

The elimination of measles in Iran



Measles is a febrile disease that is considered to be one of the world's most contagious viral diseases. Despite the existence of a safe, available, inexpensive, and highly effective vaccine, measles is still a global imperative, causing more than 100 000 deaths per year, which could be prevented through vaccination.¹

In 2019, when the Eastern Mediterranean region was experiencing its greatest upsurge in measles cases, Iran received a certificate for measles elimination in October 2019. Iran, with a population of approximately 82 million, is the third country in the Eastern Mediterranean region that has achieved the status of measles elimination, after Oman and Bahrain, both of which have a relatively small population. However, without sustained attention, this certification can be taken away. The challenge for Iran is to maintain the interruption of measles transmission by sustaining a high population immunity. In 2018 and 2019, several countries in the European and Americas region lost their measles elimination status and therefore, great attention should be paid to this matter. Notably, Iran also received the certification for rubella elimination in May, 2019. The number of rubella cases had dramatically decreased from 1154 cases in 2000, to 33 cases in 2018. Here we summarise the successful components of Iran's measles elimination strategy.

In 2003, Iran began implementing one of the largest mass immunisation campaigns against measles and rubella. Similar mass catch-up measles immunisation campaigns have been done in countries around the world, but in smaller populations or with a lower vaccination coverage.²⁻⁷ Much like the Pan American Health Organization's measles elimination vaccination strategy, Iran's national campaign consisted of three phases.⁸

The first phase, also known as the catch-up phase, began on Dec 6, 2003, and was targeted at those aged from 5 years to 25 years. At that time, the measles vaccine was administered in two doses, one at 9 months and the other at 15 months of age, as per the routine national immunisation programme. Due to this campaign, within a month, the vaccination coverage reached more than 100% in the target group and a total of 33 579 082 people were immunised. Several factors contributed to the success of this nationwide mass

vaccination campaign. The programme was advocated by the country's supreme leader and president and coordinated with the assistance of the Ministry of Health and subordinate organisations of the UN, such as UNICEF and WHO. Intersectional collaborations were developed between governmental authorities, including the Armed Forces, Red Crescent, Ministry of Education, Islamic Republic of Iran Broadcasting, Ministry of Science, Research and Technology, Serum Institute of India (vaccine producer), and many others. An important step in the programme was vaccine procurement and management. 40 million doses of vaccine were supplied at high-quality levels and stored in cold chain equipment for transportation to urban and hard-to-reach rural areas. Due to safety reasons, auto-disable syringes were used for the injection of measles-rubella vaccines. Micro plans were separately designed for each province. The campaign was managed by high-ranking experts of the Ministry of Health at the national level and expert observers at the district and university level. National and international health experts conducted, supervised, and technically assessed the process of the immunisation and its outcome, such as the serum level of measles and rubella antibodies in vaccine recipients. All the adverse events following immunisation were recorded from the time of vaccination until 1 month after vaccination. Fortunately, the prevalence of adverse events was very low. After the first phase, the number of measles cases reduced from approximately 11 000 cases in 2003, to less than 100 cases in 2004, which continued to persist in subsequent years.⁹

The second phase, also known as the keep-up phase, began immediately after the first phase and aimed to maintain the measles and rubella immunisation coverage at more than 95%, which has been successfully sustained since 2003. Every year, a few cases of people with measles are reported in rural and urban areas as localised outbreaks, with an average number of 10–20 measles cases in each outbreak. Immediately after the introduction of an outbreak, a keep-up vaccination was done; the largest of these was carried out extensively in the southeast of Iran in 2015, due to increases in measles prevalence and non-Iranian travellers.

By the third phase, also known as the follow-up phase, the number of measles cases reduced substantially. Measles elimination is defined as the absence of endemic measles virus transmission in a defined geographical area for 12 or more consecutive months in the presence of a high-quality surveillance system. If a country maintains the interruption of endemic measles virus transmission for a period of at least 36 months from the last known endemic case, it will meet the verification criteria for measles elimination. Thus, in 2018, we requested an elimination certificate after the presentation of our documents to WHO, and we were certified in October 2019, in Tunisia.

The global coverage of the first dose of measles vaccine has plateaued at 85%, and the coverage of the second dose has risen steadily to 67%; however, these rates still remain insufficient to prevent outbreaks.¹⁰ Elimination of measles is a global health priority because as long as the virus continues to circulate in any region of the world, travel-related infections will be unavoidable, unless supplemental immunisation programs are implemented in highly vulnerable populations.

We declare no competing interests.

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