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## New evidence of high infection and mortality rates with antibiotic-resistant *Acinetobacter* in a tertiary hospital in Nepal

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*Acinetobacter baumannii*, nicknamed multi-drug-resistant “Iraqibacter” infecting soldiers wounded in the Iraq war, are a major global health threat.

### Key Messages

- At Nepal Medicti Hospital in Lalitpur, Nepal, infections with multidrug-resistant *Acinetobacter* spp. are a severe health risk to patients and pose major treatment challenges to clinicians.
- *Acinetobacter* spp. infections are most common in respiratory (47.3%) and blood or body fluids samples (26.1%), indicating possible transmission at health facility level and via contaminated medical equipment.
- A significant proportion of isolates of *Acinetobacter* spp. was found to be multidrug-resistant (MDR, 30.2%) and extensive drug-resistant (XDR, 23.9%). Nearly a fifth of infected patients (18.5%) died.
- While most bacterial isolates still proved sensitive to third-line, reserve group antibiotics, improved infection prevention and control measures need to be implemented urgently to save lives and curb increased antimicrobial resistance.

### What is the problem and why is it important?

The World Health Organization (WHO) has designated *Acinetobacter* spp. as a critical priority pathogen posing a great threat to human health. In Nepal, the prevalence of *Acinetobacter* spp. has been reported to be around 11.8–12.5%, with multi-drug resistant bacteria ranging from a very high 72.4% to 95.2%.

The prevalence of *Acinetobacter* spp. and the resulting clinical burden at the Nepal Medicti Hospital, a referral tertiary care centre in Nepal, was previously unknown, posing an additional risk of hospital and community transmission of resistant bacteria clones.

### How did we measure it?

From September 2018 to September 2019, we reviewed electronic records and laboratory data of all patients with *Acinetobacter* spp. Our study assessed

*MDR Acinetobacter spp. are isolate resistant to at least 3 classes of antimicrobials.*

*XDR Acinetobacter spp. are resistant to the three classes of antimicrobials in the MDR class, as well as to carbapenems.*

*Acinetobacter spp. were resistant to most of the available 1st and 2nd line antibiotics, while being sensitive to reserve antibiotics.*

*Nearly one in five patients with an Acinetobacter spp. Infection at Nepal Medici Hospital died.*

1035 culture positive specimens, of which 364 were identified as *Acinetobacter* spp.

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#### What did we find?

- Out of 1035 culture positive specimens, 364 (35%) were identified as *Acinetobacter* spp. About  $\frac{1}{3}$  of patients (110) were infected with multidrug-resistant (MDR) strains and  $\frac{1}{4}$  (87) with extensively drug-resistant (XDR) strains. Nearly a fifth of infected patients (18.5%) died from their infection.
- Patients in inpatient wards (191, 59.9%) and those of more than 40 years of age (196, 61.4%) were significantly more likely to acquire an *Acinetobacter* infection.
- The majority of resistant isolates came from respiratory samples, followed by samples of blood and other body fluids.
- Most of the *Acinetobacter* spp. isolates remain sensitive to the reserve-group antibiotics such as polymyxin B, colistin and tigecycline.

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#### Implications

- The presence of MDR and XDR *Acinetobacter* spp. in all types of samples and the high proportion of inpatient infections indicates high prevalence of the organisms in the hospital environment, likely contributing to hospital-acquired infections.
- Compared to previous studies from Nepal, prevalence of MDR (30.2%) and XDR (23.9%) strains of *Acinetobacter* spp. was significantly lower, suggesting active infection control practices are effective.
- Improved routine surveillance and reporting are needed to assess the true treatment burden, reduce infection, and lower infection-related mortality.
- Despite most bacteria isolates remaining responsive to second- and third-line antibiotics, empirical prescription of last line or reserve antibiotics (i.e. polymyxin B, colistin and tigecycline) urgently need to be restricted to prevent pan-drug resistance and counter a looming increase in adverse patient outcome.
- More robust infection prevention and control measures at hospital level, including hand hygiene, personal protective equipment, safely managing blood and bodily fluids and medical equipment need to be implemented to prevent the spread of resistant *Acinetobacter* spp.