

Smallpox

Annual Epidemiological Report for 2019

Key facts

- Smallpox was declared eradicated in 1980. There were no reports of possible, probable or confirmed smallpox cases in the EU/EEA for 2019.

Smallpox was a systemic disease, officially eradicated since 1979 (WHO), caused by infection with the Variola major virus. The only reservoir for the virus was infected humans.

The infection was usually transmitted via inhalation of droplets. After an average incubation period of 12 days, a high fever accompanied by non-specific general symptoms abruptly appeared. The fever then receded and a characteristic skin eruption appeared. Subsequently the fever rose again, and serious complications generally developed (pulmonary, cardio-circulatory, neurological, etc.), resulting in death in up to 50% of cases. Survivors who overcame this phase would see the rash resolving, leaving permanent scars. No effective therapy was available. The disease was preventable by an effective live-attenuated vaccine, whose large-scale use led to its eradication.

Methods

This report is based on data for 2019 retrieved from The European Surveillance System (TESSy) on 9 October 2020. TESSy is a system for the collection, analysis and dissemination of data on communicable diseases. For a detailed description of methods used to produce this report, refer to the *Methods* chapter [1].

An overview of the national surveillance systems is available online [2].

In 2019, 30 EU/EEA countries reported data on the occurrence of smallpox (Liechtenstein did not report). Twenty-five countries used the EU case definition, three countries (Denmark, Germany and Italy) used an alternative case definition and two countries (Belgium and France) did not specify the definition they used. Surveillance is comprehensive in all countries.

Epidemiology

There were no reports of possible, probable or confirmed smallpox cases in the EU/EEA for 2019.

Discussion

Smallpox is caused by the *Variola* virus, a member of the *Orthopoxvirus* genus of the *Poxviridae* family [3]. The last known natural case was in Somalia in 1977 and, in 1980, the World Health Organization (WHO) declared smallpox eradicated [4]. Due to its high risk level associated with the threat of bioterrorism, viable variola virus is kept at only two maximum security laboratories, one in the USA and one in Russia, where diagnostic tests, antiviral drugs, and safer vaccines are developed [3].

Public health implications

Since the disease was eradicated, mass smallpox vaccination campaigns have ceased. Consequently, a large part of the population worldwide is immunologically naive to the virus, which renders variola virus suitable for use as a biological weapon. Therefore countries still need to consider preparedness in order to be able to deal with any accidental or intentional release, or natural re-emergence of the virus [5].

References

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3. Meyer H, Ehmann R, Smith GL. Smallpox in the Post-Eradication Era. *Viruses*. 2020 Jan 24;12(2).
4. World Health Organization (WHO). Smallpox questions and answers Geneva: WHO; [updated 28 June 2016 and 18 November 2020]. Available from: <https://www.who.int/news-room/q-a-detail/smallpox>
5. Petersen BW, Damon IK, Pertowski CA, Meaney-Delman D, Guarnizo JT, Beigi RH, et al. Clinical guidance for smallpox vaccine use in a postevent vaccination program. *MMWR Recommendations and reports: Morbidity and mortality weekly report Recommendations and reports*. 2015 Feb 20;64(RR-02):1-26.