



Measles outbreaks in Kabul, Afghanistan: A Descriptive Study, 2023

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Background: Regardless the availability of vaccines, measles remains the major cause of morbidity and mortality among the children of under 5 years. This study conducted a descriptive analysis of the outbreaks and incidence rate of measles in Kabul, Afghanistan.

Methodology: A descriptive study focusing on review of 12 measles outbreaks was conducted in 1-30 Oct 2023. We used the District Health information system (DHIS-2) database of Ministry of Public Health. Data was managed and analyzed using MS Excel and Epi Info 7.2.1.

Results: Totally 94 measles cases were reported from the outbreaks, of which 54 (57.4%) were males. Under-5 years' children were most affected with a frequency of 42 (44.7%). The most reported clinical features were rash 90 (95.74%), and the least reported was cough 60 (60.8%). This study also found 18 (19.15%) were vaccinated reported. Each outbreak was confirmed by taking few samples and testing in Ministry of Public Health (MoPH) laboratories and 53 (65.4%) cases were recorded in urban areas.

Conclusion: Measles outbreaks affected urban districts, and cases were high among children over the 5 years. The health authorities should focus on routine immunization and launching campaigns in urban areas where outbreaks occurred. More studies to find the root causes and elimination of disease, strengthening the surveillance system for measles is recommended.

Keywords: Afghanistan, Kabul, Measles, Outbreak

Introduction

Measles is a highly contagious airborne disease that affects the upper respiratory tract. Measles is caused by the measles virus, a member of the Morbillivirus genus, the Paramyxoviridae family [1]. Transmission occurs through direct contact with infectious droplets or by airborne spread when an infected person breathes, coughs, or sneezes. After exposure, the first sign of measles is usually a high fever, followed by a runny nose, cough, and rash [2]. Before the development of a measles vaccine in the 1960s, measles was a leading cause of morbidity and mortality [3].

In 2016, about 39.9 million cases of measles were recorded with 777,000 deaths, worldwide. Africa and Southeast Asia account for 70 and 84% of cases of measles and measles related mortality reported, respectively, worldwide [4–5]. Incidence varied by WHO region; the African, Eastern Mediterranean and European Regions reported increased incidence in 2014–2015 due to large measles outbreaks. The numbers of reported cases were 98,621 (incidence of 100/million) for the African region, 423 (0.6/million) for the region of the Americas,



21,335 (33/million) for the Eastern Mediterranean region, 25,974 (31/million) for the European Region, 29,109 (17/million) for the South-East Asian region and 65,176 (35/million) for the Western Pacific Region [6]. The risk of spread and prolonged transmission of measles were associated with the presence of a susceptible population, but vaccination with at least two doses of measles vaccine was the most effective measure for the prevention and control of the disease [7]. Even the WHO reported in 2021 in Afghanistan, the number of measles cases was 25,988, including 98 deaths. Among these cases, 20763 cases were the children under five years and 5225 cases were the children over five years. Most of the incidents occurred in Kabul, Ghazni, Paktika, Kandahar and Helmand Provinces [7]. In 2022, Afghanistan reported 5,484 measles cases, with approximately 300 deaths, according to the World Health Organization (WHO) report [7].

In Afghanistan, during the 2023 period, the number of outbreaks with many incidents was reported. This study was aimed to describe the cases in terms of Time, Place and Persons as well as to estimate the incidence of measles in Kabul, Afghanistan as new information about the outbreaks.

Materials and Methods

In this study, a descriptive analysis of 12 measles outbreaks was conducted, focusing on reviewing the data and incidents related to these outbreaks. The team extracted and compiled the national data of measles cases reported due to outbreaks in Kabul, Afghanistan from March to September 2023.

We used the District Health information system (DHIS-2) databases of ministry of public health. The rates, ratio and proportion were calculated using Epi Info 7.2.1.

Results

All the compiled data in this project is secondary which was done from MoPH DHIS-2 and compare some of them with Kabul surveillance outbreak dataset. All data collected by Kabul National Disease Surveillance and Response (NDSR) department during the outbreak investigations in different districts of Kabul province. Totally 94 cases, 40 (42.6%) were females and 54 (57.4%) were males. regarding measles cases by age category over-5 years were the least affected in the outbreaks with 42 (44.7%). The number of cases among children under five years decreased from March to September, reaching 52 cases (55.3%). The most clinical feature was having rash 90 (95.74%), fever 86 (91.5%), conjunctivitis 67 (71.3%), Koplik spot 45 (47.9%) and the least were cough 60 (60.8%). regarding measles cases by place category, the most cases of outbreak in Kabul province were recorded in urban areas, 53 cases (56.4%) and the number of outbreak cases in rural areas of Kabul was 41 cases (43.6%). Among the number of the cases, 18(19.15%) were vaccinated. Each outbreak was confirmed by taking few samples and testing in public health laboratory. Most cases of outbreak in Kabul province were recorded in urban areas, 53 (56.4%). No death was reported in these 12 outbreaks. The most

important response measures included coordination with stakeholders, case management, health education, and on-the-spot vaccination.

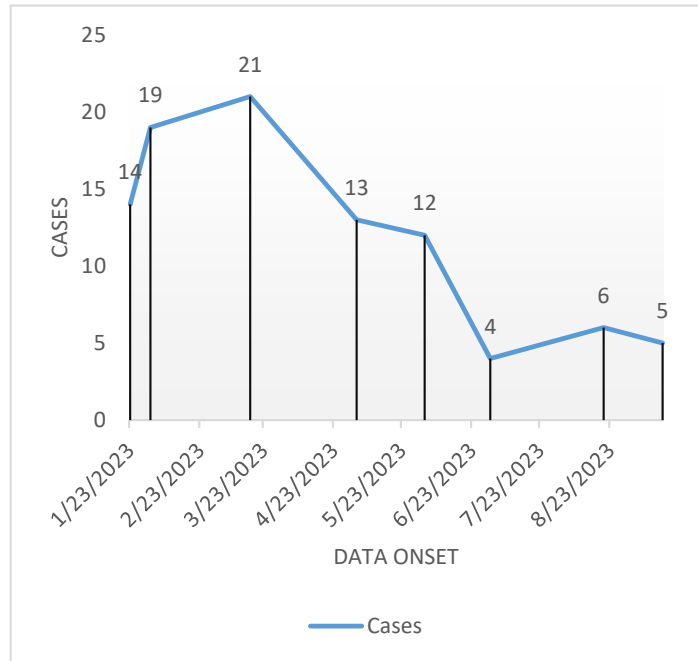


Figure 1: Clinical Feature of Measles Outbreaks Cases Kabul, Afghanistan 2023.

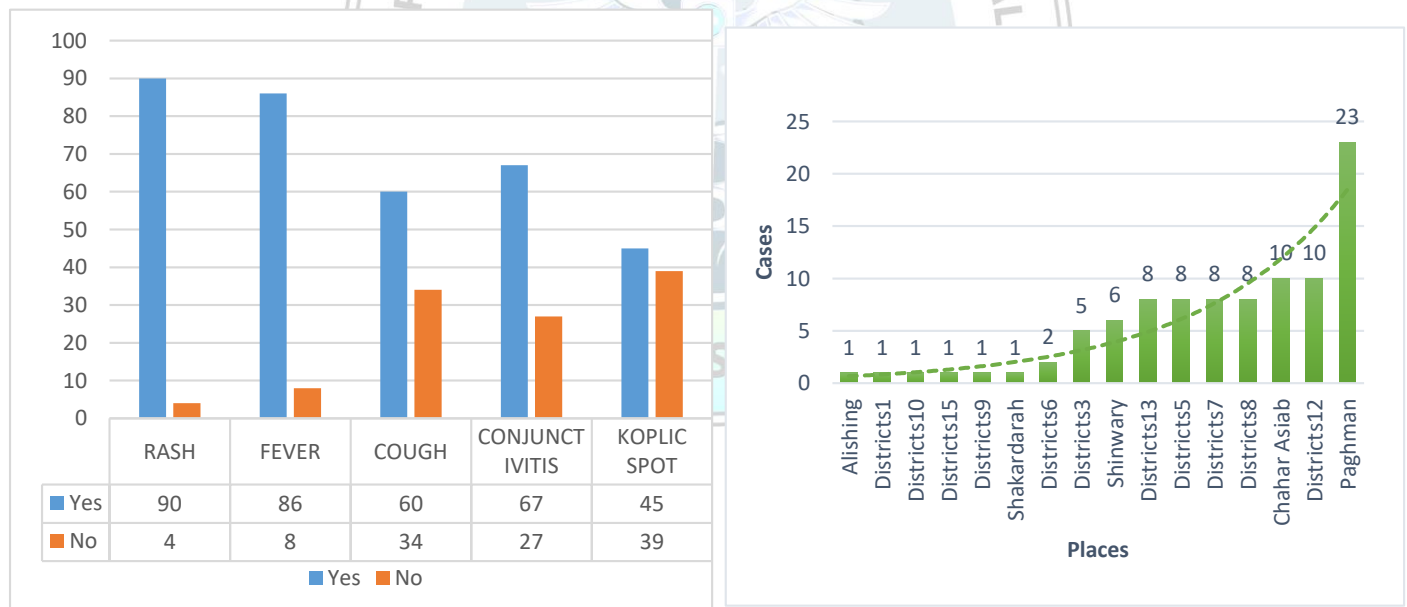


Figure 2: The Epidemic curve of measles outbreaks in Kabul, Afghanistan, shows the number of reported cases of the disease over time 2023.

Figure 3: Illustrates the distribution of measles outbreak cases across different districts of Kabul, Afghanistan, in 2023. The data highlights variations between urban and rural areas, showing higher case concentrations in specific locations.

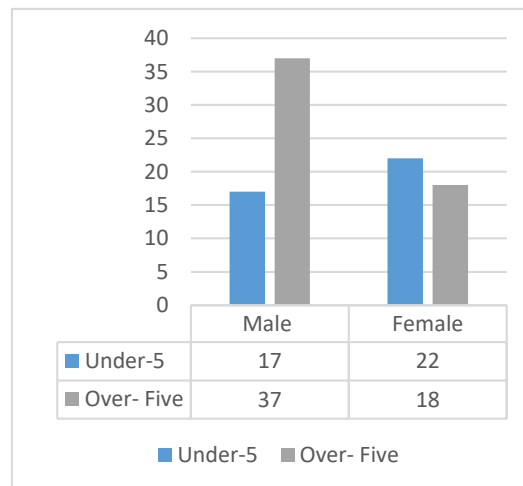


Figure 3: Gender of Measles Outbreaks Cases Kabul, Afghanistan 2023.

Discussion

The findings of this study show the epidemiological pattern of a measles outbreak in Kabul, Afghanistan in 2023. A total of 94 confirmed cases of measles were reported, with a higher proportion of cases in males (57.4%) than females (42.6%). The disease burden in children under 5 years of age (55.3%) was higher than in older age groups, consistent with the global trend of younger children being more vulnerable to measles infection due to lower immunity [8]. This pattern is consistent with the findings of other studies in neighboring countries such as Pakistan and Iran, where measles primarily affects younger children due to gaps in vaccination coverage and reduced maternal immunity [9].

The seasonal variation seen in the outbreak suggests that environmental factors, migration patterns, and access to health care influence measles transmission. Most of the cases were recorded in urban areas (65.4%), likely due to higher population density and increased contact with infected people. However, there is also a large outbreak in rural areas (43.6%), suggesting potential gaps in vaccination coverage and access to healthcare. Similar trends have been reported in other provinces of Afghanistan, such as Kandahar and Helmand, where urban areas experience higher infection rates due to overcrowding, while rural areas have limited access to vaccination services [10]. One of the main findings of this study was the low vaccination coverage in outbreak cases, with only 19.15% of cases receiving measles vaccination. This low rate indicates missed opportunities in routine immunization programs and the need for targeted catch-up campaigns. Compared to measles responses in regional countries, such as India and Bangladesh, where aggressive complementary immunization measures have significantly reduced measles incidence, Afghanistan still faces significant challenges in achieving optimal immunization coverage [11]. Clinical features observed in outbreak cases were consistent with typical measles symptoms, with rash (95.74%) and fever (91.5%) being the most common. Notably, Koplik spots were reported in almost half of the cases (47.9%), highlighting the diagnostic importance in identifying measles cases. These results are comparable to studies of measles outbreaks in other settings, where fever, conjunctivitis, and rash are the most prominent symptoms [12]. The response to the outbreak in Kabul was primarily focused on stakeholder coordination, case management, health education, and on-site



vaccination. Rapid response measures such as laboratory confirmation and vaccination campaigns played a key role in containing the spread of infection. However, strengthening active surveillance systems and ensuring higher vaccination coverage in at-risk districts remains crucial to reduce future outbreaks. Comparative data with other states and countries indicate that stronger vaccination programs, improved surveillance, and rapid response mechanisms are essential to achieve the goal of measles elimination. The experiences of countries with successful measles elimination programs, such as Sri Lanka and Bhutan, highlight the importance of sustained vaccination efforts, community engagement, and effective outbreak response strategies [12].

This study has several limitations. It is based on secondary data, which may lead to biased reporting. The short study period (March to September 2023) limits the analysis of long-term trends. Furthermore, the lack of genetic sequencing limits our knowledge of the transmission of the virus. Nevertheless, the results highlight important trends in the measles epidemic in Kabul and the need for improved vaccination and surveillance.

Conclusion

Measles outbreaks affected urban districts and it were more reported among children Over the 5 years. The health authorities should focus on routine immunization and launching campaigns in urban areas where outbreaks occurred. More studies to find the root causes and elimination of disease, strengthening the surveillance system for measles is recommended.

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