

## ORIGINAL ARTICLE

**Reasons of Measles-Rubella (MR) Vaccine Hesitancy Amongst the Parents of Primary and Secondary School Children: A Cross Sectional Study**

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**Abstract:**

**Background:** Vaccination is the cheapest and most successful public health intervention saving millions of lives and money every year. The vaccination acts like a double-edged sword it directly protects the vaccinated one and indirectly increases herd immunity. But these vaccines are victims of their own success. To lessen the burden of congenital Rubella Syndrome Government of India had planned to eliminate measles and congenital rubella syndrome by 2020. Even though vaccination saves millions of lives, there is increasing vaccine hesitancy which has become a matter of concern. **Aim and Objective:** To determine the proportion of children not vaccinated with MR and to know the various reasons of vaccine hesitancy among the parents of these children. **Material and Methods:** The present cross-sectional study was conducted among parents of primary and secondary school children (less than 15 years of age) from government schools, private Marathi schools, private English and semi-English schools in Latur city. A total of 9300 school children were screened for vaccination with MR. Either of the parents of 247 children who were not vaccinated for MR were interviewed for reasons of not vaccinating the child. **Results:** Out of 9300 school children screened, 247(2.66%) were not vaccinated with MR vaccine out of which 126 (51.01%) were from Marathi school and most were boys (79.35%). One hundred thirty-two children (53.44%) were from class IV and V socioeconomic status and 69.23% were from nuclear families. Various reasons were mentioned by the parents for not vaccinating the children. 132 (53.44%) parents said that it may affect the fertility of the child, 48.18% were worried about the safety of newly launched vaccine, 44.94% avoided it purposefully with no reason while 52.63% did not give it due to minor illness of the child, commonest being the respiratory infection. **Conclusion:** Rumours about effect on fertility, minor illnesses and safety about newly introduced

vaccine, side effects of the vaccines, and parents' perceptions on natural immunity better than vaccine acquired were some of the leading reasons of vaccine hesitancy.

**Keywords:** Vaccine hesitancy, School children, MR Vaccine, Parents.

**Introduction:**

Vaccination is the cheapest and most successful public health intervention saving millions of lives and money every year [1,2]. Several vaccine preventable diseases like small pox, polio and tetanus has been eliminated from India with effective vaccination [3]. Near about 2.7 million children every year get infected by measles along with high prevalence of rubella in India. Measles is a viral disease leading to complication like pneumonia and diarrhoea which can also lead to sub acute sclerosing panencephalitis (SSPE) [3]. Around 40,000 children every year are born with defects caused by congenital rubella syndrome. India accounts for 37% of all measles death in the world [4].

Rubella is caused by rubella virus leading to cardiovascular abnormalities and cataract in infants called as congenital rubella syndrome (CRS). It also affects many cell types like epithelial cells of lungs, kidney and ciliary body of eye [5].

To lessen this burden, Government of India had planned to eliminate measles and congenital rubella syndrome by 2020 [3]. To achieve this target MR vaccination campaign was launched to vaccinate approximately 41 crore children all over india and about 3.37 crore in Maharashtra [4]. The campaign started in Maharashtra in November 2018.

Even though vaccination saves millions of lives every year, there is increasing vaccine hesitancy which has become a matter of concern [6,7,8]. According to WHO, Strategic Advisory Group of Experts on Immunization (SAGE), vaccine hesitancy is defined as, “delay in acceptance or refusal of vaccination despite availability of vaccination services. Vaccine hesitancy is a complex and context specific, varying across time, place and vaccines which is influenced by many factors, convenience and confidence” [9].

The vaccination acts like a double-edged sword; it directly protects the vaccinated one and indirectly increases herd immunity [10]. But these vaccines are victims of their own success. According to the Economist “benefits of vaccines are not as visible as its risks” [11]. Vaccine hesitancy is not a new concept, it is prevalent from 18th century, as people questioned the Jenner’s treating small pox [12,13].

The present ongoing MR campaign in south India is affected by the antivaccine messages on various social media platforms and news [14]. One of the retired government doctor from Punjab was arrested for spreading rumours and creating panic among the community claiming that the kids will turn impotent if vaccinated with MR vaccine [15]. Due to this, parents boycotted the MR drive in Patiala of Punjab [16]. One more rumour on widely used social media platform Whats App, hampered the MR drive in Tamil Nadu and Karnataka falsely claiming that the vaccine is intended to make minority children impotent [17]. Apart from this, many other reasons are there for not vaccinating a child, like fear of side effects, pain during vaccination, illness, [18,19] risks against benefits of vaccine. Some think natural immunity is better than vaccine acquired immunity [20,21]. The lack of information or the misinformation also contributes to vaccine hesitancy. Very few studies are done on vaccine hesitancy in our country, it is necessary to know the reasons for not vaccinating the children with MR vaccine. With this background the present study was planned to determine the proportion of school children who were not vaccinated during MR vaccination campaign and to know the various

reasons of vaccine hesitancy among the parents these children.

#### **Material and Methods:**

Study design: Cross sectional study.

Study setting: All primary and secondary schools of the Latur city

Study population: Parents of the primary and secondary school children less than 15 years of age.

Study duration: 2 months

Sample Size: 9300 school children

Sixteen percent of the primary and secondary school children in Latur district did not receive Measles-Rubella vaccine in the vaccination campaign conducted between November 2018 to mid - January 2019. The data was obtained after personal communication with district immunization officer. Considering  $p$  as 16%,  $q$  as 84% and relative error ( $L$ ) 10% of  $p$ , minimum sample size was 2017 school children with formula  $Z^2pq/L^2$  where  $Z = 1.96$ . But in the middle of the study we came to know that another round was planned to cover the unvaccinated children. So we decided to screen maximum children during study period ending with a sample of 9300 school children.

The schools were categorized as government schools, private Marathi schools, private English and semi-English schools (stratification). There were five Zilla Parishad schools, 10 private English schools, 30 private Marathi schools and 11 private semi-English schools in the city with 1989, 5512, 39712 and 6329 students admitted. The school children from each category were included proportionately.

Inclusion criteria: Parents of school children who had not received MR vaccine during the campaign. Parents who were willing to participate.

Exclusion criteria: Parents not willing to participate.

The present cross-sectional study was conducted among the primary and secondary school children of the city with due permission from the education department and school authorities. All the schools in the city which underwent the MR vaccination campaign were enrolled in the study. A list of all the schools was obtained from the education department of Zilla Parishad. Either of the parents of the children not

receiving vaccine were enrolled in the study to know the reasons of vaccine hesitancy. Those who were not willing to participate were excluded from the study.

**Data Collection instrument:** A predesigned and pretested questionnaire in local language was used for collection of data from the parents. The questionnaire had two parts; first about the sociodemographic data of the student and the respondent parent and the second part had questions related to reasons of vaccine hesitancy. The questionnaire was prepared in English and was translated in local language by a language expert. The questionnaire in local language was back translated in English by another expert.

**Data collection:** The selected schools were contacted for the list of children who had not received the vaccine. The questionnaire was given to the children and they were asked to handover it over to their parents. The parents were asked to fill the questionnaire and send it back to the school authorities or the class teachers within 3 to 4 days. The consent form was attached to the questionnaire. The filled questionnaire was collected from the school by the investigator personally. The parents and school authorities were assured regarding the confidentiality of the data and that it will be used solely for research purpose. Data was entered in Microsoft Excel and was analysed by Epi Info software version 7.2.2.6. Data analysis was done with the help of percentages, chi square test.

### Results:

A total of 9300 school students were enrolled in the study and screened for vaccination with MR vaccine. As there were highest number of private Marathi schools, maximum 6600 students were enrolled in the study. The prevalence of children who were not vaccinated was highest amongst Zilla parishad school i.e., 6.25% followed by private English and semi-English school i.e., 4.55% and 3.83% respectively. The overall percentage of unvaccinated children was 2.66%. (Table 1) Most of the children belonged to age group 11 to 13 years i.e., 117 (47.36) followed by 60 (24.3%) of 14 to 15 years of age and 36 (14.57%) of 10 years. Out of 247 unvaccinated children, maximum

196 (79.35%) were males while 20.65% were females. Out of 247 children who were not vaccinated, maximum 126 (51.01%) were from private Marathi school followed by 50 (20.25%) and 46 (18.62%) were from private English and semi-English school respectively. Twenty-five (10.12%) were from Zilla Parishad (Government) Marathi School.

Table 2 shows the sociodemographic profile of the students and their parents. Most of the parents i.e., 76 (30.77%) were educated up to secondary standard, 56 (22.67%) were graduates and 17 (6.88%) were illiterate. Eighty-two (33.2%) parents were in service. 63 (25.5%) were businessmen and 58 (23.48%) were agricultural workers. As per B. G. Prosad's classification, most of the parents 132 (53.44%) belonged to socioeconomic class IV and V. Only 21 (8.5%) were from Class I socioeconomic status. Out of 247 children, 138 (55.87%) were Hindus and 109 (44.13%) were of Muslims. 171 (69.23%) children were from nuclear family.

Table 3 shows various reasons for not vaccinating the children. The reasons were categorized in five different categories as reasons related to health of child, concern about adverse effects of vaccine, negligence or inadequate knowledge about vaccine, poor response from school authorities and other reasons. There was multiple response from the parents regarding reasons for not vaccinating the child with MR vaccine.

**I. Health of the child:** Parents mentioned various reasons for not vaccinating their child with MR vaccine. Out of 247 children's parents, 132 (53.44%) said that the vaccine may affect fertility of the child, 130 (52.53%) didn't vaccinate the children due to minor illness while 123 (49.8%) thought that the child may suffer from autism. One hundred twenty (48.58%) parents didn't vaccinate the child because their child fell sick due to some other vaccine in past. **II. Concern about adverse effects of the vaccine:** Parents were very much concerned about the adverse effects of the vaccine. Most of the parents i.e., 119 (48.18%) were not sure and worried about the safety of newly launched vaccine while 105 (42.51%) believed that there are more sided effects than the benefits of the vaccine. Ninety-five (38.46%) were worried about the

serious side effects and 93 (37.65%) denied the vaccine as they heard that someone in neighborhood was affected due to the vaccine. Twenty seven (10.93%) were fearful of the pain caused due to vaccination and 29.96% thought that there may be some other health problems to their child. III. Negligence or inadequate knowledge about the vaccine: One hundred eleven (44.94%) parents said that they avoided the vaccine purposefully showing negligent and casual approach towards the nationwide campaign of MR vaccination. Seventy-five (30.36%) parents agreed that they had inadequate knowledge regarding the vaccine and the campaign so they were uncertain to take the decision. Twenty eight (11.34%) parents did not receive satisfactory information regarding MR vaccination while 49 (19.84%) were doubtful about the qualification of the vaccinators and 35 (14.17%) mentioned that their child was already vaccinated with measles so this vaccine was not required. IV. Poor response from school authorities: School authorities said that they are not responsible for any adverse event following immunization therefore, 44 (17.81%) parents said they did not vaccinate their children while 27 (10.93%) parents told that school authorities had not responded or solved their queries. V. Other: There were few other reasons too for not vaccinating the children like family doctor’s advice in 41 (16.6%) cases while 26 (10.53%) parents held social media responsible for leading their decision of not giving the vaccine. When enquired about the illnesses due to which the parents had not vaccinated their children the leading cause was respiratory infection in 59 (46.46%) of children followed by fever in 52 (40.94%). Other reasons were allergic reaction, wound infection, dog bite etc. Table 4 shows association between religion and effect on fertility as a cause for not giving the MR vaccine. Out of 138 Hindu and 109 Muslim 74 and 58 respectively mentioned that they didn’t vaccinate their children after reading misinformation that the vaccines can affect the fertility of the child on social media sites. The chi square revealed no significant association between religion and their perception regarding the effect on fertility due to the vaccine.

Table No. 1: Distribution of children according to schools

Sr. No.	School type	No. of students in the school	No. of students not vaccinated with MR	Percentage
1.	Zillha Parishad School	400	25	6.25
2.	Private English School	1100	50	4.55
3.	Private Marathi School	6600	126	1.91
4.	Private Semi English School	1200	46	3.83
Grand Total		9300	247	2.66

Table No. 2: Sociodemographic profile of parents and children

Sr. No.	Parent’s Educational Status	No. of Children (N = 247)	Percentage
1.	Illiterate	17	6.88
2.	Primary	32	12.96
3.	Secondary	76	30.77
4.	Higher Secondary	44	17.81
5.	Graduate	56	22.67
6.	Post graduate	22	8.91
	Parent’s occupation	No. of Children	Percentage
1.	Housewife	14	5.67
2.	Agricultural worker	58	23.48
3.	Non-agricultural worker	30	12.15
4.	Service	82	33.20
5.	Business	63	25.50
	Socioeconomic class	No. of Children	Percentage
1.	I	21	8.50
2.	II	39	15.79
3.	III	55	22.27
4.	IV	66	26.72
5.	V	66	26.72

	Religion	No. of Children	Percentage
1.	Hindu	138	55.87
2.	Muslim	109	44.13
	Type of family	No. of Children	Percentage
1.	Nuclear	171	69.23
2.	Joint	76	30.77

Table No. 3: Reasons for not vaccinating the child with MR vaccine

Reasons	No of Children	Percentage (%)
Health of the child		
May affect fertility of child	132	53.44
Minor illness	130	52.63
May cause Autism	123	49.8
Child fell sick due to other vaccine.	120	48.58
Child is too young to receive the vaccine	25	10.12
Concern about adverse effects of vaccine		
Worried about safety of newly launched vaccine	119	48.18
More side effects than benefits	105	42.51
Causes serious side effects	95	38.46
Heard someone affected due to vaccine in neighborhood.	93	37.65
May cause loose stools, weight loss to child	78	31.58
May cause other health problems	74	29.96
Vaccination causes pain	27	10.93
Negligence or inadequate knowledge about vaccine		
Avoided purposefully	111	44.94
Natural immunity better than vaccine acquired	96	38.87
Inadequate knowledge, so uncertain regarding decision	75	30.36
Vaccinators are not enough qualified	49	19.84
Already vaccinated with measles MR vaccine not required	35	14.17
Not received satisfactory information regarding MR vaccination	28	11.34
Not required as child may never suffer from these diseases	27	10.93

Poor response from school authorities		
School authorities said that they are not responsible for any adverse event following immunization	44	17.81
School authorities not responded or solved the queries	27	10.93
Other		
Family doctor told not to vaccinate the child	41	16.6
Other family members suffered from adverse effects	23	9.31
Social media messages led to the decision of not giving the vaccine	26	10.53

\*Multiple response

Table No. 4: Relationship between religion and effect on Fertility as a reason for not giving MR vaccine

Sr. no.	Religion	Effect on fertility as a cause for not giving vaccine		Total
		Yes	No	
1.	Hindu	74	64	138
2.	Muslim	58	51	109
Total		132	115	247

$X^2 = 0.0042$  df = 1, p = 0.95, not significant

**Discussion:**

India has launched one of the largest mass immunization campaigns to reduce the vaccine preventable diseases like Measles and Rubella. These types of campaigns are for maximum coverage of beneficiaries. This study was undertaken to know important reasons for vaccine hesitancy amongst parents of primary and secondary school children. The study was undertaken in ten schools of different categories like Zilla parishad (Government) schools, private Marathi, English and semi-English schools. About 9300 school children were screened for vaccination with MR vaccine during the campaign. There were 247 school students who did not receive MR vaccine showing 2.66% prevalence. The students from Zillha parishad who were not vaccinated were 6.25% i.e., highest among all. It may be due to the fact that most of the students are from lower and lower middle socioeconomic class whose parents may not be aware of the benefits of the vaccination campaign. The proportion of children who were not vaccinated was 16% before the start of study and it was 2.66% when



the data collection was completed. The decrease was due the repeated campaigns in all the schools. Those who did not receive the vaccine were contacted and were vaccinated while the remaining did not receive the vaccine after many efforts.

It was observed that 79.35% male children were among those who did not receive the vaccine. This was contradictory to a study by Md. Jasim Uddin et al from Bangladesh who reported that female (90.3%) child was more likely to be unvaccinated [22]. On the contrary, Corsi DJ et al and Mathew JL observed that female child was more likely to be unvaccinated [23,24]. The higher proportion of male children in the present study may be due overprotective attitude of the parents towards male child against perceived adverse effects of the vaccines.

Present study found that more than 50% children from socioeconomic class III and IV were amongst those who did not receive the MR vaccine. Sharma S. and Barman D. also observed that similar findings in their studies [25, 26]. Pallabi Dasgupta et al found that 94 (80.3%) parents belonging to lower socio-economic status were less hesitant than those in the higher socioeconomic status (87.0%) [27]. It was observed that vaccine hesitancy was more in parents having secondary and higher secondary level of education (48.58%). Dewesh Kumar et al in his review article mentioned that people with less education are less hesitant than those with higher education [28]. Pallabi Dasgupta et al in her study found that 114 parents with 5 or more years of schooling were more hesitant [27]. Brown KF et al found that lower parental income was associated with vaccine hesitancy [29]. Studies conducted by Lauridsen J.[30], Sharma S. in India and Naeem M. et al in Peshawar of Pakistan found that higher education status of parents was associated with better immunization coverage which contradicts with our findings [31,32]. In the present study, 69.23% children were from nuclear family. Pallabi Dasgupta et al in her study conducted in Siliguri India found that 89 (89.9%) nuclear families were vaccine hesitant[27]. The parents were very much concerned about the health of their child. The major cause for not immunizing the child was their perception that

vaccines will affect the fertility of the child or lead to autism Other major reason was recent illnesses. Their decision making was influenced by the anti-vaccination messages on social media sites. Active use of social media left parents more vulnerable for wrong information like this [17,32,33,34]. Dixon G et al mentioned that few website authors tried to spread false information that vaccines cause autism [35]. V K Krishnendhu et al in a qualitative study from Tamil Nadu mentioned that a minority group believed that the government was planning and plotting against them [36]. An interesting study was put forth by Betsch and collaborators mentions that 5 to 10 minutes of surfing on internet can adversely influence peoples opinion about vaccination [37]. Dewesh Kumar et al in his integrative article also mentioned that scare occurred in United Kingdom due to false association between MMR vaccination and autism which spread widely and rapidly throughout the world and still present among the parents [30]. Many parents (48.58%) did not vaccinate their children because their child fell sick due to other vaccine. Cobos Munoz et al in his systemic review conducted in 19 middle income countries showed that adverse effects caused by vaccines could be of serious concern [38]. 52.63% children were not vaccinated due to minor illnesses during the vaccination campaign. Bomi Park et al and Md Jasim Uddin et al also mentioned that the main reason for not vaccinating the child was minor illness during vaccination period [29,39].

In this study, it was observed that vaccine hesitancy was present in 48.18% parents due to concerns of serious adverse effects and safety of newly launched vaccine. Freed et al reported that more than half of parents were concerned about the adverse effects and safety of newer vaccines [40]. Parents (42.51%) also mentioned that there are more side effects than the benefits. Herath et al in his study observed that parents of 4 children out of 5 were not in favour of vaccination but said that there are more harmful effects than benefits [41]. Gust DA et al observed similar findings [24]. 38.46 % parents in the present study thought that the vaccine causes side effects and similar number heard that someone in neighbour affected due to the

vaccine. The present study findings were similar to Alessio Facciola et al in a study in Italy who found that 44.4% were hesitant to receive the vaccine due to fear of side effects [42]. In a study conducted in Bangladesh by Md Jasim Uddin et al observed that 33% of children were unvaccinated because of minor illnesses and fear of side effects each [22]. Pain (10.93%) was also one of the reasons for vaccine hesitancy in the present study. Kennedy et al mentioned that fear of pain, needles and previous experience also leads to vaccine hesitancy [43]. Communication is an important tool to provide the appropriate health education to the people in community. The false information regarding safety and efficacy of the vaccine may affect such campaigns.

It was also found that 30.36% of parents were uncertain regarding the decision of vaccinating the child in the campaign because of lack of complete knowledge about the vaccine. 14.27% of children did not receive the vaccine because their parent thought that their child already received measles vaccine so MR vaccine not required which shows their unawareness regarding importance of new vaccine. Gust et al in his study mentioned that largest proportion of who changed their minds due to lack of information or assurance from health care providers [44]. V K Krishnendhu et al also mentioned that lack of knowledge is one of the contributors for vaccine hesitancy [40]. Few parents did not receive satisfactory information about the MR campaign and 10.93% thought that their child will never suffer from illness. Similar findings were observed by Dr. Alshammari who found that young people (13%) refuse to take vaccination as they think they will never be affected by the disease [45]. 38.87% parents were

of the opinion that natural immunity is far better than vaccine acquired and 42.51% believed that there are more side effects than benefits. A study conducted by Herath et al in Sri Lanka also found similar results. In his study, he revealed that 26.2% parents believed that it is better for a child to develop natural immunity [41]. As there were rumours in social media like WhatsApp and Facebook urging parent not to get their children vaccinated with MR vaccine it claimed that the vaccine has been banned in United States due to side effects [33]. It was also a rumour that MR vaccine is turning a particular community impotent [34]. The present study showed no association between religion and perception of effect on fertility as a cause for not giving MR vaccine ( $p = 0.95$ ). Sulaiman et al in his review article stated that there is no evidence that tells vaccines are used for depopulation of Muslims and the rate of growth in Muslim countries remains the same [46].

#### Conclusion:

Rumours about effect on fertility, minor illnesses and safety about newly introduced vaccine, side effects of the vaccines, and parents' perceptions on natural immunity better than vaccine acquired were some of the leading reasons of vaccine hesitancy. Few misbeliefs like autism due to vaccine, no vaccination during minor illness, harms more than benefits should be addressed. These findings are very important when the policy makers plan for campaigns with new vaccines among the school children. There is a strong need of intersectoral co-ordination between public health and education department as few parents mentioned that there was poor response from the school authorities.

**Conflict of Interest** - Nil

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#### References

1. Campos-Outcalt D. Immunization update: what's changed, what's on the way? *Journal of Family Practice* 2015; 64(3):177-180.
2. Khabbaz RF, Moseley RR, Steiner RJ, Levitt AM, Bell BP. Challenges of infectious diseases in the USA. *The Lancet* 2014; 384(9937): 53-63.
3. Prasad R. Why India needs the rubella vaccine? *The Hindu* 2017.
4. Ministry of Health & Family Welfare, Government of India. Introduction of Measles-Rubella vaccine

- (Campaign and Routine Immunization)-National Operational Guidelines 2017 WHO. Multidrug-resistant tuberculosis (MDR-TB) 2016 Update. Geneva: WHO; 2016.
5. Lazar M, Perelygina L, Martines R, Greer P, Paddock CD, Peltecu G, Lupulescu E, Icenogle J, Zaki SR: Immunolocalization and distribution of rubella antigen in fatal congenital rubella syndrome. *Biomedicine* 2016; 3:86-92.
  6. Black S, Rappuoli R. A crisis of public confidence in vaccines. *Science Translational Medicine* 2010; 2(61):61.
  7. Leask J. Target the fence-sitters. *Nature* 2011;473(7348):443- 445.
  8. Larson H, Jarrett C, Eckersberger E, Smith D, Paterson P. Understanding vaccine hesitancy around vaccines and vaccination from a global perspective: a systematic review of published literature, 2007–2012. *Vaccine* 2014; 32(19):2150- 2159.
  9. Meeting of the Strategic Advisory Group of Experts on immunization—conclusions and recommendations. 2014 Contract No.: 50.
  10. Dube E, Loberge C, Guay M, Bramadat P, Roy R, Bettinger J. Vaccine hesitancy: an overview. *Human Vaccines and Immunotherapeutics* 2013; 9(8):1763–1773.
  11. The needle and the damage done. *The Economist*. 2002.
  12. Lynch HJ, Marcuse EK. Vaccines and immunization. *The Social Ecology of Infectious Diseases* 2008:275.
  13. Wolfe RM, Sharp LK. Anti-vaccination its past and present. *British Medical Journal* 2002; 325:430-432.
  14. John H. After Diphtheria, anti- vaccination groups oppose Measles Rubella shot, Kerala govt steps in. *The News Minute* Online 2017.
  15. Bharat Khanna. Govt doctor booked for spreading rumours against MR vaccine 2018.
  16. Karam Prakash. Parents boycott MR drive amid rumours of side-effects 2018.
  17. Menaka Rao, Vinita Govindrajan. WhatsApp rumours about vaccinations hamper India's drive to halt measles and rubella 2017.
  18. Bond L, et al. Vaccine preventable diseases and immunisations: a qualitative study of mothers? Perceptions of severity, susceptibility, benefits and barriers. *Australian and New Zealand Journal of Public Health* 1998; 22(4):441–446.
  19. Shui I, Kennedy A, Wooten K, Schwartz B, Gust D. Factors influencing African-American mothers' concerns about immunization safety: a summary of focus group findings. *Journal of National Medical Association* 2005; 97:657-666.
  20. Salmon DA, Sotir MJ, Pan WK, Berg JL, Omer SB, Stokley S, et al. Parental vaccine refusal in Wisconsin: a case-control study. *Wisconsin Medical Journal* 2009; 108:17- 23.
  21. Prislun R, Dyer JA, Blakely CH, Johnson CD. Immunization status and sociodemographic characteristics: the mediating role of beliefs, attitudes, and perceived control. *American Journal of Public Health* 1998; 88:1821- 1826.
  22. Md Jasim Uddin, Gourab Adhikary, Md Wazed Ali, Shahabuddin Ahmed, Md Shamsuzzaman, Chris Odell, Lauren Hashiguchi, Stephen S. Lim, Nurul Alam. Evaluation of impact of measles rubella campaign on vaccination coverage and routine immunization services in Bangladesh. *BMC Infectious Diseases* 2016; 16:411:1-9.
  23. Corsi DJ, Diego BG, Kumar R, Awasthi S, Jotkar R, Kaur N, et al. Gender inequity and age-appropriate immunization coverage in India from 1992 to 2006. *BMC International Health and Human Rights* 2009; 9:S3:1-12.
  24. Mathew JL. Inequity in childhood immunization in India: a systematic review. *Indian Paediatrics* 2012; 49:203-223.
  25. Sharma S. Socioeconomic factors of full immunization coverage in India. *World Journal of Vaccines* 2013; 3:102-110.
  26. Barman D, Dutta A. Access and barriers to immunization in West Bengal, India: Quality matters. *Journal of Health Population and Nutrition* 2013; 31:510-522.
  27. Dasgupta P, Bhattacharjee S, Mukherjee A, Dasgupta S. Vaccine hesitancy for childhood vaccinations in slum areas of Siliguri, India. *Indian Journal of Public Health* 2018; 62:253-258.
  28. Dewesh Kumar, Rahul Chandra, Medha Mathur, Saurabh Samdariya, Neelesh Kapoor. Vaccine hesitancy: understanding better to address better. *Israel Journal of Health Policy Research* 2016; 5(2):1-8.
  29. Brown KF, Kroll JS, Hudson MJ, et al. Factors underlying parental decisions about combination childhood vaccinations including MMR: a systematic review. *Vaccine* 2010; 28:4235-4248.
  30. Lauridsen J, Pradhan J. Socio-economic inequality of immunization coverage in India. *Health Economics Review*. 2011; 1:11.
  31. Sharma S. Socioeconomic factors of full immunization coverage in India. *World Journal of Vaccines* 2013; 3:102-110.
  32. Naem M, Adil M, Abbas SH, Khan MZ, Naz SM, Khan A, et al. Coverage and causes of missed oral polio vaccine in urban and rural areas of Peshawar. *Journal of Ayub Medical College Abbottabad* 2011; 23:98-102.
  33. Sanchita Sharma. Shot of life: saving vaccination drive from rumours and fake news 2018.
  34. Sanchita Sharma. India's measles elimination campaign rocked by rumours, fake alerts before launch 2017.
  35. Dixon G, Clarke C. The effect of falsely balanced reporting of the autism-vaccine controversy on vaccine



- safety perceptions and behavioral intentions. *Health Education Research* 2013; 28:352–359.
36. Krishnendhu VK, George LS. Drivers and barriers for measles rubella vaccination campaign: A qualitative study. *Journal of Family Medicine and Primary Care* 2019; 8:881-885.
  37. Betsch C, Renkewitz F, Betsch T, Ulshöfer C. The influence of vaccine-critical websites on perceiving vaccination risks. *Journal of Health Psychology* 2010; 15:446-455.
  38. Cobos Munoz ~ D, Monzón Llamas L, Bosch-Capblanch X. Exposing concerns about vaccination in low- and middle-income countries: a systematic review. *International Journal of Public Health* 2015; 60:767-780.
  39. Bomi Park, Eun Jeong Choi, Bohyun Park, Hyejin Han, Su Jin Cho, Hee Jung Choi, Seonhwa Lee, Hyesook Park. Factors Influencing Vaccination in Korea: Findings From Focus Group Interviews. *Journal of Preventive Medicine and Public Health* 2018; 51:173-180.
  40. Freed GL, Clark SJ, Butchart AT, Singer DC, Davis MM. Parental vaccine safety concerns in 2009. *Paediatrics* 2010; 125:654-659.
  41. N. C. Herath, T. Kudagammana, T. T. Sanathchandra, H. K. Gamage, I. M. Razik, V. Liynapathirana. Brief report: Parental attitudes and knowledge on routine childhood immunization: an experience from Central Sri Lanka. *BMC Research Notes* 2018; 11:402.
  42. Alessio Facciola, Giuseppa Visalli, Annalisa Orlando, Maria Paola Bertuccio, Pasquale Spataro, Raffaele Squeri, Isa Picerno, Angela Di Pietro. Vaccine hesitancy: An overview on parents' opinions about vaccination and possible reasons of vaccine refusal. *Journal of Public Health Research* 2019; 8:1436.
  43. Kennedy A, Basket M, Sheedy K. Vaccine attitudes, concerns, and information sources reported by parents of young children: results from the 2009 Health Styles survey. *Paediatrics* 2011; 127 Suppl 1:S92–9.
  44. Gust D, Brown C, Sheedy K, Hibbs B, Weaver D, Nowak G, et al. Immunization attitudes and beliefs among parents: Beyond a dichotomous perspective. *American Journal of Health Behaviour* 2005;29:81-92.
  45. Alshammari TM, Alfehaid LS, Alfraih JK, Aljadhey HS. Health care professionals' awareness of, knowledge about and attitude to influenza vaccination. *Vaccine* 2014; 32:5957–5961.
  46. Sulaiman K-DO. An assessment of muslims reactions to the immunization of children in northern Nigeria. *Medical Journal of Islamic World Academy of Sciences* 2014; 22:123-132.

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