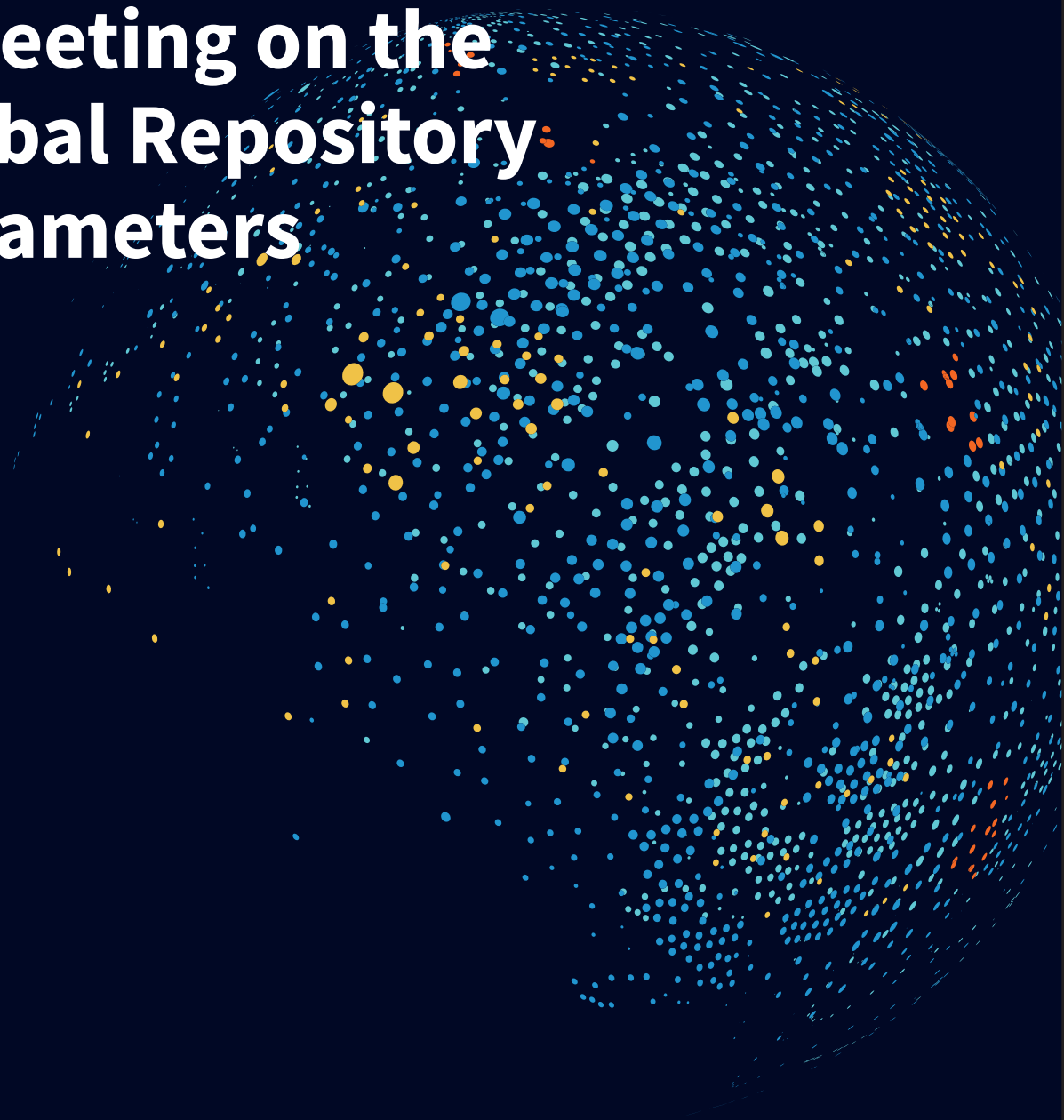
Report: Second TWG Meeting on the Establishment of a Global Repository of Epidemiological Parameters

June 20, 2023
WHO Hub for Pandemic and Epidemic Intelligence



More than 50 participants from diverse backgrounds in public health intelligence and related fields convened for the second Technical Working Group (TWG) meeting on June 20, 2023. The focus of this meeting was to advance the establishment of a standardized data model designed to capture and present critical epidemiological parameters effectively. This initiative represents a crucial step forward in enhancing the consistency and accessibility of key epidemiological parameters for public health professionals, infectious disease modelers and researchers globally.

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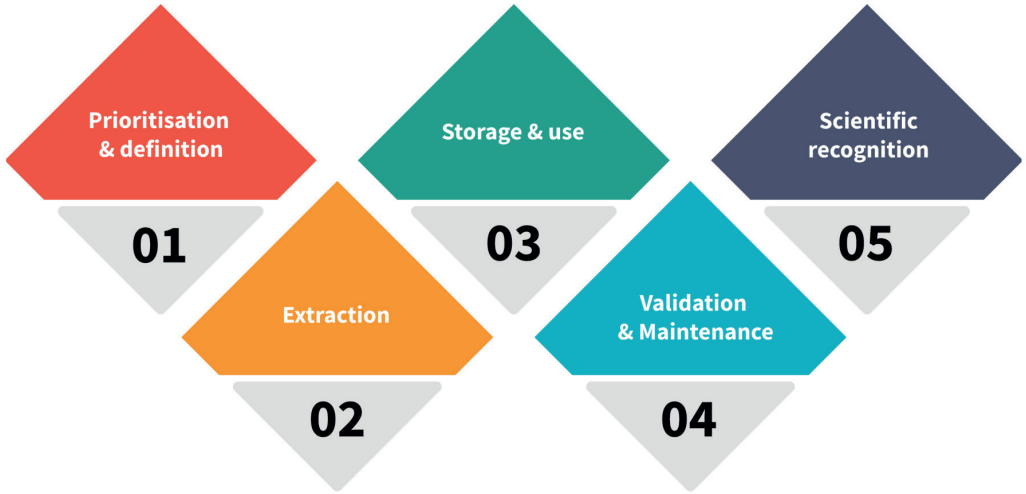
BACKGROUND

The epidemiological parameters community consists of a global collaborative working group coordinated by WHO, which aims to develop a global repository of parameters. Epidemiological parameters are used in mathematical models to help better understand the transmission dynamics of pathogens and to determine the potential impact of outbreaks in terms of morbidity, mortality, and geographical spread over time. By enabling faster and more transparent insight generation at the beginning and during an outbreak, the global epidemiological parameter repository will serve as an essential global public tool to inform and guide public health interventions designed to mitigate the spread of diseases and reduce their impact on affected populations.

The epidemiological parameters project consist of five work streams, including definition of a standardized data model for key parameters, development of extraction protocols, storage and use of parameters, mechanisms for maintenance and quality assurance, and frameworks for recognition and contribution incentives. The focus of the current workshop was on the first work stream.

CONSULTATION AIM

The primary objective of this workshop was to seek consensus on a standardized data model for the extraction and representation of essential epidemiological parameters.



More details on each workstream can be found at the project website: https://worldhealthorganization.github.io/collaboratory-epiparameter-community/#/?id=our-workstreams

CONSULTATION PROCEDURE

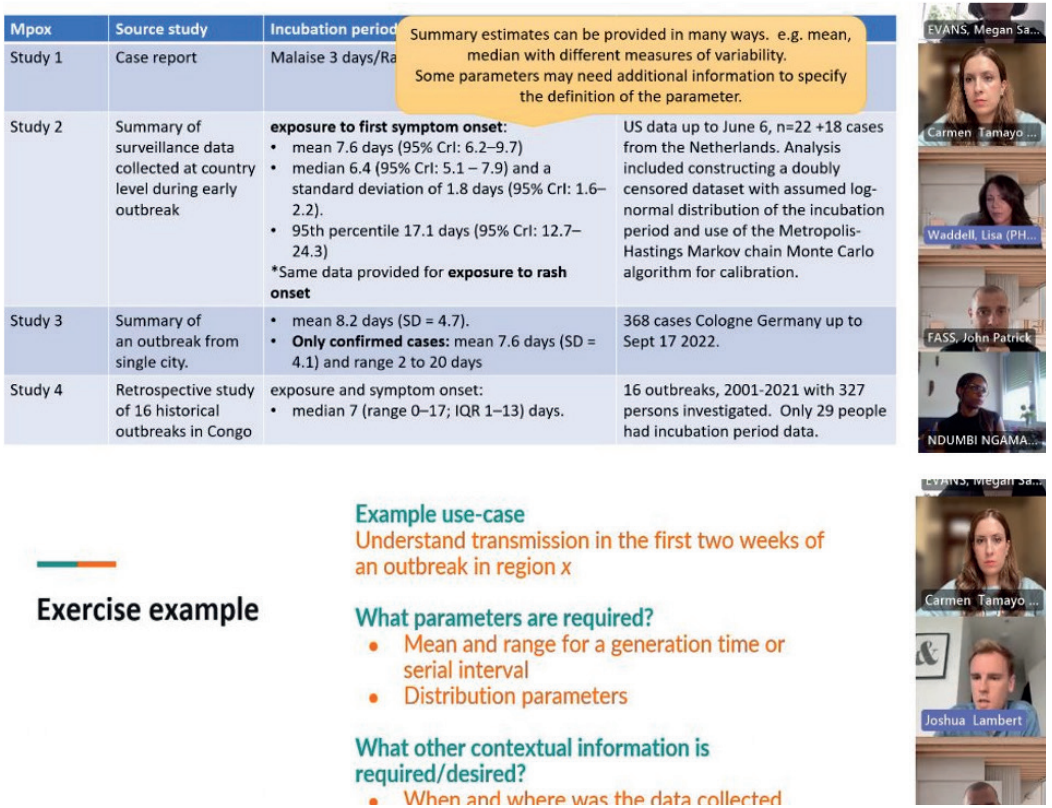
The workshop opened with an introduction on key objectives from Patricia Ndumbi (WHO) and Julia Fitzner (WHO), followed by a summary of the key outputs from the first technical working group meeting, delivered by Megan Evans (WHO).

Lisa Waddell (PHAC) then presented examples of different ways disease parameters are reported in the literature, emphasizing the need for accommodating diverse information and providing sufficient context in the data model. The presentation included examples of case reports and studies with different types of observations, prompting discussions on the minimum data requirements for inclusion in the database.

Participants then engaged in Mentimeter activity facilitated by Carmen Tamayo Cuartero (Epiverse-TRACE) to gather information on participants' areas of expertise and the public health objectives they believed would benefit from accessing the epidemiological parameter database.

Joshua Lambert (Epiverse-TRACE) then gave a presentation discussing the use cases of epidemiological parameters within different public health objectives. This was followed by a Miro board exercise where participants were asked to identify required parameters, contextual information, and limitations related to capturing parameters for an example epidemiological use case selected to help prompt reflection and discussion.

Finally, Finlay Campbell (WHO) presented the results of the survey conducted to gather feedback on the proposed data model. The survey results were then discussed section by section with the participants.



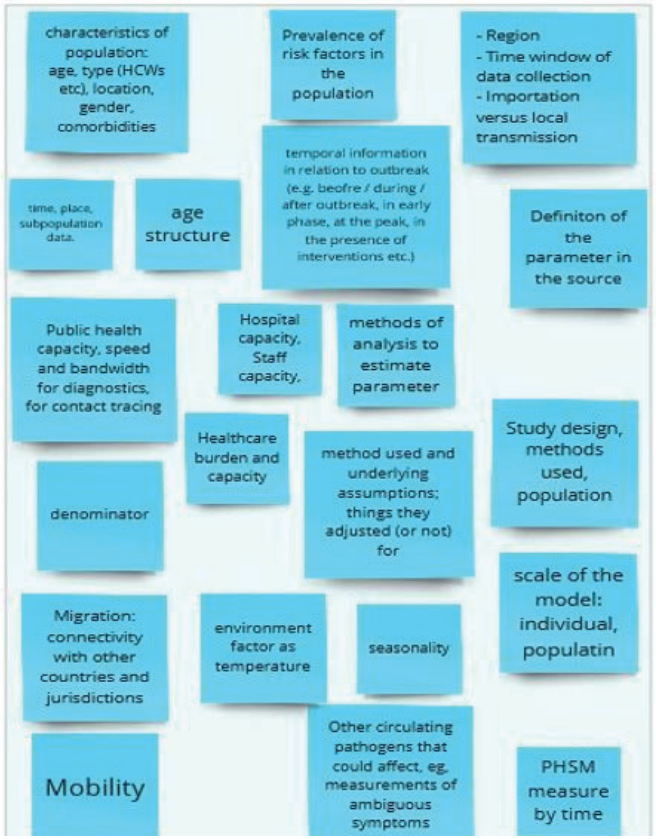
KEY OUTPUT AND DISCUSSION POINTS

Mentimeter
The results of the Mentimeter survey illustrate the varied expertise of the TWG, spanning fields such as epidemiology; mathematical modelling; public health decision-making; data science; and software development. A wide range of public health objectives were listed by participants, with the most cited being 'evaluating the impact of interventions and control measures' and 'modelling disease transmission dynamics and estimating reproduction numbers'. Anticipated use of the parameters repository primarily revolved around essential functions like epidemic forecasting, risk assessment, contact tracing, and the formulation of public health strategies.

KEY OUTPUT AND DISCUSSION POINTS

REQUIRED PARAMETERS

CONTEXTUAL INFORMATION



LIMITATIONS

Miro board illustrating key discussion points relating to required parameters, contextual information, and limitations.

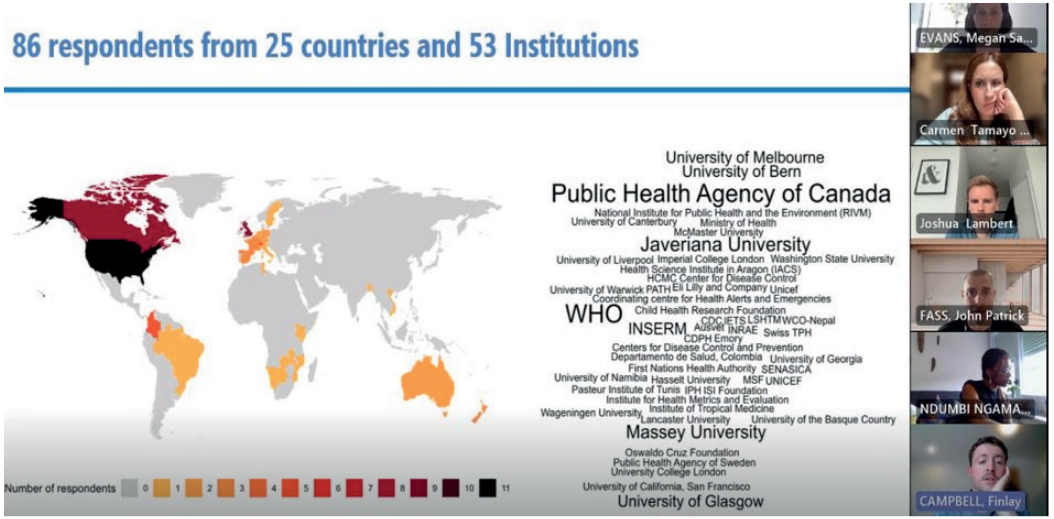
Example use case: Quantifying the spread of a disease in a specific population or geographic area and assessing the impact of a public health interventions.

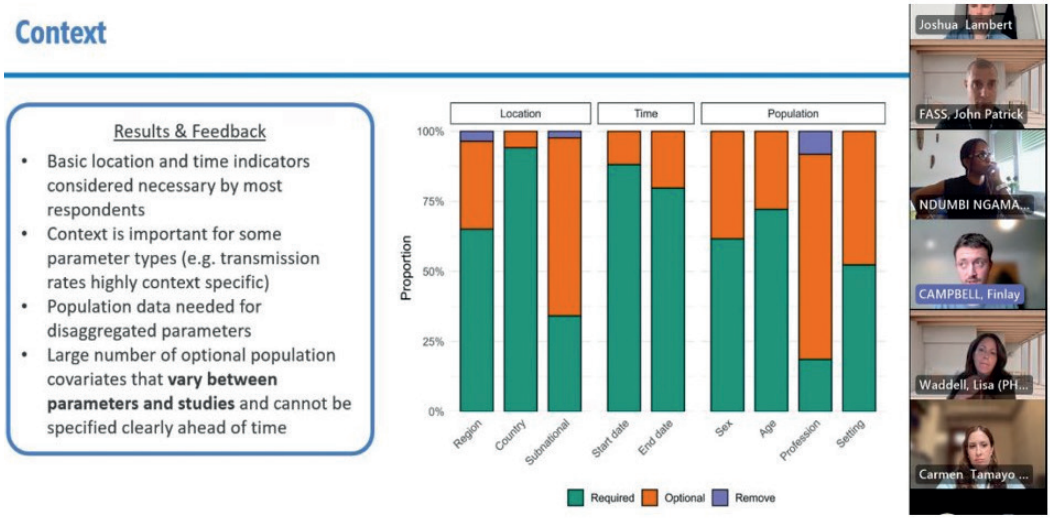
KEY OUTPUT AND DISCUSSION POINTS

Contextual information: The group emphasized the added value of incorporating contextual information alongside data, particularly underlining its significance during the COVID-19 pandemic. Although the type and extent of contextual information to include will require ongoing discussion, it was collectively agreed that temporal, geographical and socio-demographic factors were particularly relevant.

Data source: Significant deliberation centered around how to capture information about the source of extracted data. Participants stressed the importance of providing sufficient information for users to track and access the original data source. This might necessitate the inclusion of a Digital Object Identifier (DOI), a URL, and/or the name of the institution, organization, or research group responsible for the data.

Repository format: The discussion also revolved around the repository's structure and design to ensure optimal usability, including streamlined and standardized data entry processes.

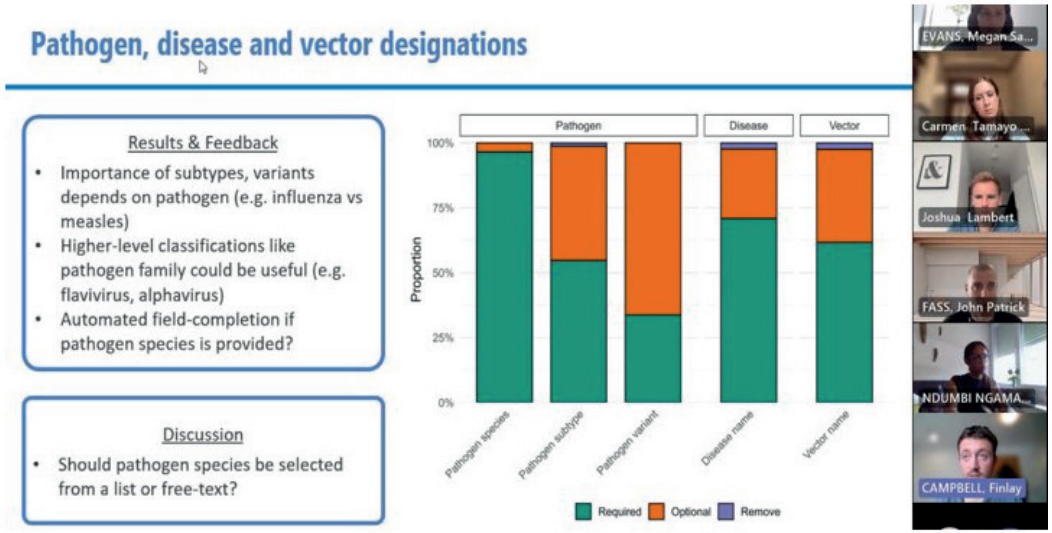


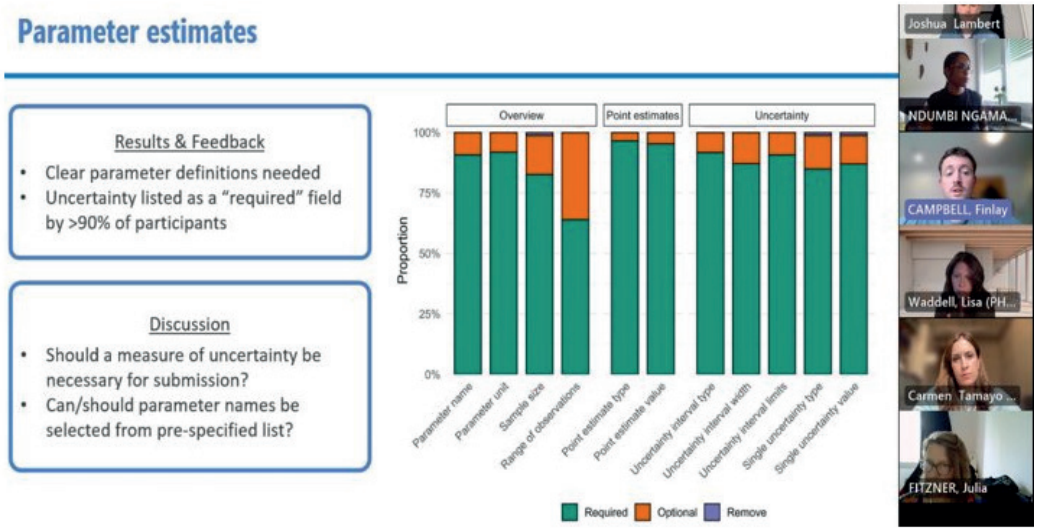


KEY OUTPUT AND DISCUSSION POINTS

Pathogen, disease and vector designations: There was agreement that a predefined list of pathogens could help streamline and standardize the data entry process. Many participants echoed the importance of maintaining flexibilityin the disease and vector designation to avoid undue constraints and accommodate diverse needs.

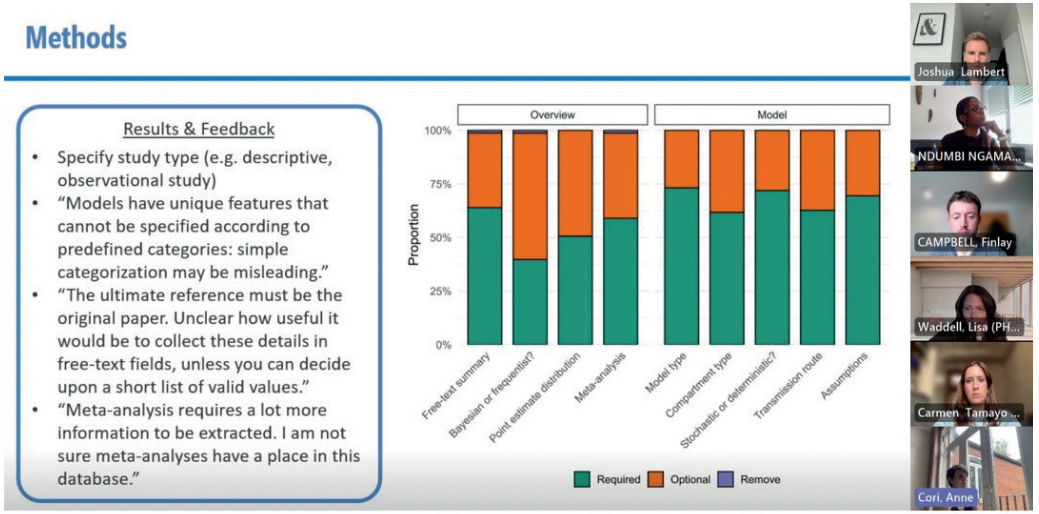
Parameter estimates: The participants engaged in a productive discussion about providing a more comprehensive and nuanced data representation. One suggestion involved introducing an “uncertainty” field for estimates and an “other” category for additional contextual data. Additionally, the idea of incorporating a binary flag to distinguish between Frequentist and Bayesian approaches was discussed, with the understanding that interested parties could access more detailed information as needed.





KEY OUTPUT AND DISCUSSION POINTS

Methods: It was recognized that multiple modeling and statistical approaches could be used to estimate parameters. The participants suggestedthe inclusion of a checkbox to differentiate between parameters estimated from a model vs. parameters estimated from observed data. Concerns were raised about howtoeffectivelyextract a parameter that is estimated multiple ways in a single study.Effective documentation and appropriate capture of the estimatesand measures of variability were considered very important.



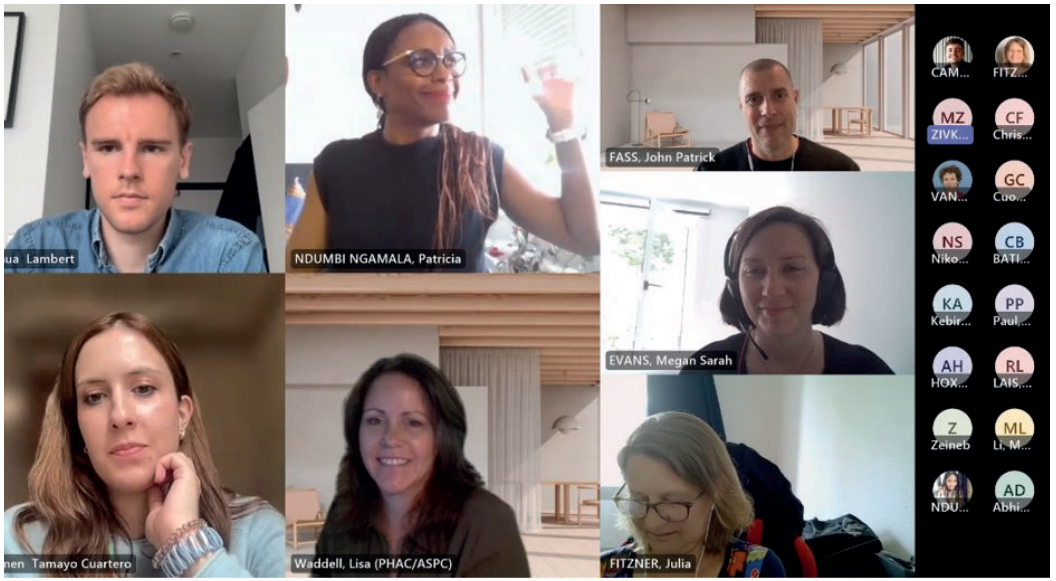
OUTCOME AND FEEDBACK

Outcome
The meeting's key outcome was a shared commitment to advancing public health intelligence by establishing a standardized data model, enriching it with contextual information, ensuring transparent data sourcing, and structuring the repository format for optimal usability. These collaborative efforts underscore the TWG's dedication to improving public health decision-making, forecasting, and risk assessment.

Feedback
The meeting received positive feedback from participants, who applauded the forward-thinking approach and recommended incorporating a testing phase for the initial versions of the database.

As one participant aptly put it: "Great to see all this up-front thinking and solicitation, and I hope that there will be an iterative/agile process of feedback and improvement as the first versions of this database are rolled out".

Moreover, participants commended the interactive nature of the sessions, recognizing that they effectively addressed the most critical discussion points throughout the workshop. Some participants suggested experimenting with a more concise format for future sessions to maintain focused engagement from start to finish.



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