

Overview of papers

Selected Abstracts

Khan, N, Chimhini, G, Kumar Shrestha, S, Cortina-Borja, M, Chimhuya, S, Zailani, G, Gannon, H, Mangiza, M, Fitzgerald, F, Heys, M*, Chiume, S. **Assessing the use of neonatal sepsis guidelines and antibiotic prescription with large-scale prospective data from Zimbabwe and Malawi**, Journal of the Pediatric Infectious Diseases Society, 2025;, piaf017, <https://doi.org/10.1093/jpids/piaf017>

Ellis J, Khan N, Gannon H, et al. **Respiratory distress in low-resource settings: a scoping review and quantitative analysis** Archives of Disease in Childhood 2024;109:A287-A288.

Sengupta P, Khan N, Wilson E, et al. **Using routinely collected hospital data from low-resource settings to identify current practices and areas of improvement in newborn care** Archives of Disease in Childhood 2024;109:A284-A286.

Gannon H, Heys M, Wilson E, et al. **Review of positionality: the challenges of ethnographic observation in the evaluation of a newborn digital tool in Zimbabwe during crisis** BMJ Open 2024;14: [doi: 10.1136/bmjopen-2024-UCL-QHRN2024.16](https://doi.org/10.1136/bmjopen-2024-UCL-QHRN2024.16)

Gannon H, Heys M, Fitzgerald F, et al., **The effect of weekends and public holidays on neonatal mortality; a Zimbabwean tertiary hospital experience**. Archives of Disease in Childhood 2023;108:A309-A310. https://adc.bmj.com/content/108/Suppl_2/A309.

Dube, A., Wilson E., Lorencatto., F. et al., **Mothers' and Caregivers' perceived acceptability of a digital data capture and clinical decision support intervention (Neotree) in neonatal intensive care units in two low resource settings**. International Maternal Newborn Health Conference, 08 May - 11 May 2023

Mikanda, M., Nkhoma, D., Harawa, E. et al., **Creative storytelling as a tool to foster patient involvement and drive quality improvement in neonatal care: experiences from Kamuzu Central Hospital, Malawi**. International Maternal Newborn Health Conference, 08 May - 11 May 2023

Crehan C, Huq T, Kesler E, Dube Q, Lakhanpaul M, Heys M. **073 A qualitative study of healthcare workers perceived barriers and facilitators to neonatal care in a central hospital in Malawi**. Archives of Disease in Childhood. 2018;103(Suppl 2):A30-A.

Published papers

Palmer T, Chimhuya S, Khan N, Cortina-Borja M, Wilson E, Hull-Bailey T, et al. **Impact and cost-effectiveness of Neotree, a digital data capture and decision support tool designed to improve neonatal survival in Zimbabwe: an interrupted time series analysis and economic evaluation.** *BMJ Global Health.* 2026;11:e016828. <https://doi.org/10.1136/bmjgh-2024-016828>

Lowther E, Khan N, Cortina-Borja M, Chimhini GL, Neal SR, Mangiza M, Fitzgerald F, Heys M, Chimhuya S. **Predicting risk of early-onset sepsis in low-resource neonatal units using routine healthcare data: development and evaluation of multivariable statistical and machine learning models.** *BMJ Paediatrics Open* (2025);9:e003617. <https://bmjpaedsopen.bmj.com/content/9/1/e003617>

Wilson E, Hull-Bailey T, Sutcliffe-Goodman S, Sinjanic M, Chintolod E, Deulac R, Mwandira K, Nkhomac D, Zailanid G, Rao A, Chiumed M* and Heys M. **Adapting a digital quality improvement system (Neotree) for newborn care in primary health centres and community hospitals: a mixed-methods implementation study in Malawi.** *Global Health Action* Vol. 18, 2560716 (2025) <https://doi.org/10.1080/16549716.2025.2560716>

Khan, N, Mugwagwa, E, Cortina-Borja, M, Catherall, E, Fitzgerald, F, Chimhuya, S, Chimhini, G, Gannon, H, Crehan, C, Mangiza, M, Heys, M **Scoping review and modelling of predictors of an abnormal Thompson score in term neonates in low-resource settings.** *Scientific Reports* 15, 12217 (2025). <https://doi.org/10.1038/s41598-025-96566-7>

Khan, N, Chimhini, G, Kumar Shrestha, S, Cortina-Borja, M, Chimhuya, S, Zailani, G, Gannon, H, Mangiza, M, Fitzgerald, F, Heys, M*, Chiume, S. **Assessing the use of neonatal sepsis guidelines and antibiotic prescription with large-scale prospective data from Zimbabwe and Malawi,** *Journal of the Pediatric Infectious Diseases Society*, 2025;, piaf017, <https://doi.org/10.1093/jpids/piaf017>

Neal, S, Sturrock, S, Musorowegomo D, Gannon, H, Zaman, M, Cortina-Borja, M, Le Doare, K., Heys, M, Chimhini, G, Fitzgerald, F **Clinical prediction models to diagnose neonatal sepsis in low-income and middle-income countries: a scoping review** *BMJ Global Health*, 2025 Apr 9;10(4):e017582. doi: 10.1136/bmjgh-2024-017582. DOI: 10.1136/bmjgh-2024-017582

Gannon H, Larsson L, Chimhuya S, Mangiza M, Wilson E, Kesler E, Chimhini G, Fitzgerald F, Zailani G, Crehan C, Khan N, Hull-Bailey T, Sassoon Y, Baradza M, Heys M, Chiume M **Development and Implementation of Digital Diagnostic Algorithms for Neonatal Units in Zimbabwe and Malawi: Development and Usability Study.** *JMIR Form Res* 2024;8:e54274, doi: 10.2196/54274, PMID: 38277198, PMCID: 10858425

Gannon, H., Chappell, E., Ford, D. et al. **Effects of the COVID-19 pandemic on the outcomes of HIV-exposed neonates: a Zimbabwean tertiary hospital experience.** BMC Pediatr 24, 16 (2024). <https://doi.org/10.1186/s12887-023-04473-5>

Mupambireyi Z, Cowan FM, Chappell E, Chimwaza A, Manika N, et al. (2024) “**Getting pregnant during COVID-19 was a big risk because getting help from the clinic was not easy**”: COVID-19 experiences of women and healthcare providers in Harare, Zimbabwe. PLOS Global Public Health 4(1): e0002317. <https://doi.org/10.1371/journal.pgph.0002317>

Chappell E, Chimwaza A, Manika N, Wedderburn CJ, Mupambireyi Nenguke Z, et al. (2023) **Impact of the COVID-19 pandemic on the provision and uptake of services for the prevention of mother-to-child transmission of HIV in Zimbabwe.** PLOS Global Public Health 3(8): e0002296. <https://doi.org/10.1371/journal.pgph.0002296>

Haghpast-Bidgoli H, Hull-Bailey T, Nkhoma D, Chiyaka T, Wilson E, Fitzgerald F, Chimhini G, Khan N, Gannon H, Batura R, Cortina-Borja M, Larsson L, Chiume M, Sassoon Y, Chimhuya S, Heys M **Development and Pilot Implementation of Neotree, a Digital Quality Improvement Tool Designed to Improve Newborn Care and Survival in 3 Hospitals in Malawi and Zimbabwe: Cost Analysis Study** JMIR Mhealth Uhealth 2023;11:e50467, doi: 10.2196/50467

Neal SR, Fitzgerald F, Chimhuya S, et al.,. **Diagnosing early-onset neonatal sepsis in low-resource settings: development of a multivariable prediction model.** Archives of Disease in Childhood. Published Online First: 27 April 2023. DOI: 10.1136/archdischild-2022-325158

Kaur E, Heys M, Crehan C, et al. **Persistent barriers to achieving quality neonatal care in low-resource settings: perspectives from a unique panel of frontline neonatal health experts.** Journal of Global Health Reports. 2023;7:e2023004. [doi:10.29392/001c.72089](https://doi.org/10.29392/001c.72089)

Khan N, Crehan C, Hull-Bailey T et al. **Software development process of Neotree - a data capture and decision support system to improve newborn healthcare in low-resource settings.** Wellcome Open Res 2022, 7:305. <https://doi.org/10.12688/wellcomeopenres.18423.1>

Gannon H, Chimhini G, Cortina-Borja M, Chiyaka T, Mangiza M, Fitzgerald F, et al. (2022) **Risk factors of mortality in neonates with neonatal encephalopathy in a tertiary newborn care unit in Zimbabwe over a 12-month period.** PLOS Glob Public Health 2(12): e0000911. <https://doi.org/10.1371/journal.pgph.0000911>

Chimhuya S, Neal SR, Chimhini G, Gannon H, Cortina Borja M, Crehan C, Nkhoma D, Chiyaka T, Wilson E, Hull-Bailey T, Fitzgerald F, Chiume M, Heys M. **Indirect impacts of the COVID-19 pandemic at two tertiary neonatal units in Zimbabwe and Malawi: an interrupted time series analysis.** BMJ Open. 2022 Jun 21;12(6):e048955. doi: [10.1136/bmjopen-2021-048955](https://doi.org/10.1136/bmjopen-2021-048955). PMID: 35728901; PMCID: PMC9213761.

Crehan C, Chiume M, Mgusha Y, et al. **Usability-Focused Development and Usage of NeoTree-Beta, an App for Newborn Care in a Low-Resource Neonatal Unit, Malawi.** *Front. Public Health* 2022 10:793314. doi: [10.3389/fpubh.2022.793314](https://doi.org/10.3389/fpubh.2022.793314)

Heys, M, Kesler, E, Sassoon, Y, et al. **Development and implementation experience of a learning healthcare system for facility based newborn care in low resource settings: The Neotree.** *Learn Health Sys.* 2022;e10310. doi:[10.1002/lrh2.10310](https://doi.org/10.1002/lrh2.10310)

Wilson E, Gannon H, Chimhini G, Fitzgerald F, Khan N, Lorencatto F, Kesler E, Nkhoma D, Chiyaka T, Haghparast-Bidgoli H, Lakhanpaul M, Cortina Borja M, Stevenson AG, Crehan C, Sassoon Y, Hull-Bailey T, Curtis K, Chiume M, Chimhuya S, Heys M. **Protocol for an intervention development and pilot implementation evaluation study of an e-health solution to improve newborn care quality and survival in two low-resource settings, Malawi and Zimbabwe: Neotree.** *BMJ Open.* 2022 Jul 5;12(7):e056605. doi: [10.1136/bmjopen-2021-056605](https://doi.org/10.1136/bmjopen-2021-056605). PMID: 35790332.

Evans M, Corden MH, Crehan C, Fitzgerald F, Heys M. **Refining clinical algorithms for a neonatal digital platform for low-income countries: a modified Delphi technique.** *BMJ Open.* 2021;11(5):e042124.

Gannon H, Chimhuya S, Chimhini G, Neal SR, Shaw LP, Crehan C, et al. **Electronic application to improve management of infections in low-income neonatal units: pilot implementation of the Neotree beta app in a public sector hospital in Zimbabwe.** *BMJ Open Qual.* 2021;10(1)

Mgusha Y, Nkhoma DB, Chiume M, Gundo B, Gundo R, Shair F, Hull-Bailey T, Lakhanpaul M, Lorencatto F, Heys M, Crehan C. **Admissions to a Low-Resource Neonatal Unit in Malawi Using a Mobile App and Dashboard: A 1-Year Digital Perinatal Outcome Audit.** *Front Digit Health.* 2021 Dec 23;3:761128

Stevenson AG, Tooke L, Edwards EM, Mangiza M, Horn D, Heys M, et al. **The use of data in resource limited settings to improve quality of care.** *Semin Fetal Neonatal Med.* 2021;26(1):101204

Chimhini G, Chimhuya S, Madzudzo L, Heys M, Crehan C, Robertson V, et al. **Auditing use of antibiotics in Zimbabwean neonates.** *Infection Prevention in Practice.* 2020;2(2):100046

Neal SR, Musorowegomo D, Gannon H, Cortina Borja M, Heys M, Chimhini G, et al. **Clinical prediction models to diagnose neonatal sepsis: a scoping review protocol.** *BMJ Open.* 2020;10(8):e039712.

Crehan C, Kesler E, Nambiar B, Dube Q, Lufesi N, Giaccone M, et al. **The Neotree application: developing an integrated mHealth solution to improve quality of newborn care and survival in a district hospital in Malawi.** *BMJ Glob Health.* 2019;4(1):e000860

Theses

Gannon H; (2025) **Evaluating implementation of neonatal digital health tool in crisis affected Zimbabwe.** (PhD Thesis, University College London).

Mugwagwa E; (2024) **Association between adherence to continuous positive airway pressure (CPAP) guidelines and neonatal outcomes in Malawi** (MSc thesis, London School Tropic Medicine and Hygiene).

Ellis, J (2024) **Clinical Diagnostic Criteria for Respiratory Distress in Newborns in Low-Resource Settings; a Zimbabwean and Malawian case study,** MSci Clinical Paediatrics, UCL

Crehan, Caroline; (2023) **Optimising and Evaluating Usability, Acceptability and Feasibility of a Neonatal Digital Health System in a Low-Resource Setting: The NeoTree Case-Study.** Doctoral thesis (M.D(Res)), UCL (University College London).

Mugwagwa E. **A data-driven approach to improving identification of neonatal encephalopathy in low-to-middle-income countries: a sub-study of the Neotree Project.** BSci thesis London, UK: University College London; 2021.

Neal SR. **Identifying neonatal sepsis in low-income and middle-income countries using routine clinical data from the Neotree application:** University College London; 2020.

Kesler, Erin. **Developing the DeCREaSE trial: Decreasing Case fatality Rates of newborns through E-health, virtual Support, and Education: a cluster randomized step-wedge trial in rural Nepal.** Dissertation. University College London, 2013.

Study protocols

Evaluating the Neotree in Malawi and Zimbabwe. [Trials.gov](https://clinicaltrials.gov/ct2/show/NCT05127070)
(<https://clinicaltrials.gov/ct2/show/NCT05127070>)

Evaluation of the Impact of the COVID-19 Pandemic on Provision and Uptake of Services for the Prevention of Mother-to-child Transmission of HIV and Syphilis in Zimbabwe. [Trials.gov](https://www.clinicaltrials.gov/ct2/show/NCT04782739) (<https://www.clinicaltrials.gov/ct2/show/NCT04782739>)