RESEARCH FOR VACCINES

Vaccines and vaccination: their power, their challenges

Vaccines are among the most powerful and cost-effective medical interventions ever introduced for the prevention of many infectious diseases. The World Health Organization (WHO) reports that each year vaccines save more than 2–3 million deaths from diphtheria, tetanus pertussis and measles\(^1\). Thanks to vaccination, smallpox has been eradicated, and many other diseases almost eliminated. Nonetheless, several EU countries are still facing outbreaks of measles and a comeback of other vaccine-preventable diseases\(^2\). There are also a number of major infectious diseases for which suboptimal or no vaccines exist (e.g. HIV, tuberculosis, HCV, emerging viral treats) and numerous are the challenges and unmet needs in vaccine research and innovation making the development of vaccines lengthy, complex and with high risk of failure.

What is the EU doing in the area of vaccination

The EU’s political commitment to support vaccination in general is laid down in the Commission Communication and Council recommendation on strengthened cooperation against vaccine-preventable diseases\(^3\) adopted in December 2018. This aims to increase vaccination coverage, foster support to research and innovation, and strengthen EU cooperation on vaccine-preventable diseases. Among the actions proposed is the establishment of a European Information Sharing System to gather knowledge and develop guidelines for a core EU vaccination schedule by 2020, and a European vaccination information portal by 2019 to provide online objective, transparent and updated evidence on the benefits and safety of vaccines. Furthermore, it aims to increase the effectiveness and efficiency of EU and national funding of vaccine R&D\(^4\).

What is the EC doing to meet the challenges in research and innovation

The Commission is strongly committed to address the scientific and social challenges where research, development and innovation are key to develop novel solutions and deliver new or improved vaccines. It is also strengthening the involvement of all relevant stakeholders in the research process (e.g. patient community, social scientists), as well as influencing policy-making by supporting the generation of high quality data for evidence-based recommendations.

In the current framework programme for research and innovation, Horizon 2020 (H2020), it has so far invested over €500 million on vaccine and vaccination research and development. Large projects are generating predictive tools and developing and selecting the most promising vaccine candidates against HIV, TB and malaria to be tested at an early stage of the process. Horizon 2020 also includes the development of vaccines against several neglected-infection diseases, influenza as well as the fast-track development of Zika and Ebola vaccines. The H2020 portfolio also includes projects tasked to evaluate vaccine effectiveness for influenza and pneumonia, and to establish a European vaccine R&D infrastructure supporting innovation for both prophylactic and therapeutic vaccine development based on a disease-overarching and one-health approach. Support has been given also to research to tackle risk communication and the behavioural approach towards vaccination.

\(^1\) WHO Immunization coverage, [http://www.who.int/immunization/](http://www.who.int/immunization/)
Other key initiatives

The European and Developing Countries Clinical Trials Partnership (EDCTP) launched in 2003 and currently at its second phase (EDCTP2, 2014-2024) with a budget of €1.3bn, is supported by 16 European countries, 16 African Countries and the Commission. It supports clinical trials and capacity building to fight HIV/AIDS, malaria, tuberculosis and neglected-infectious diseases in Africa. Clinical research, with several large-scale studies to test vaccine candidates, make up the bulk of the EDCTP2 portfolio.

The Innovative Medicine Initiative (IMI), a public-private partnership between the EU and European Federation of Pharmaceutical Industry and Association (EFPIA), created to speed-up the development of, and patient access to, innovative medicines and also in its second phase with a budget of €3.27bn, is substantially supporting vaccine research. IMI-funded consortia are developing vaccine safety and efficacy test systems with higher predictive values in the preclinical and early clinical phases, to prioritize candidates and guide development of next-generation vaccines, as well as working on late stage development of vaccine candidates for several pathogens (including Ebola), effectiveness studies, methodologies and assay standardization.

InnovFin Infectious Diseases (ID), a finance facility, launched jointly by the EC and European Investment Bank in 2015. It provides loans to innovative players to ensure that new drugs, vaccines and medical and diagnostic devices or research infrastructures for infectious diseases are made available faster; its portfolio includes a loan for the development of a universal flu vaccine.

Additional information

Horizon 2020: www.ec.europa.eu/programmes/horizon2020
Health research: www.ec.europa.eu/research/health

Contact: European Commission, DG Research and Innovation, People Directorate, Combatting Diseases Unit.

5 http://www.edctp.org/
6 https://www.imi.europa.eu/