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Entrepreneurial innovation made Covid-19 vaccines possible

Compulsory licences are supposed to help prevent vaccine shortages. But that may jeopardise our ability to respond to future pandemics through scientific innovation

In the current debate on vaccine shortages, demands for compulsory licences have become increasingly common. This proposal seems plausible at first glance: the existing patent protection serves to safeguard, even monopolise, the economic benefits accruing from existing scientific knowledge on how to produce vaccines. It seems to follow quite naturally that the quantity produced can be quickly increased if the use of that knowledge is no longer restricted.

However, it's not quite that simple. The first counter-argument relates to the fundamental incentive structure. We know from innovation economics that intellectual property rights are an important incentive for the investment of resources in research and development in the first place. Although it's true that the vaccines are already available, and therefore in this case the incentive problem no longer exists, this will not be the last pandemic. We will always be dependent on pharmaceutical companies and their ability to innovate in the future.

In order to ensure that compulsory licences don't jeopardise the incentive framework for market-based innovation, they would have to be linked to very high compensation payments. It remains to be seen whether something like this could be enforced in the current political process. And it doesn't correspond at all to what the advocates of compulsory licensing usually favour: a kind of expropriation of intellectual property rights.

The new BioNTech facility in Germany

But would compulsory licensing, if enforced, achieve anything at all? Again, this is very unlikely. First of all, it is important to recognise that it takes time to build up vaccine production. One example is the plant that BioNTech has recently converted in Marburg, Germany. The company

took over the plant from a competitor, so BioNTech didn't have to start from scratch, but was able to use, expand and develop existing facilities.

BioNTech started this process in September 2020 and has now been producing since the end of January. So the retooling has already taken a good four months. However, the batches produced cannot be delivered yet, as the production process in Marburg still has to be certified by the regulatory authorities. According to media reports, this was expected to happen at the end of February. It would take much longer to build a completely new production facility from scratch. So even in the best case scenario, we have to expect a longer timescale for new production capacity.

In view of the urgency of fighting the pandemic, it would even have been possible for the state to take on all of the risk involved in building more capacity before the clinical trials had been completed.

Some economists are now calling for what they describe as a 'wartime economy', in which a government commission would identify where spare capacity exists so that patent holders could be forced to work together with companies that have such capacity. Here, too, of course, a process of retooling and certification would first be necessary – the additional production would not start immediately, but only after a few months.

Nevertheless, in some respects it's understandable that people want to opt for this kind of programme. After all, it appears to be calculable, manageable and therefore reliable. Who better to govern this process than a well-informed and well-intentioned state commission of experts?

Most economists are sceptical, as they believe the decentralisation of knowledge is empirically an important factor. Of course, one can seek advice from so-called industry experts, but decentralised, dispersed knowledge, which can be found in the companies themselves, is the key to solving the problem. Ultimately, it is above all the engineers and managers on the ground who know best how quickly and at what cost individual plants can be converted. This leads to the conclusion that it's better not to rely on hierarchical thinking as expressed through orders and compliance, but to use incentives to encourage companies to mobilise new capacities on their own initiative.

The state needs to take the risk

Ideally, this should have been done already in the summer of 2020. That would have enabled the EU to negotiate conditional contracts involving

high premiums for rapid delivery over and above the normal basic price. Those suppliers who, like BioNTech, could see relatively early on from their clinical trials that their vaccine was promising would then have had greater incentive to build up capacity even earlier and faster.

In view of the urgency of fighting the pandemic, it would even have been possible for the state to take on all of the risk involved in building more capacity before the clinical trials had been completed. This is arguably a key lesson for future pandemics: building vaccine capacity very quickly is so important for all of society that the government should declare its willingness to pay for it as early as possible.

This not infrequently provokes the objection that such an approach is unfair. The risks are then largely assumed by the state, while the profits are reaped by the companies. But in a pandemic, such distributional considerations should only be secondary. What matters is finding the fastest way to save the greatest number of lives through mass vaccination and enabling social life to return to normal as quickly as possible. Set against this goal, other political preferences are very much subordinate.

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However, we also have no reason at all to assume that any model other than that of the market-based, entrepreneurial innovation process would provide a better and faster solution to this problem. It was the small but very innovative and agile company BioNTech that made the key breakthrough of using mRNA technology to develop the vaccine. We will probably see how important this was when it comes to adapting the vaccine to mutations. According to medical experts, this is much easier to do using this new technology than with conventional vaccines.

The success of the entrepreneurial innovation model

Nor does the argument that BioNTech has built here on basic research originally financed by the state call into question the importance of the entrepreneurial innovation model. Funding basic research for which the concrete applications are entirely unknown at that point is exactly what the state should be doing. And that was precisely the case with mRNA technology.

Such research is associated with positive externalities, the scale of which cannot be known in advance. Fundamental uncertainty prevails here. This is why such basic research is usually financed by the state or by research-oriented private foundations. But the crucial question is how such basic research can be developed into marketable applications. And for this, nothing and no one is more efficient than companies seeking profits.

It's therefore now a question of harnessing this market dynamic for a rapid further expansion of capacity. For this purpose, appropriate premiums should be offered to suppliers. Even then, the additional quantities of vaccine will not be delivered overnight. Given the resource constraints and regulatory requirements, it will take several months. The goal of vaccinating all of humanity this year by means of a 'wartime economy' or compulsory licensing remains utopian.

We have lost valuable months through waiting until now to initiate the massive capacity expansion needed and not already setting it on track in the summer of 2020. Now we have to make up for this lost time as quickly as possible; but it is advisable to exercise a degree of scepticism when miracles are being promised – especially when it comes to miracles that require us to abandon the market economy.

Jan Schnellenbach
Cottbus

Prof Dr Jan Schnellenbach is an economist and serves as Chair of Microeconomics at the Brandenburg University of Technology in Cottbus.