

Emerging and re-emerging plagues: Is there a rising danger?

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As a result of dominant media coverage of new epidemic threats such as swine influenza, other infection risks receive less public attention than they deserve.

“We would like to bring to everybody’s attention that the infectious diseases with the most severe consequences continue to be old acquaintances such as [tuberculosis](#), HIV/AIDS, malaria and [hepatitis C](#). About six million people worldwide die of these diseases every year,” says Professor Dr. Dr. h. c. Stefan H. E. Kaufmann, Director of the Max Planck Institute for Infection Biology in Berlin, at the 2nd European Congress of Immunology ECI 2009. “We urgently need vaccines against these great epidemics!”

New risks are often perceived as more critical than those that have been known for a long time; the latter tend to be pushed aside. “[Swine flu](#) is a perceived threat in Germany at the present time, while tuberculosis, HIV/AIDS, malaria and hepatitis C are real threats,” says infection expert Kaufmann, who is also President of the European Federation of Immunological Societies EFIS* and Vice President of the International Union of Immunological Societies IUIS. With this remark, Kaufmann aims to correct distorted perceptions, while he does not intend to play down the relevance of swine influenza, which has killed about 3,500 people worldwide so far. “This flu can become more dangerous by further mutations, too - just like the [Spanish Flu](#) in 1918. But: Immunology today enables us to develop vaccines against it.”

Tuberculosis: Why a vaccine is urgently needed

As opposed to the flu, this has not sufficiently been achieved in the case of the above mentioned great epidemics. Vaccine development is a huge effort and such investments in research and development do not pay off very well, at least when it comes to neglected diseases. Among these neglected diseases is tuberculosis. At the start of the last century tuberculosis was the leading cause of death in Germany and Europe. In the 1960s, the disease was believed to have been overcome. Today, it is on the rise again, favored by the spread of AIDS, particularly in Africa, Asia and Eastern Europe. Moreover, it has taken on new forms which are resistant to traditional drugs. Each year, more than nine million people are newly infected with tuberculosis and two million people die from it.

At the initiation ceremony of World Health Day 2009 in April in Beijing, Margaret Chan, Secretary General of the World Health Organization (WHO), warned: “The present situation is alarming. It is threatening to become much worse very quickly ... If we do not fight against the new problem with all our might, we will soon encounter resistant pathogens in 95 percent of cases.” Factors promoting the development of multiresistant pathogens include premature termination of antibiotics treatment for disease and massive use of these drugs in animal farming.

Although a vaccine against tuberculosis, called bacillus Calmette-Guérin (BCG) vaccine, has been available since the 1920s, it protects only against tuberculosis in infancy, which typically takes a severe course, but not against the most common form of this disease, pulmonary tuberculosis. For several years now, several groups worldwide have been working to develop an improved tuberculosis vaccine. Kaufmann's team at the Max Planck Institute has developed a vaccine that is planned to succeed BCG one day. In preclinical models, this improved vaccine has

shown substantially better effectiveness and safety. The vaccine is currently in a phase I clinical trial in Germany carried out by the “Vaccine Project Management”. “But work on tuberculosis is time-consuming, so it will take about ten years at least for a new tuberculosis vaccine to be released,” Kaufmann emphasizes.

The renowned scientist has formulated strategies for global epidemics containment in readily comprehensible form in a book**. In this context, Kaufmann finds developments in his own country worrisome: “Although vaccinations range among the most cost-efficient medical measures, vaccine development often does not receive as much attention in the public as would be corresponding to its societal relevance,” he criticizes. “In many industrial countries, we are even seeing a growing vaccination gap, which is responsible, for example, for recurrent outbreaks of measles in Germany. “

Global philanthropists wanted

Since [vaccine](#) development is such a huge effort, Kaufmann suggests doing so in partnerships. In the process, it is important to develop, at a very early stage, strategies for distribution at affordable prices in poor countries such as guaranteed purchase of vaccines and global access strategies. So far, mankind has once succeeded in eradicating an infectious disease - smallpox. There is reasonable hope that the same can be done with poliomyelitis and measles. Although this is technically feasible, there are political, social and economic obstacles to this goal. In recent years, multidisciplinary organizations such as the Global Alliance for Vaccination and Immunization have facilitated basic immunization through large-scale programs in numerous countries of the world, regardless of their economic situation. “This is a great success of public-private philanthropic partnerships,” emphasizes Kaufmann.

In the past, vaccination has only been used as a means of controlling

[infectious diseases](#). In recent times, further areas of application are being explored thanks to the findings of modern immunology. Such applications include vaccinations against allergies, autoimmune diseases, and cancer.

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