SHOULD VACCINES BE PATENT PROTECTED IN A PANDEMIC?

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As vaccine rollouts progress in a number of high-income nations, developing countries are lobbying the World Trade Organization to temporarily suspend patent protections on Covid-19 vaccines. They argue a suspension will make vaccines more accessible to poorer nations.

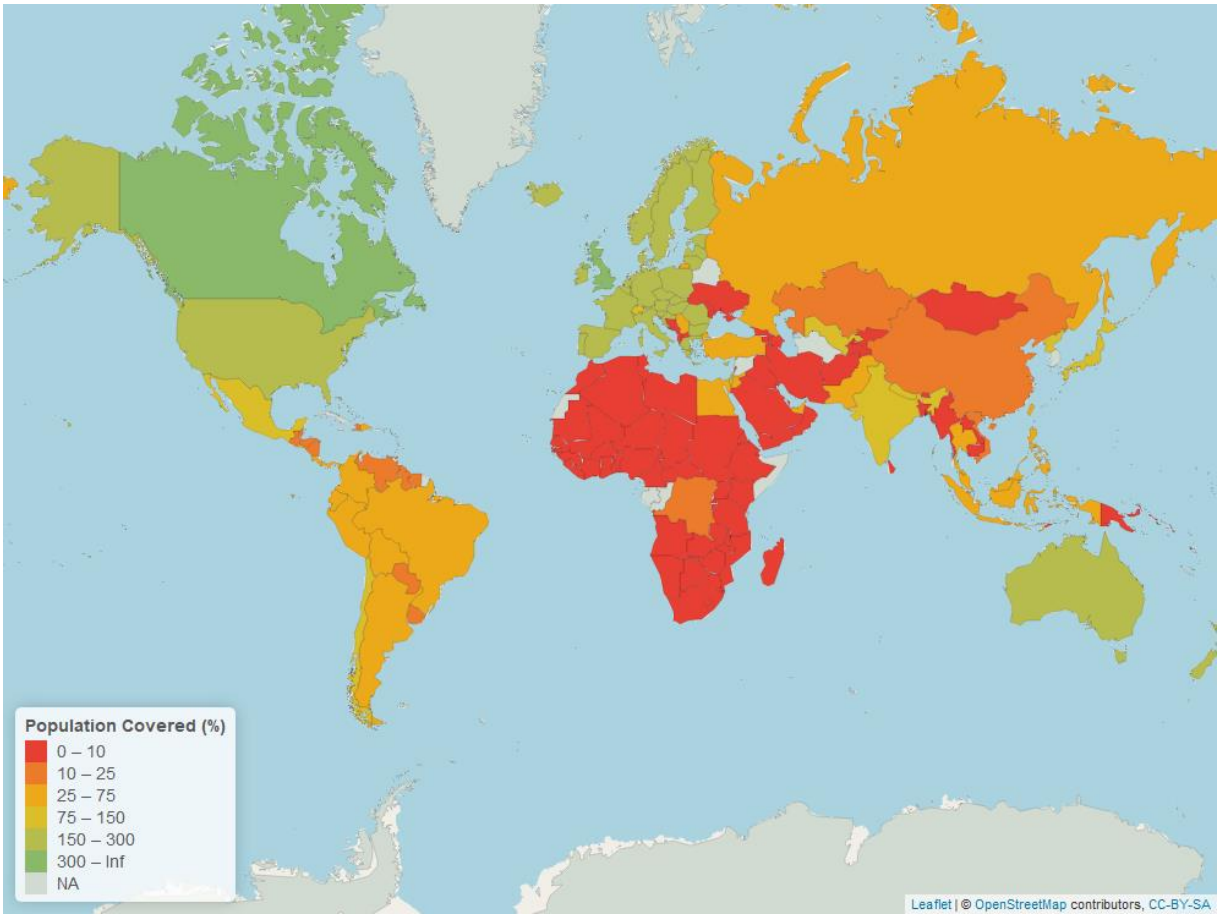
Pharmaceutical companies, and richer nations, say waiving patents will de-incentivise innovation at a crucial time and ignores the true cause of supply constraints – difficulties in expanding manufacturing capability. Is easing intellectual property rights the key to redressing the balance in global vaccine access?

DEVELOPING COUNTRIES CURRENTLY HAVE LIMITED ACCESS TO VACCINE SUPPLY

As things stand, the global share of vaccines is heavily skewed towards richer nations. At the beginning of the year, developed countries had secured over 3.7 billion doses, many through advanced-purchase orders agreed with vaccine manufacturers early in the pandemic. These doses account for 51% of targeted manufacturing capacity in 2021, and almost all of the publicly declared capacity for the year.

This has driven a significant shortage in the supply of doses available for purchase. As a result, the number of doses secured by developing countries – who largely rely on WHO not-for-profit initiatives to purchase vaccines on their behalf – is so far sufficient to provide only a small share of their populations with a full course of treatment (see Figure 1).

FIGURE 1 VACCINE COVERAGE BY COUNTRY BASED ON CONTRACTS NEGOTIATED TO DATE



Source: Frontier Economics based on data from Bloomberg (2021)

Note: Data is based on countries' public disclosure of negotiated vaccine contracts. Estimated coverage may be lower than actual coverage for countries intending to produce vaccines domestically under terms that have not been publicly disclosed (e.g. coverage in China is estimated to be closer to 77% once domestic supplies are taken into consideration). Calculations of country coverage take into account the number of vaccine doses required to provide an individual with a full course of treatment.

SOME ARGUE THAT SUSPENDING PATENTS COULD INCREASE THE AVAILABLE SUPPLY

Because of this unequal landscape, developing countries are proposing a temporary suspension of intellectual property rights related to Covid-19. They argue that protecting vaccines and other treatments with patents concentrates them in the hands of richer countries, locking out poorer countries who have so far struggled to gain access to them.

It is claimed that waiving IP rights could allow for vaccine technology to be more easily shared. This would mean generic or otherwise non-licensed manufacturers could begin production in the countries considered to have the production capacity to do so (such as India and Brazil).

With even the most optimistic of vaccine supply targets insufficient to meet global demand, a proposal that could allow for production to be ramped up in this way has the potential to significantly increase the global stock of available vaccines. It could also reduce the possibility of limited vaccine supplies being rationed according to price (though a number of manufacturers have committed to make vaccines available at cost price, at least initially).

WOULD INNOVATION BE STIFLED?

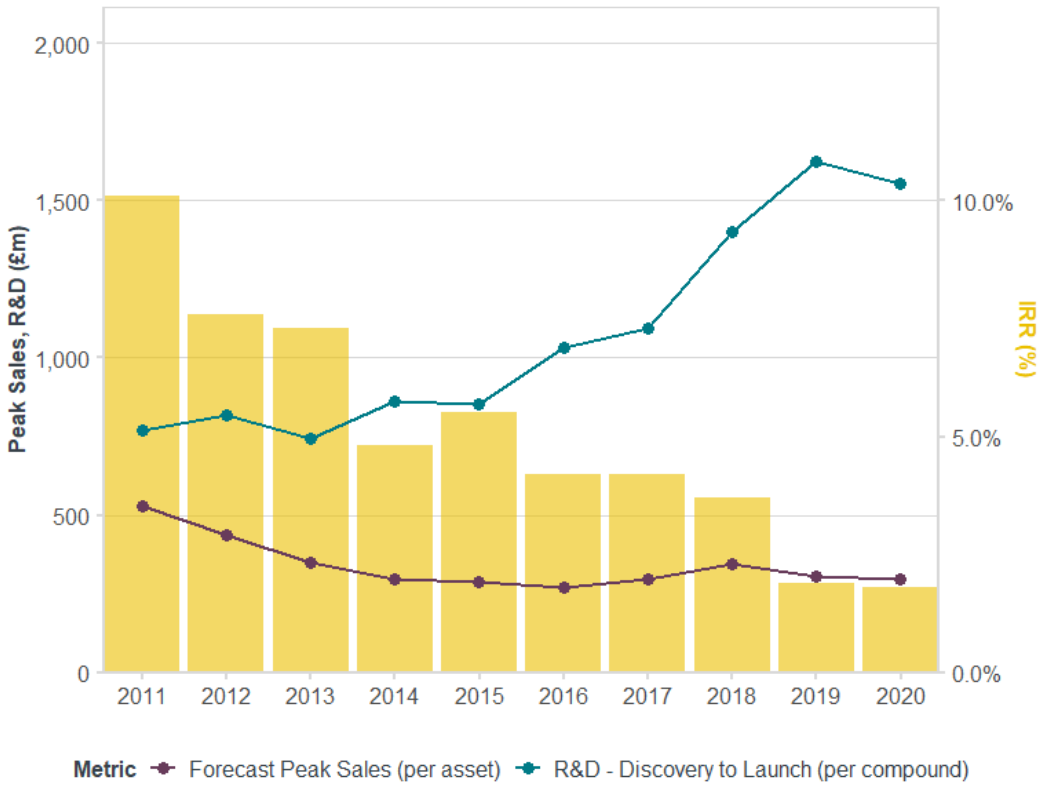
Pharmaceutical companies have generally opposed these suggestions, arguing that any suspension of patent protections would have damaging effects on innovation. Generally, the economics of intellectual property rights are well understood. Patents are designed to legally enforce ownership of a process or technology, typically for a period of 20 years. They allow the holder to exclusively manufacture and commercialise their invention.

Some innovations require significant research efforts to create, possibly involving very significant (and certain) up-front costs. The results of research efforts, however well-designed and controlled, may be highly unpredictable: in many cases - perhaps the vast majority of cases - the research may not produce any outputs that will generate future revenue. But where research effort does pay off, this can create significant value for the firm, and for society overall.

Patent protection therefore provides firms with a measure of comfort that up-front investment costs can be recouped over some specified future period, thus increasing the level of research and development activity that firms are willing to invest in.

These effects play out particularly strongly in the pharmaceutical sector, in which the risk of product failure is high, the potential benefits to society are significant, and the cost of innovation is large (and growing). The probability of success for a compound entering Phase 1 trials remains at less than 10%. Solutions to many of the world's 'easy diseases', to quote one pharma executive, have been delivered – the challenges that remain are more difficult to tackle. This is pushing up the average cost of bringing a drug to market, and returns on investment in the industry are falling (see Figure 2).

FIGURE 2 EVOLUTION OF RETURNS FROM PHARMACEUTICAL INNOVATION



Source: Frontier Economics based on data from Deloitte (2020)

DO THE STANDARD ARGUMENTS ON PATENT PROTECTION APPLY TO THIS PANDEMIC?

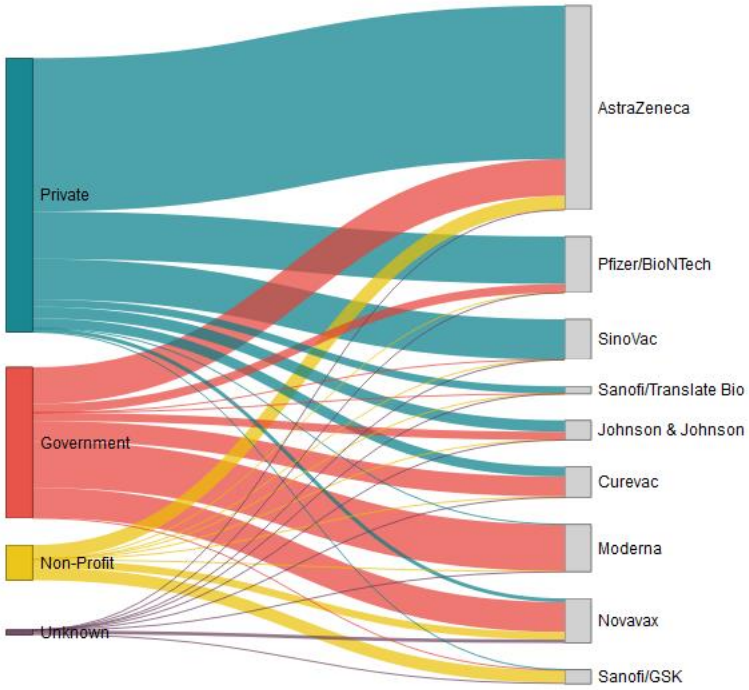
Standard economic logic suggests that removal of patent protection would indeed lower the incentive to innovate. But in the context of the Covid-19 pandemic, the debate has focussed around some additional factors specific to the current environment.

It has been pointed out that while pharmaceutical companies have invested heavily in the development of Covid-19 vaccines, most have also received financial support from government and not-for-profit organisations. As Figure 3 shows, three candidate vaccines – Moderna, Novovax and Curevac – have received significant funding from public bodies. Only two vaccines have so far received no government or not-for-profit funding: SinoVac and Sanofi/Translate Bio.

In this specific case the relevant innovation has, to some extent, already successfully taken place, with the risks partly borne by external investors. Governments in particular have demonstrated a strong willingness to invest (and tolerance for risk). A number of manufacturers have also committed to make vaccines available at cost-price, and there are already several effective vaccine products available.

Like the pandemic itself, this is a far from a typical context, and as a result it is less obvious that the standard arguments relating to the role of patent protection necessarily apply.

FIGURE 3 FUNDING SOURCES FOR COVID-19 CANDIDATE VACCINES



Source: Frontier Economics based on data from Airfinity, BBC (2021)

Note: Composition of funding for candidate vaccines is estimated on the basis of publicly disclosed information on funding details. Reported funding does not include payments provided by Governments to vaccine manufacturers through advanced purchase orders.

INTELLECTUAL PROPERTY RIGHTS ARE NOT THE ONLY BARRIER TO EXPANDING SUPPLY

Looking more broadly at the economics of vaccine rollouts to date, it is questionable that waiving patent protection would in itself overcome the existing barriers that are preventing faster increases in supply.

As things stand, all vaccine manufacturers hold a strong incentive to maximise their available supply of vaccine doses. There is significant excess demand across the world, and ensuring a plentiful supply of doses in the short-term is likely to generate significant reputational benefits for the businesses concerned. Building relationships with prospective customers today also raises the prospect of securing more profitable contracts in future.

And yet in the face of huge global demand – and strong incentives to expand production – there are significant supply shortages. This suggests that the barriers to expanding supply stretch beyond patent ownership and intellectual property rights to the relevant technologies.

Indeed, manufacturing capability and regulatory clearances also present significant challenges for any manufacturer to overcome. For example, AstraZeneca has had well-publicised yield issues, and appropriate sites for production have proven hard to come by: only three production sites identified by AstraZeneca had received regulatory approval from the European Medicines Agency to produce the vaccine as of last

month (one each in Belgium, the US and UK). Some countries have paused rollouts of certain vaccines on the basis of health concerns by regulatory authorities. Similar issues would apply in developing countries, and for any manufacturer seeking to supply to those countries. After all, it is unlikely that many would see expanding production at the expense of safety as a sensible trade-off, given it could risk undermining public confidence in the safety and efficacy of the vaccines being produced, and negatively impact vaccine uptake rates as a result.

RELAXING PATENT PROTECTION ISN'T LIKELY TO PROVE A STANDALONE SOLUTION

There is unlikely to be a 'silver bullet' solution to the difficulties of increasing vaccine supply. Patent protection may form one part of the ongoing debate on accelerating vaccine production and rollout, but removing these protections looks unlikely to resolve other regulatory and political barriers that have proven important so far.

The supply of vaccines required to provide the global population with protection is forecast not to be ready until 2024, and all countries, businesses and individuals are likely to share a desire to shorten this timeframe on both economic and humanitarian grounds.

Access to vaccines are likely to improve as developed countries complete their rollouts and release spare capacity to others, an outcome helped by the delivery of several effective vaccines available globally and approved for use. Accelerating the timetable to global rollout is likely to require resolving issues in production and distribution through ongoing collaboration between businesses, governments and regulators. Continued cooperation will therefore be crucial to the speed and success of the global rollout programme, regardless of who holds the relevant IP.

AUTHORS

SCOTT BURRELL
Analyst

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WWW.FRONTIER-ECONOMICS.COM

HELLO@FRONTIER-ECONOMICS.COM

+44 (0) 207 031 7000