

# Building Knowledge, Saving Children's Lives Child Health and Mortality Prevention Surveillance

## IMPACT REPORT

July 2023



**CHAMPS**

Child Health and Mortality  
Prevention Surveillance

# A Message From the CHAMPS Network

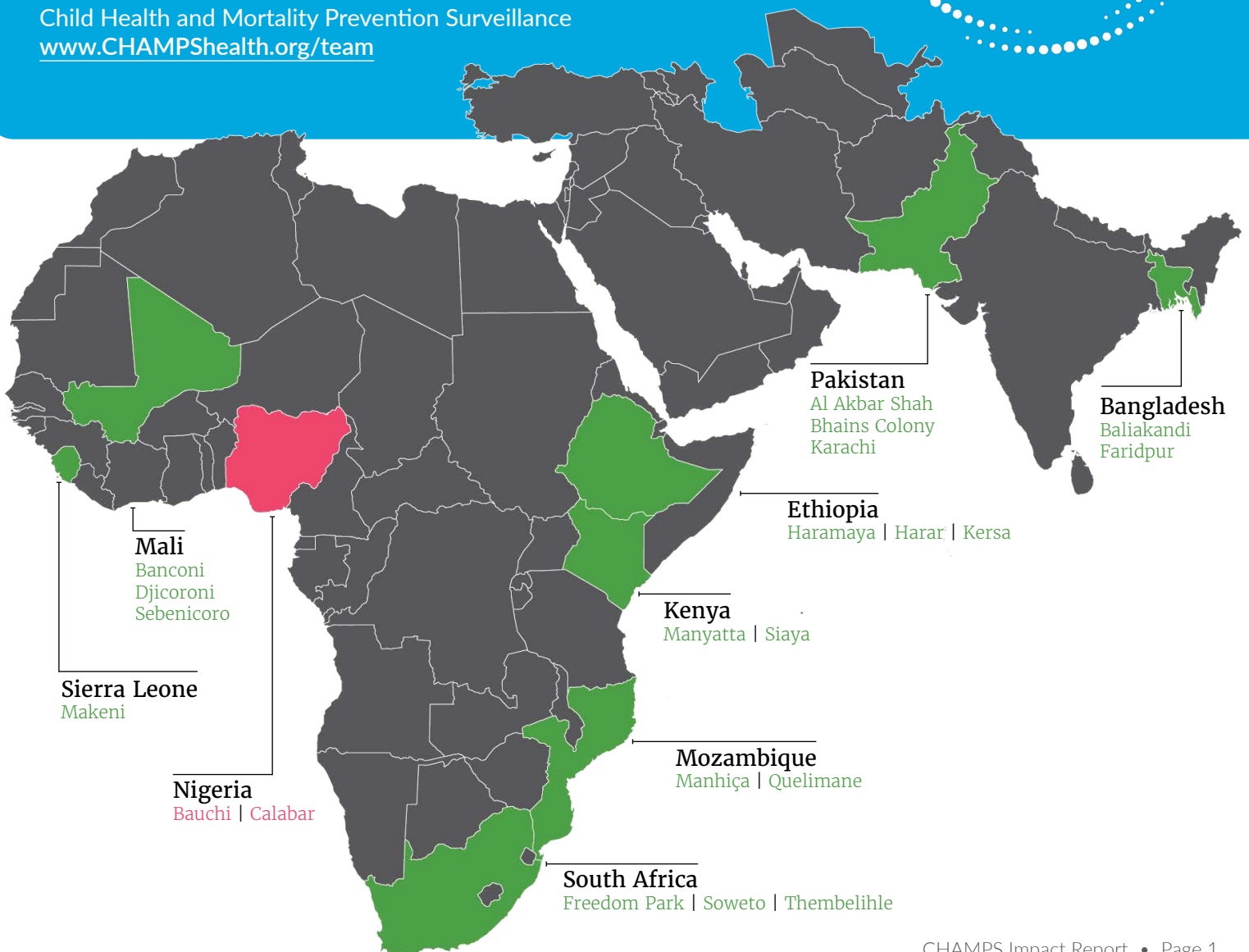
CHAMPS' success is built on the trust and resilience of the families we serve and the support of communities who have lost too many children. Over 8 years, CHAMPS has worked with communities and built local capacity to determine definitive causes of stillbirths and child deaths across our network of sites in Africa and South Asia, two regions that account for 82% of under-five child mortality worldwide.

Our detailed data and analysis on causes of death show that at least 70% of stillbirths and child deaths are preventable with existing interventions. To address persistent health inequities and improve maternal health and child survival, CHAMPS is sharing knowledge and using its network to provide policymakers, partners, health workers, communities, and parents with information and recommendations to save young lives.

We thank the many stakeholders and partners who make CHAMPS' work possible and commit to accelerating our shared goals to end preventable child deaths everywhere.

CHAMPS operates in 19 catchments in 8 countries & will soon launch a new site

CHAMPS Network  
Child Health and Mortality Prevention Surveillance  
[www.CHAMPShealth.org/team](http://www.CHAMPShealth.org/team)



# Advancing CHAMPS Mission to Save Children's Lives

**Too many children under the age of five die from preventable causes of death each year.** While under-five mortality is dropping globally, efforts to reach the most severely affected communities are failing, and the number of stillbirths and newborn deaths has not declined. Accurate information on why deaths occur is vital to inform solutions. With funding from the Bill & Melinda Gates Foundation, Child Health and Mortality Prevention Surveillance (CHAMPS) launched in 2015 to generate data on definitive causes of stillbirth, neonatal, and early child deaths in high-burden regions of the world. As we continue to gain and share knowledge across our network and globally, CHAMPS is also partnering to mobilize its data into action to inform policy, systems, and health interventions to save young lives.



CHAMPS generates the best possible information on causes of child death using minimally-invasive tissue sampling (MITS) pathology-informed methods to rapidly identify deaths in Africa and South Asia. When a stillbirth or child death is identified, and with a family's consent, CHAMPS teams:

- Collect tissue, blood, and other specimens using MITS
- Conduct advanced microbiology, histology, and pathology testing
- Gather information about what happened from health records and families
- Collaborate with local medical and public health experts who review the information, assign underlying and co-morbid causes of death, and determine whether deaths were preventable

CHAMPS also conducts demographic and pregnancy surveillance in the same communities to better understand the burden of specific causes of deaths and what might be contributing factors. Teams share findings with families privately, and de-identified data is shared with community groups, public health leaders, health providers, and researchers to inform public health actions to save young lives.

## CHAMPS By the Numbers

**11,038**  
deaths investigated

**6,624**  
minimally-invasive tissue  
sampling procedures completed

**5,126**  
deaths assigned causes  
with full results

**78%**  
of deaths could have been prevented  
with existing interventions

*\* cumulative as of June 2023*

# CHAMPS Findings on Causes of Stillbirths & Child Deaths



## Stillbirths

35% of all CHAMPS-enrolled deaths

A large majority (76%) of stillbirths are attributed to intrauterine hypoxia or birth asphyxia. These diagnoses indicate that the stillbirths were caused by pregnancy or delivery complications rather than a health condition identified in the baby. Smaller percentages of stillbirths are caused by infections (10%) and congenital defects (7%).



## Neonatal Deaths

37% of all CHAMPS-enrolled deaths

CHAMPS data show how the first 4 weeks of life—the neonatal period—are a high-risk time for babies. Deaths that occur in the first day or two of life are usually related to delivery complications rather than a specific health issue in the baby; the cause of these neonatal deaths is identified as birth asphyxia. After the first day or two of life, the most common causes of death in newborns are complications of preterm birth, such as respiratory distress syndrome and sepsis. Many preterm babies develop sepsis, a severe infection that is often caused by antibiotic-resistant bacteria the babies acquire within the hospital environment. Almost one-third (28%) of deaths that CHAMPS identifies in the neonatal age group have complicated medical courses with three or more causes of death.



## Deaths in Infants & Children Under 5

28% of all CHAMPS-enrolled deaths

Infectious diseases play a role in nearly all (85%) deaths in infants and children. While some of these deaths are caused by just one illness, CHAMPS investigations identify a series of multiple causes that led to death in a large majority (78%) of cases. Malnutrition, malaria, pneumonia and HIV are the most common underlying conditions in infant and child deaths enrolled in CHAMPS.

# Building Community Trust & Ownership

## Impact

A coalition of community representatives, partners and an advisory board is formed at each site to collaborate with CHAMPS social behavioral and community engagement (SBS/CE) teams to improve pregnancy and mortality surveillance. This collaboration builds trust, supports community-led solutions, and facilitates community ownership to sustain maternal and child health programs.



## Interventions

CHAMPS investigations show that at least 70% of child deaths in regions of Africa and South Asia are preventable with existing interventions, a stark reminder of health inequities and an urgent call to accelerate action to save these young lives.

### Prenatal Care

By offering ultrasounds to pregnant women and providing referrals to local OB/GYN providers when complications were suspected, the pregnancy surveillance team in Ethiopia was able to earn community members' trust in CHAMPS and increase use of prenatal care services. Pregnancy surveillance also improved consent rates for mortality surveillance and substantially helped with capturing data on community deaths.



**41,203**

women enrolled in pregnancy surveillance across CHAMPS sites as of June 2023

### Strengthening Local Health Systems

SBS/CE teams continue to strengthen maternal and child health efforts in CHAMPS communities, including:

- Transportation for community members to health care facilities in Mozambique
- Grief counseling services in South Africa
  - Links to antenatal care services in Kenya through CHAMPS pregnancy surveillance
- Community health activities in Sierra Leone, in collaboration with local health officials and health facilities
- Better access to antenatal care in Bangladesh, in coordination with local programs
- Community health education through theatre in Mali and Ethiopia



**161,751**

people participated in 1,917 events, between March 2019-June 2023

# Engaging Families to Improve Public Health

## Impact

CHAMPS enrollment and findings, shared with families, bring understanding after the loss of a child. The information can:

- Empower families to improve health practices when planning for another child
- Benefit the health of other children
- Motivate families to consent to participate in pregnancy surveillance

## Sharing Knowledge Increases Health-Seeking Behavior

### Preventing HIV Transmission

A family in a CHAMPS community sought help from traditional healers and nearby medical clinics for their six-month old child who had not been gaining weight. They were unable to determine what was wrong; sadly, she died at home. CHAMPS testing found that the child had HIV and, because of that, was severely malnourished and had bacterial and viral lung infections. A test for HIV early in the mother's pregnancy was negative, and she had not been tested since. After hearing the investigation results, the mother was tested for HIV and sought treatment. She is now taking medication that will prevent transmission of HIV in future pregnancies.

### Improving Enrollment

The Kenya team found that use of a mobile van improved consent rates and timely enrollment of child deaths, including deaths that occur at home or on the way to a health facility. The team travels to communities or nearby health centers where deaths occur. The mobile unit makes the process of CHAMPS enrollment and specimen collection easier for families seeking answers about their child's death.



**Prenatal care  
could prevent**  
4 of 5 stillbirths &  
3 of 5 newborn  
deaths

# Transforming Data into Action

## Impact

Public health leaders are using CHAMPS findings to inform health policies, resource allocation, and partner-led interventions that improve maternal and child health.

To address leading causes of deaths at CHAMPS sites, our teams collaborate with local health authorities to:

- 1 Improve antenatal and obstetric services**  
CHAMPS teams work on increasing demand for antenatal and obstetric services and improving their quality. Better prenatal health screening can ensure early referral to necessary maternal care, timely management of pregnancy complications, and fewer perinatal deaths.
- 2 Support infection prevention and control**  
CHAMPS aims to prevent infections caused by antibiotic-resistant bacteria found in hospitals through training of health care workers. CHAMPS labs provide testing of neonatal unit environments and antimicrobial resistance testing to ensure children are given effective antimicrobials.
- 3 Address malnutrition**  
CHAMPS teams collaborate with local communities and health care providers to improve detection and management of acute malnutrition. CHAMPS also supports nutrition education programs that aim to improve household food baskets and food preparation.

**~1 in 5**  
child deaths could  
be prevented  
by eliminating  
malnutrition

### Intervention: Folic Acid

In Ethiopia, CHAMPS works with the Ministry of Health as it develops locally produced salt fortified with folic acid. **Use of the fortified salt could prevent up to 15,800 stillbirths and 2,200 neonatal deaths in Ethiopia annually.**

# Leveraging the CHAMPS Platform



## Impact

The CHAMPS platform—experience, infrastructure, and relationships—enables CHAMPS teams to support additional scientific work and respond to emerging health needs. Collectively, the CHAMPS network builds capacity by mentoring scientists, providing feedback to health personnel, and empowering communities to ensure sustainable health improvements.



**Access  
CHAMPS data**  
for research,  
policymaking &  
public health action  
[champshealth.org/data](https://champshealth.org/data)

CHAMPS provides open access, summarized and de-identified data in real time and upon request. We also share data sets and specimens for independent research.


## Interventions

### Pivoting to Pandemic Response

In 2020, as SARS-CoV-2 spread across the globe, CHAMPS teams quickly turned their attention and resources to pandemic response. This pivot demonstrated the capacity of our global network to adapt and respond to large-scale public health emergencies.

- CHAMPS pathologists and microbiologists offered technical support, operated COVID-19 testing laboratories, trained staff and shared testing equipment with local health facilities and hospitals.
- CHAMPS Social Behavioral Science and Community Engagement teams worked with district health officials to conduct community health education on COVID-19 prevention, infection control and treatment options.
- By utilizing health and demographic surveillance data from CHAMPS catchment areas, CHAMPS demographers worked with the University of Witwatersrand in South Africa to better understand the global burden of COVID-19 deaths.

### Improving Global Health Metrics



Public health officials in many high-mortality areas use verbal autopsy—a series of questions an investigator asks a family—to try to understand why deaths occur. CHAMPS teams in Mozambique and Sierra Leone worked with Johns Hopkins University and University of Toronto on Countrywide Mortality Surveillance for Action (COMSA), a program that tracks births, deaths, and causes of death in representative communities using verbal autopsies. Researchers compared the verbal autopsy results to CHAMPS' accurate findings to refine the cause of death information for the COMSA program.



# Addressing New Scientific Questions

## Impact

CHAMPS supports new lines of scientific inquiry through innovative use of our network.



## Questions CHAMPS is investigating include:

### Were children who died of malnutrition lacking specific nutrients?

With a new grant from the Bill & Melinda Gates Foundation, CHAMPS will test micronutrient levels in samples from deceased infants and children in six sites in Africa and in pregnant women in Ethiopia and Kenya.

### What role do genetic disorders play in early childhood deaths?

CHAMPS is examining DNA and conducting metabolic screening for a subset of early childhood deaths to determine whether congenital disorders are more common than previously thought in high-mortality settings and whether routine screening for such conditions is needed.

### Is malaria a significant cause of death in adults?

As people living in high-transmission areas gain immunity over time to the parasites that cause malaria, nearly all deaths from malaria in these areas are thought to occur in children. Recent data have challenged this assumption. CHAMPS is now investigating adult deaths at sites in Sierra Leone and Kenya, areas with high malaria transmission rates, to determine whether malaria contributed to a significant proportion of those deaths.



# Looking Forward

**CHAMPS continues to set new standards for the design and implementation of global surveillance networks.** Expanding the number of policymakers, researchers, and program leaders who use CHAMPS data will improve health interventions and prevent child mortality.



## Inspiring New Leaders

We are excited to implement the CHAMPS Leadership Center initiative. Launched in 2023 in Bangladesh, the Leadership Center aims to direct health and demographic surveillance system activities for the network and provide technical support to CHAMPS sites as they build or improve their local systems.

**Our disseminated leadership model aims to place key network positions in CHAMPS countries.** A Senior Director for Impact and Engagement is based in South Africa, a Senior Director for Science, Site Strategy, and Implementation in Kenya, and a pathologist based in Nigeria will serve as a technical resource for the network.

**In 2023 CHAMPS will establish a site in Karachi, Pakistan,** led by partners from Aga Khan University and the University of Texas, Southwestern School of Public Health. By providing information from a second CHAMPS site in South Asia, the Pakistan CHAMPS site will substantially strengthen our understanding of causes of stillbirths and child deaths from the region. CHAMPS is also **launching a site in Nigeria**, with a catchment in Calabar in the south led by the University of Calabar and a catchment in Bauchi, in northern Nigeria, led by Abubakar Tafawa Balewa University.



## Establishing New Sites

**CHAMPS teams are working with global partners and public health leaders** to ensure they have ready access to CHAMPS data for analysis, policy development, and public health action. Expanding access to CHAMPS' growing body of results is a high priority for the network. Partners actively using CHAMPS data include:

- [The National Institute of Epidemiology, Disease Control and Research in Bangladesh](#)
- [The Ethiopia National Public Health Institute](#)
- [The National Institute of Health in Mozambique](#)
- [United Nations Inter-agency Group for Child Mortality Estimation](#)
- [Respiratory Syncytial Virus Consortium in Europe](#)
- [Institute of Health Metrics and Evaluation](#)
- [World Health Organization](#)



## Expanding Partnerships

## Ongoing Priorities

CHAMPS remains committed to advancing data collection methods, strengthening relationships in the communities where we work, and providing timely and comprehensive cause of death data to shape public health initiatives.

Going forward, CHAMPS will continue to:

- Collect data that yield unique insights and findings
- Support and share findings with CHAMPS families who have lost a child
- Promote the use of CHAMPS data for policy decision-making and health systems improvement
- Monitor trends in causes of death to guide programs and response
- Pursue additional innovative research and high-impact interventions to prevent child mortality
- Act on CHAMPS findings in collaboration with countries and global health partners to save lives

We build partnerships to accelerate our work to identify preventable causes of child deaths, share knowledge, and save young lives.



CHAMPS' work would not be possible without generous funding and collaboration from the Bill & Melinda Gates Foundation.

Every individual, organization, and community within the CHAMPS network plays a critical role in preventing child mortality. We value the broad range of advocates and partners who support our work.



If you are a current or future partner, **thank you.**

If not, join us!

If you have questions about CHAMPS or want to discover how you can use CHAMPS data, please visit our website at [www.champshealth.org](http://www.champshealth.org) or contact us at [info@champshealth.org](mailto:info@champshealth.org).



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