

Managing bio-threat information under the WHO international health regulations of biosecurity

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Abstract

Sharing security threat information is a challenge for governments and their agencies. Especially in biotechnology and microbiology, the agencies do not know how to classify or to disclose collected information on potential bio-threats. There is vague border between man-made and natural biological threats. An example is the several month delays of the publication of research on the transmissibility of H5N1 avian influenza virus in the leading scientific journal science by researchers of the Erasmus Medical Centre in Rotterdam, Netherlands. The publication was delayed in 2012 by several months due to the fact that various organizations first wanted to investigate whether the details could be misused by malicious individuals. In the study, the researchers show that only a small number of mutations were necessary to change the H5N1 virus so that it can spread through the respiratory system between mammals. This implies that the risk of a H5N1 pandemic cannot be ruled out. On the other hand, this information can be used to develop new therapies and/or vaccines for influenza. It also gives insight into the disease mechanism, which helps in the prevention. The same arguments are valid for therapeutic antibodies, like the antibodies, which are developed to treat anthrax. They have an extreme high affinity for the lethal factors of the bacterium and stop the disease, but the same antibodies could be misused to select the most pathogenic strains.

Microorganisms have from nature itself the capacity to reorganize and change their pathogenicity, which could lead to a pandemic spread of a disease. But if the disease is too infectious and too deadly, like some stains of Ebola virus are, the lethality will be locally limited. But if the incubation time is longer in a certain strain of an Ebola virus, the risks on epidemics and even a pandemic is much higher. The knowledge of these natural mutation mechanisms could be misused to weaponies microorganisms. It enables the engineering of the lethality like it is done with some anthrax strains. Are these laboratory techniques considered as public science or should it be classified? Academics want to publish and to share information for the progress of science and to find useful applications. The Rotterdam scientist were really annoyed when their research was blocked for publication and feared that other groups would be first in publishing a part of their obtained experimental results. Biosafety is already common practice in microbiology, but biosecurity is often still questionable. A 'Code of conduct', like the Dutch Academy of Science has developed, would help; especially for the so-called insider risk. Educational programs for the identification and assessment of risks and threats to security have to be developed to give scientists bio-threat awareness and for government officials to rationalize the real threat, without damaging the progress of science.

This work is partly presented at [12th World Congress on Biotechnology and Microbiology](#)