Workstream 2: AMR surveillance – information for participants

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Discussion topics:
1. Individual data reporting
2. Inclusion of molecular markers
3. Improving data quality and representativeness

Background:

1. Individual data reporting
For the next stage of implementation, GLASS-AMR offers the option of submitting individual, line-listed anonymized AMR data. Compared to aggregated data, individual-level data will allow to monitor the occurrence of multidrug resistance, explore additional data analyses and stratifications, analyse drivers and risk factors linked to resistance, add genetic information, and improve interpretation of results, in addition to better options for data validation and management.

Feedback provided by countries for the draft GLASS-AMR Manual during the online consultation shows that 51% of 63 responding countries would be capable of starting anonymised individual data submission in the next stage of the GLASS implementation. Some of these countries are already submitting individual level data to international networks and more countries collect individual AMR data at the national level. 20% answered “No”, explaining this by limitations of the laboratory-centred systems, lack of human and IT resources, while several countries were not convinced by the provided rationale. The majority of countries which hesitated to provide a definite answer (29%) explained that further discussions/consultations with national authorities/stakeholders are required.

Points for discussion include:
- What are the major challenges for implementing the individual level data reporting and how to overcome them?
- What is expected from WHO to support the implementation?
- What should be the roadmap for incorporation of the individual data submission into GLASS 2.0?

2. Inclusion of molecular markers
For the next stage of implementation, GLASS-AMR offers the option for submission of data generated by molecular AMR diagnostics to complement phenotypic AMR diagnostics data and improve understanding of the underlying mechanisms responsible for resistance. The selected molecular markers will be included in the individual level datasets:

<table>
<thead>
<tr>
<th>GLASS target pathogens</th>
<th>Mechanisms of resistance</th>
<th>Molecular targets</th>
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</thead>
<tbody>
<tr>
<td>Acinetobacter spp.</td>
<td>Carbapenem resistance</td>
<td>NDM, OXA, VIM, IMP, GES, KPC</td>
</tr>
<tr>
<td>P. aeruginosa</td>
<td>Colistin resistance</td>
<td>mcr 1-10</td>
</tr>
<tr>
<td>E. coli</td>
<td>Extended spectrum beta-lactamases</td>
<td>CTX-M, TEM, SHV</td>
</tr>
<tr>
<td>K. pneumoniae</td>
<td>Carbapenem resistance</td>
<td>NDM, OXA, VIM, IMP, GES, KPC</td>
</tr>
<tr>
<td>Salmonella spp.</td>
<td>Carbapenem resistance</td>
<td>NDM, OXA, VIM, IMP, GES, KPC</td>
</tr>
<tr>
<td>Shigella spp.</td>
<td>Colistin resistance</td>
<td>mcr 1-10</td>
</tr>
<tr>
<td>S. aureus</td>
<td>Methicillin resistance</td>
<td>mecA/mecC</td>
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<tr>
<td></td>
<td>Linezolid resistance</td>
<td>cfr</td>
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Feedback provided by countries for the *Whole genome sequencing for surveillance of antimicrobial resistance* document during the online consultation shows that many (65% of 57 responding countries) national AMR surveillance systems are currently applying diverse molecular methods targeting specific resistance genes in support to phenotypic methods, but this still remains a challenge in all regions, in particular for LMIC.

Points for discussion include:

- How GLASS should proceed with the inclusion of the molecular markers?
- How can WHO support the implementation?

### 3. Improving data quality and representativeness

The current GLASS-AMR surveillance approach relying on diagnostic microbiological results routinely generated for clinical purposes has several limitations, particularly in limited resource countries. These include: i) difficulties in obtaining a representative sample of the population seeking care, even when minimum sampling criteria are set; ii) lack or limited access to health care and microbiological tests which could exclude a significant proportion of the population that should be under surveillance; iii) reporting bias when microbiological tests are not performed routinely (many patients may be tested only after antimicrobial treatment failures or when severely ill); inaccurate microbiological testing distorting the estimation of frequency of AMR.

To improve the “routine” surveillance, GLASS is developing protocols to help enhance its precision and representativeness. Additionally, other surveillance approaches can be implemented, including syndrome-based (case-based, patient-based) surveillance, and population-based surveillance using Lot Quality Assurance Sampling (LQAS). A very promising approach might be addition of data collected by population-based studies (e.g., repeated surveys), designed specifically to fill in the gaps left by the routine surveillance.

Points for discussion include:

- What needs to be done by GLASS and Countries to improve the quality and representativeness of the AMR surveillance?
- What would be preferred approaches?
- How can WHO support the implementation?