Vaccination strategies and policies: What can be done by whom, when and where?

by Samantha Vanderslott

Future generations will think we were completely unprepared for a predictable pandemic. We had numerous warnings from AIDS, Avian flu, SARS, MERS, Ebola, Zika[1] that should have acted as a catalyst for better preparedness. In the end, complacency and overconfidence, among other failures, led to disastrous handling. According to Sydney's Lowy Institute Europe, five South American countries (Peru, Mexico, Colombia, Argentina, Ecuador), Iran – which was hit badly in the first wave, and the US – which had the highest number of deaths, fared the worst on six criteria.[2] The criteria included confirmed cases, confirmed deaths and testing metrics (note Brazil and China were not included in the ranking due to lack of available data).

However, what did go well and was an exceptional health achievement, was the development of safe and effective vaccines against SARS-CoV-2, which happened much quicker than for previous vaccines, and will set standards for vaccines in the future.[3,4]

COVID-19 vaccines against SARS-CoV-2 were developed quickly because they built on existing research that has sought to understand coronaviruses.[5] For example, the Oxford-AstraZeneca

vaccine used learning from developing a vaccine for MERs, which was already in early-stage clinical trials. Also, the mRNA vaccines have come of age at the right time. While these technologies are new, they have been researched over the past decade in other trials and have offered the opportunity for fast development. Having Chinese scientists find and publish the SARS-CoV-2 virus genetic sequence sped up the initial phase of determining how to produce an immune response.[6]

The resources, funding, and focus that a global pandemic has brought meant that time was not wasted waiting for funds or making the case for research attention.[7] Arranging for industry partners and organisation of international testing sites has happened much more easily because of the concentration of efforts. There has not been an issue with the recruitment of trial volunteers either, as people have been very willing to take part. The number of people these vaccines have been tested on in fact constitute a higher number and from a broader range of countries than is usual for vaccine testing. Such an emphasis on fast working has also meant that stages of the trial overlapped, and the vaccines were manufactured at risk, so the quantities needed for each stage and for the anticipated rollout have already been produced. The advance purchase agreements and pre-orders are additionally bolstering the funding for the vaccine developers.

Regulatory agencies have also been working very closely with vaccine developers. Regulatory agencies in the United States, Europe, and Japan, in particular, have a historically developed capacity in regulating pharmaceuticals.[8] As vaccines are normally given to healthy people, they are among the most closely evaluated medical products. Even before trials begin, they have to pass ethical review boards to be allowed to begin – and data and safety monitoring boards independently assess the trial throughout.[9] Regulators are able to set out what requirements of efficacy and safety data they will be expecting for approval.

In addition, regulators have been conducting in-time assessments as a 'rolling review', so instead of waiting for data to be sent at one time, they have been receiving this incrementally as they become available. Rolling reviews are a tool that regulators use to speed up the assessment of a promising medicine or vaccine during a public health emergency.[10] The process happens before a formal application for authorisation is submitted.

The development of vaccines cannot be a success in itself. Next comes producing enough vaccines at scale, making sure the rollout happens efficiently and people are willing to be vaccinated. Countries who negotiated the best supply deals with pharmaceutical companies have fared better,[11] but the lasting failing will be in vaccine nationalism and the vast vaccine inequity globally. The COVAX initiative (by GAVI, the Vaccine Alliance, the Coalition for Epidemic Preparedness Innovations, and the World Health Organization) to support research and development, raise funding, and negotiate the purchase and distribution of COVID-19 vaccines, was an attempt at avoiding such a situation.[12] However, it has not achieved the cooperation needed. Future pandemics will need better arrangements to ensure protection via vaccines throughout the whole world.

Notes

1 Reperant / Osterhaus 2017: 4470–4474.
2 Lowy Institute, Sydney n.d.
3 Almond / Hacker / Harwood et al. 2020.
4 Bloom / Cadarette / Ferranna et al. 2021: 410-418.
5 Vanderslott / Pollard / Thomas et al. 2020.
6 Amodio / Vitale / Cimino et al. 2020: 51.
7 Hanney / Wooding / Sussex et al. 2020: 61.
8 Fonseca / Jarman / King et al. 2021.
9 Yao / Zhu / Jiang et al. 2013: 94–106.
10 Mahase 2021.
11 Wouters / Shadlen / Salcher-Konrad et al. 2021: 1023–1034.
12 The Lancet 2021: 941.

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Dr Samantha Vanderslott is a University Research Lecturer at the Oxford Vaccine Group at the University of Oxford.
Email: samantha.vanderslott@paediatrics.ox.ac.uk