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# COVID-19 in Malawi: lessons in pandemic preparedness from a tertiary children's hospital

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The COVID-19 pandemic curve in Africa has lagged behind that of Europe. The first case of SARS-CoV-2 in Malawi was confirmed on 2 April.<sup>1</sup> Malawi closed schools and airports, but no 'lock-down' was enforced in recognition of the risk to a population vulnerable to economic and health service disruption.<sup>2</sup> Although overall ascertainment was low, detection of cases nationwide confirmed community transmission by July. Nonetheless, the number of acute cases presenting to hospital remained less than expected. The current total number of confirmed COVID-19 cases nationwide is just over 6000<sup>1</sup> with Blantyre district contributing one-third of the nationwide total.<sup>3</sup>

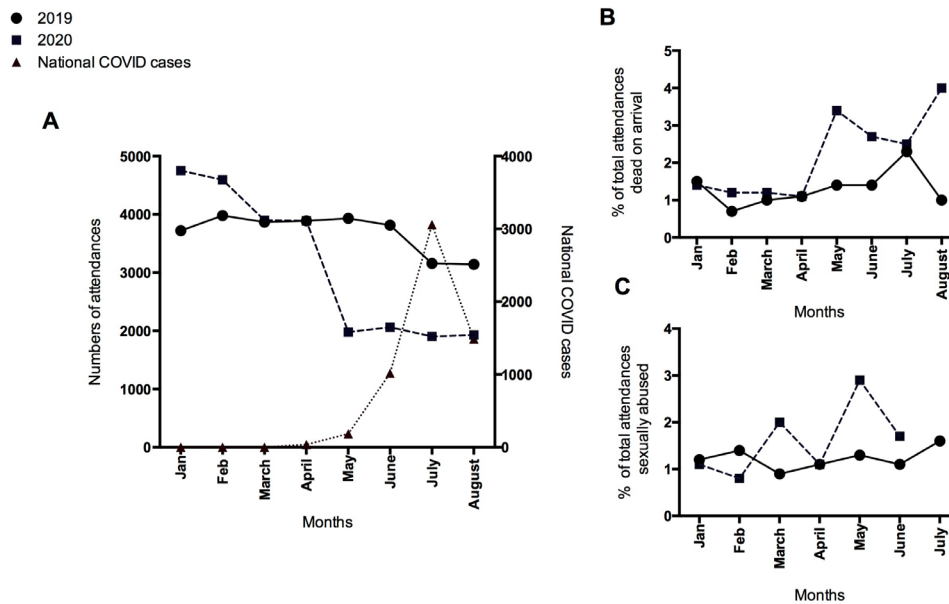
Queen Elizabeth Central Hospital (QECH) in Blantyre is the tertiary referral hospital for the Southern Region of Malawi. The pandemic heightened existing challenges related to limited human and material resources. Public fear and healthcare worker (HCW) sit-ins associated with concerns around inadequate personal protective equipment (PPE) disrupted services and contributed to delayed patient presentation. We established a multidisciplinary COVID-19 task force to work with hospital, district and national leaders in the coordination of activities aimed at mitigating the direct and indirect risks of the COVID-19 pandemic on staff and paediatric patients. We now reflect and share our initial lessons in pandemic preparedness in the Department of Paediatrics at QECH.

In the early months of the pandemic, there was mounting evidence that the risk of nosocomial transmission and occupational exposure was high.<sup>4,5</sup> In response, the Ministry of Health of Malawi developed COVID-19 treatment centres separate from central hospitals. This policy was challenging for paediatrics as the WHO clinical case definition used for isolation overlaps with the majority of in-patient paediatric diagnoses. Limited diagnostics led to a risk of inappropriate isolation, unnecessary exposure of high-risk children and guardians to COVID-19 and a reduced level of specialty care for acutely unwell children. We addressed this issue on two fronts. First, we collaborated with the district health team to provide paediatric training and consultation at the local isolation facility. Second, we developed a respiratory COVID zone in the emergency department (ED) where suspected cases

could be stabilised and receive specialist services such as bubble continuous positive airway pressure ventilation prior to assigning a diagnosis of COVID-19. Ultimately, this approach prioritises the rights of the individual child while aligning with the broader public health strategy.

Shortages of PPE has been a worldwide issue, more prominent in low-income countries. The procurement efforts of Ministries of Health in low-income and middle-income countries (LMICs) have been hampered by disruption to supply chains, uncontrolled pricing and drastic cuts to donor and coordinating agencies. The provision of PPE is essential to maintaining staff morale and services. In February, we faced the real threat of PPE shortage. We accessed two effective resources; strong, devolved leadership and community solidarity. Departmental and hospital level leadership at QECH is empowered to progress change and innovate. We launched a 'COVID-19 response' campaign, and team members were free to leverage their partnerships. We received cash donations to develop a reusable gown laundry service, PPE items, cloth masks, water sanitation and hygiene items and hand sanitiser from academic partners, local charities and religious groups. Although our hospital benefitted from many pre-existing partnerships, many new relationships were forged in this process, particularly with local groups. There is great strength in asking for help and mobilising community when it is needed.

Umunthu is a Ngoni Bantu word that has been used to describe an African ideal, a social construct of a communal or interconnected way of living. This ideal permeates through Malawian society, including the health sector and dictates patient-HCW, patient to patient and HCW to HCW relationships within the hospital setting. Hospital policies to slow the spread of COVID-19 resulted in physical distancing between children and HCWs, diminished interaction between colleagues and limited the availability of community support for carers. These realities negatively affected staff morale and highlighted the need to balance pandemic response with staff well-being. Our response was to provide repeated, intensive, cadre-appropriate teaching and debrief sessions, including psychological first aid where appropriate. Communication via online platforms



**Figure 1** Hospital-based data for the Department of Paediatrics (QECH) from January to August 2020 compared with the same time period in 2019. (A) Total attendances at paediatric ED, (B) children brought in dead as a proportion of total admissions (%) and (C) children presenting to the One-Stop family centre for sexual assault as a proportion of total admissions. ED, emergency department; QECH, Queen Elizabeth Central Hospital.

became essential, and while convenient, it was not always easy. Effective communication through social media require patience, trust and an environment where people can speak openly in the absence of non-verbal cues. Ultimately these modes of communication can only function well with an institutional culture of open discourse and psychological safety, a culture of Ubuntu.

Embedded research has been part of our departmental COVID-19 response. We are prospectively collecting clinical data on children admitted with suspected COVID-19 using the International Severe Acute Respiratory and Emerging Infection clinical characterisation protocol.<sup>6</sup> To date, of 254 children who met the clinical case definition, only 3% were COVID-19 PCR positive. Ninety per cent (10/11) were under 3 years of age, and three had underlying conditions (cerebral palsy, laryngomalacia and congenital heart disease). We have diagnosed one case of paediatric inflammatory multisystem syndrome temporally associated with SARS-CoV-2 infection, a diagnosis only possible through enrolment within the study.<sup>7-9</sup> Although provisional, these results support the paradigm that children are less severely affected by COVID-19 disease, even in settings where there is a high prevalence of poorly controlled HIV and malnutrition. However, data from Africa remains limited, and recently published data from a UK cohort indicated that clinical outcomes following COVID-19 disease are worse in HIV-infected adults on anti-retroviral therapy.<sup>10</sup> Embedding research into the departmental COVID-19 response allows for contribution to a global dataset while simultaneously increasing local diagnostic capacity.

Despite the mild direct effects of COVID-19 on children at QECH, the risk of service disruption and indirect effects on child health remain. We are using operational research methods to prospectively monitor the situation. To date, we have documented a significant drop in both ED and outpatient department attendances. There was a simultaneous rise in the number of children who were pronounced dead on arrival to hospital and a spike of admissions to the 'One Stop' family centre for sexual assault at the time of school closures (figure 1). This is powerful information to use in public health and advocacy campaigns being developed by the Paediatric and Child Health

Association of Malawi. These research methods require few resources outside of the team and are supported by online tools including the WHO Tropical disease research implementation toolkit and the Medecin sans Frontiers/UNION SORT-IT toolkit for operational research. Embedding operational and implementation research into the departmental response provides training opportunities, fosters team spirit and promotes sustainability.

We will have little control over the social and economic fall-out of COVID-19 in Malawi. The pandemic has progressed slowly and is likely to continue to present a threat for many years. By embedding research, we have gained confidence in our ability to identify and manage the direct effects of the disease while simultaneously developing systems for collecting and using routine data that will add value to inpatient care beyond the pandemic. While some elements of COVID-19 response require resources, many do not. Open communication, partnership and strong local leadership are free and can be fostered in any environment. Ultimately, these will be the most effective tools in mitigating the direct and indirect effects of COVID-19 in LMICs. Potentially, harnessing the 'tension for change' brought about by the pandemic to build these skills can have long lasting effects on paediatric healthcare in the region. Optimism is also a skill.

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#### REFERENCES

- 1 PHIM) PHIoM. Daily update coronavirus disease-19, case report; 2020.
- 2 Divala T, Burke RM, Ndeketa L, *et al*. Africa faces difficult choices in responding to COVID-19. *Lancet* 2020;395:1611.
- 3 Office BDH. Blantyre DHO COVID-19 registrar; 2020.
- 4 Garzaro G, Clari M, Ciocan C, *et al*. COVID-19 infection and diffusion among the healthcare workforce in a large university-hospital in northwest Italy. *Med Lav* 2020;111:184–94.
- 5 Jin YH, Huang Q, Wang YY, *et al*. Perceived infection transmission routes, infection control practices, psychosocial changes, and management of COVID-19 infected healthcare workers in a tertiary acute care hospital in Wuhan: a cross-sectional survey. *Mil Med Res* 2020;7:24.
- 6 Dunning JW, Merson L, Rohde GGU, *et al*. Open source clinical science for emerging infections. *Lancet Infect Dis* 2014;14:8–9.
- 7 Ben-Farhat J, Schramm B, Nicolay N, *et al*. Mortality and clinical outcomes in children treated with antiretroviral therapy in four African vertical programmes during the first decade of paediatric HIV care, 2001–2010. *Trop Med Int Health* 2017;22:340–50.
- 8 Harris C, Mills R, Seager E, *et al*. Paediatric deaths in a tertiary government hospital setting, Malawi. *Paediatr Int Child Health* 2019;39:240–8.
- 9 Nosek CA, Buck WC, Caviness AC, *et al*. Hospital admissions from a pediatric HIV care and treatment program in Malawi. *BMC Pediatr* 2016;16:22.
- 10 Geretti AM, Stockdale AJ, Kelly SH, *et al*. Outcomes of COVID-19 related hospitalization among people with HIV in the ISARIC who clinical characterization protocol (UK): a prospective observational study. *Clin Infect Dis* 2020. doi:10.1093/cid/ciaa1605. [Epub ahead of print: 23 Oct 2020].