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Report from the Field

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Abstract

After the beginning of the Syrian crisis, increased rates of infectious diseases were reported. Lebanon, a neighboring country with a major socioeconomic crisis, witnessed a measles outbreak since July 2023, with 519 reported suspected cases. Half of the cases were under 5 y of age, most of them were unvaccinated. The mass displacement of refugees from conflict areas in Syria to Lebanon and the low vaccination coverage have made the situation more challenging. Further efforts are required in Lebanon to address identified gaps to prevent or at least better control future outbreaks.

After the beginning of the Syrian crisis, increased rates of infectious diseases were reported in Syria and other neighboring countries hosting displaced refugees from Syria.^{1–4} The emergence of tuberculosis, measles, mumps, hepatitis A, leishmaniosis, cholera, and polio were observed.^{1–4}

Lebanon has the largest immigration rate per capita in the Mediterranean region. Just after the Syrian migration, studies reported simultaneous increase in infectious diseases in Lebanon.^{1,3,4} In the year 2012, Tuberculosis cases increased by 27% with a total of 630 cases reported, the numbers kept on increasing until the year 2014.⁴ Measles cases were very low in the years 2011 and 2012 with 10 cases reported every year, then went up to 1760 cases in the year 2013.^{1,4} Similarly, a rapid increase in the cases of Hepatitis A were reported in the years 2013 (1551 cases) and 2014 (2582 cases), mainly in the areas with the highest refugee concentration that are close to the Lebanese—Syrian border.¹ Since 2019, the country has suffered from political instability and a major socioeconomic crisis that is further increasing the burden on the health-care system and, hence, has increased the risk of communicable diseases. This can be seen in the recent major outbreaks of cholera, hepatitis A, and measles.^{1,5} The cholera outbreak started in Syria in 2022. Immediately after, numbers started to rise in Lebanon, with 5105 suspected cholera cases in December 2022.⁵

Worldwide, 36 cases of measles per 1 million persons are reported each year.⁶ Per 1000 children who get measles, 1 or 2 will die from it.⁶ Little literature is available regarding the epidemiology of measles in Lebanon.⁷ These reports should be published to spread knowledge of these diseases and the vulnerability of specific population. This report aims to address specific gaps in the country: the socioeconomic situation of the displaced population, the incomplete measles vaccination coverage, and the delay in interventions needed.

Discussion

Measles is a vaccine-preventable disease spread through person-to-person contact and airborne transmission. It is among the most contagious infections affecting humans, with a basic reproduction number (R0) of 12–18, that is, 1 measles case can infect 12–18 others over the course of its infectious period, in a previously uninfected and susceptible population.⁸ Common symptoms of measles are fever, rash, cough, runny nose, and conjunctivitis.⁸ Despite the availability of vaccines against measles, major outbreaks are still being recorded worldwide.⁹ In fact, measles has a high herd immunity threshold, ranging between 89% and 94%, and it is challenging for several countries to vaccinate sufficient individuals to reach the disease elimination potential.¹⁰

Lebanon has experienced several measles outbreaks over the past 20 y.⁷ Data from the Lebanese Ministry of Public Health Epidemiological Surveillance Unit show that measles outbreaks are still ongoing in Lebanon.⁷ On average, 10 cases of measles were reported annually in Lebanon between 2010 and 2012.¹¹ In 2013, a measles outbreak of 1760 cases occurred; the reported strains were B3, D8, and H1. Note that 13.2% of these cases were in Syrian refugees, and this outbreak coincided with a massive influx of this population.^{4,11} In 2018, another outbreak was reported with 952 and 1070 cases in 2018 and 2019, respectively, 12.7% of which were Syrian refugees.^{4,11} The geographic distribution of measles cases was the highest in the Beqaa (44.5%) and North (34.4%) governorates.¹¹ New strains, like the B3, a more transmissible genotype, are becoming increasingly widespread, leading to new epidemics worldwide.⁷

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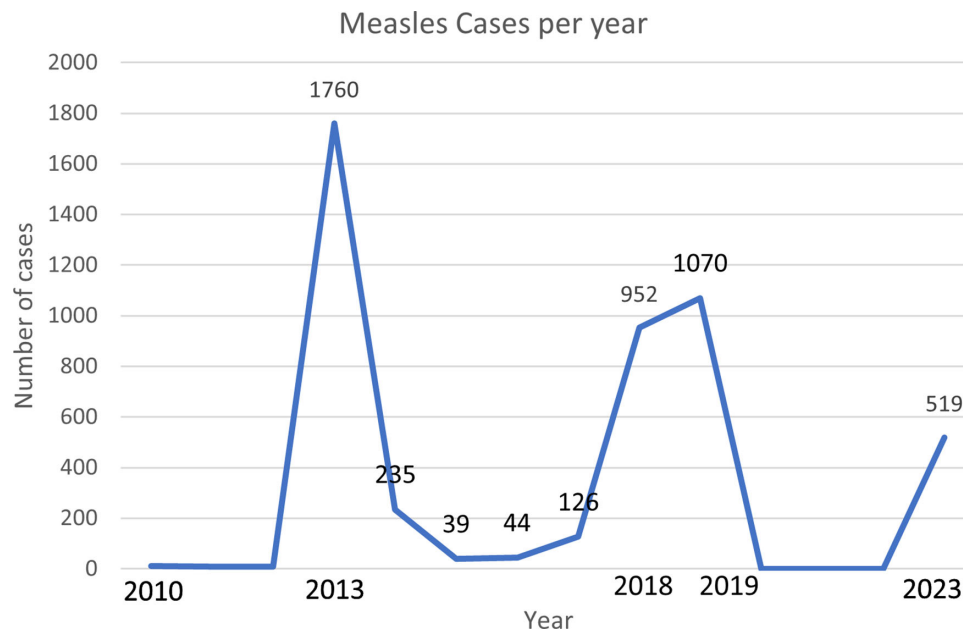


Figure 1. Measles cases per year.

Lebanon witnessed another measles outbreak in 2023, illustrated in Figure 1. Up to July 28, 2023, a total of 519 rash cases were reported as possible measles, 257 of which were discarded. Among the remaining 262 cases of measles, 146 were lab-confirmed.¹² Of these, 53% of cases were under 5 y of age, with an attack rate of 27/100,000 for this age group. Note that 24% of cases were inpatients. Furthermore, 77% of the measles cases with known status were unvaccinated. The highest attack rates were in Baalbeck Hermel (17.7/100,000), Akkar North (6.8/100,000), and Nabatieh governorates (5.4/100,000).¹²

While the pattern of the measles outbreaks of the years 2013 and 2018 was similar in their presentation and geographical distribution, less transmission was documented in the recent outbreak of 2023 reflecting possible partial herd immunity.

The ease of measles transmission, its free circulation through travelers, the mass displacement of refugees from conflict areas in Syria to Lebanon, and low vaccination coverage have made the situation more challenging.²

Population Displacement

The Syrian crisis has significantly impacted public health in Lebanon. Lebanon is currently hosting the highest concentration of refugees worldwide.¹³ The influx of more than 1 million Syrian refugees into Lebanon who are living in poor sanitary conditions has created a favorable medium for the circulation of several infectious diseases.² Several infectious disease outbreaks have been noted in Lebanon in correlation to the huge influx of Syrian refugees into the country.² The overcrowded Syrian population in these areas might have promoted measles transmission.¹¹ The majority of displaced Syrian refugees lived under crowded conditions with poor infrastructure, without access to proper hygiene and sanitation.¹ The influx of Syrians has overwhelmed the Lebanese health system. The need of primary health-care services increased by 50%, mostly for women and children, overwhelming Lebanese public hospitals. Hence, the situation hindered the refugees' access to health-care services.¹

Immunization

The immunization schedule for measles was revised in March 2014, whereby children were to receive a zero dose (MCV0) at 9 mo, followed by a first dose of MMR (including the first dose of the measles vaccine [MCV1]) at 12 mo and a second dose of MMR (including the second dose of the measles vaccine [MCV2]) at 18 mo.⁷ The estimated global coverage of MCV1 has seen a significant rise from 72% in 2000 to 85% in 2010,¹⁴ but Lebanon is still among countries with <90% coverage with MCV1.¹⁵ The data show that, of individuals in Lebanon who contracted measles between 2003 and 2018, an average of 9.66% were vaccinated against the virus, 38% had an unknown vaccination status, and a mean of 52.26% were confirmed as nonvaccinated.⁷ In 2019, Kmeid et al. evaluated the vaccination status of 571 Syrian and Lebanese children. They demonstrated low compliance with the measles vaccine (55-70%) and a higher compliance with the MMR vaccine (96-100%). The lack of vaccination among children is a major cause of the outbreak.³ Socioeconomic factors play a major role in vaccination compliance, and contracting measles is itself associated with a significant economic burden. A recent study found several factors that hinder vaccination, including socio-demographics, knowledge, beliefs, and practices associated with age-appropriate vaccination.¹⁶ Different factors contribute to the low vaccination coverage in adults. Lack of knowledge and hesitancy are common causes. A study conducted recently about perception of vaccination in Lebanese adults showed that 25.6% are not aware of the need of vaccines and 27.9% thought it is not indicated.¹⁷ Adults have concerns and fear about vaccination products. Around 40% agree or are uncertain whether vaccines contain harmful chemicals and around 50% believe that vaccines can trigger diseases.¹⁷ The possibility that nonvaccinated individuals may be clustered together should be considered, suggesting that the estimated vaccination coverage rates do not reflect the status of the general population but rather represent that of a higher-risk subpopulation.

Prevention

Vaccination campaigns are a quick and effective method of catching up with the vaccination status of children when this appears to be suboptimal.¹³ However, campaigns are logistically and financially challenging and cannot replace routine vaccination services, which require reinforcement.¹³

In addition, regardless of vaccination status, active surveillance of measles contacts should be implemented. In fact, secondary measles contraction in vaccinated individuals can present with atypical symptoms, leading to viral circulation in the absence of active monitoring.

The surveillance system in tracking vaccination status must be improved through encouraging families to retain home-based records. This is to be bolstered by routine revaccination of high-risk individuals, including health-care workers and contacts of measles cases. Based on our data, the outbreaks in Lebanon were detected and the numbers were adequately reported, despite having the highest number of refugees per capita. A World Health Organization (WHO) assessment mission was conducted in 2016 to assess the national surveillance system in Lebanon, results showed compliance of 93%.³ It is essential to keep active surveillance even in these difficult times to control this outbreak. Awareness should be created and invested in to target different audiences and inform them of the importance of vaccination.

Measles outbreak has spread by means of a population movement across the borders. Awareness and prevention should be conducted within Lebanon and the neighboring countries to prevent spread. International collaboration and assistance in implementing effective prevention strategies (like vaccinating refugees crossing from country with an outbreak) is needed.

The resurgence of measles is multifactorial. Several factors can be responsible for the transmission and resurgence of measles: population density, inter/intra-age contact, timing of vaccination, and waxing conferred immunity.

Conclusions

Lebanon is facing a major outbreak of measles. This report will add to the epidemiology of measles outbreaks and their prevention through available modalities. Measles is a vaccine-preventable disease. Active surveillance, education of public and health sectors, and quarantine are important at this stage. We should also consider mass vaccinations and reinforce primary vaccination. These measures should be implemented immediately and should be considered as an urgent national public health intervention to prevent future outbreaks in the country.

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