The necessity of high quality production standards

This is how Bloomberg quotes the German government's position towards Biden's proposal:

> "The limiting factor for the production of vaccines are manufacturing capacities and high quality standards, not the patents," the German government spokeswoman said.

Keeping high production standards requires costly investments by firms, in particular when producing mRNA vaccines. Patents make it much more likely that prices can be achieved that allow to recover those investment costs. If patents are waived, it is really not obvious whether indeed more investments into high quality production capacities take place. Also most observers assume that such investment would take considerable time. How sure are we that this would be faster than letting existing patent protected producers further expand their production network?

Maybe in such a crisis more production capacities may be beneficial even if the production standard is lowered? That might then be achieved faster and at a larger scale. Yet, that seems a very risky strategy. For example, there were recent news reports that in several African countries there is substantial reluctance against vaccinations that may even lead to destruction of expired vaccines that could not be vaccinated quickly enough.

But what will be the effect if absent patents some novel producers lower production standards so that we have increased risk of bad vaccine batches? One can well imagine how such events may substantially reduce worldwide willingness to get vaccinated…

The Astra-Zeneca vs Biontech/Pfizer experience

My feeling that guaranteeing vaccine producers sufficient profits may be the best way to quickly ramp-up worldwide supply is also strongly influenced by our European experience of supply reliability of Biontech/Pfizer vs AstraZeneca.

According to leaked price lists the EU paid less than 2 Euro for an AstraZeneca jab but 12 Euro or 15 Euro for a Biontech/Pfizer jab.

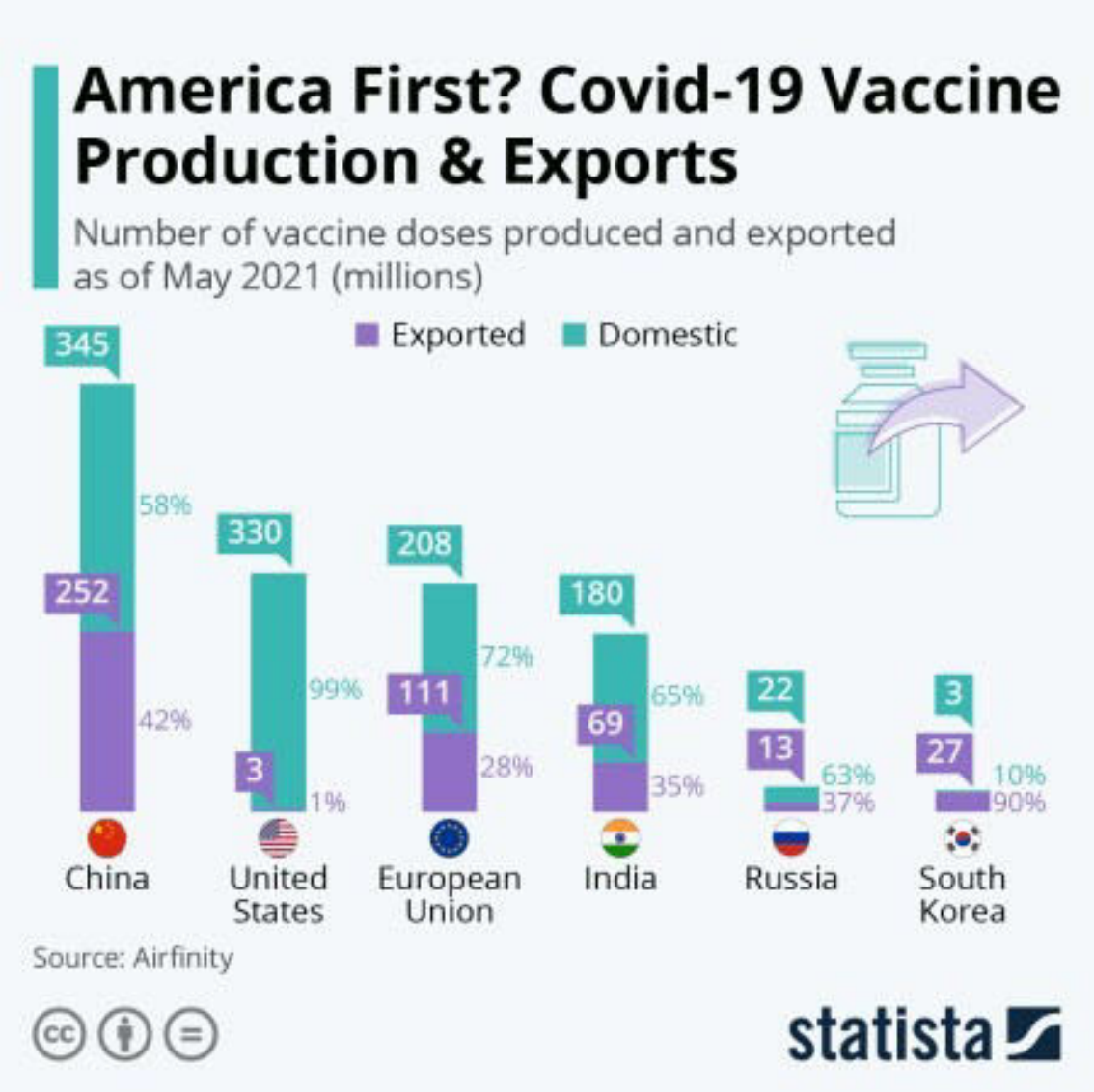
But the EU states that in the first quarter of 2021 AstraZeneca delivered only 30 million out of contracted 90 million jabs to the EU and in the 2nd quarter probably only 70 out of 180 million. In contrast, Biontech/Pfizer seemed to have substantially increased supply beyond initial agreements (see e.g. here) and now expects to produce 3 billion shots in 2021.

Sure, there may be many reasons for those outcomes, e.g. possibly a decision of AstraZeneca to preferably honor its contract with the UK at cost of its contract with the EU. But it suggests that too low profit margins may deteriorate incentives or abilities to effectively expand production.

But how do poorer countries get sufficiently many vaccines?

But what about the worry that poorer countries just cannot afford the prices vaccine producers want to charge? Of course, there are extremely good arguments that richer countries should strongly support poorer countries to buy vaccines, e.g. through initiatives like Covax.

That current volumes of Covax vaccines are still low might be due to the fact that, to different extent, western countries first wanted to secure enough vaccines themselves. E.g. here is Statista figure of domestic use and exports of vaccines for different important players:



Given that the US and UK now already reached high vaccination rates, they will probably soon join those countries that are willing to export substantial amounts of vaccines. This hopefully will speed up vaccine supply in other countries. It probably also would help strongly if access barriers to necessary raw materials for vaccine productions would be relaxed.

Even if rich countries pay for vaccines, could we really afford to supply the world at the prices of the original producers?

Sure, a patent waiver might be cheaper for rich countries' public budgets than helping poorer countries to buy vaccines from the original producers. But would costs without a patent waiver be really so much higher?

Let us consider the 15.50 Euro Biontech/Pfizer may have charged the EU per dosage. Buying at this price two dosages for everyone of the 1.370 billion inhabitants of Africa would cost 42.5 billion Euro. In comparison, here is a study that estimates the economic costs of two months lock down just in Germany to be up to ten-fold this amount (between 255 and 495 billion Euro).

Prices of non mRNA vaccines are much cheaper. And, at least for smaller quantities, Biontech/Pfizer already agreed to sell vaccines to Covax at cost. (Of course, it is not clear how scalable that pricing scheme is. Recall my argument from above that allowing sufficient profit margins likely provides much better incentives to expand production capacities.) Even if patents are waived prices probably won't fall below production costs and it is not obvious why costs should be lower for new market entrants.

What about vaccine producers' profits?

Well in theory one can imagine a lot, like greedy vaccine makers that leverage their patents too make as much profits as possible, e.g. by limiting licensing to create under-supply that increases prices. But I really didn't see any evidence suggesting such behavior at all. In my view, most vaccine developers are rather heroes without whom the world would be in much worse shape for years to come.

Let us run some R code to look at the development of stock prices for Pfizer and Biontech:

```
library(quantmod)
getSymbols(c("PFE","BNTX"), src = "yahoo", from = "2020-01-01", to =
"2021-05-07")
stocks = cbind(biontech = BNTX[,4], pfizer = PFE[,4])
library(ggplot2)
ggplot(stocks, aes(x=Index)) +
  scale_y_continuous() +
  geom_line(aes(y=biontech), color="blue")+
  geom_line(aes(y=pfizer), color="black")+
  ylab("") + xlab("Date")+
  theme_bw()
```

The Pfizer stock price (black line) has almost not changed at all compared to January 2020. Sure Biontech's stock price (blue line) has increased roughly 5 fold. But is that really excessive for a start-up company with such massive impact?

Also note that even firms that have nothing to do with vaccine production that had large stock price increases during the crisis. E.g. Amazon's stock price nearly doubled in the same time interval.

Should we really make a world-wide agreement that reduces profits of vaccine producers? The pharmaceutical business is extremely risky. Many attempts to create vaccines or other drugs fail and can create substantial losses. Of course, if a company is lucky, one drug can make large profits. But without this chance to compensate for the losses of unsuccessful drugs, I strongly fear that development of future drugs and vaccines may substantially slow down.

While in general, I am quite skeptic about excessive intellectual property rights (e.g. the idea of software patents just feels completely wrong to me), drug & vaccine development is the one sector where I really see the need for IP to compensate for the huge development costs and risks.

So for the pharmaceutical sector, I would again agree with the statement of the German government towards Biden's proposal:

> The protection of intellectual property is a source of innovation and this has to remain so in the future.