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ReEBOV: Developing an Ebola rapid diagnostic test at research ground zero

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By Imogen Bevan, Alice Street and Ann H. Kelly



Expired ReEBOV tests in a hospital laboratory in Sierra Leone.
Photograph by Ann Kelly

In June 2015, as Sierra Leone and Guinea was experiencing new surges in clusters of Ebola virus cases, *Nature* published a [news article](#) asking why an inexpensive test that “could save lives” was not being deployed to the field. Indeed, while it seemed obvious to many policy makers and health experts that Ebola rapid diagnostic tests were urgently needed, the question of how these objects should be implemented and used ‘in the field’ remained uncertain.

The test in question – dubbed the “ReEBOV” by its developers – is an in vitro test that identifies Ebola virus by detecting the presence of VP40 antigen in a sample of patient’s blood. The device is the product of a collaboration between industry and academic scientists and promised to generate results in a third of the time required by the gold standard

reverse transcription polymerase chain reaction method. The US National Institutes of Health and Bill and Melinda Gates and Paul Allen Family Foundations provided generous financial support. An expression of interest was submitted by ReEBOV's manufacturers to the WHO in October 2014. In February 2015, the testing device was cleared through the WHO's [Emergency Use Assessment and Listing \(EUAL\)](#) procedure – an accelerated assessment mechanism established to provide international guidance on the “[quality, safety and performance of certain In Vitro Diagnostics \(IVDs\)](#)” in the context of a Public Health Emergency of International Concern. In February 2015, ReEBOV became the first approved commercial rapid antigen test on the market.

The origins of the ReEBOV device can be located in a research laboratory in Kenema Government Hospital, Sierra Leone, at a time before the Kenema district became an epicentre of the Ebola outbreak. The Kenema lab played a pivotal role in the Ebola outbreak as a hub for processing infected patient samples and is often cited as the “[ground zero for research](#)” in Sierra Leone. The laboratory hosted an international network of people and institutions – which included Tulane University, Corgenix, and Zolgen Labs – brought together under the umbrella of the [Viral Haemorrhagic Fever Consortium \(VHFC\)](#). The consortium was in the process of developing a rapid diagnostic test for Lassa fever at the time of the Ebola outbreak. When the WHO announced a [call to manufacturers to produce a rapid Ebola test](#), the network's researchers and developers reacted quickly – drawing on their financial resources, their relationships with local authorities, their existing diagnostic templates and their access to supplies of infected patient blood to produce an Ebola rapid test.

If measured in terms of the speed of development and regulatory approval then ReEBOV provides an unparalleled example of success in emergency R&D. Speed was certainly a key concern of the international actors behind the establishment of the EUAL process, and the source of ReEBOV's rapid development can be located in the VHFC's “rooted collaboration” (Yozwiak et al., 2016). ReEBOV was built on the back of an existing network of technologies, funding, institutions and people. But once we look at deployment and use, the ‘success’ of this device becomes more questionable.

There is little evidence that ReEBOV was clinically deployed in West African outside of validation and field trials, nor that it played a significant role in curbing the epidemic. In fact, by the time ReEBOV and other rapid diagnostic tests had been approved and become available, the attention of public health experts was firmly focused on the opportunities that new high-speed bench-top PCR machines presented for highly accurate testing in treatment centres at a district level. The accuracy of RDTs like ReEBOV was considered too low, and the infrastructure requirements (personal

protective clothing, complex algorithms, waste disposal, training) too high to make them a viable part of the outbreak response. Caught between the irreconcilable demands for high specificity and high sensitivity, the ReEBOV was classed too risky a device to mass deploy. The ReEBOV could not become a tool in political projects to certify countries as 'Ebola-free' because of its risk of producing false positives, while even the slightest risk of producing false negatives and returning infected patients to their communities was unthinkable from a public health perspective.

ReEBOV's story leads us to ask what counts as success for a device in an emergency context and to wonder what the post-emergency future of such rapidly developed devices will look like.

[Imogen Bevan](#) is a PhD candidate in social anthropology at the University of Edinburgh, and research assistant on 'Investigating the Design and Use of Diagnostic Devices in Global Health'. Her research interests include anthropology of global health, anthropology of food and drugs, and material culture studies. She has published research on tobacco and e-cigarette use, and currently explores the role of sugar in social relationships in urban Scotland.

[Alice Street](#) is a Senior Lecturer in Social Anthropology at the University of Edinburgh, where she currently holds a European Research Council Starting Grant for 'Investigating the Design and Use of Diagnostic Devices in Global Health' ([DiaDev](#)). Her research focuses on hospital ethnography, health systems research, global health interventions and medical innovation. She has carried out ethnographic research in Papua New Guinea and India and is the author of [Biomedicine in an Unstable Place: Infrastructure and Personhood in a Papua New Guinean Hospital](#).

[Ann H. Kelly](#) is a Senior Lecturer in the Department of Global Health and Social Medicine, King's College London and the Co-Deputy Director of the King's Global Health Institute. Her ethnographic work focuses on the socio-material practices of global health research and innovation in Sub-Saharan Africa, recent examples of which have been published in *Cultural Anthropology*, *Social Studies of Science*, *Social Science and Medicine* and *Visual Anthropology*. She is currently collaborating on a number of transdisciplinary initiatives including an NIHR Research Unit on System Strengthening in Sub-Saharan Africa (ASSET) and an ERC-funded project investigating the Design and Use of Diagnostic Devices in Global Health (DiaDev), lead by Alice Street at the University of Edinburgh.

[Diagnostic stories](#) follows the emerging world of devices, instruments, protocols and machines that make up the world of global health diagnostics. Through the telling of stories about specific technological artefacts it traces the rise of diagnosis as a global health concern and offers a critical perspective on the device-focused approach of many attempts to improve diagnostic infrastructure in the Global South. The series is edited by Alice Street.

Reference

Yozwiak, N. L., Happi, C. T., Grant, D. S., Schieffelin, J. S., Garry, R. F., Sabeti, P. C., & Andersen, K. G. (2016). Roots, Not Parachutes: Research Collaborations Combat Outbreaks. *Cell*, 166(1), 5–8.
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