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Statistical Analysis of Suspected Measles Cases And Vaccination of Delhi

KEYWORDS: Measles incidence, vaccination, hypothesis testing, confidence level & U5 age.

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ABSTRACT *There are 1337 cases of measles were investigated during the months of February 2014 to August 2014 on the basis of Immunized and Unimmunized in Primary Health Centre (PHC) of Govt in Delhi and its impact . The major focus of work is occurrences of measles under five age of children i.e. 845 cases and status of immunization .The statistical significant of this impact has been also examined by the testing of hypothesis for Occurrences of Measles in delayed in Vaccinated Children and its age group as usual confidence level. The rate of incidence of post and measles and the vaccination coverage in last seven months till 23 months age group is last covered in this research paper. The proper statistical interpretation has been also presented with usual justification in suggestive manner for minimising the occurrences of measles cases in minimum effort.*

INTRODUCTION

There are lot of Infectious virus present in environment with accelerating the several kind of infectious diseases. Measles is the one of the highly infectious, contagious, serious virus disease caused by a viral illness like fever; rash and some other complication affect the all age groups especially children under 5 (U5) are most at risk (Generally most effective month is 12-23 and 24-59 is the second most effective months). The unvaccinated persons are the very high risk zone of this disease due to severe health complications such as pneumonia, diarrhoea, and encephalitis and accelerating towards disability towards children in the form of affecting the brain and blindness. The virus is spread with lot of tiny droplets that are coughed out by an infected person. Persons around who breathe in the droplets with the virus can catch the infection and spread when objects contaminated with the droplets touched the hands or brought near the nose of mouth.

The primary symptoms of measles are the cold, flu , high fever, red and runny eyes and nose and a characteristic rash then greyish white spots in the mouth and throat. After then a dip red-brown spotty rash will appear in most part of the body especially behind the ears, spreads around the head and neck before spreading to the legs and the whole body. India has among the lowest number of children vaccinated against measles, accounting for more than a third of all measles deaths (around 56,000 in 2011) of the estimated 20 million children worldwide who did not receive the first dose of vaccine in 2011, 6.7 million lived in India and the other part of World Health Organization (WHO) report 2013 also said the global measles deaths have decreased by 78 percent worldwide in recent years from 5, 62,400 deaths in 2000 to 1, 22,000 in 2012 due to proper attention and awareness in PHC .

However, measles is still common in many developing countries, particularly in parts of Africa and Asia. Indeed, more than 20 million people are affected by measles each year. The overwhelming majority (more than 95%) of measles deaths occur in countries with low per capita incomes and weak health infrastructures. The effectiveness of Measles is by the 2 doses of Measles vaccine given in the combined shot of MMR vaccine (Measles, Mumps and Rubella) as per standard national immunization programmes. The measles vaccine has two shots, one that is administered after the 9th-12th month after birth, and the second after the 16th month.

As per WHO report, Delhi has witnessed of one of the most occurrence city which is also confirmed by the various reports of Delhi Health department and civic agencies especially by Maharishi Valmiki Infectious Diseases Hospital (MVID) in which most of the cases coming from trans Yamuna area. The significant number of children who were detected with measles despite vaccinated is the major cause of worry. The effective awareness ,governance , planning , implementation and monitoring are the most crucial for developing ,accelerating the control of measles cases in city like Delhi NCR especially in urban , slums or area of trans Yamuna River .

Material & Methods

This study is carried major PHC of government dispensary of Delhi located in slum cluster or trans Yamuna River (more than 130 PHC of Delhi) under the expert of Delhi Govt and MVID Hospital during the month of February to August 2014 in several correspondence. The sample of PHC is selected by cluster sampling methods to study the incidence of measles especially in age of U5 children. The analysis is also focused on the effect of immunised and unimmunised children having measles suspected. The website of various government agencies of Delhi and its dispensary is another source of data during the month of February to August 2014 in several correspondences. Source of NPSP also the helping the collection of data for research purpose. The record available in PHC the most of the children we have confirmed with measles were U5 age and migrated to Delhi from neighbouring states within two years old.

The statistical hypothesis testing and descriptive analysis is used for analysis of data. The concept of test of significance wherever required were applied for better conclusion of hypothesis. The sampling distribution had been applied for selecting the sample of PHC at the time of collecting the statistical data. The same way the identification, tabulation and presentation of data is applied for consigned view along with diagrams. The p values may also helps to drawing the conclusion of occurrences of measles infectious diseases under immunized or unimmunized children.

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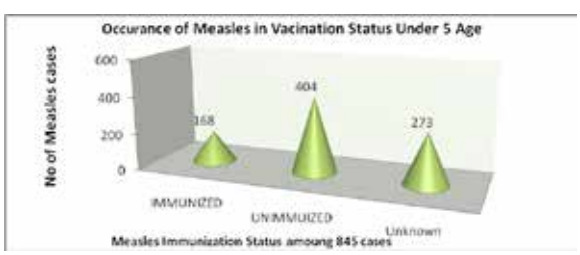
Statistical Analysis

The Micro Soft Excel 2007 is used for analysis of data and hypothesis testing had been completed in SPSS VERSION-22 for checking the statistical significance of collected data at 95% significance level.

In the clusters of 130 PHC, total cases of measles is 1337 in which Male is 688 and Female is 649 having sex ratio 949 for all age group out of this 845 children under 5 years were studies among 463 boys and 382 were girls having sex ratio was 825. The largest proportion of children belonged to the age group of 12-23 month which is statistically significant at 95% confidence level. The data of measles also confirmed that the average age of affecting the measles is 50 months but in children (U5) age is 23 month.

Average Age for Occurrence of Measles Incidence in Group wise age and sex for U5				
Age Group (Months)	Boy	Girl	Tota	
	Total Children	Total Children	Total Children	Average Age(Months)
0-8	99	64	163	6.3
09-11	62	39	101	9.6
12-23	77	96	173	15.9
24-35	74	70	144	27.2
36-47	86	68	154	38.0
48-59	65	45	110	49.4
Total U5	463	382	845	23.6

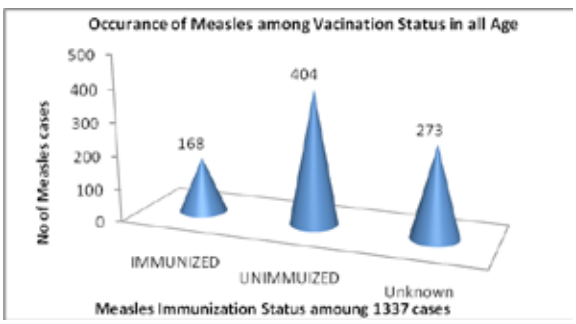
It is observed that the 168 no of measles cases has been found in fewer than five children who were vaccinated by PHC out of 845 measles cases. In percentage 20% of U5 children have measles even after immunized by PHC. This is not good news for Department of Health and Family Welfare. The expected causes behind this are MMR vaccine (Measles, Mumps and Rubella) was not given at time or two doses at interval which clearly reflects the carelessness in PHC towards the alertness of immunization.



The mean age of case was 23.6 months in U5 among which 23.7 of boy and 23.5 of boy which is also statistically significant at usual confidence level.

Hypothesis Testing

Now I want to investigate the occurrences of Measles may be due to delayed in vaccinated children is statistically significant or not. The following hypothetical assumption is made i.e. the null hypothesis H0: No Association b/w Occurrence of Measles in delayed Vaccination & corresponding age (in Month) and the alternative hypothesis H1: An Association b/w Occurrence of Measles in delayed in Vaccination & corresponding age (in Month). The calculated value of Chi-Square is 3.106 which is less than tabulated value at 95% confidence level .Hence it is easy to conclude that little or no real evidences against the null hypothesis. That means Occurrence of Measles in delayed in Vaccination and corresponding age (in Month) is significant. The p value of vaccination is 0.607 is reflecting the 61% chances to non occurrence of measles after immunization however 39% chances the measles may be identified in immunized children due to delayed vaccination . This can be easily seen in graphical presentation.



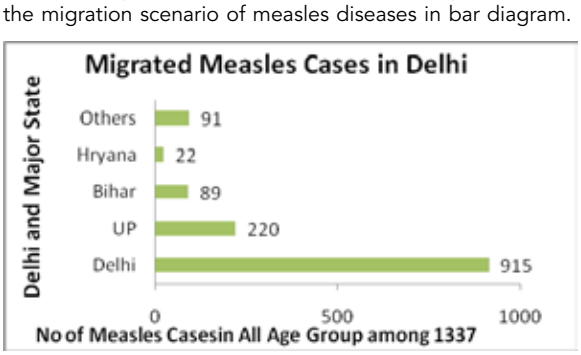
This is very panic situation for Delhi Government the immunized children (i.e.274 cases out of 1337 cases) is also affected by measles i.e. around 21%. The average age of infection of measles diseases is four year in all age group however two years in fewer than five children group.

Migration Analysis of Measles Cases

As we ware that the identity of Delhi is made from mixed migrated population from Utter Pradesh (UP), Bihar, Haryana and some other state like Rajasthan, Madhya Pradesh, Punjab, etc. The impact of total number of measles cases is also influences by the migrated measles from these states.

Migrated Measles Cases Including Delhi		
State	No of Measles Cases	%
Delhi	915	68.44
UP	220	16.45
Bihar	89	6.66
Haryana	22	1.65
Others	91	6.81

The largest migration of measles cases from UP & Bihar having share of 16.45% & 6.66 respectively. UP is the nearest neighbouring state of Delhi causes the maximum migration and also reflecting poor health facility in UP as compared to Delhi and Haryana. It's also indicating the health facility in Haryana is far better than UP and Bihar resulting lower migration of measles cases in Delhi. This migration must be occurred due to pool factor of better health facility in Delhi even in PHC. It is easy to observe the migration scenario of measles diseases in bar diagram.



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Conclusion

In Delhi the average age of occurrences of measles diseases of the children age 23 months or two years under the age of five. Almost 20% child got affected by measles even immunized in early age. The same scenario is observed in all age group having average affected age is 4 years or 50 months. It means that a large number of children who have contact with services providers are missed out of subsequent services. The collected data of measles during the month of February 2014 – August 2014 is statistically significant in the sense of occurrences of measles diseases due to delayed in vaccination MMR at 95% significance level. It is necessary to ensure the health department of Delhi to regular immunization services on a fixed day and fixed place basis at priority level and monitoring it with the help of e-services. It is the duty of government to minimising the issue of poor utilization of immunization services and changed behaviour of communication with head of the family. Around 16 % migration of measles cases from UP due to most nearest to Delhi is also reflecting the poor health facility in UP at PHC. Government of Delhi may require coordinating with the neighbouring sate for maximum coverage of child immunization to minimising the case of measles.

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