

Okafor AF  
Korie FC  
Ukegbu AU  
Ibe BC

CC –BY

## Prevalence and reasons for missed opportunities for vaccination in a Nigerian hospital

DOI:<http://dx.doi.org/10.4314/njp.v46i4.7>

Accepted: 21st October 2019

Okafor AF (✉)

Korie FC

Department of Paediatrics,  
Federal Medical Centre Umuahia  
Email: amarafan@yahoo.co.uk

Ukegbu AU

Department of Community  
Medicine

Federal Medical Centre Umuahia

Ibe BC

Department of Paediatrics,  
University Nigeria Teaching  
Hospital Enugu, Nigeria.

**Abstract:** *Background:* Missed Opportunity for Vaccination (MOV) is a significant cause of low immunisation coverage and resurgence of vaccine preventable diseases. Hence, identifying the causes of MOV in our health facilities and eliminating them will help improve immunisation coverage in the area.

*Objectives:* To determine the prevalence and reasons for MOV in children aged 0 to 23 months at the Federal Medical Centre, (FMC) Umuahia, Abia State.

*Methods:* Exit interviews were conducted for 300 mother/child pairs of children aged 0 to 23 months consecutively as they visited the preventive and the curative sections of FMC Umuahia.

*Results:* Of the 300 children recruited, 158 (52.7%) were males and 142 (47.3%) were females with a M:F ratio of 1.1:1. Thirty six (12%) of all the children had missed opportunities for vaccination. MOV rate was significantly higher among the in-patients ( $p=0.02$ ). The reasons for MOV

noted were; presentation of the children on the 'wrong' immunisation days (72.2%), false contraindications to vaccination by the health workers (13.9%), unavailability of vaccines (8.3%) and refusal to open a new vial by the health workers (5.6%). The commonest remote reason why the children who presented on the 'wrong' immunisation days missed their previous immunisation appointments was because of non-availability of the mothers due to illness, parent's travel and farm work.

*Conclusion:* The prevalence of MOV at FMC Umuahia is 12% and the commonest reason was that the children presented on the 'wrong' immunisation days. Hence, all the vaccines should be made available to every eligible child on any day of the week in order to effectively eliminate MOV.

**Keywords:** Missed Opportunities for Vaccination, Children, Umuahia.

### Introduction

A Missed Opportunity for Vaccination (MOV) refers to any contact with health services by an individual (child or person of any age) who is eligible for vaccination (e.g. unvaccinated or partially vaccinated and free of contraindications to vaccination), which does not result in the person receiving one or more of the vaccine doses for which he or she is eligible.<sup>1</sup> It is a significant obstacle to raising immunisation coverage and leads to resurgence of vaccine preventable diseases.<sup>2,3</sup> Immunisation is widely known to be the most cost-effective method of preventing childhood morbidities and mortalities and averts an estimated 2-3 million deaths annually from Vaccine Preventable Diseases (VPDs).<sup>4</sup> The Nigeria Demographic and Health Survey (NDHS) 2013 showed that only 25% of Nigerian children aged 12-23 months were fully vaccinated with BCG, measles and three doses each of DPT and polio vaccines while 21% received no vaccinations at all.<sup>5</sup> This was far below the

National target of reaching 90% of children under the age of one year nationwide with routine immunisation, and at least 80% of coverage for every country district by the year 2020.<sup>6</sup> As a way of combating poor immunisation coverage, the Expanded Programme on Immunisation Global Advisory Group (GAG) recommended that immunisation be provided to all eligible persons at every contact with a health facility.<sup>7</sup> It was also recommended that missed opportunity surveys be used to routinely monitor immunisation programmes in all regions.<sup>2</sup> Studies on MOV could be community-based or health facility-based. However, studies done in health facilities make it possible to more accurately assess why a child who goes to a health facility with a parent/guardian is not given the necessary vaccines despite having no contraindications for vaccination.<sup>8</sup>

In Abia State where this study was carried out, 49.8% of children aged 12-23 months received all the basic vaccinations which was one of the lowest rates in the South

Eastern Nigeria.<sup>5</sup> Hence, there is need to identify the reasons why MOV occurred in our health facilities and reduce them to the barest minimum. This present study therefore aimed at determining the prevalence and reasons for MOV in children aged 0 to 23 months at the FMC, Umuahia.

## Subjects and methods

This study was a descriptive, cross-sectional, health-facility based survey. It was carried out from April to June 2015. The consecutive sampling method was used in the study. Children aged 0 to 23 months were consecutively recruited from both the preventive and curative sections of FMC Umahia in Umuahia-North Local Government Area (L.G.A) and its satellite Health Centres at Umuigu and Nsukwe, in Ikwano and Umuahia South L.G.As of Abia State respectively. FMC Umuahia is a referral centre for all the primary and secondary healthcare institutions in the State and also offers both primary and tertiary healthcare services to the urban and the rural communities in the state as well as the surrounding communities in the neighbouring states. The average number of children seen in F M C Umuahia and its satellite Health centres are over 10,000 per annum. Before commencing the study, ethical clearance was obtained from the Hospital Research and Ethics Committee. Written informed consent was obtained from the parents/primary care givers of the children. The estimated sample size was 300 using the formula for population greater than 10,000.<sup>9</sup> Data was collected using a questionnaire adapted from the standardized WHO questionnaire for assessing Missed Opportunities for Immunisation.<sup>10</sup>

The vaccination status of the children were recorded using their immunisation cards or by recall by their mothers/ permanent caregivers when the cards were not available. A missed opportunity was recorded when a child aged between 0 to 23 months who was eligible for vaccination visited the hospital and could not be vaccinated without having any contraindications to the needed vaccines. The vaccine specific missed opportunity rates were calculated based on the number of children who had MOI for each vaccine, divided by the total number of children eligible for that particular vaccine.<sup>2</sup> Data entry was done using the Microsoft Excel software and analyzed with EPI-INFO version 7 package data on indices of immunisation. The results were displayed using prose, tables and figures, expressed in means for parametric data. Chi square was used to test for significance. A p-value less than 0.05 was considered statistically significant.

## Results

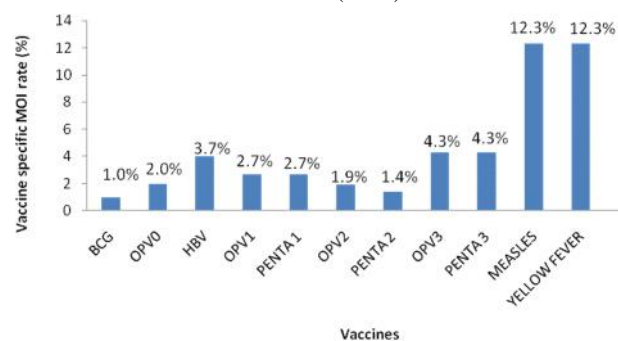
Three hundred mother/child pairs (of children aged 0 to 23 months) were enrolled into the study. Of the 300

children recruited, 158 (52.7%) were males and 142 (47.3%) were females with a M:F ratio of 1.1:1. Thirty six (12%) of all the children had MOV. The rate was significantly higher among the in-patients than the out-patients ( $p= 0.02$ )(Table 1) The vaccines with the highest vaccine specific missed opportunities were measles and yellow fever (both 12.3%) while the lowest was BCG with a rate of 1.0% (Figure 1). The reasons for MOV noted in this study were; presentation of the children on the 'wrong' immunisation days (72.2%), false contraindications to vaccination by the health workers (13.9%), unavailability of vaccines (8.3%) and refusal to open a new vial by the health workers (5.6%). The commonest remote reason why the children who presented on the 'wrong' immunisation days missed their previous immunisation appointments was because of non-availability of the mothers due to illness, parent's travel and farm work (Table 2). One hundred and forty eight out of the 300 (49.3%) mothers, whose children were vaccinated at FMC Umuahia appraised the immunisation services and rated it as 'very good', while only 1 (0.3%) rated it as bad (Table 3).

**Table 1:** The distribution of MOV among the in-patients and out-patients in children aged 0 to 23 months at the Federal Medical Centre Umuahia

Hospital sections	Number recruited	Frequency of MOV
In-patients	13	2
Children Emergency Ward	14	6
Paediatric Ward	=27	= 8/27 (29.6%)
Out-patients	114	12
Children outpatient clinic	96	5
F M C Umuahia immunisation clinic	37	8
Umuigu satellite health centre	26	3
Nsukwe satellite health centre	=173	=28/173 (16.2%)
Total	300	36 ( $p= 0.02$ )

**Fig 1:** Vaccine specific missed opportunities in children aged 0 to 23 months at FMC Umuahia (n=36)



**Table 2:** Reasons for missing immunisation appointments in the twenty six children that presented on a wrong immunisation day

Reasons	Number of children	%
Non availability of parents: Parents travelled – 4 Parents went to farm - 2 Mother's illness - 2 False contraindications by the parents	8	30.8
Ignorance of immunisation day	7	27.0
Discharged home after hospital admission without being vaccinated	5	19.2
Health workers strike	4	15.4
Fear of side effects	1	3.8
Total	26	100.0

**Table 3:** Clients' rating of the immunisation services at FMC Umuahia

Appraisal	Number n=300	Percentage (100%)
Very good	148	49.3
Good	101	33.7
Fair	8	2.7
Bad	1	0.3
Not assessed	42	14.0

## Discussion

MOV is a significant cause of low immunisation coverage. In this study, the prevalence of MOV (12%) was lower than most of the previous Nigerian studies,<sup>11,12,13,14, 15</sup> an Indian study,<sup>16</sup> a Dominican republic study<sup>17</sup> and the pooled MOV prevalence of 32.2%<sup>18</sup> from review of 45 studies on MOV done in middle and low income countries. The lower rate of MOV in FMC Umuahia could be as a result of the increased awareness that accompanied the introduction of new vaccines (IPV, pentavalent and pneumococcal vaccines) by the Nigerian government between the years 2012 and 2014, prior to this study.<sup>5, 19, 20</sup> It could also be as a result of high level of client satisfaction among the mothers that received immunisation services in F M C Umuahia which was rated 'very good' by the majority. Poor satisfaction by the mothers in the immunisation clinic can occur due to factors such as long waiting time, and rude attitude of the health workers. This leads to refusing vaccination even when an eligible child is brought to the hospital for other services. Studies have shown that negative perceptions about a health facility are major barriers to childhood immunisation.<sup>13, 21</sup>

A lower prevalence of 3% was recorded in Kenya.<sup>22</sup> The lower rate in Kenya was due to the policy in place that every eligible child that visits the hospital must be vaccinated. Such policy was not in place in FMC umuahia at the time of this study.

In this study, MOV was significantly higher among the in-patients than the children seen on out-patient basis (even though the number recruited from the wards was

affected by recurrent industrial actions during the period of this study). The higher rates of MOV in the wards could be as a result of the fact that vaccines were not administered in the curative sections and most of the vaccines were given once a week. Hence, patients discharged from the wards may not likely wait to receive the vaccines given once a week before going home. The higher rate of MOV on the wards could also be as a result of the lapses by the health workers in crosschecking every child's document to ensure that on getting well, they receive their due vaccinations before discharging them from the hospital. A similar finding of higher rate among the in-patients was noted in India.<sup>16</sup>

The vaccines with the highest rate of vaccine specific MOV in this study were measles and yellow fever. There is a longer interval between Pentavalent 3 and the measles vaccine (three and a half months) as compared to the interval between the earlier vaccines in the schedule (four weeks). This could lead to drop out from the immunisation programme since measles and yellow fever vaccines were the last vaccines to be received in the National Programme on Immunisation (NPI) schedule for infants. The high vaccine specific MOV of measles and yellow fever is a similar finding in some other Nigerian studies<sup>11, 12</sup> and Gambia.<sup>24</sup> Mothers are also known to be more enthusiastic about immunisation for their children in early infancy than in the late infancy.<sup>23, 24</sup>

BCG had the lowest vaccine specific MOV because most newborn babies received their BCG before their mothers were discharged home. BCG can still be received after 2 weeks of age unlike OPV<sub>0</sub> and Hepatitis B vaccine which are replaced by the OPV<sub>1</sub> and Pentavalent 1 vaccine at 6 weeks of age. Low MOV rate for BCG vaccine was a similar finding in Enugu<sup>12</sup> and Benin City.<sup>13</sup>

Presenting on the wrong immunisation day was the commonest reason for MOV in this study. Most vaccinations in F M C Umuahia and its satellite health centres were done once a week except for the pentavalent and oral polio vaccines that are given four times a week at the F M C Umuahia immunisation clinic. That could explain why the rate of MOV for the pentavalent series and the OPV were lower than measles and yellow fever in this study. When vaccines are not administered every day, eligible children who come in contact with the hospital both for curative or other purposes are denied the benefit of being vaccinated. Similarly, visit on a wrong immunisation day was one of the major reasons for MOV in some Nigerian centres.<sup>13, 15</sup> The other reasons for MOV in this study were; false contraindication by health workers (such as refusing vaccination for jaundiced babies and children that had Measles infection before nine months of age), vaccines not being available and inability to open a vial for a few number of babies.

The commonest remote reason why children missed their previous immunisation appointments in this study was due to non-availability of the mothers/caregivers as a result of mothers' illness, parent's travel and farm work. The other reasons noted were ignorance of immu-

nisation days, fear of side effects and industrial action by the health workers.

---

### Conclusion/Recommendation

The prevalence of MOV in FMC Umuahia (12%) is lower than most studies in Nigeria and other developing countries. The commonest reason why MOV occurred was because vaccines were not given every day and the children presented on the wrong immunisation days. Immunisation services should be rendered everyday both in the preventive and curative sections of hospitals for every eligible child. Regular training/ retraining of

health workers on immunisation practices is very necessary. The public should on the other hand be advised against missing their vaccination appointments for whatsoever reasons and appointment reminders should be sent across to the mothers via phone calls, home visits and internet/software where possible.

---

### Acknowledgement

My gratitude goes to Prof. Ngozi Ojinnaka, the Heads of Department and Consultants in the Departments of Paediatrics, FMC Umuahia and University of Port Harcourt Teaching Hospital respectively for their support to this work.

---

### References

1. WHO. Missed Opportunities for Vaccination (MOV) Strategy. [http://www.who.inrt/immunization/programmes\\_systems/policies\\_strategies/MOV/en](http://www.who.inrt/immunization/programmes_systems/policies_strategies/MOV/en) (accessed 1st March 2019).
2. Sato P. Protocol for the assessment of missed opportunities for immunisation. WHO/EPI/GEN/88-6. <http://www.who.int/iris/handle/10665/59970>. assessed 22<sup>nd</sup> October 2018.
3. Hutchins SS, Jansen HA, Robertson SE, Evans P, Kim-Farley RJ. Studies of missed opportunities for immunisation in developing and industrialized countries. *Bull World Health Organ* 1993; 71: 549-60.
4. World Health Organisation. Health topics, Immunisation. <http://www.who.int/topics/immunisation/en> (accessed 1st March 2019)
5. Nigeria Demographic and Health Survey. Abuja, Nigeria. Preliminary report. National Population Commission. *Federal Republic of Nigeria*. 2013: 158 – 73.
6. The United Nations Children's Fund, Nigeria: Expanding immunisation coverage. [www.unicef.org/immunisation/index\\_coverage.html](http://www.unicef.org/immunisation/index_coverage.html) (accessed 2nd Oct 2018).
7. World Health Organisation. Expanded programme on immunisation, Global Advisory Group (1983). *Wkly Epidem Rec* 1984; 59:85-89.
8. Pan American Health Organization. Methodology for the evaluation of Missed Opportunities for Vaccination. Washington, DC: PAHO, 2014.1.
9. Charan J, Biswas T. How to calculate sample size for different study designs in medical research. *Indian J. Psychol Med*. 2013; 35: 121 – 126.
10. World Health Organisation: Expanded Programme on Immunisation. Training for mid-level managers. Identify missed opportunities. Geneva, World Health Organization; 1991:69 (WHO/EPI/MLM/91.7.)
11. Okoro KJ, Ibekwe RC, Ibekwe MU, Ibe BC. Factors associated with Missed Immunization Opportunities in Abakaliki South-Eastern Nigeria. *West Afr J Med*. 2015 34: 15-9.
12. Tagbo BN, Onwuasigwe C. Missed immunisation opportunities among children in Enugu. *Nig J Paediatr* 2005; 32:73-76.
13. Onyiriuka AN. Vaccination default rates among children attending a static immunisation clinic in Benin City, Nigeria. A peer review. *J Med Res* 2005;4:71-77.
14. Anah MU, Etuk IS, Udo JJ. Opportunistic immunisation with in-patient programme: Eliminating a missed opportunity in Calabar, Nigeria. *Ann Afri Med* 2006; 5 :188-91.
15. Ubajaka FC, Ukegbu AU, Okafor NJ, Ejiofor O. The prevalence of missed opportunities for immunization among children utilizing immunization services in Nnamdi Azikiwe University Teaching Hospital, Nnewi. *J Biol Agric Health Care* 2012; 2 : 112-115.
16. Verma SK, Mourya HK, Yadav A, Mourya S, Dabi DR. Assessment of missed opportunities of immunization in children visiting health facility. *Int J Contemp Pediatr*. 2017 4:1748-1753.
17. Garib Z, Vargas AL, Trumbo SP Anthony K, Diaz-Ortega JL, Bravo-Alcantara Pet al. Missed Opportunities for Vaccination in the Dominican Republic: Results of an operational investigation. *Biomed Res Int*. 2016:4721836.
18. Sridhar S, Maleq N, Guillermet E, Colombini A, Gessner BD. A systematic literature review of Missed Opportunities for Immunization in low- and middle-income countries. *Vaccine*. 2014; 32: 6870-79.
19. World Health Organisation, African region: Nigeria launches penta vaccine. Nigeria 2012. (<http://www.afro.who.int/en/nigeria/press-materials/item/4735-nigeria-launches-penta-vaccine.html>) accessed July 2018.

20. Muhammed A, Nuhu A. New vaccines introduction in Nigeria: Catalyst for improving immunisation coverage and child survival. *J Pain Relief* 2015; 4:3.
21. Koumaré AK, Traore D, Haidara F, Sissoko F, Traoré I, Drame. *et al* Evaluation of immunization coverage within the Expanded Program on Immunisation in Kita Circle, Mali: a cross-sectional survey. *BMC Int Health Hum Rights*. 2009; 9(suppl 1):S13. (doi:10.1186/1472-689X9-S1-S13)
22. Borus PK. Missed Opportunities and inappropriately given vaccines reduce immunisation coverage in facilities that serve slum areas of Nairobi. *East Afr Med J* 2004; 81 : 124-129.
23. Sadoh AE, Eregie CO. Continuing barriers to optimum immunisation uptake in Nigerian children: the role of missed immunisation opportunities and inappropriately timed immunisation. *Nig J Paediatr* 2007; 34: 57-61.
24. Odotola A, Afolabi M O, Ogundare E O, Lowe-Jallow Y N, Worwui A, Okebe J, *et al*. Risk factors for delay in age-appropriate vaccinations among Gambian children *BMC Health Serv Res* 2015; 15 :346. (doi:10.1186/S12913-015-1015-9)