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How to cite:

Banda, Geoffrey; Mugwagwa, Julius; Wanjala, Cecilia; Mackintosh, Maureen and Kale, Dinar (2021). Local manufacturing, local supply chains and health security in Africa: lessons from COVID-19. *BMJ Global Health*, 6(6), article no. e006362.

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Version: Version of Record

Link(s) to article on publisher's website:

<http://dx.doi.org/doi:10.1136/bmjgh-2021-006362>

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Local manufacturing, local supply chains and health security in Africa: lessons from COVID-19

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To cite: Banda G, Mugwagwa J, Wanjala C, *et al*. Local manufacturing, local supply chains and health security in Africa: lessons from COVID-19. *BMJ Global Health* 2021;**6**:e006362. doi:10.1136/bmjgh-2021-006362

Received 20 May 2021
Accepted 1 June 2021



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We welcome the recent *BMJ Global Health* Commentary noting the low African authorship of pandemic-related published research.¹ This finding follows a long-term relative dearth of African-led research and publication on global health matters, which in turn has weakened African leadership in setting global health research priorities and agendas. African researchers and manufacturers have long pointed^{2–5} to the dangers for local health security of extreme import dependence and reliance on very few international suppliers ('concentration risk'), yet that argument has struggled to gain an international hearing.

However, the impact of COVID-19 in Africa has conclusively demonstrated the dangers of siloed health systems planning, funding and research that ignores the implications of local medical technologies manufacturing capabilities for local health security and resilience. African health systems have been damaged during the pandemic by a toxic combination of high import dependence, low purchasing power allowing African countries to be outbid for resources and relatively low local manufacturing capabilities. The resultant supply chain crisis has shown the critical nature of local manufacturing for tackling local medical emergencies and generating local health security.

Collaborative evidence-sharing by African manufacturers and other stakeholders in a closed webinar in October 2020⁶ documented how, as the pandemic hit African countries, externally sourced supplies of essential drugs and other commodities vanished. Local manufacturers saw input prices shoot up on global markets, inputs become unobtainable and freight charges escalate, as local health-care institutions and governments desperately turned to local industry for replacement supplies. The scaling up and innovation by some local manufacturers has been impressive,

Summary box

- ▶ African commentators have long emphasised the importance of local manufacturing for local health security, but the argument has struggled to gain an international hearing.
- ▶ COVID-19 has, however, demonstrated the health dangers from extreme import dependence and low purchasing power; it has also shown the scope and capability for local industrial innovation.
- ▶ Local innovation and manufacturing scale-up during the pandemic was facilitated by adaptable government procurement policies and a health research base with strong links to manufacturing.
- ▶ Constraints included lack of local testing and accreditation facilities, and skill and finance shortages.
- ▶ African researchers and planners should be heard and supported when focusing on localising supply chains and tackling severe concentration risk in the interests of local health security.

as has the speed and flexibility of industrial problem-solving by some research institutes and governments. Examples from several countries⁶ include: restarting and scaling up hand sanitiser production, using local ethanol and adapted plastic bottle delivery systems; making local swabs from scratch and scaling up viral transport medium output, alongside developing PCR test kits for local laboratories; making locally produced masks and protective equipment while struggling to replace meltblown fabric imports suddenly unavailable; scaling up dexamethasone production; and inventing and producing local ventilators and low-tech oxygen therapy delivery methods. A Southern African manufacturer noted that some innovations were by 'people who weren't given the opportunity to innovate in a pre-Covid world'.⁶

African countries where local manufacturers responded more effectively than elsewhere have generally possessed broader and deeper industrial structures. They could also

turn to local universities as innovation centres to support adaptation and upgrading. Adaptable government procurement, and a health research base with strong links to manufacturing, have been national facilitators in some cases, while in some instances, a dearth of competent governance institutions has been a hurdle. Conversely, a lack of rapid and effective local testing and accreditation facilities, scarcity of key high level technical and regulatory skills, and lack of patient capital funding have been blockages on local innovation⁶ and agile responses to the pandemic.

Furthermore, these are not just lessons for African policy makers: active pharmaceutical ingredient (API), medical devices (including ventilators and personal protective equipment (PPE)) and medicines production concentration risk is global. African countries have suffered severely from a globally transmitted supply chain crisis, through competitive procurement by governments with deeper pockets that drove price hikes, and national export controls on essential commodities and raw materials that blocked access. Globally, health systems and global health research has very rarely incorporated research questions or expertise on local industrial development and their link to local health security as well as systemic agility and resilience during pandemics. Manufacturing supply chains and industrial development are very rarely included, as they should be, in the social determinants of health.⁵ When global health has turned its attention to supply chains, as in WHO prequalification initiatives or global fund purchasing rules, the result has often been to generate dependence on a few suppliers.⁴ The pandemic has foregrounded longer standing worries about global, and specifically Indian, over-dependence on API supplies from China.^{7,8}

To challenge the exclusionary and disequalising dynamic represented by the wave of 'crisis nationalism' in monopolising essential supplies, of which 'vaccine nationalism' has the highest profile,^{9,10} research and planning for health security must turn greater attention to localising supply chains and tackling severe concentration risk. Addressing the severe deficit of health security in most of Africa requires medium-term investment in broadening and deepening the local industrial base. This in turn means re-thinking the public health system's role in stimulating local industrial development, through innovative procurement, assured markets for local manufacturers and shaping technological upgrading, while building on the pandemic-strengthened collaborative capabilities between multiple public and private stakeholders in many countries.

The pandemic has taught once more that global health security is built on robust local health security foundations. It has also foregrounded the fragility of health-industrial supply chains in African (and other developing) countries and their reinforcing impact on global inequalities. The silos of health versus industrial research now need definitive breaking down. It is

time for global health research funders, planners and researchers to work much more closely with industrial and innovation experts, and to give space to, and reinforce, crisis-generated African research, agency, expertise and leverage in shaping local industrial and technological development for local and global health security— ahead of the next pandemic. The local health-industrial complex as a coalition nucleus for building robust local health security and by extension resilient global health security has been ignored for too long.

Contributors The authors equally contributed to the conceptualisation and authorship of the article.

Funding The authors have not declared a specific grant for this research from any funding agency in the public, commercial or not-for-profit sectors.

Competing interests None declared.

Patient consent for publication Not required.

Provenance and peer review Not commissioned; internally peer reviewed.

Data availability statement All data relevant to the study are included in the article.

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