



Measles Resurgence in Iran: A Preventable Public Health Crisis

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Measles is an extremely contagious viral infection caused by the measles virus, yet it is preventable through effective immunization. For several decades, robust vaccination efforts allowed for the establishment of herd immunity, culminating in the Ministry of Health and Medical Education of Iran declaring in 2019 that the country had achieved measles elimination (1). Unfortunately, this progress was undermined as measles made an alarming resurgence, with a significant number of outbreaks reported in recent years, particularly in border areas (2). This resurgence represents a serious public health threat, exposing inadequacies in vaccination coverage, healthcare access, and disease surveillance systems (3). This editorial delves into the underlying factors driving the outbreak, examines its implications, and calls for urgent, decisive actions to curb the further spread of this preventable disease.

The World Health Organization (WHO) has alarmingly reported a rising trend in measles cases in Iran over the past few years, with incidents escalating from 103 in 2021 to 230 in 2022, surging to 648 in 2023, and somewhat stabilizing at 449 in 2024 (4). Most of these cases have emerged from border provinces, particularly Sistan & Baluchestan, Khuzestan, Hormozgan, and Khorasan (5). Most of these regions are situated along borders with Pakistan, Afghanistan, and Iraq, all of which report huge numbers of measles cases annually (4, 6).

Several critical factors contribute to this resurgence:

- Decreased vaccine coverage: The coronavirus disease 2019 (COVID-19) pandemic has led to a dramatic decline in routine measles vaccination rates. Factors such as lockdowns, limited access to healthcare services, a redirected focus on controlling the pandemic, and

rising vaccine hesitancy have exacerbated the situation. As a result, countless individuals, especially those in vulnerable populations, are now at an alarming risk of contracting measles (7, 8).

- Cross-border transmission: The influx of migrants and refugees, especially from Afghanistan — where vaccination coverage is critically low and inadequate for establishing herd immunity — has created a perfect storm for the spread of measles in border provinces (2, 6). Alarmingly, a substantial portion of reported cases in Iran involves individuals of Afghan nationality, highlighting the urgent need for action (5).

- Delayed response to outbreaks: Ineffective surveillance in remote areas has allowed the measles virus to spread undetected, hampering timely containment efforts and intensifying the outbreak. It is imperative that we address such deficiencies to protect public health and prevent further escalation of this preventable disease (9).

Measles stands out as one of the most contagious human viruses, with a basic reproduction number (R_0) ranging from 12 to 18. This alarming statistic indicates that a single infected individual can potentially spread the virus to 12-18 other people in an unvaccinated population. The ongoing outbreak underscores critical deficiencies in herd immunity, which necessitates at least 95% vaccination coverage to effectively thwart outbreaks (10).

What makes the current resurgence of measles especially troubling is Iran's past success in eliminating the disease. For years, the country achieved impressive immunization rates; however, pandemic-related disruptions to healthcare, economic challenges, and rampant vaccine misinformation have significantly

eroded that progress. This situation demands urgent attention to restore and maintain effective vaccination efforts and protect public health (11).

The resurgence of measles poses multiple clinical and public health threats that cannot be ignored. High-risk groups, including unvaccinated children, immunocompromised individuals, and those suffering from malnutrition, face a heightened risk of grave complications such as pneumonia, encephalitis, and even death if they become infected (12, 13). Overall, the case fatality rate for measles is alarmingly high, ranging from 2% to 3% (13). Additionally, the ongoing outbreaks are placing immense strain on healthcare facilities and hospitals, diverting critical resources away from urgent medical needs (14).

If decisive action is not taken to control these outbreaks, Iran could regress from its hard-earned status of measles elimination to a dire state of emergency. This would squander years of dedicated efforts to eliminate measles both on a national and global scale, jeopardizing the health and safety of countless individuals.

Despite the daunting challenges ahead, there is a powerful opportunity to bring the resurgence of measles in Iran under control through a series of impactful actions:

- Launch urgent vaccination campaigns: We must significantly enhance vaccination coverage to achieve herd immunity swiftly. Rapid door-to-door initiatives and mobile clinics will be instrumental, particularly in high-risk border regions and among unvaccinated refugees and migrants (8, 11).

- Vaccinate healthcare workers: Healthcare workers are classified as a high-risk group and must be vaccinated to effectively reduce the risk of infection and transmission of the virus to others (15). The latest directive from the Deputy Health Minister of Iran's Ministry of Health mandates that all healthcare workers under the age of 50 who are unvaccinated, have an unknown vaccination status, or possess insufficient antibody titers against measles must receive two doses of the vaccine, administered one month apart. Compliance with this directive is essential for protecting both healthcare workers and the communities they serve.

- Enhance surveillance systems: It's imperative to establish a robust surveillance system that enables the early detection of cases, effective contact tracing of infected individuals, and genomic sequencing. By equipping our laboratory facilities, we can adeptly monitor transmission patterns and respond proactively (3).

- Foster cross-border collaboration: Coordinated efforts with neighboring countries are vital to synchronizing vaccination initiatives and sharing critical outbreak data. Additionally, we must take resolute steps to prevent illegal migration by fostering cross-sector cooperation and meticulously monitoring the vaccination status of migrants at border crossings (11).

- Empower community engagement: To combat the spread of misinformation and vaccine hesitancy, it is crucial to involve knowledgeable and trusted experts in compelling social media campaigns. By disseminating accurate information, we can effectively dispel doubts and build public confidence in vaccines (8).

- Mobilize international support: The WHO and the Global Alliance for Vaccines and Immunization (GAVI) must step forward with essential emergency funding and vaccine supplies to bolster Iran's efforts in addressing this outbreak. Together, we can turn the tide against measles and protect the health of our communities (3).

The resurgence of measles in Iran is a critical alarm for global health. Measles does not recognize borders, and its return serves as a stark reminder of the vulnerability of vaccination programs in the face of conflict, migration, and rampant misinformation (8). Immediate and decisive action is urgently needed to restore immunization coverage, enhance surveillance, and thwart further outbreaks (11). We have the tools to eradicate measles; what is now essential is strong political commitment and unwavering dedication to public health to implement these tools effectively.

Footnotes

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