

Neonatal Colonisation with multidrug resistant gram-negative bacteria and fungi in high burden countries in South-East Asia and the Pacific

Robert Kelleghan¹, Khanh Boi Luu³, Le Minh Hang^{3,4}, Dr Phan Thi Hang², Michelle Harrison¹, Prof. Thu-Anh Nguyen^{1,3}, Duy Pham Thanh⁵, An Thanh Pham³, Dr Hoang Thi Diem Tuyet², A/Prof. Phoebe Williams¹

¹Sydney School of Public Health University of Sydney, ²Hung Vuong Hospital, Vietnam, ³University of Sydney Vietnam Institute, ⁴Hanoi Medical University Hospital, Vietnam, ⁵The Oxford University Clinical Research Unit (OUCRU), Ho Chi Minh City, Vietnam

Introduction

Neonatal sepsis poses a significant global health burden, contributing to high rates of infant mortality and morbidity. The growing prevalence of antimicrobial resistance (AMR) further complicates this, reducing the effectiveness of standard therapies and increasing the risk of poor health outcomes for newborns. The NeoCol study aims to reduce the current burden of AMR in neonatal infections, by understanding and characterising colonisation, infection and transmission of pathogens in neonates at birth and during their hospital admission. Screening swabs for multidrug-resistant gram-negative pathogens, Group B Streptococcus and *Candida* spp. will be collected from mothers, their infants and the environment alongside detailed clinical data to enable characterisation of colonisation and infection patterns. This will enable opportunities to break the transmission of serious infections in neonates and help ensure treatment guidelines remain effective as AMR rises. With better knowledge of the risk factors and sources of multi-drug-resistant pathogen acquisition, we can implement targeted interventions that are relevant to local needs.

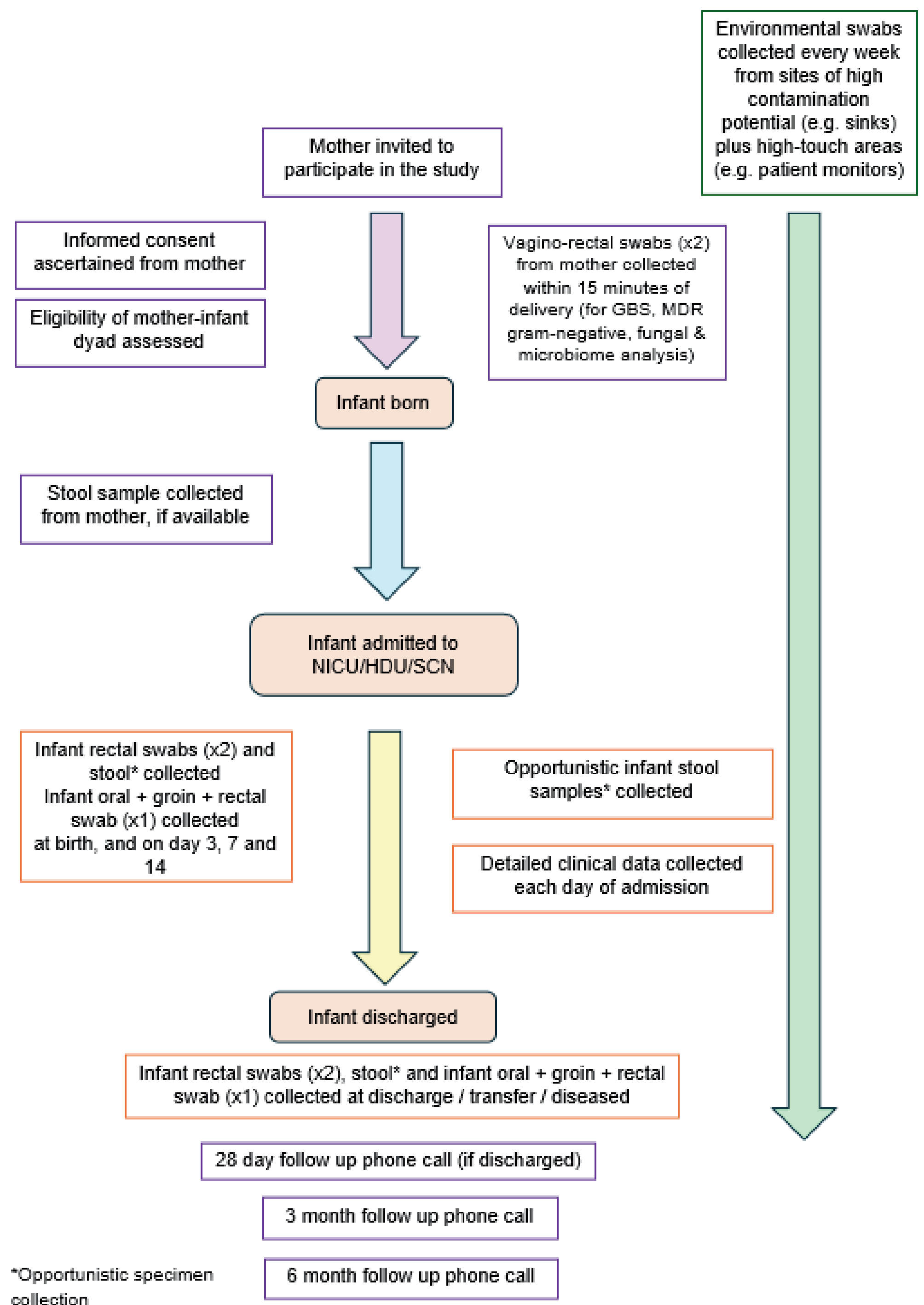
Primary Aim

- To identify the colonisation and transmission pathways of bacterial and fungal pathogens in hospitalised neonates.

Secondary Aims

- Identify the role of vertical (mother-to-child), horizontal and environmental transmission of pathogens causative of invasive infections in neonates.
- Assess the association between colonisation and infection with gram-negative bacteria and *Candida* spp.
- Assess the prevalence of maternal Group B Streptococcus colonisation at delivery and neonatal clinical outcomes.
- Identify the impact of antibiotic prescribing on colonisation and infection with bacterial and fungal pathogens.
- Evaluate the impact of antibiotic prescribing on changes to the neonatal microbiome and subsequent clinical outcomes.

Study design



Collaborative Research & Capacity Building



University of Sydney team visiting the research team at Hanoi Medical University Hospital to discuss laboratory training for the study, with both parties sharing laboratory expertise to formulate a plan for this element of the study.



University of Sydney & Sydney Vietnam Institute teams visiting the research team at Hung Vuong Hospital to discuss study procedures, conduct training and to visit wards. A knowledge sharing experience to discuss the local teams ideas on how best to conduct the study in their hospital.