

Establishing an Enteric Reference Laboratory in Sierra Leone, a six week elective.

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Sierra Leone experienced the worst Cholera outbreak for 15 years in 2012. With over 300 fatalities and more than 20,000 people affected, the World Health Organisation (WHO) together with the Ministry of Health and Sanitation (MoHS) established a Cholera Command and Control Centre to manage this national emergency. The Gastrointestinal Bacteria Reference Unit, Colindale (GBRU), in collaboration with other Public Health England (PHE) laboratories developed an enteric bacteria diagnostic and reference laboratory - Central Public Health Reference Laboratory (CPHRL) in Lakka.

Since PHE left CPHRL in 2013 Marie Anne Chattaway, (GBRU, Colindale) and her colleagues worked tirelessly to obtain funding to reinforce and sustain activities with a view to accredit the laboratory to ISO15189 standards under 'Strengthening Laboratory Management Towards Accreditation' (SLMTA) guidelines. As a result a further Microbiologist request was released in February; interviews were held in March and by April I was on my way to Freetown.

During week one we undertook a two-day workshop led by PHE's Global Consultant, Mark Salter, discussing the future of Sierra Leone's public health. It was a great opportunity to meet key stakeholders and discuss the requirements to develop CPHRL capacity. A laboratory visit determined that without samples, generator fuel or running water for hand washing, major issues needed addressing before undertaking some of my main objectives, such as implementing antimicrobial susceptibility testing.

The project was aimed at helping CPHRL become self-sufficient and independent, the available budget was therefore restricted to providing expertise and consumables, not laboratory infrastructure. During the following weeks we began to adapt to the immediate challenges, by sourcing and containing fresh hand-wash water daily from the local village, communicating fuel availability so daily activities (e.g. media preparation or safety cabinet usage) were planned around power provision, and began to re-build relationships with local hospitals and district surveillance officers. This regenerated sample collection and as a result helped maintain and develop staff competency ensuring fulfillment of CPHRL's key purpose.

Outcomes were required within a very tight timescale and being posted to Sierra Leone independently, time management between all aspects represented a real challenge. Despite this, weekly action-plans ensured intense training activities, implementation of new techniques, and improvement of quality systems such as audit training and introduction of an EQA scheme provided by the National Institute for Communicable Diseases in South Africa. It was encouraging to see the laboratory making progress despite the initial setbacks.

Unfortunately Week 5 manifested another unexpected course of events; Sunday morning I was called to an emergency meeting at the Ministry following reports of 4 fatalities in the Kailahun district. Sadly, this represented the spread of the relentless Ebola outbreak from neighbouring Guinea into Sierra Leone.

With diarrhoea and vomiting being the predominant features, Cholera was suspected first and subsequently, highly infectious samples ended up at CPHRL. It was traumatic experiencing the fear instilled amongst the local community and healthcare workers expected to manage this situation without requisite training, and certainly not a situation I had anticipated being involved with. Action was needed and I was aware that posting

specialist response teams to manage the outbreak would take time. I was fortunate to have access to UK resources and support by PHE colleagues, Professor Noel Gill and Dr. Colin Brown. After an overnight crash-course reading relevant guidance, the following morning we sourced storage containers from local markets and managed to store and successfully dispose of infectious samples safely.

Upon returning to everyday comforts, my peers have asked if I would ever return to undertake a similar project. Without any hesitation, my answer is 'Yes'; the unique experience of being pushed to my limits, thinking spontaneously and meeting amazing people in stunning surrounds developed my personal and professional skills in an unimaginable manner. My experience will stay with me for a lifetime.



Eric Sefoj, Chloe Eaton and Marie Chattaway discussing with staff at the Ola During Children's hospital, Freetown, the prospect of triaging Rotavirus negative samples for enteric bacteriology at CPHRL.



Slum, built on reclaimed land in New Town. These toilets (left foreground and right background) are built from scrap wood and metal, raised on stilts beneath which sewage mixes with tidal and rainwater that flows through the settlement. Image adapted from WHO, 'Working together to beat cholera' article.



Konneh Kelfala, laboratory technician in Sierra Leone being trained to perform antimicrobial susceptibility testing



Ahmed Samba with Chloe Eaton, safely containing and disposing of known Ebola positive samples.