

# **Pathogen Specific Diarrheal Diseases**

**Review Process, Preliminary  
Results and Plans for Finalization**

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# Diarrhea Morbidity, Mortality, and Etiology: Search Strategy

- Search Objective: published and unpublished literature meeting inclusion/exclusion criteria
- Search terms included combinations of:
  - “diarrhea”, “morbidity”, “incidence”, “prevalence”, “mortality”, “etiology”, “cause of death”
  - Key words and MeSH terms
- Databases searched:
  - PubMed
  - WHO library (WHOLIST)
  - SIGLE (System for Information on Grey Literature in Europe),
  - CAB Abstracts

# Inclusion / Exclusion Criteria

(not comprehensive)

## **Inclusion:**

- Prospective studies conducted in representative populations
- Studies with > 12 mo of surveillance

## **Exclusion:**

- Special populations (travelers, cancer patients, etc), except HIV
- Patients hospitalized for reasons other than diarrhea
- Antibiotic associated diarrhea
- Studies that do not articulate age ( < 5 /  $\geq$  5 years)
- Case reports of outbreaks
- Recall periods > 2 wks for morbidity

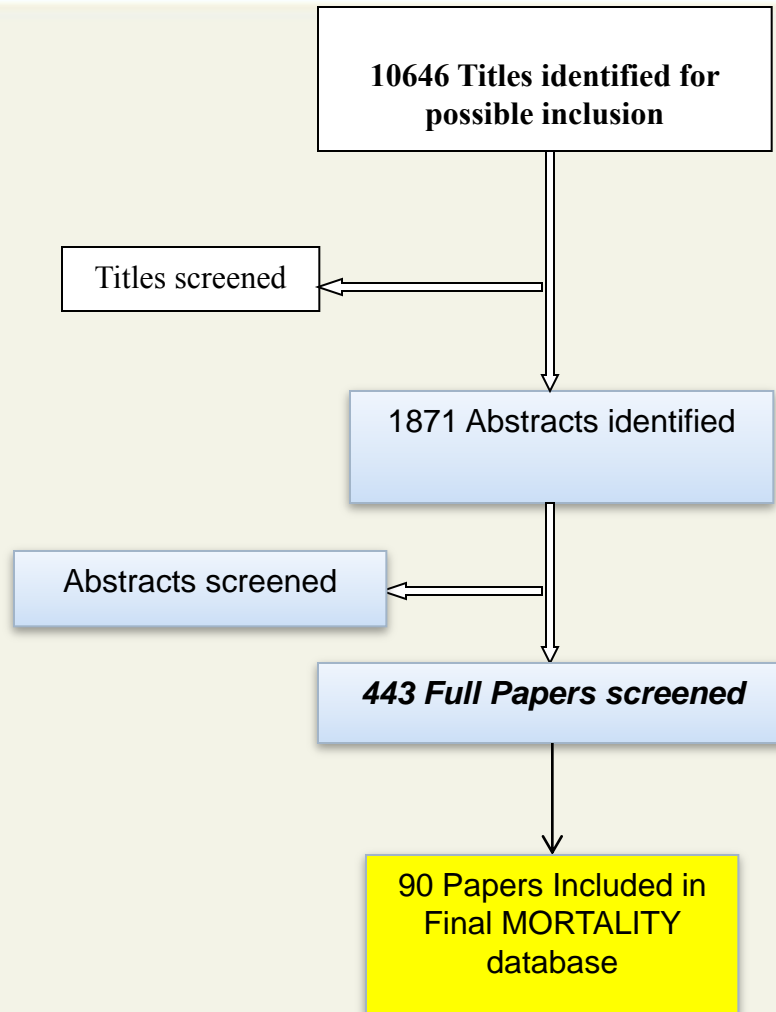


# Mortality

## **MORTALITY: Modeling Goal**

- Goal: Calculate diarrhea proportionate mortality for 2008 and 1990 using single cause model for all countries lacking appropriate VR data including:
  - 119 countries lacking all VR data or < 90% coverage of VR data
- Model has been tested for 2008. A similar model will be run for 1990
- Final results have been submitted for publication.
- Results will be available on CHERG website following publication

# Selection Process for Mortality



# Mortality Model Inputs

90 studies, including 96 Data Points & > 650,000 Deaths





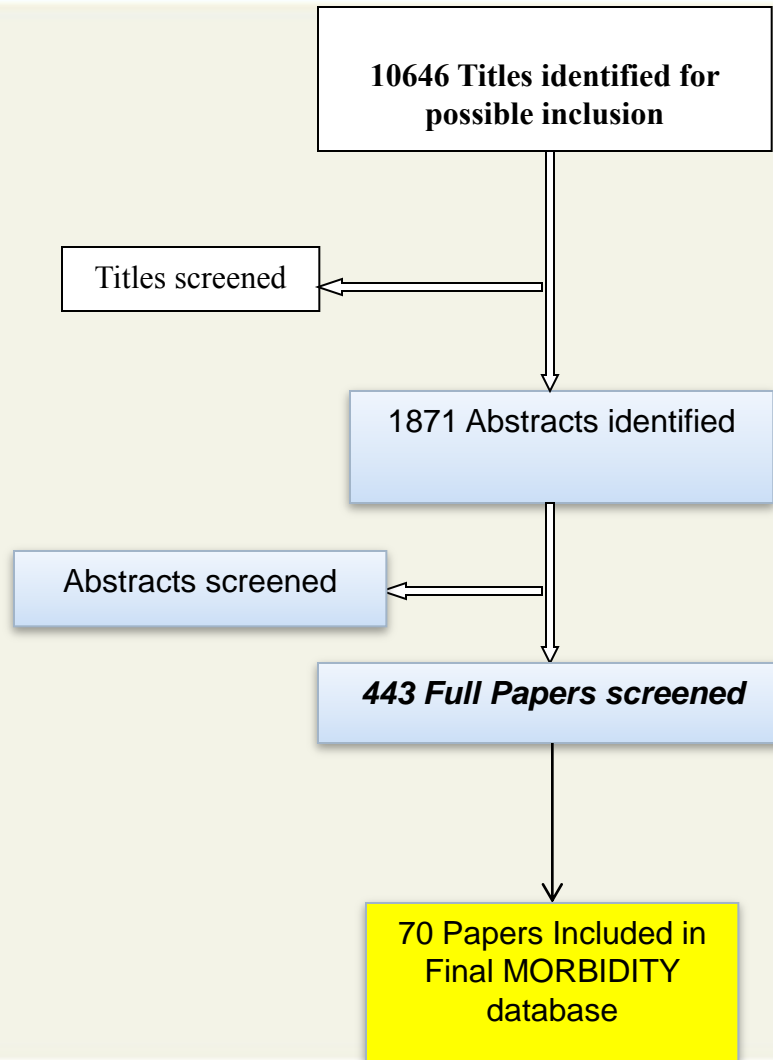
# Morbidity



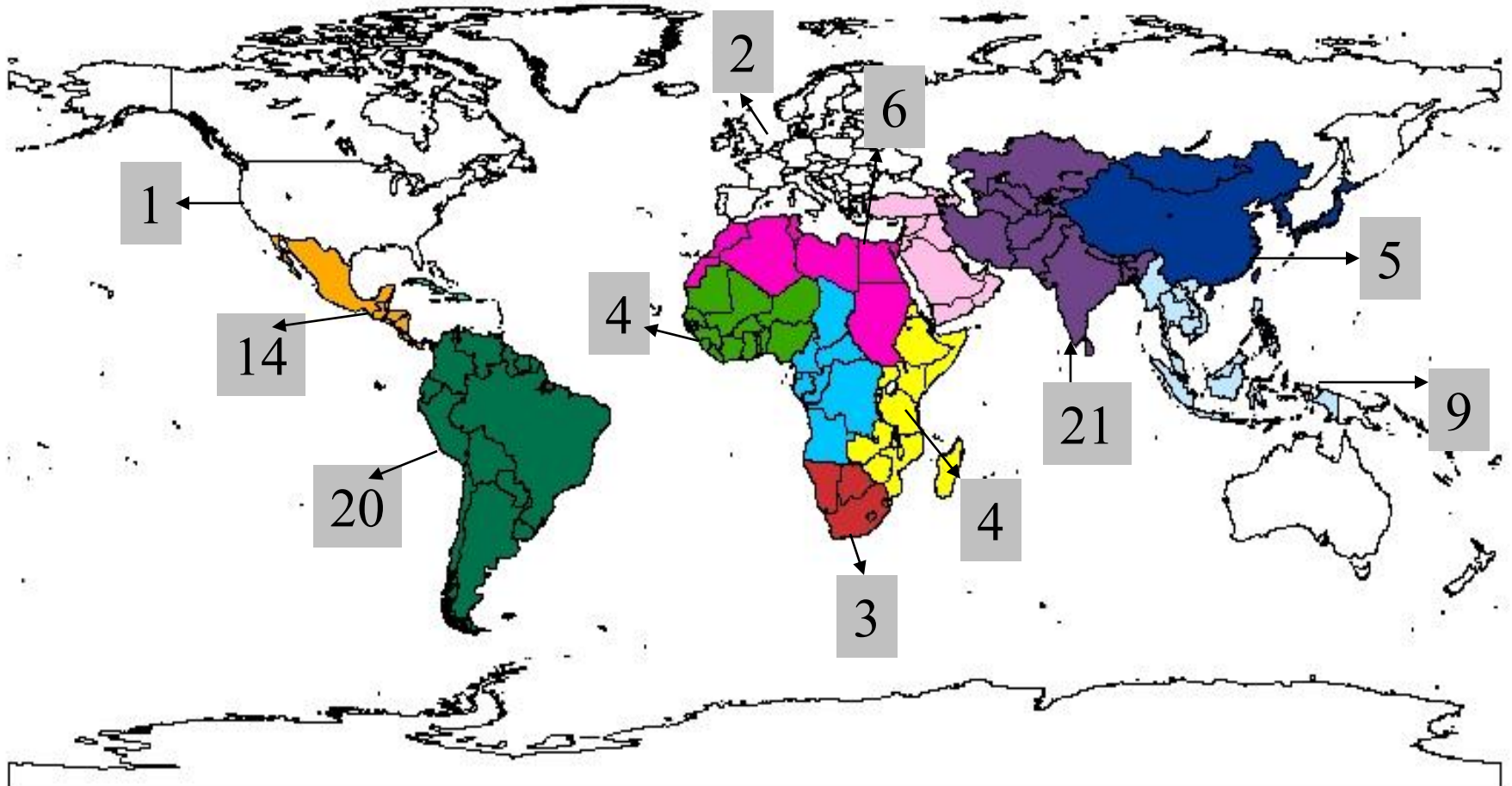
# **MORBIDITY Review Objective and Update**

- Goal: Calculate diarrhea incidence rates for 2010 and 1990 using age specific incidence data from cohort
- Final results have been submitted to the Global Burden of Disease Project and have been submitted for publication
- Results will be available on CHERG website following publication

# Selection Process for Morbidity Systematic Review



# Children < 5 years: Distribution of Morbidity Studies Model Inputs



# Diarrhea Duration & Severity Systematic Review

GOAL: Describe the proportion of diarrhea episodes for children under 5 that are mild, moderate, and severe for better understanding of the burden of diarrhea disease

- Literature search for peer-reviewed publications on the duration and/or severity of diarrhea in children and adults
- Pubmed Mesh search terms: *diarrhea, gastroenteritis, duration, persistence, severity, infant, child, teenage, adult*
- Published from 1990-present in any language
- Reviewed the full papers of unique publications with relevant title/abstract

# Diarrhea Duration in Children

- 1,604 unique publications -> 121 relevant titles/abstracts -> 49 included studies

<b>Measure of Duration Reported</b>	<b># Studies*</b>
Mean Duration	34
Median Duration	5
Proportion Persistent ( $\geq 14$ days)	18
<b>Study Location by WHO Region</b>	
Africa	6
Europe	0
Eastern Mediterranean	3
Americas	22
South East Asia	15
Western Pacific	2

\* Single studies may report multiple measures and/or study locations

# Diarrhea Severity

- 3,061 unique publications -> 284 relevant titles/abstracts
- Review of relevant publications currently in progress
- According to preliminary data abstraction, the measures of severity implemented include:
  - Level of dehydration (mild, moderate, severe)
  - Daily frequency of loose stool passage
  - Presence of vomiting & blood and/or mucus in stool
  - 20-point Vesikari scoring system, combining the above indicators and episode duration



## **Duration and Severity Next Steps**

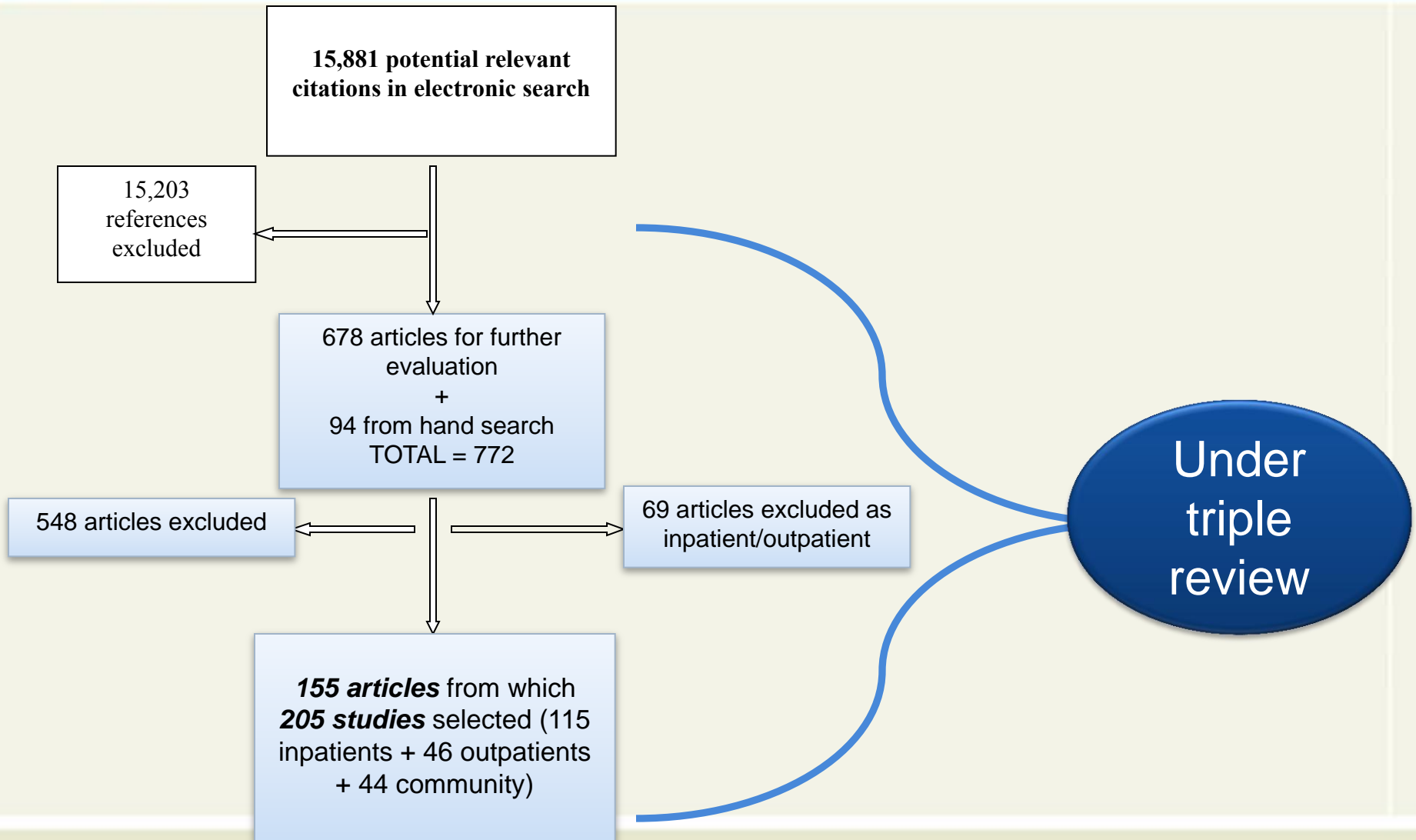
- Final duration and severity results have been submitted for publication and will be available on the CHERG website after publication



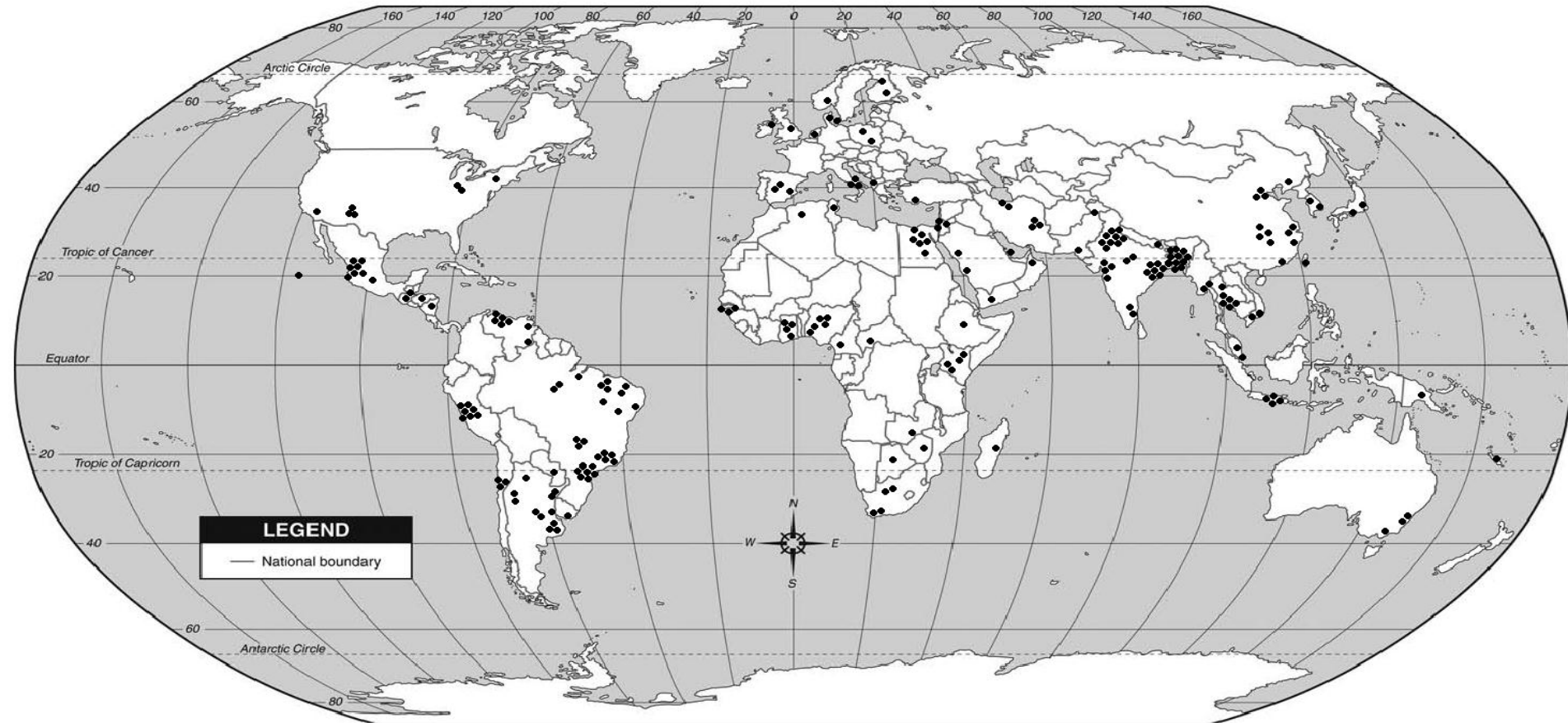
# **Etiology**



# Selection Process for Etiology



# ETIOLOGY: Model Inputs



# Analytic Methods (I)

**Goal:** Estimate median prevalence proportion for each pathogen for all children 0-59 mo by type of study (outpatient, inpatient, and community).

**Age adjustments:** Studies that do not directly report prevalence by pathogen for all ages 0-59 mo

- Step 1: Calculate age group conversion factors using all studies that report both prevalence for all 0-59 and smaller age groups. The conversion factor for age group X is calculated as the median of  $\text{prev}_{0-59} / \text{prev}_X$
- Step 2: Proportion reported for each age group given in the study is converted to a full 0-59 mo estimate

## Analytic Methods (II)

**Median pathogen prevalence** = median of age - converted rates by study population (in-, out-patient, and community)

### Uncertainty estimates:

- Bootstrap confidence intervals are calculated for those estimates based on a minimum of 3 studies.
- ‘Pseudo-datasets’ created by sampling studies with replacement from the real dataset. Each of the 1000 pseudo-datasets is used in the estimation procedure described above to generate a corresponding 1000 prevalence proportions. The 2.5<sup>th</sup> and 97.5<sup>th</sup> percentile of these proportions give the 95% CI.



## Moving Forward

- Final results have been submitted for publication and will be available on the CHERG website after publication