

FULL IMMUNISATION COVERAGE OF UNDER FIVE CHILDREN AND ITS CORRELATES AMONG WOMEN IN LUBUTO, NDOLA, ZAMBIA.

PERSPECTIVE

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Child morbidity and mortality in most developing countries is mainly due to vaccine-preventable diseases and Zambia is not an exception according to WHO. Although numerous interventions have been made to increase immunisation coverage, full immunisation coverage in Zambia remains relatively low at 68%. This study examines the predictors of full childhood immunisation. A cross-sectional study of a representative sample of 364 women with children under the age of five years from households of diverse socio-economic levels in a peri-urban locality in Ndola, Zambia, was performed.

Only 44.8% of subjects were found to be fully immunised. Children aged 1-12 months were less likely to be fully immunised than younger or older children: 30.7% compared with 56.5% for children aged <1month, 50.0% for those aged 13-24 months, and 55.6% for children aged 25-60 months. Contrary to other studies, distance from health centre, and maternal education were not found to predict the outcome of the immunisation status of a child.

Immunisation coverage in Lubuto, Ndola, was much lower than found in other surveys done in the region. The differences found in immunisation coverage by marital status and age of the child should be considered by programme and policy makers if better rates of immunisation are to be achieved. In addition to this, younger mothers should be targeted.

Key words: Full immunisation, Correlates, Under-five Children, Lubuto, Ndola.

INTRODUCTION

Immunisation can control or eliminate life-threatening infectious diseases and

is estimated to avert between 2 and 3 million deaths each year [1]. Not only is immunisation a cost effective method of preventing child morbidity and mortality, it also has a positive effect on economic development by reducing the cost of health care [2]. Morbidity and mortality caused by diseases that are preventable by vaccine are still very high in many developing countries around the world [3] and Zambia is not an exception [4]. Although no data are available on deaths caused by vaccine-preventable diseases, the figures pertaining to the average under-five mortality rate in Zambia have shown an impressive decline by 61 percent from 191 deaths per 1,000 live births to 75 deaths per 1,000 live births over the past two decades (1992 – 2014), but these rates are still very high [5].

In sub Saharan Africa, the proportion of unimmunised children ranged from as low as 4.6% in Malawi to 84.2% in Uganda in 2010[4]. Zambia adopted the UNICEF and WHO guidelines for childhood immunisation. These guidelines require that for a child to be considered fully immunized, he/she must receive BCG vaccination (against tuberculosis), three doses of DPT (diphtheria, pertussis, and tetanus) vaccine, three doses of polio vaccine, and measles vaccine by the age of 12 months or the child must be up to date with the vaccines he/she is supposed to have received for his/her age [6]. Overall, 68% of children in Zambia are considered fully immunised but these still remain relatively low as most children are still not fully immunised [1,5,7].

Despite many strategies to improve immunisation coverage, including the Expanded Programme on Immunisation,

Universal Child Immunisation introduced to reinforce the Expanded Programme on Immunisation [8], Integrated Management of Child Illness programme and Reach Every Child/District adopted in 2003[9,10], and the Global Alliance for Vaccines and Immunisation (GAVI), a public-private global health partnership[11], immunisation coverage in Zambia has remained the same since 2007. Although there was an increase in immunisation coverage and community participation over the past decade because of these strategies, coverage could not reach optimal levels because of a number of problems [9,10]. A review of previous studies showed that many factors have been said to contribute to low immunisation rates in Zambia and many other countries. Among these, service factors [12,13], parental attitudes, and knowledge about immunisation [14] emerged as the most important categories. Mothers' responsibility for children's full immunisation is affected, among other things, by their level of education [5,6,15,16], access to media, use of maternal health care services, and economic status [2]. Place of residence [3,5,6,17] and distance from the nearest health centre [3,12,16,18] are among some of the other factors that are said to influence immunisation coverage in countries around the world. Mothers with high parity were less likely to fully immunise their children in Bangladesh[18], Jamaica, Trinidad and Tobago[19], and South Africa[20].

Every immunization programme should strive to provide quality services that are accessible, affordable, reliable, convenient, acceptable, and friendly and should try to obtain feedback from families and

community leaders as well as monitor missed and under-immunised children. This can assist in assessing and addressing the causes of missed opportunities and under immunization [21]. Therefore, the present study examined children's full immunisation coverage and the demographic and socio-economic correlates of immunisation status among mothers in Lubuto, Ndola, Zambia.

METHODS

The current study utilized a cross-sectional design using a representative sample of women with children under the age of five years from households with varying socio-economic levels in peri-urban locality in Ndola, Zambia.

Ndola is the third largest city in Zambia with population of 455, 194 as of the 2010 Census. It is situated in Copperbelt Province. Lubuto is one of the biggest peri-urban areas of Ndola city with its local clinic, Lubuto Health Centre, having a catchment area of about 48, 550 of which 6, 865 are children under five years as of 2014.

A systematic random sampling method was used to select eligible households from which women with children under five were sampled.

A sample size of 364 children aged under five years from the target population was used for the study. This was determined using the statistical programme Epi Info version 7.1.3.3

Data was collected using a questionnaire developed to gather information on socio-demographic characteristics of participants, immunisation knowledge, and immunisation status of the child. The mothers were interviewed and data recorded accordingly. To assess the knowledge levels of mothers on immunisation various questions were asked, scored and recorded as poor, moderate or good. The immunisation status of the children was considered as the outcome (dependent) variable and was recorded as fully immunised when a child was up to date with the vaccines he/she was supposed to have received. In addition to the age of the mother, number of children, age of the last child, education level, religion, distance from health centre and knowledge on immunisation were other

variables. Data collected was then entered into SPSS version 20 and later analysed. Cross tabulation was done and logistic regression was further done to establish the determinants of immunisation status.

Ethical Consideration

The research proposal was reviewed and approved by Tropical Disease Research Center (TDRC) Ethics Committee at Ndola Teaching Hospital. Then authorization document was obtained from the District Medical offices in Ndola.

RESULTS

A total of 364 women took part in the survey of which 84% were aged between 15 and 35. Only 343 participants were enrolled giving a response rate of 94.2%. 44.3% of children were fully immunised. Of the 54.5% of children who were not fully immunised, 52.2% were partially immunised and 2.3% had not received any vaccination. 1.2% of the children's information was not given.

Immunisation coverage varies with background characteristics. In Table 1, full immunisation was higher in children with mothers aged >36 (60.0%) as compared with mothers aged 15–25 years (37.6%) 26–35 years (46.2%). Children with mothers who were less likely to be fully immunised (33.8%) achieved full immunisation at 33.8% compared to mothers who were married, divorced, separated, or widowed (47.9%)

As shown in Table 1, although most children were aged between 1 month and 12 months, full immunisation was higher among those aged 25–60 months (55.9%). The percentage of full immunisation increased consistently with the increase in the number of children a woman had, from 34.6% for 1 child to 57.5% for 5 or more children.

Full immunisation coverage was lowest in children with mothers who had attended college/university (36.9%) and highest among those with mothers that never attended school 50.0%.

Almost all (96.7%) participants were Christians so no analysis by religion was performed. Of children who lived near the health centre, 46.7% were fully immunised compared with 41.0% of children who lived far from the health centre. Most of

the mothers had poor knowledge about immunisation but 42.8% of children with such mothers were fully immunised compared with 51.5% of children with mothers with more knowledge (Table 1).

Table 1 shows frequencies and percentages of full immunisation for Specific Age according to Background Characteristics. After Chi square testing it was found that age of the mother, marital status, age of the last child and number of children a mother had some association with the immunisation status of a child.

evidence of improving population coverage of agreed standards and assessments. By 2025 80% of Member States will show evidence improving population coverage of agreed standards and assessments.

CONCLUSION

The theme of the World Health Day 2018 has put a spotlight on the need for renewed commitment to accelerate the efforts for moving towards Universal Health Coverage and the attainment of the Sustainable Development Goals. Although countries have made progress in improving coverage for life saving interventions, significant gaps still exist and many people still suffer financial cost. The call made to countries at the Tokyo Declaration in 2017 to accelerate progress towards UHC by making specific plans with indicators was timely. Using the existing implementation frameworks for UHC and the Global UHC monitoring framework by WHO and the World Bank, many countries can make a difference in improving health and equity. Moving towards UHC will involve ensuring adequate health care budgets, financial protection mechanisms, human resources, information systems, health infrastructure and health technologies and adequate stocks of essential drugs. WHO therefore remains committed to continue working with other partners in supporting efforts aimed at bringing quality healthcare services to the population in an equitable manner and to support monitoring of UHC. Universal Health Coverage is both technically and financially feasible and is the best investment for a safer, fairer and healthier world for everyone.

Table 1: Frequencies and percentages of full immunisation for specific age by background Characteristics

FULL IMMUNISATION FOR AGE				
BACKGROUND CHARACTERISTICS				
	YES	NO	TOTAL (n)	P Value
AGE: 15 – 25	53 (37.6%)	88 (62.4%)	141 (100%)	0.030
26 – 35	67 (46.2%)	78 (53.8%)	145 (100%)	
36 – 45	30 (60.0%)	20 (40.0%)	50 (100%)	
46 - highest	1 (100%)	0 (0.0%)	1 (100%)	
Marital status				
Single	25 (33.8%)	49 (66.2%)	74 (100%)	0.037
Married	104 (46.8%)	118 (53.2%)	222 (100%)	
Divorced	10 (71.4%)	4 (28.6%)	14 (100%)	
Separated	10 (55.6%)	8 (44.4%)	18(100%)	
widow	3(27.3%)	8 (72.7%)	11 (100%)	
Age of last child:				
Less than 1 month	13 (56.5%)	10 (43.5%)	23 (100%)	0.001
1 month – 12 months	39 (30.7%)	88 (69.7%)	127 (100%)	
13 months – 24 months	45 (50%)	45 (50.0%)	90 (100%)	
25 months – 60 months	55 (55.6%)	44 (44.4%)	99 (100%)	
Number of children:				
1	37 (34.6%)	70 (65.4%)	107 (100%)	0.018
2	38 (42.2%)	52 (57.8%)	90 (100%)	
3-4	54 (52.9%)	48 (47.1%)	102 (100%)	
5-highest	23 (57.5%)	17 (42.5%)	40 (100%)	
Maternal Education:				
Primary school	29 (43.9%)	33 (56.1%)	66 (100%)	
Secondary school	60 (44.8%)	74 (55.2%)	134 (100%)	0.461
College/university	24 (36.9%)	41 (63.1%)	65 (100%)	
Never attended school	39 (50.0%)	39 (50.0%)	78 (100%)	
Distance from health center:				
Far	78 (46.7%)	89 (53.3%)	167 (100%)	0.590
Near	26 (32.1%)	55 (67.9%)	81(100%)	
Not very far				
Knowledge:				
Poor	110 (42.8%)	147 (57.8%)	257 (100%)	
Moderate	39 (50.0%)	39 (50.0%)	78 (100%)	0.155
Good	2 (100%)	0 (0.0%)	2 (100%)	

N = 343, where N is for Total number of participants

Determinants of immunisation status

Multiple logistic regression analysis was used to identify the most relevant determinants of the immunisation of children under the age of five. Table 1 presents the results of the binary logistic regression analysis, with full immunisation for age as the dependent variable, after the categorical variables were identified.

The Table 2 shows that marital status

and age of the last child were significant predictors of correct vaccination for the child's age. The odds ratio (OR) indicated that women on separation were 8.58 more likely to get their children fully immunised compared to those who were single.

The age of the child was strongly related to his or her immunisation status. Children aged 13 – 24 months were 0.36 times less likely to have been fully immunised than

those aged less than one month.

Furthermore, maternal education and knowledge about immunisation had not shown significant influence on the odds of the child being correctly immunised. Similarly, age of the mother, number of children, religion and distance from health centre played no role in the odds of the child being fully immunised.

Table 2: Results for Logistic Regression Analysis of the determinants of child immunisation

BACKGROUND CHARACTERISTICS	ODDS RATIO (Confidence Interval 95%)
Marital status;	
Single	1*
Married	1.745 (0.41 – 7.49)
Divorced	2.962 (0.74 – 11.81)
Separated	8.580 (1.41 – 52.13)**
Widow	3.638 (0.70 – 18.84)
Age of Child;	
Less than 1 month	1*
1 month – 12 months	1.204 (0.46 – 3.14)
13 months – 24 months	0.363 (0.21 – 0.64)**
25 months – 60 months	0.792 (0.44 – 1.43)

* = Reference Category

**= P value < 0.05 (significant)

DISCUSSION

The full immunisation coverage in the present study was found to be 44.8%, which is lower than the provincial coverage of 81%, the national coverage of 68%, and much lower than the worldwide coverage of 84% [6, 22]. This shows that despite high coverage in urban areas, gaps are marked as the health services and supplies may not be adequate for immunising the large population in peri-urban areas. Thus, coverage in the poorest slums and peri urban areas within cities may be as bad as or even worse than in rural areas [17].

Most children had received some of the vaccines but were not completely immunised for their age. The issue of not completing recommended doses of vaccines is of much concern. A child is protected optimally from specific infections if the child received all of

the doses. Skipping, delaying or missing a dose or doses makes the child vulnerable to the specific infection [23].

The major factors affecting full immunisation coverage among women, in the present study, were found to be; marital status, and the age of the child.

Most children in the current study were born to mothers who were married and had a better chance of being fully immunised. For single mothers, the immunisation rate was 33.8%, significantly less than for all other statuses combined (47.9%). The impact of marital status on the child's vaccination status has been reported elsewhere [24]. In addition Mapatano et al [25] stated that although marital status was not a predictor of immunisation in their study, a husband's involvement showed significant impact

and thus involving the father will benefit immunisation programmes.

Age of the child also played a part in the outcome of the immunization status of a child. Most mothers are afraid of the side effects of the vaccines especially in the early days of life [3]. This may have explained the low levels of immunisation in the early years of life. This seems to reflect a gap in knowledge about vaccines [3]. Although not significant in this study, vaccination-related knowledge is a significant determinant of immunisation status, as observed by Kim et al [26]. Studies have shown that increasing maternal knowledge regarding vaccines improves immunisation status [27].

Maternal age and number of children had some association to the immunisation status

of the child but did not significantly contribute to the outcome of the immunisation status of a child in the current study. Contrary to what was found in other studies, distance from health centre [12, 16, 18] and Maternal Education [24] were found not to be significantly associated with the outcome of the immunisation status of the child in this study. This could have been due to having multiple vaccination centers spread throughout Lubuto. This means shorter distance to the vaccination center and the clinic is less congested. In addition, Lubuto has Community Health Volunteers who constantly remind mothers to have their children vaccinated and assist health workers with educating women about various health-related topics including immunisation.

The most important limitation of the present study is that the gender of the child was not recorded while collecting the data. This shortcoming creates an unclear picture with regard to the role of gender as a factor that might have an effect on immunisation coverage among children under the age of five years and a study to explore the role of gender in immunisation coverage is recommended.

CONCLUSION

These findings show that with 44.8% full immunisation coverage, the main limiting factors for full immunisation in Lubuto, Ndola are marital status and age of the child. Programmes and policy makers should take these factors into account

when designing strategies for enhancing the utilization of immunisation services.

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