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Is science ever enough? Dare to play politics

Richard Horton[1] argued that "medicine and public health are being co-opted into a political programme of population control to protect the power of the modern neoliberal state". Measures to bend the COVID-19 pandemic would aim to protect economies more than population health. If true, what can we do? In many jurisdictions, public health authorities are under the control of democratically elected leaders. If other policies are desired, other leaders must be elected. And if public health scientists want to make a difference, they should leave science for a moment and dare to play politics.

COVID-19 is painfully reminding us that the path is very complex—from gathering evidence to the implementation of sound public health interventions.[2] Nothing is new in the fact that leaders or citizens are difficult to convince. Evidence in public health is never enough; more is needed to influence stakeholders and make them change. Thomas R Oliver was right when he said, "science can identify solutions to pressing public health problems, but only politics can turn most of those solutions into reality".[3] Politics, more than analyses, determine policies.[2,3]

The key is to convince most people, and this is where the path becomes difficult. To gain influence on COVID-19-mitigating policy, public health scientists have to play politics—that is, fight opponents with competing interests that are blocking healthy public policy,[4] account for bounded rationality, convince key players, practice lobbying through interest groups, and make elected leaders serve their agenda. Public health science will never be enough.

I declare no competing interests.

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A step backwards in the fight against global vaccine inequities

The news that an effective vaccine against severe acute respiratory syndrome coronavirus 2 will be introduced imminently was welcomed with great enthusiasm worldwide. The consensus is that access to vaccines for low-income countries is a global responsibility.[1] To make sure that all countries and their citizens will have equal access to a vaccine, Eswatini, India, Kenya, and South Africa proposed a waiver[2] from certain provisions of the Agreement on Trade-Related Aspects of Intellectual Property Rights by the World Trade Organization. Acceptance of the proposal would allow low-income countries to produce their own COVID-19 vaccine. However, various high-income countries rejected the proposal, arguing that they cannot support the proposed broad exceptions to protection of intellectual property rights, even in an exceptional crisis such as COVID-19.[3] Another argument, which is used more informally, is that the COVID-19 vaccine is difficult to produce, with demanding production lines and storage requirements. In short, waiving provisions of trade-related aspects of intellectual property rights would not make sense since basic scientific and technological conditions for producing and storing the vaccine are insufficiently fulfilled in low-income countries.

The conservative position that is taken by high-income countries is a step backwards in the campaign against global vaccine and immunisation inequities. To move forward, we can no longer accept the basic inequality resulting from the most resourceful nations of the world continuing to claim an unreasonably large share of the global production capacity, as in the case for COVID-19 vaccines. Therefore, strengthening research institutions in low-income regions should be an absolute priority in cooperation agreements between high-income and low-income countries and regions. Strengthening these institutions is particularly relevant for global education and science collaboration with Africa, which is mainly focused on primary and lower-secondary education (ie, age 6–15 years), largely marginalising scientific cooperation and building of scientific capacity.

To alter this traditional focus on primary and lower-secondary education, an alliance of 36 African and European research universities has launched an initiative[4] to promote the prioritisation of research and innovation in the new strategic, multiannual agreement between the African Union and the EU. The initiative argues for major investments in African research universities to enhance their research and innovation productivity in key areas and improve career opportunities for African researchers on their own continent.

With this initiative, the participating universities give a clear message to all public authorities involved: if the necessary increase in the production and use of relevant knowledge and technology is to be realised throughout the whole continent, then strengthening research universities should be prioritised. The challenges of

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vaccine and immunisation inequities clearly show the fundamental need for long-term investments in African universities as their continent's key institutions for knowledge.

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Buyer beware: inflated claims of sensitivity for rapid COVID-19 tests

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For more on **BD Veritor tests** see https://www.bd.com/en-us/offerings/capabilities/microbiology-solutions/point-of-care-testing/bd-veritor-plus-system-for-rapid-covid-19-sars-cov-2-testing

Widespread COVID-19 testing is paramount for the receipt of timely medical care and for curtailing transmission. The USA continues to face formidable challenges in making testing accessible for all because efforts to scale up COVID-19 testing have fallen short.[1] RT-PCR testing for severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), which is considered to be the gold standard for identifying cases, is limited by processing time, exacerbating delays that are generated by surging demand. To expand testing capacity and accelerate diagnosis, the US Food and Drug Administration has issued an emergency use authorisation (EUA) for several diagnostic products, including six rapid antigen tests.[2] Although EUA for the rapid antigen tests provides essential countermeasures during this public health crisis, we outline the causes for concern regarding claims by manufacturers about performance metrics that might engender misinterpretation.

The sensitivity and specificity of these tests have been presented by manufacturers in a way that inflates these performance characteristics. For example, the manufacturers of the BinaxNOW test (Abbott; Chicago, IL, USA) claimed a sensitivity of 97·1% (95% CI 85·1–99·9)[3] and the manufacturers of BD Veritor tests (Becton Dickinson; Franklin Lakes, NJ, USA) have claimed a sensitivity of 83·9% (66·3–94·5). However, the reported accuracy of these rapid antigen tests is actually the percent positive agreement (PPA) and not sensitivity. The PPA is measured relative to an RT-PCR test, which is imperfect itself.[4] Due to variation in the diagnostic sensitivity of different RT-PCR tests, which are evaluated by the Foundation for Innovative New Diagnostics (FIND), understanding the accuracy of a rapid antigen test requires knowledge of the exact RT-PCR test that is selected as the comparator. However, manufacturers of most rapid antigen tests have not specified the test comparator. Compounding this uncertainty, the minimum sample size that is required to apply for EUA is 30 positive cases. Such small sample sizes have led to large CIs for the PPA. For example, the BD Veritor EUA study had 31 positive cases (PPA 83·9%, 95% CI 66·3–94·5). Combining the effect of small sample size with the reported sensitivity that is typical of RT-PCR (92·1%, 95% CI 86·6–95·9; over the first 7 days after symptom onset)[4] would correspond to diagnostic sensitivities of 89·4% (81·7–94·7) for BinaxNOW and 77·3% (63·5–87·8) for BD Veritor.

Furthermore, the real-world use of these antigen tests has extended beyond the EUA for postsymptom diagnosis to encompass routine screening. Screening is fundamental to the control of COVID-19, particularly because silent infections (ie, asymptomatic and presymptomatic infections) are major drivers of transmission.[5] However, the performance of rapid antigen tests has not been evaluated for detection of asymptomatic infections or during the incubation phase. The dangers of disregarding or misunderstanding the imperfections in test sensitivity are evidenced by the outbreak that unfolded in the White House, which relied exclusively on rapid antigen screening as a sufficient measure to prevent transmission.

Policy optimisation and implementation requires an accurate understanding of testing sensitivity. Numerous universities rely on antigen testing to screen students in congregate living facilities and identify infectious individuals for isolation. Many schools are examining testing as a pathway for safe instruction in person, despite high incidence in the community. University and school decisions about testing frequency and closing or isolation criteria often rely on risk tolerance for missing infections, the probabilities of which depend on test sensitivity. Adjusting from the reported test performance to real-world diagnostic sensitivity shows that such decision makers could be substantially underestimating the number of missed infections. For example, organisations relying on BinaxNOW miss three times as many infections as they have been led to believe. If rapid testing is going to become a viable, trusted screening strategy for control of COVID-19, then performance characteristics should be well understood and screening strategies should be designed with test imperfections clearly in mind.

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