



CHAMPS

Building Knowledge.
Saving Children's Lives.

Child Health and Mortality Prevention Surveillance (CHAMPS) Network

Patient Safety Webinar: Neonatal and Child
Infections

17 September 2025

UNIVERSITY OF THE
WITWATERSRAND,
JOHANNESBURG



WITS VIDA
UNIVERSITY OF THE WITWATERSRAND
VACCINES & INFECTIOUS DISEASES ANALYTICS



CHAMPS

Building
Knowledge.
Saving
Children's
Lives.

Presentation Overview:

1. Introduction to Wits VIDA & CHAMPS
2. Brief Findings: Across the CHAMPS Network
3. Brief Findings: SA-Specific Data
4. Findings and Activities in Relation to Enhancing Patient Safety

UNIVERSITY OF THE
WITWATERSRAND,
JOHANNESBURG



WITS VIDA
UNIVERSITY OF THE WITWATERSRAND
VACCINES & INFECTIOUS DISEASES ANALYTICS

About Us

The Vaccines and Infectious Diseases Analytics (VIDA) is a renowned African-led research unit established in 1995.

- High-quality, translational scientific research
- We save lives in Africa and LMICs
- Clinical & Molecular epidemiology of vaccine-preventable diseases
- Vaccine development & assessment
- Immunology of vaccines
- Basic Science research



About CHAMPS



What We Stand For

The CHAMPS Promise

CHAMPS transforms data into action, working at the local, national and global levels to ensure sustainable changes in policies, systems, and health interventions to accelerate improvements in child health.



Reducing Child Mortality

Our data catalyzes evidence-driven interventions that can save the lives of millions of children.



Building Local Capacity

CHAMPS works with communities, ministries of health and national public health institutes to strengthen local health and science capacity.



Data to Action

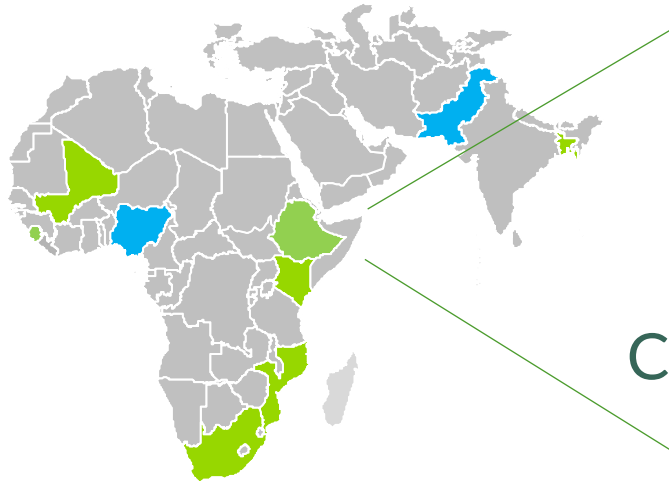
CHAMPS transforms data into action, working with partners to use our findings to inform interventions that address under-five mortality.



Data Sharing

Our open-access data sharing and diverse, multi-sectoral partnerships drive evidence-based interventions.

CHAMPS engages communities, identifies and examines deaths, then feeds back results to families and communities



Where we work

Cause of Death Determination



Community Engagement



Surveillance



Case Enrollment



How Do We Produce High Quality Data?

1. Data collection

- Deaths identified within 72 hours
- Parents provide consent
- Family interviews--“Verbal Autopsy”
- Clinical Records Review

2. Examination

- Photographs
- Physical Measurements
- Specimen collection--“MITS”



Blood



Spinal Fluid



Oral/Nasal Swab



Stool



Liver



Lung



Brain



Placenta




3. Laboratory testing

- Culture for bacteria
- Rapid tests for HIV, TB, Malaria
- Molecular (PCR) tests for infectious organisms
- Pathology examination of tissues

Cause of Death
Determination
(DeCoDe)

CHAMPS Insights

Coding Causal Pathway to Death - WHO

| Administrative Data (can be further specified by country) | | | | | | | | | | | | | | | | | | | |
|---|--|---------------------------------|----------------|-----------------------------------|---|-------------------------------|---|---|---|----------------------------------|--|---|---|---|---|---|---|---|---|
| Sex | | <input type="checkbox"/> Female | | | | <input type="checkbox"/> Male | | | | <input type="checkbox"/> Unknown | | | | | | | | | |
| Date of birth | | D | D | M | M | Y | Y | Y | Y | Date of death | | D | D | M | M | Y | Y | Y | Y |
| Frame A: Medical data: Part 1 and 2 | | | | | | | | | | | | | | | | | | | |
| 1 Report disease or condition directly leading to death on line a Report chain of events in due to order (if applicable) State the underlying cause on the lowest used line |    | | Cause of death | Time interval from onset to death | | | | | | | | | | | | | | | |
| | | a | | | | | | | | | | | | | | | | | |
| | | b | Due to: | | | | | | | | | | | | | | | | |
| | | c | Due to: | | | | | | | | | | | | | | | | |
| | | d | Due to: | | | | | | | | | | | | | | | | |
| 2 Other significant conditions contributing to death (time intervals can be included in brackets after the condition) | | | | | | | | | | | | | | | | | | | |

CHAMPS

Empowers People and Organizations to Act

CHAMPS data

Families

- Understand why their child died -- closure
- Apply knowledge to improve health of other or future children
- Understand causes of death in their communities

Community

- Learn about topics such as proper nutrition, prenatal care, danger signs
- Make changes in prenatal care practices
- Create or improve services such as emergency transportation

Health facilities

- Clinical staff understand what went wrong with their patients
- Hospital leaders review and improve clinical practices to improve outcomes
- Stronger pathology services

National Public Health Agencies

- Revise health policies
- Engage CHAMPS infrastructure in emergency response
- Launch specific actions, e.g.
 - ✓ Emergency Feeding Programs (Sierra Leone)
 - ✓ Aspirin to combat pre-eclampsia (South Africa)
 - ✓ Fortified salt for neural tube defects (Ethiopia)

Global Institutions

- Revise program priorities, e.g. responding to undiagnosed child deaths from HIV
- Vaccine development in response to new data on high burden of drug-resistant bacteria e.g. *Klebsiella*
- Improve accuracy of models for disease burden estimates



CHAMPS

Building
Knowledge.
Saving
Children's
Lives.

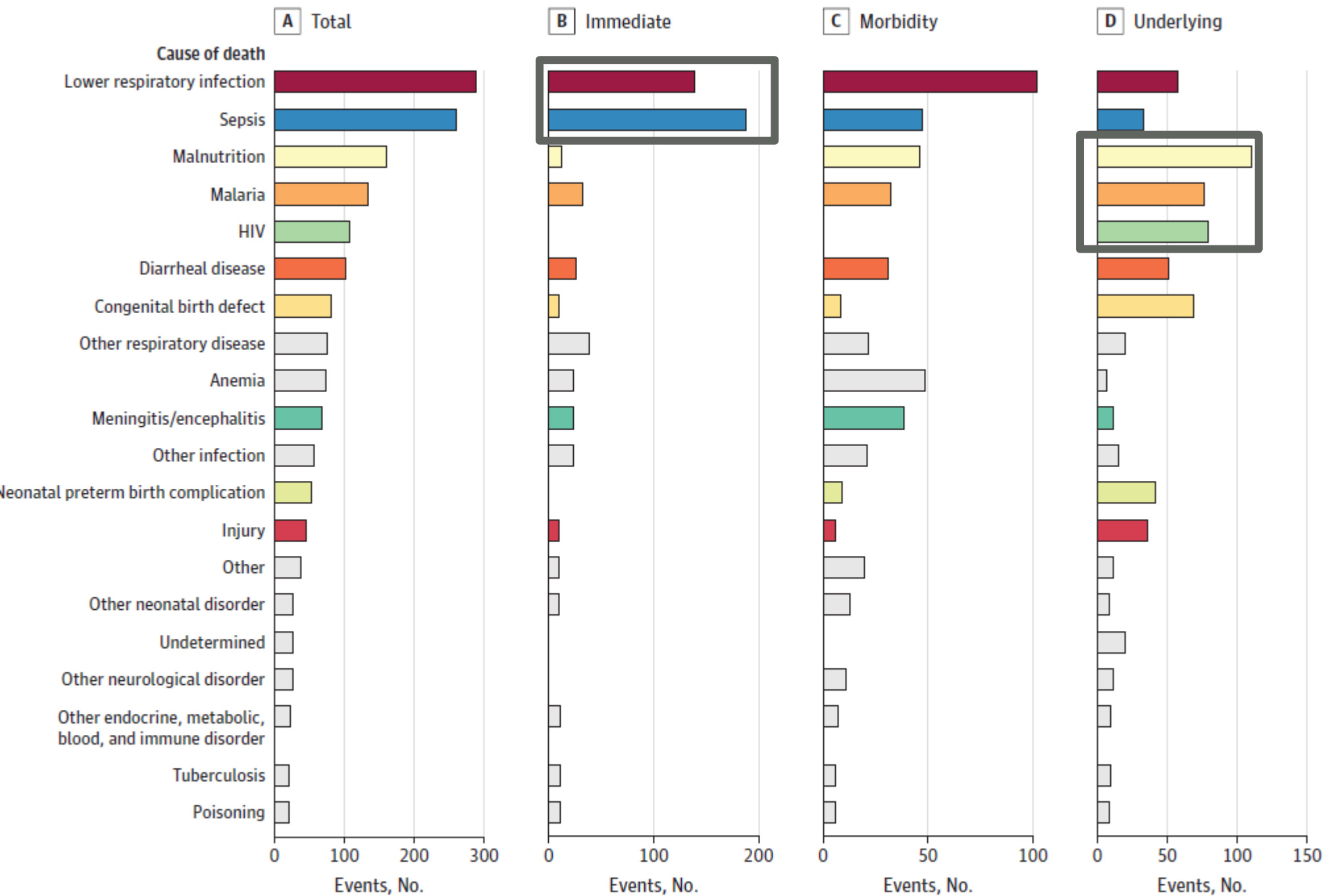
Cross Network Data

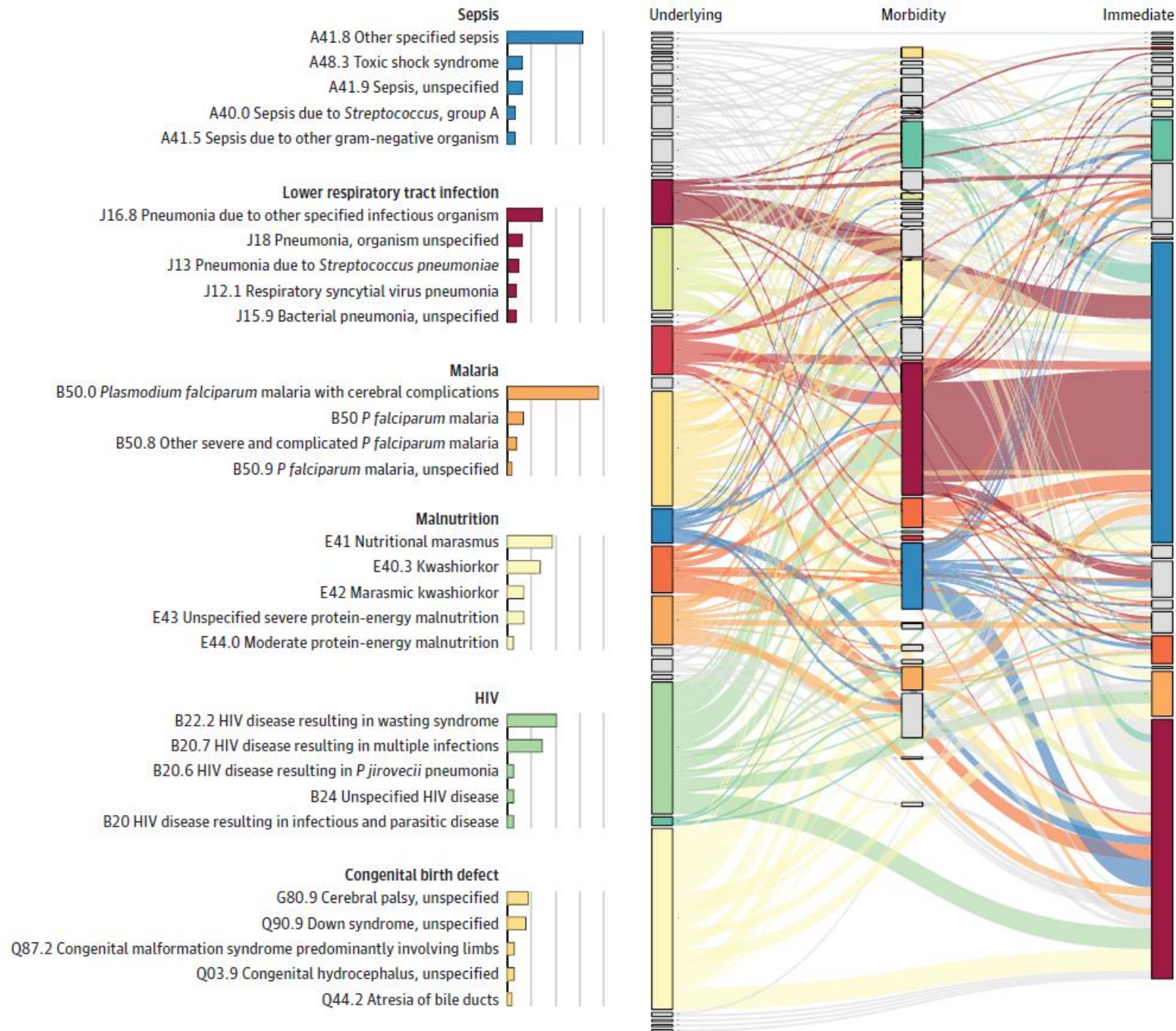


WITS VIDA

UNIVERSITY OF THE WITWATERSRAND
VACCINES & INFECTIOUS DISEASES ANALYTICS

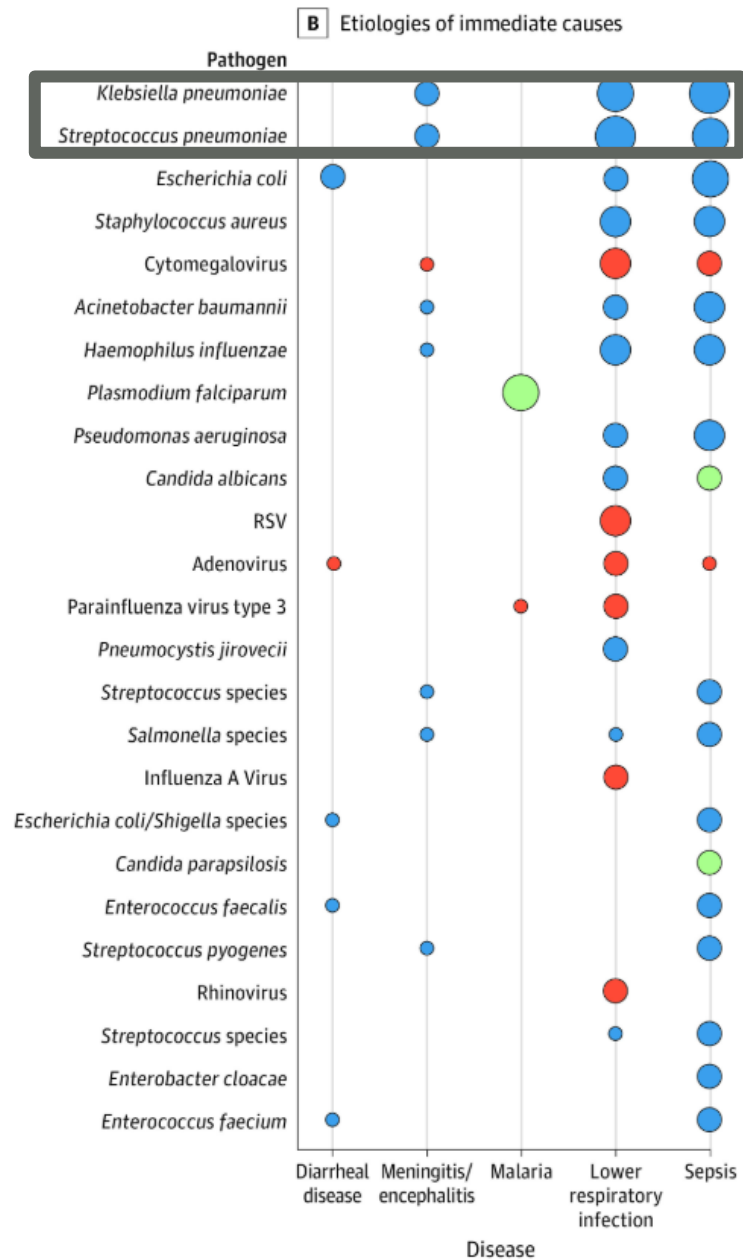
wits-vida.org



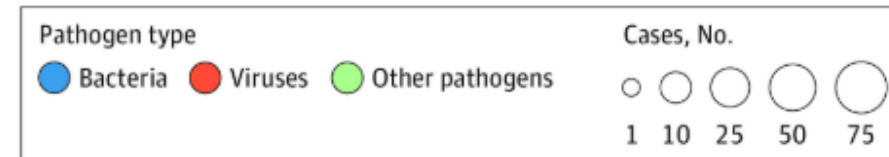


Causes of Death Among Infants and Children in the Child Health and Mortality Prevention Surveillance (CHAMPS) Network

Quique Bassat, MD, PhD, MSc; Dianna M. Blau, DVM, PhD; Ikechukwu Udo Ogburn, PhD, MPH; Solomon Samura, BSc; Erick Kaluma, MPH; Ima-Abasi Bassey, MBBCh; Samba Sow, MD; Adama Mamby Keita, MD; Milagritos D. Tapia, MD; Ashika Mehta, MPH; Karen L. Kotloff, MD; Afruna Rahman, MBBS; Kazi Munisul Islam, MPH; Muntasir Alam, PhD; Shams El Arifeen, DPhil, MBBS, MPH; Emily S. Gurley, PhD, MPH; Vicky Ballie, PhD, MSc; Porsha Mutevedzi, PhD, MSc; Sana Muhtab, MD, PhD; Bukire Nana Thwala, MPH; Beth A. Tippet Barr, DPhil; Dickens Onyango, MD; Victor Alele, MD; Emily Røgen, PhD; Peter Onyango, MA; Richard Omoro, PhD, MSc; Inacio Mandomando, PhD; Sara Aljanovic, MD, MSc; Rosaura Varo, MD, MSc; Antonio Siteo, MD; Miquel Duran-Frigola, PhD, MSc; Nega Assefa, PhD; J. Anthony G. Scott, MSc; Lola Madrid, PhD, MSc; Tseyon Tesfaye, MPH; Yadeta Dessie, PhD; Zachary J. Madewell, PhD, MPH; Robert F. Breiman, MD; Cynthia G. Whitney, MD, MPH; Shabir A. Madhi, MBBCh, MMEd, PhD; for the Child Health and Mortality Prevention Surveillance (CHAMPS) Network



Relative contribution of different pathogens to the most common syndromes



JAMA Network | Open



Original Investigation | Pediatrics

Causes of Death Among Infants and Children in the Child Health and Mortality Prevention Surveillance (CHAMPS) Network

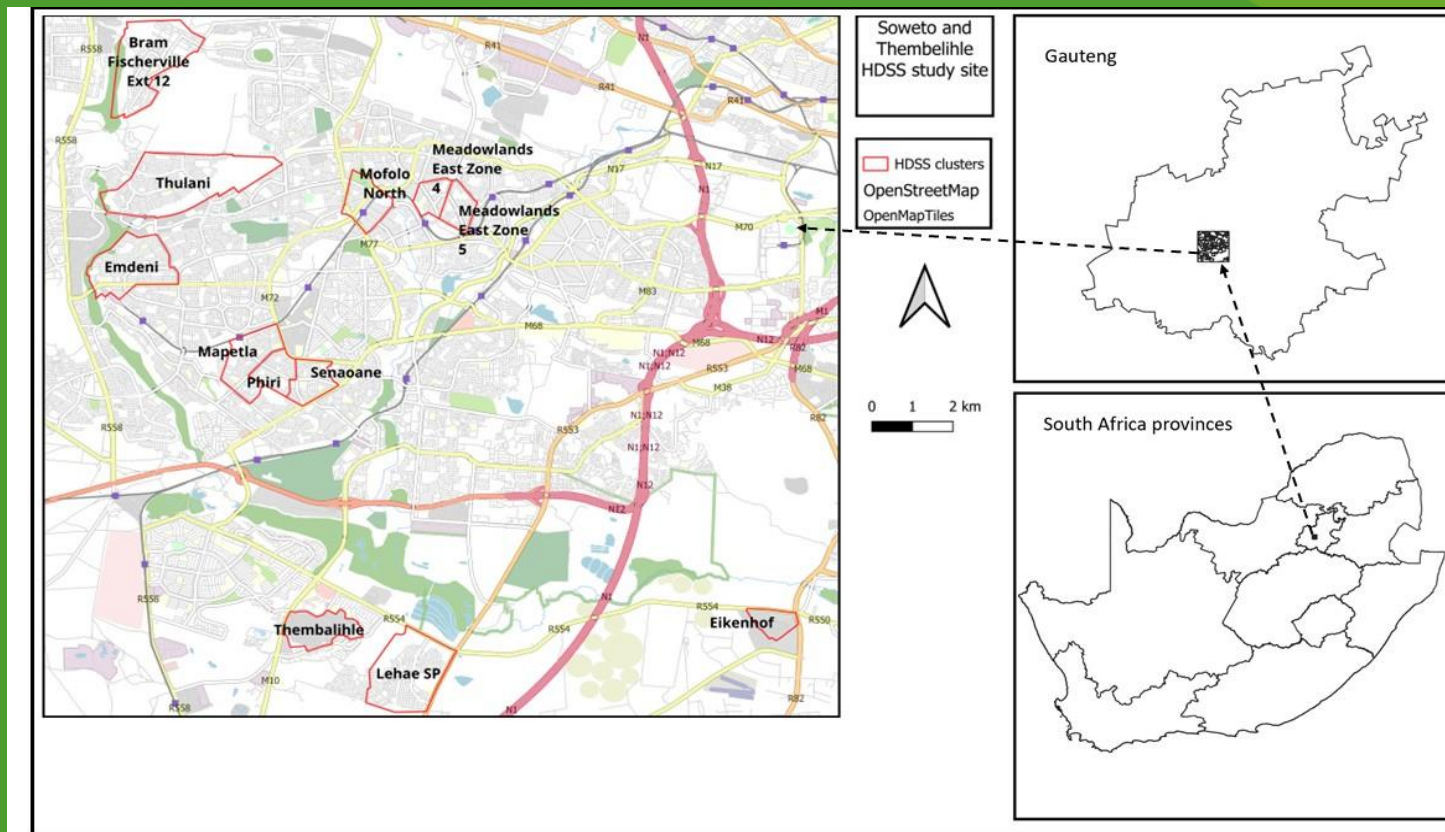
Quique Bassat, MD, PhD, MSc; Dianna M. Blau, DVM, PhD; Ikechukwu Udo Ogburnu, PhD, MPH; Solomon Samura, BSc; Erick Kaluma, MPH; Ima-Abasi Bassey, MBBCh; Samba Sow, MD; Adama Mamy Ketta, MD; Milagritos D. Tapia, MD; Ashika Mehta, MPH; Karen L. Kotloff, MD; Afruna Rahman, MBBS; Kazi Munisul Islam, MPH; Muntasir Alam, PhD; Shams El Arifeen, DrPH, MBBS, MPH; Emily S. Gurley, PhD, MPH; Vicky Baillie, PhD, MSc; Portia Mutevedzi, PhD, MSc; Sana Mahtab, MD, PhD; Bukwe Nana Thwala, MPH; Beth A. Tippet Barr, DrPH; Dickens Onyango, MD; Victor Akelo, MD; Emily Rogena, PhD; Peter Onyango, MA; Richard Omoro, PhD, MSc; Inacio Mandomando, PhD; Sara Ajanovic, MD, MSc; Rosauo Varo, MD, MSc; Antonio Siteo, MD; Miquel Duran-Frigola, PhD, MSc; Nega Assefa, PhD; J. Anthony G. Scott, MSc; Lola Madrid, PhD, MD, MSc; Tseyon Tesfaye, MPH; Yadeta Dessie, PhD; Zachary J. Madewell, PhD, MPH; Robert F. Breiman, MD; Cynthia G. Whitney, MD, MPH; Shabir A. Madhi, MBBCh, MMed, PhD; for the Child Health and Mortality Prevention Surveillance (CHAMPS) Network



CHAMPS

Building
Knowledge.
Saving
Children's
Lives.

South African Findings – Soweto

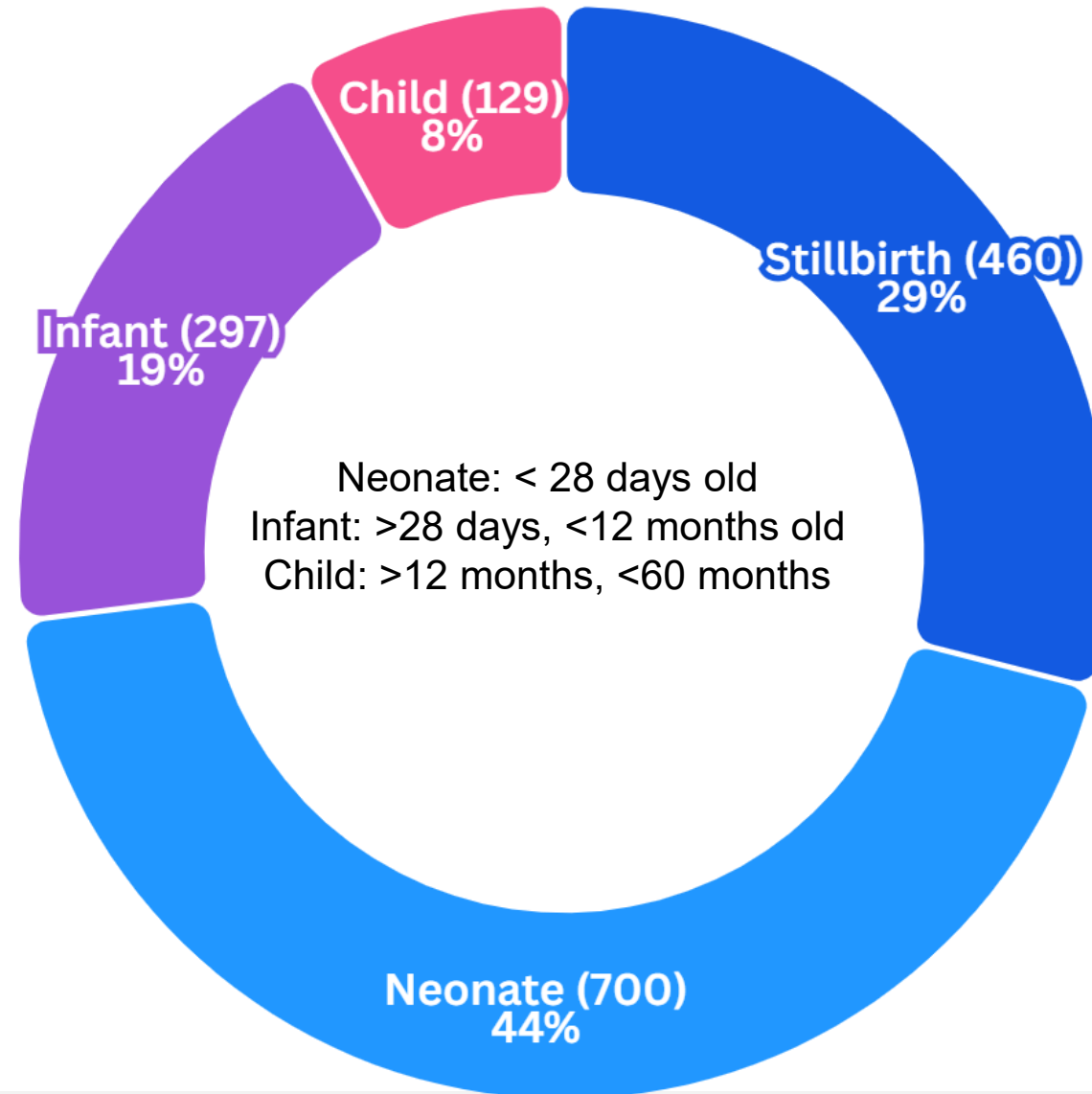


WITS VIDA

UNIVERSITY OF THE WITWATERSRAND
VACCINES & INFECTIOUS DISEASES ANALYTICS

wits-vida.org

Age Distribution of Cases Enrolled





CHAMPS

**Building
Knowledge.
Saving
Children's
Lives.**

Stillbirths

Underlying Cause of Death in Stillbirths (%)

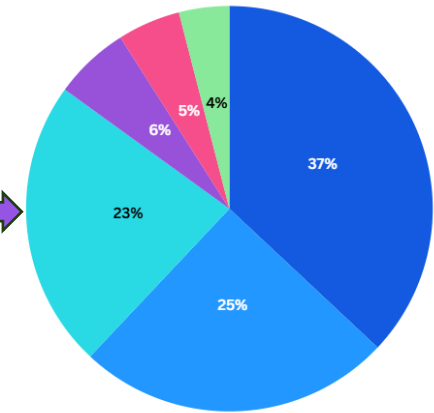
Intrauterine hypoxia/asphyxia
61,9

Congenital infection
28,7

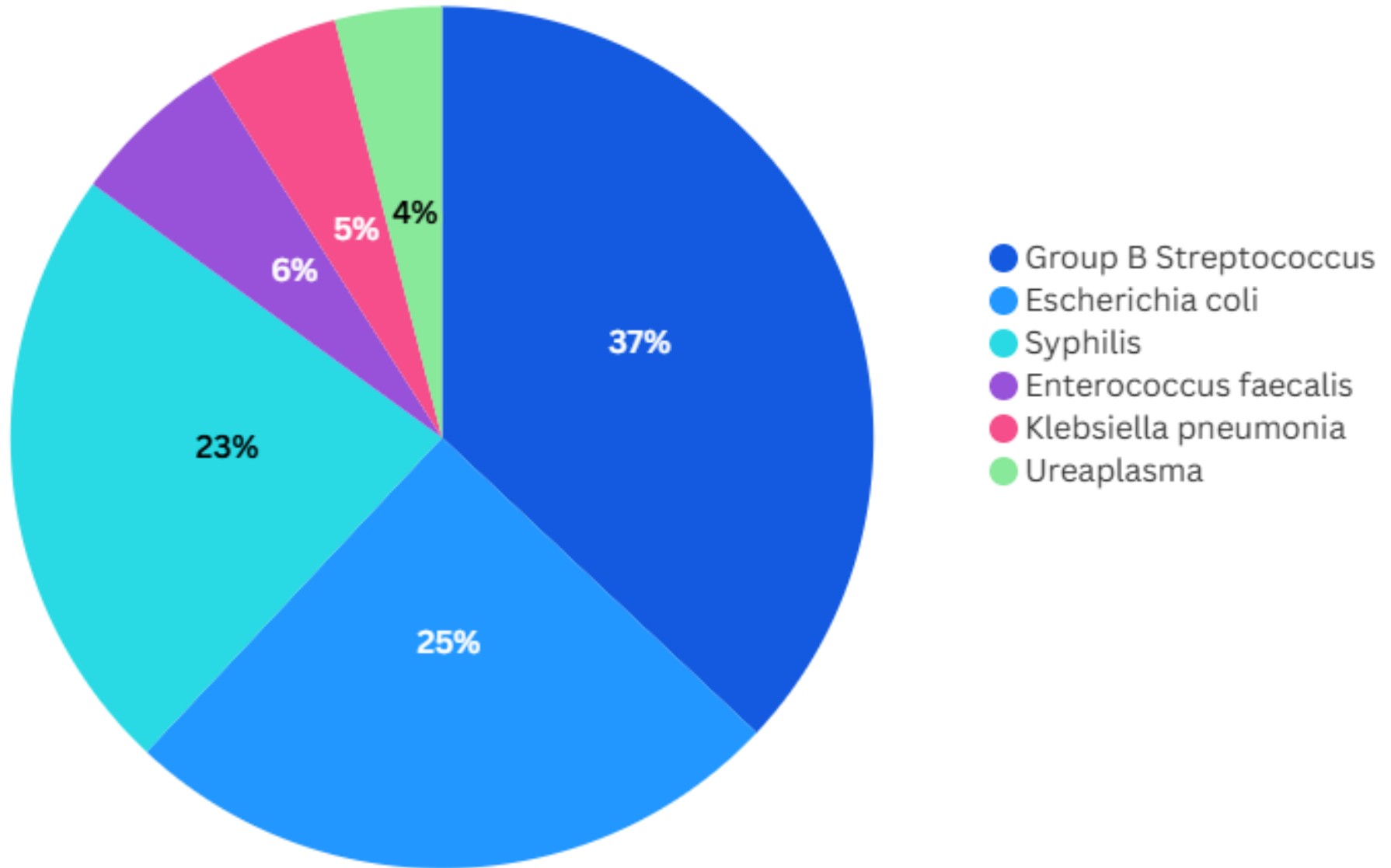
Congenital malformations,
deformations and
chromosomal
abnormalities
4,8

Undetermined
4,3

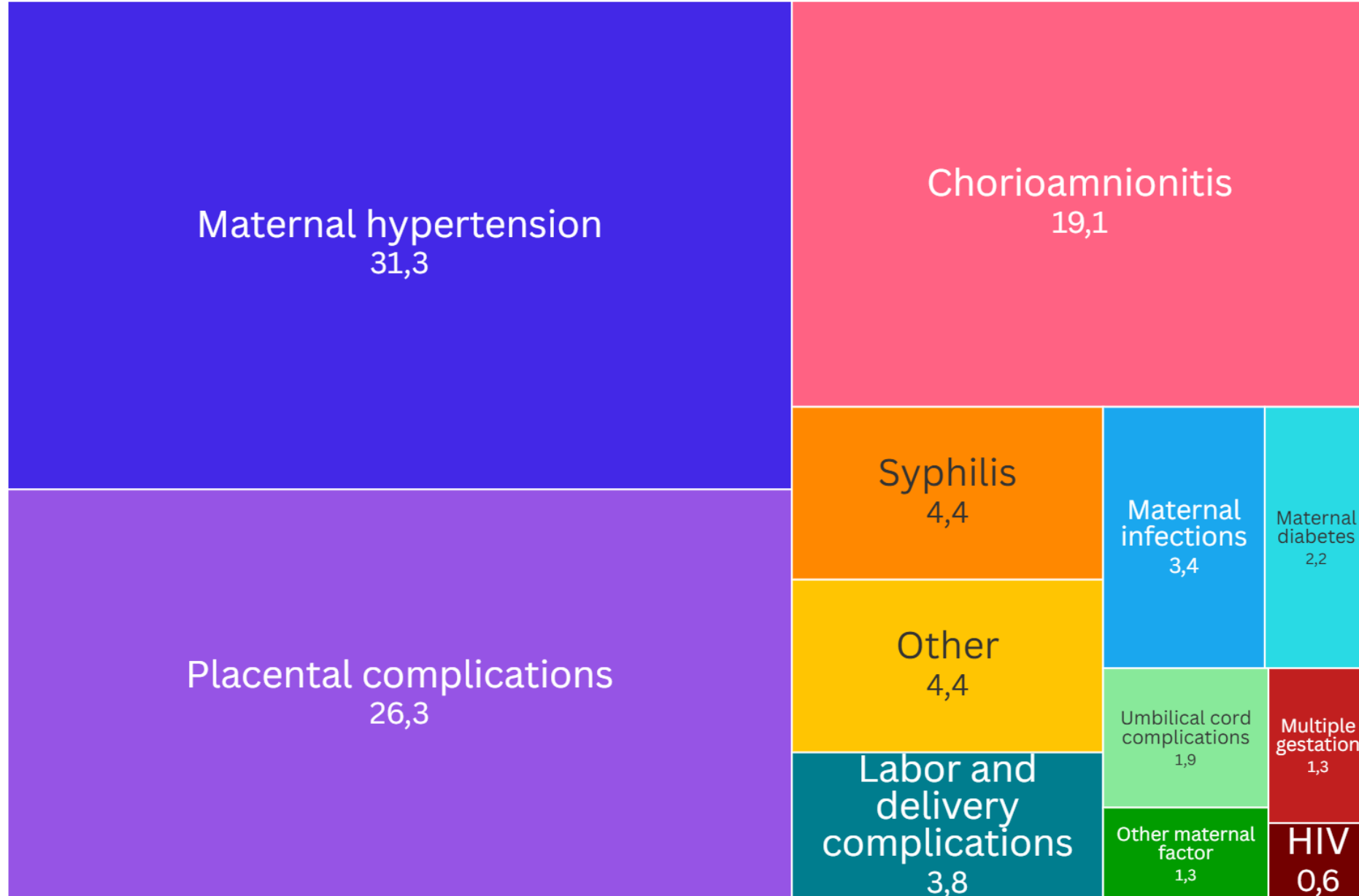
Other 0,3



Congenital Infection Organisms in Stillbirths



Main Maternal Cause of Death in Stillbirths (%)



Preventability - Stillbirths (%)

IMPROVED ANC AND OBSTETRIC CARE AND MANAGEMENT



IMPROVED HEALTH-SEEKING BEHAVIOR



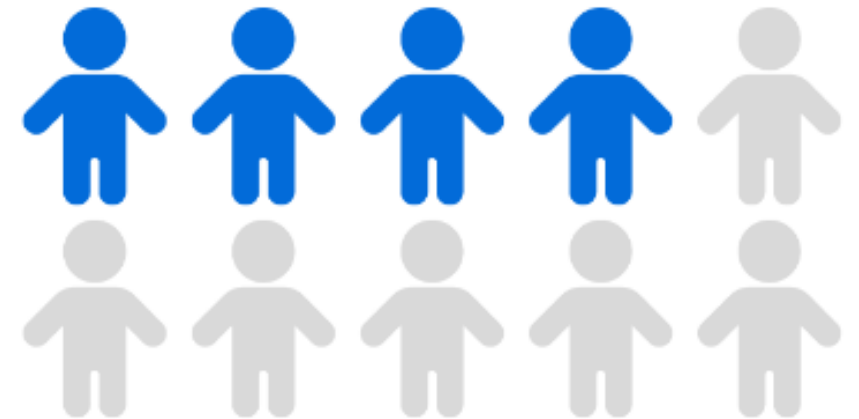
IMPROVED HEALTH EDUCATION



IMPROVED PRECONCEPTION COUNSELING AND FAMILY PLANNING



IMPROVED CLINICAL MANAGEMENT AND QUALITY OF CARE



*More than 1 preventability recommendation can be given per case

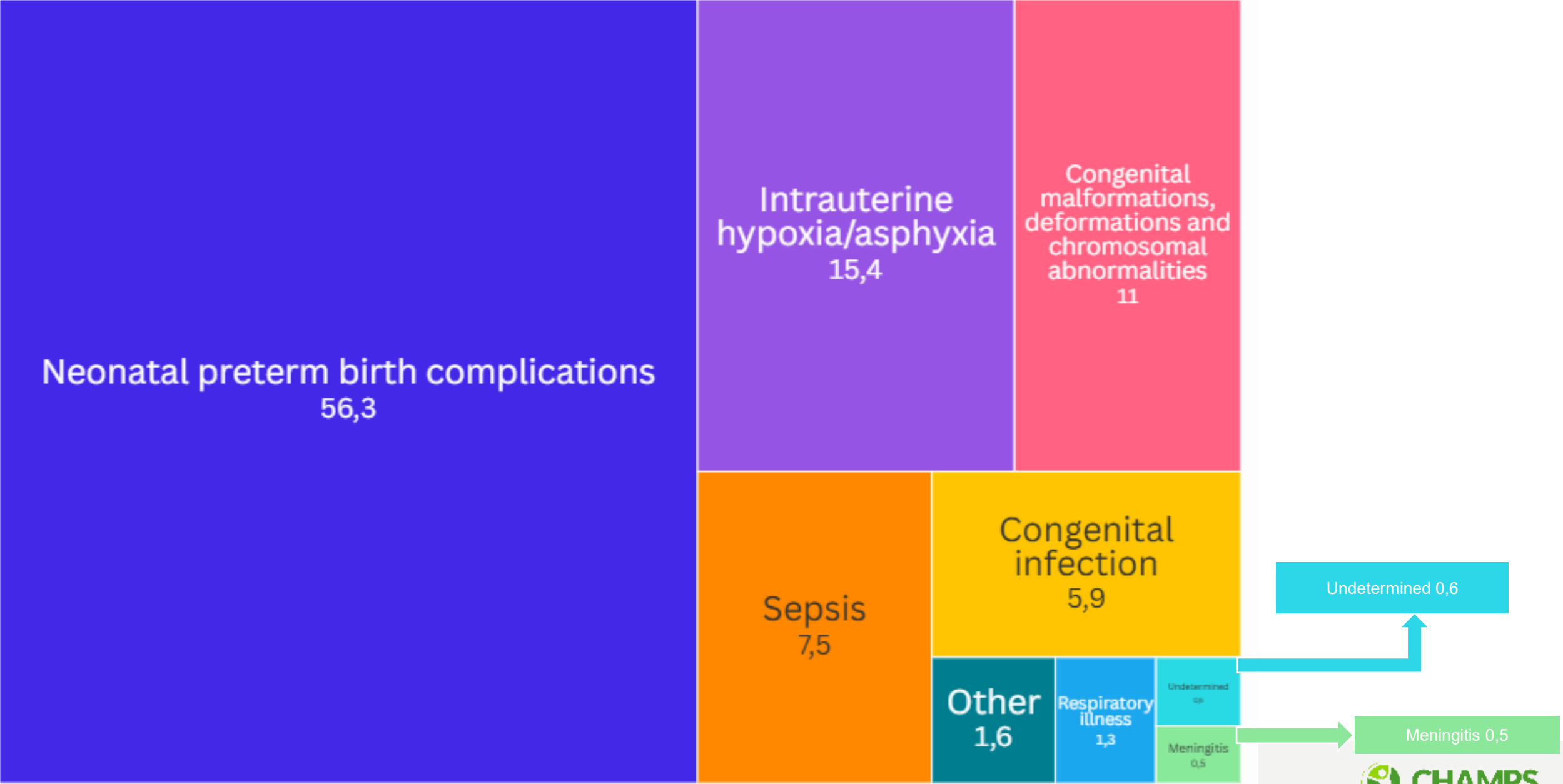


CHAMPS

**Building
Knowledge.
Saving
Children's
Lives.**

Neonates

Underlying Cause of Death in Neonates - %



Immediate Cause of Death in Neonates (%)

Sepsis
52,4

Neonatal preterm birth
complications
33,6

Respiratory illness
8,6

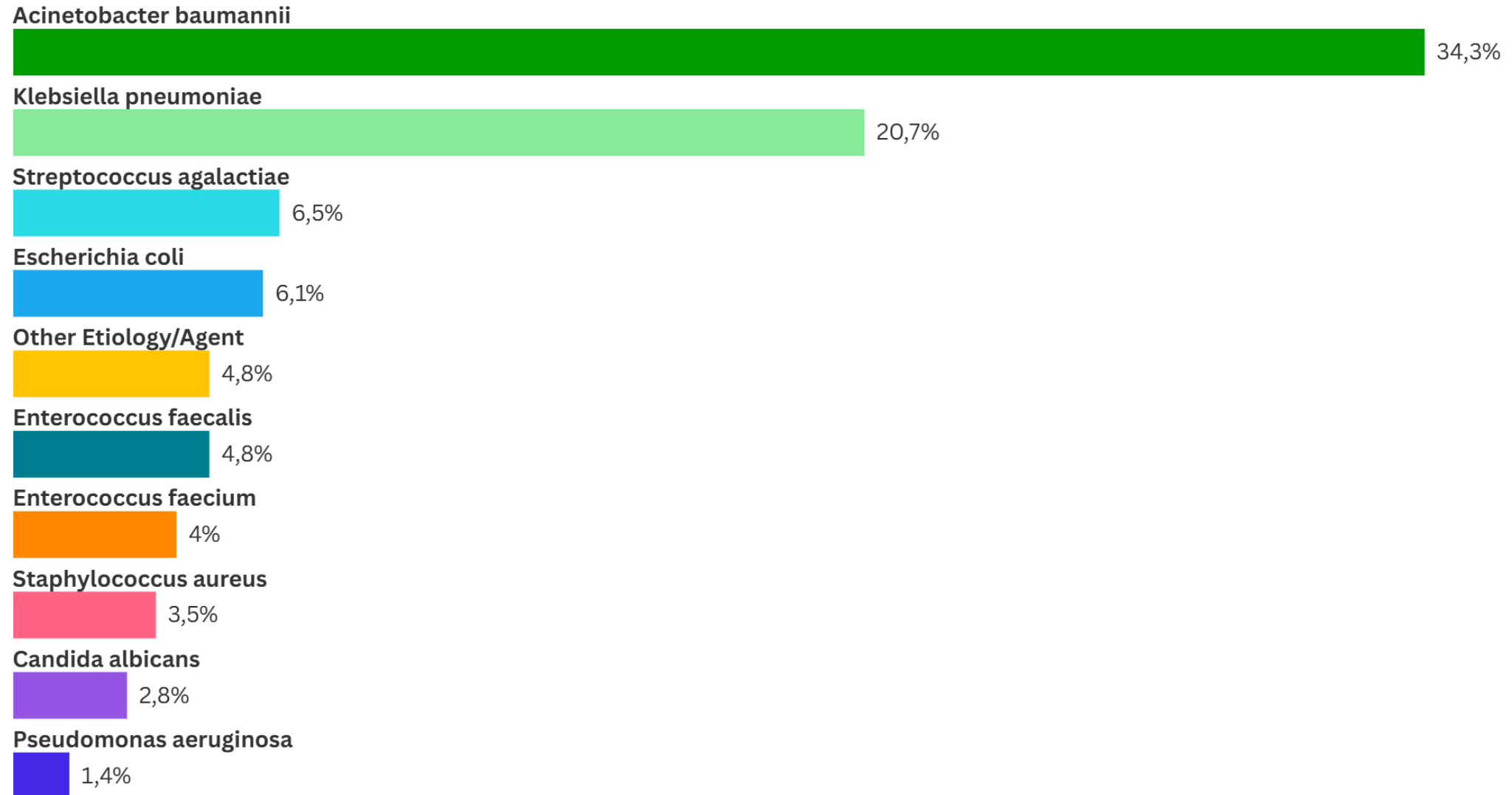
Meningitis
3,3

Other
1,8

Congenital malformations,
deformations and chromosomal
abnormalities
0,2

Top 10 Organisms in the Causal Pathway to Death (Neonates)

Data is presented as proportion of total organisms (%)



Preventability – Neonates (%)

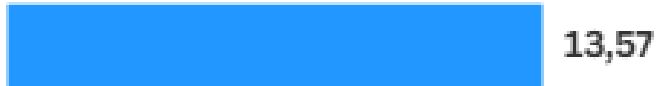
IMPROVED INFECTION PREVENTION AND CONTROL



IMPROVED ANC AND OBSTETRIC CARE AND MANAGEMENT



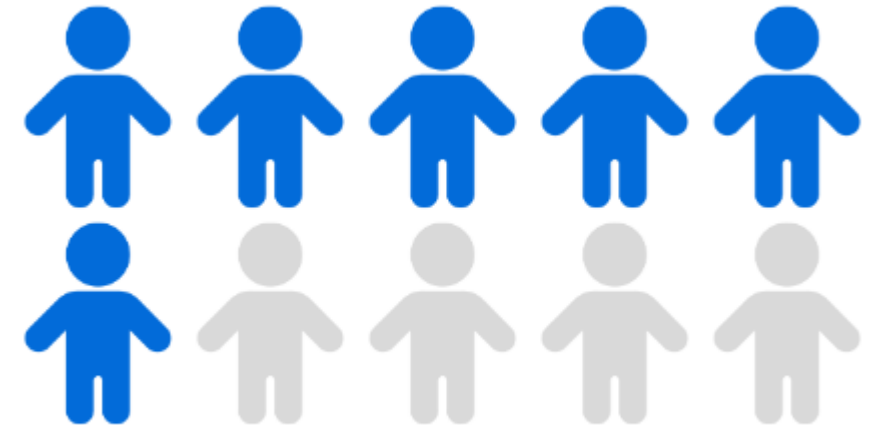
IMPROVED HEALTH-SEEKING BEHAVIOR



IMPROVED HEALTH EDUCATION



IMPROVED PRECONCEPTION COUNSELING AND FAMILY PLANNING



*More than 1 preventability recommendation can be given per case

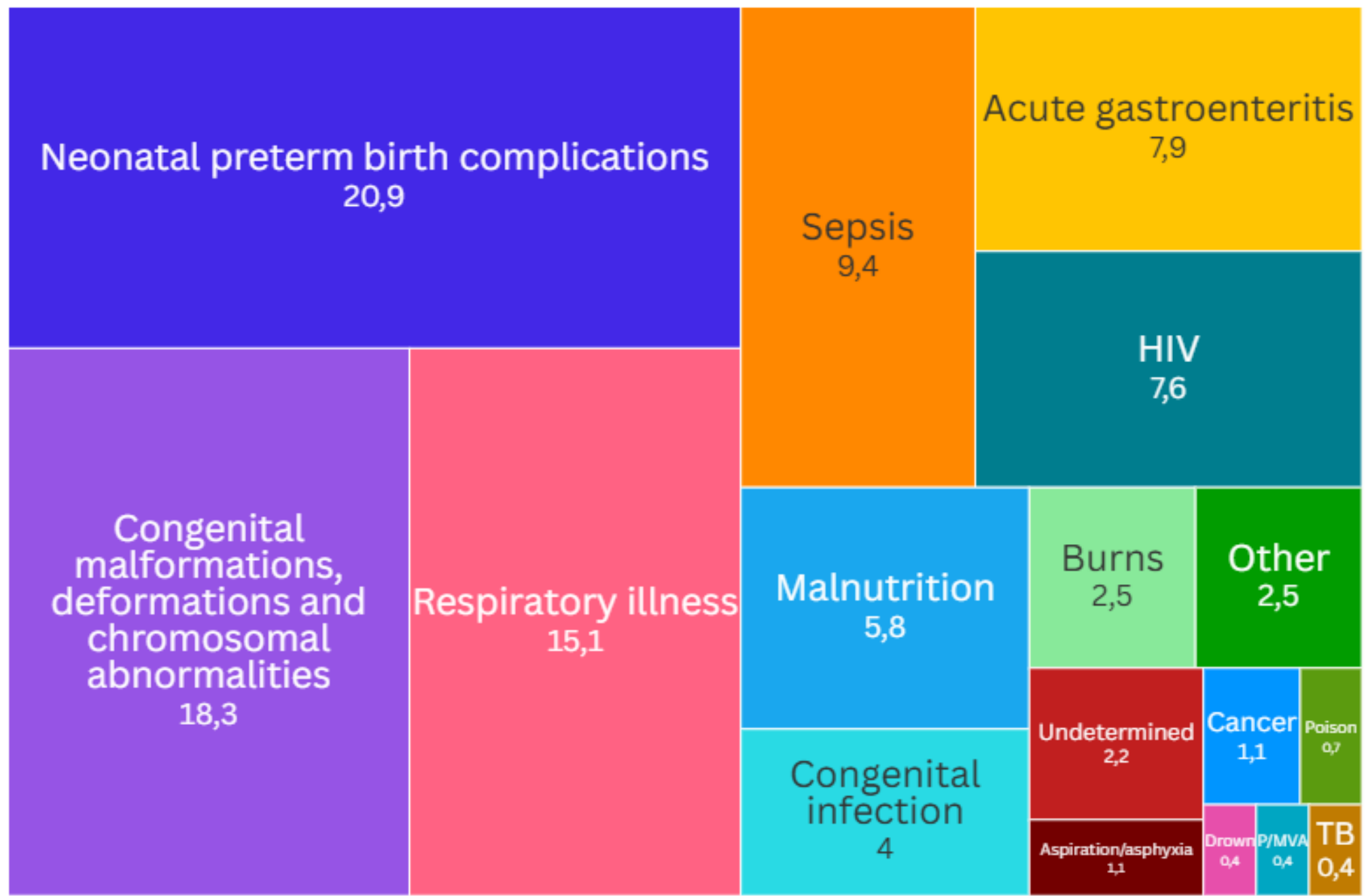


CHAMPS

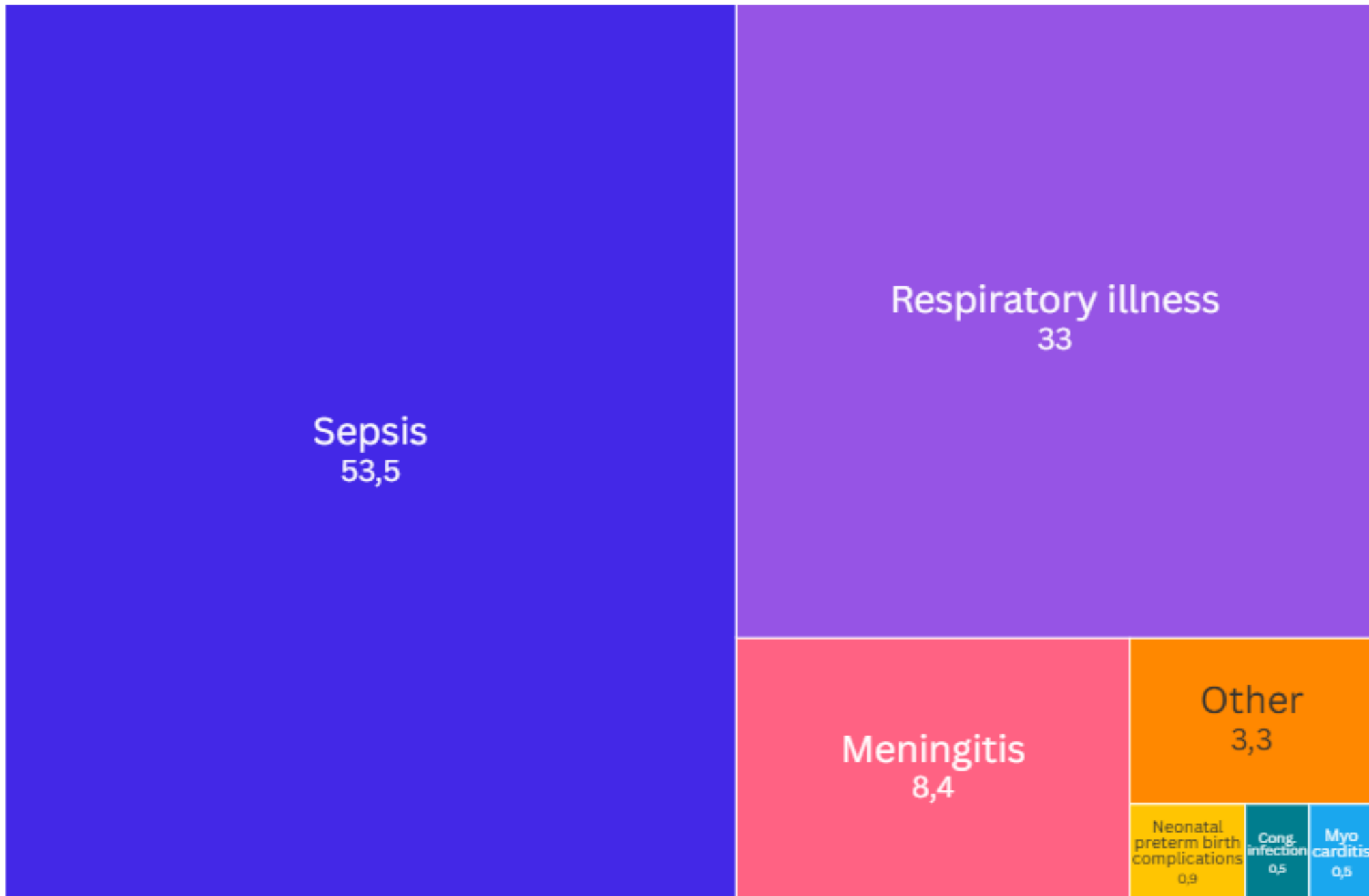
**Building
Knowledge.
Saving
Children's
Lives.**

**Infants (28 days to
<12 months)**

Underlying Cause of Death in Infants (28 days to <12 months) - %

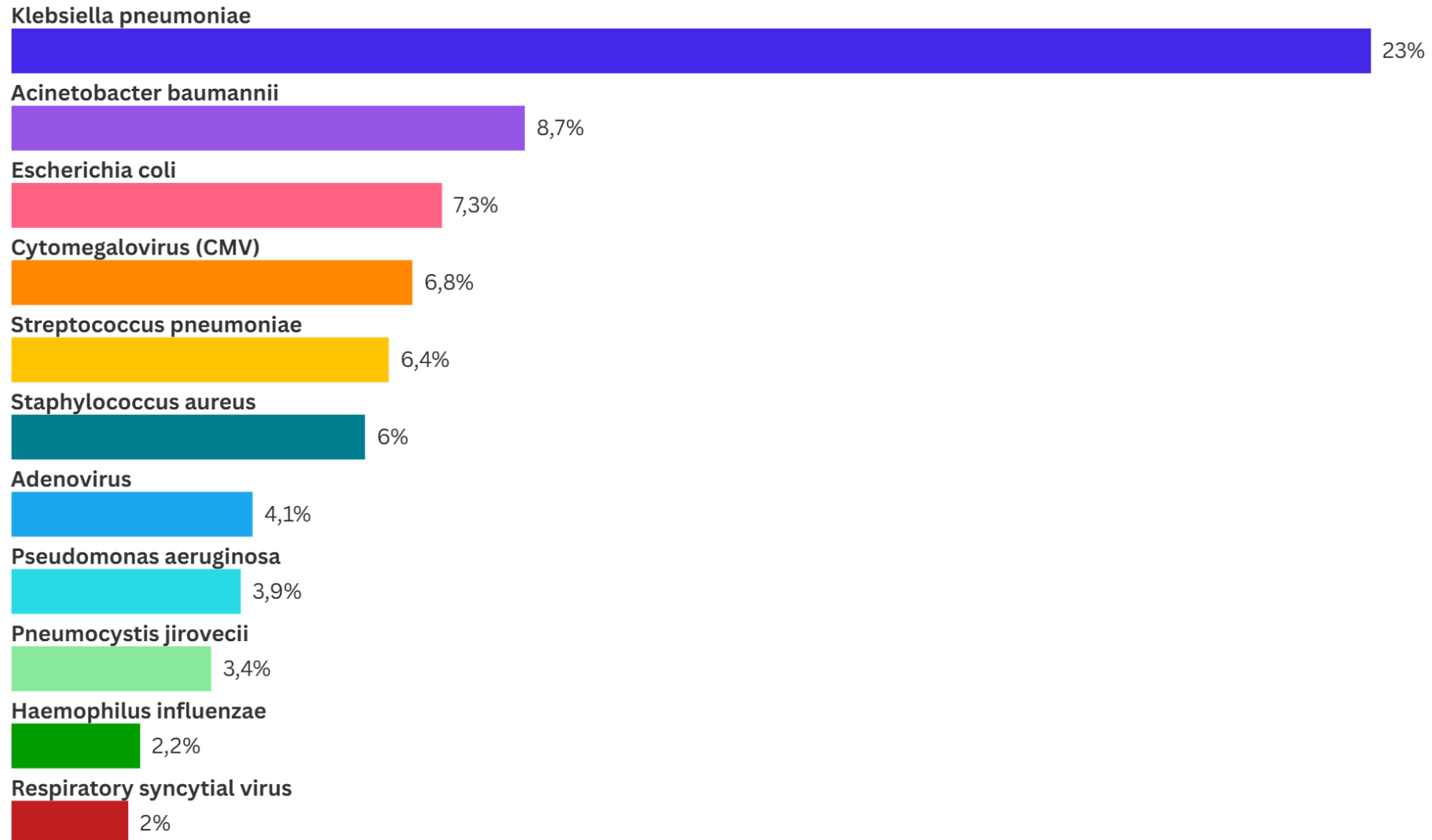


Immediate Cause of Death in Infants (28 days to <12 months) - %



Top 10 Organisms in the Causal Pathway to Death (Infants)

Data is presented as proportion of total organisms (%)



Preventability – Infants (%)

IMPROVED INFECTION PREVENTION AND CONTROL



IMPROVED HEALTH-SEEKING BEHAVIOR



IMPROVED HEALTH EDUCATION



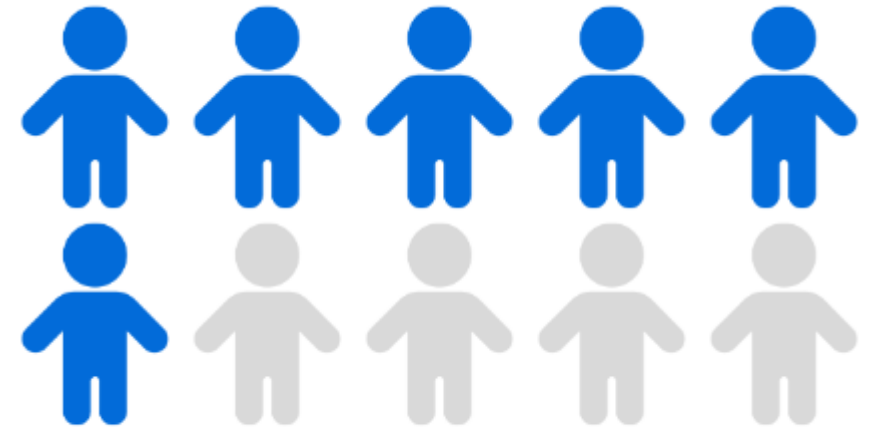
IMPROVED HIV PREVENTION AND CONTROL



IMPROVED PEDIATRIC CLINICAL MANAGEMENT AND QUALITY OF CARE



IMPROVED NUTRITIONAL SUPPORT



*More than 1 preventability recommendation can be given per case

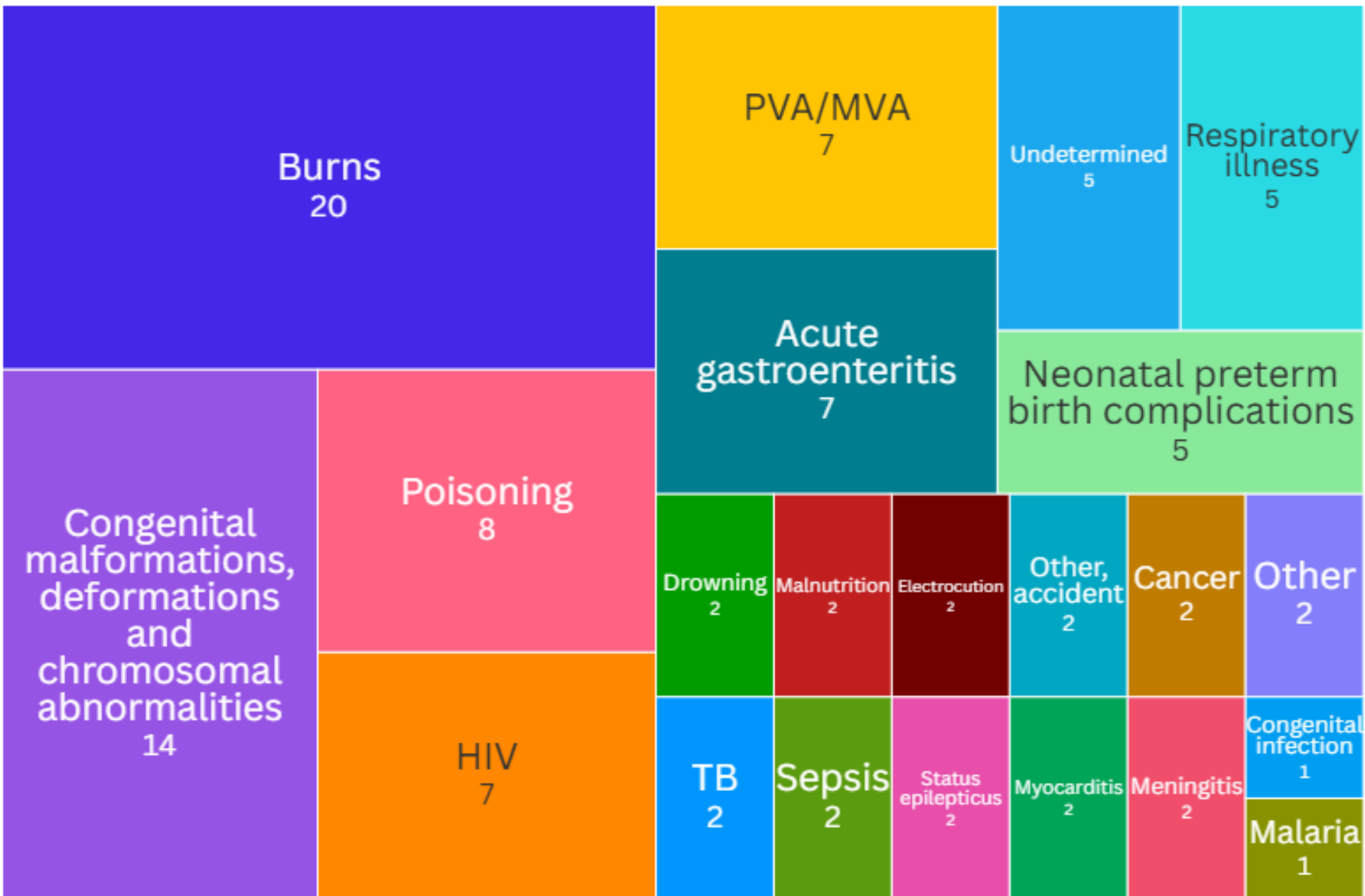


CHAMPS

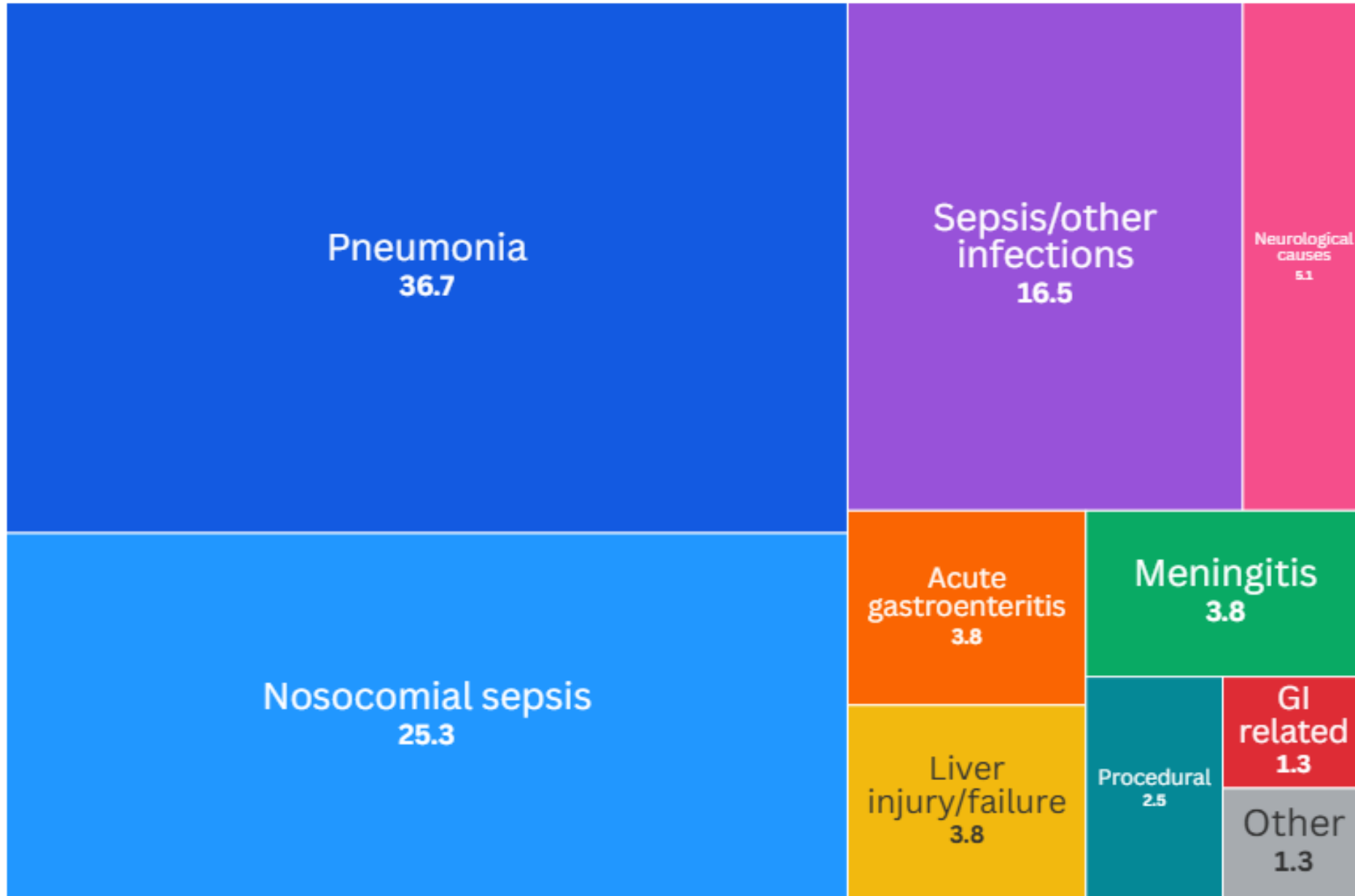
**Building
Knowledge.
Saving
Children's
Lives.**

Paeds (12 – 59 months)

Underlying Cause of Death in Children (12 to 59 months) - %



Immediate Cause of Death in Children (12 to 59 months) - %



Preventability - Children 12-59 months (%)

IMPROVED HEALTH EDUCATION



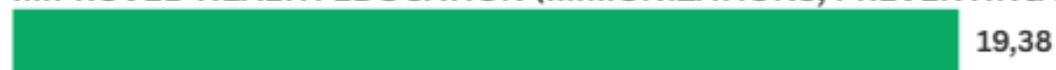
OTHER RECOMMENDATION



IMPROVED INFECTION PREVENTION AND CONTROL



IMPROVED HEALTH EDUCATION (IMMUNIZATIONS, PREVENTING MALNUTRITION, DIARRHEA, BUR...)



IMPROVED HIV PREVENTION AND CONTROL



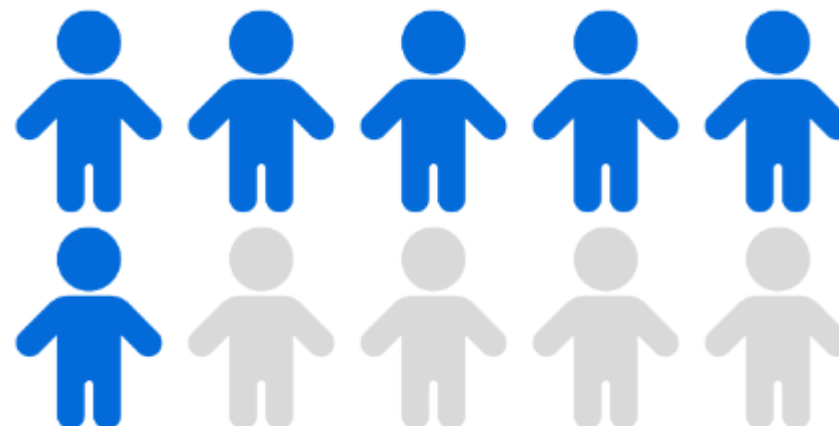
IMPROVED PEDIATRIC CLINICAL MANAGEMENT AND QUALITY OF CARE



IMPROVED NUTRITIONAL SUPPORT



IMPROVED HEALTH-SEEKING BEHAVIOR



*More than 1 preventability recommendation can be given per case

Raising Awareness of Safety Risks in Paediatric and Newborn Care

- **High burden of preventable deaths (~60%)**
- **Leading causes of death:**
 - Stillbirths linked to maternal hypertension and placental issues
 - Neonatal deaths driven by preterm complications and AMR infections
 - Child and infant deaths from respiratory infections, sepsis, and injuries (burns, accidents and poisoning)
- **System gaps:**
 - Improvements in infection control
 - Limited maternal data hinder prevention efforts



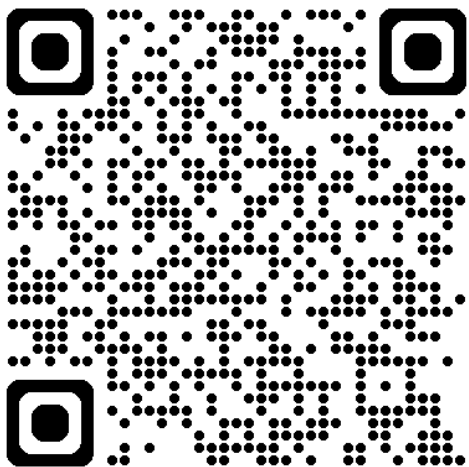
Mobilize Stakeholders for Safer Newborn & Child Care

Empowering Families in Patient Safety

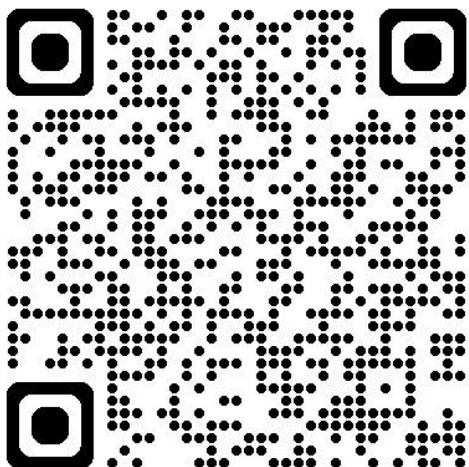
- **Community Engagement:**
 - CAB, information sharing
 - Qualitative research
- **Strengthening the use of the Road-to-Health Booklet (RTHB)**
- **Family-Centered Care**
- **Creating Safer Home Environments**
- **Tailored Support & Education**

Strengthening Research in Paediatric & Newborn Patient Safety

- **Innovative Methods:**
 - MITS, advanced diagnostics, WGS studies target AMR pathogens.
- **AI & Data Innovation:**
 - Tools for cause-of-death prediction, pathology interpretation, and real-time dashboards to enhance efficiency.
- **Surveillance Platforms:**
 - HDSS and pregnancy surveillance platforms track maternal and child health; Social behavioral sciences team ensures culturally relevant insights.
- **Implementation Science:**
 - Research to inform interventions (designed in collaboration with communities and stakeholders)
 - Areas of focus include premature care, RTHB enhancement, and family care packages.



Scan for local underlying cause of death
data shared in this presentation



Scan to see more data on the CHAMPS
website (or view:
<https://champshealth.org/data/>)



CHAMPS

Building Knowledge.
Saving Children's Lives.

> **Thank you**



WITS VIDA

UNIVERSITY OF THE WITWATERSRAND
VACCINES & INFECTIOUS DISEASES ANALYTICS