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## Rethinking Infrastructures for Global Health: A View from West Africa and Papua New Guinea

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By Alice Street



“Without staff, stuff, space and systems, nothing can be done”. [Paul Farmer’s reflections on his recent trip to Liberia](#) in *The London Review of Books* reiterated in stark terms what health experts have been saying for months. There is by now a fairly clear consensus in the global health community that the uncontrolled spread of Ebola in West Africa this year was due to the collapse of already weak infrastructure. Ebola, we all know, is fairly difficult to transmit and easy to contain. The rapid and catastrophic spread of the disease in West Africa has therefore highlighted the absence of the most basic equipment and expertise: where there is no running water, no ambulances, no gloves or protective clothing, and few health workers or laboratories, what seems easy elsewhere becomes exceedingly difficult, and thousands of lives are lost.

Suddenly, the phrase ‘health infrastructure’ is rolling off everyone’s tongues. Reports of West Africa’s ‘[poor infrastructure](#)’, of Ebola working through the ‘[cracks in fragile health infrastructure](#)’, and of the disease spurring a ‘[collapse in health infrastructure](#)’ abound. Following the botched admission and death of a patient with Ebola at Dallas Hospital, in Texas, we are told that Obama has even been briefed on the ‘[preparedness of the US health infrastructure](#).’ The phrase ‘health infrastructure’ sounds so prosaic we might think it had been around forever, yet it is only with the policy fallout from Ebola in 2014 that it has become a commonplace expression in the global health lexicon. Given the sudden ubiquity of the expression, it is important to interrogate what exactly ‘health infrastructure’ means and what potential value it may have for improving healthcare and reducing inequalities.

To talk about infrastructure is to draw attention to the sheer materiality of health system architecture. For years social scientists and health experts have been emphasizing the importance of ‘health system strengthening’ and have highlighted the violence done to health systems by vertical disease-centric programmes that focus on magic-bullet solutions to seemingly isolated problems. But the focus on systems can also lead to abstractions. Health systems are imagined from afar, from offices in government buildings or donor agency headquarters. They are depicted in diagrams and drawn on white boards.

Health infrastructure, by contrast, conjures presence; the sticky materiality of being there. Paying attention to health infrastructure is about paying attention to the relentless particularity of material life: what you wear (a t-shirt? a paper mask? personal protective equipment (PPE)?), what you pick up (the edge of a used sheet? an old flannel? a paper tissue?), and after you have used it to wipe a mouth or sweaty forehead, where you put it down (a table? a hazardous waste receptacle? a concrete floor?) when you are *doing* healthcare. As [Uli Beisel has recently written here](#), the object that has become more emblematic of the life-saving simplicity of material infrastructure than any other in recent weeks is the rubber glove—an object that is both entirely innocuous and entirely necessary, whose presence or absence signals a material politics that prompts us to question the infrastructural histories of colonial and postcolonial medicine.

Yet dangers lurk if we endeavor to reduce infrastructure to materiality.

In 2011 I followed the rollout of rapid diagnostic tests for malaria in Papua New Guinea. RDTs are designed for places with weak public infrastructure. Places that do not have a network of laboratories, power-grids, or doctors. The RDT for malaria is a simple lateral flow test that requires a health worker to deposit a drop of blood from a fingertip in a small hole, to add buffer, wait 15 minutes, and then read off from a

series of up to three blue lines that appear in a small screen. Technologies like the rapid diagnostic test, in other words, are designed to substitute for absent infrastructure. They are what [Peter Redfield has called a “solution in a box”](#). Yet, as the problems that emerged during the RDT rollout in PNG illustrate, infrastructural externalities abound. RDTs have to be transported from medical stores to rural health centres and where there are no roads they must be carried. RDTs must be stored under 30 degrees centigrade for their accuracy to be preserved, but medical stores, dispensaries and road-side dropping off points all regularly exceed this threshold. The value of the RDT depends entirely on their result being acted upon by a health worker, who has also been equipped with a new treatment protocol that requires them not to treat patients with negative results. Yet those same health workers have few other treatment options and no other diagnostic options. For decades they have also been trained to treat all fever presumptively for malaria.

Infrastructures cannot be built into boxes.

Paul Farmer undoubtedly has it right. Staff (health workers who are there when the patients, or the RDTs turn up), stuff (the rapid diagnostic test, anti-malarial medication), and space (the dense forest that must be traversed for the RDTs to reach the health facility, the breezy verandah where health workers can attend to patients) and systems (the supply and distribution system that enables the RDTs to be reliably transported) are crucial. But he did not, I suspect, intend those items to be read as a checklist. If technologies do not work autonomously, then it is the relationships between stuff, space, people and systems that matter.

Infrastructure is relational.

Take something as mundane as how life-saving devices get from one place to another. According to Papua New Guinea’s medical supply and distribution system, medicines and equipment are transported from Madang Province’s medical store to Begasin Health Centre, a 10 mile hike from the edge of the national highway into the thick bush and steep inclines of Usino-Bundi District, by community volunteers: People walking on bush tracks substitute for trucks on bitumen roads. The grueling work of carrying up to 50kg in weight over ravines, through gorges and along slippery tracks is, according to the bureaucrats who devised and depend on this system, the work of public citizenship. It is called ‘community work’ and has a long colonial legacy.

In 2010 the son of a Nursing Officer at the health centre had an affair with the Officer in Charge’s local babysitter, resulting in her pregnancy, and the community revolted. For several weeks, until the Nursing Officer and her family had fled and suitable compensation payments had been made,

no medicines were carried and the health centre was closed. For young men and women living in the vicinity of the health centre the hard graft of carrying supplies is not only 'community work', it is also a personalized exchange; part of a history of transactions with the health workers who have come to live in their midst. The physical infrastructure that enables medicines and equipment to move from one place to another depends fundamentally on those relationships and transactions.

In 2012, when RDTs were finally rolled out in Madang Province, the Global Fund and its recipients did not want to take any chances. Personal relationships, the thinking went, are much too unreliable. Commercial transactions, by contrast, were deemed predictable and controllable. One day an unknown youth group from a village near the highway turned up in Begasin, carrying boxes of RDTs. They had each been paid 20 kina (£6) by a newly established medical logistics company in the town. 3 months later, when the next shipment was due, it did not turn up. Longstanding tensions had erupted in several skirmishes between the people living by the highway and those in the Begasin interior, and the youths were too scared to walk through the villages between their own and the health facility.

Why, young people from Begasin wanted to know, did paid contracts for carriers go to youth groups from another area? (They suspected political nepotism.) And why did they not get paid for carrying everyday medicines, like antibiotics, when carriers of 'special' medicines and equipment received a fee? I wondered how soon it would be before people from Begasin refused to carry any medicines at all without payment; a cost the embattled health ministry could hardly afford. The commodification of relationships spreads quickly but, as with other kinds of social relationships, it cannot always be controlled.

If infrastructure is relational the hardest lesson is surely that it cannot be routinized.

Infrastructure is neither an abstract system nor physical stuff; it is the relationships between people, stuff, and space that enables health systems to work. When a nurse at Dallas Hospital in Texas carried out a CDC issued checklist that revealed the man she was examining had travelled from Liberia, why was he not subsequently admitted and diagnosed with Ebola? We do not yet know the precise answer to this question. What we do know is that the checklist, which we have learnt from [Atul Gawande](#) is an ingeniously simple and powerful device, was nonetheless not able to script its own use. What technology ever can completely?

So, infrastructure, yes. As an anthropologist whose research has focused

on the materiality of Papua New Guinea's under-resourced hospitals and rural health systems, it is gratifying to see infrastructures for global health rise up the agenda of international organisations like the WHO.

But also, relational infrastructures. Otherwise we are doomed to end up with the technological determinism that so often led to the depletion of those very health infrastructures we hope to strengthen in the first place.

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Image: Mark Doyle

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