

# MISSED OPPORTUNITIES FOR IMMUNIZATION IN CHILDREN UNDER 2 YEARS ATTENDING AN URBAN TEACHING HOSPITAL

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## ABSTRACT

*A cross-sectional survey was done to assess the missed opportunity for immunization (MOI) in children under two years of age attending Medical Outpatient, Newborn Follow-up Service and Immunization Clinic of Institute of Child Health and to evaluate interventions. Baseline survey phase-I was done and two interventions: (i) education and awareness of immunization among health personnel; and (ii) attaching immunization slip to the outpatient form were done. After each intervention phase-II and phase-III surveys were carried out. The data from the different phases were analyzed for the effect of interventions.*

*The total number of children surveyed were 634; 423 from Medical Outpatients, 108 from Newborn Follow-up Service and 103 from Immunization Clinic. MOI was 35.5%, 23.1% and 9.7% in the above health facilities, respectively. After intervention I, the MOI was 24.5% and 12.2% in Medical Outpatient and Newborn Follow-up Service and none in Immunization Clinic. After intervention-II there was an improvement in immunization of 18.4%, 30.4% and 16.0% in the three health facilities mentioned above. MOI was avoided because the medical officers*

Under Universal Immunization Programme (UIP) evaluation, there are three main categories of reasons attributed for non-immunization/partial immunization, namely (i) lack of information, (ii) lack of motivation, and (iii) obstacles. "Missed Opportunity" for immunization (MOI) is defined as missing the benefit of getting immunization by the partially or non-immunized child, during a visit to a health facility for check-up/illness, when there is no absolute contraindication for that particular immunization as per the national policy(1). Missed opportunity for immunization occurs due to lack of motivation by the attending physician/health personnel. When partially immunized children attend a health care facility, they should be given immunization if eligible, otherwise full immunization coverage may not be possible. The objective of this study was to assess the missed opportunity for immunization in children under 2 years of age attending Outpatient Department of Institute of Child Health (ICH), Madras and to evaluate interventions

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*advised immunization in the above children. The difference in the MOI among Medical Outpatient and Immunization Clinic between baseline, phase-I and phase-II were significant ( $p < 0.001$ ). It is concluded that MOI can be brought down by creating awareness periodically and that attaching an immunization schedule to the outpatient forms is an effective method of reducing MOI.*

**Key words:** *Missed opportunity, Immunization.*

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in the form of education of health care personnel.

### Patients and Methods

A baseline cross sectional survey (Phase-I) was done to assess the missed opportunity among children under 2 years of age attending the following outpatient services of the ICH, Madras in November '91: (O) Medical Outpatient Department; (») Immunization Clinic; and (m) Newborn Follow-up Service.

The following definitions were used:

*A. Fully immunized:* A child who had completed the recommended EPI Immunization schedule of BCG, DPT and OPV (3 doses) and Measles vaccine before one year of age.

*B. Partially immunized:* A child who was not yet fully immunized. (i) Partially immunized but 'upto date': Child who had received all the immunization for which he/she was eligible by age criteria; and (ii) Partially immunized and 'not upto date': Child had not completed the doses of vaccine for his/her age as per schedule.

*C. Unimmunized:* A child who had not yet received any vaccine for the age, though eligible.

*Contraindications* in general, for all vaccinations were: (i) Severe febrile illness requiring hospital admission; and (ii) Previous untoward reaction to particular vaccine. The following were considered as specific contraindications: (i) *Measles vaccine:* under immunosuppressants for malignant conditions, recipients of gammaglobulins within past 6 weeks, and allergy to egg; and (ii) *Pertussis:* for children with convulsive disorders DT in place of DPT(2,3).

*Phase-I Baseline Survey:* After the child

had been attended to by the physicians at the health facility, mothers were administered a questionnaire at the exit, eliciting data on exact age of the child, immunization status and symptoms for which the child was brought to the hospital. These were recorded in a predefined data card. The attending physicians were not revealed the actual purpose of survey. The diagnosis was noted from the outpatient card. The age was arrived at for the completed months. If mother was having birth record or delivery notes, the date of birth was confirmed. Whenever possible, immunization status was documented from the immunization card. Parents were advised immunization at the same visit if they had missed the opportunity.

*Intervention I:* After the base line survey, intervention I, was carried out in November 1991, education and awareness creation of the clinicians—Medical Officers, Postgraduates and House Officers. They were given a two hour session education in the form of lecture and demonstration, explained about the MOI, definitions used, relative and absolute contraindications and the need for immunization advice. They were advised to immunize all the targeted population except for absolute contraindication. Another survey, Phase II, was carried out in January 1992 to evaluate the effect of the above intervention.

*Intervention II:* Following this, intervention II was administered in May '92. In order to make the clinicians fully aware, a printed immunization data slip, as per national immunization schedule was pinned to the Out Patient card for the targeted population before they visited the clinicians. The clinicians were requested to fill up this immunization slip so that eligible children can be advised about immunization. Another

survey, as MOI phase-III, was done in June 1992. The data for 3 different phases were analyzed for the effect of interventions.

Results

In phase I (baseline survey), 634 children were surveyed—from medical outpatient 423, newborn outpatient 108, and

immunization clinic 103. The proportions of children who were fully immunized, partially immunized upto date and those who missed the opportunity for immunization (MOI) in above health facilities are shown in *Table I-III*. Missed opportunity was 35.5%, 23.1% and 9.7% in these health facilities, respectively. After intervention I,

TABLE I—Missed Opportunity for Immunization: General Outpatient Clinic

	Phase-I n (%)	After intervention I Phase-II n (%)	After intervention II Phase-III n (%)	'p' value
a	423	302	288	
b <sub>1</sub>	183 (43.4)	119 (39.4)	112 (38.9)	
b <sub>2</sub>	81 (19.1)	81 (26.8)	57 (19.8)	
b <sub>3</sub>	9 (2.1)	22 (7.3)	13 (4.5)	
b (b <sub>1</sub> +b <sub>2</sub> +b <sub>3</sub> )	273* (64.5)	222*# (73.5)	182# (63.2)	*0.003 #0.58
c (a-b)	150 (35.5)	80 (26.5)	106 (36.8)	
f <sub>1</sub>		6 (2.0)	53 (18.4)	
f <sub>2</sub>		-	-	
f (f <sub>1</sub> + f <sub>2</sub> )		6 (2.0)	53 (18.4)	
d (c-f)	150* (35.5)	74*# (24.5)	53# (18.4)	

- \* : for significant difference 'p' value
- # : for significant difference 'p' value
- a : total number of children
- b<sub>1</sub> : fully immunized
- b<sub>2</sub> : partially immunized upto date
- b<sub>3</sub> : contraindication
- c : partially immunized not upto date eligible for immunization
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- f<sub>2</sub> : advised by MO not immunized
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b <sub>2</sub>	81 (19.1)	81 (26.8)	57 (19.8)	
b <sub>3</sub>	9 (2.1)	22 (7.3)	13 (4.5)	
b (b <sub>1</sub> +b <sub>2</sub> +b <sub>3</sub> )	273* (64.5)	222*# (73.5)	182# (63.2)	*0.003 #0.58
c (a-b)	150 (35.5)	80 (26.5)	106 (36.8)	
f <sub>1</sub>		6 (2.0)	53 (18.4)	
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TABLE II—Missed Opportunity for Immunization: Newborn Follow-up Service

	Phase-I n (%)	After intervention I Phase-II n (%)	After intervention II Phase-III n (%)	'p' value
a	108	98	112	
b <sub>1</sub>	6 (5.6)	7 (7.1)	5 (4.5)	
b <sub>2</sub>	52 (48.1)	50 (51.0)	57 (50.9)	
b <sub>3</sub>	25 (23.1)	4 (4.1)	4 (3.6)	
b (b <sub>1</sub> +b <sub>2</sub> +b <sub>3</sub> )	83* (76.8)	61*# (62.2)	66# (58.9)	*p=0.36 #p=0.59
c (a-b)	25 (23.1)	37 (37.8)	46 (41.1)	
f <sub>1</sub>		24 (24.5)	34 (30.4)	
f <sub>2</sub>		1 (1.0)	3 (2.7)	
f (f <sub>1</sub> + f <sub>2</sub> )		25 (25.5)	37 (33.1)	
d (c-f)	25* (23.1)	12*# (12.2)	9# (8.0)	

\* : for significant difference 'p' value

# : for significant difference 'p' value

a : total number of children

b<sub>1</sub> : fully immunized

b<sub>2</sub> : partially immunized upto date

b<sub>3</sub> : contraindication

c : partially immunized not upto date eligible for immunization

f<sub>1</sub> : advised by MO and immunized

f<sub>2</sub> : advised by MO not immunized

d : missed opportunity

Phase II survey revealed that 26.5%, 31.8% and 8.7% were eligible for immunization, in Medical Outpatients Department, Newborn Follow-up Service and Immunization Clinic, respectively and 2%, 24.5% and 8.7% of children were advised immuniza-

tion by clinicians. The MOI was 24.5% and 12.2% in Medical Outpatient and Newborn Follow-up service, respectively. None had missed the opportunity in the immunization clinic.

In phase III survey, after intervention II,

**TABLE III-Missed Opportunity for Immunization: Immunization Cell**

	Phase-I n (%)	After intervention I Phase-II n(%)	After intervention II Phase-III n (%)	'p' value
a	103	104	100	
B <sub>1</sub>	11 (10.7)	44 (42.3)	49 (49.0)	
b <sub>2</sub>	37 (35.9)	50 (48.1)	35 (35.0)	
B <sub>3</sub>	-	1 (0.9)	-	
b (b <sub>1</sub> +b <sub>2</sub> +b <sub>3</sub> )	48* (46.6)	95* (91.3)	84* (84.0)	*0.001
c (a-b)	55 (53.4)	9 (8.7)	16 (16.0)	
F <sub>1</sub>	458 (43.7)	9 (8.7)	16 (16.0)	
f <sub>2</sub>		-	-	
f (f <sub>1</sub> + f <sub>2</sub> )	45@ (43.7)	9 (8.7)	16 (16.0)	
d (c-f)	10* (9.7)	-	-	

\* : for significant difference 'p' value

a : total number of children

b<sub>1</sub> : fully immunized

b<sub>2</sub> : partially immunized upto date

b<sub>3</sub> : contraindication

c : partially immunized not upto date eligible for immunization

f<sub>1</sub> : advised by MO and immunized

f<sub>2</sub> : advised by MO not immunized

d : missed opportunity

@: those who came for immunization by themselves

the advice for immunization by physicians improved to 18.4%, 30.4% and 16.0%, respectively. The MOI was 18.4% and 8.0% in Medical OPD and Newborn Follow-up Service and none in immunization clinic. There was an improvement of 16.4%, 5.9% and 7.3% in phase III over phase-II. MOI

decreased by 4 to 6% from phase-II to phase-III.

In the General OPD, the MOI between phase-I and phase-II had significantly reduced after intervention-I (p=0.003). Intervention-II has not shown statistically

significant difference over intervention-I ( $p=0.58$ ). In Newborn Follow-up service, there was no statistically significant difference in MOI between phase I and II ( $p=0.36$ ) and between II and III ( $p=0.59$ ). In Immunization Clinic, there was a statistically significant difference in MOI between phases I and II ( $p=0.001$ ). The difference in MOI among medical outpatient and immunization clinic between baseline, phase-I and phase-II were significant ( $p < 0.001$ ). There was an improvement in the proportion of children who had immunization after intervention II by 16.4%, 5.9% and 7.3% in above mentioned health facilities, respectively.

### Discussion

Surveys of missed opportunity for immunization have been performed in developing countries. All these were conducted at different health facility sites. Differences exist in definition of MOI, type of health facility, study population, immunization considered, analysis of causes and use of survey results for recommendations and follow-up. The present study used standard definitions recommended by the WHO. The age group was confined to less than 2 years. The MOI varies from 0%-90% in earlier reports(4-7). In the present study, it ranged from 0%-35.5% depending on health facility studied and before or after intervention. Among the three different health facilities—General OPD, Newborn Follow-up Service and Immunization Clinic surveyed, we found the MOI was minimum at the Immunization Clinic before intervention and nil after I and II intervention.

The common cause for non-immunization in other studies was reluctance on the part of the IIV/care taker to immunize the sick child(8,9). In Sudan, two interventions

were done in 1989; (i) moving the immunization site close to the curative services so that children could be screened and immunized after leaving the consulting room; and (ii) instructing curative workers to refer all children to the immunization site for screening and if needed immunization, but the difference in impact between the two interventions was not statistically significant(10). McConnochie did a review of records in Rochester, New York and found that even though two third of missed opportunities occurred during an acute illness, one third occurred at visit where no acute problem was identified(11). In Tanzania's record and within Los Angeles, by 7 months of age only one third of infants had received 3 doses of DPT(12). In the survey done at Comores in five health centres, the MOI ranged from 39-95% but the number interviewed was small(13). Immunization survey done in Turkey in 1988, MOI was 60% in children under one year of age(14). In a study conducted at Lucknow, India, involving 3 large urban hospitals and primary health centres of Lucknow District, MOI was 57.1% and the true contraindication was 3%(15). In the present study, the initial MOI was assessed and due to effective intervention programme it declined significantly in Medical OPD and Immunization Clinic, whereas marginal decrease of MOI was observed in the Newborn Follow up Service.

It is concluded that MOI can be brought down by creating awareness periodically once in 2 or 3 months for immunization among health personnel in the hospitals. We find attaching immunization data details to the out-patient forms of the health facility is an effective method to reduce MOI.

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