Laboratory perspectives (EQASIA)

Role of AMR data quality to support formulation of evidence-based policy / actions

RADSA

Tuesday, 8 June 2021

11:10 -11:30 IST Virtual meeting

AMR - A global emerging threat

"**Antimicrobial resistance is a crisis** that must be managed with the **outmost urgency**…..

….**Antimicrobial resistance threatens the very core of modern medicine** and the sustainability of an effective, global public health response to the enduring threat from infectious diseases…

…**Without harmonized and immediate action on a global scale, the world is heading towards a post-antibiotic era in which common infections could once again kill**"

Dr Margaret Chan
Director-General (former)
World Health Organization

Factors affecting infectious disease

- Dynamics of common infectious diseases are changing
  - Demographic change, urbanization, population density, etc.

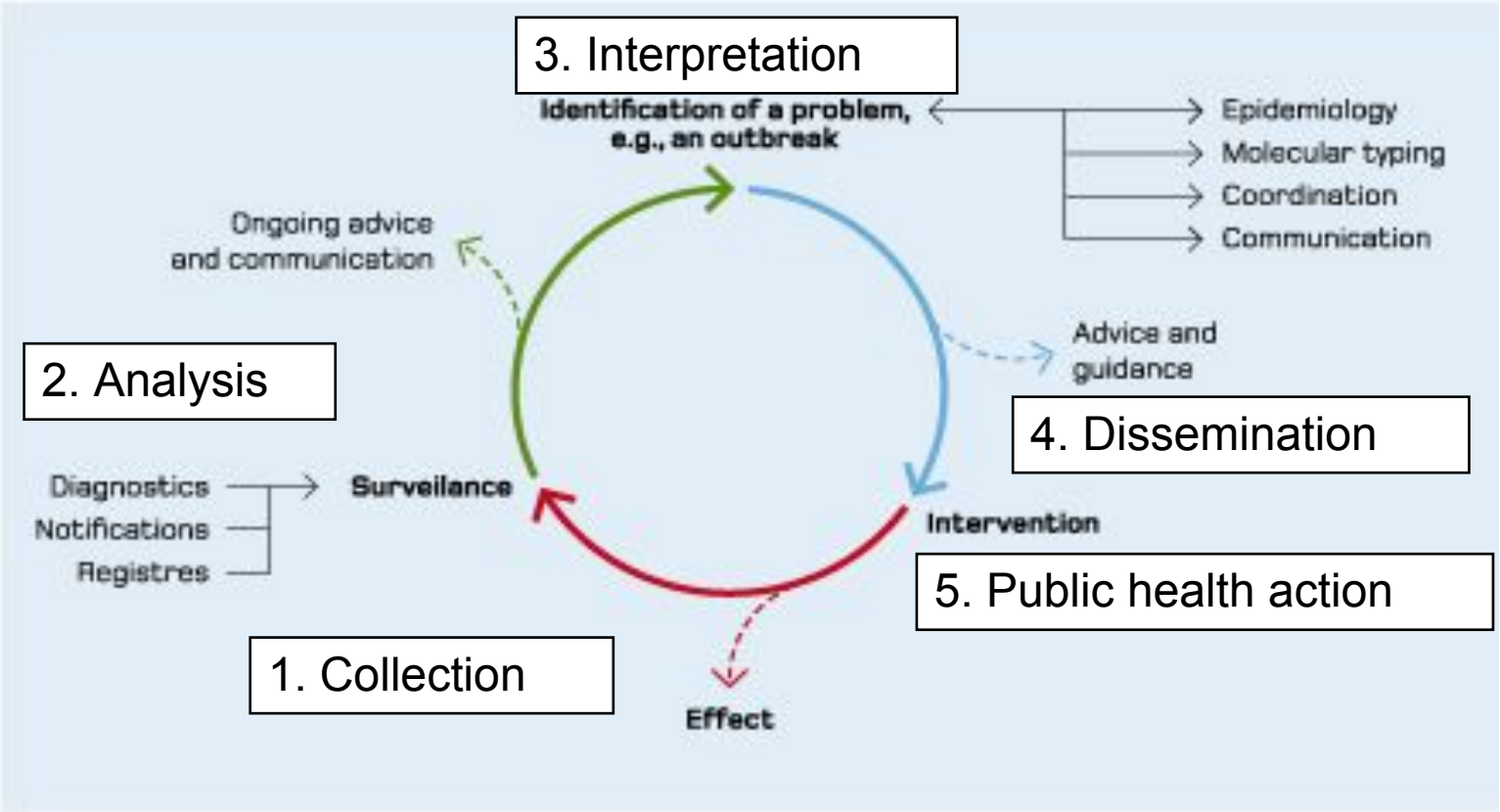
- New diseases emerge frequently
  - Travel, trade, climate changes, population growth, health system inequalities, deforestation etc.

- Difficult to predict the occurrence due to complexity of problems

- Public health and clinical response depend on global capacity for disease surveillance
  - Real time data sharing, comparison and analysis of data from multiple sources and using multiple methodologies

Concept of surveillance

- The systematic, ongoing, collection, analysis, interpretation, and dissemination of data for public health action



Purpose of Surveillance

- Estimate burden of disease
  - How big is the problem?
  - Relative importance of pathogens and reservoirs

- Monitor trends
  - Is it getting better or worse?
  - Measure effect of interventions

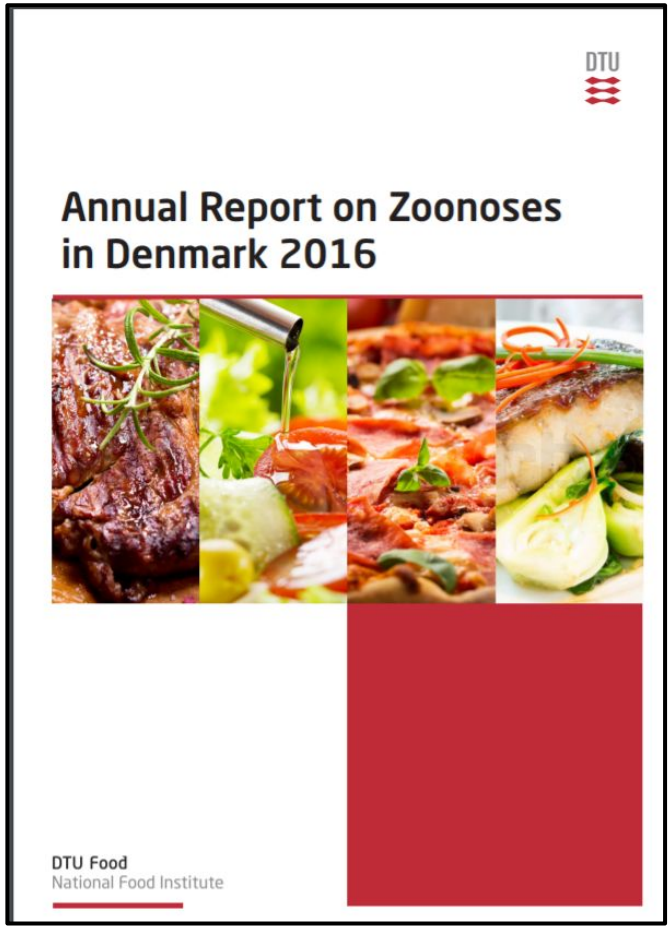
- Detect outbreaks
  - Is urgent action needed?

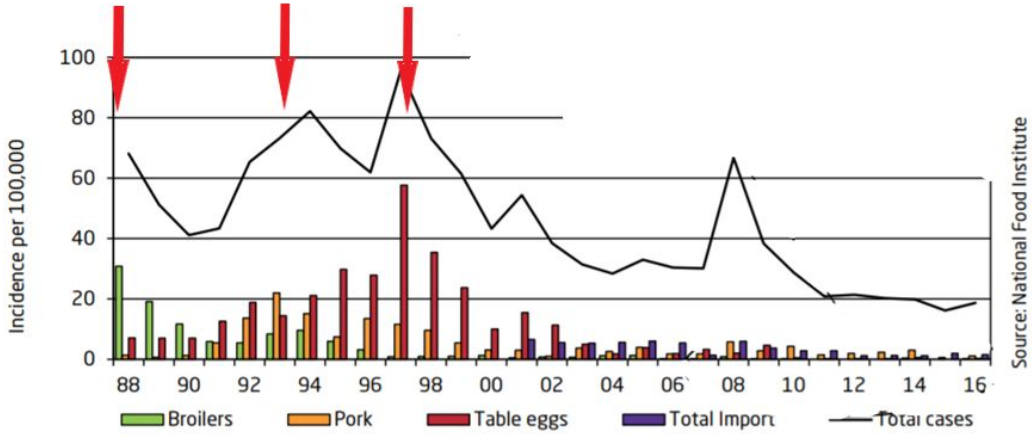
- Assess control programs
  - How are we doing?
  - Launch target interventions

The main purpose of Surveillance

- Knowledge of the distribution of health events
- Rapid detection of outbreak
- Public health planning and evaluation

Track report for surveillance in Denmark



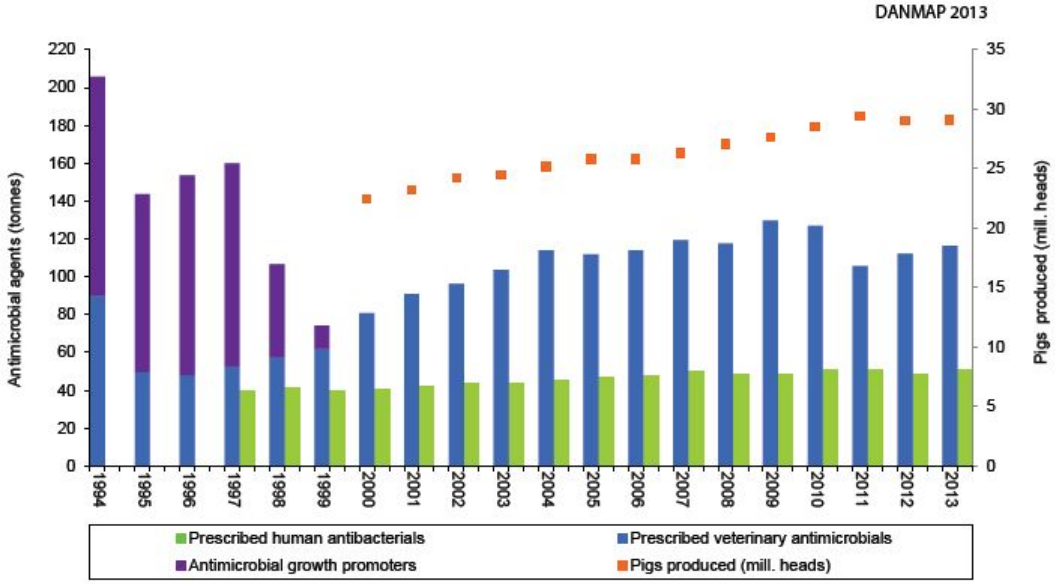


Source: National Food Institute, Technical University of Denmark

- Several control programmes to target
  - Broilers, 1988
  - Pork, 1993
  - Eggs, 1997
  - Imported food, >2000

Track report for surveillance in Denmark

Figure 4.1. Prescribed antimicrobial agents for humans, and for animals compared with the number of pigs produced, Denmark



- Yellow card introduced in Dec 2010
- Voluntary ban of cephalosporins issued July 2010 in the pig production

Only possible due to high quality AMR data

WHO strategy on EQAs

- The NRL should participate in an International External Quality Assurance (EQA) program to evaluate local proficiency and capacity to identify areas for potential improvements in support to the AMR National Surveillance System
  - Ideally, the NRL should participate in International EQAs that test preferable all pathogens included in GLASS and perform recommended tests to confirm and characterize AMR mechanisms

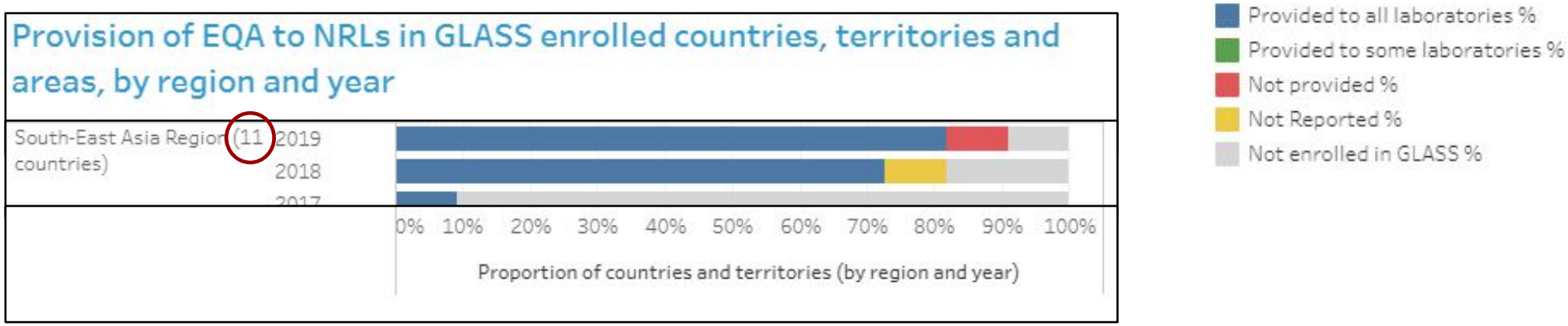
- The NRL should organize or facilitate the participation of all laboratories at AMR surveillance sites in national EQA schemes

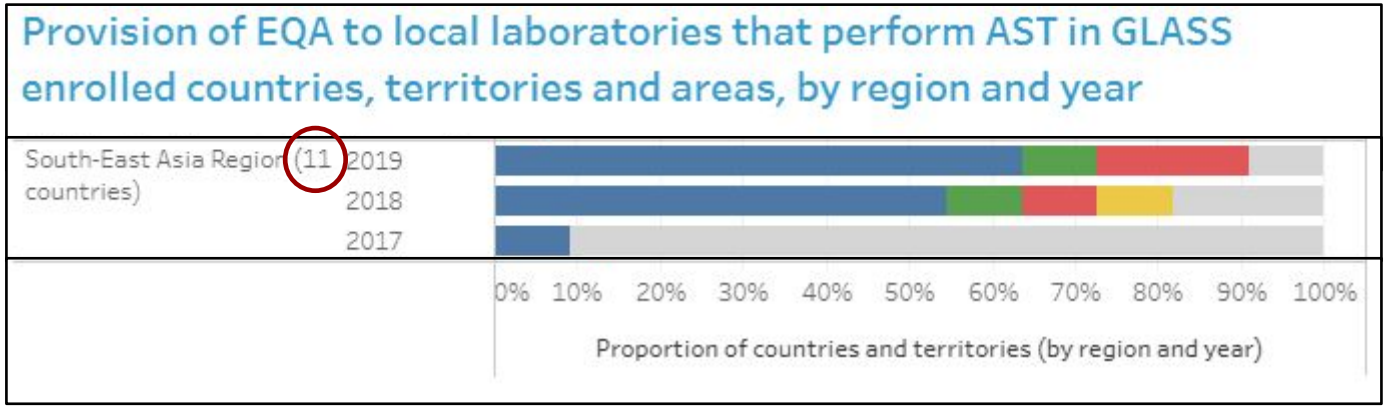
External Quality Assurance systems (EQAs)

- The objective is to ensure production of reliable phenotypic and genotypic results e.g. antimicrobial susceptibility testing and whole genome sequencing

- External quality control is one of the main and important parts for ensuring and maintaining excellent analytic quality of laboratory tests performed

Coverage of EQA participation in WHO GLASS





https://apps.who.int/gho/tableau-public/tpc-frame.jsp?id=2009

EQA deviation level based in EU (Vet/ food NRLs)

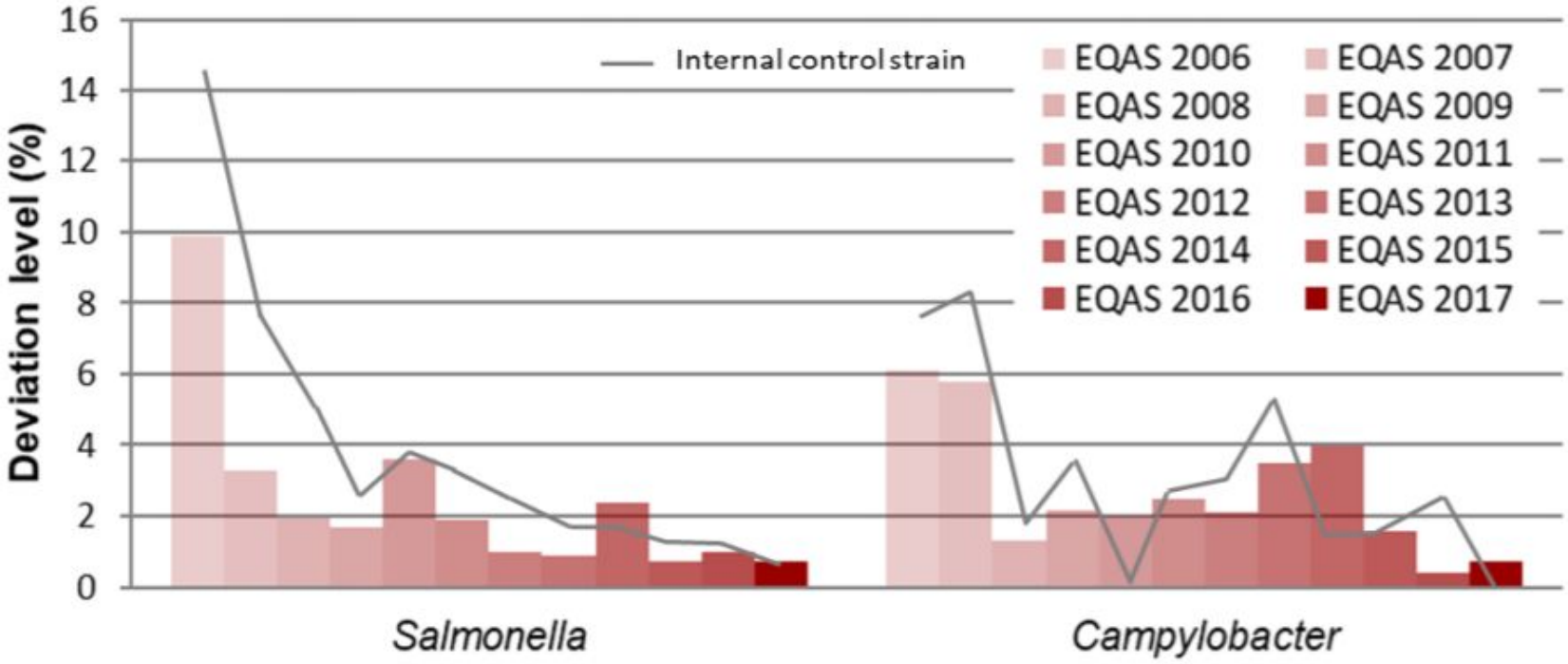
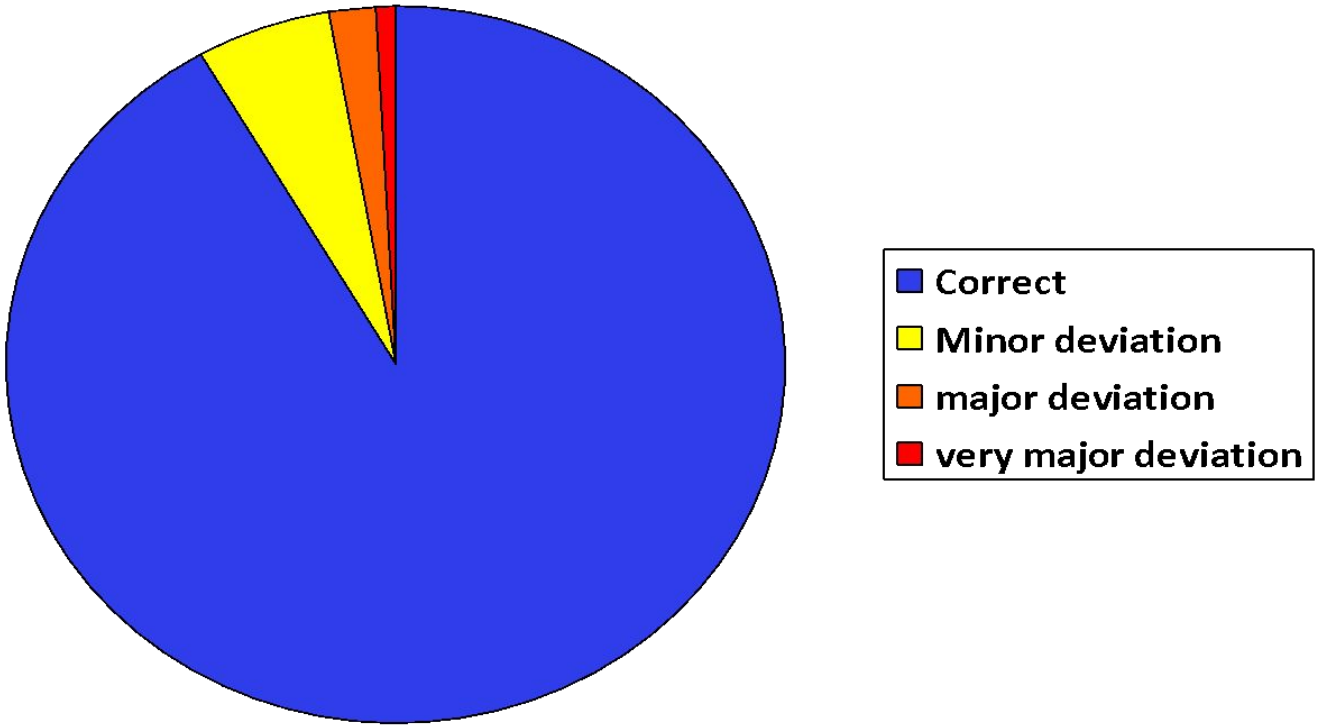


Figure 2: A comparison between the EURL-AR EQAS's since 2006, showing the total percentage of deviations for antimicrobial susceptibility testing performed by participating laboratories.

www.eurl-ar.eu

EQA deviation level based in WHO GFN (2000-2007)

6,051 (**9%**) of 67,229 tests incorrect



Hendriksen et al., JCM. 2009 Jan;47(1):79-85

Objectives of EQASIA

Key objective: Improving the Quality of Bacteriology Diagnostics for AMR

- Address regional challenges to achieving quality assured bacteriology identification and antimicrobial susceptibility testing results in Asia
  - EQA bodies across the regions existing, however, these initiatives need supporting and strengthening
    - Challenges include cross border transfer of isolates used in proficiency testing schemes
    - Lack of national capacity to prepare standardised EQA panels
    - Challenges of resourcing sustainable EQA programmes

- Funding by the UK AID via the Fleming Fund

Organizational structure

Expansion of the consortium:

- National Institute of Health (NIH), Thailand
- The Faculty of Veterinary Science, Chulalongkorn University (CU)
- Efficient communication
- MoU

Advisory board

- Advice on alignment, capacity building activities and sustainability of the program
- WHO, FAO, OIE
- Pacific Pathology Training Centre (New Zealand), University of New South Wales (UNSW) (Australia) and The Peter Doherty Institute for Infection and Immunity (Australia)

EQASIA EQA participation

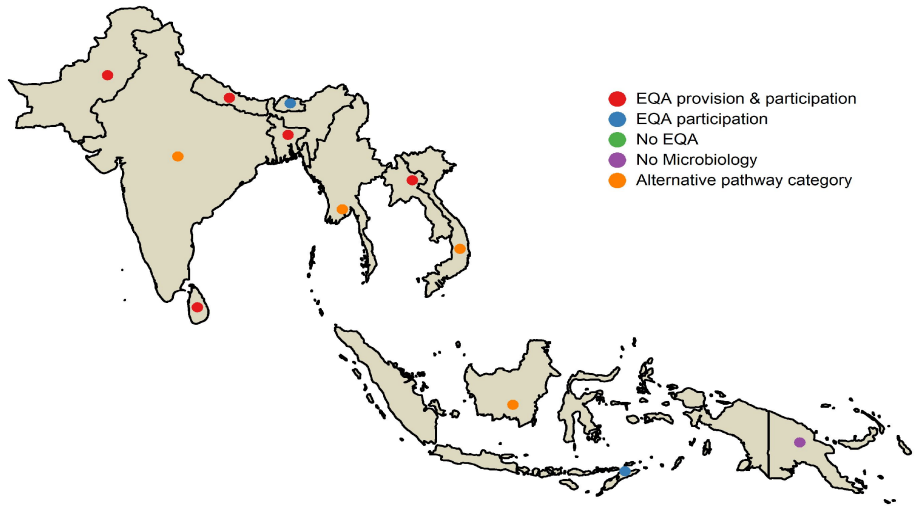
Large heterogeneity in current capacity/ participation

- Most of the NRLs for human health (HH) participate in several different EQA programs for AMR
- Gaps in the content and comprehensiveness of individual programs.
- Some of the HH NRLs also provide EQAs to sentinel labs within their own country.
- Very few animal/food safety labs currently participate in EQAs.

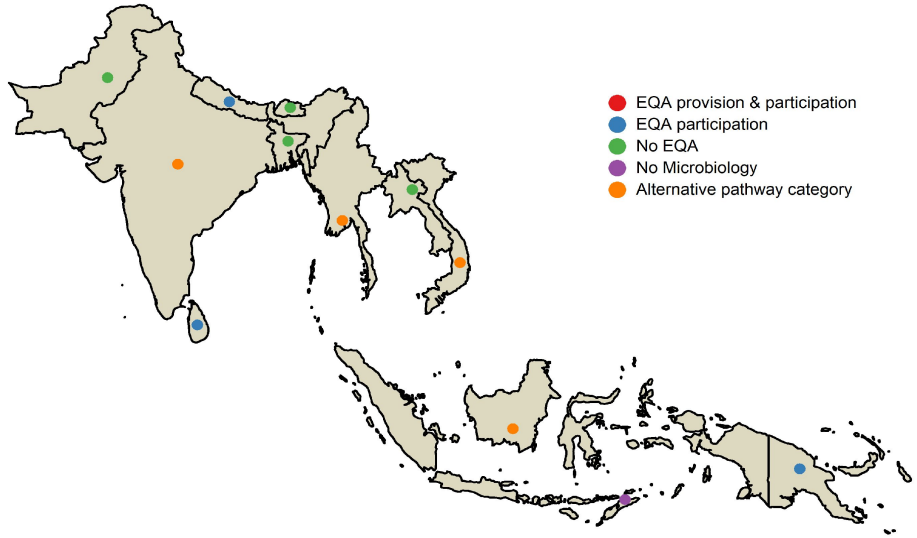
Major challenges identified by labs:

- Cost of participation and consumables
- Lack of support for participation and corrective actions

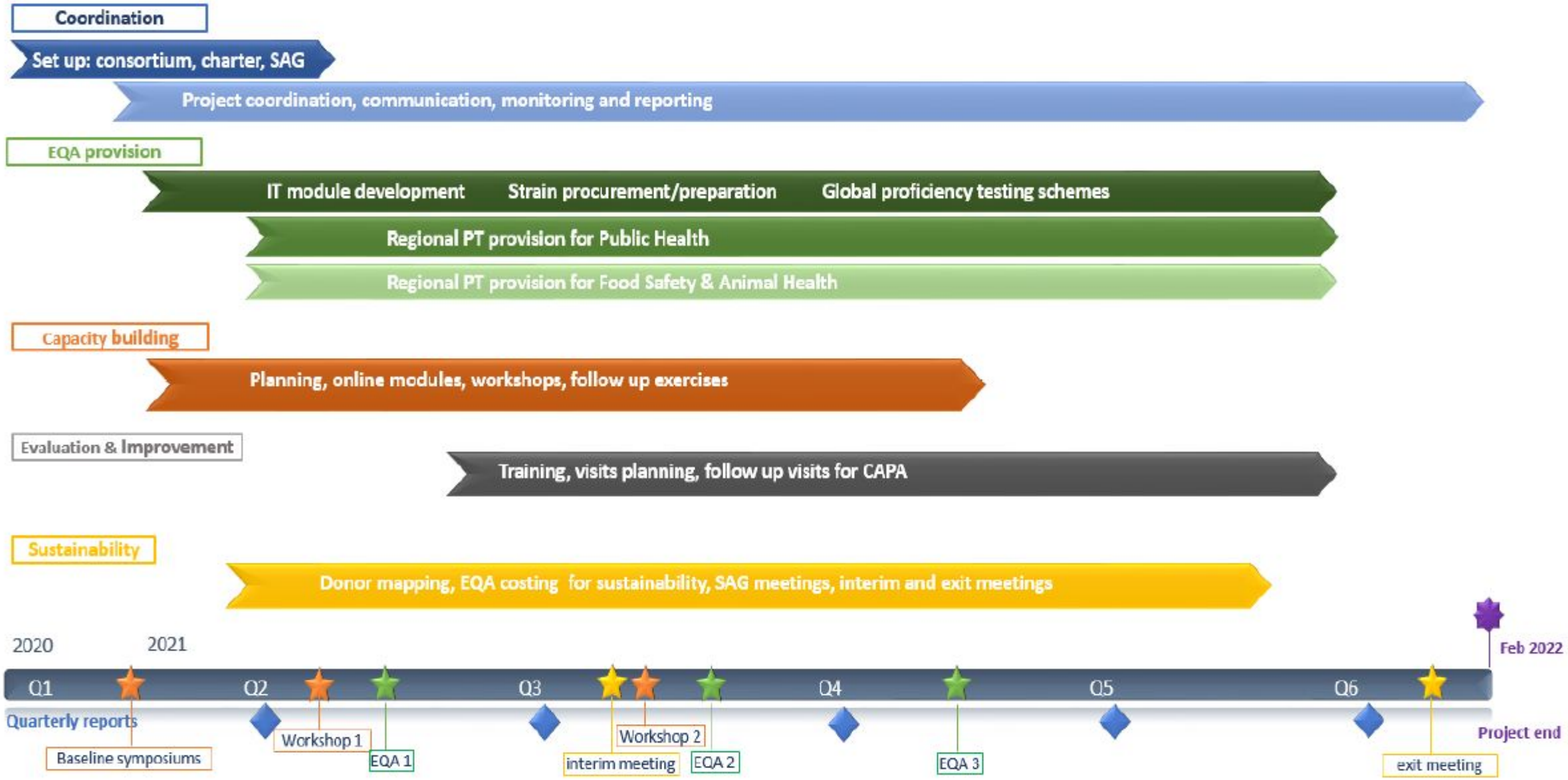
Human health



Animal health



Activity and time plan



In summary

- Data quality is key to support evidence-based policy and public health actions thought surveillance

- Results have shown underperformance and a need for improving the laboratories capacity and knowledge in most regions of the world

- Surprisingly a lack of funding surveillance, EQAs and capacity building
  – Now we pay the price as showcased by the covid pandemic

- IVI and DTU are leading the Fleming Funds regional project, EQASIA
  – build capacity for AMR surveillance by training and site visits
  – develop EQAs for all pathogens included in GLASS and FAO priority pathogens
  – develop a system to support to the AMR National Surveillance System via NRLs
  – address underperformance and provide the support

Thank you for your attention

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