

BioNTainer

A Manufacturing Solution for Africa or Circumventing Capacity?

On the occasion of the EU-Africa Summit in February this year in Brussels, several African Heads of State and public health experts were traveling to Europe. BioNTech used the opportunity to invite the presidents of Senegal Macky Sall, Paul Kagame of Rwanda and Nana Akufo-Addo of Ghana, the Head of the African CDC John Nkengasong, as well as the Director General of the WHO Tedros Adhanom Ghebreyesus to Germany. At a ceremonially arranged press conference that also the German minister for development cooperation Svenja Schulze and the Director of the European Investment Bank Markus Berndt attended, BioNTech proudly announced “a manufacturing solution for Africa” (BioNTech COO Poetting, press conference)^[1]. BioNTech’s CEO Ugur Şahin stated the company asked themselves what they “can do to make mRNA accessible across the planet” and they proceed to present a mobile mRNA manufacturing facility for African countries. The factory consists of a “modular system, scalable and turnkey solution for local manufacturing” (BioNTech COO Poetting, press conference). 12 shipping containers house the drug manufacturing facility on the ground level, while the top level provides air purification, electricity and the IT infrastructure.

BioNTech’s approach to move production into a modular and mobile vaccine factory is technologically remarkable. It brings the high-end technology of an mRNA production facility into a shipping container and so promises to shortcut building up fixed production infrastructures in African countries. In choosing the technology of a shipping container, they rely on the “unsung hero of consumer capitalism” (Martin, 2013). As Craig Martin puts it: “The shipping container models the fundamentals of late capitalism even as it facilitates it: a standardized, reproducible structure that

looks and functions the same everywhere” (ibid.). And yet, it is mobile and versatile. For reasons of speed and quality, BioNTech argues, it is not feasible to build a state-of-the-art vaccine factory, like the one they have just opened in Marburg. Rather, the company moves its 12-containers-factory to selected African countries.

BioNTech has established two partnerships so far: the first BioNTainers are due to go to Rwanda and Senegal. The local partners’ role is (merely) to support the production with local staff, a hall to house the containers, provision of utilities – like power, water and waste disposal – as well as with “access to talent”, meaning trainees, technicians or professionals with whom they can work on the regulatory framework (Sahin, 2022).

Let’s first look at the wider context in which this proposal is made and then examine a few features of the BioNTainer, the vision of technology transfer and capacity building in a bit more depth. In what follows I suggest that the BioNTech initiative might be more about securing the African continent as a future market than about addressing vaccine inequity. Furthermore, I argue that such a mobile vaccine factory is not suited to build needed local capacities, but rather replicates antiquated patterns of exploitation.



Figure 1: BioNTech Vaccine Equity for Africa meeting, Marburg, 16 February 2022 (Flickr Stream Paul Kagame, <https://www.flickr.com/photos/paulkagame/51885217526/in/album-72177720296723172/>, CC BY-NC-ND 2.0)

Vaccine Inequity or Future Markets?

Until today, **only 15% of the African population received two doses of vaccines, 20% are partially vaccinated**. The continent currently produces less than 1% of the vaccines it uses. So far, only the last step of the production for Covid-19 vaccines – fill and finish – is happening there. While the acceleration of vaccine production on the African continent is much needed, the move from BioNTech to contribute to building up manufacturing capacity comes rather late. So far, BioNTech has not been open to share their technology or support an IP waiver, which has been demanded by a coalition led by India and South Africa since October 2020 and been supported by a wide variety of countries, including the USA. Notably several European states,

including Germany, were not amongst the supporters.

In early 2021, in response to vaccine inequity and the continuing IP protection, the WHO has taken the unusual step to establish WHO mRNA vaccine hubs in the Global South with the aim to “increase access to mRNA vaccines made closer to home by establishing manufacturing capacity using a technology transfer hub model to ensure sustainable vaccine security in future pandemics” (Medicines Patent Pool, 2022). BioNTech and Moderna have so far not been supportive of the technology transfer, although Moderna publicly announced to not reinforce their patents while the pandemic lasts. The refusal of the big two mRNA producers to support the technology transfer has forced WHO into producing their own mRNA vaccine, a formulation that has been described as a copy of the Moderna mRNA vaccine. This is not only a risky legal endeavor, but also requires new clinical trials to be undertaken, which significantly slows down the process until vaccines can be licensed.

Furthermore, BioNTech – via the Kenup Foundation – has recently been suspected to actively undermine the WHO Hub efforts (bmj, 2022). At the same time, after 18 months of “deadlock”, the news outlet Politico reports that a compromise between the EU, the US, India and South Africa on the IP waiver seems to be on the horizon (Furlong, 2022). Although critics have already suggested that the compromise is “not much of a waiver” (Kang, 2022). Nevertheless, these developments mean that the acceleration of vaccine production has become more urgent for the established producers: if IP-holding companies like BioNTech want “a piece of the cake” of production in the Global South, collaborations and production facilities are urgently needed.

Set against this background, it becomes a bit less clear how BioNTainers will actually “accelerate” Covid-19 vaccine production “for” Africa. This is further put into doubt by some of BioNTech’s remarks at the press conference. Politico asked them how many doses they expect to be produced by the BioNTainers in 2022 and 2023. Uğur Şahin answered that there is no production expected until mid 2023, as the set up

and procedures will take six months to be installed – not quite “turnkey” after all, it seems. From then onwards production will depend “on the need”. He then proceeded to comment that they expect malaria, tuberculosis and maybe HIV mRNA vaccines to be ready by 2026/27, and that they can then be produced there, as the BioNTainer is a platform technology “suitable to the people living in this region”. Şahin’s answer makes one wonder if the BioNTainer initiative is really about ending the Covid pandemic and not much more about opening up future markets? Afterall, the majority of global malaria and HIV patients, and approx. 25% of global tuberculosis patients live on the African continent. And mid 2023 seems rather far off as the pandemic is concerned. For future markets, the mobile design of the container is an asset: if production is no longer needed in one place, it can move elsewhere. If the production of Covid-19 vaccines is no longer needed, production can be changed quickly to other vaccines or drugs. Agile container capitalism in action.

Mobile infrastructures of vaccine production and capacity building

In the academic literature on technology and development so called mobile or “fluid technologies” have received quite some attention. In his analyses of Médecins Sans Frontières’ medical response kits, Peter Redfield shows that these technologies have their origin in military medicine from the second world war, and later developed into established humanitarian logistical tools (Redfield, 2013). Self-contained mobile devices provide targeted, small solutions to “big” infrastructural issues, such as the life-straw to drinking water provision (Redfield, 2016), or prepackaged Plumpy’nut® peanut butter paste to address malnutrition (Redfield, 2012; Scott-Smith, 2018). Redfield characterises them as “humanitarian goods”, arguing that they anticipate state failure and make a humble intervention by addressing narrowly defined issues (Redfield, 2012).

While many of these small-scale technologies can alleviate immediate suffering in cases of infrastructure breakdown and humanitarian crises, epidemics and pandemics have also underlined the limitations of such approaches to global health. As I argued, for instance, at the height of West Africa's devastating Ebola epidemic 2013-15: "West Africa's Ebola epidemic all too painfully shows that this spatio-temporal logic of patchy, vertical and time-bound projects [and devices] has significant shortcomings. Health care infrastructures cannot be circumvented when one aims to improve health care sustainably" (Beisel, 2014). Indeed, the Ebola epidemic triggered important investments in health systems strengthening and the foundation of the African Centre for Disease Control (Africa CDC) headquartered in Nairobi, which has spearheaded important initiatives, such as the Partnership for African vaccine manufacturing (PAVM). In its recently published Framework for Action the initiative advances the goal of 60% domestic vaccine production until 2040 (PAVM, 2022, 8), and calls for investments in the order of \$30 billion (ibid., 11).

Surely, BioNTech's building-set vaccine factory comes at a lower prize, yet it is worth asking what kind of capacity building the company has in mind? Can we understand the BioNTainer as one of these humble humanitarian goods like the life-straw or Plumpy'nut®? Is it the fast-track "scaleable, turnkey solution for local manufacturing" (Poetting, press conference) that will support the African continent in building towards their aim of 60% home-grown vaccines in 20 years? Or is it a clever business strategy to open up future markets for mRNA vaccines to the world's fastest growing continent? Be that as it may, what is for sure is that BioNTech's understanding of local cooperation and capacity building sounds rather antiquated. Equal partnership would have included working with biomedical experts in Senegal and Rwanda from the start of designing and implementation. Instead, BioNTech focuses on local utilities and aims for people to be included into the "BioNTech Team", with a vague promise to "hand over" the technology at some point, with terms and conditions still to be negotiated.

As many a failed technology transfer, and countless studies in STS have shown, successful technology implementation is best thought of as a process of translation, where the “context” and the technology are adapted to each other, rather than as a one-way street. Furthermore, BioNTech’s vagueness about the technology transfer and capacity building, and the ease with which local partners are called upon to – literally – clean up after the BioNTainers by providing utilities and waste disposal stands in stark relief to the finished feel the flashy model containers and the promotion video display

(<https://player.admiralcloud.com/?v=16188d1c-098a-4da9-b29a-86af408820ae>).

This is sobering and echoes a colonialist and developmentalist mindset of trickle-down effects and Africans as passive recipients of the European innovations. Indeed, it was sad to see that BioNTech was praised by the German minister for development cooperation, the African Heads of State, WHO Director General and the Head of Africa CDC for their humanitarian efforts despite their track record of previously contributing to the “necropolitics of vaccine capitalism” (Sariola, 2021) through their refusal to support technology transfer and sharing. Asked by a journalist after their press conference why BioNTech is not instead supporting the WHO mRNA Hub, Ugur Şahin inadvertently summarized this continuing neo-colonial power dynamic (Bierly, 2022): “We had a wonderful meeting with our partners from Africa, and one of the most impressive statements is that vaccine equity is not about the past, it’s about the future”. However, as the Ghanaian Akan Adinkra symbolic bird Sankofa that looks back while holding the golden egg of the future in its beak, teaches us: we are well advised to look to the past when determining our future.

So, what kind of future do mobile mRNA vaccine container-factories promise? In this piece I suggested that the mobile technology might – in the end – benefit BioNTech most by opening up new markets on the African continent for a variety of mRNA products. And what about vaccine equity, ending the pandemic and capacity building on the African continent? Sadly secondary.

Uli Beisel is professor of Human Geography at Free University in Berlin. Her research is concerned with the spatialisation of global inequalities, especially in the thematic areas of cultures of nature, planetary health and environmental justice. Her work is situated in the interdisciplinary field of feminist and postcolonial science and technology studies, more-than-human geography and global health. This piece has been written in the context of a research project “Uneven geographies of vaccine manufacturing in the Global South” funded by the Deutsche Forschungsgemeinschaft (DFG, German Research Foundation) – project number 468434645. Many thanks to Hansjörg Dilger, Dominik Mattes and Madlen Hornung for valuable suggestions on earlier versions of this piece.

#Witnessing Corona

This article was simultaneously published on the [Blog Medical Anthropology](#). [Witnessing Corona](#) is a joint blog series by the [Blog Medical Anthropology](#), [Curare: Journal of Medical Anthropology](#), the [Global South Studies Center Cologne](#), and [boasblogs](#).

References

African Union and Africa CDC (2022). “Partnerships for African Vaccine Manufacturing (PAVM) Framework for Action”

<https://africacdc.org/download/partnerships-for-african-vaccine-manufacturing-pavm-framework-for-action/> last accessed 25/03/2022

Beisel, U. (2014). „On gloves, rubber and the spatio-temporal logics of global health“. Somatosphere, October 6,
<http://somatosphere.net/2014/10/rubber-gloves-global-health.html> last accessed 30/04/2022

Bierly, T. (2022). Pop-up vaccine factories for Africa labelled ‘neo-colonial stunt’.
<https://www.globaljustice.org.uk/news/pop-up-vaccine-factories-for-africa-labelled-neo-colonial-stunt/> last accessed 30/04/2022

Furlong, A. (2022). “Compromise reached on COVID-19 vaccine intellectual property rights waiver”
<https://www.politico.eu/article/compromise-reached-on-covid-19-vaccine-intellectual-property-rights-waiver/> last accessed 25/03/2022

Kang, H.Y. (2022). “Not Much of a Waiver. The Leaked Draft Text of the TRIPS Waiver Compromise”. <https://verfassungsblog.de/not-much-of-a-waiver/> last accessed 01/04/2022

Martin, C. (2013). “The Shipping Container. A Cyber Monday paean to the unsung hero of consumer capitalism”
<https://www.theatlantic.com/technology/archive/2013/12/the-shipping-container/281888/> last accessed 25/03/2022

Medicines Patent Pool (2022). “The mRNA vaccine Technology Transfer Hub”
<https://medicinespatentpool.org/covid-19/technology-transfer-hub> last accessed 25/03/2022

Redfield, P. (2012) ‘Bioexpectations: Life Technologies as Humanitarian Goods’, *Public Culture*, 24(1 (66)), pp. 157–184. doi:

<https://doi.org/10.1215/08992363-1443592>.

Redfield, P. (2013) *Life in Crisis: The Ethical Journey of Doctors without Borders*. Univ of California Press.

Redfield, P. (2016) 'Fluid technologies: The Bush Pump, the LifeStraw® and microworlds of humanitarian design', *Social Studies of Science*, 46(2), pp. 159–183.

Sariola, S. (2021). "Necropolitics of Vaccine Capitalism" Visualizing the Virus, 12/10/2021

<https://visualizingthevirus.com/entry/necropolitics-of-vaccine-capitalism/> last accessed 30/04/2022.

Scott-Smith, T. (2018) 'Sticky technologies: Plumpy'nut®, emergency feeding and the viscosity of humanitarian design', *Social Studies of Science*, 48(1), pp. 3–24.

Footnote

[1] The video of the press conference held in Marburg on the 16th of February 2022 can be found [here](#) (last accessed 28//042022)