

Missed Immunisation and Immunisation Drop-outs among Infants in Rural Health Facilities in Abakaliki, Nigeria

Abstract

Background: Missed immunisation, immunisation drop-out and coverage rates at primary health care (PHC) level indicate the level at which communities utilize the preventive services and thus serve as a measure of the strength of the public health system. They also measure the effectiveness of the immunisation programme. The extent of missed immunisation and immunisation drop-out is not well known in the study area. This study therefore determined the extent of missed immunisation and immunisation drop-outs in Abakaliki.

Materials and Methods: Descriptive cross-sectional analytical study design was used for the survey. Total number of infants in the health facilities was used as sample size in this study (406 infants at Mile-Four hospital and 281 infants at St. Vincent hospital). Data were extracted from the existing immunisation registers in the two health facilities studied. Statistical Package for Social Sciences (SPSS) version 22 was used for data analysis. Ethical approval for this study was obtained from the Research and Ethics Committee (REC) of the Federal Teaching Hospital Abakaliki (FETHA).

Results: Showed significant differences in the proportion of missed immunisations (39.7% in Mile-Four and 48.4% in St. Vincent respectively, $p=0.02$) and immunisation drop-outs (35.7% in Mile-Four and 47.7% in St. Vincent respectively, $p=0.02$). The drop-out rate is 64.3% in Mile-Four and 52.3% in St. Vincent. It also showed that 36.6% of male infants when compared to 34.8% of female infants dropped-out of 3rd dose of pentavalent vaccines in Mile-Four while 44.5% of male infants and 51.1% of female infants dropped-out 3rd dose of pentavalent vaccines in St. Vincent hospital. There was no significant difference in the immunisation drop-out rates between male and female infants in the study groups ($p>0.05$).

Conclusion: Higher proportion of infants missed immunisation and dropped out of vaccination at St. Vincent than Mile-Four. This calls for an aggressive public campaign on need to ensure immunisation timeliness for effective immunisation in such rural areas.

Keywords: Missed immunisation; drop-out; infants; rural health facilities; Abakaliki

Introduction

Immunisation drop-outs refer to infants who have used or missed immunisation services and do not return for subsequent vaccinations. When drop-outs exceed 10 percent, it indicates a problem of utilisation of services. In most settings where full immunisation coverage is low, most infants receive at least one dose of pentavalent vaccines, but the proportion that receive

the needed second and third doses drops significantly. Drop-out rates are calculated as the percentage point difference between successive doses of a vaccine, expressed as a percentage of the first dose¹.

Immunisation coverage which is the indicator of access to the preventive services at PHC level is measured by the percentage of infants who have received the appropriate immunisations. Immunisation coverage is calculated as the total number of infants that have received all their immunisations up to the measles vaccine, divided by the total population of children under one year old in a given area¹. However differences in the indicators of access and utilisation of immunisation services exist. Indicators of access to health services among other factors include level of education, sex, patriarchal social arrangement, rural residence, poverty, religious and cultural beliefs about certain diseases and location of health facilities etc. Indicators of utilisation of immunisation services include quality of staff skills, protocols of treatment, availability of supplies and environment of health facilities, physical and financial accessibility of services, knowledge of what services exist, education about how to best utilize self and practitioner-provided services and cultural norms of treatment^{2,3}. The extent of missed immunisation and immunisation drop-out is not well known in the study area. This study therefore determined the extent of missed immunisation and immunisation drop-outs in Abakaliki.

Materials and Methods

Descriptive cross- sectional analytical study design was used for the survey. Data were extracted from the existing immunisation registers in the two health facilities studied. Total number of infants in the health facilities was used as sample size for the study (406 infants at Mile-Four hospital and 281 infants at St. Vincent hospital, both in Abakaliki, Ebonyi State). Statistical Package for Social Sciences (SPSS) version 22 was used for data analysis. Chi-squared test was to determine association or differences between proportion of the variables and the level of statistical significance was set at $p < 0.05$ and confidence level at 95%. Ethical approval for this study was obtained from the Research and Ethics Committee (REC) of the Federal Teaching Hospital Abakaliki (FETHA), Ebonyi State, Nigeria

Results

A total of 687 infants were studied, 406 (59%) in Mile-Four and 281 (41%) in St. Vincent. These figures were the number of infants recorded as at the time of data extraction. Review of immunisation register showed significant differences in the proportion of missed immunisations (39.7% in Mile four and 48.4% in St. Vincent respectively, $p=0.02$) and immunisation drop-outs (35.7% in Mile Four and 47.7% in St. Vincent respectively, $p=0.02$).

Table 1 showed that the proportion of infants who missed immunisations was 39.7% in Mile-Four and 48.4% in St. Vincent. The difference in proportion of infants who missed immunisation was statistically significant ($p=0.02$). Table 2 showed that the proportion of male and female infants who missed penta-valent vaccines. The difference in their proportion was not significant. Table 3 showed that 35.7% of infants dropped out of pentavalent vaccines 3 in Mile-Four when compared with 47.7% who dropped out of pentavalent vaccines 3 in St. Vincent. The difference in their proportions was statistically significant ($p=0.02$). The drop-out rate is 64.3% in Mile-Four and 52.3% in St. Vincent. Table 4 showed that 36.6% of male infants and 34.8% of female infants dropped-out of 3rd dose of pentavalent vaccines in St. Vincent while 44.5% of male infants and 51.1% of female infants dropped-out 3rd dose of pentavalent vaccines in Mile-Four. There was no significant difference in the immunisation drop-out rates between male and female infants in the study groups ($p>0.05$).

Table 1: Proportion of infants who missed immunisations in both facilities

Variables	Mile-Four (n=406) Freq. (%)	St.Vincent (n=281) Freq. (%)	χ^2 (p-value)
Number who missed immunisation			
Yes	161 (39.7)	136 (48.4)	5.17 (0.02)*
No	245 (60.3)	145 (51.6)	
Number who missed each vaccine			
BCG	0 (0.0)	0 (0.0)	
OPV0	0 (0.0)	0 (0.0)	
HB0	2 (0.5)	0 (0.0)	
OPV1	60 (14.8)	22 (7.8)	
Pentavalent1	11 (2.7)	5 (1.8)	
PCV1	26 (6.4)	7 (2.5)	
OPV2	89 (21.9)	57 (20.1)	
Pentavalent2	80 (19.7)	58 (20.6)	
PCV2	99 (24.4)	57 (20.3)	
OPV3	152 (37.4)	136 (48.4)	
Pentavalent3	146 (36.0)	135 (48.0)	
PCV3	161 (39.7)	136 (48.4)	

*statistically significant

Table 2: Within group comparison between Sex of infants and missed immunisation in both facilities

Variables	Mile Four (n=406)				St.Vincent (n=281)			
	Missed immunisation			χ^2	Missed immunisation			χ^2 (p-
	Yes	No	Total		Yes	No	Total	

		Freq. (%)	Freq. (%)	(p-value)	Freq. (%)	Freq. (%)	value)
Sex of infants	Pentavalent vaccines1				Pentavalent vaccines1		
Male	4 (2.0)	201 (98.0)	205 (100)	0.90 (0.34)	4 (2.7)	142 (97.3)	146 (100)
							FT
							(0.37)
	Pentavalent vaccines 3				Pentavalent vaccines 3		
Male	76 (37.1)	129 (62.9)	205 (100)	0.22 (0.63)	65 (44.5)	81 (55.5)	146 (100)
							1.51
							(0.21)
Female	70 (34.8)	131 (65.2)	201 (100)		70 (51.9)	65 (48.1)	135 (100)

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90 **FT**=Fisher's exact test

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92 **Table 3: Proportion of clients who dropped- out of vaccines in both facilities**

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Variables	Mile-Four (n=406) Freq. (%)	St.Vincent (n=281) Freq. (%)	χ^2	(p-value)
Number who dropped-out vaccines				
Yes	145 (35.7)	134 (47.7)	6.10 (0.02)*	
No	251 (64.3)	147 (52.3)		
Drop-out rate	64.3%	52.3%		
Number who dropped-out each vaccine				
OPV3	147 (36.2)	134 (47.7)	9.05 (<0.01)*	
Pentavalent3	145 (35.7)	134 (47.7)	9.87 (<0.01)*	
PCV3	152 (37.4)	136 (48.4)	7.11 (0.01)*	

94 *statistically significant

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97 **Table 4: Within group comparison between Sex of infants and immunisation drop-outs**
 98 **in both facilities (3rd dose of pentavalent vaccines)**

Variables	Mile Four (n = 406)				St.Vincent (n=281)			
	Immunisation drop-out			χ^2 (p-value)	Immunisation drop-out			χ^2 (p-value)
	Yes	No	Total		Yes	No	Total	
	Freq. (%)	Freq. (%)			Freq. (%)	Freq. (%)		
Sex of	Pentavalent 3				Pentavalent 3			

infants								
Male	75 (36.6)	130 (63.4)	205 (100)	0.13 (0.71)	65 (44.5)	81 (55.5)	146 (100)	1.22 (0.26)
Female	70 (34.8)	131 (65.2)	201 (100)		69 (51.1)	66 (48.9)	135 (100)	

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101 Discussion

102 In this study, a significantly lower proportion of infants (39.7%) in Mile Four than St.Vincent
103 (48.4%) missed immunisation. More infants missed immunisations in increasing interval
104 (most commonly missed are 14th week vaccines compared to 10th week vaccines and least
105 missed are 6th week vaccines). This may be due to the fact that as immunisation time intervals
106 increase, caregivers tend to forget the exact date of immunisation of their infants thereby
107 making immunisation timeliness unrealisable and putting such infants temporally at risk of
108 infection by vaccine preventable diseases⁴. This finding is at variance with that found in
109 Nnewi in a study of mother-neonate pairs where most commonly missed immunisations were
110 BCG, OPV0 and OPV1, HBV1 and DPT1 compared to the 10th week and 14th week vaccines.
111 In that study, mother's age, education and knowledge of immunisation were not significantly
112 associated with missed immunisation. There was comparable proportion of missed
113 immunisations (pentavalent vaccines 1 and 3) between the male and female infants who were
114 vaccinated three (3) months before the intervention. This may explain the importance
115 attached to both male and female infants now unlike olden days when preference was given
116 to male infants in the African society. Higher proportion of infants missed OPV3, Pentavalent
117 3 vaccines and PCV3 than the 6th and 10th week vaccines. The prevalence of missed
118 immunisation in Mile-Four (39.7%) is higher compared to those reported in Nnewi (17%)⁵,
119 Benin City (27.6%)⁶ among mothers of infants 6 months to 1 year and consistent with that in
120 Calabar (39.1%)⁷ but lower than the 57.1% reported in India⁸. The missed vaccines would
121 invariably reduce herd immunity of such population and consequently make such infants
122 prone to vaccine preventable diseases⁴. The commonest vaccines missed were OPV1, HBV1
123 and DPT1 (40.38%), followed by BCG and OPV0 (38.46%), and OPV2, HBV2, and DPT2
124 (11.54%). The finding of higher rate of missed immunisation is in keeping with other study
125 elsewhere⁹ suggesting that the reasons for this high level of missed immunisation have not
126 been adequately addressed. These should be addressed through adequate communication
127 between mothers and health workers, training of health workers and policy flexibility⁵.
128 Lower proportion of infants in Mile-Four (35.7%) than St.Vincent (47.7%) dropped-out of
129 vaccination. There was a statistically significant difference in the proportion of infants who

dropped-out of vaccination in the groups. This significant dropout rate among the infants would invariably compromise the herd immunity of such population and consequently make such infants prone to vaccine preventable diseases with attendant morbidity and mortality⁴.

There was no significant difference in the immunisation drop-out rates between male (36.6%) and female (34.8%) infants in Mile-Four and St.Vincent (male;44.5% and female;51.1%). The cumulative drop-out rates were 64.3% in Mile-Four and 52.3% in St.Vincent. This may be due to the fact that most infants were delivered in the facility and as their mother's postnatal care services ended, they continued the immunisation in a nearby health facility⁵.

Conclusion

Higher proportion of infants missed immunisation and dropped out of vaccination in St.Vincent than Mile-Four hospital. This finding calls for an aggressive public campaign on need to ensure immunisation timeliness for effective immunisation in such rural areas.

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