

Reducing the impact of Neonatal Encephalopathy

Malcolm Battin
CD Newborn Services &
Chair NE Working Group PMMRC

Neonatal Encephalopathy

- Clinically defined syndrome:
 - Disturbed neurological function < 1 week
 - Term infant
- Manifestations include:
 - Difficulty initiating & maintaining breathing
 - Depression of tone and reflexes
 - Sub normal level of consciousness
 - Seizures

Ways to reduce impact:

- Decrease number of cases

Ways to reduce impact:

- Decrease number of cases
- Improve clinical outcomes

Ways to reduce impact:

- Decrease number of cases
- Improve clinical outcomes
- Optimise management
 - Some overlap with improved outcomes
 - Improved quality of information and timeliness of parental counselling

NE Working Group of PMMRC

- For NZ population need national data:

NE Working Group of PMMRC

- For NZ population need national data:
 - Frequency and time trends
 - Distribution – geographical / ethnic / health provider

NE Working Group of PMMRC

- For NZ population need national data:
 - Frequency and time trends
 - Distribution – geographical / ethnic / health provider
 - Clinical features and associations
 - Assessment at discharge & follow up
 - Rates of adverse outcome (CP, death)

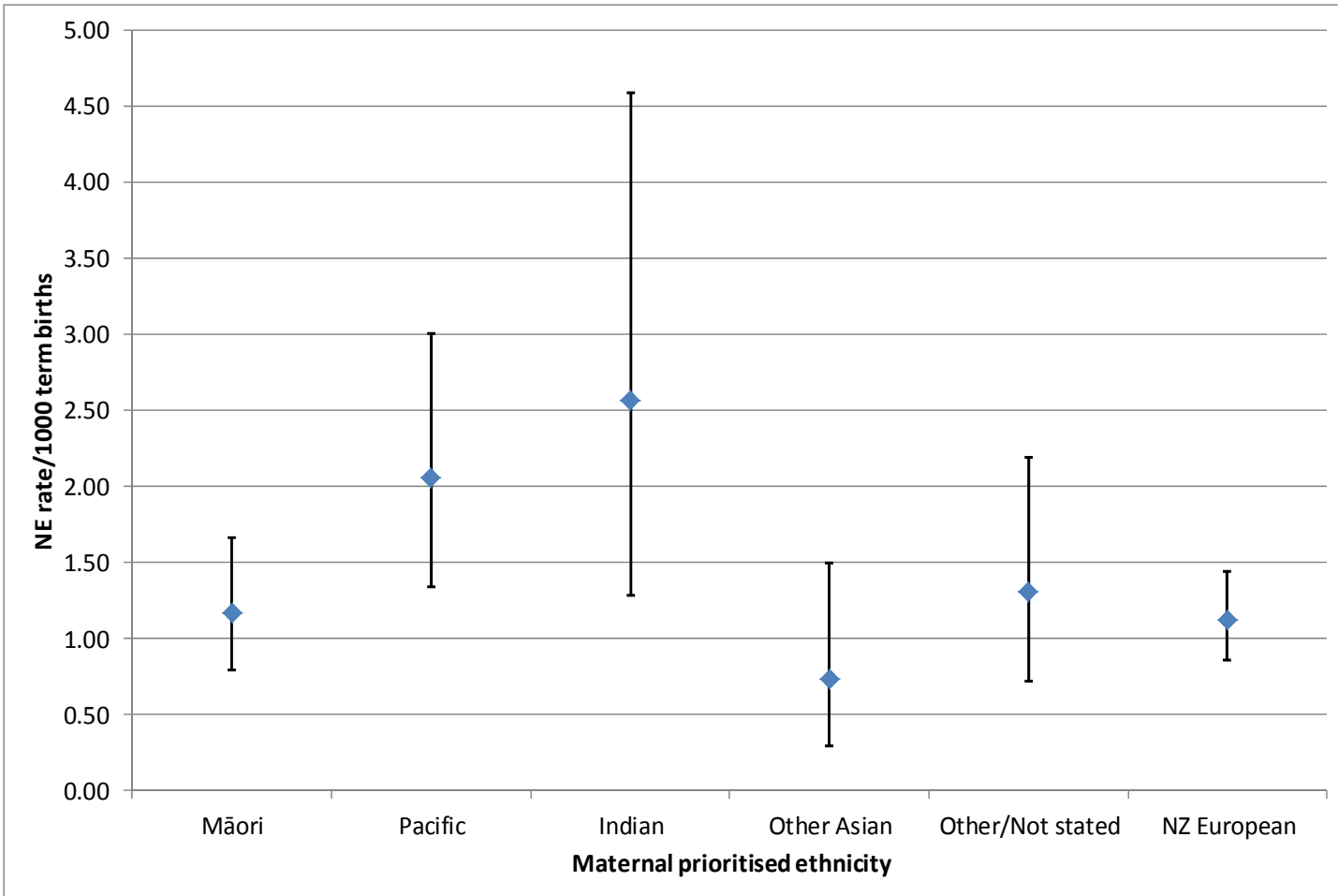
NE Working Group of PMMRC

- For NZ population need national data:
 - Frequency and time trends
 - Distribution – geographical / ethnic / health provider
 - Clinical features and associations
 - Assessment at discharge & follow up
 - Rates of adverse outcome (CP, death)
- Ways to prevent cases & improve outcome

Rate of NE for 2010–2011

- 149 mod/severe NE cases reported via NZPSU
- Rate = 1.17/1000 births (95% CI 0.99–1.37)
 - Or 1.27/1000 births at term
- Hard to directly compare with other series
 - UK estimate 1-1.5/1000 births (*Azzopardi PLOS One 2012*)
- Data reported in 7th PMMRC report & following slides acknowledge NEWG, Lynn Sadler & Frank Bloomfield

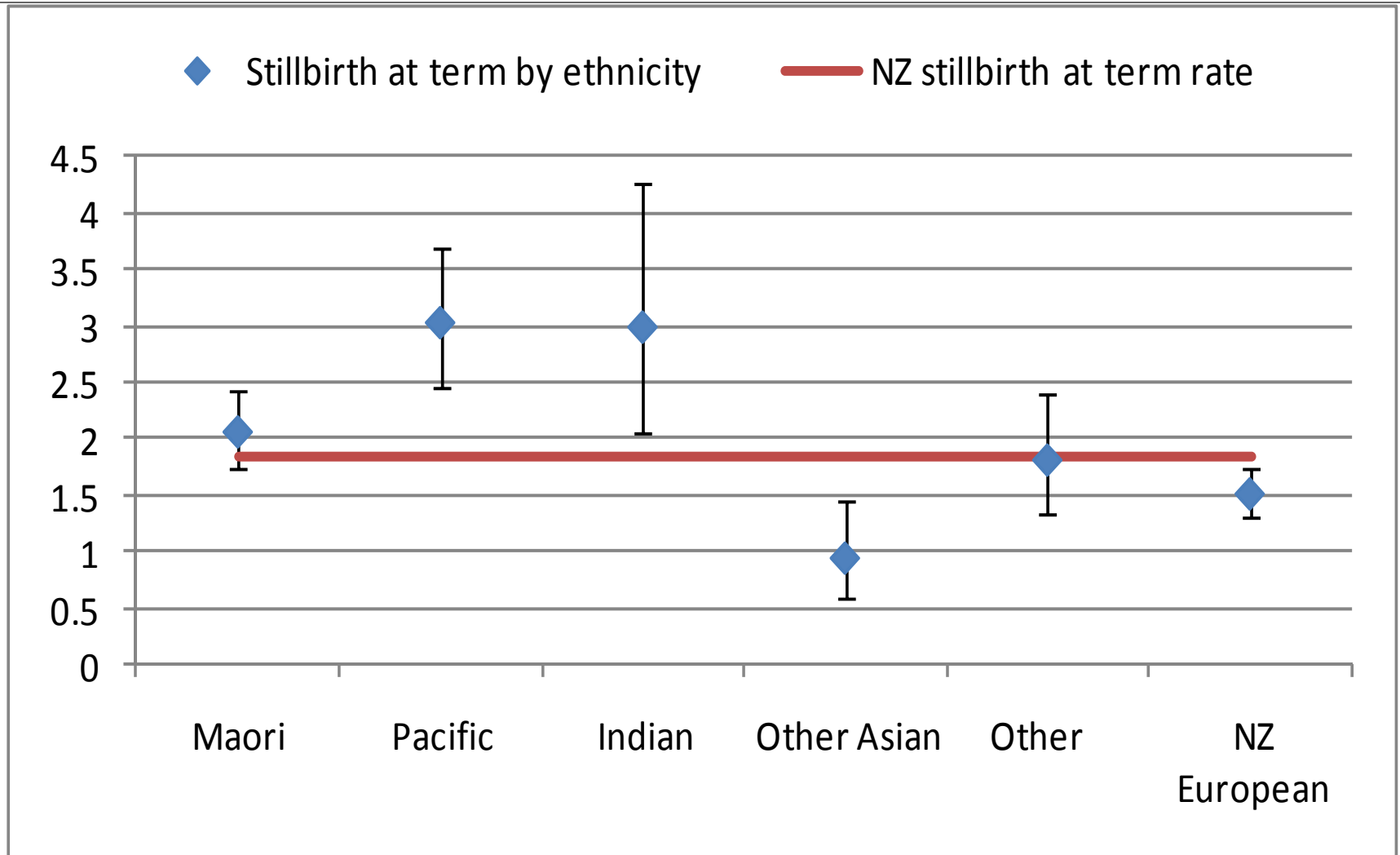
NE rates (per 1000 term births) by prioritised maternal ethnicity



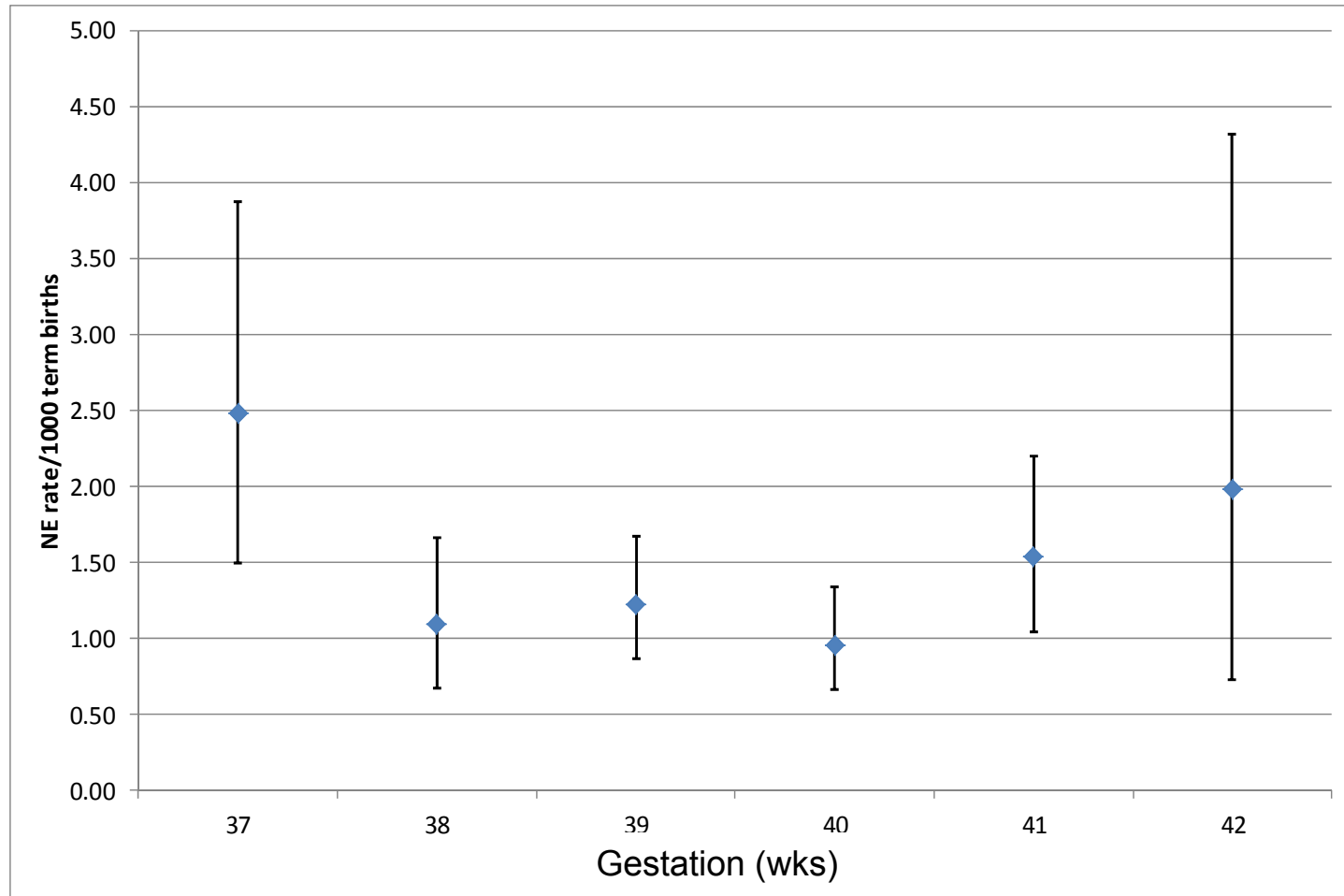
Ethnicity

Ethnicity (Source BDM birth BDM death NE form)	NE cases 2010–2011 N = 149		NZ registered births 2010-2011 ≥ 37 weeks N=117,499		Rate (/1000 births) Term only	
	n	%	N	%	/1000	95% CI
Māori	31	20.8	26,534	22.6	1.17	0.79–1.66
Pacific	26	17.4	12,689	10.8	2.05	1.34–3.00
Indian	11	7.4	4,296	3.7	2.56	1.28–4.58
Other Asian	7	4.7	9,637	8.2	0.73	0.29–1.50
Other/Not stated	14	9.4	10,747	9.1	1.30	0.71–2.19
NZ European	60	40.3	53,596	45.6	1.12	0.85–1.44

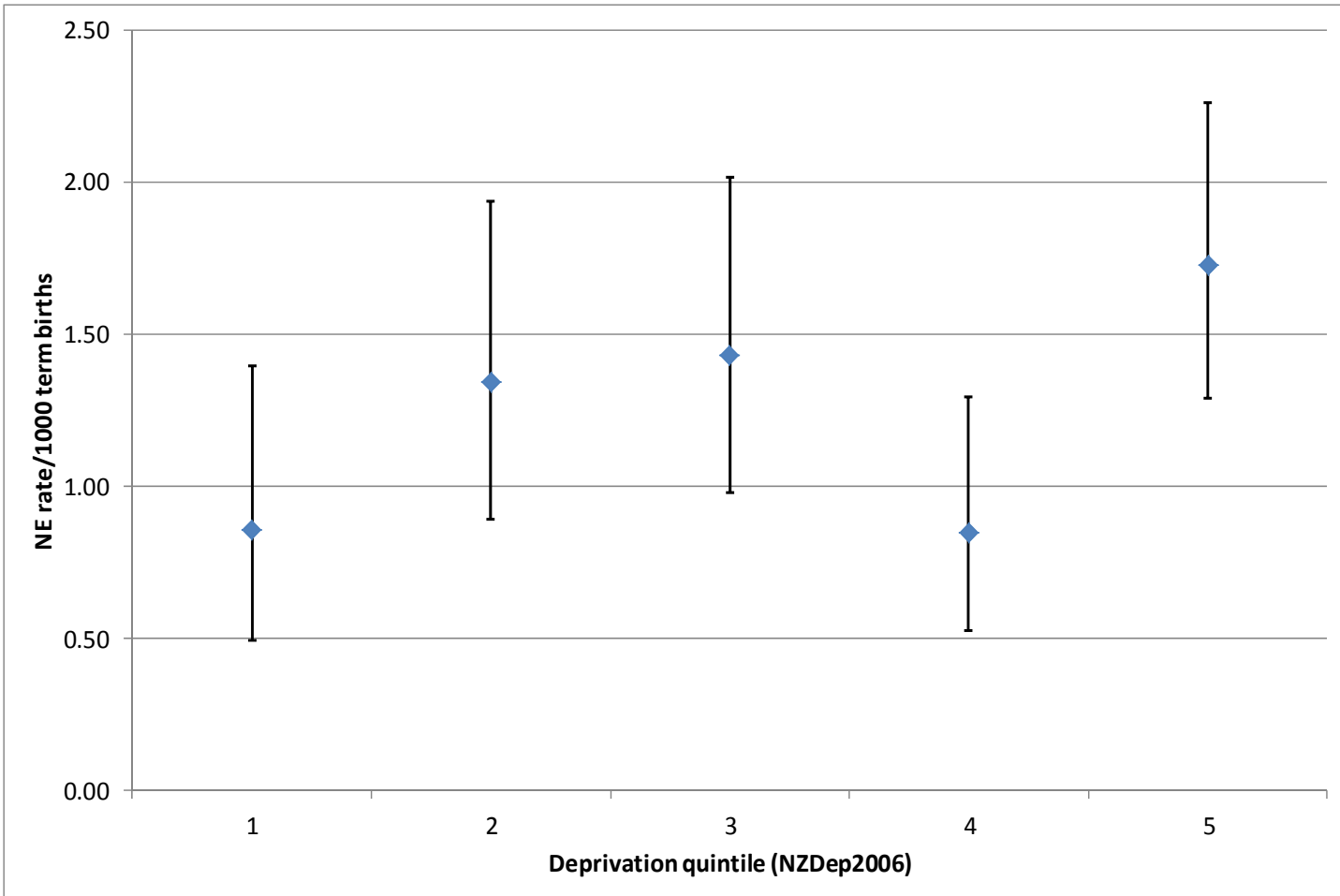
Stillbirth



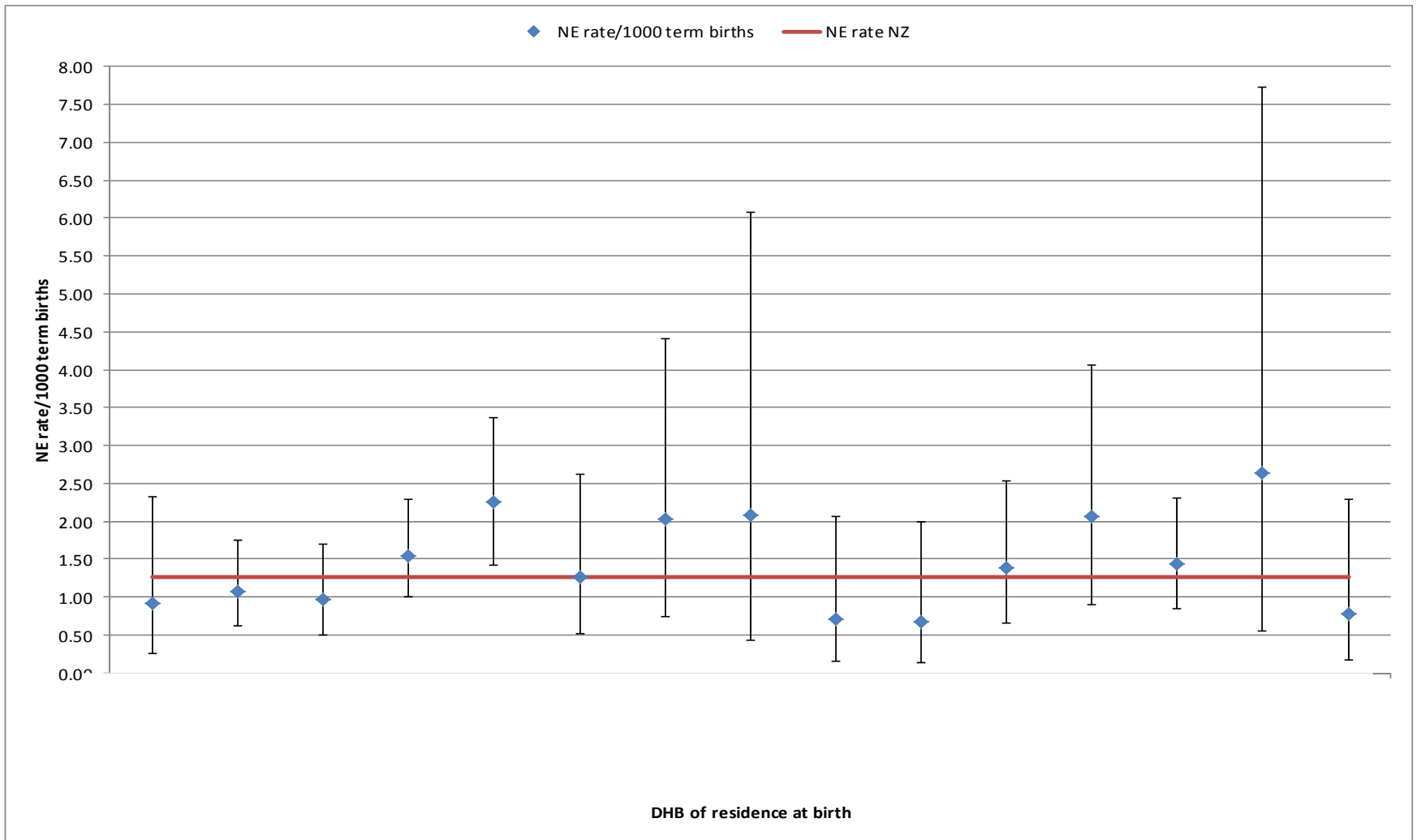
Gestation



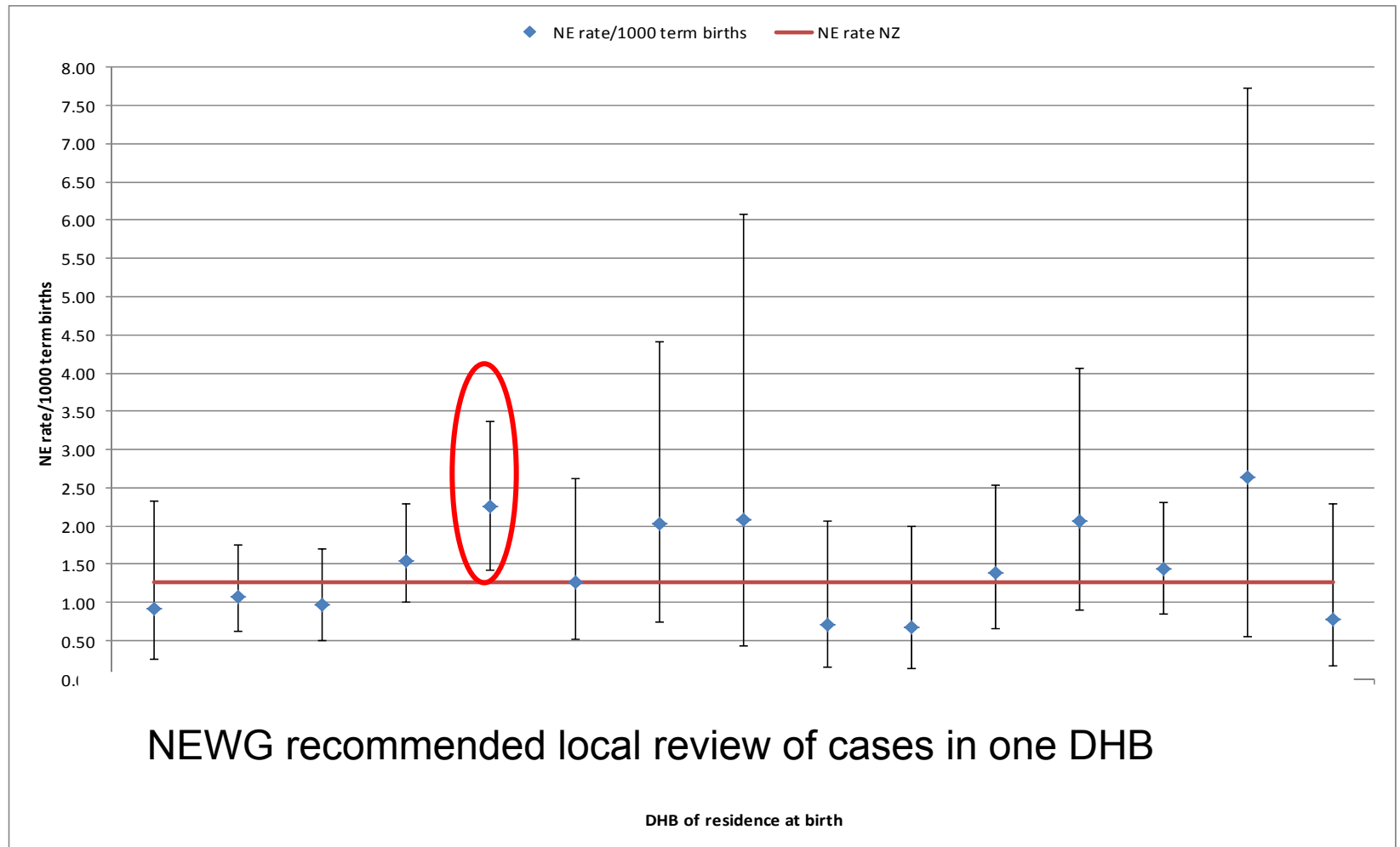
Deprivation



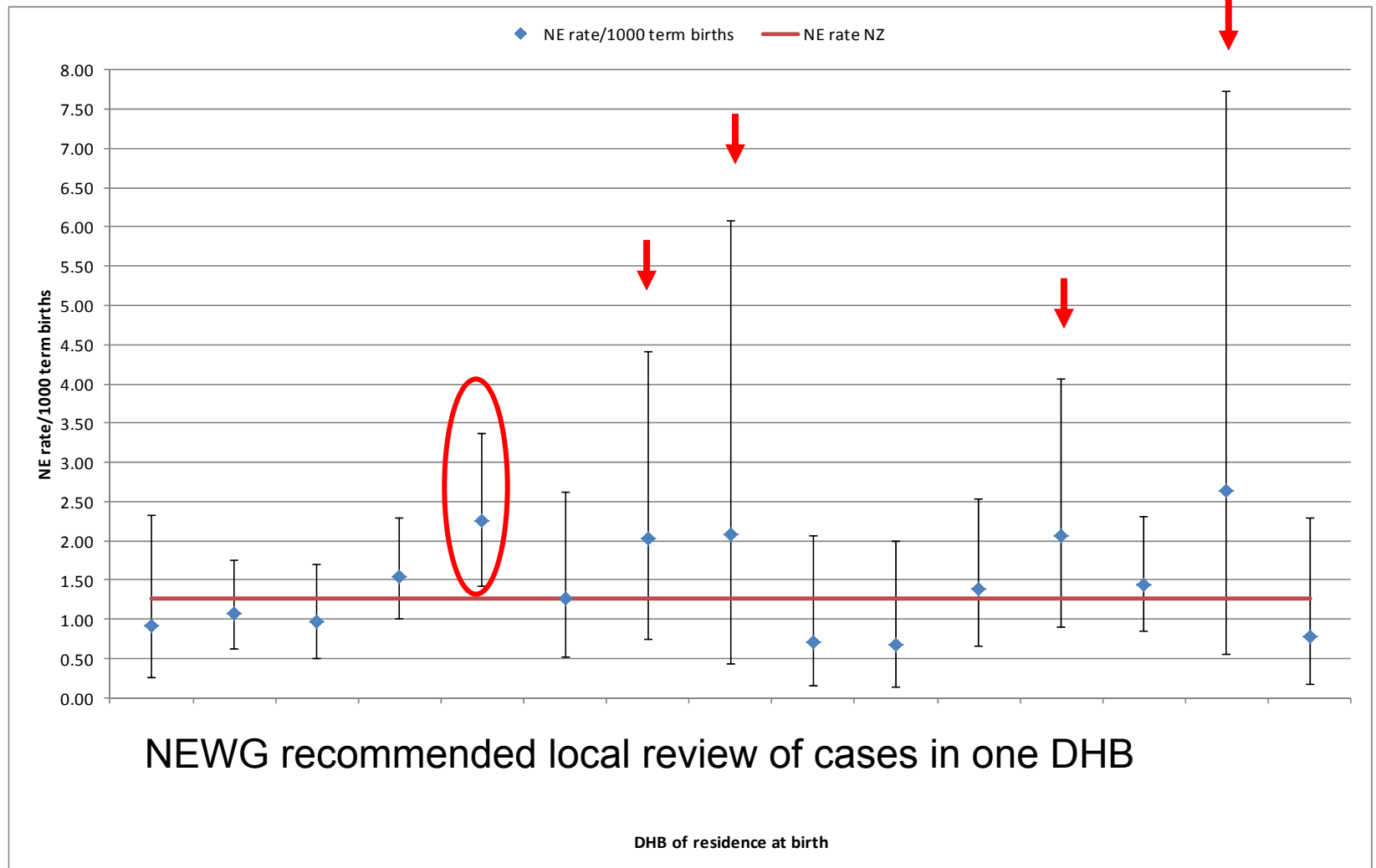
DHB of residence



DHB of residence



DHB of residence



LMC and intended place of birth

- Distribution for LMC at booking in NE dataset was basically same as overall NZ LMC
- At time of birth there was a shift to more hospital provider but this is to be expected
- 25 cases (17%) birth at site other than intended
 - 11 transfers in labour
 - 6 to level 2 or 3 hospital i.e. ↑ level of care

Intrapartum care

- Case review underway
- Some sentinel events
- Key information for preventing cases
 - Methods based on published models
 - Multidiscipline
 - Contributing factors
 - Preventability



Postpartum care



Observation of mother and baby in the immediate postnatal period: consensus statements guiding practice



July 2012



Keeping Babies Safe
A Message For Parents

Skin to Skin contact in the early hours after birth helps babies to make an easier transition to life outside the womb

During the early hours of life all babies need close observation by parents and staff which includes:

- A good position that keeps baby's airway open
- Easy, regular breathing
- Good colour (Pink)

(your midwife will explain all of these to you)

If at anytime your baby

- Does not have easy, regular breathing
- Does not have a pink colour

RING YOUR EMERGENCY BELL OR CALL FOR HELP IMMEDIATELY



- If mother has recently had sedation, or is being sutured, she may not be able to observe her baby properly.
- Hospital staff will be able to observe baby, so skin contact with mother may be maintained.
- In some cases placing baby in skin contact with Dad, or support person, or in a cot, may be the safer option.

Queensland Government

It is acknowledged that information provided in this guide has been taken and modified from: NHS National Health Service United Kingdom (2010)

Input into Ministry document on care in immediate postnatal period

Advocacy and education around avoiding SUEND

Neonatal care

Table 68: Contributory factors to unsatisfactory neonatal resuscitation among neonatal encephalopathy babies 2010-20

	NE cases	
	n=149	
	n	%
Were there any features that caused or contributed to an unsatisfactory neonatal resuscitation?		
Yes	23	15.4
Unsure	16	10.7
No	98	65.8
Missing	12	8.1
If yes, were they:		
Organisational and/or management	10	6.7
Personnel or training	13	8.7
Technology or equipment	2	1.3
Environment	3	2.0
Woman and her family	5	3.4

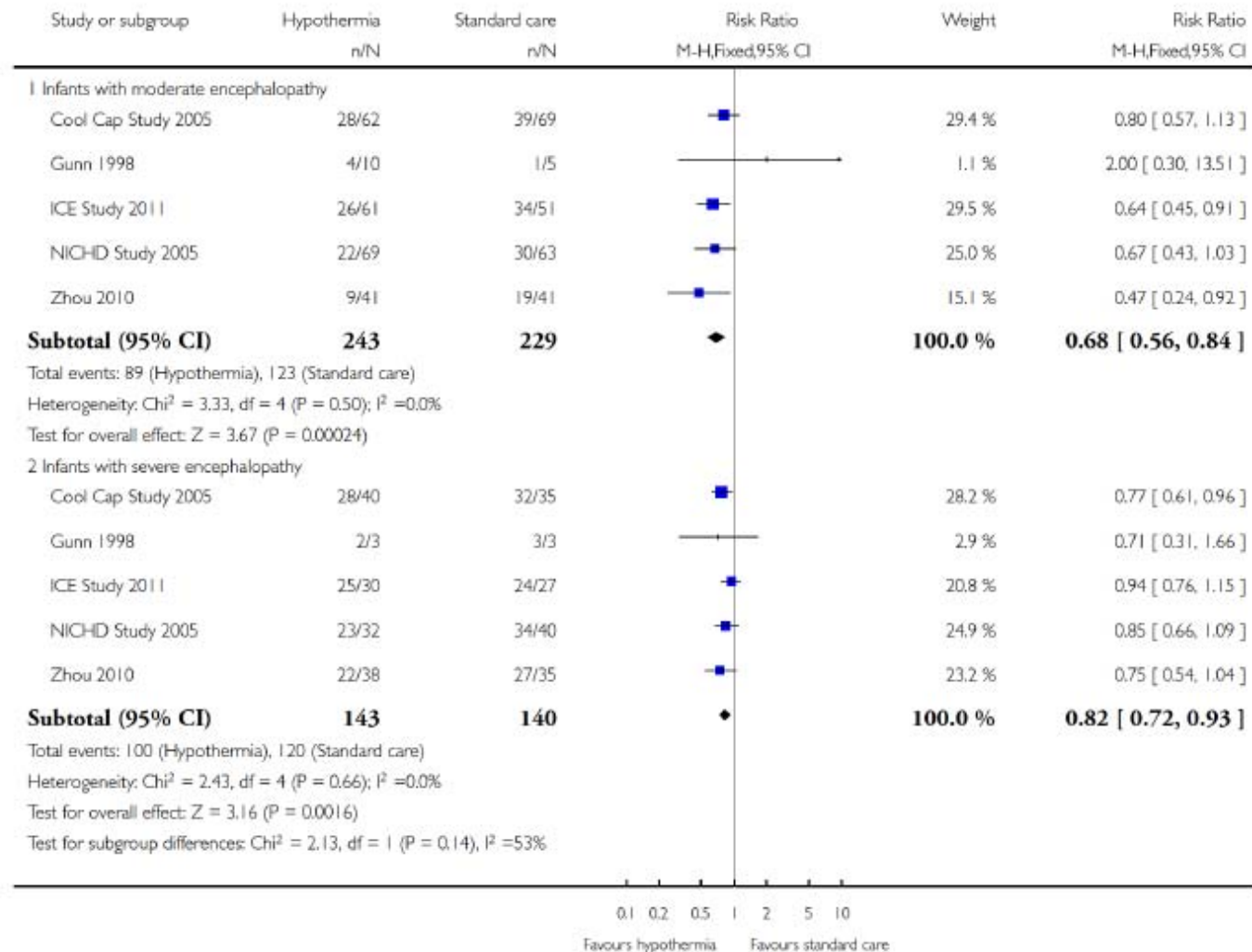
26%

Condition at birth

- Apgar <7 @ 5 min: 77%
- Abnormal cord gases: 68%
- No cord gases taken: 24%
 - No gases but Apgar <7 @ 1 min 15%

James L S, Weisbrot I M, Prince C E. et al. The acid base status of human infants in relation to birth asphyxia and the onset of respiration. J Pediatr 1958.

Effect of cooling on death or disability: cooling vs normothermia by severity



Treatment to improve outcomes

Neonatal encephalopathy 2010/11

	Yes	No
Induced hypothermia	107/149 (72%)	42/149 (28%)
Within 6 hours	81/107 (76%)	
Resuscitated at birth	135/149 (91%)	14/149 (9%)
Resus + cooling	104/135 (77%)	3/14 (21%)

72 % received cooling and 76 % of these < 6 hrs

Can we improve recognition and early transfer ?

Documentation & information for parents

Examination at discharge	n	%
Normal	57	50.4
Mild or Moderate	31	30.1
Severe abnormality	4	3.5
Not Examined	5	4.4
Examined but finding not known	4	3.5
Missing data	9	8.0

MRI as a prognostic tool

Investigation	Survivors n=113		Induced cooling Survivors n=88		No cooling Survivors n=25	
MRI (investigation done)	76	68%	59	67%	17	71%
Moderate / severe abnormal	27	24%	19	22%	8	33%
Normal or only mildly abnormal	47	42%	38	43%	9	38%
Unknown result	2	2%	2	1%	0	
No MRI	35	31%	28	32%	7	29%

Summary

- Data on size and distribution of problem
 - ongoing analysis looking for significant factors
- Ongoing work reviewing intrapartum care for preventable factors + recommendations
- Education - observation in the 1st hrs of life & early recognition NE
- Identified areas where treatment and/or documentation could potentially be improved