

## Research Article

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## Mass Vaccination against Measles among Private Schools Population of Dubai 2015-2016, Coverage, Refusal and Response Rates

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### Abstract

**Background:** The World Health Organization estimates that 2.5 million children younger than 5 years die from vaccine-preventable diseases each year. Immunization is the most effective tool for combating and eliminating infectious diseases.

**Objectives:** The study aims to identify the coverage rates of students, and refusal and non-response of parents during the measles mass vaccination campaign 2015-2016. It aims also to understand the current situation and the factors influencing voluntary vaccination coverage among 5-18 years old children at private schools of Dubai, and parents' attitudes toward voluntary vaccination activities.

**Methodology:** The Primary Health care service at Dubai Health Authority developed guidelines for the measles vaccination campaign in Dubai as a part of the national campaign all over UAE Emirates and the global efforts to reduce measles morbidity and mortality using Supplementary Immunization Activity (SIA) Strategy. These included information on the target population, the general campaign strategy, approaches to vaccine distribution and delivery, the location of temporary vaccination sites, the supervision of campaign implementation, and the reporting and treatment of adverse events following immunization (AEFI). A total of 266343 students at private schools in Dubai were identified as target population for the phase one. The target group was the students in the age group of 5-18 years. Medical staff were trained to take part in the vaccination activities in 175 schools in Dubai. School teams (90) and Dubai health authority mobile teams (25). Healthcare professionals were identified and trained to conduct on-site supervision of the campaign. All parents of students were approached with health educational materials and consent form. Meetings with parents were held in order to understand the non-response circumstances. Campaign vaccination activities and reports were reviewed.

**Results:** The study revealed that about 61.8% of the total students population were vaccinated at schools, 3.36 were vaccinated at other primary health care facilities, 11.3% were refused vaccination due to previously receiving two doses of the vaccine, 3.45% were refused due to other causes, 0.42% were shown contraindications and about 19.58% were not responding to consent form. The study showed that about 12.7% of the vaccinated were below 5 years old and 87.3% were above 5 years old. The study reflected that about 78.6% of the total below 5 years students' population and about 76.2 of the total above 5 years student's population were covered. Current study showed that about 49.9% of those who were vaccinated inside schools were males and 50.1 % were females. As per nationality, the study showed that about 11.5% of total population vaccinated at schools were UAE nationals and 88.5% were expatriate.

**Conclusion:** The campaign has achieved good percentage of coverage. Comprehensive mobilization, and support from government departments were critical to the success of the campaign. However, those parents who did not respond were a lot, which raise issue of communication in need to be further investigated. There is a need to improving communication with parents through different available approaches in order to better understanding of the phenomena of not responding and improving the environment for future cooperation.

**Keywords:** Mass Vaccination, Measles, Dubai Private Schools, Coverage

**Conflict of interest:** The authors declare that they do not have any conflict of interest.

## Introduction

Measles is a highly contagious vaccine-preventable respiratory disease caused by the measles virus. It is still a common and fatal disease, and a leading cause of death in children in many developing countries.<sup>1</sup> More than 95% of measles deaths have been shown to occur in countries with low per capita incomes and weak health infrastructure. In 2014, there were 114 900 measles deaths globally – about 314 deaths every day or 13 deaths every hour.<sup>2</sup>

As immunization is known to be the most effective tool for combating and eliminating infectious diseases,<sup>3</sup> measles vaccination resulted in a 79% drop in measles deaths between 2000 and 2014 worldwide. During 2000-2014, measles vaccination prevented an estimated 17.1 million deaths making measles vaccine one of the best buys in public health.<sup>2</sup>

Twenty-four of the 37 countries and areas in the World Health Organization (WHO) Western Pacific Region have either achieved or nearly achieved the measles elimination goal. Nonetheless, 131 441 confirmed measles cases were reported from China in 2008.<sup>4</sup> Other advanced countries besides Japan provide many vaccines free of charge. For example, compared with the 8 different diseases targeted by the routine vaccines in Japan, 15 and 12 different diseases are targeted by the highly recommended vaccines-which are available to patient at no cost- in the United States and Germany, respectively. In addition, in such countries, to raise the vaccination rate and to ease the burden for those who receive the vaccination, simultaneous administration and use of combination vaccines such as MMRV (measles-mumps-rubella-varicella), DTP-HBV-IPV (inactivated poliovirus vaccine) pentavalent or DTP-Hib-HBV-IPV hexavalent vaccine are also recommended. In some countries, a child is denied admission to school if she or he is not vaccinated or if the vaccination is not conducted systematically.<sup>5-7</sup>

## Objectives

The study aims to identify the coverage rates of students, and refusal and non-response of parents during the measles mass vaccination campaign 2015-2016. It aims also to understand the current situation and the factors influencing voluntary vaccination coverage among 5-18 years old children at private schools of Dubai, and parents' attitudes toward voluntary vaccination activities.

## Methodology

The Primary Health care service at Dubai Health Authority developed guidelines for the measles vaccination campaign in Dubai as a part of the national campaign all over UAE Emirates and the global efforts to reduce measles morbidity and mortality using Supplementary Immunization Activity (SIA) Strategy. These included information on the target population, the general campaign strategy, approaches to vaccine distribution and delivery, the location of temporary vaccination sites, the supervision of campaign implementation, and the reporting and treatment of adverse events following immunization (AEFI). A total of 266343 students at private schools in Dubai were identified as target population for the phase one. The target group was the students in the age group of 5-18 years. Medical staff were trained to take part in the vaccination activities in 175 schools in Dubai. School teams (90) and Dubai health authority mobile teams (25). Healthcare professionals were identified and trained to conduct on-site supervision of the campaign. All parents of students were approached with health educational materials and consent form.

It was noticed during the implementation of the campaign that non-response rate was very high. It reached more than 50% in some schools. A meeting with parents was held in order to discuss this issue and understand the non-response circumstances. The meeting was attended by Parents of the school students, School health staff, School administration and DHA staff.

Campaign vaccination activities and reports were quantitatively reviewed. Non-response data were quantitatively and qualitatively analysed.

## Results

The study revealed that about about 61.8% of the total students population were vaccinated at schools, 3.36% were vaccinated outside schools (at other primary health care facilities), 11.3% were refused vaccination due to previously received two doses, 3.45% were refused due to other causes, 0.42% were shown contraindications and about 19.58% were not responding to consent form as shown by table No (Table 1).

Category	Total	
	No.	%
Vaccinated in school	164613	61.8
Vaccinated outside school	8949	3.36
Refusal 2 doses	30328	11.39
Refusal due to other causes	9190	3.45
Contraindication	1108	0.42
No response	52155	19.58
<b>Total</b>	<b>266343</b>	<b>100</b>

**Table 1:** Distribution of the school students according to their vaccination status in the campaign

The study showed that about 12.7% of those who were vaccinated were below 5 years old and 87.3% were above 5 years old (Table 2).

According to age	< 5		5+		Total
	No.	%	No.	%	
Vaccinated in school	20874	12.7	143739	87.3	164613
Vaccinated outside school	2410	26.9	6539	73.1	8949
Refusal 2 doses	4766	15.7	25562	84.3	30328
Refusal due to other causes	2182	23.7	7008	76.3	9190
Contraindication	171	15.4	937	84.6	1108
No response	5296	10.2	46859	89.8	52155
<b>Total</b>	<b>35699</b>	<b>13.4</b>	<b>230644</b>	<b>86.6</b>	<b>266343</b>

**Table 2:** Distribution of the school students according to age and status

The study reflected that about 78.6% of the total student population below 5 years were covered by vaccination campaign and about 76.2 of the total students population above 5 years old were covered with vaccination by the campaigns as shown by table (3).

Coverage according to age			
	No.	%	Total
< 5	28050	78.6	35699
5+	175840	76.2	230644

**Table 3:** Coverage according to age

Current study showed that about 49.9% of those who were vaccinated inside school were males, and 50.1 % were females, while about 56.7% of non-responding were males and 43.3% of non-responding were females (Table 4)

**Table 4:** Distribution of the school students according to gender and status

According to gender	M		F		Total
	No.	%	No.	%	
Vaccinated in school	82126	49.9	82487	50.1	164613
Vaccinated outside school	4427	49.5	4522	50.5	8949
Refusal 2 doses	15483	51.1	14845	48.9	30328
Refusal due to other causes	4768	51.9	4422	48.1	9190
Contraindication	575	51.9	533	48.1	1108
No response	29567	56.7	22588	43.3	52155
<b>Total</b>	<b>136946</b>	<b>51.4</b>	<b>129397</b>	<b>48.6</b>	<b>266343</b>

Table number 5 revealed that 74.5% of the total vaccinated population were males and 78.7% were females.

**Table 5:** Coverage according to gender

Coverage according to gender			
	No.	%	Total
<b>M</b>	<b>102036</b>	<b>74.5</b>	<b>136946</b>
<b>F</b>	<b>101854</b>	<b>78.7</b>	<b>129397</b>

As per nationality, the study showed that about 11.5% of total vaccinated population at schools were UAE nationals, and 87.5% were expatriate, while 12.5% of the total non-responding were UAE nationals and 88.7% were Expatriate (Table 6)

**Table 6:** Distributions of School students according to the nationality

According to nationality	UAE		Expatriates		Total
	No.	%	No.	%	
<b>Vaccinated in school</b>	<b>18926</b>	<b>11.5</b>	<b>145687</b>	<b>88.5</b>	<b>164613</b>
<b>Vaccinated outside school</b>	<b>2202</b>	<b>24.6</b>	<b>6747</b>	<b>75.4</b>	<b>8949</b>
<b>Refusal 2 doses</b>	<b>941</b>	<b>3.1</b>	<b>29387</b>	<b>96.9</b>	<b>30328</b>
<b>Refusal due to other causes</b>	<b>1298</b>	<b>14.1</b>	<b>7892</b>	<b>85.9</b>	<b>9190</b>
<b>Contraindication</b>	<b>155</b>	<b>13.9</b>	<b>953</b>	<b>86.1</b>	<b>1108</b>
<b>No response</b>	<b>6507</b>	<b>12.5</b>	<b>45648</b>	<b>87.5</b>	<b>52155</b>
<b>Total</b>	<b>30029</b>	<b>11.3</b>	<b>236314</b>	<b>88.7</b>	<b>266343</b>

Table 7 shows that 73.5% of the total UAE students and 76.9% of the total expatriate students were covered by MMR vaccine during this campaign.

**Table 7:** Coverage according to nationality

Coverage according to nationality			
	No.	%	Total
<b>UAE</b>	<b>22069</b>	<b>73.5</b>	<b>30029</b>
<b>Expatriates</b>	<b>181821</b>	<b>76.9</b>	<b>236314</b>

Regarding non-response issue, a meeting was held with parents. a brief description of the background of the campaign and its significance was given. Concentration was on the need to know the opinion of those parents who did not respond, and to know if they agree or refuse. Their attitude was negative because of using the word “mandatory” in the consent form.

Meeting focus was also on the level of protection that lead to disease prevention in the community. Non-response statistics showed that 912 (44.13%) of parents in one school for example did not respond. Parents argued that two doses are enough for protection.

## Discussion

The national campaign announced in response to increase in measles cases and used the mass vaccination activities. National MMR vaccination program in England used catch up strategy in response to increase in measles cases.

Current study showed that coverage rate of MMR vaccination during the national campaign of 2015-2016 at private schools in Dubai was 76.15% of total students' population. This result is comparable with another study in England, which estimated that vaccine coverage (one dose of measles-containing vaccine) at baseline was higher than routinely reported, close to 95%; mid-

point coverage reached an estimated 95.3%. It is possible that actual coverage among children aged ten to 16 years is higher than we have estimated. Eleven per cent of the target population (previously unvaccinated children aged ten to 16 years) were reached by the catch-up campaign at mid-point. Work is under way to identify factors associated with non-vaccination, and to compare the success rate of the different strategies used during the campaign.

Estimated coverage in London was 88% at mid-point, significantly lower than in the rest of England.<sup>8-11</sup>

As for non-response issue, the current study showed that about 23.85% of the parents of the total target population did not respond to national immunization campaign at private schools in Dubai. This was similar to another British study which showed that the reasons behind non-response were many, for example, the notion that, over MMR, parents are confronted with comparable risks (of autism or measles) is itself part of the problem. There is in fact no genuine equivalence of risks, and the presentation of the issue in a formally 'balanced' way in the media has contributed to unwarranted parental anxieties. If there is a risk of autism from MMR, it is so small that it cannot be quantified. In the 1998 Lancet paper that launched the controversy, Dr Andrew Wakefield and colleagues at the Royal Free Hospital in London claimed to have identified, According to a survey carried out at the height of the MMR controversy in early 2002, 53% of those interviewed believed that, because both sides of the debate received equal media coverage, there must be equal evidence for each. Though almost all scientific experts reject the claim of a link between MMR and autism, Parents who are not giving their children MMR, are responsible for adding increases the risk of measles to their children and to other children.<sup>12-21</sup>

Investigation of other causes of non-response showed that the word "mandatory" that was used in the consent form resulted in a lot of non-response. Parents did not respond after that to all communications regarding measles campaign. However, school health team & school staff did not vaccinate any student without consent.

Some parents refused vaccination because their children had been received two doses of MMR. It is explained that two doses will not give a full level of protection; the protection will reach only up to 97%.

The issue of single vaccine (measles only) was raised. The parents wondered why not the health authorities did not use the single vaccine instead of MMR injection? It is explained, however, that the available vaccine in UAE is only MMR.

## Conclusion

The campaign has achieved good percentage of coverage. Comprehensive mobilization, and support from government departments were critical to the success of the campaign. However, those parents who did not respond were a lot, which raise issue of communication in need to be further investigated. There is a need to improving communication with parents through

different available approaches in order to better understanding of the phenomena of not responding and improving the environment for future cooperation.

## References

1. World Health Organization Regional Office for the Western Pacific. Field guidelines for measles elimination. Geneva: WHO; 2004, p. 46-9.
2. World Health Organization Media Centre. Measles. Factsheet 286. Geneva: WHO; 2010, Available at: <http://www.who.int/mediacentre/factsheets/fs286/en/index.html> (accessed 16 March 2016).
3. World Health Organization. Health topics: immunization. <http://www.who.int/topics/immunization/en/>. Accessed April 10, 2013
4. World Health Organization. Progress towards the 2012 measles elimination goal in WHO's Western Pacific Region, 1990-2008. *Wkly Epidemiol Rec*, 84 (2009), pp. 271-279
5. Centers for Disease Control and Prevention (CDC). Recommended immunization schedule for persons aged 0 through 18 years: United States, 2012. *MMWR Morb Mortal Wkly Rep*. 2012;61(5):1-4.
6. European Centre for Disease Prevention and Control (ECDC). Vaccination schedules. <http://ecdc.europa.eu/en/activities/surveillance/euvac/schedules/Pages/schedules.aspx>. Accessed April 10, 2013.
7. Centers for Disease Control and Prevention (CDC). General recommendations on immunization: recommendations of the Advisory Committee on Immunization Practices (ACIP). *MMWR Recomm Rep*. 2011;60(2):1-64.
8. Public Health England. Published 25th April 2013. Available on: <https://www.gov.uk/government/news/national-mmr-vaccination-catch-up-programme-announced-in-response-to-increase-in-measles-cases> (accessed: 25 September 2013)
9. Chief Medical Officer. MMR catch-up programme CEM/CMO/2008/12. London: Department of Health, 2008. Available on <http://www.hpa.org.uk/hpr/archives/2008/news3208.htm#mmr> (accessed: 13 November 2013)
10. MMR ready reckoner background document. Published 23rd April 2013; Updated 25th April 2013. Available on <https://www.gov.uk/government/publications/calculating-mmr-coverage-ready-reckoner-tool-2013> (accessed: 25 September 2013)
11. Series: MMR catch-up programme 2013. Public Health England. Published 11 June 2013 Available on <https://www.gov.uk/government/organisations/public-health-england/series/mmrcatch-up-programme-2013> (accessed: 26 September 2013)
12. Fitzpatrick M. MMR: risk, choice, chance. *Br Med Bull* (2004) 69 (1): 143-153. doi: 10.1093/bmb/ldh002.
13. Fitzpatrick M. MMR and Autism: What Parents Need to Know. London: Routledge, 2004

14. Taylor B, Miller E, Farrington CP, Petropoulos M-C, Favot-Mayaud I, Li J, Waight PA. Autism and MMR vaccine: no epidemiological evidence for a causal association. *Lancet* 1999; 353: 2026–9
15. Farrington CP, Miller E, Taylor B. MMR and autism: further evidence against a causal association. *Vaccine* 2001; 19: 3632–5
16. Taylor B, Miller E, Lingam R, Andrews N, Simmons A, Stowe J. MMR vaccination and bowel problems or developmental regression in children with autism: population study. *BMJ* 2002; 324: 393–6
17. Dales L, Hammer S, Smith N. Time trends in autism and in MMR immunization coverage in California. *JAMA* 2001; 285: 1183–5
18. Kaye JA, del Mar Melero-Montes M, Jick H. MMR vaccine and the incidence of autism recorded by GPs: a time-trend analysis. *BMJ* 2001; 322: 460–3
19. Peltola H, Patja A, Leinikki P, Valle M, Davidkin I, Paunio M. No evidence for MMR vaccine-associated inflammatory bowel disease or autism in a 14-year prospective study. *Lancet* 1998; 351: 1327–8
20. Patja A, Davidkin I, Kurki T, Kallio MJT, Valle MHP. Serious adverse events after MMR vaccination during a 14-year prospective follow-up. *Pediatr Infect Dis J* 2000; 19: 1127–34
21. Madsen KM, Hvidt A, Vestergaard M, Schendel D, Wohlfart J, Thorsen P, Olsen J, Melbye M. A population-based study of MMR vaccine and autism. *N Engl J Med* 2002; 347: 1477–82.