Neonatal mortality and evidence-based practice - a global perspective

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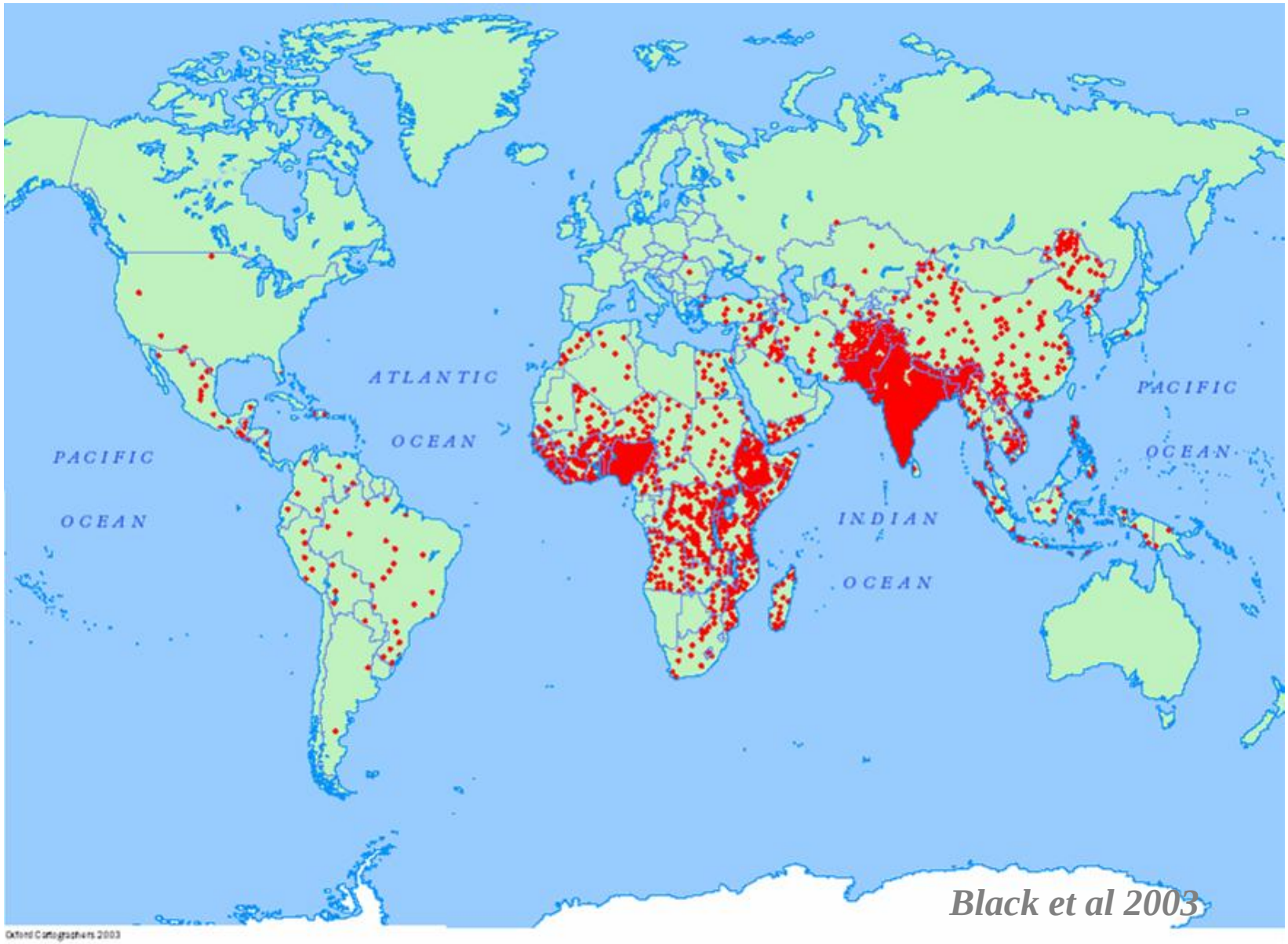
KT Forum, Banff, June 10, 2008

A presentation about

- Brutal facts
- Global inequity
- The potential of evidence-based practice
- The lack of knowledge on implementation of EBP in developing countries

Where 10 million children are dying every year

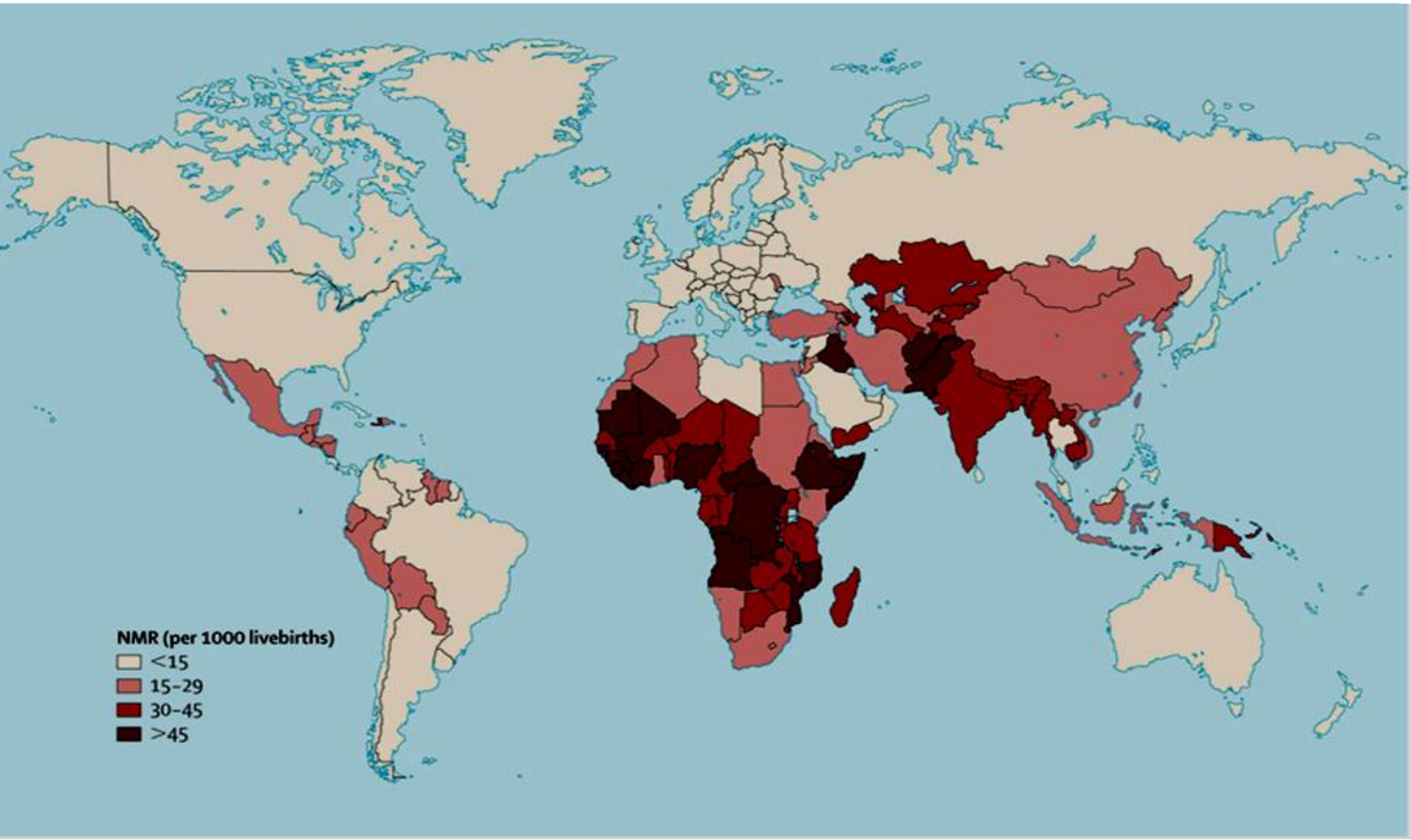


40% of all child deaths are neonates

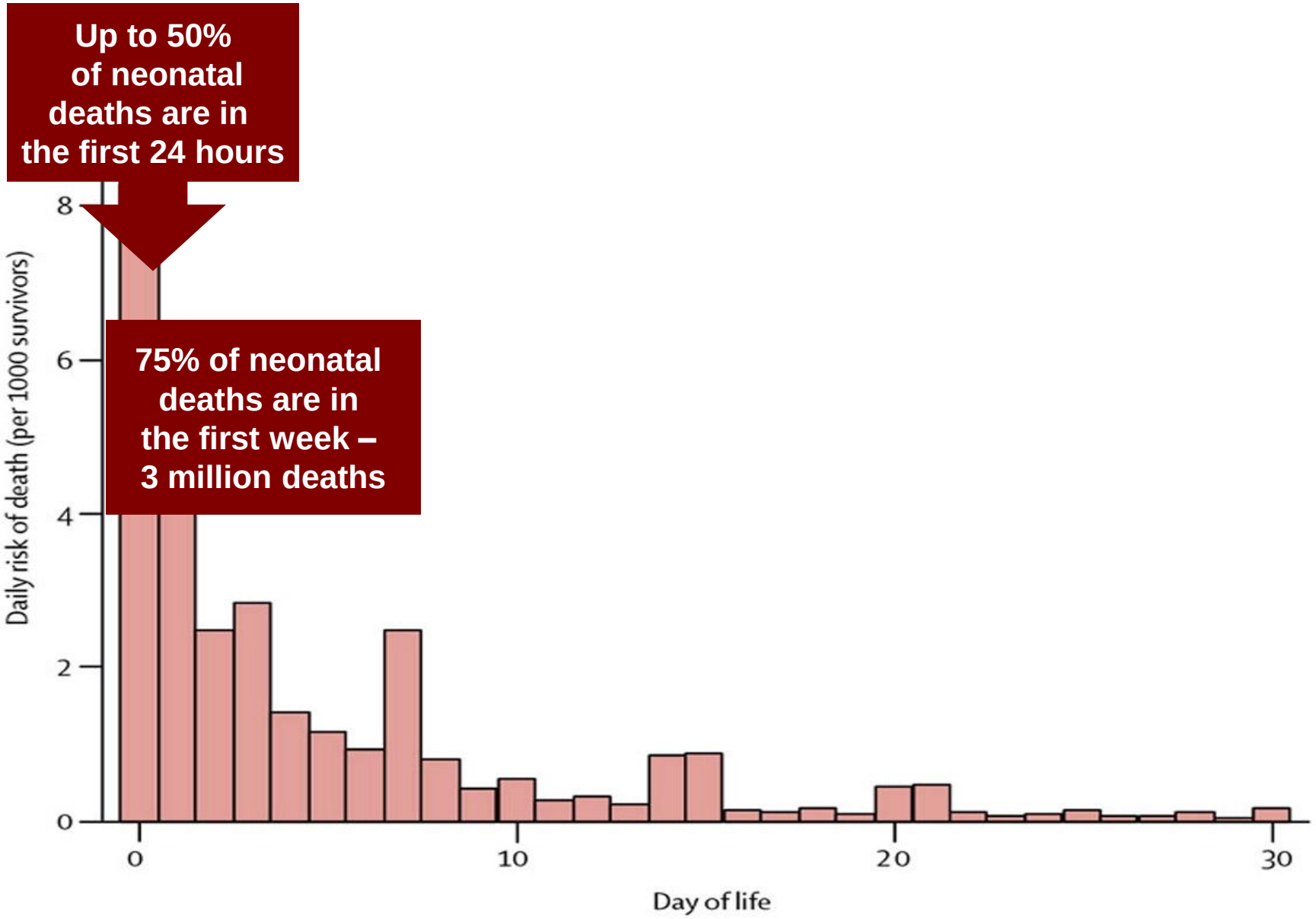
- 130 millions babies are being born every year
- about 4 million die during the neonatal period (the first 4 weeks of life)
- this is equivalent to all the infants born in the US in 1 year
- and happens despite well established knowledge on basic interventions that could avert up to 70% of these deaths

4 million newborn deaths Where?

- 99% of newborn deaths are in developing countries
- In some countries newborn deaths are 60% of all child deaths
- Largest numbers of deaths are in South Asia
- Highest rates of death are in Africa
- More than 50% occur at home

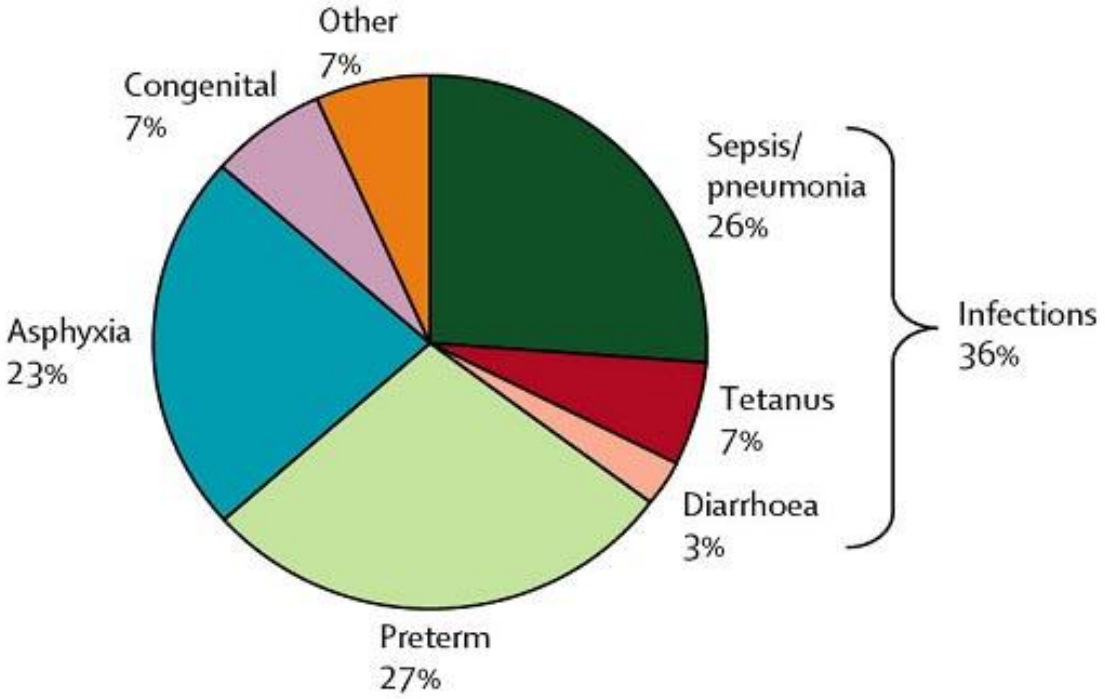

NMR (per 1000 livebirths)
<15
15–29
30–45
>45

When do they die?

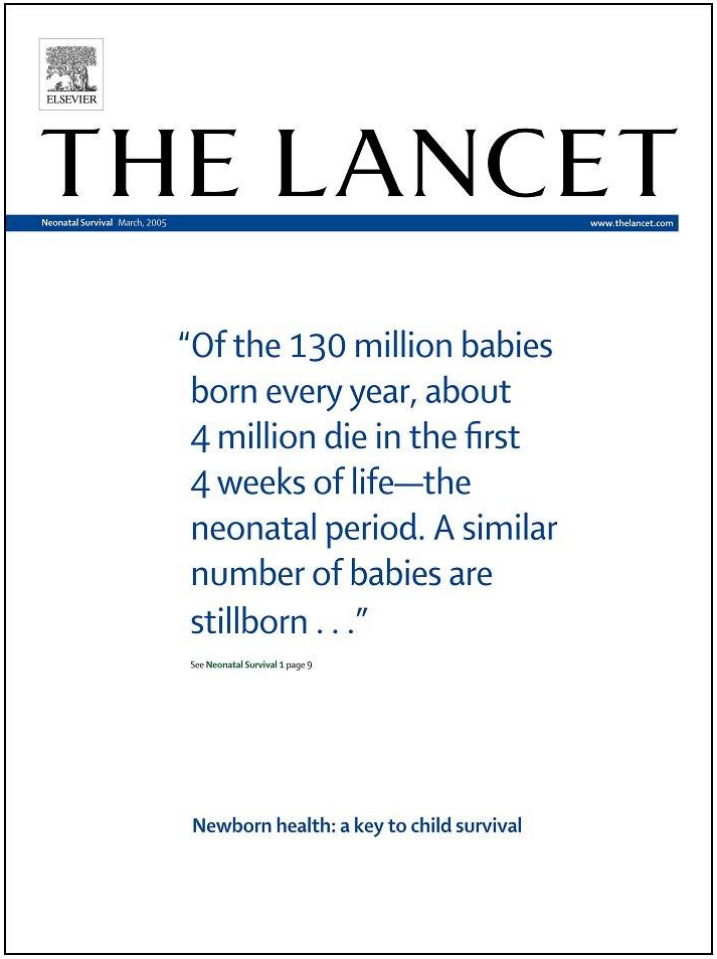


Why do they die?

Almost all are due to preventable conditions



Lancet Series on Newborn Survival 2005



ELSEVIER

THE LANCET

Neonatal Survival March, 2005 www.thelancet.com

"Of the 130 million babies born every year, about 4 million die in the first 4 weeks of life—the neonatal period. A similar number of babies are stillborn . . ."

See Neonatal Survival 1 page 9

Newborn health: a key to child survival

Effective interventions for Newborn Care
Lancet Series on Newborn Survival
Paper 2 (Darmstadt et al.)

- The systematic review introduced by "*a major barrier to action on neonatal health has been the erroneous perception that only expensive, high technology and facility based care can reduce mortality*"

- 16 interventions identified with adequate evidence of effect on neonatal deaths (e.g., tetanus toxoid immunization, clean delivery, obstetric care, breastfeeding, antibiotics for infections)

- All are highly cost-effective especially if packaged and delivered within other programmes (e.g., maternal and child health)

Essential Interventions - linked to cause of mortality

Infections 36%

- Tetanus 7 %
  - Tetanus toxoid can eliminate tetanus deaths
  - Clean home delivery and hygienic cord care can reduce tetanus deaths by 75-85%
- Serious Infections (sepsis) 26%
  - Clean home delivery, hygienic cord care, thermal care, breastfeeding can reduce up to 50% of newborn deaths
  - Malaria IPT can reduce 10-30% of newborn deaths
  - Community based management pneumonia/sepsis can reduce deaths due to pneumonia by 18-35%

Chlorhexidine cleansing: Nepal

- A single cleansing of newborn skin as soon as possible after delivery (median 6 h):
  - 28% reduction in mortality among LBW infants
- Cleansing umbilical cord with 4% chlorhexidine on days 0,1,2,3,5,7,9:
  - 24% reduction in overall neonatal mortality *(Lancet 2006)*

Courtesy Darmstadt & colleagues

Essential Interventions - linked to cause of mortality

Prematurity and low birth weight 27%

- breastfeeding (55-87%)
- hypothermia prevention and management (18-42%)
- kangaroo mother care (skin-to-skin) (7-75% reduction of incidence of infections for low birth-weight infants)

Essential Interventions - linked to cause of mortality

Asphyxia 23%

- Resuscitation of newborn baby can reduce neonatal mortality by 5-42%

Effect of a participatory intervention with women's groups on birth outcomes in Nepal: cluster-randomised controlled trial

Lancet 2004; 364: 970–79

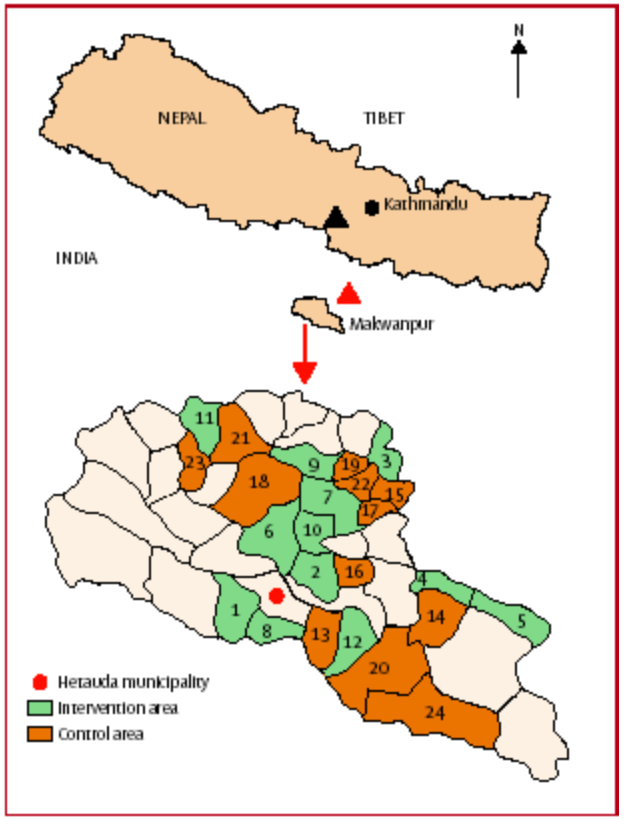
See Comment page 914

Dharma S Manandhar, David Osrin, Bhim Prasad Shrestha, Natasha Mesko, Joanna Morrison, Kirti Man Tumbahangphe, Suresh Tamang, Sushma Thapa, Dej Shrestha, Bidur Thapa, Jyoti Raj Shrestha, Angie Wade, Josephine Borghi, Hilary Standing, Madan Manandhar, Anthony M deL Costello, and members of the MIRA Makwanpur trial team

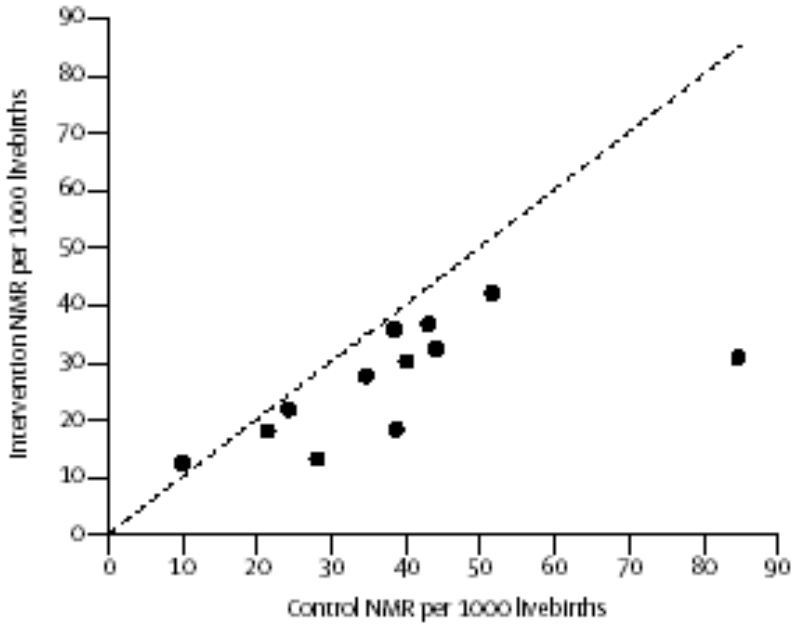
Mother and Infant Research Activities (MIRA), PO Box 921, Kathmandu, Nepal (Prof D S Manandhar FRCP, B P Shrestha MSc, K M Tumbahangphe MSc, S Tamang BSc, S Thapa MSc, D Shrestha BSc, B Thapa BSc.

Summary

Background Neonatal deaths in developing countries make the largest contribution to global mortality in children younger than 5 years. 90% of deliveries in the poorest quintile of households happen at home. We postulated that a community-based participatory intervention could significantly reduce neonatal mortality rates.



30% reduction in neonatal mortality!
78% reduction in maternal mortality!



	Intervention clusters	Control clusters	Adjusted odds ratio (95% CI)
Documented births	2972	3303	
Livebirths	2899	3226	
Stillbirths	73	77	
Neonatal deaths	76	119	
Early (0–6 days)	50	70	
Late (7–28 days)	26	49	
Maternal deaths	2	11	
Stillbirth rate per 1000 births	24·6	23·3	1·06 (0·76–1·47)
Neonatal mortality rate per 1000 livebirths	26·2	36·9	0·70 (0·53–0·94)
Maternal mortality ratio per 100 000 livebirths	69	341	0·22 (0·05–0·90)

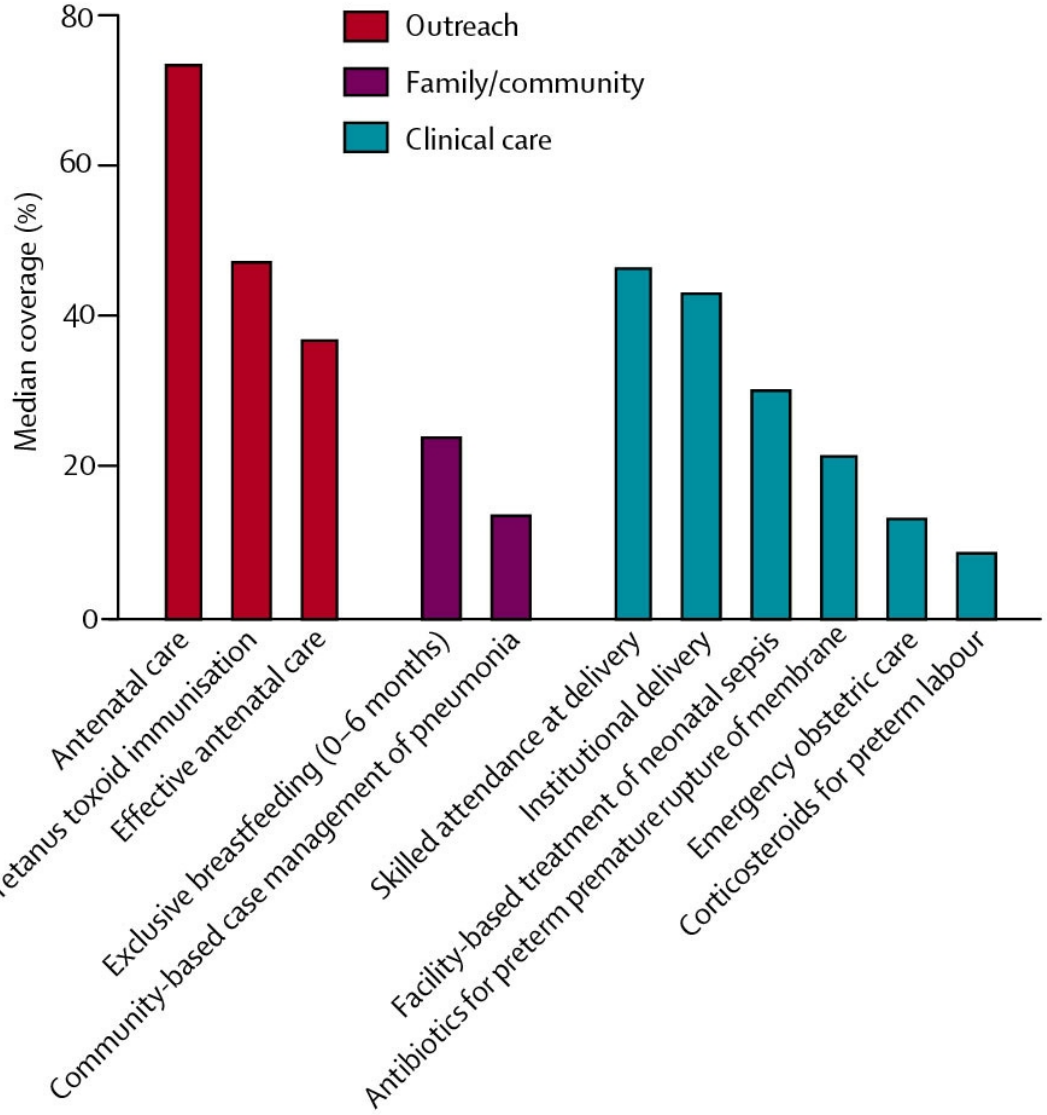
Table 3: Mortality rate comparisons between intervention and control clusters

The potential impact of EBP is huge!

- Neonatal mortality can be decreased up to 40% by implementing a programme of home based maternal and newborn care in the community. If done in conjunction with strengthening health facilities, and at scale, the reduction can be as high as 70%.
- The interventions that have the greatest effect are those that are less dependent on technology and well equipped facilities but still require people with knowledge and skills.

Why is this not happening?

Coverage rates are low!



Lack of implementation research

- Only a small fraction of global health research is devoted to health system and implementation research in low-income settings.
- Relatively few studies have evaluated strategies for implementation of research-based knowledge in low-income countries.
- Two reviews on implementation studies in developing countries suggest that some approaches, such as supportive supervision and audit with feedback, may be effective (Rowe et al 2005, Siddiqi et al. 2005).
- However, the evidence generated was judged as either limited in nature or flawed due to poorly designed research.

Summing up

- We need much more of a global perspective on knowledge translation. The greatest impact of evidence-based practice is not to be found in Western countries, but in low and middle income countries.
- Knowing that 10000 babies die every day, most of them from preventable causes, should give an impetus to the efforts on improving knowledge translation in developing countries.