Antimicrobial resistance (AMR) represents a significant threat to human health. To date, there is a paucity of AMR data at the global level. Moreover, developing countries are under-represented in existing reports despite the likely higher AMR burden in such countries when compared to high-income countries.

We conducted a laboratory-based global survey on the prevalence of multidrug-resistant organisms (MDROs) in inpatient clinical blood and urinary specimens in a diverse range of healthcare facilities worldwide, while also evaluating laboratory microbiology capacity.

Summary of methods:
- **Design**: online survey (1st March-30 June 2014) based on:
  - routine collection of clinical blood and urine (MSU & CSU) culture specimens
  - Only 1st isolate from inpatients during one week
- **Participants**: health-care settings registered for the WHO SAVE LIVES: Clean Your Hands global campaign and other WHO-associated networks
- **Main targeted resistance patterns**:
  - methicillin-resistant *Staphylococcus aureus* (MRSA)
  - vancomycin-resistant enterococci (VRE)
  - extended-spectrum β-lactamase producing Enterobacteriaceae (ESBL-PE)
  - carbapenem-resistant Enterobacteriaceae (CRE)
  - multi-resistant *Acinetobacter* species (MRAB)

To evaluate laboratory microbiology capacity, we assessed microbiologic methods used for bacterial identification and identification of resistance (Table).

### Methods used for bacterial identification

<table>
<thead>
<tr>
<th>Organism</th>
<th>Methodology</th>
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</thead>
<tbody>
<tr>
<td><em>S. aureus</em></td>
<td>Gram stain AND confirmation either by Slide or Tube Coagulase OR Automated OR Non-automated methods</td>
</tr>
<tr>
<td>Enterococci spp.</td>
<td>Gram stain confirmation either by Automated OR Non-automated methods</td>
</tr>
<tr>
<td>Enterobacteriaceae</td>
<td>Gram stain confirmation either by Automated OR Non-automated methods</td>
</tr>
</tbody>
</table>

### Methods used for identification of resistance

- Gram stain AND use of one of the following susceptibility testing methods: CLSI, or EUCAST, or BSAC or SFM

Laboratories with clinical microbiologist: 85.5%.

Laboratories meeting minimum standards for both bacterial identification and identification of resistance:
- *Staphylococcus aureus*: 380 (90.5%)
- Enterococci spp.: 359 (85.5%)
- *Enterobacteriaceae*: 368 (87.6%)

Capacity was lowest in Africa, particularly for identification of resistance.

*Enterobacteriaceae* were the most common organisms (1,721 blood and 12,763 urine strains), and had lowest proportion of MDRO (Figure 1).

*S. aureus* was the next most frequent organism from blood cultures (n=409), with 38.1% (32.8–42.3) MRSA (Figure 1).

MDRO prevalence tended to be higher in low- and middle-income countries.

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