What when there's a vaccine?

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What when there's a vaccine?

by Stuart Blume and Maurizia Mezza on 15th May 2020

Amid the accelerated scientific quest for a vaccine against the coronavirus, crucial ethical and social questions have not yet been addressed.

Stuart Blume

Each day brings reports of progress toward a coronavirus vaccine. As millions struggle with separation, loss of income, isolation and fear for vulnerable loved ones, the prospect of a vaccine offers courage and hope.

Vaccination has indeed saved countless lives and has been a cornerstone of public health for more than half a century. Currently 120 candidate vaccines against the coronavirus are under development, of which eight have entered human trials. One or more will almost certainly become available—not this year, hopefully next. But what then?

Maurizia Mezza

How the vaccine is to be deployed may seem a trivial question compared with the urgency of today. Just a few months ago the only vaccination-related concern seemed to be the reluctance of some parents to have their child vaccinated.

Nevertheless, the history of recent vaccination campaigns shows that introducing a new vaccine is rarely unproblematic. It is best to clarify potential problems before solving them becomes itself a matter of urgency.

Two scenarios

When a vaccine is licensed, what are these problems likely to be? Over the months to come we can imagine two scenarios.

In the first, optimistic, scenario, a combination of hygienic, social and therapeutic measures will have brought the epidemic under control. There will be no dreaded ‘second wave’. When the vaccine becomes available, people will view Covid-19 as akin to the flu. In Europe, rates of vaccination against seasonal influenza among over-65s vary hugely between countries: from less than 20 per cent to nearly 80 per cent.

When the human papilloma virus (HPV) vaccine was introduced, not only were initial vaccination rates lower than expected but here too huge differences emerged between countries. In Scotland in 2012 86.4 per cent of the target population (of adolescent girls) were vaccinated, but in Greece only 9 per cent. This was partly explicable in terms of how vaccination was organised—school-based programmes achieved higher rates. But sometimes girls were cajoled, threatened or bullied into getting themselves vaccinated.

Will it matter if there is little demand for the vaccine? The answer depends on the coverage needed for 'herd immunity'. If enough people are immune, whether from vaccination or recovery, circulation of the virus is restricted. Unvaccinated people are then protected. The threshold percentage varies from one virus to another and may be around 70 per cent for the SARS-CoV-2 virus. It does matter.

Reports of responses to current social-distancing rules give some idea of the groups in which coverage might be problematically low: young people who regard themselves as low-risk, whole regions in which the state is viewed with suspicion and communities cut off by language or detained in overcrowded refugee camps. If adequate coverage is not achieved, what then? What measure of compulsion is acceptable?

Supply outstripped

In a second scenario the epidemic will have re-emerged. People are again dying. Everyone is clamouring to be vaccinated.

But the new vaccine is expensive and there is too little of it. Most of the institutions with vaccines already in human trials are small biotech firms. Production will gear up gradually and for months international demand will outstrip supply. Poor countries with weak health systems will be pushed to the back of the queue—however great their need.

This is what happened with HPV vaccines when they first became available in 2006. Four-fifths of the women affected by an HPV-related disease live in low and middle-income countries. But at $360 per capita for the required three shots these countries could not afford the vaccines at the time.

The introduction of the H1N1 flu vaccine in 2009 is also illuminating. When H1N1 was declared a pandemic, advance purchase contracts were automatically activated. Wealthy countries had paid an annual subscription to maintain these, sometimes with more than one manufacturer. They then had prior claim on a limited supply, though still only part of what they had ordered. Many countries subsequently developed guidelines, anticipating a future influenza pandemic.

Under such guidelines, priority should be given to healthcare workers and to people at greatest medical risk—as in respect of the coronavirus epidemic. But where regional sentiments are strong the most affected regions might claim priority or, elsewhere, insist that supplies should be equitably distributed among regions.

What has to be avoided at all costs is the nationalistic pushing and shoving which has taken place in recent weeks over ventilators and diagnostic tests. Can acceptable rationing criteria be found, so political haggling is later avoided?

Contract secrecy

Experience with the H1N1 vaccine a decade ago highlights something else. Although not public knowledge at the time, it emerged that many contracts absolved manufacturers of any obligation in respect of vaccine-related complications or side-effects. And such complications did arise: in Sweden and Finland, for example, cases of narcolepsy were found to be associated with one of the influenza vaccines used to control the pandemic.

Three of the eight candidate vaccines now in human trials make use of genetic material from the virus. The underlying technology has never been proven in a licensed human vaccine. There will be pressure to fast-track a coronavirus vaccine. Since there will not have been time to test it in all population groups, side-effects might again emerge.

An acceptable division of responsibility between states and manufacturers in the event of this happening needs to be established. Can the European Union use its bargaining power to negotiate contracts on behalf of member states, while not forgetting the interests of poor member (and non-member) countries?

None of this is to cast the slightest doubt on the crucial value of a coronavirus vaccine. But whatever our hopes, the licensing of a safe and effective vaccine will still leave difficult issues of accessibility, acceptability and responsibility—which need to be debated.

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