

Safe Childbirth - What Can Infection Prevention Contribute?
Patricia Lynch
A Webber Training Teleclass

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Neonatal and Maternal Mortality

- 4 million Neonates Die Every Year
- .5 million Women Die of Childbirth Complications
- Millions More Women Are Disabled by complications of childbirth

Neonatal Deaths: What?

- 38% of all mortality in children <age 5 occurs in the first 28 days of life Zupan
- Neonatal Mortality Rates (NMR) of 40-50/1000 live births compared to 3-5 in affluent settings Lawn 2004
- Neonatal infection rates range: 3-20 times higher than hospital-born babies in affluent facilities

Neonatal Deaths: When?

- Deaths within first 28 days
- 25-50% of neonatal deaths occur within 24 hours of birth
- Neonatal deaths account for 24-56% of deaths in children < age 5 across the 6 WHO regions

Lawn J, Cousens S, Zupan J. 4 M neonatal deaths: When? Where? Why? Lancet online March 3, 2005.

Neonatal Deaths: Where?

- 99% die in low-middle income countries: great variation within countries
- Poor registration of births & deaths in general, neonates in particular: <3% of deaths are in countries with accurate statistics
- >60% of deaths occur in 10 countries
- Most occur outside hospitals

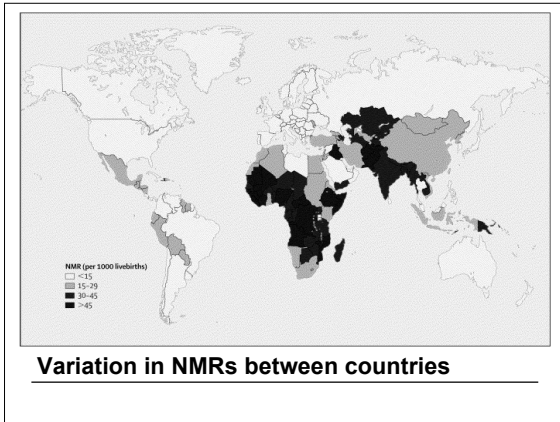
Lawn J, Cousens S, Zupan J. 4 M neonatal deaths: When? Where? Why? Lancet online March 3, 2005 for the Neonatal Mortality Unit

10 Countries with Highest NMRs Per 1000 Live Births (LB)

Country	Pop. Rank	% age of Global NMR	NMR/1000 LB
India	2	27%	43/1000 LB
China	1	10	21
Pakistan	6	7	57
Nigeria	9	6	53
Bangladesh	8	4	36
Ethiopia	14	3	51
DR Congo	18	3	47
Indonesia	4	2	18
Afghanistan	37	2	60
UR Tanzania	30	2	43

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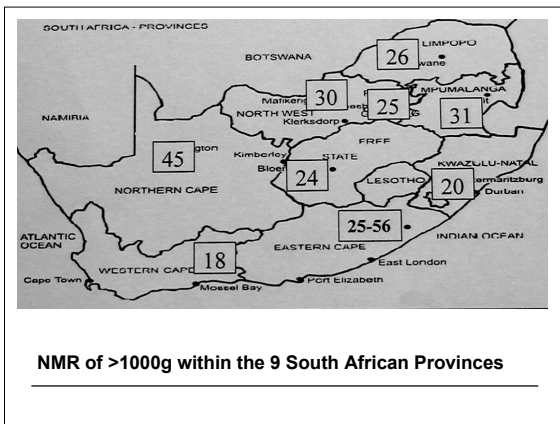
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Indirect Cause of Neonatal Deaths: Poverty

- Relative poverty within a country: Disparity in NMR between top & bottom quintiles in Canada (Luo) probably occurs in all countries
- 20 African + 3 South Asian countries: higher NMRs in bottom quintile. If the rates were equalized, NMRs would be reduced by 19%

Luo ZC et al. Disparities in birth outcomes by neighborhood income. *Epidemiology* 2004;15:679-86



Direct Causes of Neonatal Mortality

- In very high (NMR>45) mortality settings, >50% die of severe infection, tetanus, diarrhea
- In NMR <15, sepsis & pneumonia are more common, diarrhea & tetanus nonexistent. In high NMR, risk of death due to infection is 11x greater
- Late neonatal deaths are mainly due to infection, often acquired during delivery

Direct Causes of Neonatal Mortality

- Low birthweight
- Asphyxia
- Infection
- Maternal health + intrapartum complications
- Inadequate prenatal health care

Maternal Mortality

- The risk of a woman dying as a result of pregnancy or childbirth during her lifetime is about one in six in the poorest parts of the world compared with about one in 30,000 in Northern Europe

Ronsmans C, Graham W. Maternal mortality: Who? When? Where? Why? *Lancet* 2006;368:1189-1200 for the Maternal Mortality Group

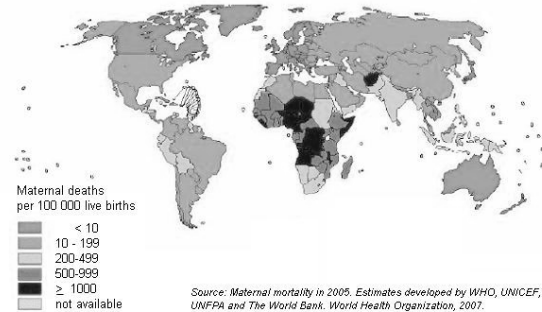
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Maternal Mortality

- In S Asia & s-S Africa, >2/3 of women deliver without skilled attendant
- Rates for C-sections are low in low-income settings, resulting in obstructed labor, hemorrhage and fistula
- Rates for no antenatal care: 30% overall, 46% in S Asia, 34% in s-S Africa

Maternal mortality ratio, by country, 2005



Direct Causes of Maternal Mortality

- Obstructed labor
- Mal-presentation
- Hemorrhage
- Anemia
- Hypertension disorders

Effect of 3 Conditions

- Tetanus, often from unhygienic and unsafe childbirth delivery practices, killed 200,000 newborns and 30,000 mothers in 2001 alone.
- Anemia from malaria and/or nutrient deficiency caused >111,000 maternal deaths in 2001
- HIV transmission from infected mother to infant=>50% in s-S Africa. UNICEF

Global Plan for Improvement: Millennium Development Goals

- MDG 4: commits the international community to < mortality ratio in children < age 5 by 65% before 2015.
- MDG 5: reduce maternal mortality ratio by 75% between 1990 and 2015
- MDG 6: Halt or begin to reverse the spread of HIV/AIDS, malaria and other diseases. HIV is often transmitted via healthcare or maternal/neonate

WHO. Proceedings of Meeting of Development Partners: Maternal and Newborn Health with a focus on country implementation, Stockholm, 2006. Accessed May 26, 2008.

Sri Lanka Experience: Core Effectiveness

- Population 20M, GDPpp \$3470, health 1.8% of country budget. 6% <\$1/day
- 1950 NMR: 50/1000; <20 in 1980
- Sustained primary care emphasis with midwives posted to rural areas for hospitals, clinics & home
- 2500 trained midwives in 2000, prenatal care, referral pathway for hospital care

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Hospital Infections Contribute to Neonatal Mortality

International Nosocomial Infection Control Consortium (INICC) reported a broad range of infection rates in newborn ICUs of limited resources countries; they were 3 to 6 times higher in the INICC ICUs than the benchmark hospitals; participating hospitals are university-affiliated and have surveillance programs.

Lynch P, Rosenthal V et al. Health Care-Associated Infections: In: Hospital Infections, Jarvis W (ed), Fifth Edition, Lippincott-Raven, Philadelphia, 2007; 255-270

Device-associated Infection Rates in NICUs of INICC

CLAB rate of 12.37 per 1000 CL days was higher than the 4.4 rate (neonatal ICUs,) per 1000 CL days published by CDC-NHSN.

Rosenthal V et al. International Nosocomial Infection Control Consortium report, data summary for 2002-2007, issued January 2008. Am J Infect Control 2008;36:627-37.

What About Low Income Countries? Or Populations?

- Must add capacity
- May need donor funding
- Works best when linked to existing facilities, resources, and services

Effect of Trained Birth Attendants

- Trained TBAs were significantly more likely to practice hygienic delivery than untrained TBAs (45.0 vs. 19.3%, $p < 0.0001$). However, no significant difference in levels of postpartum infection was found when deliveries by trained TBAs and untrained TBAs were compared. Training alone will not solve the problems.

Goodburn, E et al. Health Policy and Planning; 15(4): 394-399

Best Reading: *Lancet 2005:* Neonatal Survival Unit Series

- Continuing publications
- Best general references:
 1. 4 million neonatal deaths
 2. Evidence based, cost-effective interventions: How many newborn babies can we save?
 3. Systematic scaling up of neonatal care
 4. Neonatal survival: a call for action

Recommendations for Global Improvement

- Implementation of universal packages for community care, prenatal, intrapartum and post-natal period
- Cost estimate \pm \$US 2100/life saved
- Great benefits beyond lives saved: reduced HIV, improved health, better global public health system

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How Does This Relate To Infection Prevention Globally??

1. 1/3 of neonatal deaths are related to infections
2. Many of the infections are acquired during delivery
3. Hospital infections play a major role
4. Infection prevention societies aren't involved
5. Much of the training literature lacks sound IP content

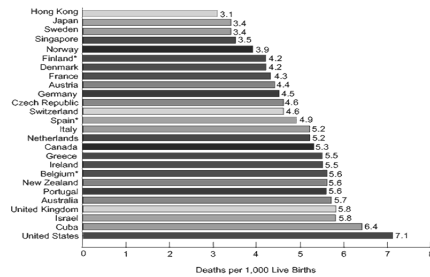
How Does This Relate To Infection Prevention Globally??

6. It's a major public health issue
7. The "poverty gap" in NMRs affects all countries
8. Improvement is likely to be better if infection control is involved

Where is Infection Prevention on this issue?

- No articles, commentary, or editorials in IC journals
- No IC societies with childbirth infection prevention as a goal or on their web sites
- No major initiatives with partners such as UNICEF, B&M Gates, Save the Children
- No Millennial Development Goal support
- IFIC and APIC support WHO HH & "Safe" but have not pushed for safe childbirth

Comparison of National Infant Mortality Rates, 1999, U.N.



Comparison of NMRs in Washington State, 2001-03

- Low income mothers (Medicaid+TANF) 9.1/1000 LB
- Moderately low income (Medicaid, no TANF) 6.3
- Higher income (no Medicaid) 4.5

Health of Washington State report, 2005

Comparison of NMRs in Maryland

- Statewide neonatal mortality rate: 8/1000 LB
- Baltimore neonatal mortality: 11.3/1000 LB
- African American NMR is 3X that for whites

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Healthiest Wisconsin 2010: Elimination of health disparities is an overarching goal of the state health plan

Infants born to African American women in Wisconsin: 3-4 times more likely to die before their first birthday. Virtually no decline has occurred in Wisconsin's African American infant mortality rate since 2000.

Neonatal Mortality By State, US, 2002

- U.S. Department of Health and Human Services, Health Resources and Services Administration, Maternal and Child Health Bureau. *Child Health USA 2004*. Rockville
- Search your own state health statistics
- Google: Neonatal Mortality, USA

Who Pays For This?

- Society
- Taxpayer funded programs
- Next generation
- **HOSPITALS: ER visits, emergency obstetric care, care of premies**

Low Birth Weight Infants

- In 2001, 308,747 babies (7.7 percent of LBs in US) weighed less than 2,500 grams at birth, a slight increase from 2000, despite improvements in the use of prenatal care.
- The percentage of newborns born at low birth weight has risen from a low of 6.8 percent in 1985 and is currently at the highest level recorded in the past three decades. Mothers < than 15 years and > than 45 are at the highest risk of a low birth weight infant.

How Does This Relate to Infection Prevention in the US?

It hasn't in the past and doesn't now ...

BUT ...

it could.

Why?

Inadequate federal, state and local funding means that hospitals have an opportunity to improve care and decrease costs.

Prenatal Support Program: Banner Hospitals, Mesa, AZ

- Initiated by the hospital after budget cuts eliminated school services and reduced services at "crisis pregnancy center".
- "I think this is an emergency in our community. This program just would not exist without the fabulous volunteers we have."

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Prenatal Support Program: Banner Hospitals, Mesa, AZ

Potential clients are always poor, usually young, who self-refer for pregnancy test. Labor & delivery nurse provides and interprets test, and a kit of information. If no MD, L&D nurse will review MDs in the program who will accept new patients before funding is approved and accompany to the office of the patient's choice. Office staff greet, make an appointment and develop application for funding.

Prenatal Support Program: Banner Hospitals, Mesa, AZ

- "Fewer surprises in the delivery room"
- "Fewer come to the ER in labor with no prenatal care"
- Some of the clients choose to deliver at Banner

How Can You Promote Safe Childbirth in Your Own Facility?

- Assess safe childbirth in your facility: How to reduce infection from the community? How improve mother/baby health?
- Reduce NICU device-related infections
- Use the opportunity to develop facility awareness of infection prevention
- Increase public and government consciousness

What Can Infection Prevention Societies Contribute Locally?

1. Commitment & leadership: determine the "poverty gap" in your own country or region.
2. Work with existing health organizations to bring up the lowest quintile so that it matches the average NMR and MMR.
3. Get other health care professional associations involved.
4. Amplify existing action with "Buzz" and good use of local media.

National Infection Prevention Contribution

- In some countries, the national IC society is important in pushing policy: without the IC society, the government wouldn't have adequate guidance, education materials for the public or HCWs, or plans.
- When the government is incapable, the IC society potentially plays a larger role

Global Contributions from IC Societies

- Write: Write research reports, letters to editors, other IC society leaders,
- Join others: Form regional projects
- Push: global organizations including IFIC, APSIC, ASEAN to develop projects, and integrate infection prevention as an essential element in existing projects
- Collaborate: obstetric, pediatric, & public health colleagues

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**Get it on the world agenda
and keep it there**

THE NEXT FEW TELECLASSES

18 Aug. 09	(Free British Teleclass) Fitness for Purpose in Infection Control Speaker: Martin Kierman, Southport and Ormskirk NHS Trust
10 Sep. 09	Influenza Vaccination of Healthcare Workers Speaker: Monica Mehta & Dr. Charles Pastor, Long Island University
21 Sep. 09	(Free British Teleclass) <i>Live Broadcast from the Infection Prevention Society Conference</i> Fifty Years of Resistance Speaker: Prof. Gary French, Guy's & St. Thomas' Hospital, England
22 Sep. 09	(Free British Teleclass) <i>Live Broadcast from the Infection Prevention Society Conference</i> The Pursuit of Excellence During a Global Pandemic Speaker: Prof. Robert Pratt, Thames Valley University
23 Sep. 09	(Free British Teleclass) <i>Live Broadcast from the Infection Prevention Society Conference</i> Hot Off the Press - A Review of the Evidence Speaker: Dr. William Jarvis, President, Jason and Jarvis Associates

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