

A cluster of multidrug-resistant *Acinetobacter baumannii* infections in a neonatal intensive care unit at a regional hospital in KwaZulu-Natal, August 2022.

Infections caused by multidrug-resistant *Acinetobacter baumannii* (MDR-AB) are among the most challenging to prevent and treat in new-born and immunocompromised individuals¹. Indwelling devices, pre-existing colonisation, prior exposure to antimicrobial agents, recent surgery, invasive procedures, and underlying illness-severity are risk factors for infection with this multidrug-resistant Gram-negative bacterium¹. On 16 August 2022, the Centre for Healthcare Infections, Antimicrobial Resistance and Mycoses (CHARM) at the NICD was informed of an increase in cases of MDR-AB infections in a neonatal ICU of a regional hospital in the KwaZulu-Natal Province. The cluster involved five new-born babies with MDR-AB cultured from cerebrospinal fluid (n=3), blood (n=1) and endotracheal aspirate (n=1). The specimens were collected ≥ 3 days after admission for all the babies and within a maximum of 4 days between each other. The organism was isolated from a blood culture taken on 31 July 2022 from the index case and from a CSF specimen from the same patient taken on 11 August 2022. All three CSF specimens from three cases were blood stained. All babies had underlying conditions and four of the five cases died. At the time of the notification, an outbreak investigation was supported by KwaZulu-Natal Provincial Department of Health, including Infection Prevention and Control (IPC), Provincial and District hospital outbreak teams, NHLS and NICD. As part of the investigation, several activities were undertaken by the team; including secondary data analysis for cases of bloodstream infections (AB isolated from blood

culture) and meningitis (AB isolated from CSF) from 1 January 2022 through to 16 August 2022. In addition, MDR-AB isolates cultured from the five cases were sent to the NICD for phenotypic and molecular characterisation including whole genome sequencing (WGS). During the investigation period, 16 incident cases of culture-confirmed *A. baumannii* were reported with an apparent increase in patients with suspected meningitis in August 2022 (Figure 11). Laboratory analysis showed that all five isolates from the cluster were phenotypically resistant to tested antibiotics including amikacin, gentamicin and meropenem. All isolates were susceptible to tigecycline and four of the five isolates were susceptible to colistin. Phylogenetic analysis showed two clusters, a major cluster consisting of four closely related isolates (all belonged to sequence type (ST) 2) and a minor cluster with one isolate that is different from isolates in the major cluster (ST79) (Figure 12). In this investigation, we found one dominant strain with four clonal isolates, indicating a possible common source and/or person-to-person transmission. The unit exceeded approved bed occupancy and was not adherent to staffing norms. Control measures included reducing bed occupancy in the unit, strengthening of IPC, such as hand hygiene and environmental cleaning, decontamination of equipment, aseptic technique for procedures, retraining of staff and surveillance. As of 26 August 2022, no further cases of MDR-AB infection were reported.



HEALTHCARE-ASSOCIATED INFECTIONS, ANTIMICROBIAL RESISTANCE AND MYCOSES

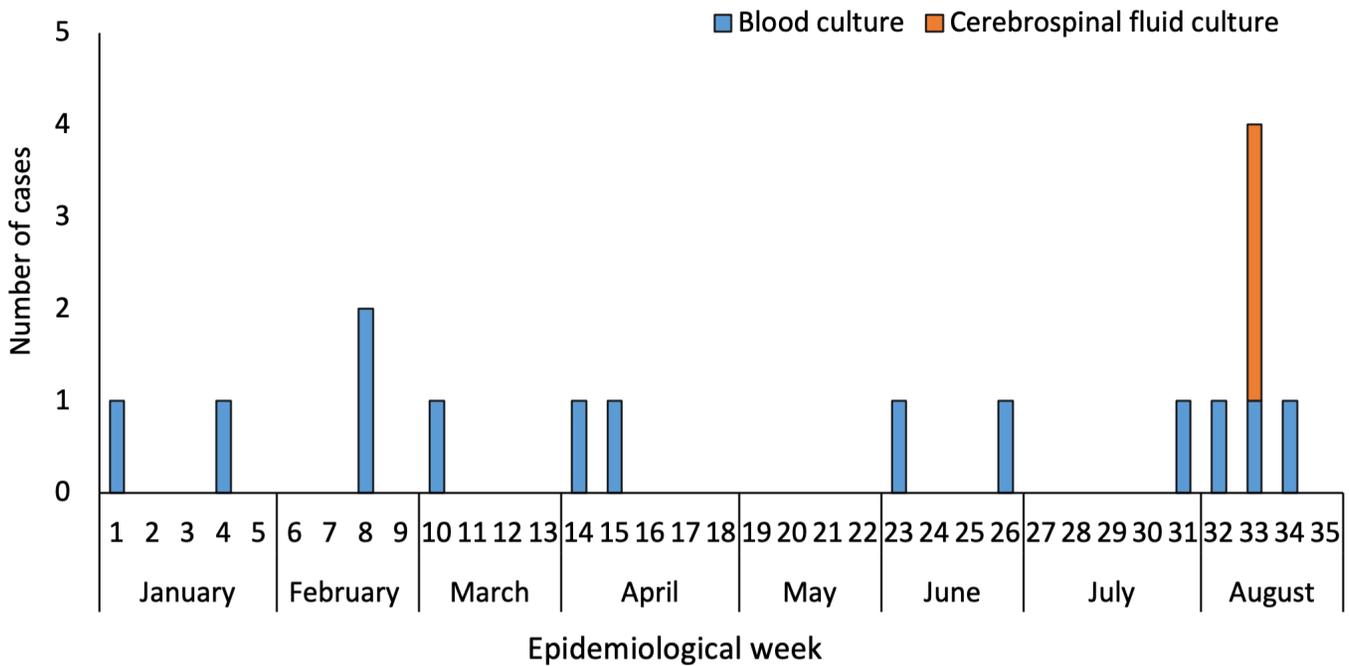


Figure 11. Cases of culture-confirmed *Acinetobacter baumannii* infection from neonates at a regional hospital in the KwaZulu-Natal Province of South Africa, 1 January 2022 to 16 August (n=16).

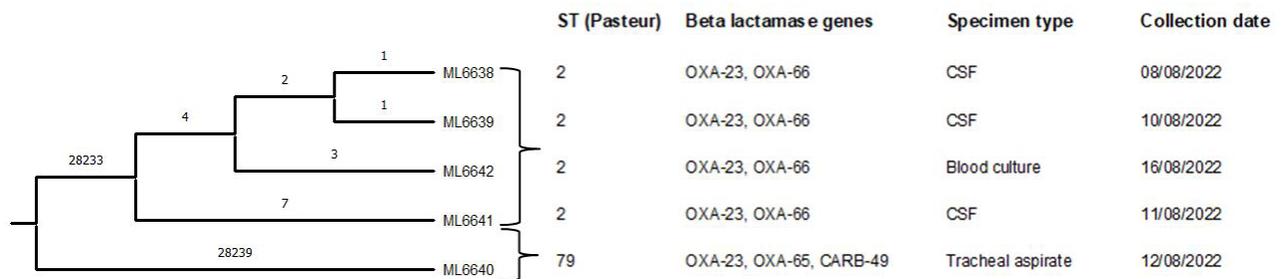


Figure 12. Phylogenetic comparison of phylogenetic tree of *Acinetobacter baumannii* isolates based on single nucleotide polymorphism (SNP) core distances.

Source: Centre for Health-Associated Infections, Antimicrobial Resistance and Mycoses, NICD-NHLS; LiliweS@nicd.ac.za

1. Maragakis LL, Perl TM. *Acinetobacter baumannii*: Epidemiology, antimicrobial resistance, and treatment options. Vol. 46, Clinical Infectious Diseases. 2008. p. 1254–63