

## Hot News

### Alert for polio outbreaks in developed countries

Since the beginning of 2022, two cases of paralysis due to poliovirus have been reported in Jerusalem (February) and New York (June) (Link-Gelles et al., *MMWR 2022*).

Polio was a terrible and frequent illness until half a century ago. It is produced by an RNA virus that is transmitted mainly by the fecal-oral route, mostly involving contaminated water. Although many cases are asymptomatic, some patients develop neurological damage, with neuronal destruction in the spinal cord. Flaccid paralysis of the lower extremities occurs irreversibly in 1 out of 200 infected persons, mostly non-immune children. The most severe forms, with encephalitis, can be fatal.

After World War II, the vaccine injected with inactivated viruses (Salk's vaccine) and, a decade later, the oral vaccine with attenuated viruses (Sabin's vaccine) managed to eliminate the infection in much of the world. However, it is still endemic in Afghanistan and Pakistan, where vaccination coverage is insufficient. Wars and the COVID-19 pandemic have worsened access to vaccines in other Third World countries, such as Yemen, where polio outbreaks have been described in recent years.

In Western countries, about 6% of 6 years-old are not vaccinated and are susceptible to infection. Since the beginning of the year, the study of wastewater in London, New York, and Jerusalem has reported the presence of polio virus (Guglielmi G., *Nature 2022*). In all cases, it is the attenuated variant used in the oral polio vaccine (Sabin's vaccine). Health authorities have undertaken campaigns to boost vaccination of all children aged 1 to 9 years (Ledford H., *Nature 2022*).

Although the oral polio vaccine (Sabin) is more effective than that of inactivated viruses, it can occasion-

ally cause disease, following the selection of mutations in the attenuated virus. The recent outbreak is mostly caused by these mutated vaccine-derived variants (Hill et al., *Lancet 2022*). Therefore, the vaccine injected with inactivated viruses (Salk) is currently the most widely recommended. However, although it prevents the development of disease, it does not block infection and transmission of the virus.

The WHO approved 2 years ago a new formulation of the oral vaccine, with a new attenuated virus that incorporates a hypermutagenic system, which avoids the risk of reversion to virulent forms. It has already been administered to more than 100 million people and is expected to be recommended in health emergency situations.

The fight against infectious diseases has three fundamental pillars. The first is hygiene and prevention of the risk of exposure. The second is vaccines, which block infection (sterilizers) or protect from severe forms. The third weapon against viral infections is antiviral drugs (Soriano et al., *Future Microbiol 2022*). A clever combination of all these weapons must be undertaken to halt the human risk of new and re-emerging infectious pathogens.

In a globalized world, with significant migratory flows, it is important to keep active: (1) health surveillance systems; (2) ensure high vaccination rates, to prevent the resurgence of outbreaks of viral infections that we thought were controlled; and (3) have sufficient stocks of antivirals for immediate use if needed. Looking at the ongoing polio outbreak (Lai et al., *E Clinical Medicine 2022*), it seems that pushing vaccination efforts will be the most effective strategy everywhere.

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