Countdown to 2015
Maternal, Newborn & Child Survival

New evidence on intervention efficacy & effectiveness

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Countdown to 2015
Maternal, Newborn & Child Survival

New research evidence

- Introduction
- What's new since Countdown 2008
  - Child survival (Betty Kirkwood)
  - Newborn survival (Joy Lawn)
  - Maternal survival (Fernando Althabe)
  - Implementation (Anuraj Shankar)
- What's on the horizon
- Major gaps

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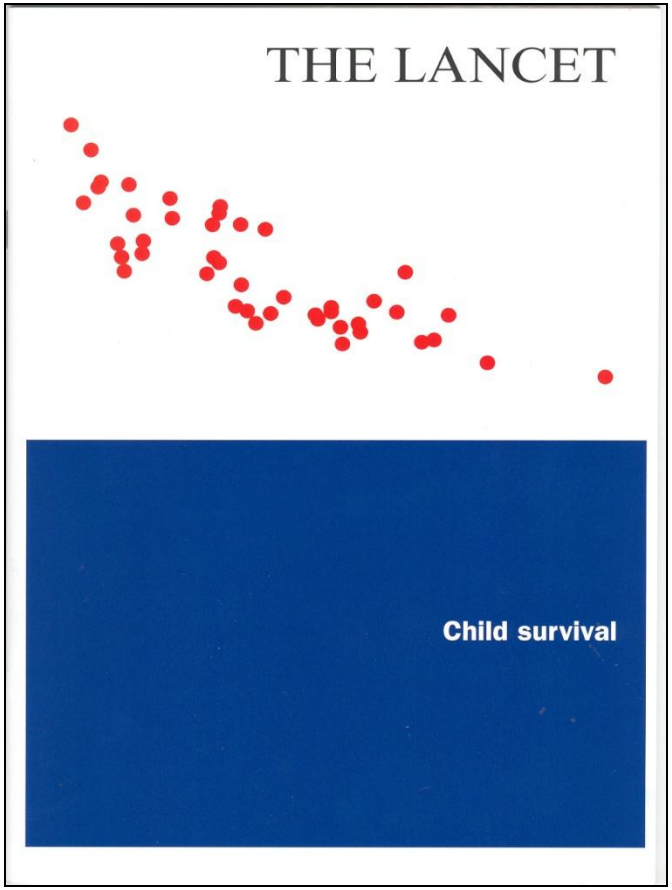
The beginning!

- **Lancet Child Survival Series 2003**
- **23 effective affordable interventions**
  - 15 preventive (9 child, 6 newborn)
  - 8 case-management (6 child, 2 newborn)
- **Could save 6.6m of 10.6m deaths**
- **Call to action: child survival fallen off the agenda**



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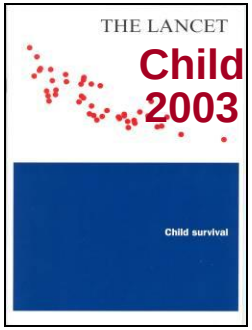
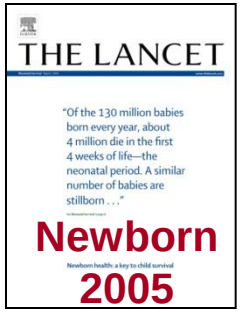
Followed by!



Child 2003



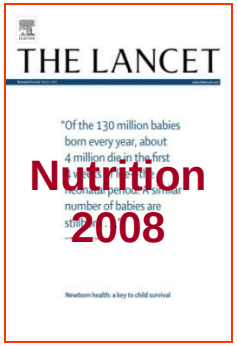
Newborn 2005

About 200 interventions

Maternal 2006

Repro-ductive Health 2006

Child Develop-ment 2007



Nutrition 2008

Stillbirths 2009

- 15 effective child survival interventions + RUTF for SAM
- 6 to watch

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New Evidence

- Promoted interventions
  - Challenging current thinking
  - PMNCH review
  - Interventions "on watch"
  - Accumulating evidence base
- New interventions
- Good ideas that don't work
- Delivery strategies
- Implementation

Thanks to

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New evidence: adapting existing intervention

Severe pneumonia: Amoxycillin & task shifting

- Pakistan Randomised Open-label Equivalency Trial:
  - Home treatment with high-dose oral amoxicillin equivalent to hospitalisation and parenteral ampicillin
  - Treatment failure at day 6: 7.5% vs 8.6%; P>0.05
- Observational cohort study Bangladesh:
  - CFR reduced from 1.1% (when cases referred) to 0.6% (treatment at 1st level facilities introduced); P=0.39
- Pakistan cluster RCT of home management of severe pneumonia by Lady Health Workers:
  - Encouraging preliminary findings

Hazir et al, Lancet 2008; Chowdhury et al, Lancet 2008; Bhutta personal comm

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New evidence: adapting existing intervention

HIV+ mothers: BF then Abrupt weaning

- RCT Lusaka Zambia
  - Counseling encouraged abrupt weaning at 4 months
  - encouraged continued BF for as long as women chose.
- The primary outcome was either HIV infection or death of the child by 24 months.
- No difference in rate of HIV-free survival at 24 months; 68.4% vs 64.0% survived (P=0.13)
- Higher mortality among children HIV+ by 4 months in intervention group; 73.6% vs. 54.8% (P = 0.007)

Kuhn et al, NEJM 2008

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New evidence: "on watch" intervention

HIV+ infants: Early ARVs reduce mortality

- RCT South Africa: HIV+ infants 6-12 weeks
  - Immediate ARVs
  - Deferred: CD4 <20% (25% aged < 1 year) or clinical criteria
- Early ARVs reduced:
  - Early infant mortality by 76% (49%-89%, P<0.001); 4% vs 16%
  - HIV progression by 75% (59%-85%, P<0.001); 6% vs 26%
  - Stopped by DSMB (average 40 weeks followup)

Violari et al, NEJM 2008

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New intervention "to watch": "old" intervention, new outcome

Antenatal iron & Child mortality

- RCT Nepal; 7 year follow-up; 3761 children

	Deaths/1000 child years	HR (95% CI)
VA (control)	15.2	1
VA+Folic acid	13.4	0.90 (0.65,1.22)
VA+Folic acid+IRON	**10.3**	**0.69 (0.49,0.99)**
VA+Folic acid+IRON+zinc	12.0	0.80 (0.58,1.11)
MMN (above + 11 others)	14.0	0.93 (0.66,1.31)

Christian et al, AJE 2009

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New intervention: rediscovery of old intervention

Indoor residual spraying (IRS)

- WHO Position Paper 2006; recommends IRS as a major means of malaria vector control
- New systematic review; Evidence gaps
- Bioko, Equatorial Guinea: intensive malaria control
  - IRS all houses; ACT (oral artesunate with SP) free of charge to children < 15 years and pregnant women as the first-line treatment, IPTp (2004-2008)
  - Under-5 mortality fell from 152 to 55 per 1,000
  - 66% reduction [95% CI = 51%–77%]

Pluess et al, Cochrane Review 2010
Kleinschmidt et al, AJTMH 2009

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"On watch" vaccines New evidence

- **Rotavirus Vaccine:**
  - High efficacy: LA/US
  - New RCT South Africa & Malawi
  - VE 61.2% (44.0%, 73.2%); lower in Malawi than SA
- **Pneumococcal conjugate 11 valent vaccine:**
  - RCT Philippines; VE 22.9% (-1.1%, 41.2%) Xray Pn
  - No impact on clinical pneumonia
- **PCV7:**
  - Trend data (USA) suggest 64% reduction in meningitis in those aged < 2 years

Madhi et al, NEJM 2010
Lucero et al, PIDJ 2009; Hsu et al NEJM 2009

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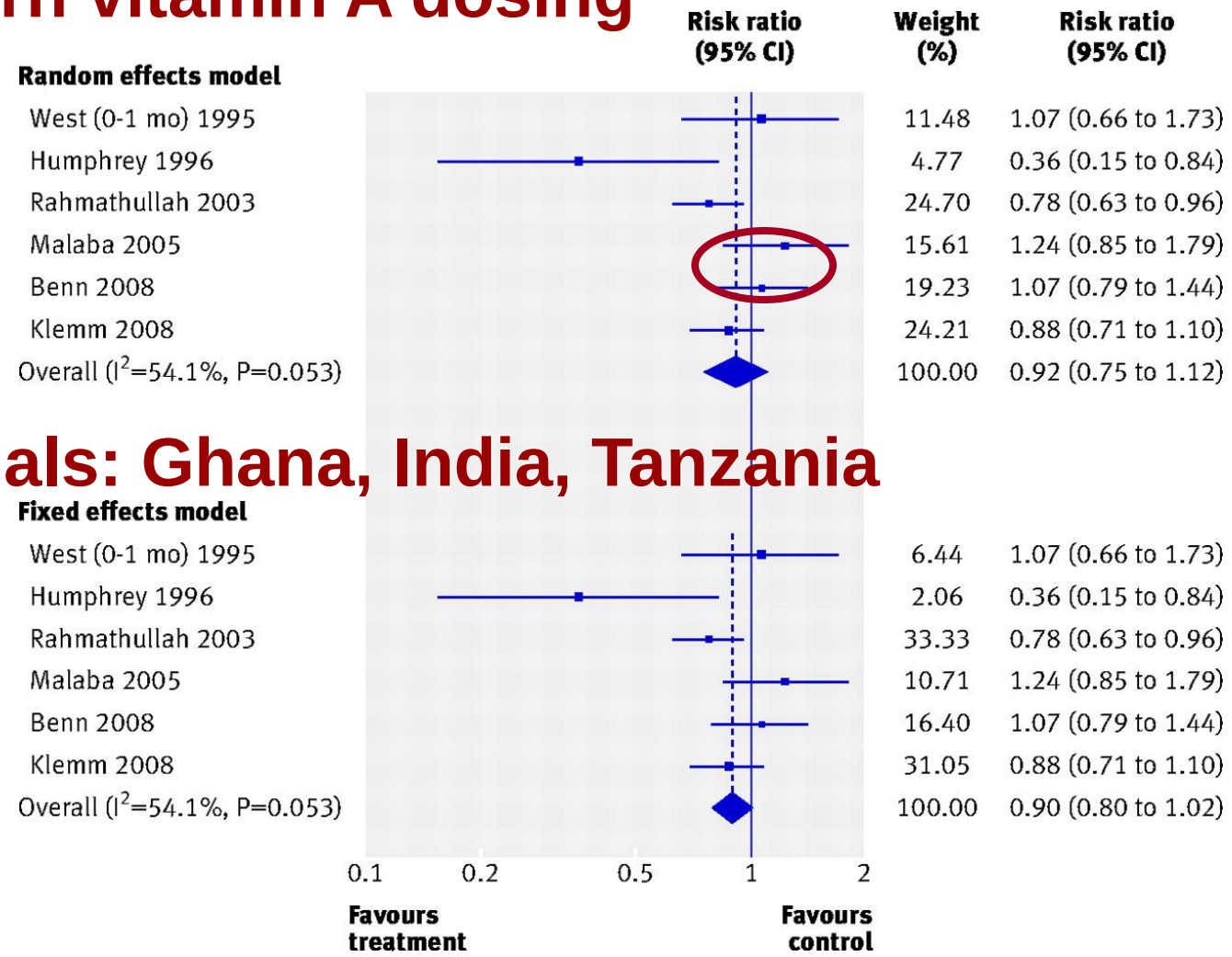
Accumulating evidence: intervention "to watch"

Newborn vitamin A dosing



New trials: Ghana, India, Tanzania

BMJ

Gogia, S. et al. BMJ 2009

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Accumulating evidence: intervention "to watch"

Home fortification: complementary foods

- Systematic review and meta-analysis:
  - Micronutrient powders (e.g. Sprinkles®), crushable tablets and lipid-based or soy-based products.
  - 16 trials (5 anaemia treatment, 11 prevention)
- Home fortification highly effective for prevention of iron deficiency and iron deficiency anaemia.
- Products that contain both micronutrients and a small amount of energy (mainly from fat and protein) can have positive effects on child growth & development.
- Acceptability high by caregivers and young children.

Dewey, Maternal & Child Nutrition 2009

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On the horizon: New child survival intervention?

Mass distribution of oral azithromycin

- Cluster RCT Ethiopia: Mass distribution for trachoma control
- Reduced mortality among children aged 1-9 years:
  - 18,415 children; 48 clusters
  - 4.1 vs 8.3 per 1000 child years
  - RR = 0.51 (0.29-0.90); *P=.02*

Porco JAMA 2009

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On the horizon

- RSV & malaria vaccines
- Lab on a chip diagnostic tools
- Sound wave analysis for auscultation of pneumonia
- Improved stoves that dramatically reduce IAP & cost <$30
- Low cost micronutrient fortified, lipid-based supplements for home fortification (maternal diets, complementary foods)
- Maternal depression; Domestic violence

Major gaps

Interventions to improve nutrition in 1st 2 years: window of opportunity

- Growth faltering occurs in the first 2 years and increases short-term mortality
- The timing of weight gain affects the future risk of chronic diseases
  - Early weight gain is neutral or even protective
  - Later weight gain is consistently detrimental
- The worst possible combination seems to be early undernutrition followed by later rapid weight gain

Victora, de Onis et al. Pediatrics (in press)

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Major gaps

Evidence-based implementation

- Delivering interventions effectively and equitably. And at scale. And with an impact.
- Bridging trial impact – programme delivery gap: Mortality impact in routine implementation