Medical Xpress

Comment: Global Ebola threat demands a global solution

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As a virologist, I am often asked when science will come up with a solution to stop deadly viruses, such as the Ebola outbreak in Guinea. With collaborators I have helped to design and/or test over a hundred potentially life-saving antiviral drugs. These have led to patents and publications, which are the hallmarks of success in my profession. Yet not one of these drugs has ever made it from the lab to market.

Pharmaceutical companies are businesses - they last only as long as they can continue to make money. While a new wonder drug may be hugely profitable in the short-term, the financial health of a company depends on its drug development pipeline, the ability to bring a steady flow of new drugs to the market in the long-term. A company is only as strong as its pipeline.

For every virus-stopping drug that makes it to market, there were several more that dropped out during development. Many drugs that work well in sheets of cells that researchers use to grow viruses are completely ineffective in animals. Others go on to fail in people because they cause bad side effects, or are quickly broken down by the body's filter organs. Faced with these difficulties, it is a wonder that we have any new drugs at all.

So, developing new drugs that could treat diseases like Ebola is a financially risky proposition at best. It takes time to dream up ways to attack a virus. Often what appears to be its Achilles heel turns out to be armour plated. Viruses are adaptable and thick-skinned, finding ways to

surviving millions of years' worth of virus-crushing weaponry.

In their 1976 rock memento mori (Don't Fear) The Reaper, the Blue Öyster Cult make the point that death shouldn't be so frightening because it is constantly around us: '40,000 men and women everyday...' World population has blossomed since the seventies. Today about four times as many meet the reaper each day. The current Ebola outbreak is nearing a hundred deaths in a period of about a month. As shocking as it sounds, if all of those people died in a single day, together with all the victims of SARS, MERS, bird flu, swine flu, and half a dozen viral haemorrhagic fevers, they wouldn't produce a noticeable blip in the daily death statistics. As deadly as Ebola is, far more in Africa will die of malaria, tuberculosis and the complications of HIV this year.

This is why the early stages of drug and vaccine development are usually undertaken by small groups of scientists working in their own labs, relying on funds by governments, charities or universities. There are many potentially deadly viruses in the world, but few are considered widespread enough to merit the tens to hundreds of millions needed to bring a new vaccine to market. The process works, but it is slow...and practicalities kick in.

There are far more viruses in the world than virologists. We each have to choose what we work on. Self-interest plays a part. Why should the government of a country like the UK expend a large amount of money on Ebola, which only seems to crop up in sub-Saharan Africa? Especially when heart disease and cancer take far more lives both here and throughout the world? Well deadly diseases don't only cost lives.

The economic losses[1] from a virus can be enormous compared to the loss of life. The SARS epidemic of 2002-2003 infected about 8000 people and claimed around 800 lives. Estimates of economic losses due to restricted trade, travel and heightened surveillance measures range from

40 to 80 billion dollars. For each of the approximately 800 lives lost to SARS, the impact on the world economy was between 50 to 100 million dollars - far greater than the lifetime earning power of the victims.

Globalisation means there's no hiding place from deadly viruses. Now that Ebola has spread to the Guinean port city of Conakry, there is more potential for the virus to be accidentally exported around the world. We should take note. Just as SARS was able to spread from China to 36 other countries around the world by commercial airline, there is the potential that Ebola could one day do the same. Mobility drives the spread of infectious diseases. As long as Ebola exists, and keeps crossing over from wildlife to humanity, the threat of a humanitarian disaster is ever present.

Treatments and promising vaccines are stuck in the small science pipeline. The cost of pushing these treatments through the last few sections is a barrier for most charities and ruinous for most private sector companies.

Once we recognise that Ebola threatens the world, and not just a small part of Africa, it becomes clear that a global problem demands a global action.

The UN, African Union, G8, NATO, the EU. The funds exist...and so do life-saving and financial solutions.

Provided by University of Reading