

FIRST BREATH: The Global Network's Trial of Two Methods of Resuscitation



Linda L. Wright, MD
Deputy Director, CRMC
Director, Global Network for Women's & Children's Health
NICHD, NIH, DHHS
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NIH and Gates Foundation

Unique private-public sector collaboration to build maternal and child health capacity in the developing world through research partnerships

Jointly established the Global Network for Women's and Children's Health Research in 2001 after applications rated by competitive peer review

10 Research Units
1 Data Center (RTI)
NIH scientific staff

Global Network Goals

- To address important perinatal public health problems to improve the outcome of mothers and children in the developing world
- To build sustainable public health and research infrastructures
- To build scientific capacity
- To provide multidisciplinary, multi-level training opportunities

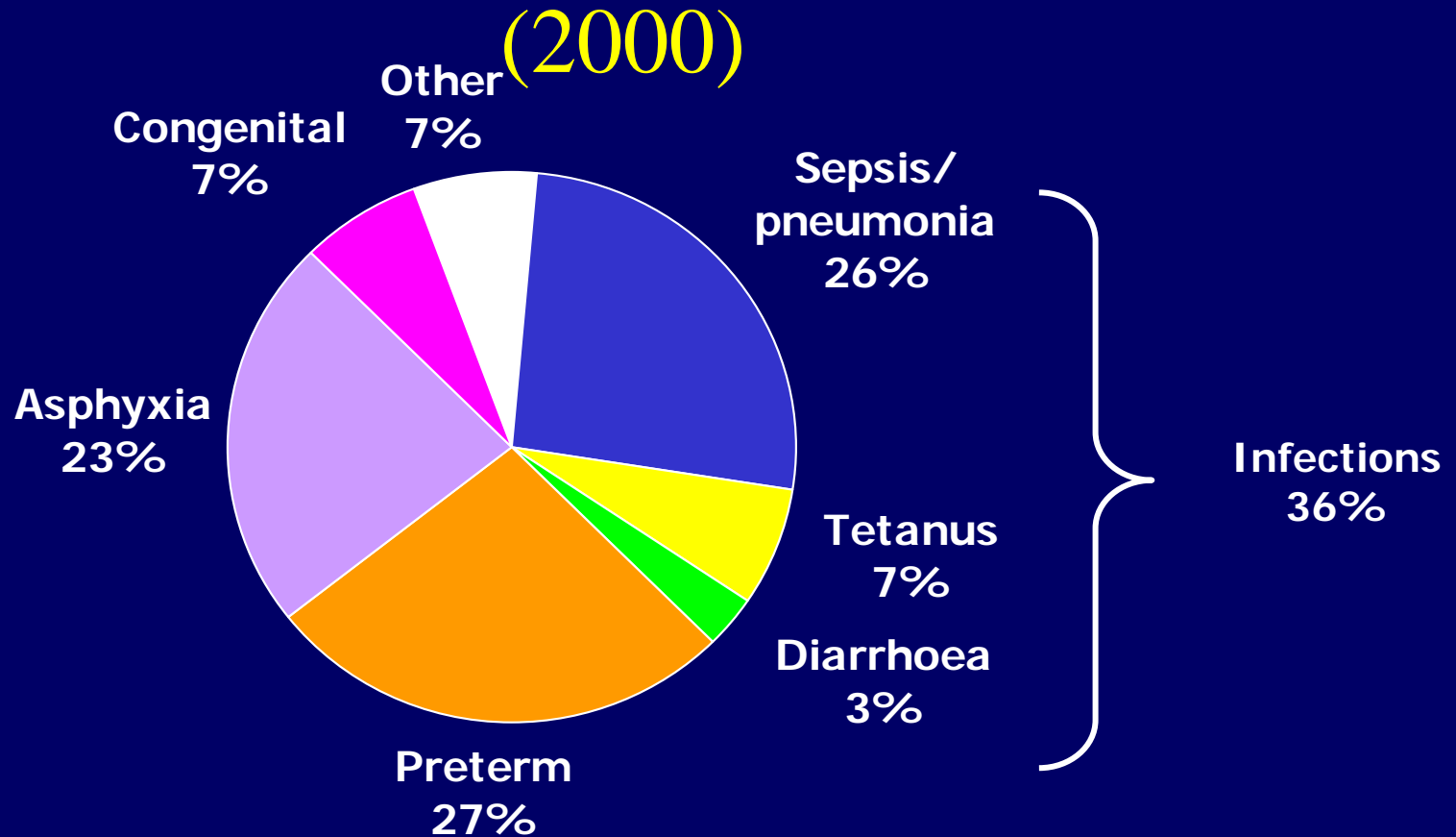
Global Network Structure

- Multi-disciplinary research units led by a US Principal Investigator and a Senior Foreign Investigator
- A Data Coordinating Center to provide research support services
- A senior NICHD trialist to provide oversight with staff scientists assigned to individual projects to provide logistical support
- A Data Monitoring Committee and Advisory Group to provide oversight

Where is the Global Network?



Causes of Neonatal Deaths Worldwide



Lawn et al. The Lancet 2005.

Scope of the Larger Problem

Asphyxia is the most frequent cause of early death worldwide (23% of neonatal mortality):

- 4 million neonatal deaths and 3.8 million intrapartum stillbirths occur annually
- 99% of asphyxia occurs in developing countries
- Asphyxiated neonates require prompt, skilled resuscitation to survive the neonatal period

Neonatal Resuscitation

- Simple, inexpensive, available & cost-effective
- Often not initiated or the methods used inadequate or wrong
- Training widely used in the developed world but has had limited dissemination in developing countries

(WHO Technical Working Group, 1994)

Neonatal Resuscitation Training

- The AAP Neonatal Resuscitation Program was developed to provide resuscitation training to all delivery attendants
- WHO Essential Newborn Care (ENC) sets minimum standards for training in neonatal care, including thermoregulation, breastfeeding, resuscitation, breastfeeding, etc.

Although NRP training is universal in developed countries:

- No randomized controlled trials
- Research to date is not community-based
- Lacks standardized definitions
- Confounders (many other interventions simultaneously introduced)

FIRST BREATH Pilot

- Goal: Reduce 7 day neonatal mortality or stillbirth by 30% (RRR) among infants > 1500 gms following NRP training compared to ENC
- Design: 115 NMW from 18 first level urban health centers in Zambia trained for 1 wk in neonatal assessment/data collection; ENC; NRP by certified trainers
- Baseline data collection (4 mos)
- Post ENC data collection (7 mos)
- Post NPR data collection (12 mos)

FIRST BREATH Pilot

- Compared the impact of two methods of resuscitation training of NMW (WHO Essential Newborn Care Program vs. ENC + the AAP's NRP)
- Primary outcome: 7-day (early neonatal) mortality
- Secondary outcomes: mortality due to asphyxia, HIE, need for advanced resuscitation, 5 minute Apgar score

FIRST BREATH Common Protocol

- FIRST BREATH is a scale-up of a pilot in Zambia comparing the impact of two methods of resuscitation training on 7-day neonatal mortality
- It is the first RCT of the AAP Neonatal Resuscitation Program (NRP)
- It is the first head-to-head comparison of the WHO Essential Newborn Care (ENC) training program vs. the ENC + AAP Neonatal Resuscitation Program

FIRST BREATH Design

- Design: Cluster RCT to train all birth attendants in >80 community clusters to resuscitate neonates
- Goal: To determine whether training in ENC & NRP vs. ENC alone reduces early mortality
- Primary outcome: 20% reduction in 7-day mortality
- Secondary outcomes: HIE, mortality due to asphyxia, need for advanced resuscitation, 5 minute Apgar score

Overview:

- Staff:
 - Country coordinators
 - 1 Community coordinator/community
 - Birth attendants (trained and traditional)
- All taught how to collect newborn data:
 - 4-6 mo baseline data collection
- All taught WHO Essential Newborn Care
 - 6 mo data collection
- Randomized to continued ENC or ENC/NRP
- Half of communities trained in NRP
 - 12 mo of data collection

Scheduled Evaluations

- Baseline
- Pre-post ENC training to assess the impact of ENC
- Pre-post NRP training in the cluster randomized communities to assess the impact and cost-effectiveness of additional NRP training

Training of Trainers

Newborn Assessment

- Birth weight
- Gestational age
- Apgar scoring
- Neurological assessment of resuscitated babies on 7th day
- Verbal autopsy of neonatal deaths





Training of Birth Attendants (ENC)

Data collection - Pictorial form for TBAs

- Clean delivery practices (safe delivery kits)
- Keeping the baby warm using mother as a heat source (skin-to-skin)
- Resuscitation with room air using bag and mask
- Initiation of early breastfeeding and promoting exclusive breastfeeding
- Identification of danger signs and referral







Challenge

Capturing/correctly classifying every

- Birth
- Stillbirth
- Neonatal death

Solutions

- Pregnancy Tracking System
- Updating eligible couple & antenatal care registries
- Communication network
 - Health clinics
 - Birth attendants
 - ANW workers
 - Community health workers
 - Village leaders
 - Postal workers
 - Taxi drivers

Sustainability

- Train-the-trainer model
- Minimum equipment
 - Safe delivery kit
 - Stethoscopes
 - Bags and masks
 - Scales
- Maternal expectations

Key Messages

(n >45,200)

- More than half the deliveries occur at home
- More than two thirds of deliveries are conducted by TBAs and nurse midwives
- Newborn assessment by TBAs is feasible
- Birth asphyxia and low birth weight are leading causes of mortality
- Resuscitation practices are inadequate or wrong
- Impaired neurodevelopment is a significant problem

Status of FIRST BREATH Pilot

- In Zambia, ENC training of nurse midwives delivering low-risk women in community health centers reduced early neonatal mortality by ~50% (from 11.2 to 6.2 (n=40,613), $p < 0.001$)
- Rates of SB and mortality by discharge home or transfer weren't affected

Status of FIRST BREATH Trial

- Randomized community coordinators were trained in July, 2006 in NRP
- The trial will be completed by November 2006
- Further research will be needed to determine the effectiveness of resuscitation training for institutional vs. community births

The Global Network

- **US PI Carl Bose, MD, UNC; SFI Antoinette Tshefu, Sch of Public Health, DRC**
- **US PI Pierre Buekens, MD/ PhD, Tulane Sch of Public Health; SFI: Jose Belizan, MD Instit for Clinical Effectiveness & Health Policy, Univ of Buenos Aires**
- **US PI Waldemar Carlo, MD, UAB; SFI Elwyn Chomba, Univ Teaching Hosp ZM**
- **US PI Richard Derman, MD, MPH, University of MO, KC; SFI Bhalchandra Kodkany, MD, MBBS, Jawaharal Nehru Medical College**
- **US PI Robert Goldenberg, MD, UAB; SFI Omrana Pasha, MD, Aga Khan Univ**
- **US PI Michael Hambidge, MD, University of Colorado; SFI Manolo Mariegos, MD, CESSIAM, Guatemala**
- **US PI Jeff Murray, MD, University of Iowa; SFI Eduardo Castilla, MD, ECLAMC & Danilo Moretti, MD, Centrinho**
- **US PI Pinaki Panigrahi, MD/PhD, Univ of Maryland; SFI SN Parida, MD, SCB Medical College, Orissa**
- **US PI Joseph Spinnato II, MD, Univ of Cincinnati; SFI Salvio Freire, MD, PhD, Univ of Pernambuco**
- **US PI Michael Varner, MD, University of Utah; SFI Dr. Tudeng, TAR Health Bur**
- **US PI Ty Hartwell, PhD; Co-PI Beth McClure, Research Triangle Instit Internatl**
- **NICHD Yvonne Maddox, PhD; Anne Willoughby, MD; Linda L. Wright, M.D.; Macaya Douoguih, M.D., Lorette Javois, PhD; Nancy Moss, PhD**

Global Network for Women's and Children's Health Research

<http://gn.rti.org>

<http://www.globalhealthreporting.org>

<http://ClinicalTrials.gov>











Neonatal Resuscitation

U.S. PI	Waldemar Carlo, MD, UAB at Birmingham
SFI	Elwyn Chomba, Univ Teaching Hospital, ZM
Location	19 community-based birth clinics in Lusaka/Ndola
Design	Cluster RCT to compare effect of two neonatal resuscitation programs on mortality Midwives trained to resuscitate asphyxiated newborns using the new WHO Essential Neonatal Care (ENC) vs. Neonatal Resuscitation Program + ENC

Neonatal Resuscitation

Revised design

Location	18 community-based birth clinics	
Design	Pre-post study to compare effects of two neonatal resuscitation programs on mortality	
Status	Aug 2004	Trained 40 NMW in data collection
	Jan 2005	Trained NMW on WHO ENC
	Dec 2005	Trained NMW in NRP
	Feb 2005	7,230 enrolled in 3 mos 5,561 7d FU (78%)

