Antibiotic resistance patterns of potential pathogens isolated from two major hospitals in Lusaka and Ndola

Bertha Chibwe,¹ Michelo Simuyandi,¹ David Ojok,¹ Roma Chilengi,¹ Annika Kruuner¹,² ¹CIDRZ, Zambia; ²UAB, Zambia

Background This study was conducted as part of an assessment of the effectiveness of existing hygiene and sanitation practices in two first-level hospitals in Lusaka and two central clinics in Ndola to determine the drug resistance patterns of potential pathogens in health care facilities in Zambia.

Methods In this cross-sectional study, the samples analysed were collected from health care workers’ hands, touch surfaces, disinfectant buckets in delivery rooms, post-natal and paediatric wards, operation theatre, post-operation wards and outpatient departments. The swabs in Cary-Blair transport media were used for sample collection and inoculated to 3 (Blood-, Chocolate- and MacConkey agar) primary plates. For species identification and drug susceptibility testing BD Crystal ID System and disk diffusion method with panel of 20 antibiotics was used.

Results A total of 132 swabs were collected resulting in isolation of 275 Gram negative and positive bacteria. 65 bacterial isolates were successfully identified as the following species: Acinetobacter, Enterobacter, Klebsiella, Pseudomonas, Staphylococcus, Streptococcus spp. All identified bacteria were tested for drug resistance. Among the Pseudomonas spp, the highest level of resistance was detected to cephalosporins, amoxicillin and carbenicillin and was up to 70%, 90% and 60%, respectively. Staphylococcus spp had high resistance to penicillin, ampicillin, azithromycin and cephalosporins, up to 86%, 76%, 57% and 95%, respectively. Vancomycin resistance among Staphylococcus spp was 19%.

Conclusions High drug-resistance levels among potential pathogens isolated in health care facilities reflect the long-term empiric
use of antibiotics in Zambia. For better understanding of the scale of this problem a more comprehensive study including all central private and government health care facilities should be conducted. A large number of isolated bacteria (35%) remained unknown indicating that more than one identification method should be used in order to capture the full spectrum of potential pathogens colonising the health care facilities in Africa.