

Novel strategies and tools for antimicrobial resistance surveillance



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HEALTH[e]FOUNDATION

Antimicrobial resistance: a major threat to global health



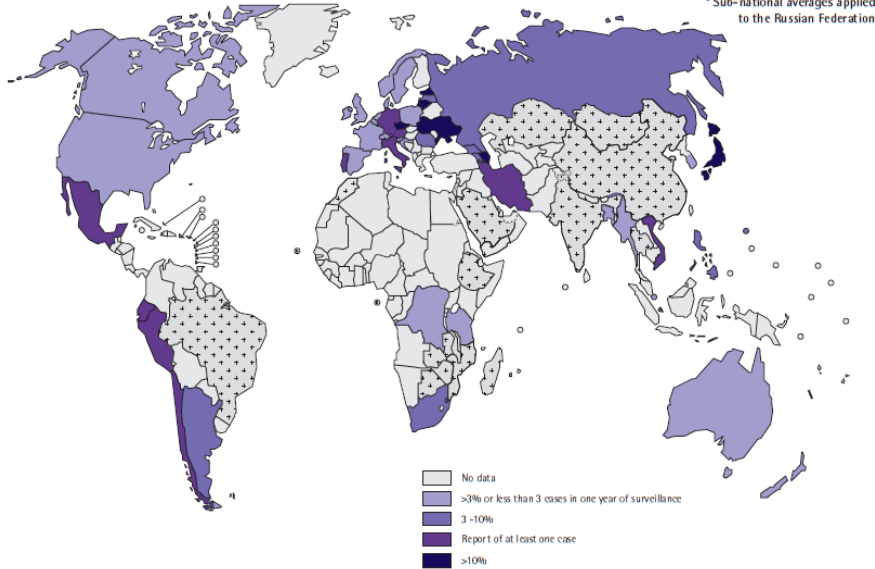
Antimicrobial resistance (AMR) results in increased morbidity/mortality and increased healthcare costs

Surveillance data are often limited...

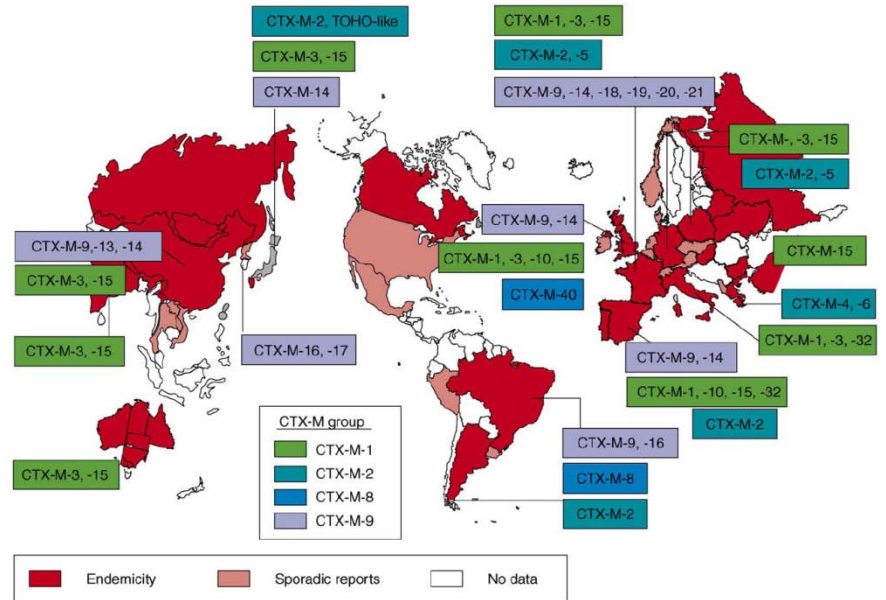
XDR-TB

XDR-TB among MDR-TB cases 2002-2007

* Sub-national averages applied to the Russian Federation

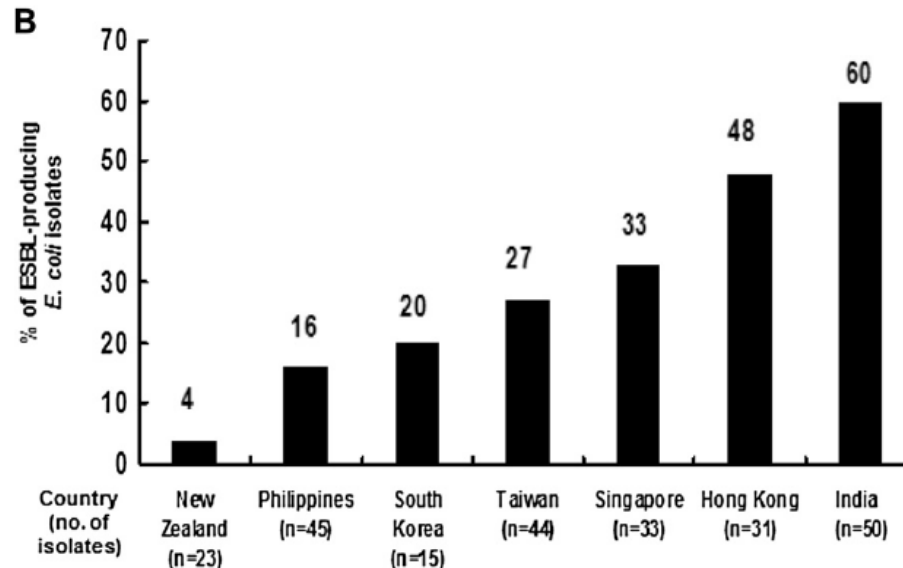


CTX-M ESBLs



...and show large geographic variation

Prevalence of ESBL-producing *E. coli* in complicated urinary tract infections across hospitals in Asia-Pacific region (2009)



Rates of *E. coli* isolates exhibiting extended-spectrum β -lactamase (ESBL) phenotype. All these isolates were collected from patients with urinary tract infection from 14 hospitals of seven countries in Asia. Data were derived from The Study for Monitoring Antimicrobial Resistance Trends (SMART), 2009. SAM, ampicillin-sulbactam; TZP, piperacillin-tazobactam.

The bottlenecks of AMR surveillance

- Routine surveillance programs often lacking
 - need for representative surveys
- ‘Conventional’ surveys have limitations:
 - large sample sizes needed for representative data
 - often laboratory-based: risk of bias
 - expensive, time-consuming, labor-intensive
 - data often not informative for local individual patient care
 - lack of timely data, lack of local data
- Challenges of surveillance in resource-limited settings
 - Limited financial resources
 - Limited laboratory capacity
 - Issues of quality assurance

A novel surveillance approach...

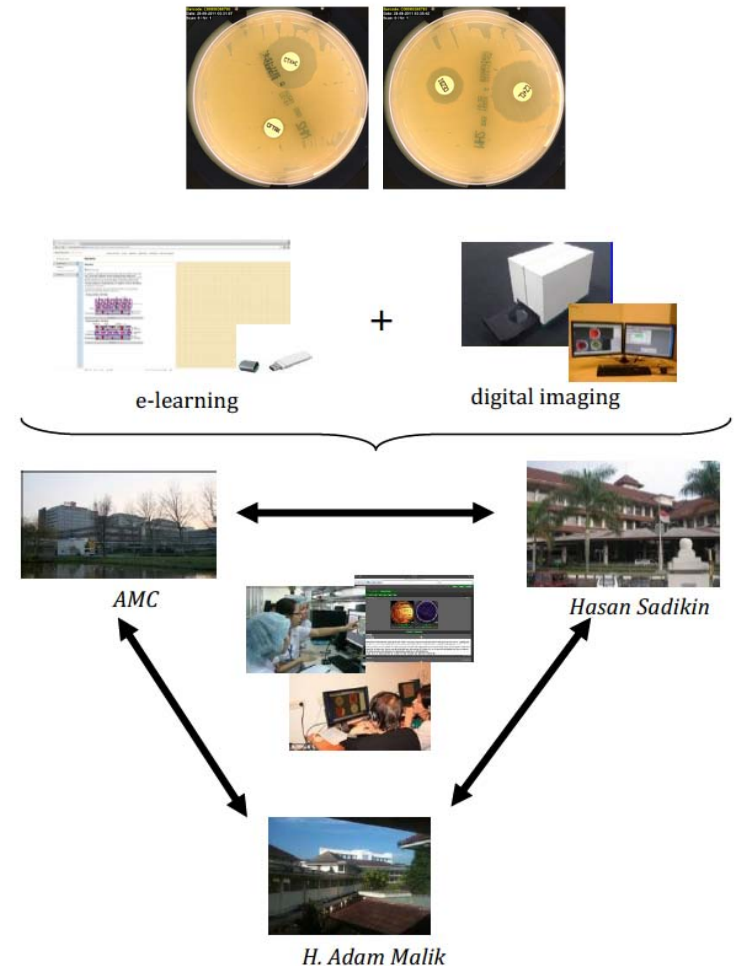
*Can **Lot Quality Assurance Sampling (LQAS)** be used as an alternative surveillance strategy which:*

- Requires smaller sample size
- Can inform local clinical practice
- Can provide estimates of the prevalence of antimicrobial resistance?



...using novel tools to enhance capacity

- Only high quality data are useful
- Novel tools for capacity building and training are required to enhance capacity to reach such quality
- Pilot of TeleMicrobiology and eLearning program has shown benefits in Vietnam



LQAS:

- *Sampling strategy* originating from industrial settings
- Production batches (Lots) rejected if *predefined number* of products fail to meet quality criteria
- Efficient because only *small numbers* are required



LQAS for AMR surveillance: more for less

- Predefined cut-offs: compatible with prevailing guidelines
- Small numbers:
 - less resources required
 - timely and local data to feed into antimicrobial stewardship programs

IDSA GUIDELINES

International Clinical Practice Guidelines for the Treatment of Acute Uncomplicated Cystitis and Pyelonephritis in Women: A 2010 Update by the Infectious Diseases Society of America and the European Society for Microbiology and Infectious Diseases

Clinical Practice Guidelines • CID 2011:52 (1 March) • e103

Trimethoprim-sulfamethoxazole 160/800 mg
(one DS tablet) bid X 3 days
(avoid if resistance prevalence is known to exceed 20% or if used for UTI in previous 3 months)

Sub projects

I Epidemiology

- Validation of LQAS against conventional surveillance
- Optimization of LQAS
 - Explore statistical and methodological assumptions using available data
- Bias introduced by laboratory based surveillance and negative culture results

II Clinical microbiology

- Effect of LQAS based surveillance on
 - appropriateness of empirical treatment
 - antimicrobial stewardship
 - cost
- Impact of telemicrobiology on lab capacity and quality
- Prevalence and genetic basis of AMR

Project partners



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Other

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Oxford University Clinical
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PhD:

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Oversight, communication & dissemination
National Institute for Health Research & Development



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COMBAT DRUG RESISTANCE

No action today,
no cure tomorrow

7 APRIL 2011 WORLD HEALTH DAY

