## Background

### What is CHAMPS?

The CHAMPS program is a new global health surveillance network aimed at preventing childhood mortality in Sub-Saharan Africa and South Asia.

### How did CHAMPS start?

CHAMPS started with an initial $75 million commitment from the Bill & Melinda Gates Foundation to develop 6 surveillance sites in 3 years. The Emory Global Health Institute is the lead partner.

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The initial focus will be on tracking the most preventable causes of mortality among children under five. In the future, the scope will be expanded to include older age groups, syndromes, disease systems, and answer specific research questions. It is envisioned that the network will grow up to 20 – 25 sites in subsequent years.
Project Stakeholders

Global Advisory Committee

Program Office (PO)

Scientific Advisory Committee

Technical Assistance Partners

Council of Site Directors

Site 1
Local Advisory Board
MOH/NPHI

Site 2
Local Advisory Board
MOH/NPHI

Site 3
Local Advisory Board
MOH/NPHI

Site 4
Local Advisory Board
MOH/NPHI

Site 5
Local Advisory Board
MOH/NPHI

Site 6
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Program Objectives

### Primary Outcomes

1. The CHAMPS Network tracks the definitive causes of child mortality
2. CHAMPS data are valued and utilized by key national and global stakeholders for decision-making
3. CHAMPS sites are able to provide additional necessary services to serve as surveillance platforms

### Approach

- DSS capabilities will allow U5 deaths to be identified within 24 hours through community-based surveillance
- Data and specimens will be collected, primarily via minimally-invasive tissue sampling (MITS)
- Specimens will be analyzed for multiple pathogens to determine cause of death
- Standardized data will be integrated and shared in near real-time with sites, Program Office, BMGF, and other stakeholders
Program Objectives

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**Approach**

- Dashboards will enable customizable reports and visualize data for each site country and major stakeholder

- IANPHI will lead an effort to engage local stakeholders and develop the technical capacity to analyze and use data locally
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The CHAMPS investments in sites’ surveillance infrastructure will enable sites to perform ancillary activities (e.g., outbreak event monitoring).

Approach:
- Ongoing collection of epi data
- Strong relationships with PIs and global experts
- Office space and physical infrastructure
- Trained human resources
- Coordination with MOHs and country stakeholders
- Pathology and lab capacity
Overview of CHAMPS Processes

Community
- Formative Research
  - Objective: Understand acceptability of proposed processes
- Demographic Surveillance
  - Objective: Understand denominator for calculation of rates
- Pregnancy Surveillance
  - Objective: Track births and identify neonatal deaths
- Death Surveillance
  - Objective: Identify deaths for MITs and collection of additional data
  1. Initial Interview
  2. MITs Specimen Collection
  3. Verbal Autopsy

Health Facility
- Severe Disease Surveillance
  - Objective: Understand what’s causing severe illness, background rates of various pathogens
  1. Clinical Information
  2. Specimen Collection
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Local Lab (Pathology)
- Specimen Processing & Analysis
  1. Tracking
  2. Results
  3. Biobanking/Storage

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Site and Program Office
- Cause of Death Determination
- Improved Understanding of Catchment Area Population

Data Flow:
- Green: Data flowing to lab
- Blue: Data flowing to cause of death determination
- Orange: Data Flowing to PO for Characterization of Catchment Area Population

Emory University
Emory Global Health Institute
Overview of MITS Lab & Diagnostics Processes

*Key special stains will be introduced within the first six months. Based on evaluation, 12-18 months after start of project select IHCs will be introduced as well
†Positives and 10% of negatives will be re-tested at the CHAMPS reference lab (CDC) for QC during the first year
§General schematic and inflammatory pattern algorithms
$ IHC and molecular assays as used by CPL
Minimally Invasive Tissue Sampling (MITS) and not Minimally Invasive Autopsy (MIA)

- Community engagement
- Formative research
- Procedure:
  - One hour with 2-3 staff members
  - Pictures
  - Kit: needles, gloves, containers, formalin, disinfectants….
  - Blood, CSF, stools and urine
  - Lungs, heart, liver, brain, spleen, kidneys, any visible LN or skin lesion.
  - Microbiology, TAC, PCR, Histopathology, Special stains, IHC
- Showing body and sampling after completion to community leaders

- Infectious and non infectious
- Telepathology
- Training
- Building capacity
- Transfer of technology
- Feedback to parents, MOH, Public health institutes
## Proposed CHAMPS Outputs (DRAFT)

<table>
<thead>
<tr>
<th>Formative Research</th>
<th>Surveillance</th>
<th>Laboratory</th>
<th>Analysis</th>
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</thead>
<tbody>
<tr>
<td>• Information about the beliefs/conceptions and practices around pregnancy, delivery, births, and deaths</td>
<td>• Estimated population size with demographic breakdown (i.e., age, sex, and geocode)</td>
<td>• Equipment, trained staff, and processes for:</td>
<td>• Expert panel to determine cause of death</td>
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<tr>
<td>• Key stakeholders and key informants identified within facilities and communities to understand decision-making around pregnancy, delivery, births, and death (e.g., health workers, healers, elders)</td>
<td>• Maternal, clinical, demographic, and lab information (# of births, birth outcomes, # of pregnant women, gestational age, pregnancy history, nutritional status, anemia, infections)</td>
<td>• HIV/TB/Malaria testing (and other relevant clinical tests)</td>
<td>• Pathogen-specific mortality rates</td>
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<td>• Improved understanding of barriers and facilitators to participation in CHAMPS activities (e.g., MITS, disease surveillance, pregnancy surveillance, demographic surveillance)</td>
<td>• Under-five deaths (enumeration of all deaths, consent for MITS and verbal autopsy, clinical and epi data)</td>
<td>• Bacterial culture</td>
<td>• Site-specific under 5 mortality rates</td>
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<tr>
<td>• Recommendations to improve participation in CHAMPS activities</td>
<td>• Pathogen-specific incidence (enumeration of all severe illness meeting case definition, clinical and epi data)</td>
<td>• TAC (including nucleic acid extraction)</td>
<td>• Trends in rates of mortality and severe disease over time</td>
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<td>• Community engagement plan, including approach to informing local stakeholders of overall CHAMPS findings</td>
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<td>• Histopathology</td>
<td>• Program monitoring</td>
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<td>• Biobanking and specimen archiving</td>
<td>• Geospatial rates</td>
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<td>• Quality management</td>
<td>• Intervention effectiveness</td>
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<td>• Analysis for data use</td>
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<td>• Relationship of disease &amp; SES</td>
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<td>• Maternal &amp; child health analysis</td>
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<td>• Nutritional analysis</td>
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Emory Global Health Institute
Severe Disease Surveillance Lab Processes

**Specimen Collection**
- Blood
- Stool
- CSF*
- NP/OP Swab
- NP Aspirate †

**Aliquoting & Transport**
- Nucleic Acid Extraction (NAE)
- Culture

**Processing**
- Malaria RDT
- PCR
- Culture
- GeneXpert MTB (for stool too)

**Analysis**
- RDT test results
- HIV test results
- TAC results
- Culture results
- GeneXpert results

**Action**
- Clinical communication

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**CASPIR**
- Specimen Receipt & Storage
- Portion of specimens sent to central specimen archive

**CDC Reference Lab**
- Specimen Receipt
- QA
- Analysis

5% of specimens will have molecular testing done by the central lab

*Only collected when there are signs of meningitis
† For severe respiratory illness only, when possible
CHAMPS and NPHIs

Funds available: $2.79 million over 3 years:

- **IANPHI Secretariat**: $50,000 annually/3 years toward annual meeting: exchange of best practices, benchmarking and linkages

- **U.S. Office**: About $100,000 annually/3 years for technical assistance

- **NPHI-to-NPHI Partnerships**: About $850,000 annually/3 years for 6 NPHI-to-NPHI twinning projects

**Leadership Role**

Program Office, on oversight board, scientific advisory board and panels
CHAMPS and NPHIs (Cont.)

CHAMPS Program Office guiding principal: A priority user of data is countries – to make informed decisions/actions

NPHIs
Unique position: ensure CHAMPS data has impact

CHAMPS
Strengthen NPHI capacity to carry out their role in supporting evidence-informed decision-making

Result
Long-term public health impact that goes beyond CHAMPS
CHAMPS and NPHIs: Methodology

CHAMPS data will help define problem ..... NPHIs may also need local/external data to form policy and program recommendations

• Vaccine-preventable diseases: why vaccination coverage is inadequate/ways of overcoming the barriers

• Dehydration during acute illnesses: information on community attitudes and knowledge about risks of dehydration, care-seeking behavior, supplies at facilities, lack of trained personnel, etc.

• Recommendations could include adapting/testing a program shown to be effective elsewhere
For example: data may show causes of death that are:

- **Preventable:**
  - Some diarrheal illnesses (WASH interventions or vaccines)
  - Vaccine-preventable diseases (better vaccine coverage)
  - Injuries (effective interventions)

- **Impact reduced by early diagnosis and treatment:**
  - Malaria
  - Pneumonia
  - Non–malarial febrile illness
CHAMPS and NPHIs: Country-led plans:

• Use a range of information to clarify why deaths occurred

• Collect additional data related to barriers to prevention and treatment to help explain CHAMPS findings

• Synthesize this information into policy recommendations

• Develop national strategies for communicating with policy-makers, which vary by country and differ substantially from scientific communications

• Work with the MOH and others to design programs and policies to reduce deaths from conditions identified through CHAMPS
CHAMPS and NPHIs: Country-led plans (Cont.):

- Country-led plans may include:
  - Long-term technical assistance
  - Training
  - Staff exchange, mentorship
  - Workshops, personnel or equipment
  - Leveraging the IANPHI network to bring additional resources/donors as feasible
CHAMPS and NPHIs: Other Activities

• Best practices for using CHAMPS data to inform national decision-making:
  – 2017: develop best practices based on the impact of CHAMPS’ data on national decision-making

• Create a community of practice for CHAMPS country NPHIs:
  – Information and tools/website
  – Webinars
  – Annual meeting of CHAMPS site NPHIs and partners to discuss and disseminate results and best practices