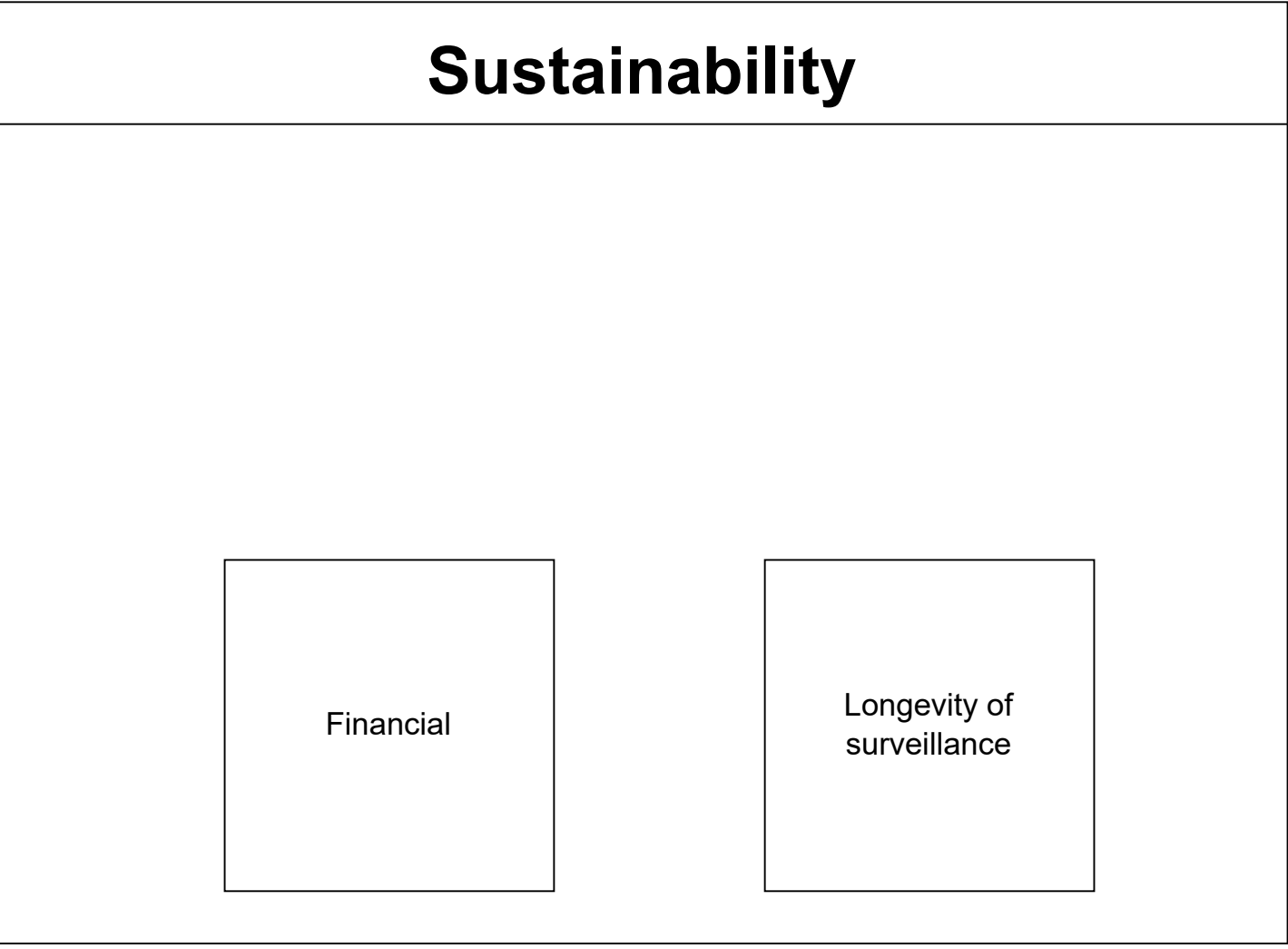
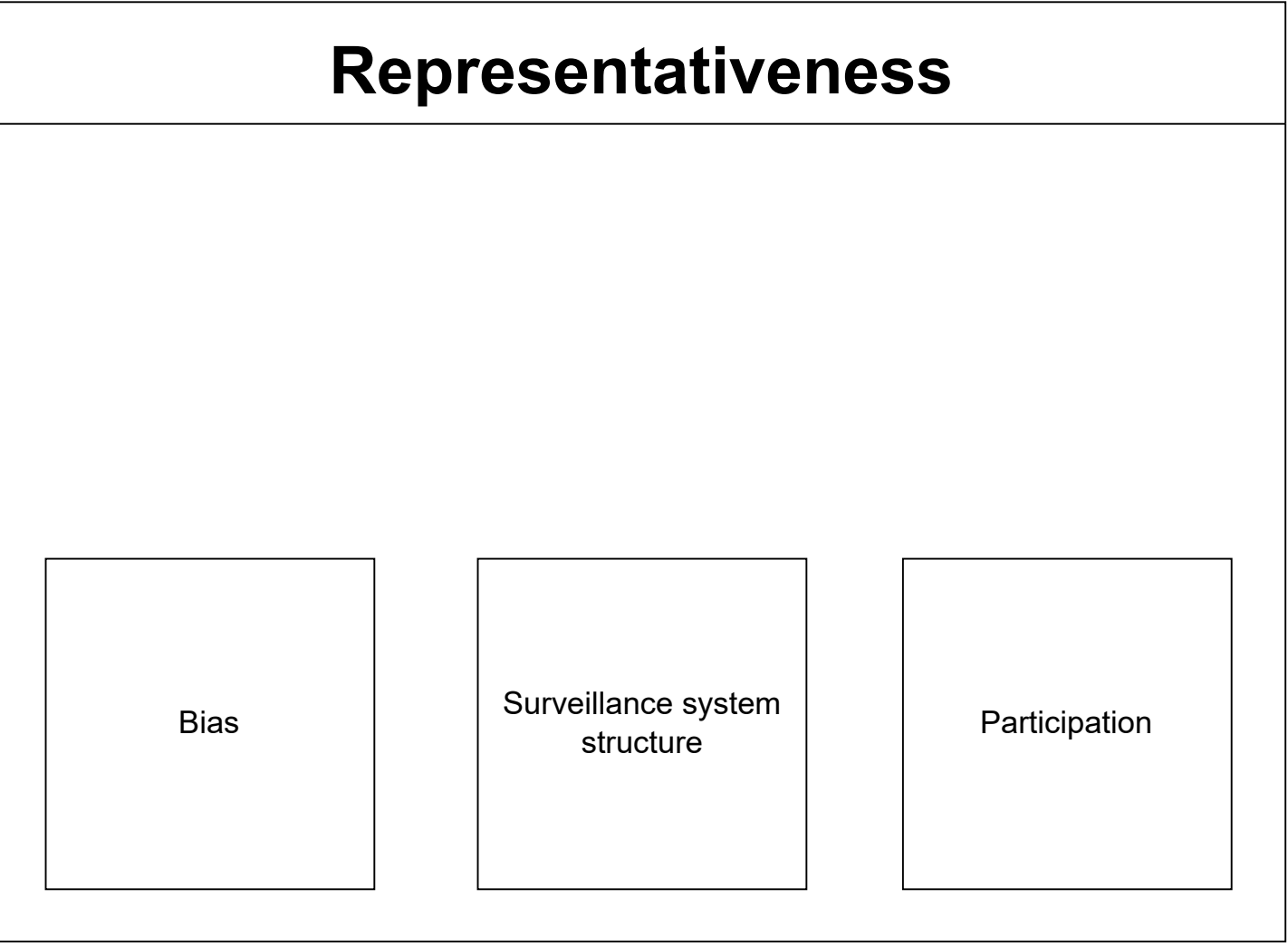
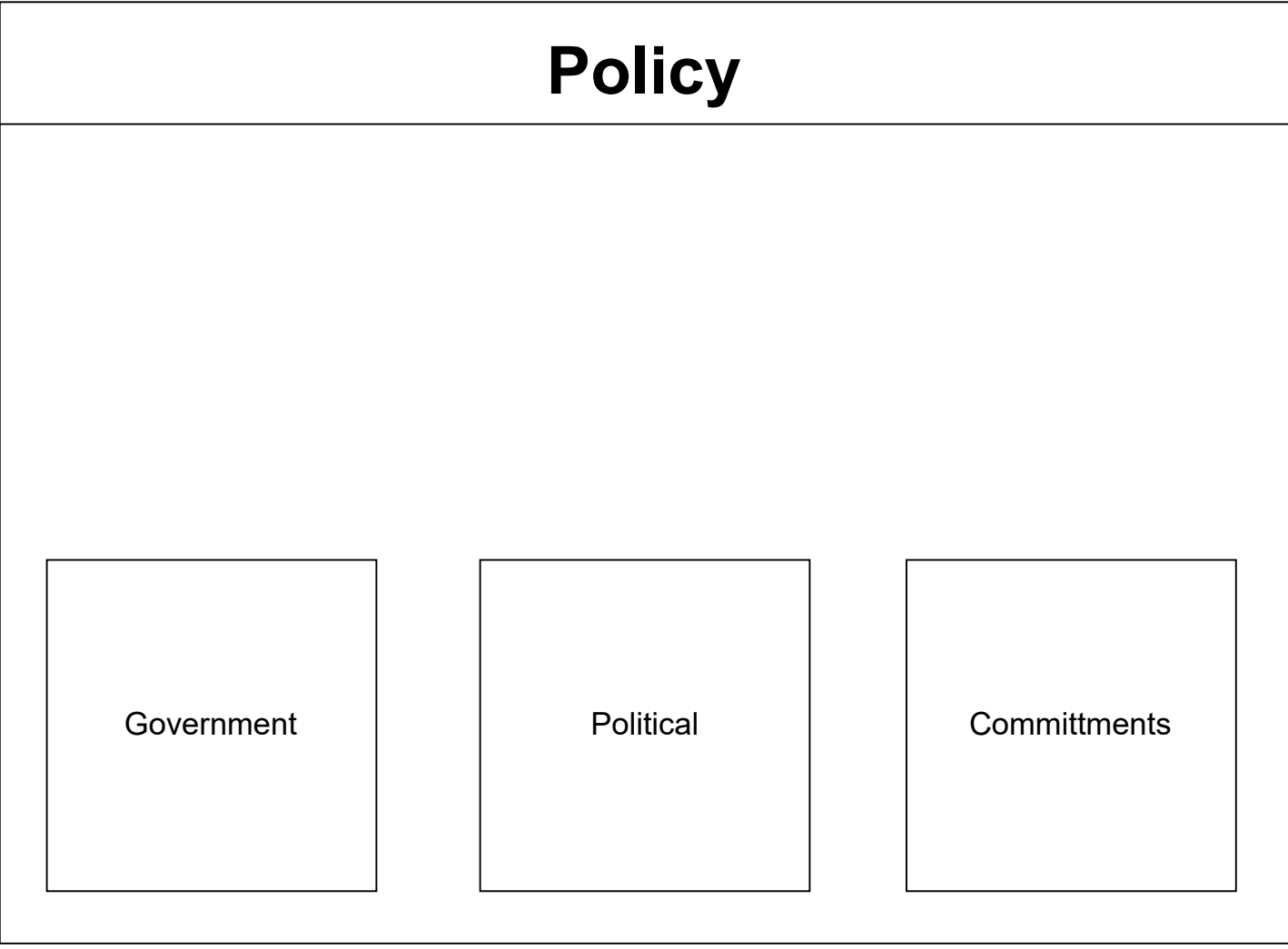
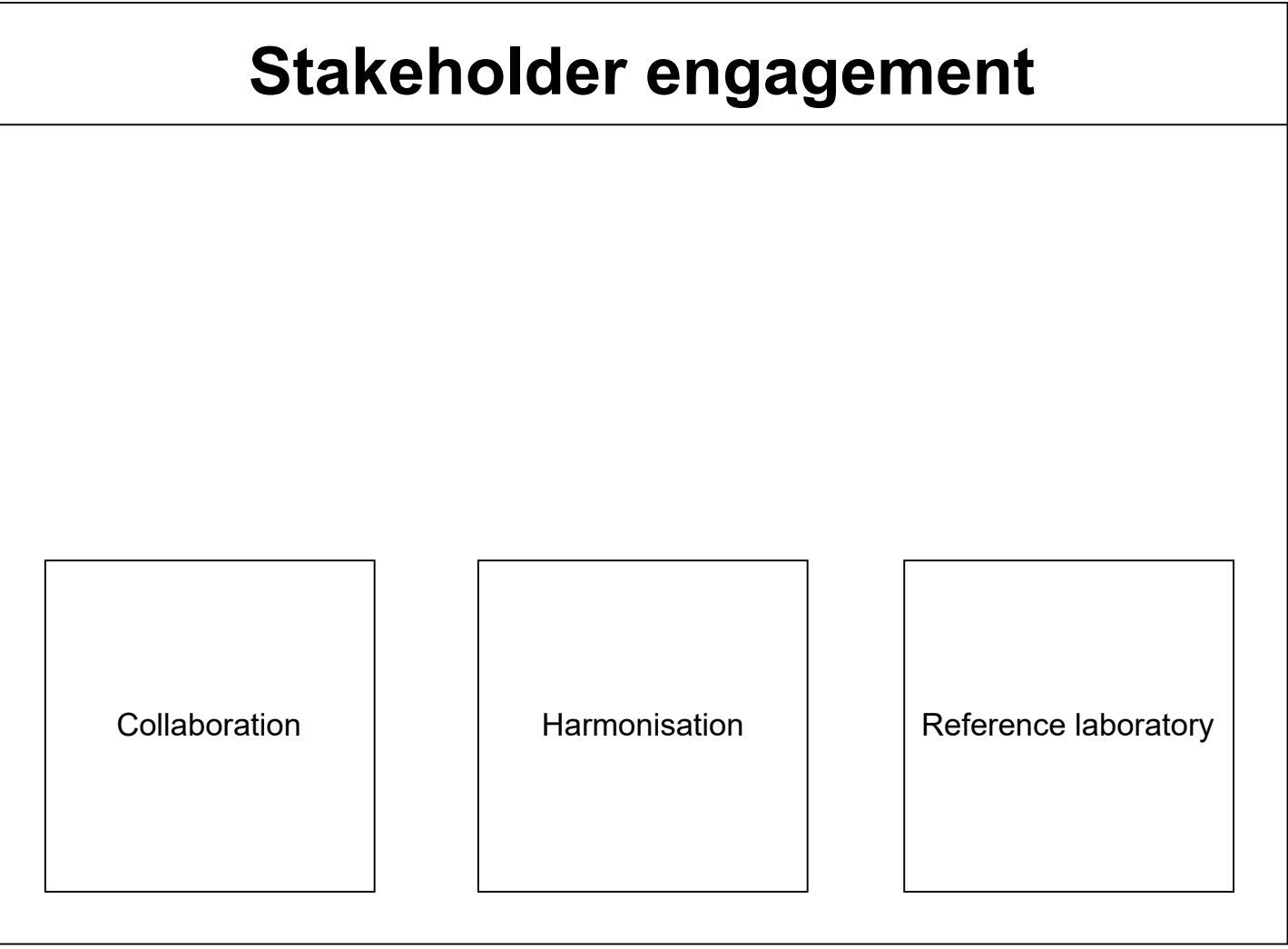
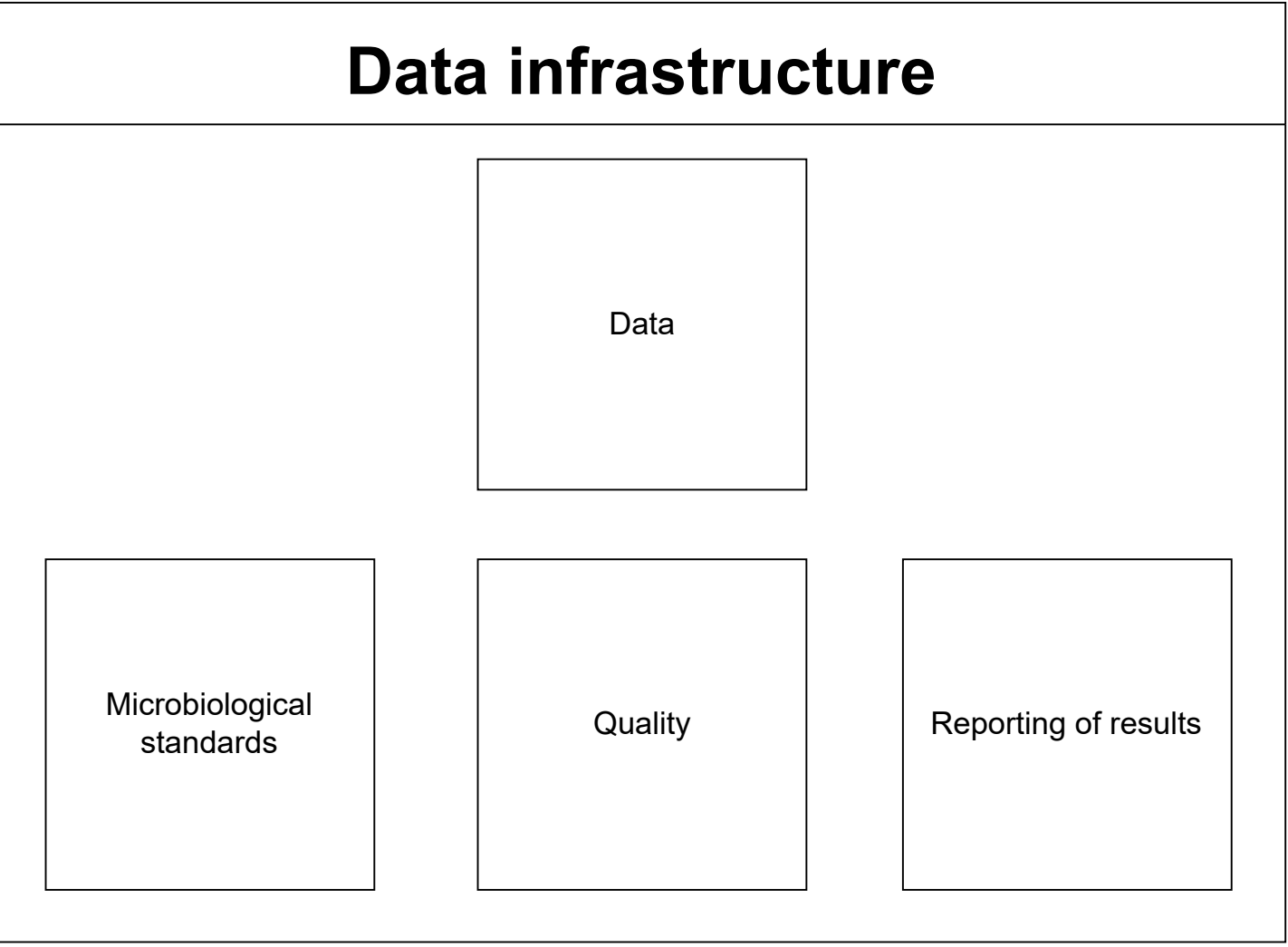
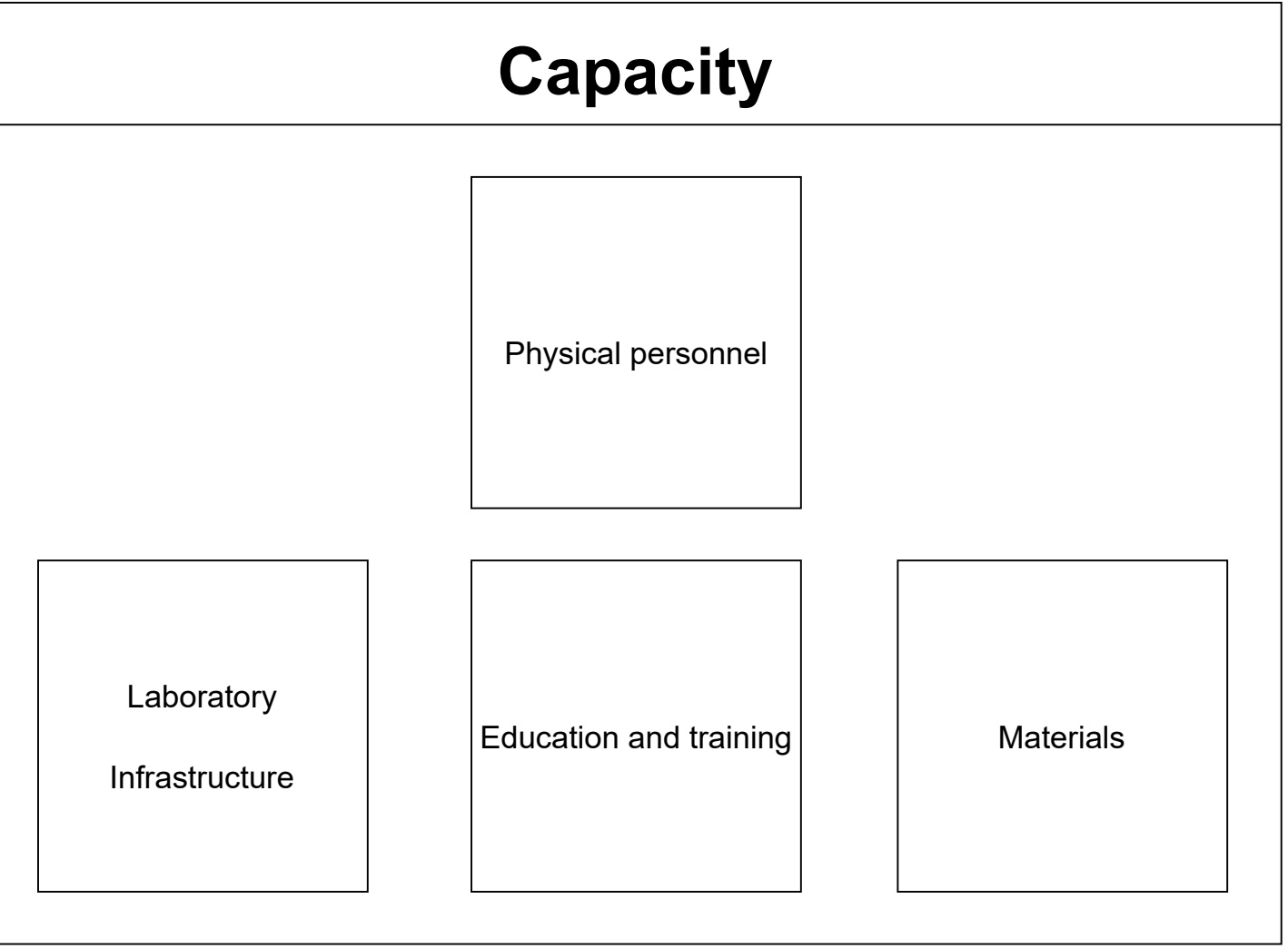


Overarching themes

Legend: Supplementary file 3 shows the aggregation process of activities into larger themes



Capacity

The overarching theme that governs the physical operations of the surveillance system was given the name capacity. It encompasses the determinants for surveillance system function throughout its infrastructure, personnel, education, and physical materials needed for microbiological investigation. It explicitly refers to the physical "capacity" for which surveillance can operate.

Policy

Policy was given the overarching theme for government, political, and commitment themes as this was the end result of all of the themes included. The common goal for these themes were to influence and create policy so that it was conducive to the operation of antimicrobial resistance surveillance.

Data infrastructure

Data infrastructure was the encompassing theme for all themes that were data-related. This included the reporting, interpretation, quality, and collection of data. The inclusion of infrastructure was pertinent as the discussions within data also pertained to how data was captured and interpreted. This was done through data infrastructure platforms which are integral to discussing antimicrobial resistance surveillance.

Representativeness

Representativeness refers to how accurately surveillance captures antimicrobial resistance. Bias, surveillance system structure, and participation are components to looking at representativeness. Bias refers to the potential biases that must be contended within surveillance. Structure and participation look at whether the system has enough breadth to do so.

Stakeholder engagement

Stakeholder engagement was designated the overarching theme as this was the common goal amongst the themes of collaboration, harmonisation, and reference laboratories. It involved multiple parties as the intricacies involved in carrying out a single objective together. This often included engaging "stakeholders" of the surveillance system.

Sustainability

Sustainability was the common goal amongst the themes of financial and longevity of surveillance. They are both determinants in the sustainability of surveillance endeavours and have significant overlap in their core ideology.

Emerging themes from codes



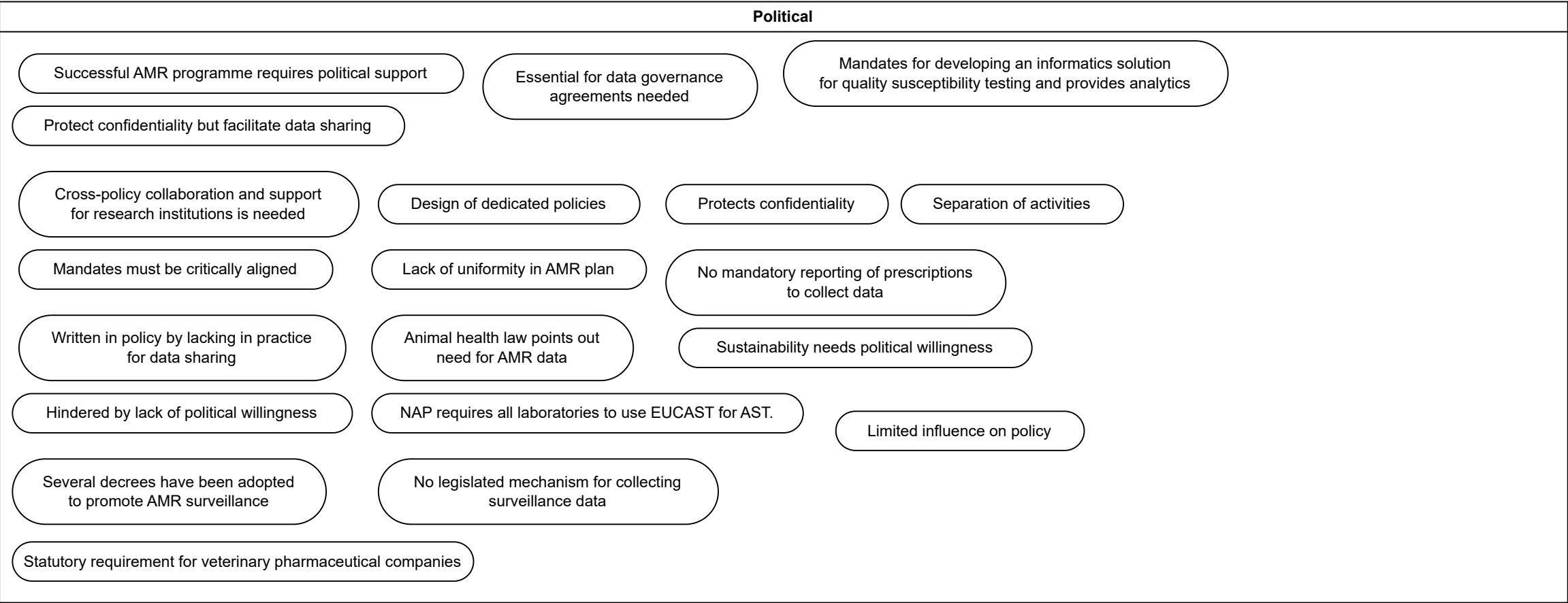
Data

Grouped together as the codes identified relate directly to the data generated by surveillance system. They detail issues and ideas directly relating to data



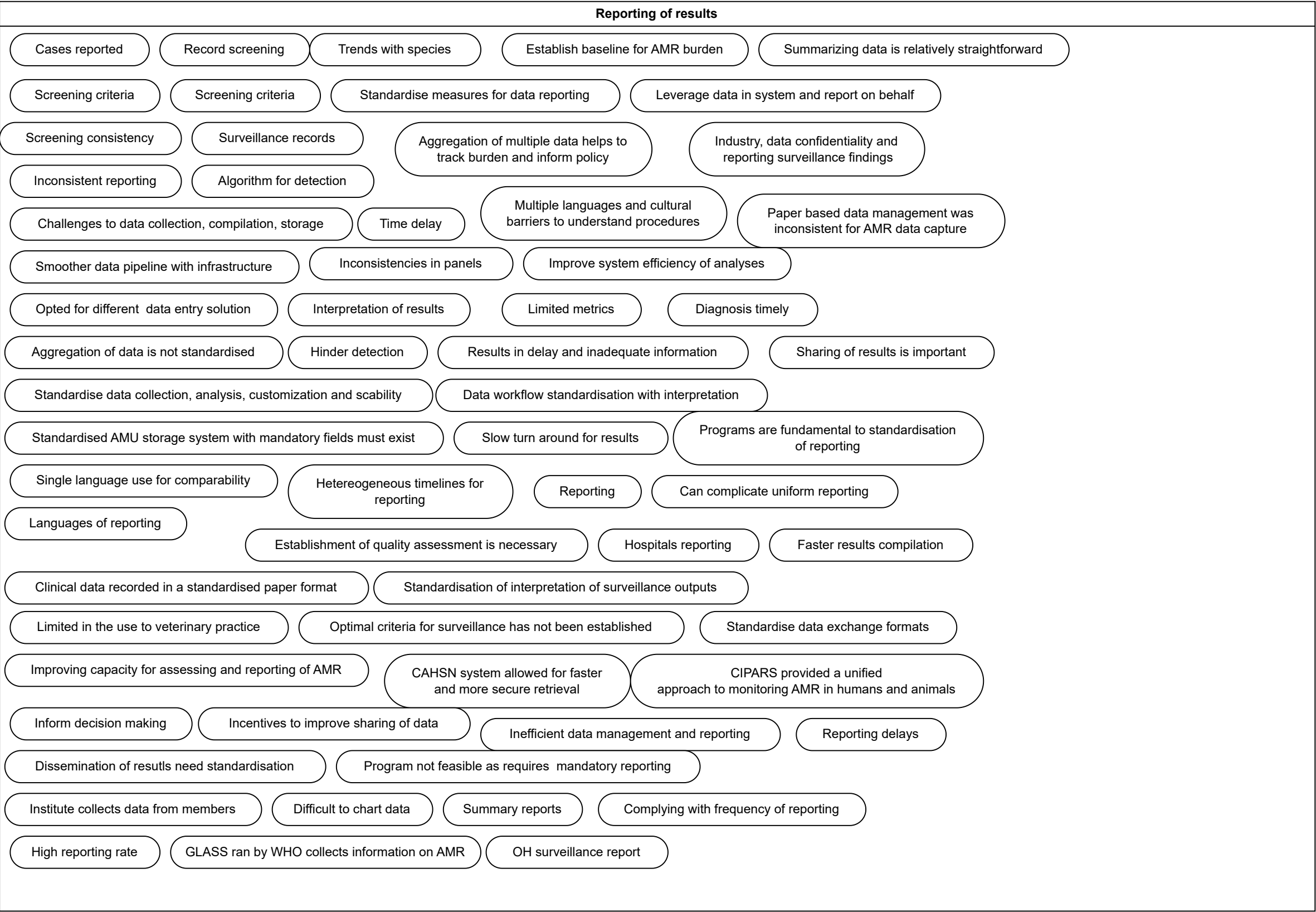
Microbiological standards

Codes grouped together as they relate to the microbiological services that are necessary to generate antimicrobial resistance data. This includes standards, guidelines, protocols, and analyses.



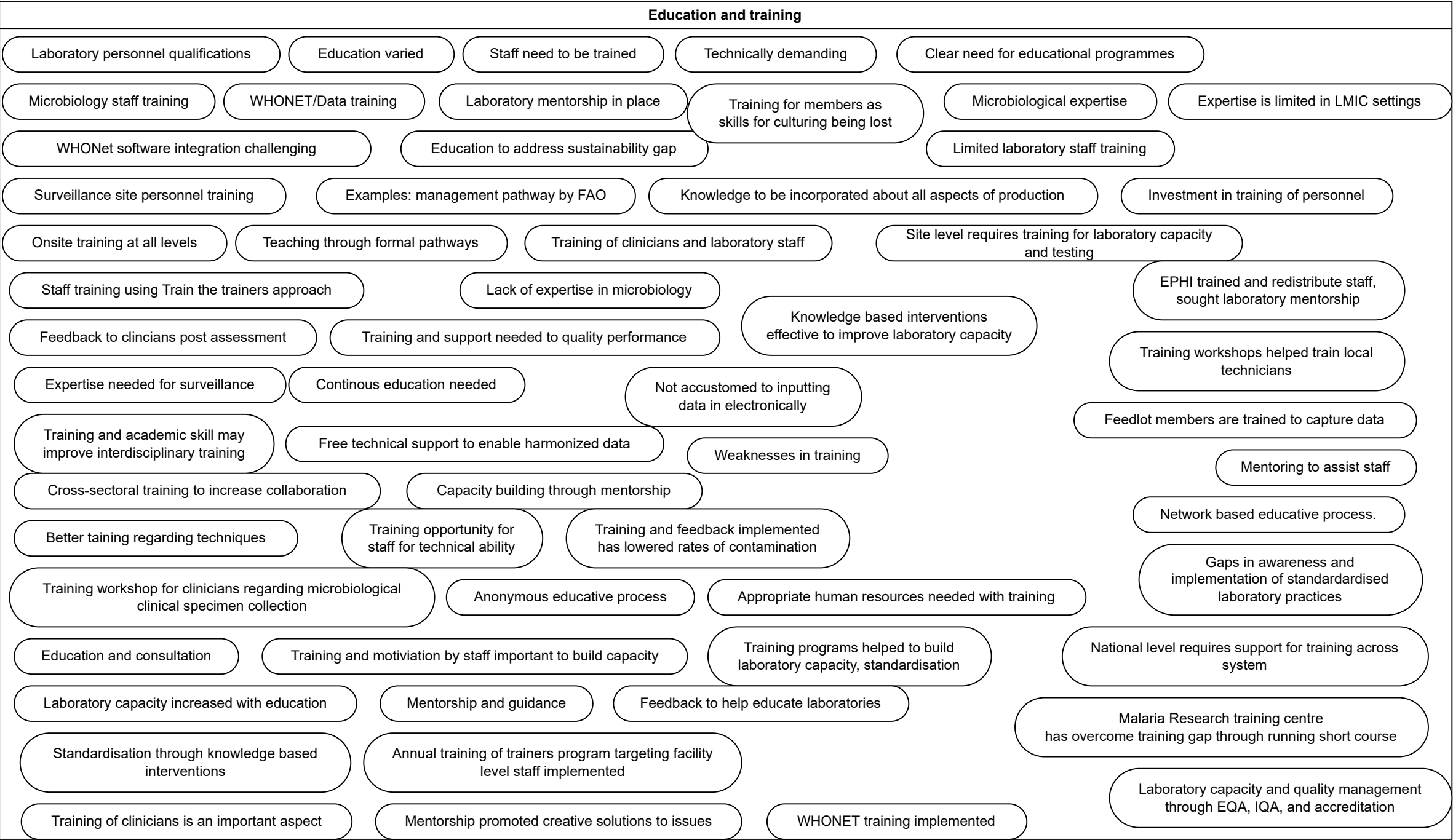
Political

Themes discussing laws, agreements, and mandates were given the theme of political. This theme encompassed the legislative foundations for which antimicrobial surveillance could act upon.



Reporting of results

This code was generated based on the reporting of data. This also includes interpretation of results by end users.



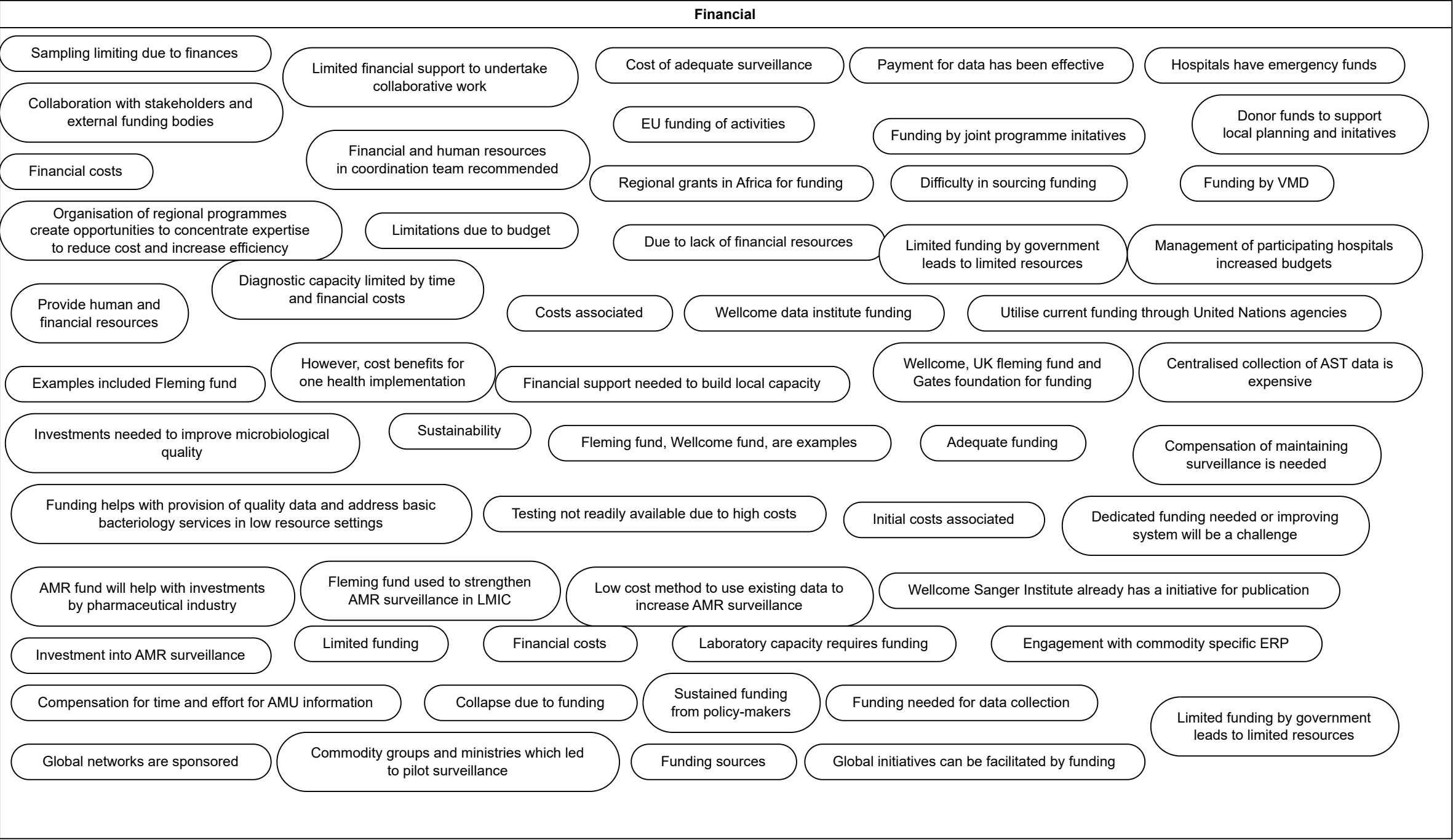
Education and training

The theme was generated by the similarities discussed with education and training necessary for the use of surveillance. It includes training for the use of software, microbiological testing, increase in expertise, and laboratory training. The theme also includes challenges and successes with edfucation and training.



Quality control

Quality control emerged as a theme with the frequent mention of assurance programs. These assurance programs were similar in by their desire to appraisal and validate data. This included quality assessments that were both internal and external, as well as issues and challenges that arose with them.



Financial

The emergence of finances as a theme was due to the similarities in discussion regarding funding of surveillance activities. This theme encompasses the mentions of the monetary aspects of surveillance through external funding, internal funding, budgets, or cost-benefits.

Information technology

Similarities in codes that discussed the use of software, computers, electronic data and linkage of data bases were similar in the means for which they are conducted. This led to the emergence of information technology which is the platform for the aforementioned activities.

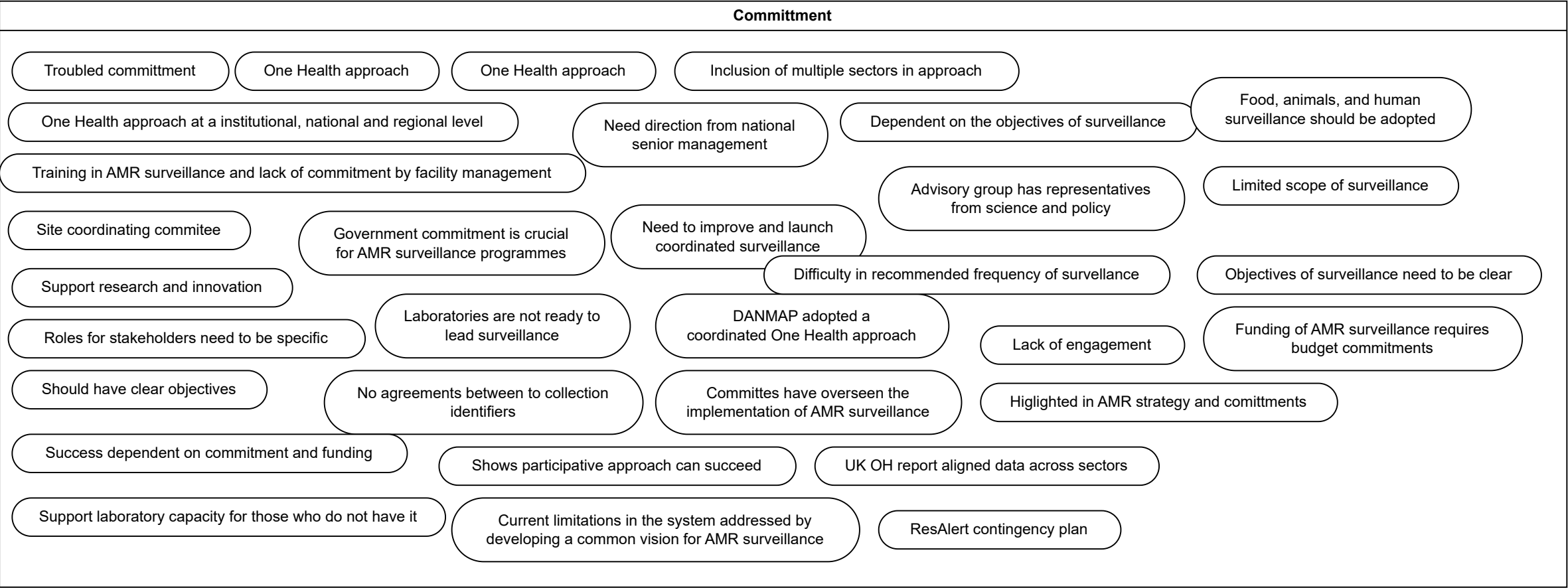
Materials

The similarities in the discussion regarding procurement of reagents, supplies, and media led to the emergence of materials as a theme. This theme encompasses discussion regarding physical materials needed for surveillance and microbiological investigation. It includes discussion with supply chains, quality, and issues that may arise from these processes.



Bias

The emergence of bias a theme was found with the similarities of discussion points which focused on survey design elements. THis includes meta-data, sampling bias, over- and -underestimation. It also includes explicit mentions of bias. Issues and challenges that are associated with bias have also been included within the theme.



Committment

Commitment was a theme that emerged from the discussion of objectives, approaches, and plan for surveillance. These were encompassing aims of the surveillance system set out by stakeholders. Issues and challenges with committment have also been included within the theme.

Surviellance structure

The theme surveillance structure was created due to the similarities of codes that discussed how the surveillance system should be structured.. This includes discussion regarding the expansion and growth of the issues as well as benefits and limitations of each structure.

Physical personnel

The theme emerged when there were similarities within articles that discussed the need for human resources. This includes trained experts for surveillance and staffing of laboratories.

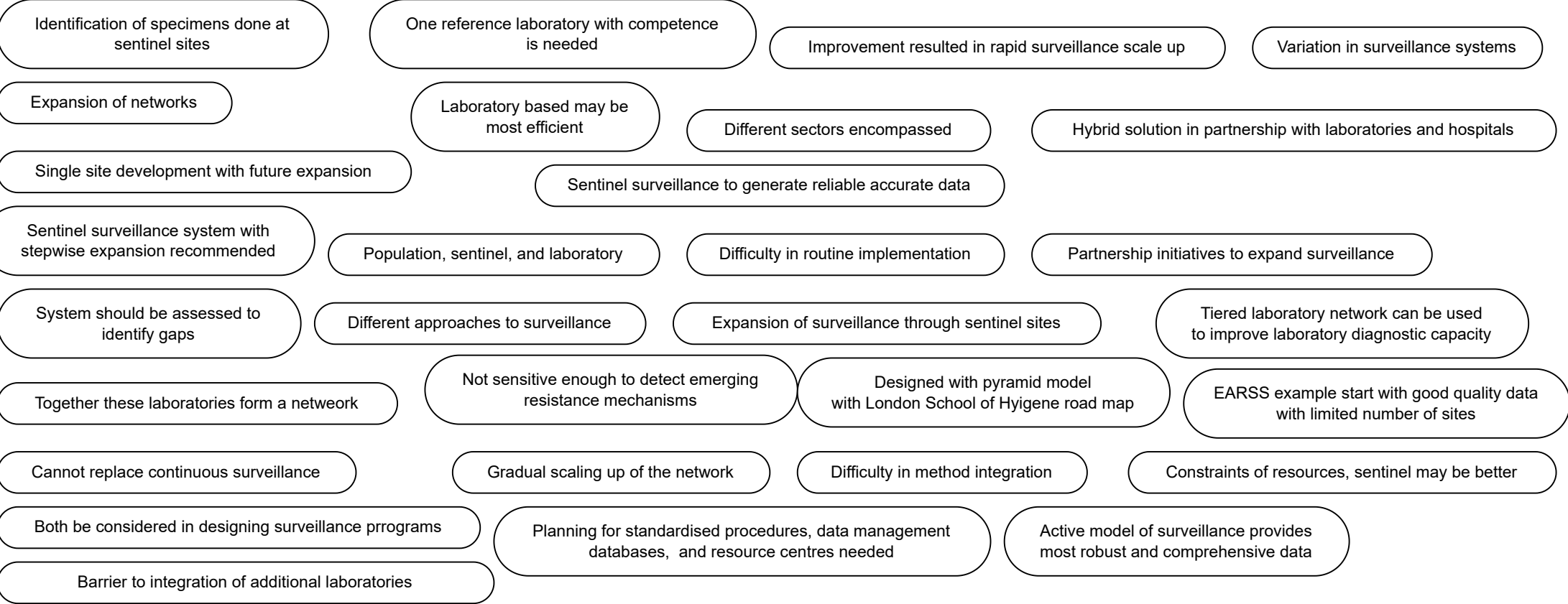
Government

Government was constructed as a theme as there was centrality in discussions regarding the involvment of ministries and wider government within antimicrobial resistance surveillance. This includes strategy, political willingness and approaches to surveillance.

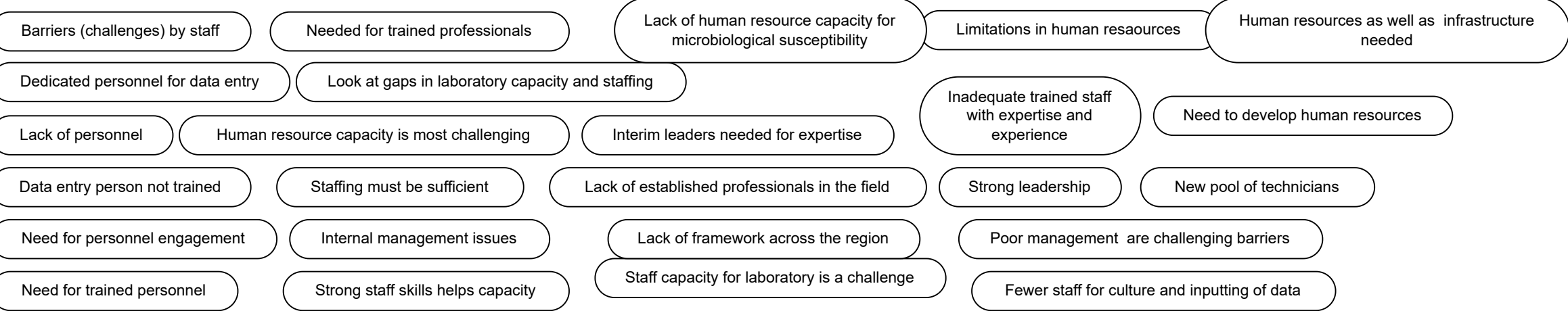
Participation

Participation was constructed as a theme with the similiarities in calls for participation in surveillance endeavours and networks. This also included the participation of external parties within current surveillance systems. It includes the successes and barriers faced by surveillance systems to increase/address participation concerns.

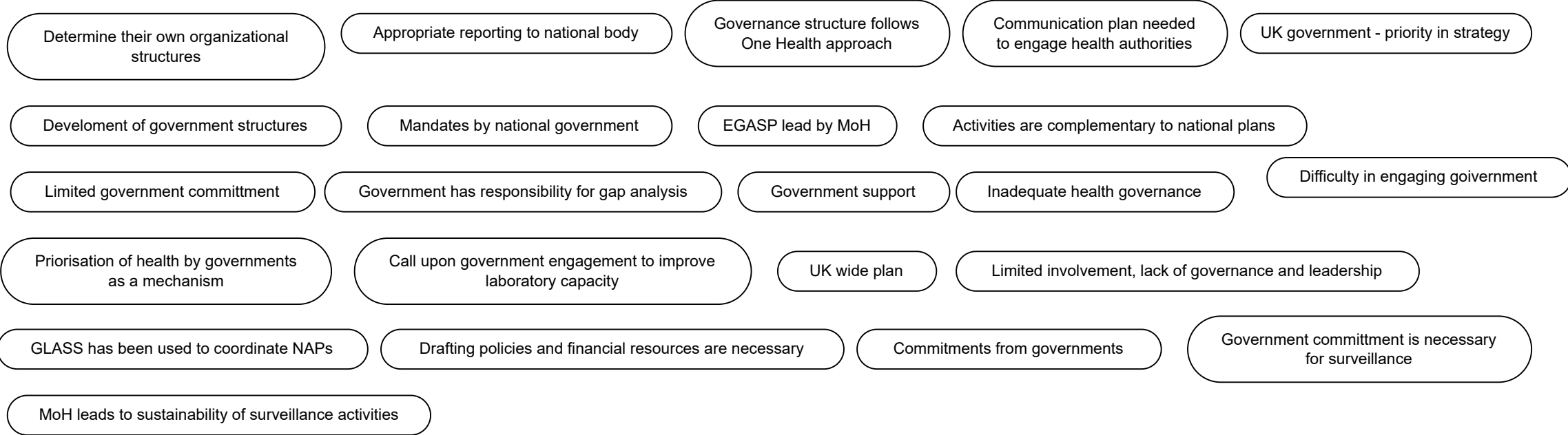
Surveillance structure



Physical Personnel



Government



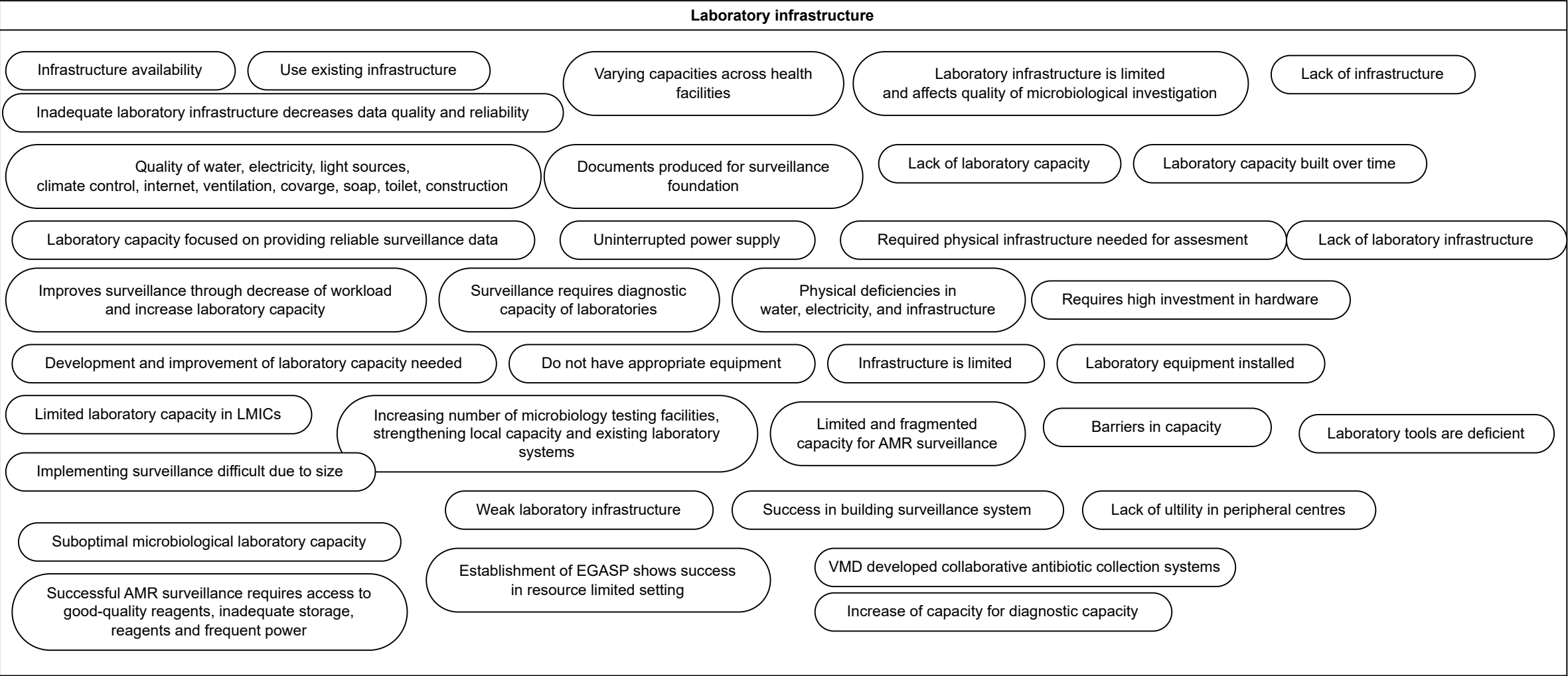
Participation





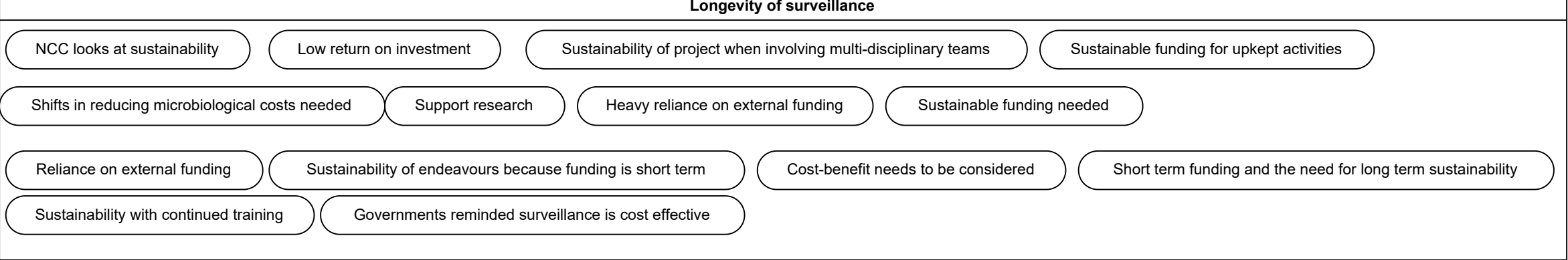
Collaboration

Collaboration is a theme that was developed from the discussion throughout the articles regarding engaging different parties and working together. This includes cross-sectorial, local level, coordination efforts, and consortiums that have been made to run surveillance.



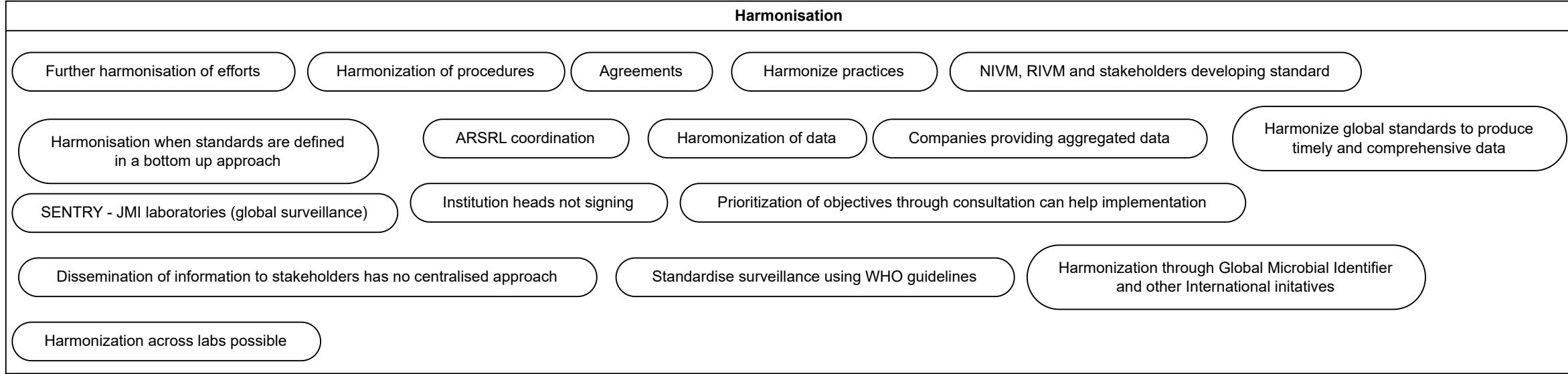
Laboratory infrastructure

Laboratory infrastructure relates to the physical infrastructure that is needed for a laboratory. This includes planning, physical materials for laboratories, power, water, and electricity.



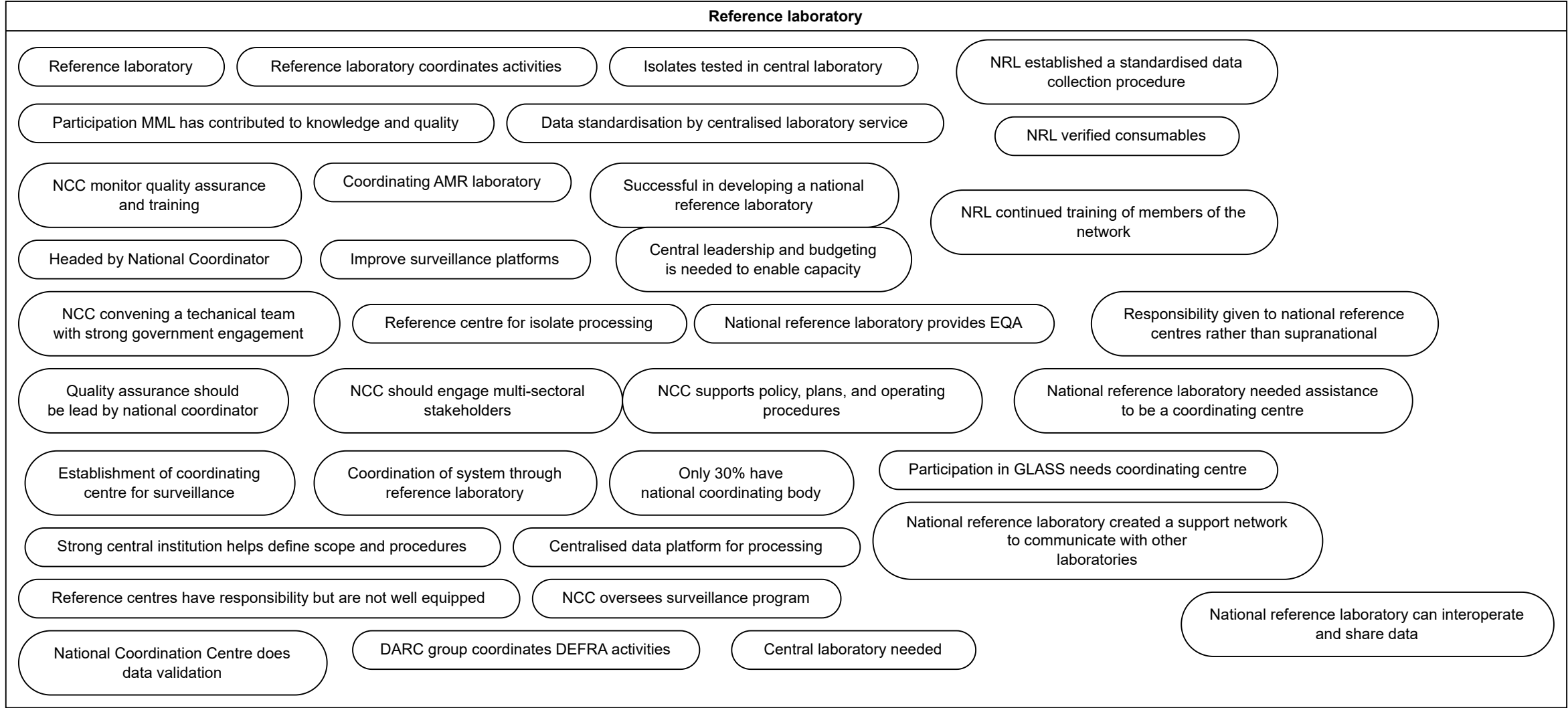
Longevity of surveillance

The theme longevity of surveillance was identified within the discussion of sustainability of surveillance. It was primarily focuses on the continued endeavour of surveillance and mechanisms which will allow that to happen. It includes criticisms regarding funding, need for research, and examination of sustainability as a concept



Harmonisation

Harmonisation was identified as a theme that primarily focused on the harmonisation of antimicrobial resistance surveillance. It includes coordination, initiatives, and approaches to harmonise efforts.



Reference laboratory

Reference laboratories were an emergent theme within surveillance literature. This theme explicitly encompasses all mentions of a national reference laboratory and the benefits and limitations it may have on surveillance efforts.