LEVEL OF NEWBORN CARE

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OBJECTIVES

I. Introduction to Cambodian Neonatal Mortality

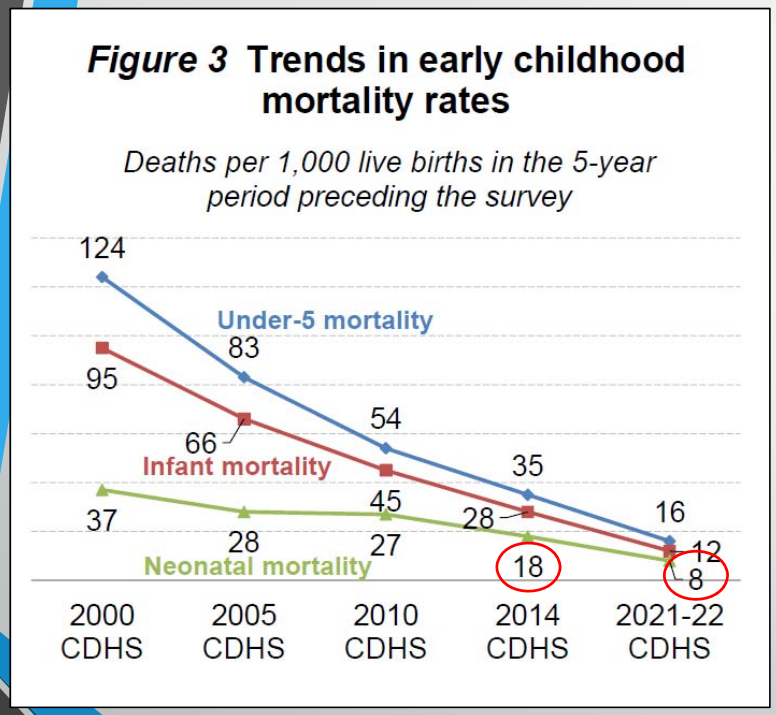
II. History of Newborn Care

III. Different Levels of Newborn Care

IV. Example of NICU of Calmette Hospital

V. Take-Home Messages

I.Cambodian Neonatal mortality decreases!



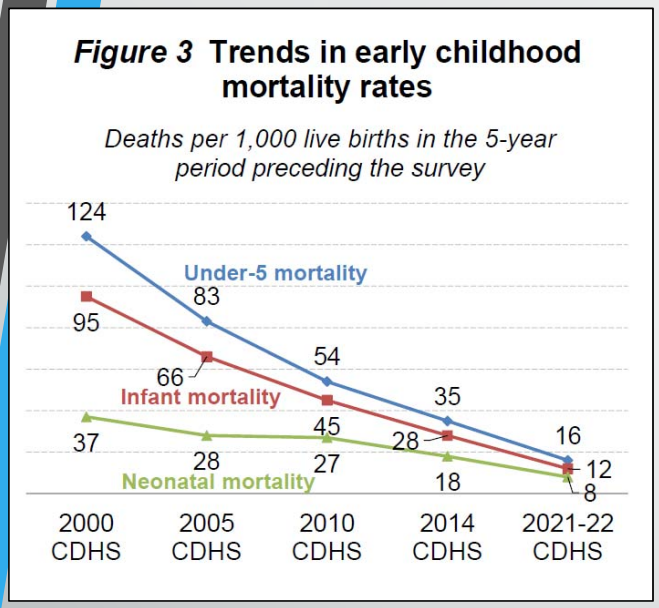
- Definition:
  - Neonatal mortality : Death <1 month of age
  - Infant : Death <1 year

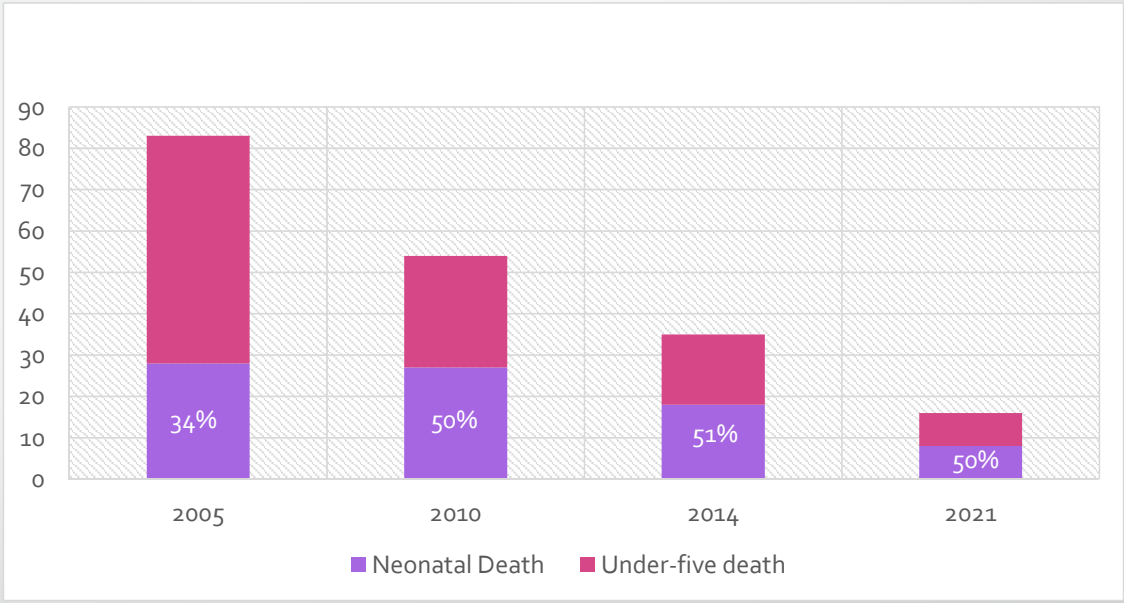
↘ from 18 (2014) to **8 per 1000 live births** (2021)

Target **CSDG 2030**: **<8 per 1000 live births** (2030)

Cambodia Demographic and Health Survey. 2021-2022.

Cambodia: Neonatal mortality is still a concern!





2010

27/54 = 50% of under-5 death!
27/45 = 60% of infant death!

2014

18/35 = 51% of under-5 death!
18/22 = 64% of infant death!

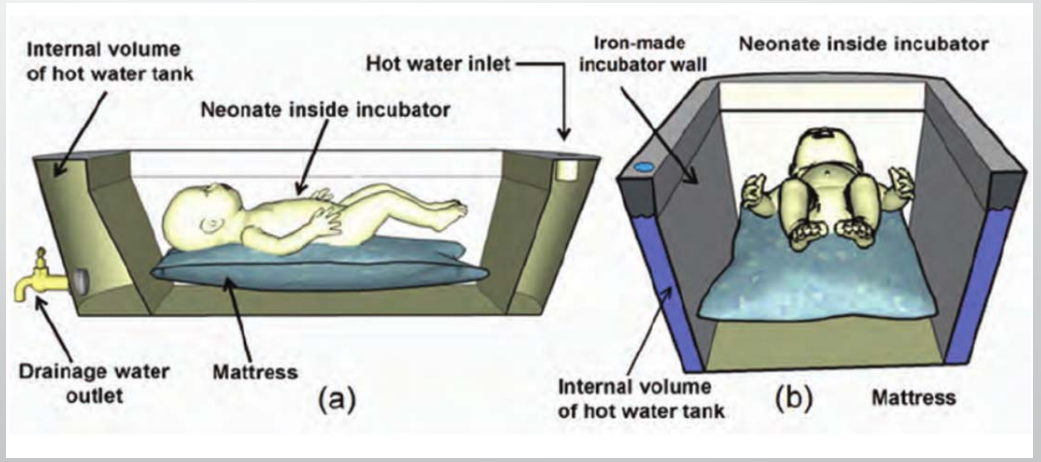
2021

8/16 = 50% of under-5 death!
8/12 = 66% of infant death!

II. History of Newborn Care (1)

- Before NICU era, the care of newborns, sick or well,
  - ⇨ remained largely in the hands of mothers and midwives
  - ⇨ died within hours at home!
- Since 18th century, doctors took an increasing role in childbirth.
- In 1825, Dr. von Ruehl created the "warming tube".

Dr. von Ruehl



II. History of Newborn Care (2)

- In 1880, French obstetrician E.S.Tarnier (Maternité Port-Royal) created:
  - Incubator
  - Gavage tube
- In 1922, hospitals started grouping newborns into one area, now called the neonatal intensive care unit (NICU).

E.S.Tarnier

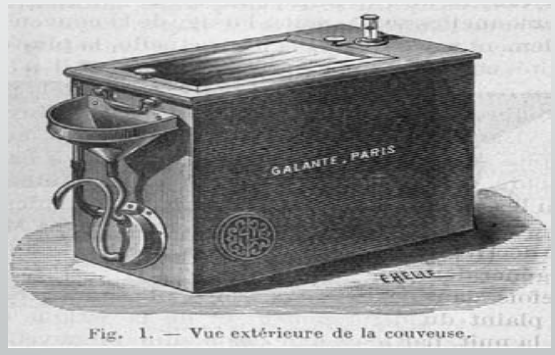


Fig. 1. — Vue extérieure de la couveuse.

Maternité Port-Royal (2015)

II. History of Newborn Care (3)

- In 1960, the term "neonatology" was coined by Dr. Alexander Schaffer, American pediatrician.
- In 1963, the death of Patrick Bouvier Kennedy ⇨ a "pivotal year" for neonatology in term of research (*respiratory)!
- In 1975, the official certification for neonatology:

  *'Sub-specialty of pediatrics that consists of the **medical care** of **newborn infants**, especially the ill or premature newborns'*

  - Neonatal period = first 28 days of life
  - NICU = hospital ICU specializing in taking care of newborns 'extremely ill' or 'extremely premature baby'.
  - At NICU, babies get around-the-clock care from a team of neonatologist expert.

III. Different Levels of Newborn Care

- The classification concept for care for newborn infants according to the level of complexity of care was first proposed in the United State **in 1976**.
- A meta-analysis of the published literature (1978-2010) demonstrates:
  - ⇗ outcomes for VLBW infants and infants <32 WGA born in level III centers
  - Those born at non-level III hospitals had a 62% increase in odds of neonatal or pre-discharge mortality compared with those born at level III hospitals.
- It is recommended that
  - If only inborn (per 1000 live births per year born in the hospital), they need at least:
    - Level 2 (SC) : 2-2.5 beds
    - Level 3 (NICU) : 0.5 beds
  - If accepting in-utero transfer and out-born (per 1000 live births per year born in the hospital), they need at least:
    - Level 2 (SC) : 3.5-4 beds
    - Level 3 (NICU) : 1.5-2 beds

‘American Classification’ Level of Neonatal Care

American Academy of Pediatrics

DEDICATED TO THE HEALTH OF ALL CHILDREN®

Level	Capabilities	Provider
Level I Well Newborn Nursery	- Provide neonatal resuscitation at every delivery - Evaluate and provide postnatal care to stable term newborns - Stabilize and provide care for infants born 35–37 wk - Stabilize newborn infants who are ill and those born at <35 wk until transfer to a higher level of care	Pediatricians, family physicians, nurse practitioners
Level II Special Care Nursery	Level I capabilities plus: - Provide care for infants born ≥32 wk , BW ≥1500 g - Provide care for infants convalescing after intensive care - Provide mechanical ventilation for brief duration (<24 h) or CPAP - Stabilize infants born < 32 wk , BW < 1500 g until transfer to a neonatal intensive care facility	Level I health care providers plus: Pediatric, neonatologist, and neonatal nurse practitioners.
Level III NICU	Level II capabilities plus: - Provide sustained life support - Provide care for infants born <32 wk, BW <1500 g and infants born with critical illness - Provide prompt and readily available access to a full range of pediatric medical subspecialists - Provide a full range of respiratory support that may include conventional and/or high-frequency ventilation and inhaled NO - Perform advanced imaging including computed tomography, MRI, and echocardiography	Level II health care providers plus: Pediatric medical subspecialists
Level IV Regional NICU	Level III capabilities plus: - Provide surgical repair of complex congenital or acquired - Maintain a full range of pediatric medical subspecialists, pediatric surgical subspecialists, and pediatric anesthesiologists at the site	Level III health care providers plus: Pediatric surgical subspecialists

'French Classification' Level of Neonatal Care

Level	Capabilities	Provider
Level I: Maternity	- ≥ 36 weeks, ≥ 2000g - Antibiotherapie < 72 h - Phototherapy	MD, midwife, family
Level II **IIA** (Néonatologie+Kangourou)	- ≥ 34 weeks, ≥ 1600g - Antibiotherapy for 7 to 10 days - Gavage - Umbilical veinus catheter /peripheral IV	Nurses and physician must be trained with basic neonatal care and resuscitation
IIB (Soins intensifs)	IIA plus: - Mechanical ventilation < 24h	Neonatologist, neonatal nurse
Level III Réanimation néonatale	- < 32 weeks, <1200g - central perfusion, TPN, all type ventilator	Neonatologist, nurse specialized in NICU

IV. Example of NICU of Calmette Hospital (1)

History of NICU Calmette

Our NICU (level 3) at Calmette Hospital:

- ✓ was created in November 2005, by **H.E. Prof IM Sethikar**
- ✓ with the support of French association 'Marguerite Marie', led by **Prof Jean Marc Dejode**.

	2005-2009	2010-2013	2014-2019	2020-2023	2024
Doctor	4	4	8	8	15
Midwives	2	0	0	0	0
Nurses	21	16	36	47	49
Head Nurse	1	1	1	2	2
Cleaners	2	2	2	3	3
Beds	4	15	18	40	56

IV. Example of NICU of Calmette Hospital (2)

Beds	Human Resources	Activities provided
56 beds : - Neonatal ICU: 15 beds - Special Care : 25 beds - Nursery Care : 10 bed - Isolation Room : 6 beds - KMC : 10 beds	- **1** Consultant Professor - **9** Specialized Doctors (Diploma from French and China) - **47** Nurses (60% experience > 5yrs)	- All types of ventilation (CPAP, SIMV, HFO) - Central catheterization (UVC, PICC) - Mobile X-ray - Heart US - Head US - FO - Newborn screening - Hearing tests

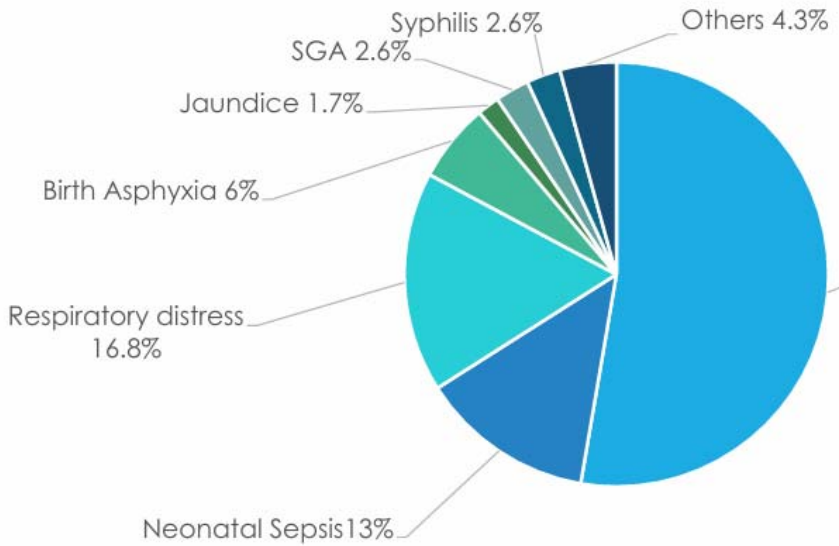



Level III NICU in Cambodia

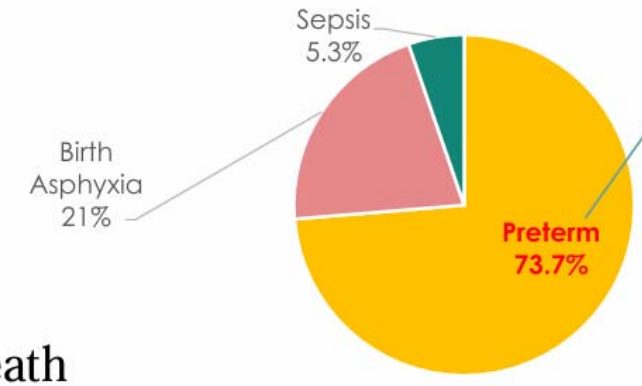
One-Stop Medical Service for Newborn Care




Data 2023



Admission



Death

- RDS 46.2%
- Pulmonary Hemorrhage 23%
- HIV 7.7%
- NEC 7.7%
- Pulmonary Hypertension 7.7%
- PNO 7.7%

V. Take-home messages

- Neonatal care is highly cost-effective.
- To save newborn life, good reproductive health knowledge and antenatal care are important!
- Saving the life of a newborn baby is associated with survival and productivity of the future adult.
  - ⇨ about 80-90% of neonates require minimal care,
  - ⇨ 10-20% need special care and only 3-5% need skilled nurses and neonatal intensive care.
- **Nationally, uniform definitions** for providing neonatal care are needed, based on (1) functional capabilities, (2) availability of appropriate personnel, (3) physical space, (4) technology, and (5) organization.
- A series of **networks** should be organized ⇨ hospitals can work together (between hospitals)!
- Evidence suggests that:
  - ✓ Mortality is lower for babies receiving neonatal intensive care with a doctor trained and experienced in advanced resuscitation skills.
  - ✓ Babies who need intensive care do better if they are born in a hospital with a NICU than if they are moved after birth.

Thank you for your attention!

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