

Background:

As the burden of antimicrobial resistance (AMR) grows and available efficacious antibiotics for treating resistant infections decline, improving the quality of surveillance and reporting is essential. There are global challenges in ensuring quality data are collected and accurately reported.

Aims: To implement a workflow to streamline data processing and data monitoring for reporting neonatal sepsis and AMR.

Methodology:

Clinical experts, global health practitioners and causal modellers co-developed a directed acyclic graph (DAG) to depict the complex clinical problem domain of neonatal infections, including how observations are made and AMR data are captured. The DAG helps to explain the problem and the data collection to the data processing and analytics team. A suite of data processing scripts were developed to streamline the routine generation of quality monitoring and analytic insight reports.

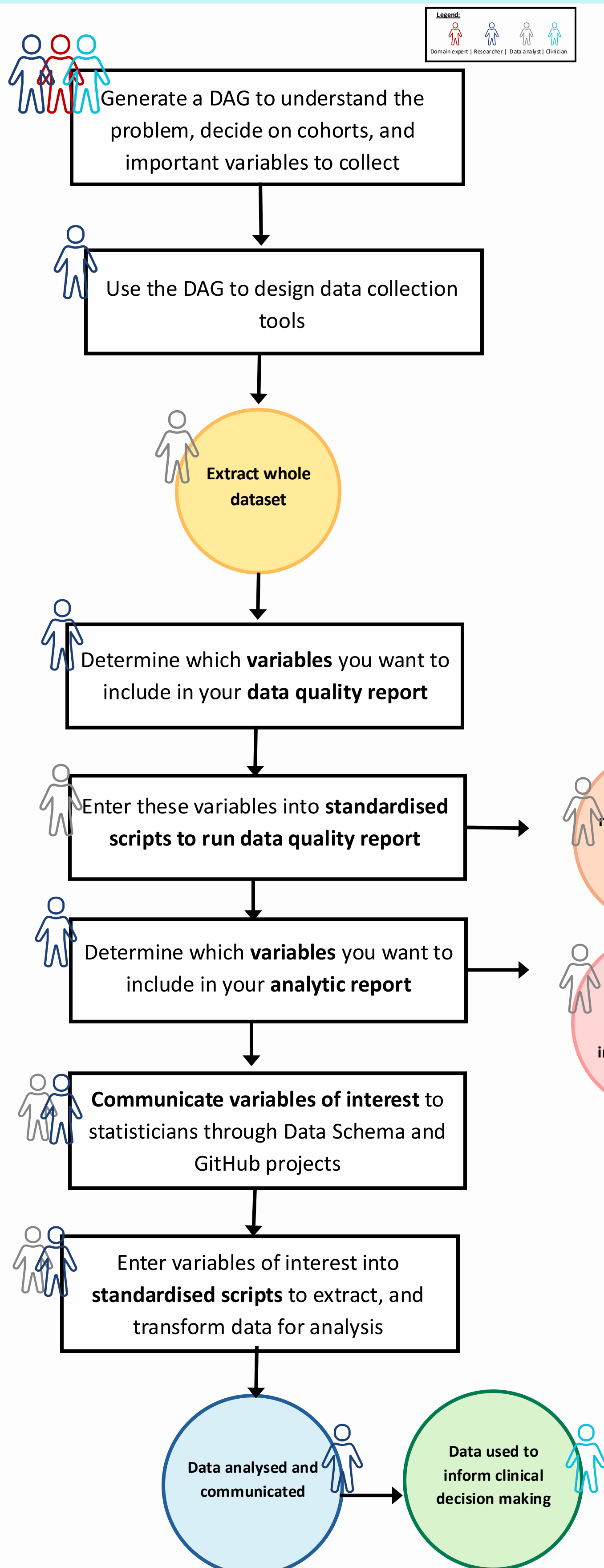


Figure 2. Causal Analytic workflow for data processing

Directed Acyclic Graph - DAG

Data collected and process on specific levels

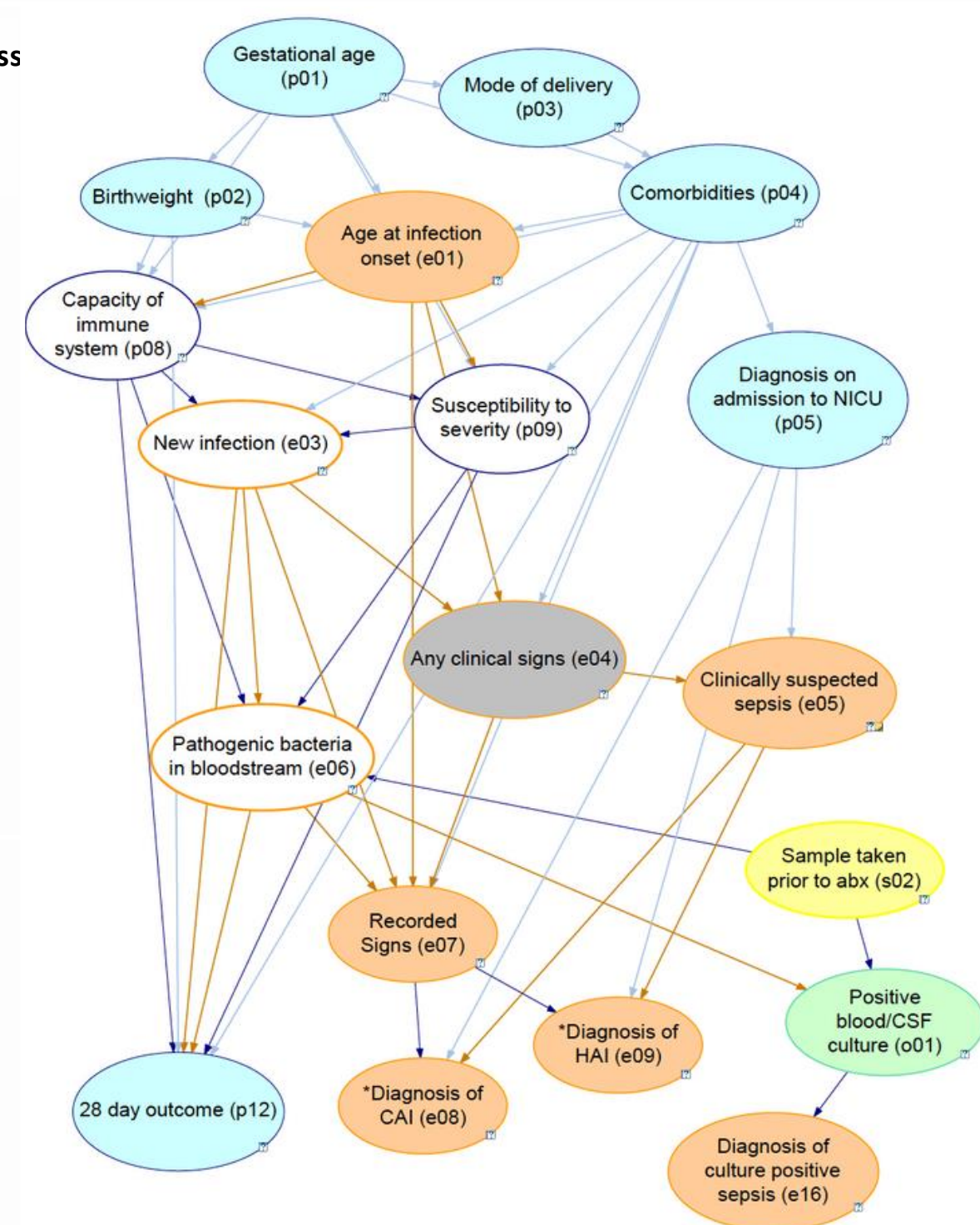
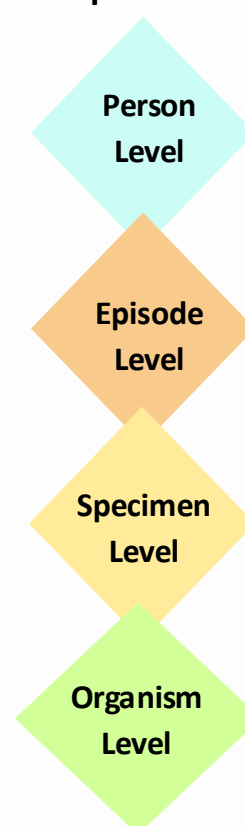


Figure 1. Directed Acyclic Graph defining the problem domain and highlighting the important aspects of proposed data collection

Results:

A DAG was developed outlining person-level, episode-level, specimen-level and organism-level features of AMR data collection (Fig. 1). The causal analytic workflow (Fig. 2) highlights the data processing and the interaction between data managers, researchers, and clinical experts. This generates a process for developing a raw data monitoring report, analytic monitoring reports, analytics and the processing of each data file outlined in the schematic workflow.

Conclusion:

A quality data monitoring system must be established to ensure reliable reporting of the true burden of AMR. Use of a predefined causal analytic workflow can reduce the surveillance workload by providing a framework for monitoring the collection of high-quality data.