Care of babies *'born too soon'* and the role of KMC

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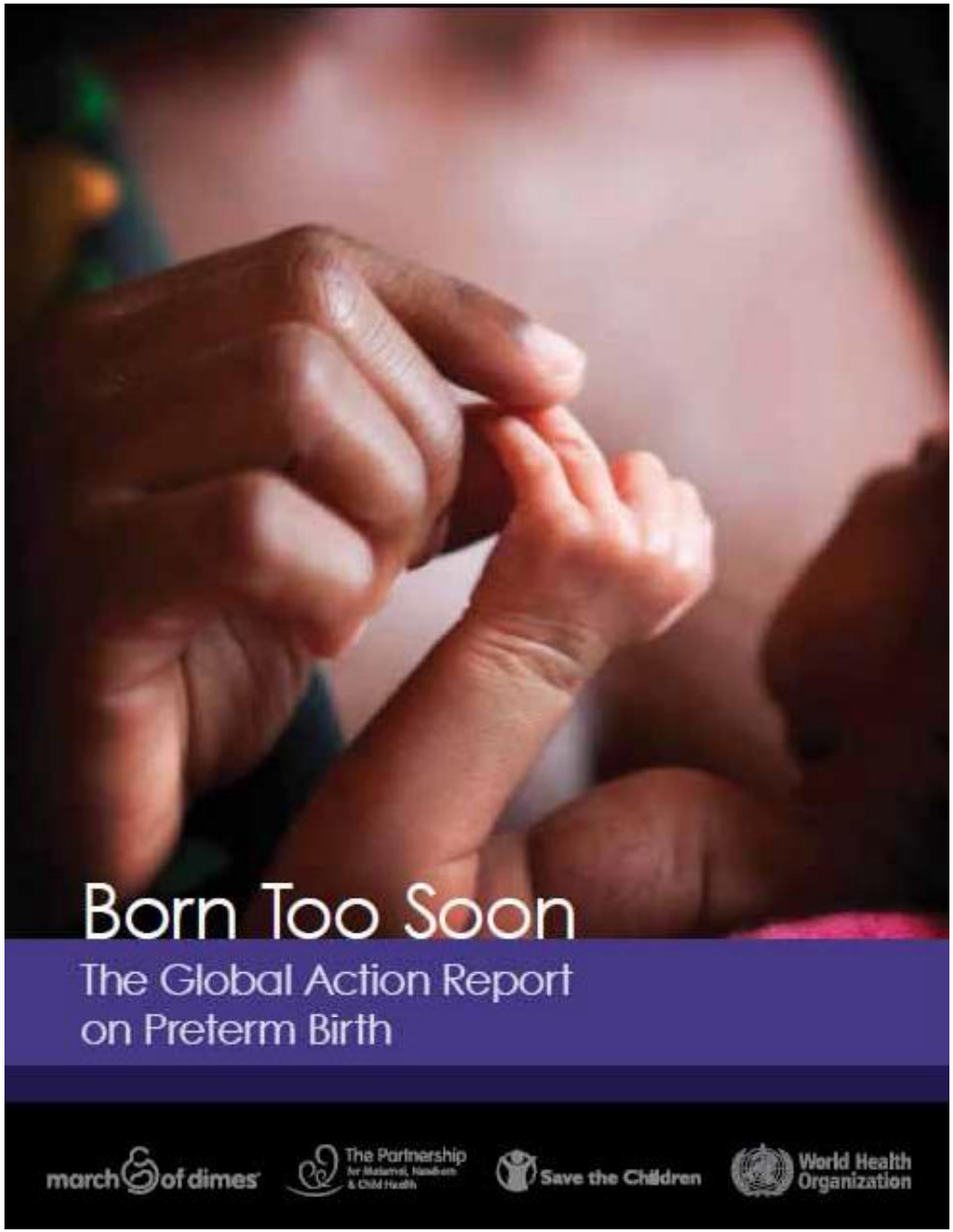
Member, High Level Expert Group on Universal Health Coverage, Planning Commission, Govt of India

Visiting Professor, Public Health Foundation of India

4 Key points

1. Highlight the problem of preterm neonates
2. Role of KMC
3. AIIMS' journey to KMC 'indoctrination', adopti on, promotion
4. KMC scale up in India and SEA Region



With the support of the following organizations:

15 million preterm babies are born each year

PRETERM BIRTH RATE 8-15%

Figure 2: Global burden of preterm birth in 2010

11 countries with preterm birth rates over 15% by rank:

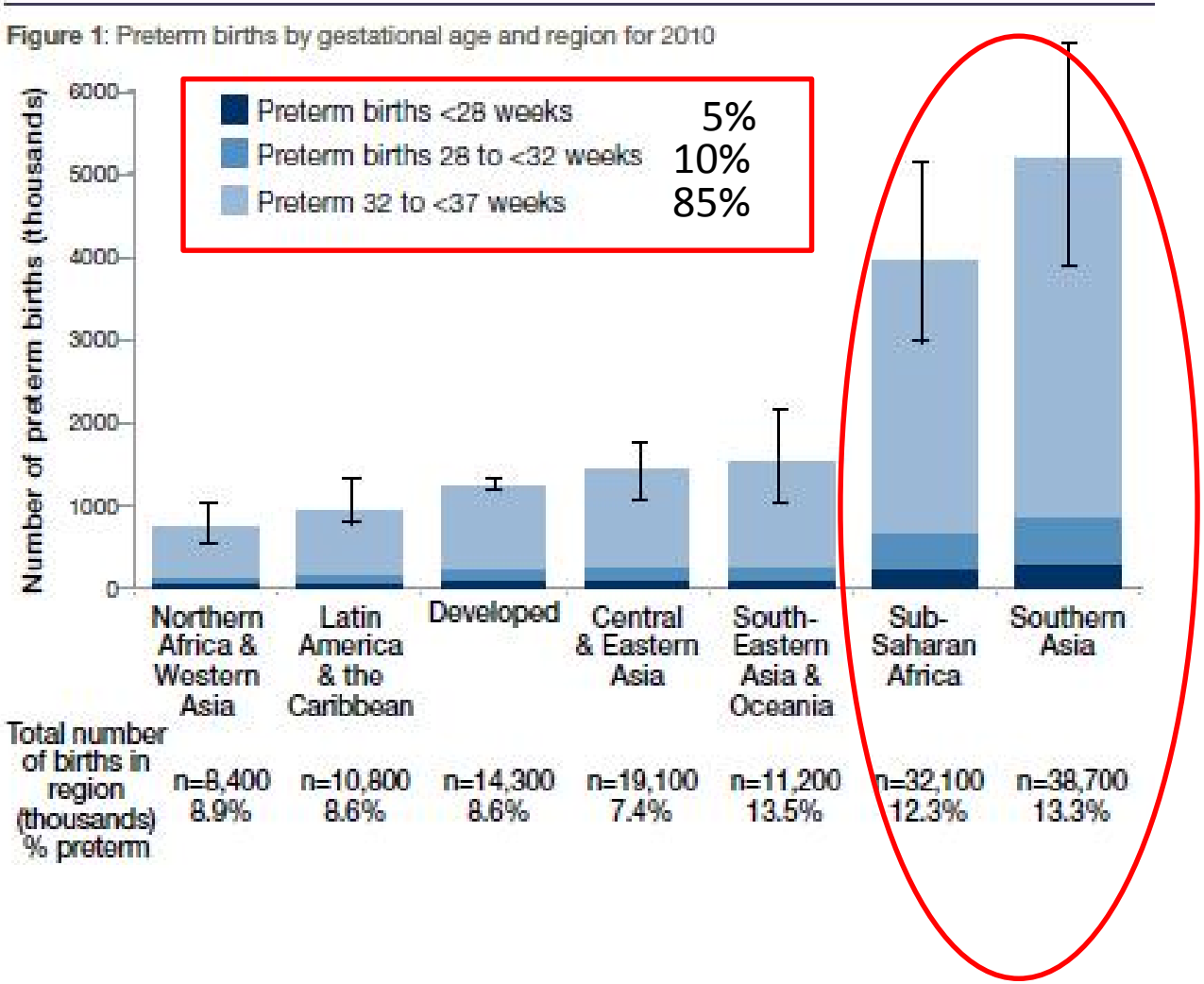
1. Malawi
2. Congo
3. Comoros
4. Zimbabwe
5. Equatorial Guinea
6. Mozambique
7. Gabon
8. Pakistan
9. Indonesia
10. Mauritania
11. Botswana

The boundaries and names shown and the designations used on this map do not imply the expression of any opinion whatsoever on the part of the World Health Organization concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries. Dotted lines on maps represent approximate border lines for which there may not yet be full agreement.

Data Source: World Health Organization
Map Production: Public Health Information and Geographic Information Systems (GIS)
World Health Organization

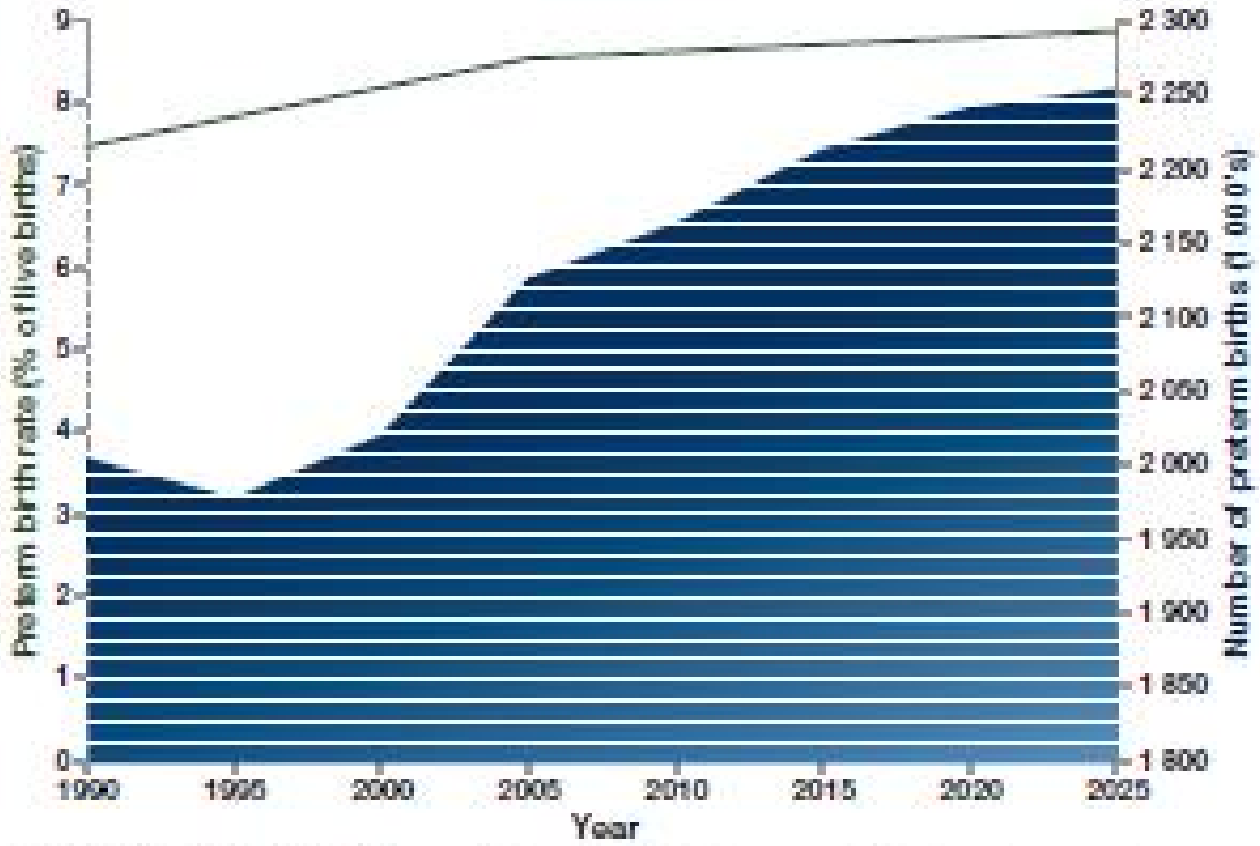
World Health Organization

60% preterm births occur in Africa and South Asia



Preterm burden is rising

Figure 2.6: Time trends in preterm birth rate for regions with adequate data (Developed, Latin America and Caribbean) projecting to 2025 assuming the average annual rate of change from 2005 to 2010 is maintained

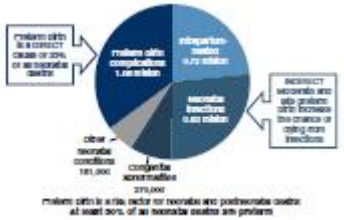


based on subregional developed/ more regions
source: estimates at six nations, regions and worldwide estimates of preterm birth rates in the year 2010 with time trends since 1990 for selected countries: a systematic analysis and implications

Preterm birth is potentially dangerous

- High risk of mortality
  - 1.1 million of the 15 million die
  - Mortality 70 per 1000
- Enormous burden of neurodevelopmental problems

•35% of neonatal deaths globally are caused by preterm birth complications

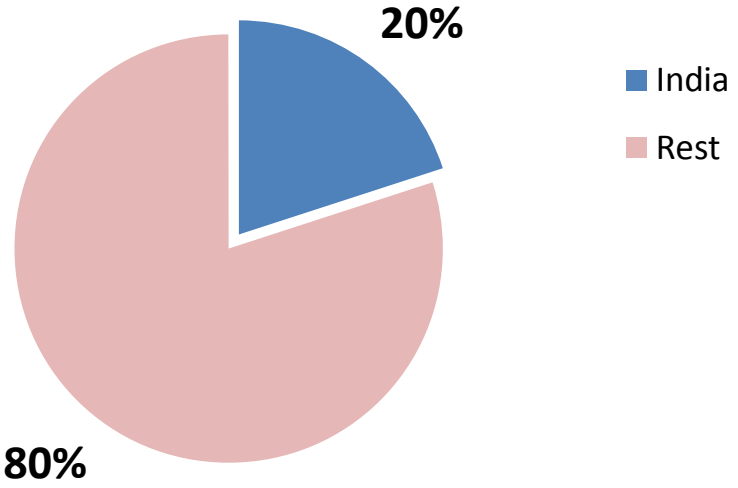


•50% of neonates who die are preterm

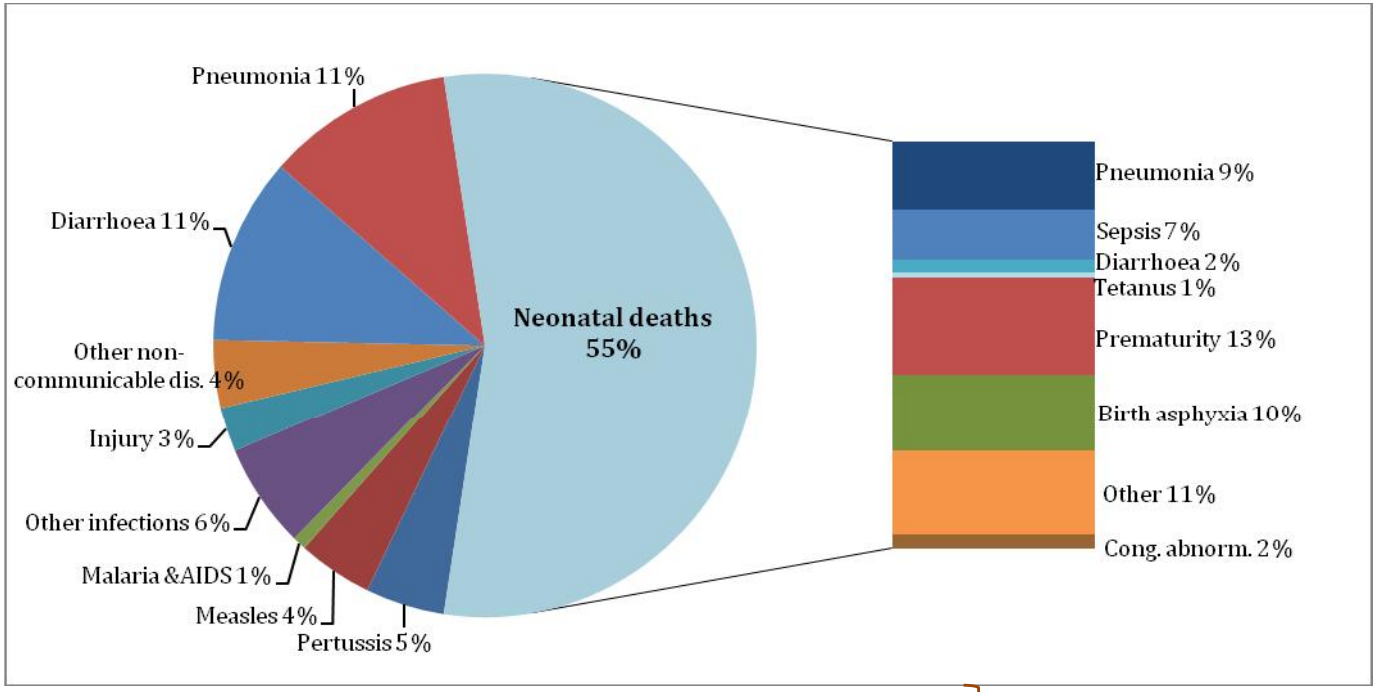
India

- Preterm birth rate 12%
- Burden in India 3 million
- About 225 000 neonatal deaths are due to preterm birth complications

20% of the global burden



Preterm birth complications are a dominant cause of U5 mortality



Pneumonia	**11%**
Neonatal pneumonia	**9%**
Neonatal sepsis	**7%**
Prematurity	**13%**
Diarrhea	**11%**
Asphyxia	**10%**

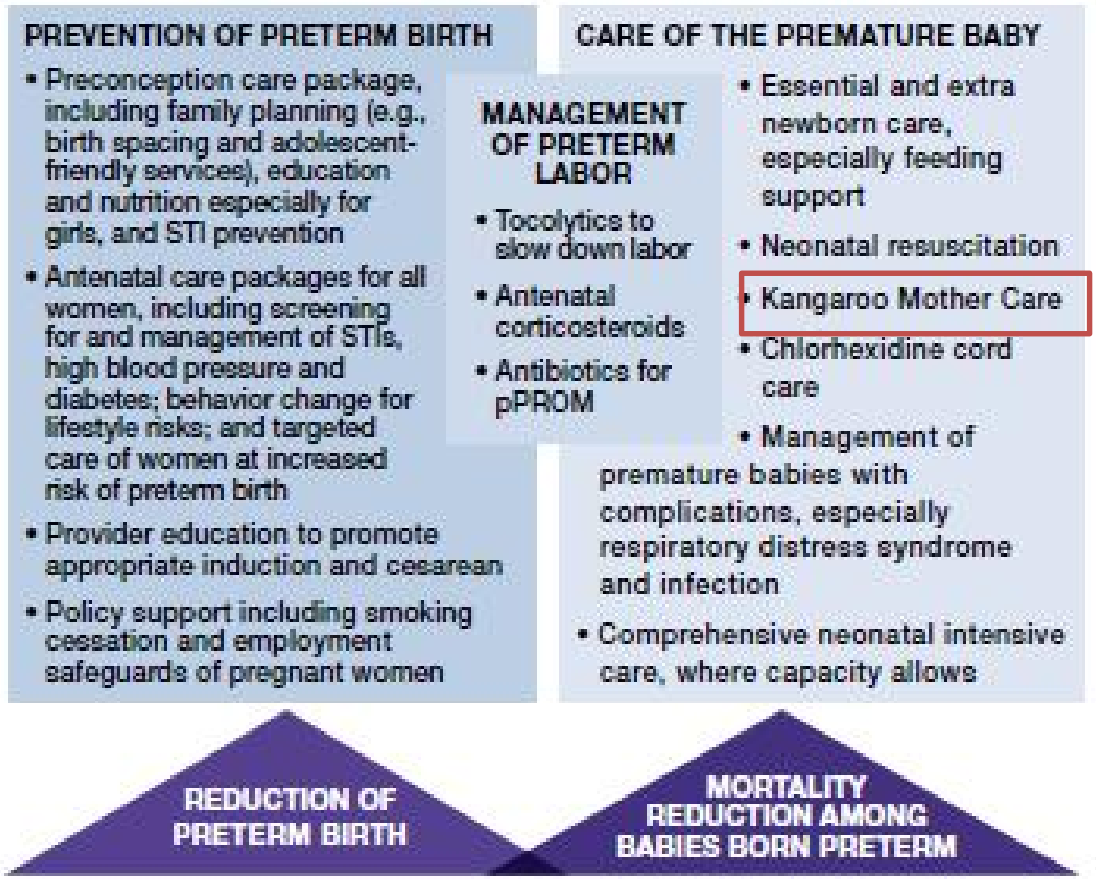
Pneumonia

Neo infections

Lancet 2012

75% preterm neonates can be saved

If existing interventions reach all women and neonates at risk



Package 3:
Kangaroo Mother Care

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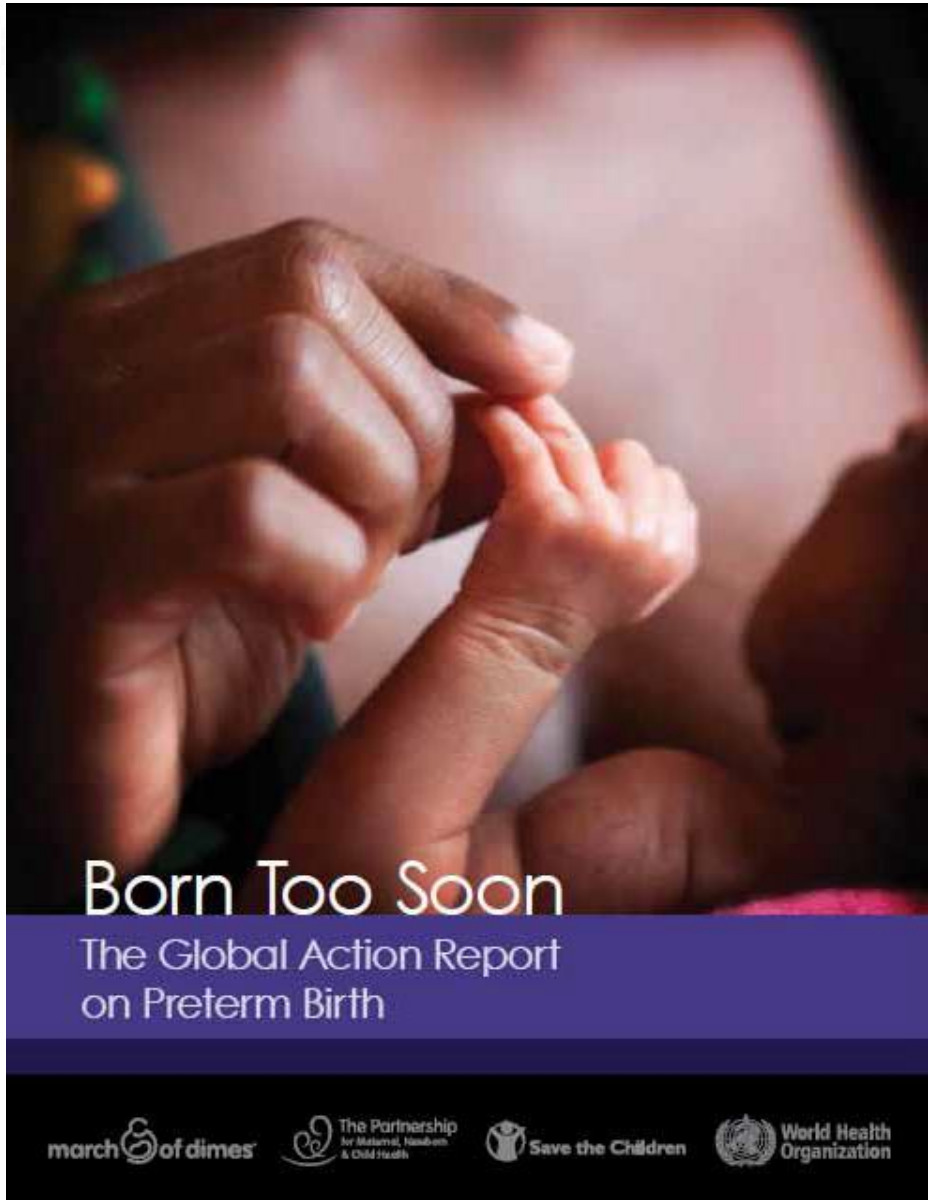
Kangaroo Mother Care

KMC was developed in the 1970s by a Colombian pediatrician, Edgar Rey, who sought a solution to incubator shortages, high infection rates and abandonment among preterm births in his hospital (Charpak et al., 2005; Rey and Martinez, 1983). The premature baby is put in early, prolonged and continuous direct skin-to-skin contact with her mother or another family member to provide stable warmth and to encourage frequent and exclusive breastfeeding. A systematic review and meta-analysis of several randomized control trials found that KMC is associated with a 51% reduction in neonatal mortality for stable babies weighing <2,000g if started in the first week,

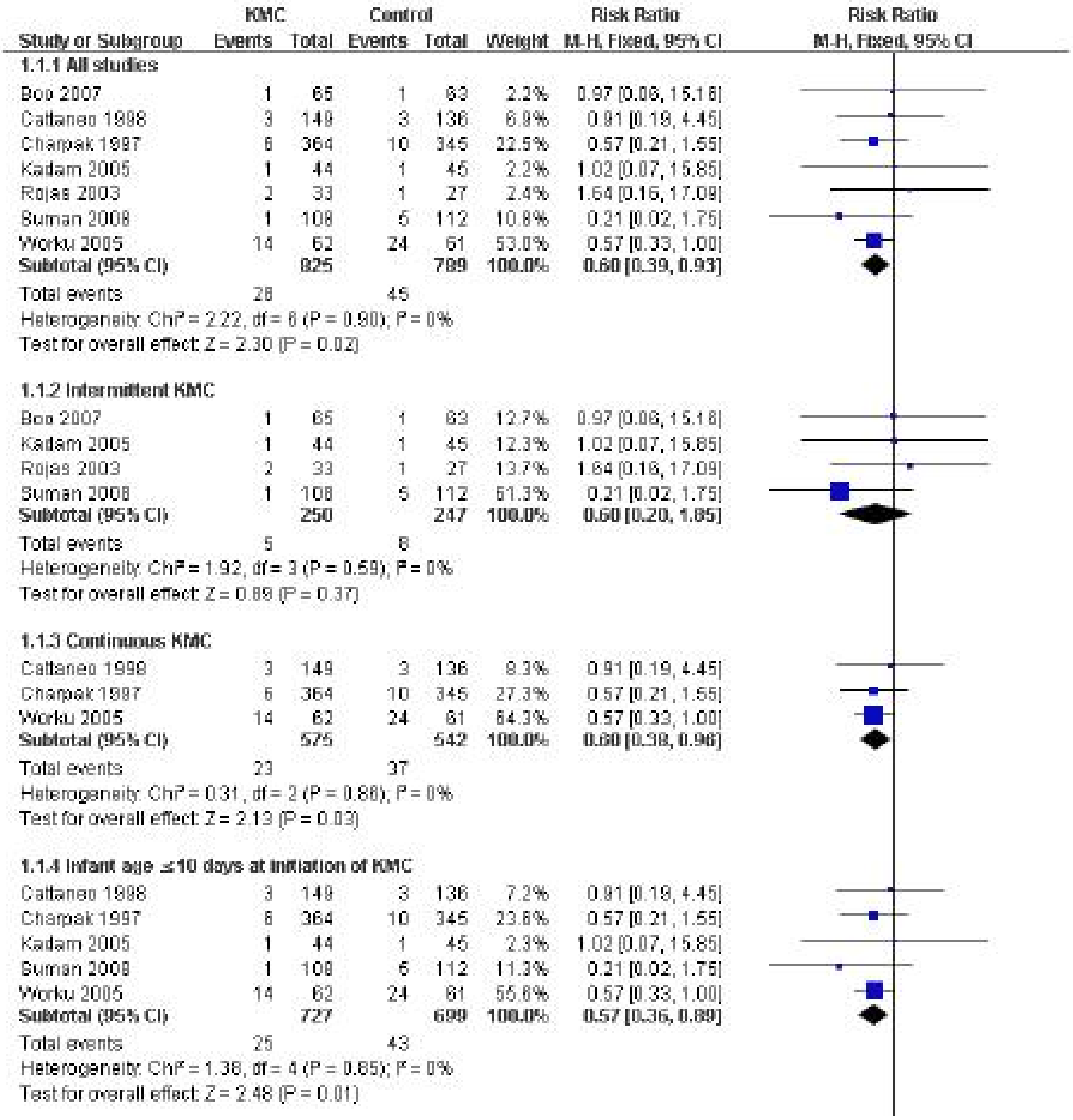


Kangaroo mother care to reduce morbidity and mortality in low birthweight infants (Review)

Conde-Agudelo A, Belizán JM, Diaz-Rossello J

THE COCHRANE COLLABORATION®

KMC Saves babies



Study or Subgroup	KMC Events	KMC Total	Control Events	Control Total	Weight	Risk Ratio M-H, Fixed, 95% CI
1.1.1 All studies						
Boo 2007	1	65	1	63	2.2%	0.97 [0.06, 15.18]
Cattaneo 1998	3	149	3	136	6.9%	0.91 [0.19, 4.45]
Charpak 1997	6	364	10	345	22.5%	0.57 [0.21, 1.55]
Kadam 2005	1	44	1	45	2.2%	1.02 [0.07, 15.85]
Rojas 2003	2	33	1	27	2.4%	1.64 [0.16, 17.09]
Suman 2008	1	108	5	112	10.8%	0.21 [0.02, 1.75]
Worku 2005	14	62	24	61	53.0%	0.57 [0.33, 1.00]
Subtotal (95% CI)		**825**		**789**	**100.0%**	**0.60 [0.39, 0.93]**
Total events	28		45			
Heterogeneity: Chi² = 2.22, df = 6 (P = 0.90); I² = 0%						
Test for overall effect: Z = 2.30 (P = 0.02)						
1.1.2 Intermittent KMC						
Boo 2007	1	65	1	63	12.7%	0.97 [0.06, 15.18]
Kadam 2005	1	44	1	45	12.3%	1.02 [0.07, 15.85]
Rojas 2003	2	33	1	27	13.7%	1.64 [0.16, 17.09]
Suman 2008	1	108	5	112	61.3%	0.21 [0.02, 1.75]
Subtotal (95% CI)		**250**		**247**	**100.0%**	**0.60 [0.20, 1.85]**
Total events	5		8			
Heterogeneity: Chi² = 1.92, df = 3 (P = 0.59); I² = 0%						
Test for overall effect: Z = 0.89 (P = 0.37)						
1.1.3 Continuous KMC						
Cattaneo 1998	3	149	3	136	8.3%	0.91 [0.19, 4.45]
Charpak 1997	6	364	10	345	27.3%	0.57 [0.21, 1.55]
Worku 2005	14	62	24	61	64.3%	0.57 [0.33, 1.00]
Subtotal (95% CI)		**575**		**542**	**100.0%**	**0.60 [0.38, 0.96]**
Total events	23		37			
Heterogeneity: Chi² = 0.31, df = 2 (P = 0.86); I² = 0%						
Test for overall effect: Z = 2.13 (P = 0.03)						
1.1.4 Infant age ≤10 days at initiation of KMC						
Cattaneo 1998	3	149	3	136	7.2%	0.91 [0.19, 4.45]
Charpak 1997	6	364	10	345	23.6%	0.57 [0.21, 1.55]
Kadam 2005	1	44	1	45	2.3%	1.02 [0.07, 15.85]
Suman 2008	1	108	5	112	11.3%	0.21 [0.02, 1.75]
Worku 2005	14	62	24	61	55.6%	0.57 [0.33, 1.00]
Subtotal (95% CI)		**727**		**699**	**100.0%**	**0.57 [0.36, 0.89]**
Total events	25		43			
Heterogeneity: Chi² = 1.38, df = 4 (P = 0.85); I² = 0%						
Test for overall effect: Z = 2.48 (P = 0.01)						

KMC: Severe pneumonia, jaundice, other severe morbodity

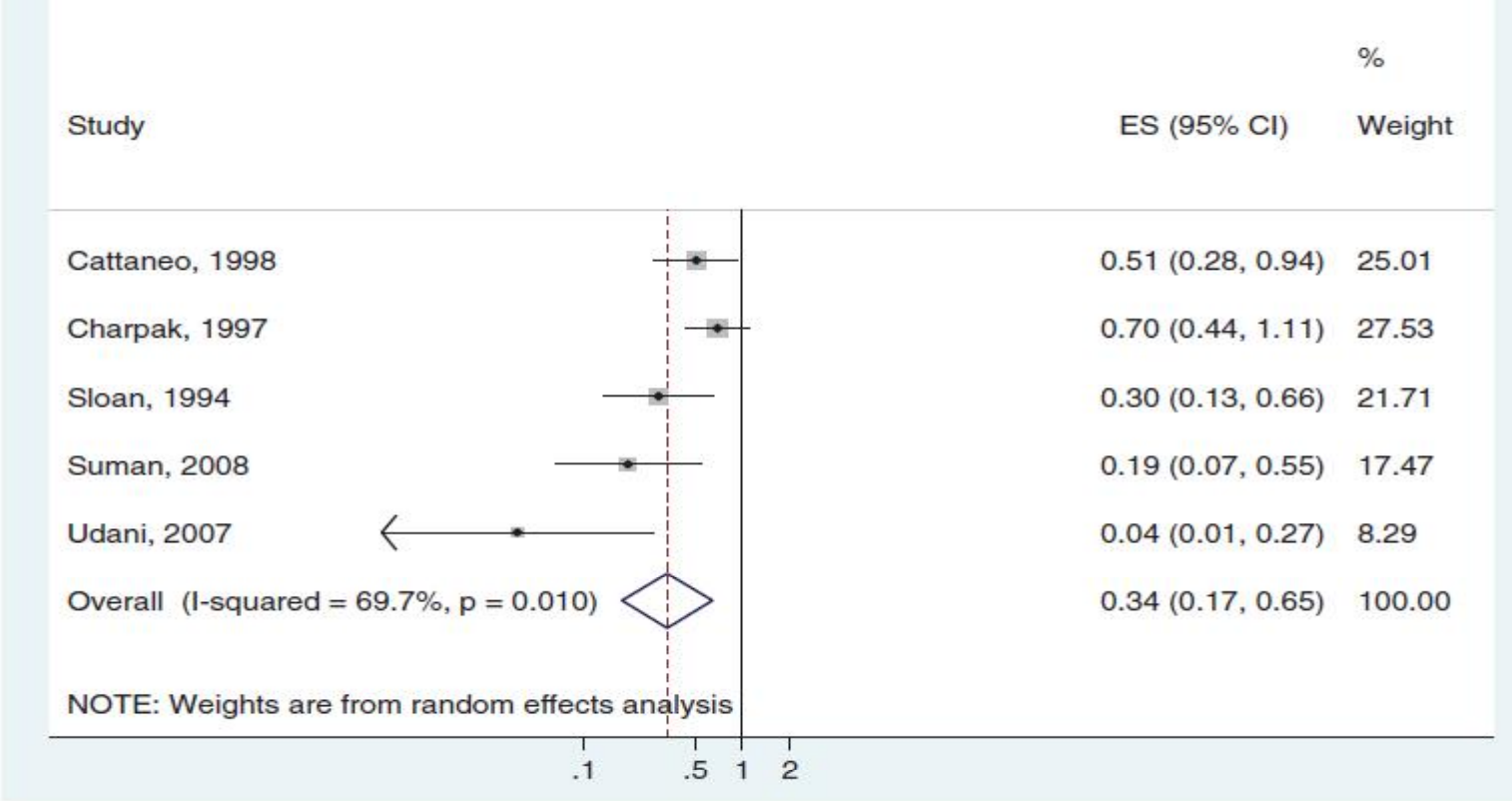


Figure 2 (**a**) Meta-analysis of three RCTs comparing KMC with standard care showing cause-specific mortality effect for babies of birth weight <2000 g (assumed to be deaths due to direct complications of preterm birth) and excluding studies where KMC was started after the first week of life. (**b**) A meta-analysis of five RCTs comparing KMC with standard care showing effect on severe morbidity (severe pneumonia, sepsis, jaundice and other severe illness) for babies of birthweight <2000 g and excluding studies where KMC was started after the first week of life. Unpublished neonatal specific data courtesy of authors, Charpak and Suman

KMC introduced generally in stable babies after a few days, but many deaths occur before that

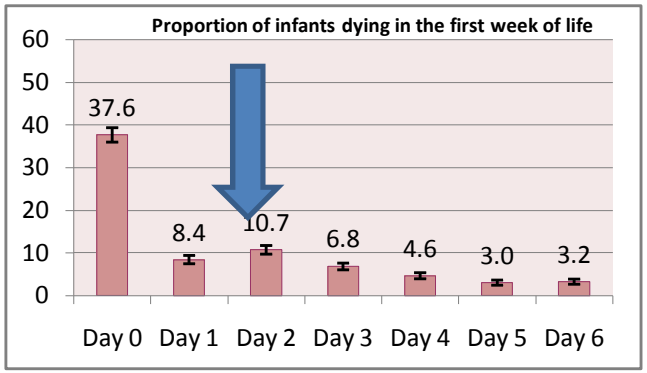
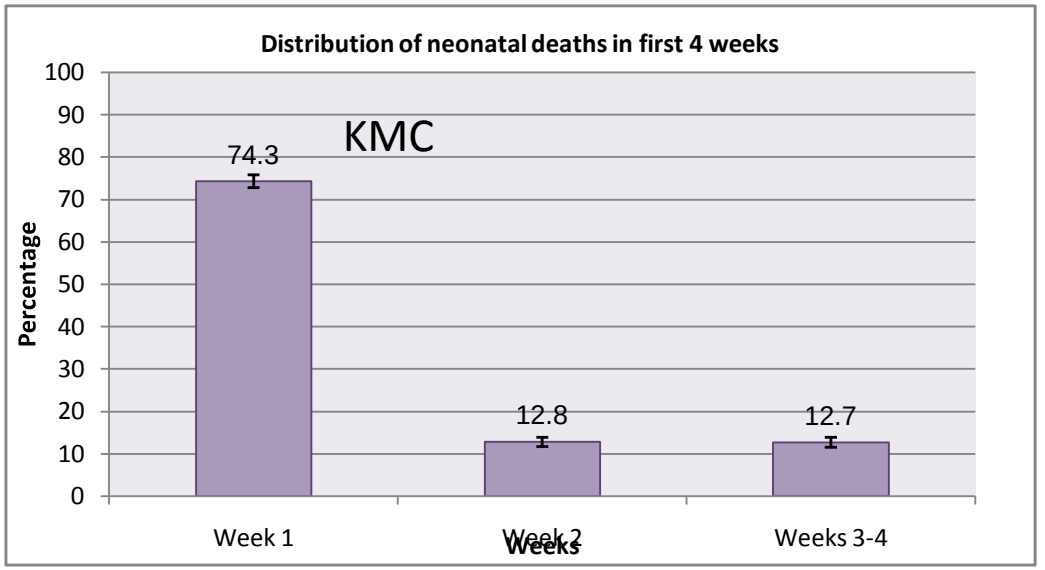


Table 1 RCTs identified which compare mortality outcomes in babies receiving KMC to those receiving standard care

Study	References	Country	Case definition (numbers in trial)	Median day of commencing KMC	Outcome	Design/limitations
1	Charpak *et al.*[9] 1997[9]	Colombia (facility)	Neonates <2000 g (*n* = 746)	6 days	Mortality at 12 months but provided neonatal specific data	RCT—outcome assess not blinded
2	Sloan *et al.*[16] 2008	India (facility)	Neonates <2000 g (*n* = 206)	3.7 days	Mortality at 9 months but provided neonatal specific data	RCT—outcome assess not blinded
3	Worku *et al.*[15] 2005	Ethiopia (facility)	Neonates <2000 g (*n* = 123)	10 h	Neonatal mortality	RCT—poor description of R and follow up
X	Sloan *et al.*[14] 2008	Bangladesh (community)	All neonates (*n* = 4165) (<2000 g = 166 and analysis restricted to <2000 g)	4 h	Neonatal mortality	Cluster RCT, more erratic implementation of KMC. Birthweight data missing for 65%. Possible undercounting of deaths
X	Sloan *et al.*[17] 1994[8]	Ecuador (facility)	Neonates <2000 g (*n* = 300)	12.4 days	Mortality at 6 months	RCT—outcome assess not blinded
X	Cattaneo *et al.*[18] 1998[8]	Mexico, Indonesia, Ethiopia (facility)	Neonates 1000–1999 g (*n* = 205)	10 days	Pre-discharge mortality	RCT—outcome assess not blinded

X indicates not included in this analysis because intervention (KMC) only commenced after the first week of life and >75% of deaths in very low birth weight babies occur during this time. See text for details and sensitivity analysis.
[a]Included in Cochrane 2003, Conde-Agudelo A *et al.*[11]



57% NMR in 72 hrs
i.e.
30% of U5 M
In <72 hours

40% of NMR n 24 hours

Hence, we need for well functioning newborn services for KMC

KMC needs nursing personnel, infrastructure, basic supplies, equipment back up

AIIMS and KMC

Inspired by Prof Shashi Vani

AIIMS' KMC journey

Mentored by Nathalie Charpak

- 1998
  - Training of two nurses at Bagota courtesy Dr Nathalie Charpak
- 1999-2001
  - AIIMS KMC Study (Ramanathan, Paul,Deorari, Taneja, George)

Kangaroo Mother Care in Very Low Birth Weight Infants

K. Ramanathan, V.K. Paul, A.K. Deorari, U. Taneja and G. George

Department of Pediatrics, All India Institute of Medical Sciences, New Delhi, India

Table 2. Comparison of Weight Gain and Age at Discharge

Characteristic	KMC Group (N=14)	Control Group (N=14)	p Value
Weight gain velocity (G)			
1st week Mean ± SD	– 17.2 ±10.4	–14.2 ± 10.4	0.55
95% C.I.	(–22.7) - (-11.7)	(–19.9) - (-8.7)	
Weight gain velocity (G)			
2nd +3rd + 4th week Mean ± SD	15.9 ± 4.5	10.6 ±4.5	0.003
95% C.I.	13.5 – 18.2	8.2 – 12.9	
Age at discharge (days)			
Mean ± SD	27.2 ± 7	34.6 ± 7	0.038
95% C.I.	23.5 – 30.8	31 – 38.2	

KMC = Kangaroo Mother Care; CI = Confidence Interval

Table 3. Follow-up at 6 Weeks

Variable	KMC Group (n=14)	Control Group (n=14)	p value
No. of mothers who continued KMC in their homes	9	NA	
No. of infants exclusively breast fed	12	6	0.04 RR=2; 95% CI=1.05-3.8

NA–Not applicable; CI–Confidence interval; RR–Relative risk

2001
KMC at AIIMS becomes a standard!!!!

Special jacket

Special jacket

Special jacket…

KMC Dissemination

Supported by Ms Anne Tinker

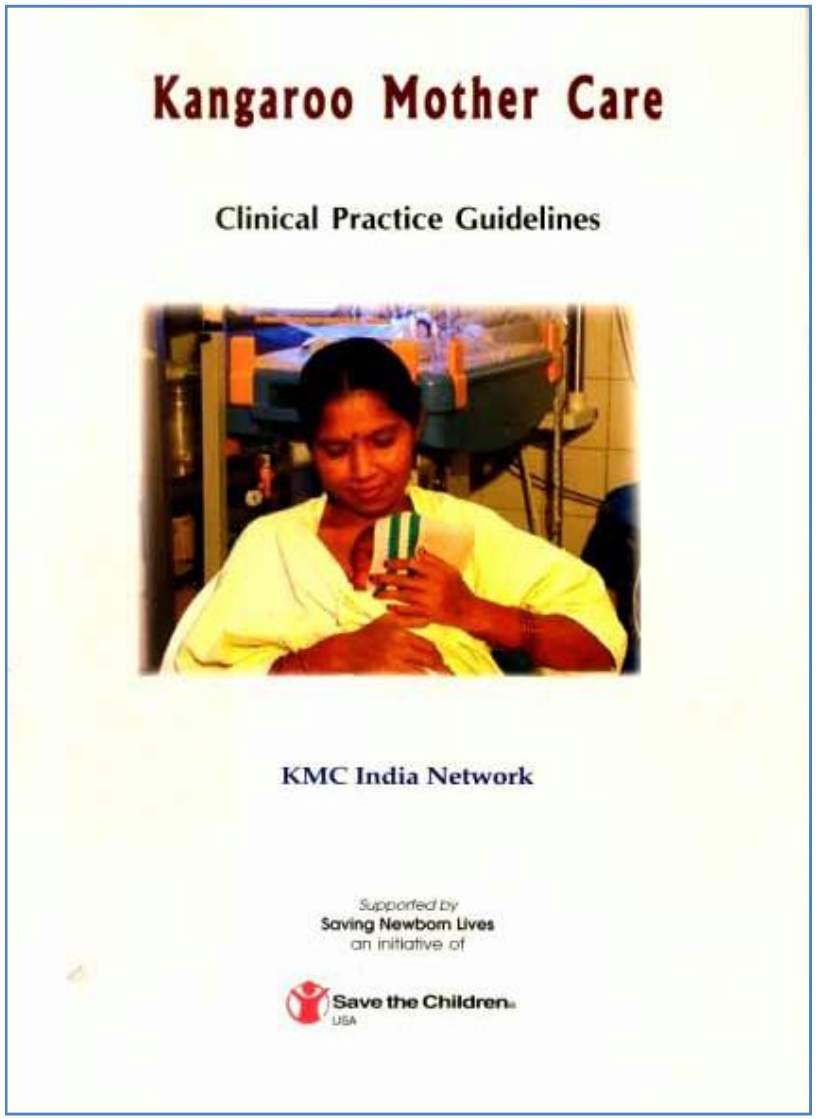
Kangaroo Mother Care (KMC) Network of India

- SEA Regional Trainers' Meeting (2002)
- **SNL sponsored training at Bagota for 5 team of neotaologist + nurse from KEM Mumbai, ICH Chennai, PGI Chandigarh, KGMU Lucknow, SMS Jaipur**

Kangaroo Mother Network of India (2003-04)

- **Created demonstration sites**
- **Conducted on- and off side workshops**

Kangaroo Mother Care (KMC)

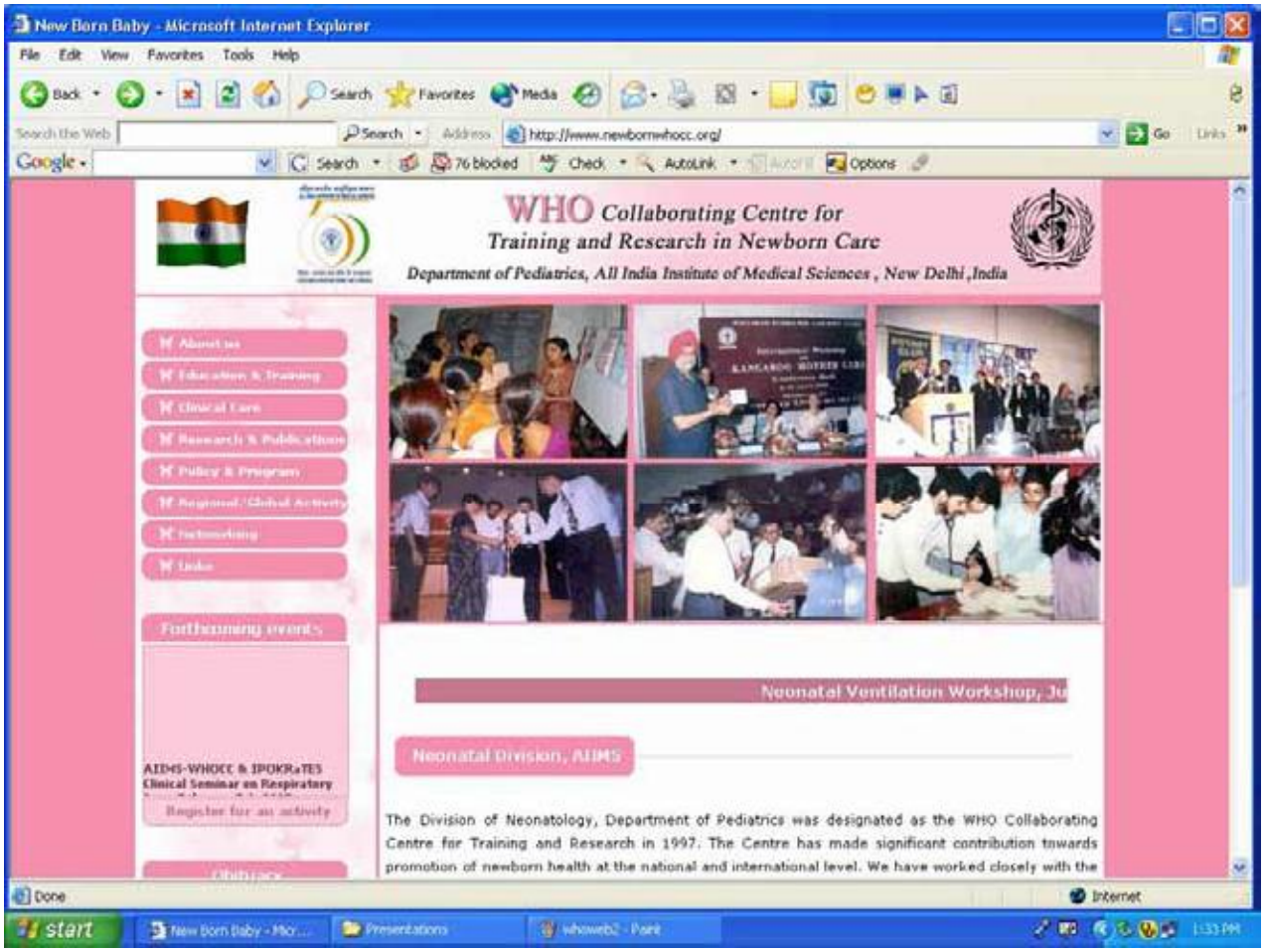


KMC website

www.kmcindia.org

The website

www.newbornwhocc.org



KMC Diffusion in South East Asia

New KMC Unit – AIIMS 2008

Part Support by Rotary International

Eight Workshops in Delhi:
Newborn Week 2008 - NNF

KMC:
How do we do it at AIIMS?

Plethora of KMC resources

- KMC network

  -Guidelines

  -Poster
- KMC teaching module
- Videos on KMC
- Webinar (Udani)
- Interactive DVD
- Website www.kmcindia.org
- E Learning ONTOP

ONTOP e -Learning

World Health Organization

ONTOP-IN/Sick NB /2012

Week 2

You will learn this week

a. Enlist the factors which contributes to heat loss and know how they can be prevented.
b. Teach the mother how to keep her baby warm after birth and at home.
c. Procedure, benefits and counselling for KMC.
d. Plan appropriate nursing interventions for a baby experiencing Hypothermia.
e. Explain what is hyperthermia and how to prevent it.

Lesson 2: Kangaroo Mother Care

1. Webinar
2. Video on KMC
3. Video KMC AIIMS

Read the Module

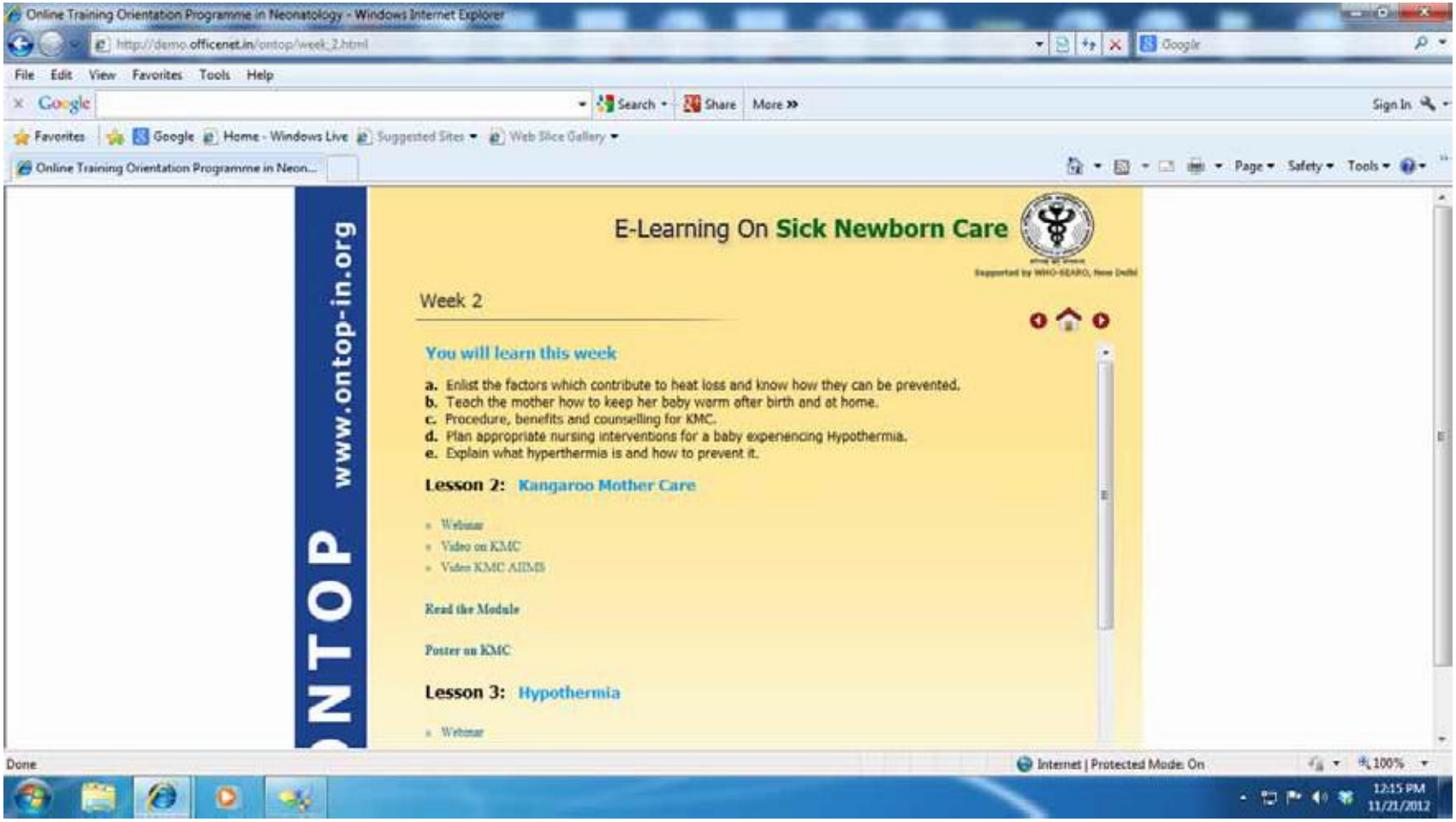
Poster on KMC

Lesson 3: Hypothermia

1. Webinar
2. Podcast on radiant warmer
3. Text radiant warmer
4. SEARO WHO STP on hypothermia
5. Video on Temperature Recording

Internet | Protected Mode: On

Interactive DVD



India: Quo vadis KMC?

KMC embedded in the Public Health Newborn Care

Facility Based Newborn care in India: A Conceptual framework

FACILITY BASED CARE OF SICK NEONATE AT REFERRAL HEALTH FACILITY

PARTICIPANT MANUAL

UNICEF

At Delivery

Newborn corner (1 bed)

Sick newborn

District Hospital → Special newborn care unit (12-20 beds)

CHC → Stabilization units (4 beds)

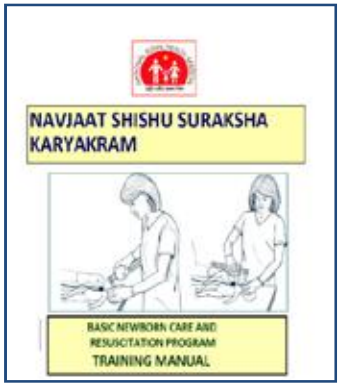
PHC

Community

Facility based newborn care module (NNF)

F-IMNCI

NSSK



But scale up is slow

KMC Coverage:
Very Low?

- **Private sector**
- **Medical schools**
- **Large hospitals**

It is about coverage – isn't it?

- India KMC coverage

  ? <5%

Why KMC movement is slow?

- Awareness gap
- Skills gap
- Opportunity gap
- Role model gap
- Skepticism gap

India;
Scale up, scale up, scale up …..

KMC

Three Priority actions

1. **Build capacity**
   - 200 workshops in 3 years
   - On site support
   - Education of providers
2. **Develop demonstration sites**
   - One each State
3. **Develop KMC India Partnership**

Conclusion

- KMC saves small babies
- Scale up is the challenge
- *Time for KMC India National Mission*