

Quality improvement: An experience/experiment in neonatal clinical practice in Japan

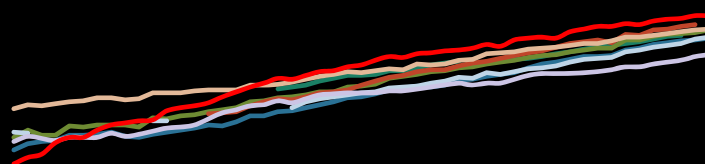
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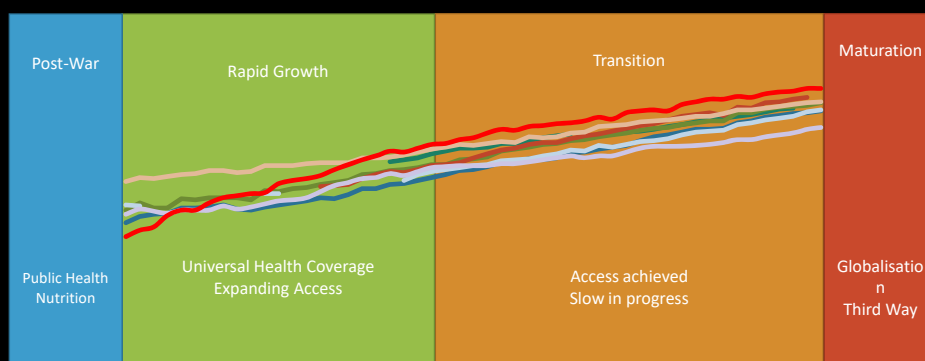
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National Center for Child Health and Development

Life expectancy in G7 countries (1960-2010)



Life expectancy in G7 countries (1960-2010)



25/05/2018

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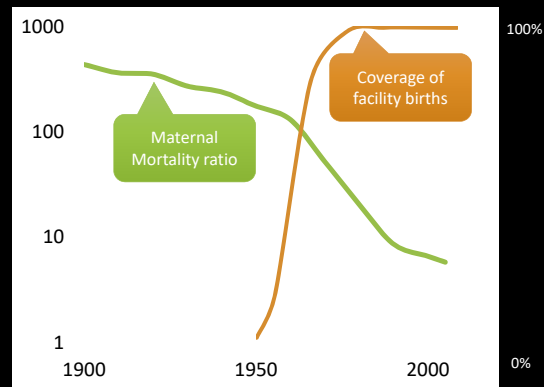
Health Status of selected OCED countries (2014)

	Life expectancy	Infant mortality (per 1000 live birth)	Neonatal mortality (per 1000 live birth)	Perinatal mortality (per 1000 live birth)	Maternal mortality (per 100000 live birth)
Australia	84.4	3.4	2.4	8.2	1.9
France	86	3.5	2.5	10.6	5.5
Germany	83.6	3.2	2.2	5.4	4.1
Italy	85.6	2.8	2	4	2.1
Japan	86.8	2.1	0.9	2.5	3.3
Korea	85.5	3	1.7	3.1	11
Sweden	84.2	2.2	1.4	5.1	3.5
UK	83.2	3.9	2.7	6.7	6.7
US	81.2	6	4	6.2	12.7

(OECD Statistics 2016)

Maternal mortality ratio and facility births (Japan, 1900-2005)

Maternal mortality ratio dramatically declined with increased coverage of facility birth (Skilled Birth Attendant) after the World War II

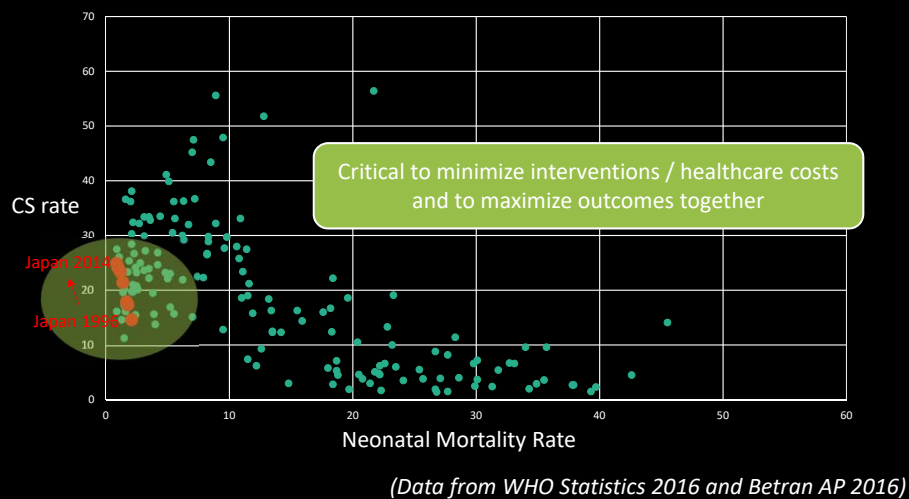


(MHLW 2008)

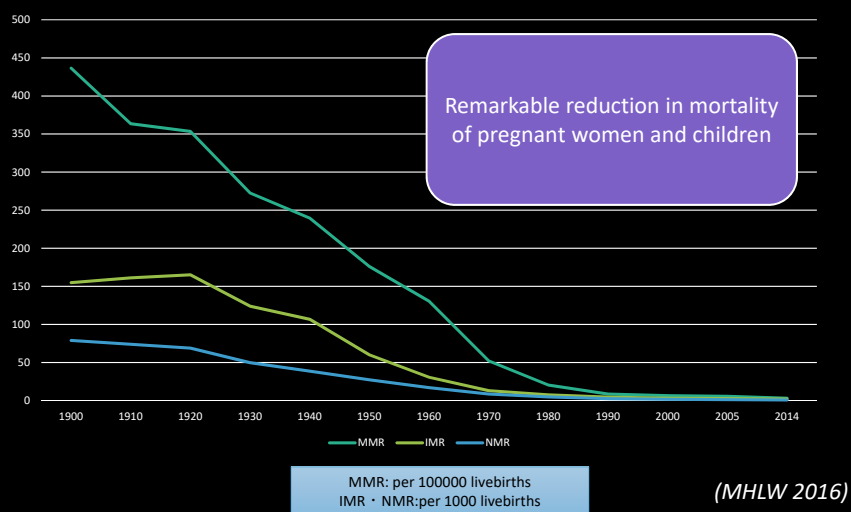
Financing childbirth in Japan

- Japan perceives maternity care not as a medical process
- All the families with childbirth receive a fixed allowance of 420,000 Japanese Yen per baby from social health insurers or local governments
- Free choice of place of childbirth ensured and each facility charges families based upon the care
- Midwifery homes charge less than the allowance and tertiary centres charge more than the allowance
- Once developed any complications, social health insurance covers all the costs

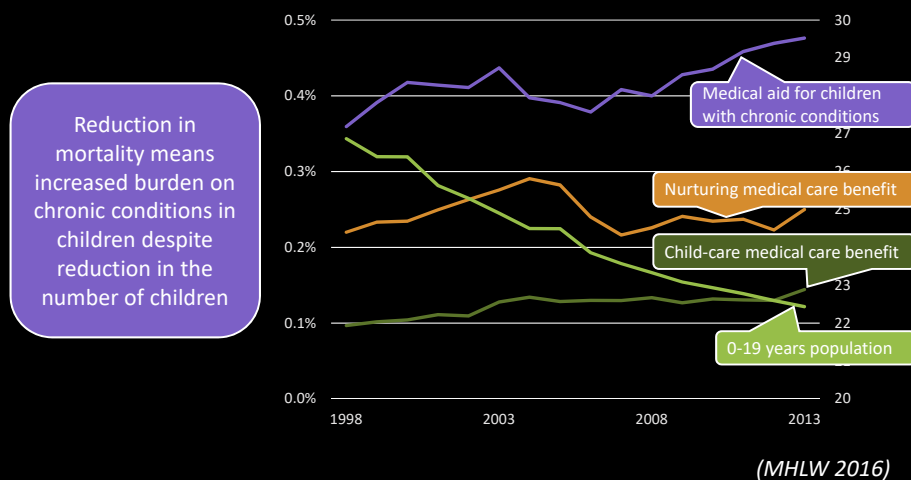
Neonatal mortality rate versus caesarean section rate globally (latest available data)



Maternal, Infant, Neonatal Mortality ratios in Japan (1900-2015)



Children receiving financial aids for their chronic conditions (1998-2013, Japan)



Policy changes/shifts for the transitions

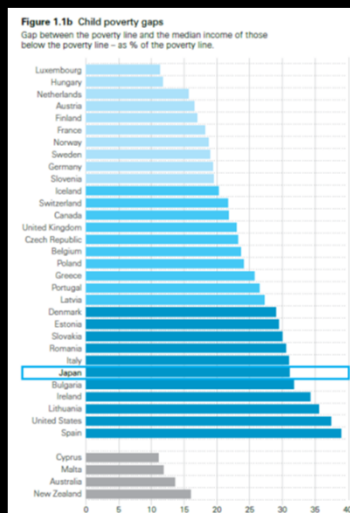
- Medical care from tertiary hospitals to homes
- Specialized care to holistic care
- Respite care for families

Policy changes being implemented to facilitate the health transition in children

Hospital to Community

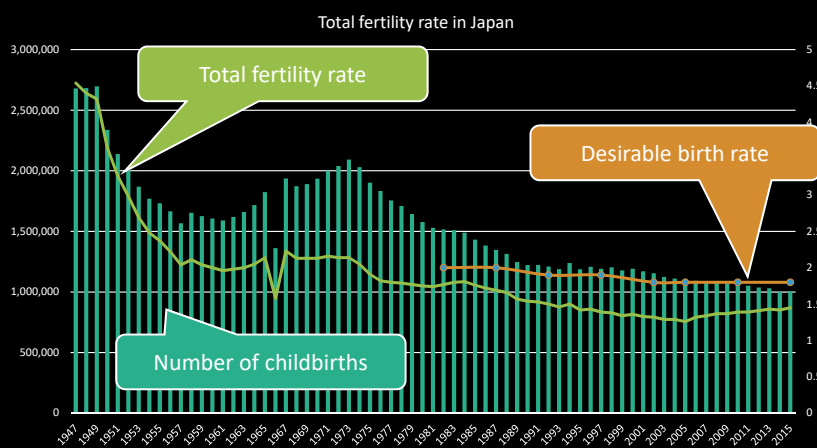
Child poverty gaps in Japan

Traditionally egalitarian society,
though inequality gradually
widened recently



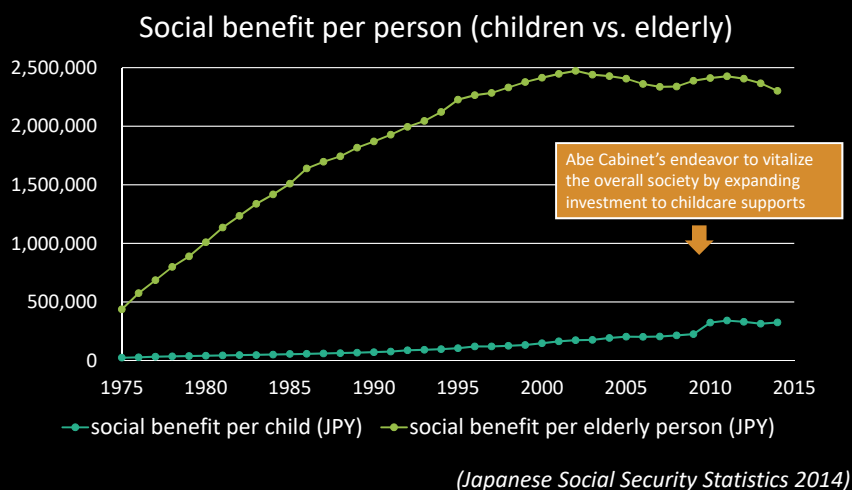
UNICEF Office of Research (2013), 'Child Well-being in Rich Countries: Comparing Japan', Report Card 11, UNICEF Office of Research, Florence

Fertility rate in Japan (1947-2015)



(Data from Statistics Japan 2016 and MHLW 2016)

Policies targeting ageing should includes support for women and children – our past negative experience



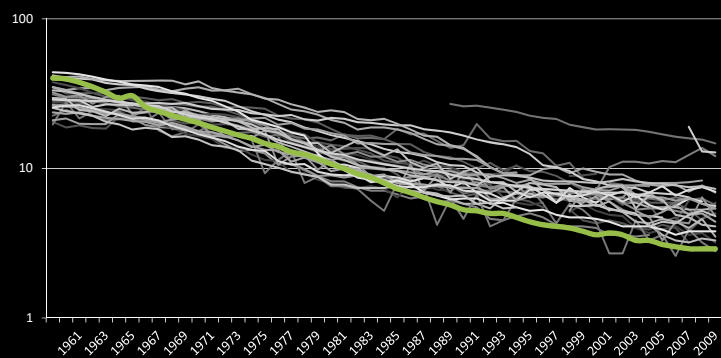
Overview



Overview

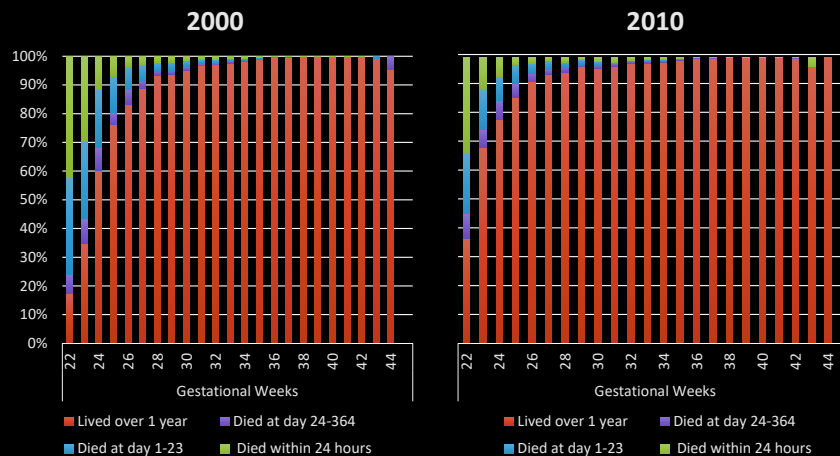


Trend of Perinatal Mortality Rate (OECD Countries)



Mori 2013

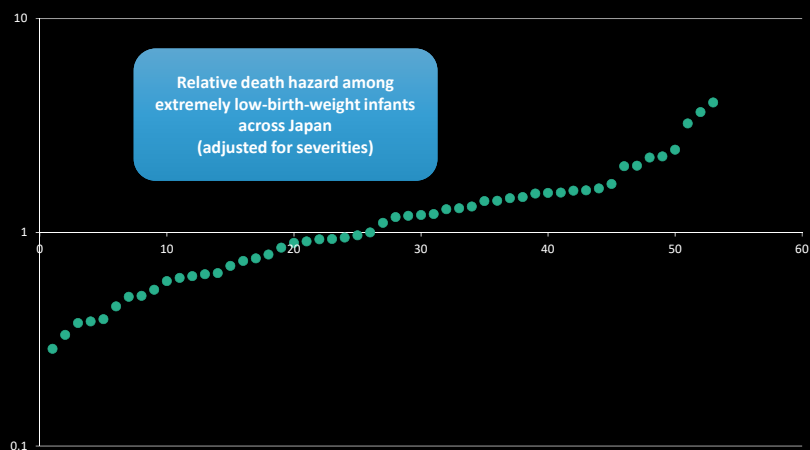
Change in Preterm birth Survival (2000, 2010, Japan)



Neonatal Research Network of Japan

- Started when tertiary neonatal units were designated by the Government of Japan
- Clinical data during admission for VLBW collected
- Variables similar to Vermont-Oxford
- Follow-up data included (up to 3 years)
- Covers 80% of the whole of Japan

Inter-facility Difference in outcomes



Overview



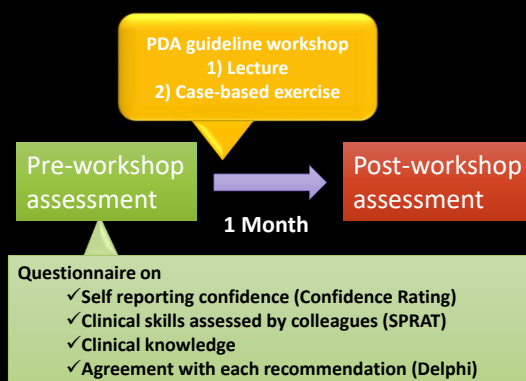
Clinical Governance



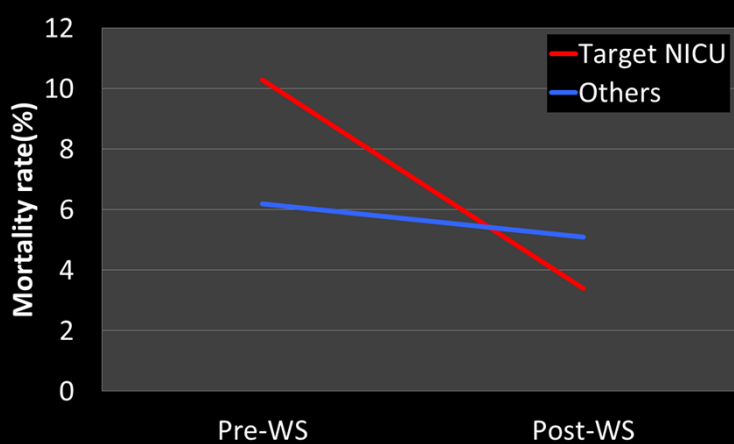
Clinical guidelines in PDA

- Methodology
 - Robust evidence-based approach
 - Systematic reviewing/meta-analyses
 - Formal consensus method
 - Modified-delphi method with public consultation
 - New information technology
 - Facilitating effective communications

The effect of introducing the guidelines
Two medical institutions and 16 doctors at their
newborn infant departments



Changes in Discharge Mortality



Changes in Discharge Mortality



Overview



Overview review implementation strategies

Implementation Strategies	Reviewers	Included Studies	Effectiveness	Note
Audit & feedback	Jamtvedt 2006	118 RCTs	Effective	Moderately effective More effective where low compliance and poor feedback
Continuing education meetings and workshops	Forsetlund 2009	81 RCTs	Effective	Marginally effective Effective where interactive
Educational outreach visits	O'Brien 2007	69 RCTs	Effective	Marginally effective More effective where combined with other effective interventions
Local opinion leader	Doumit 2007	12 RCTs	Effective	Marginally effective

Consultation with other fields

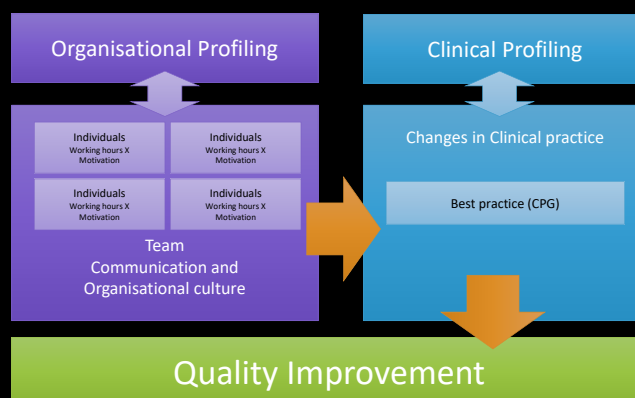
- Car manufacturers (Toyota, Nissan)
- Business management (Academics, consulting companies)

Quality improvement – a continuous process
 Organisational culture (a 'good' team)
 Local leadership development
 OJT rather than expensive training on theoretical issues

Concept



Conceptual framework of quality improvement package



Quality Improvement Package

- Audit data of VLBW against the national network with priorities specific to the unit
- Death case reviews prepared by local team
- Presentation of clinical practice guidelines selected based upon the priorities
- Organisational culture, communication, motivation and working hours
- Horizontal learning
- Mid-grade local leaders
- Workshop in the facility
- 2 years implementation of action plan developed by the local team led by the leader

Ongoing trial INTACT-Trial



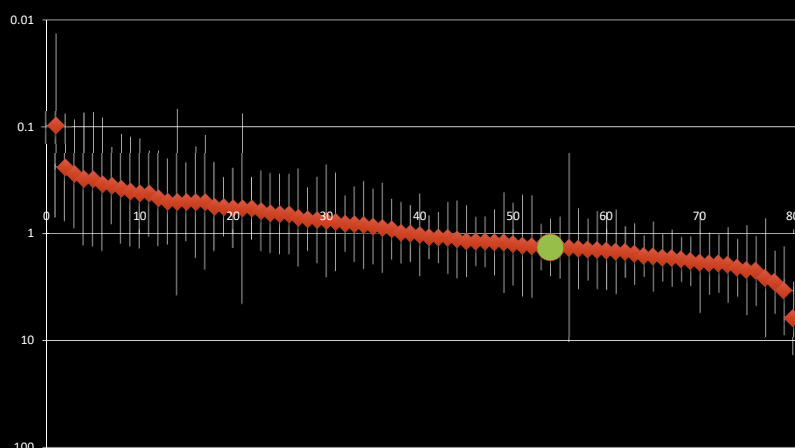
- Cluster randomised controlled trial
- Population:
 - 40 participating neonatal units in NRN Japan
- Intervention:
 - “Quality improvement package”
- Comparator:
 - Delayed intervention
- Outcome:
 - Intact survival of infants weighing 400-1250 gram at 3 years

Workshop to formulate a facility specific policy



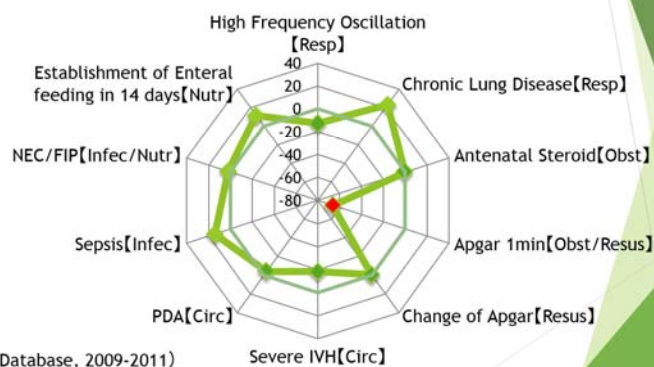
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Facility Profiling Discharge Mortality Ranking



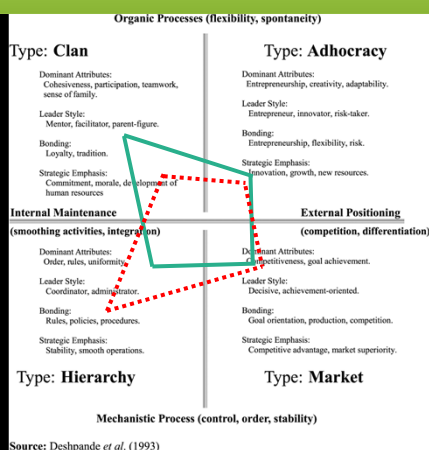
Impact to outcomes

- Contribution to ranking -



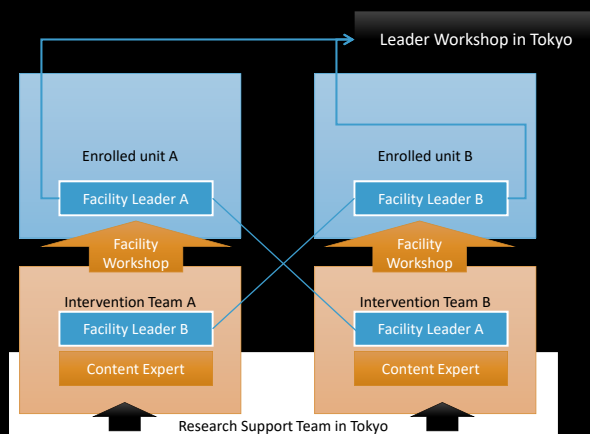
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Organisational Culture



Intervention Team

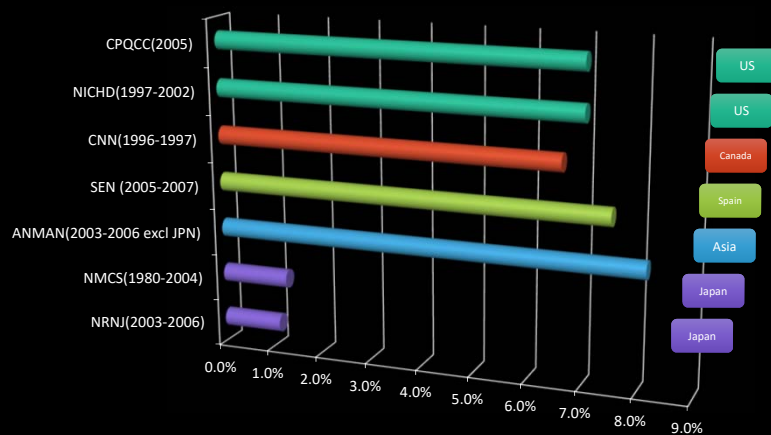
(Empower the local team)



Overview



Incidence of NEC among VLBW infants (World Networks)



Canada versus Japan Outcomes

Outcomes	All VLBW	<25 w	25 – 26 w	27 – 28 w	29 – 32 w
Mortality or any major morbidity	0.87 (0.79-0.96)	0.35 (0.25, 0.51)	0.76 (0.63, 0.91)	1.12 (0.95, 1.32)	0.92 (0.76, 1.10)
Mortality	0.40 (0.34, 0.47)	0.28 (0.22, 0.37)	0.42 (0.32, 0.56)	0.46 (0.33, 0.64)	0.82 (0.50, 1.34)
Severe neurological injury	0.57 (0.49, 0.66)	0.45 (0.34, 0.59)	0.45 (0.35, 0.58)	0.66 (0.51, 0.86)	0.83 (0.62, 1.12)
BPD	1.24 (1.10, 1.42)	1.32 (1.01, 1.71)	1.08 (0.89, 1.32)	1.48 (1.19, 1.85)	1.17 (0.87, 1.58)
Severe ROP	1.98 (1.69, 2.33)	1.09 (0.82, 1.45)	1.44 (1.14, 1.82)	4.78 (3.24, 7.04)	3.98 (2.11, 7.52)
NEC	0.23 (0.19, 0.29)	0.50 (0.33, 0.75)	0.26 (0.18, 0.38)	0.16 (0.10, 0.26)	0.07 (0.04, 0.15)
Late onset Sepsis	0.22 (0.19, 0.25)	0.35 (0.27, 0.47)	0.18 (0.14, 0.22)	0.17 (0.13, 0.22)	0.24 (0.19, 0.33)

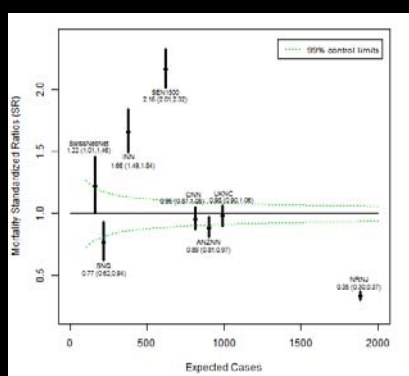
International Network for Evaluation of Outcomes of Neonates(iNeo)



Network Name	Australia and New Zealand Neonatal Network	Canadian Neonatal Network	Israeli Neonatal Network	Neonatal Research Network Japan	Spanish Neonatal Network	PNQn	Swiss Neonatal Network & Follow-Up Group	UK Neonatal Collaborative
Country	Australia and New Zealand	Canada	Israel	Japan	Spain	Sweden	Switzerland	UK
Level III NICUs in the country	23 + 6	30	23	93	n/a	7	10	45
Level III NICUs in the network	29	30	23	73	36	7	10	44
Network coverage	National	National	National	National	National	National	National	National
Number of inhabitants	Australia: 23 million NZ: 4.4 million	34 million	7.9 million	126 Million	47 million	9.5 million	7 million	52 million
Number of births/year	Australia: 300,000 NZ: 60,000	380,863	166,000	1,071,304	497,023	110,000	80,000	687,000

Results

Figure



Bi-country comparison

	ANZNN	CNN	INN	NRNJ	SNQ	SwissNeonNet	SEN1500	UKNC
ANZNN	1	0.94 (0.76, 1.13)	0.51 (0.42, 0.62)	2.02 (0.97, 1.75)	1.30 (0.54, 0.95)	0.71 (0.32, 0.44)	0.90 (0.76, 1.00)	
CNN	1.06 (0.89, 1.20)	1	0.54 (0.46, 0.66)	3.09 (2.54, 3.70)	1.38 (1.03, 1.86)	0.76 (0.37, 1.00)	0.95 (0.80, 1.11)	
INN	1.97 (1.62, 2.41)	1.86 (1.53, 2.28)	1	5.77 (4.07, 7.12)	2.07 (1.89, 3.51)	1.41 (1.05, 1.96)	1.77 (1.45, 2.15)	
NRNJ	0.34 (0.28, 0.42)	0.32 (0.27, 0.39)	0.17 (0.14, 0.21)	1	0.43 (0.33, 0.61)	0.24 (0.18, 0.33)	0.33 (0.11, 0.15)	0.31
SNQ	0.77 (0.57, 1.00)	0.73 (0.55, 0.98)	0.39 (0.29, 0.53)	2.24 (1.65, 3.04)	1	0.53 (0.38, 0.79)	0.69 (0.51, 0.92)	
SwissNeonNet	1.40 (1.06, 1.86)	1.32 (1.00, 1.76)	0.71 (0.53, 0.96)	4.09 (3.05, 5.49)	1.63 (1.26, 2.64)	1	1.27 (0.80, 0.89)	1.25
SEN1500	2.69 (2.29, 3.17)	2.54 (2.16, 3.00)	1.36 (1.13, 1.60)	7.86 (6.54, 9.45)	3.51 (2.63, 4.69)	1.82 (1.46, 2.53)	1	2.41
UKNC	1.12 (0.94, 1.32)	0.86 (0.69, 1.25)	0.57 (0.47, 0.69)	3.26 (2.66, 3.95)	1.46 (1.09, 1.95)	0.80 (0.60, 1.06)	0.42 (0.35, 0.49)	1

Sjors 2015

Quality improvement – lessons learnt

- Learn from differences
- Organisational aspects for sustainability