases include tuberculosis, diphtheria, pertusis (whooping cough), tetanus, poliomyelitis, measles and yellow fever. Couples' socio-economic status such as income, level of education, occupation and social statuses in the community has been found to be a major contributory factor to children's immunization completeness. Usually, a family unit consists of father, mother, children and the health of the children is always a paramount issue to any couple. Moreover events in recent years have shown that couples' income, education and occupation amidst a wide range of cultural, social and behavioral factors significantly influence the health of their children, particularly the immunization uptake of such children (Esimai et al, 2001; UNICEF, 2001; Orubuloye, 1999).

According to the World Health Organization (WHO), to be considered fully vaccinated, a child should receive a dose of BCG vaccine against tuberculosis at birth or soon after; three doses of DPT for the prevention of diphtheria, pertussis (whooping cough), and tetanus; at least three doses of polio vaccine; and a vaccination against measles. The DPT and polio vaccinations should be given at approximately 4, 8, and 12 weeks of age; there is also a dose of polio vaccine that should be given at birth. Measles vaccine should be given at or soon after the child reaches nine months. WHO further recommends that children receive the complete schedule of vaccinations before 12 months of age and that the vaccinations be recorded on a health card given to parents or caretaker (World Health Organization, 2004).

Poor vaccinations are one of the major contributory factors to high infant and child mortality in Nigeria. For the period between 2004 -2008, the 2008 Nigeria Demographic and Health Survey (NDHS) estimated infant mortality to be 75 per thousand live births, child mortality to be 88 per thousand children and under five mortality to be 157 per thousand - most of these deaths have been found to have resulted from vaccine-preventable diseases (Esimai et al, 2001; NPC/ORC Macro, 2004, 2008)

Research method

Data were collected through the use of primary and secondary sources. Multistage sampling technique was adopted in primary data collection together with purposive sampling which was used to select eight districts out of eleven districts in the study area. From each of the selected districts five enumeration areas were selected randomly after which the household listing was done. Systematic random sampling was used to select 25 couples for the study from each district. In all, 200 couples were interviewed using a structured questionnaire. Eligible respondents for this study were couples whose last two children were less than or equals 5 years of age. Vaccination cards were requested from the couples to determine the extent of completeness of immunization of those children. The statistical techniques used are univariate, bivariate and multivariate analysis.

NOTE: It was observed that none of the next-to-last children was less than 12 months old and that at this age all of them ought to have completed the required immunizations based on WHO recommendations. Hence, the index children here are the next–to–last children.

Research findings

Information on the socio-demographic characteristics of couples shows that the mean age of the male respondents was 39 years, while that of the female respondents was 32 years. Also, 53.5% and 37% of male and female respondents respectively had tertiary level of education. More than half of the male respondents (53.5%) and almost one third of the female respondents (32.5%) were civil servants. More than 90% each of the male and female respondents respectively were Christians; 7.5% and 5.5% were Moslems, while 1.5% respectively was traditionalists. Couples' knowledge of the diseases against which children should be immunized showed that mothers (90%) were more knowledgeable than fathers (84.5%).

Of the index children, 98.5% had taken a BCG vaccine at birth; and the same percentage had taken polio vaccine. However, 5.6% had taken only 1 dose of polio vaccine, 14.2% had taken 2 doses, about one quarter (24.4%) had taken 3 doses, and 23.3% had taken 4 or more doses. About 92% (91.5%) had received DPT vaccine, of

which less than 6% (5.5%) had taken four doses, 34.4% had three doses; about 31% (30.6%) had two doses, less than 10% (9.3%) took only 1 dose. It was also reported that over 90% (93%) of the children had received measles vaccine. In all, only 54.5% of the children did complete immunization.

Further findings from the bivariate analysis showed that, children's immunization completeness significantly increased with father's level of education ($p<0.05$) and type of occupation ($p<0.05$); significant relationships exist between children's immunization uptake and mothers educational attainment ($p<0.05$), occupational type ($p<0.05$) and income level ($p<0.05$). The result of the multivariate analysis showed that a significant relationship exists between fathers' income and children's immunization completeness ($p<0.05$, OR=1.000). A significant relationship also exists between fathers' religious affinity and children's immunization uptake ($p<0.05$, OR=0.015); more so, a significant relationship exists between fathers' occupation and children's completeness of immunization.

The result of the forward stepwise regression (tables 1&2) further showed that of all the socioeconomic variables considered earlier only 3 were found to be significant predictors of children's completeness of immunization; these include fathers' religious affinity, income and occupation. On the other hand, a significant relationship exists between mothers' occupation al type and children's completeness of immunization ($p<0.05$, OR=0.043). The result of the forward stepwise regression of the variables shows that of all the mothers' socioeconomic variables, education is the most significant predictor of children's completeness of immunization.

Table 1: Forward Stepwise Logistic Regression Relating Fathers' Socio-Economic Characteristics with Children's Immunization Completeness.

Variables	**Log b Co-efficient**	**Odd Ratio**	**P- Value**
Religion			
Other Religions	- 3.877	0.021	0.023**
Christianity	RC	1.000	-
Income	0.000	1.000	0.031**
Occupation:			
Civil servant	- 0.049	-	0.936
Artisans	- 0.979	0.952	0.145
Business/Trading	0.366	1.442	0.001*
Others	RC	1.000	-

*Significant at 1% RC = Reference Category **Significant at 5% ***Significant at 10%

Table 2: Forward Stepwise Logistic Regression Relating Mothers' Socio Economic Characteristics With Children's Immunization Completeness

Variable	**Log b**	**Odd Ratio**	**P-Value**
Education:			
Primary	- 1.599	0.202	0.001*
Secondary	- 0.699	0.500	0.031**
Post secondary	RC	1.000	-
Constant	0.734	2.083	0.003*

*Significant at 1% RC = Reference Category **Significant at 5%

Discussion and Conclusion

The present study was conducted to assess the extent of complete immunization uptake of children in the study area and to determine the extent to which the immunization status of those children is affected by the socio-economic characteristics of their parents. Findings from the study showed that more than half of the fathers (53.5%) had a tertiary education, while most of the mothers (47.5%) had up to a secondary level of education. While the majority of the fathers were civil servants, most of the mothers interviewed were either not gainfully employed (7.0%), artisans (20.0%), farmers (6.5%) or into some other kinds of job (9.0%) at the time of the interview. More so, almost 60% of the mothers earned less than ₦11,000 (100usd) a month, while more than half of the fathers earned between ₦11,000 (100usd) and ₦40,000 (350usd) a month at the time of the interview. Most of the couples interviewed were monogamists.

Findings from the study clearly showed that the level of children's immunization uptake is still low in the study area; only 54.5% of the children were fully immunized at the time the interview was conducted. A significant relationship exists between couples' educational attainment, occupation income and children's complete immunization uptake. This finding corroborates findings by other studies that, parental income, education and occupation among other socio-economic characteristics are strong and consistent predictors of children's health status, particularly the immunization uptake (Adler et al, 1993; Newacheck et al, 1994; UNICEF, 2001; Uba, 1992; Louise et al, 2004)

Further findings from the study showed that fathers' religious affinity, income and occupation were best predictors of children's complete immunization uptake. Existing literatures show a significant relationship between fathers' education and children's immunization uptake (Nath et al, 2007; Brugha et al, 1996). However, many studies show a close relation between mothers' religion and children's complete immunization uptake (Magadi, 2007; Adeyeye, 2004). On the other hand, mothers' level of education was found to be the best predictor of children's completeness of immunization, despite that most mothers did not have beyond a secondary level of education. Some studies have also found a close association exists between maternal education and children's completeness of immunization (Chabbara et al, 2007).

Observations from the study show that the status of immunization completeness of under 5 children is still low in the study area despite the efforts of the government to sensitize the public on complete immunization uptake of children. However, the findings from this study point to the fact that there still remain a lot to be done by individual parent and the government in the reduction of under 5 morbidity and mortality, particularly from vaccine preventable diseases. Many literatures exist on the effect of mothers' socio-economic characteristics on the immunization uptake of their children, while very few exist on the relationship between fathers' socio-economic characteristics and the immunization uptake of the children. This shows that there is the need to carry fathers along when it comes to their children's health, particularly the complete immunization uptake of those children.

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