

PREVALENCE OF MEASLES IN VACCINATED AND UNVACCINATED CHILDREN AT QAZI HUSSAIN AHMAD MEDICAL COMPLEX

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ABSTRACT

Objective: Measles is an infectious disease that is a prodigious threat to mortality under study was conducted to find the prevalence of measles vaccination and its effectiveness.

Study design: A Cross Sectional Observational Study.

Place and duration of study: Department of Pediatrics Qazi Hussain Ahmad Medical Complex, Nowshera, from June 20, 2022, to July 20, 2023

Materials & Methods: total of 606 samples were taken of children under 5 years of age visiting QHAMC, Nowshera. A structured proforma asked about the Bio data, Vaccination status and Measles contraction history. MSWord and. SPSS software were used for data management and presentation.

Results: Results showed that Among 606 participants, 339(55.94%) were vaccinated, while 267(44.06%) were unvaccinated. Of these 339 vaccinated children, 147(43.36%) had measles, while 192(56.64%) were free of measles. In the 267(44.06%) unvaccinated children 168(62.92%) had measles while 99(33.08%) were free of measles

Conclusion: This study concludes that Measles is a huge burden on the health and economic sectors of the state, and measures need to be taken seriously, including the measles vaccine, which is very effective. Steps need to be taken to ensure the administration of these vaccines to all the population to reduce further burden. Also, more effective vaccines and strategies need to be developed.

Keywords: Measles, Children under 5 years of age, vaccination, mortality.

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INTRODUCTION

Measles is an infectious viral illness that mainly occurs in children below the age of five years. Measles remains a significant public health threat even though a safe and effective vaccine exists, particularly in the developing world. The WHO approximated that in 2018, measles killed 136,000 people, and 90% of these were children below the age of five [1]. The WHO Expanded Program on Immunization (EPI) puts the global annual child mortality from measles at 1.6 million in developing countries, ranking it among the EPI target diseases' leading causes of death [2]. Measles was a major global problem before the development of the vaccine and affected about 135 million people and killed 6 million every year [3]. Measles is an infectious disease caused by the rubella virus belonging to the Morbillivirus genus of the Paramyxoviridae family. It is an enveloped, single-stranded, negative-sense RNA virus that spreads through respiratory droplets. The virus does not infect animals. Thus, humans are the natural reservoir of the virus. The WHO describes a clinical case of measles as any individual with fever, maculopapular rash, cough, runny nose, or conjunctival infection [4]. Measles, on the other hand, can lead to severe complications in persons with the following conditions: AIDS, congenital immune deficiencies, or persons on cancer treatment. These include pneumonia, diarrhoea,

Some of the Otitis media and croup may be fatal [5]. Measles is still a public health issue of concern, although a live attenuated vaccine is safe and effective. The vaccine is administered at 9 and 15 months and may be administered alone or with mumps, rubella, or MMR [6]. In Pakistan, there is some problem with measles vaccination coverage, though it is improving; these problems are related to infrastructures and people's awareness. WHO has reported that 64 people died from measles in Pakistan in 2011, which proves the need to enhance vaccination activities [7]. Studies have also shown that when the measles vaccine is administered early, it provides good immunity and the rate of the disease can also be brought down. For instance, while conducting a study, Laura M et al. identified that measles is better protected by infants under 9 months through vaccination [8]. Therefore, this cross-sectional study aimed to establish the prevalence of measles among vaccinated and unvaccinated children under five years of age attending Qazi Hussain Ahmad Medical Complex (QHAMC) in Nowshera, Pakistan. The study aimed to evaluate the effectiveness of the measles vaccine in this population group and the outcomes concerning the impact of vaccination on the frequency of measles.

METHODS

The research was cross-sectional observational conducted at QHAMC Nowshera on children below five years of age. Ethical clearance was sought from the Medical Education Department regarding the study. The study targeted 606 children, and the sampling technique used was the stratified sampling. The respondents were asked to complete questionnaires that included biodata, vaccination history.

APPROVAL FORM ETHICS COMMITTEE STATEMENT

This study received ethical approval from the Ethics Review Board (ERB) at **Qazi Hussain Ahmad Medical Complex (QHAMC) Nowshera** just before starting the research. The research obtained approval from the Ethics Review Board minimum four months before the scheduled research period in order to comply with human research ethical obligations. This study holds approval from the Ethics Review Board of QHAMC Nowshera with the **IRB/QHAMC/344/03/22** as the corresponding author Ahmad Waqas serves as a member of the Pediatrics Department at QHAMC Nowshera. Prior to data collection the guardians of every participant signed the informed consent document.

DATA COLLECTION

After seeking their consent, the parents or guardians of the children were administered questionnaires with closed-ended questions. The proforma gathered biodata, vaccination status, and a history of measles infection.

STATISTICAL ANALYSIS

The data were analyzed using the statistical package for social sciences (SPSS) version 24. 0.

Frequency distribution was used to analyze the data, and the chi-square test was used to determine the relationship between vaccination and measles. The data was analyzed and summarized in tables and percentages.

RESULTS

Out Of the 606 participants, 339 were vaccinated, which is 55. 94%, while 267 participants were unvaccinated, which is 44. 06%. Out of the vaccinated children, 147 were affected 43. 36% with measles, and 192 were Not affected 56. 64%. Of the unvaccinated people, 168 (62. 92%) developed measles, while 99 (37. 08%) did not. The results of this study reveal a higher rate of measles in children who did not receive a vaccine compared to those who were vaccinated. The chi-square test chi-square owed showed a significant relationship between vaccination and measles infection ($p < 0. 05$).

Figure 01: the prevalence in vaccinated vs unvaccinated children

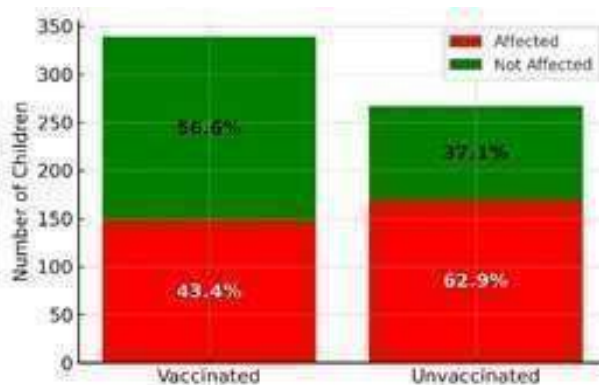


Figure 02: overall vaccination status

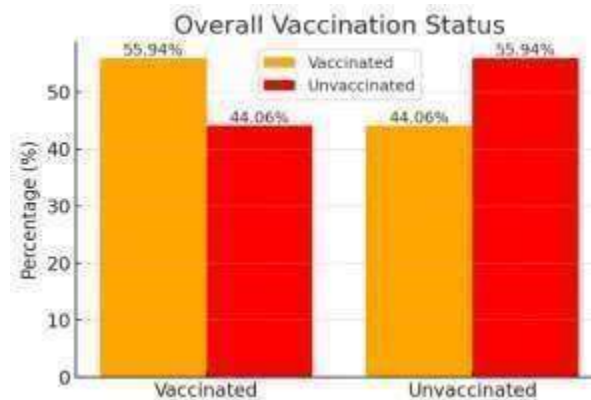


Table 1: Vaccination Status of Participants

Status	Number of Cases	Percentage (%)
Vaccinated	339	55.94
Unvaccinated	267	44.06
Total	606	100

Table 2: Measles Cases in Vaccinated Children

Status	Number of Cases	Percentage (%)
Contracted Measles	147	43.36
Free of Measles	192	56.64
Total	339	100

Table 3: Measles Cases in Unvaccinated Children

Status	Number of Cases	Percentage (%)
Contracted Measles	168	62.92
Free of Measles	99	37.08
Total	267	100

Table 4: Summary of Measles Cases by Vaccination Status

Vaccination Status	Contract d Measles	Free of Measles	Total
Vaccinated	147	192	339
Unvaccinated	168	99	267
Total	315	291	606

DISCUSSION

The results of this study are in concordance with the previous studies that have underlined the importance of vaccination in the decrease of measles cases among children. Measles is still a significant threat to people's health, especially in areas where children have not been vaccinated. The findings of the present study of higher infection rates of measles amongst unvaccinated children support the fact that the measles vaccine is effective in preventing the disease. Tahir et al. (2020) cross-sectional study conducted in District Bannu, Pakistan revealed a high proportion of measles in unvaccinated children. Among 7200 children, 578 had measles 88. 41% of whom were not vaccinated [9]. This is in support of our study where we recorded that 62. 92% of children who had not received the vaccination were affected by measles compared to 43. 36% of children who had received the vaccination. The results also call for better vaccination campaigns and health promotion activities to enhance vaccination. In their study, Laura et al. (2020) pointed out that early vaccination can help decrease the number of measles morbidity and mortality cases. They found vaccinated infants before 9 months were more protected from measles than the others [10]. Our study also goes with the idea of early vaccination, as most vaccinated children were not affected by measles. This discovery calls for early vaccine administration to boost immunity among children.

Also, the WHO's EPI has been instrumental in the reduction of measles incidence across the world. This is evident in the countries where vaccination has been implemented since the incidence of measles has reduced and where there is high vaccination coverage [11]. However, in Pakistan, there are some barriers, like infrastructure problems, low community awareness, and vaccine resistance, that affect the program. Our study captures These challenges well, with many children remaining unvaccinated and thus susceptible to measles. A dynamic modeling study by Fu et al. in ten high-burden countries showed that MCV1 reduced measles cases by 66% while MCV2 and SIA reduced the cases to 90% [12]. This substantial reduction in measles cases emphasizes the need for the first and second doses of the vaccine and other immunization activities to achieve adequate coverage. Measles cases remain a concern in different regions of the world even though vaccines for the disease are available. Gastañaduy et al. (2021) stated that although the overall incidence of measles has decreased, outbreaks are still seen because of inadequate vaccination [13]. Our study supports this inference, as the frequency of measles was significantly higher among the children who had not received the vaccine. This means there is a need to ensure and sustain high levels of vaccination to reduce incidences and contain the spread of the disease[14]. The drawbacks of our study are the small number of participants and the short observation period. More research with a larger sample

size and longer observation duration can provide more specific data regarding the effectiveness of measles vaccination. Furthermore, the barriers to vaccination, including access to the vaccines and awareness of the vaccination programs, should be eradicated to improve the vaccination [15].

CONCLUSION

This study reveals that measles vaccination assists in decreasing the disease's occurrence among children. This distribution indicates that children who have not been vaccinated are at a higher risk of contracting measles. Hence, the a need to step up vaccination and other health promotion activities to immunize more children. Thus, the challenges of vaccination and early and complete immunization can be solved, and the effect of measles can be minimized to protect the at-risk population.

LIMITATIONS

The weaknesses of this research are that it has a small number of participants and a short time frame, which might not reflect all the fluctuations in measles occurrence. However, data collection was restricted to a single medical complex, which may impact the results' generalization. More studies should be conducted with different and more numerous participants.

FUTURE DIRECTIONS

Further studies should be conducted on a wider and more diverse population to increase the external validity of the results. This is why there is a need to undertake longitudinal investigations to evaluate the sustained efficacy of measles vaccination campaigns and the

Role of booster doses. Also, strategies to counter vaccine misinformation and strengthen health

systems are vital for eliminating measles.

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Authors Contribution

Concept & Design of Study: **Irfan Khan**.

Drafting: **Ahmad Waqas**

Data Analysis: **Anwar Khan Wazir**.

Critical Review: **Anwar Khan Wazir**.

Final Approval of version: **All Manton Authors Approved the Final version.**

REFERENCES

1. Shahid S, Ahmed S, Qazi MF, Ali R, Ali SA, Zaidi AKM, Iqbal NT, Jehan F, Imran Nisar M. Differential coverage for vaccines in the expanded program on immunization (EPI) among children in rural Pakistan. *Vaccine*. 2023;41(16):2680-2689. doi:10.1016/j.vaccine.2023.03.007.
2. Ilyas M, Afzal S, Ahmad J, Alghamdi S, Khurram M. The Resurgence of Measles Infection and its Associated Complications in Early Childhood at a Tertiary Care Hospital in Peshawar, Pakistan. *Pol J Microbiol*. 2020;69(2):1-8. doi:10.33073/pjm-2020-020.
3. Khalid Z, Muhammad J, Ali H, Rana MS, Usman M, Alam MM, Ullah R, Ullah A, Umair M, Ahmad A, Salman M, Ikram A, Khan A, Bari A. Insights into measles virus: Serological surveillance and molecular characterization. *J Infect Public Health*. 2022;17(6):994-1000. doi:10.1016/j.jiph.2024.03.028.
4. Jamison AF, McCormick BJJ, Hussain E, Thomas ED, Azam SI, Hansen CL, Rasmussen ZA. Determinants of vaccine coverage and timeliness in a northern Pakistani village. *PLoS One*. 2022;17(2):e0263712. doi:10.1371/journal.pone.0263712.
5. Javed N, Saqib MAN, Bullo MMH, Asghar RJ. Seroprevalence of Transplacentally acquired Measles antibodies in infants before vaccination: A hospital based study from Islamabad, Pakistan. *BMC Infect Dis*. 2019;19(1):546. doi:10.1186/s12879-019-4167-0.
6. Bawankule R, Singh A, Kumar K, Shetye S. Does Measles Vaccination Reduce the Risk of Acute Respiratory Infection (ARI) and Diarrhea in Children: A Multi-Country Study? *PLoS One*. 2017;12(1):e0169713. doi:10.1371/journal.pone.0169713.
7. Zaidi SSZ, Hameed A, Ali N, Umair M, Alam MM, Sharif S, Shaukat S, Angez M, Khurshid A, Aamir UB. A measles outbreak in Sindh, Pakistan caused by a genotype B3 virus. *Arch Virol*. 2017;162(12):3603-3610. doi:10.1007/s00705-017-3524-9.
8. Zaidi SSZ, Hameed A, Suleman Rana M, Alam MM, Umair M, Aamir UB, Hussain M, Sharif S, Shaukat S, Angez M, Khurshid A. Identification of measles virus genotype B3 associated with outbreaks in Islamabad, Pakistan, 2013- 2015
9. Zaidi SSZ, Hameed A, Ali N, Rana MS, Umair M, Alam MM, mN. Epidemiological and molecular investigation of a measles outbreak in Punjab, Pakistan, 2013-2015. *J Med Virol*. 2018;90(8):1297-1303. doi:10.1002/jmv.25206.
10. Hussain H, Waters H, Omer SB, Khan AJ, Halsey NA. The cost of treatment for child pneumonias and meningitis in the Northern Areas of Pakistan. *Int J Health Plann Manage*. 2008;23(3):229-244. doi:10.1002/hpm.931.

11. Khan T, Qazi J. Measles outbreaks in Pakistan: causes of the tragedy and future implications. *Epidemiol Infect.* 2014;142(12):247-253. doi:10.1017/S0950268813001532.
12. Nisar MI, Ansari N, Khalid F, Salam RA, Lassi ZS, Bhutta ZA. Implementation of the WHO Expanded Program on Immunization (EPI): progress and challenges in a megacity (Karachi) of Pakistan. *Vaccine.* 2010;28(47):7083-7088. doi:10.1016/j.vaccine.2010.08.030.
13. Owais A, Hanif B, Siddiqui AR, Agha A, Zaidi AK. Does improving maternal knowledge of vaccines impact infant immunization rates? A community-based randomized- controlled trial in Karachi, Pakistan. *BMC Public Health.* 2011;11:239.
14. Siddiqi DA, Munir M, Shah MT, Khan AJ, Chandir S. Effect of vaccine reminder and tracker bracelets on routine childhood immunization coverage and timeliness in urban Pakistan: protocol for a randomized controlled trial. *BMC Public Health.* 2019;19(1):1421. doi:10.1186/s12889-019-7667-3.
15. Usman HR, Akhtar S, Habib F, Jehan I. Redesigned immunization card and center-based education to reduce childhood immunization dropouts in urban Pakistan: a randomized controlled trial. *Vaccine.* 2009;27(3):467-472. doi:10.1016/j.vaccine.2008.10.048.



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