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Brief summary

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Improving Antimicrobial Resistance Surveillance in Nepal

Key Messages

- Data on antimicrobial resistance reported through Nepal's national surveillance system is often incomplete, inconsistent, and delayed.
- The low data quality jeopardizes the crucial surveillance pillar of Nepal's AMR response and implies that the true AMR situation in Nepal is incorrectly reflected in global databases.
- There is a lack of dedicated data personnel and basic infrastructure such as a computer with internet connection, and a signed agreement with NPHL for regular data reporting is often missing.
- Expanding on-site training initiatives and providing essential materials for testing and reporting offer a promising approach to improve AMR data quality.

What is the problem and why is it important?

To tackle the impending global public health crisis of antimicrobial resistance (AMR), surveillance of drug-resistant microorganisms is crucial. National and global surveillance networks provide policy-makers and healthcare practitioners with data on local outbreaks and emerging resistance patterns, allowing for effective, evidence-informed health and regulatory interventions.

The Global Antimicrobial Resistance Surveillance System (GLASS-AMR) collects aggregated resistance data on eight specific pathogens frequently causing severe hospital- and community-acquired infections. The platform allows countries to share, compare, and analyze validated global data to drive their AMR response at national and regional levels.

In Nepal, the National Public Health Laboratory (NPHL) leads the compilation and reporting of AMR indicators to the GLASS-AMR platform from 21 countrywide surveillance sites. Incomplete or inconsistent reports and delays in data submission pose major challenges to the reporting team at NPHL, and jeopardize the crucial surveillance pillar of Nepal's AMR response.

How did we measure it?

We analyzed the consistency, completeness, and timeliness of GLASS-AMR indicators reported through the national surveillance system. A representative sample of 1584 laboratory records of eight priority pathogens and their antibiotic susceptibility testing was taken from five reporting sites in Bagmati Province. In addition, we conducted an

[1]Reference: Acharya, J. et al. Quality Assessment of an Antimicrobial Resistance Surveillance System in a Province of Nepal. Trop. Med. Infect. Dis. 2021, 6, 60. https://doi.org/10.3390/tropicalmed6020060

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infrastructure assessment using a structured questionnaire to identify resource constraints and reporting barriers at four other surveillance sites that had not been submitting data for several months.

What did we find?

- Out of the 1584 laboratory records reviewed from five surveillance sites, a majority (99%) tested the indicated samples for suspected pathogens.
- Overall, only 66% were able to test pathogens' suspectibility to antibiotics as per the GLASS criteria. Particularly when testing for resistance to *Streptococcus pneumoniae*, *Neisseria gonorrhoeae* and *Klebsiella pneumoniae*, antibiotics not specified in the GLASS criteria were used.
- While the majority of data was complete when it reached NPHL, two sites were missing data on community- and hospital-acquired infections. Approximately 13% of the records received by NPHL showed discrepancies to the original records archived at surveillance sites.
- Three of the five surveillance sites reported with delays of up to 269 days.
- Despite having sufficient personnel to perform routine microbiological testing, none of the sites had dedicated data personnel. Some sites did not have a computer with internet access, or a dedicated data input workspace. Most surveillance sites did not have a signed agreement with NPHL for data reporting. Virtually all laboratory staff had received AMR surveillance training provided by NPHL.

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Implications

- Incomplete, inconsistent, and delayed reporting of antimicrobial resistance threatens to create a blindspot for resistance patterns and outbreaks of drug-resistant pathogens in Nepal. The reporting issues also result in problematic evidence-gaps in the GLASS database.
- A regular supply of testing materials, sufficient laboratory personnel, and minimal reporting technology standards, including a computer with an internet connection, are essential to improve AMR surveillance. Written agreements (MoUs) should be signed with all surveillance sites to improve their committement to routine data sharing.
- NPHL's trainings on AMR surveillance are effective in building technical capacity, but should additionally emphasize quality data reporting. On-site training efforts should be tailored to support the local staffing and supply situation, and encourage exchange with clinicians and data managers.
- Our study provides a snapshot of gaps and challenges in reporting data at nine surveillance sites in Nepal. Suggested measures to improve the reporting quality can be piloted in Bagmati province and should be scaled-up nationally.