

“Growing Up Healthy across the Globe
- exploring harmonization as a tool to
understand what shapes wellbeing
across population contexts”



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“Growing Up Healthy across the globe”

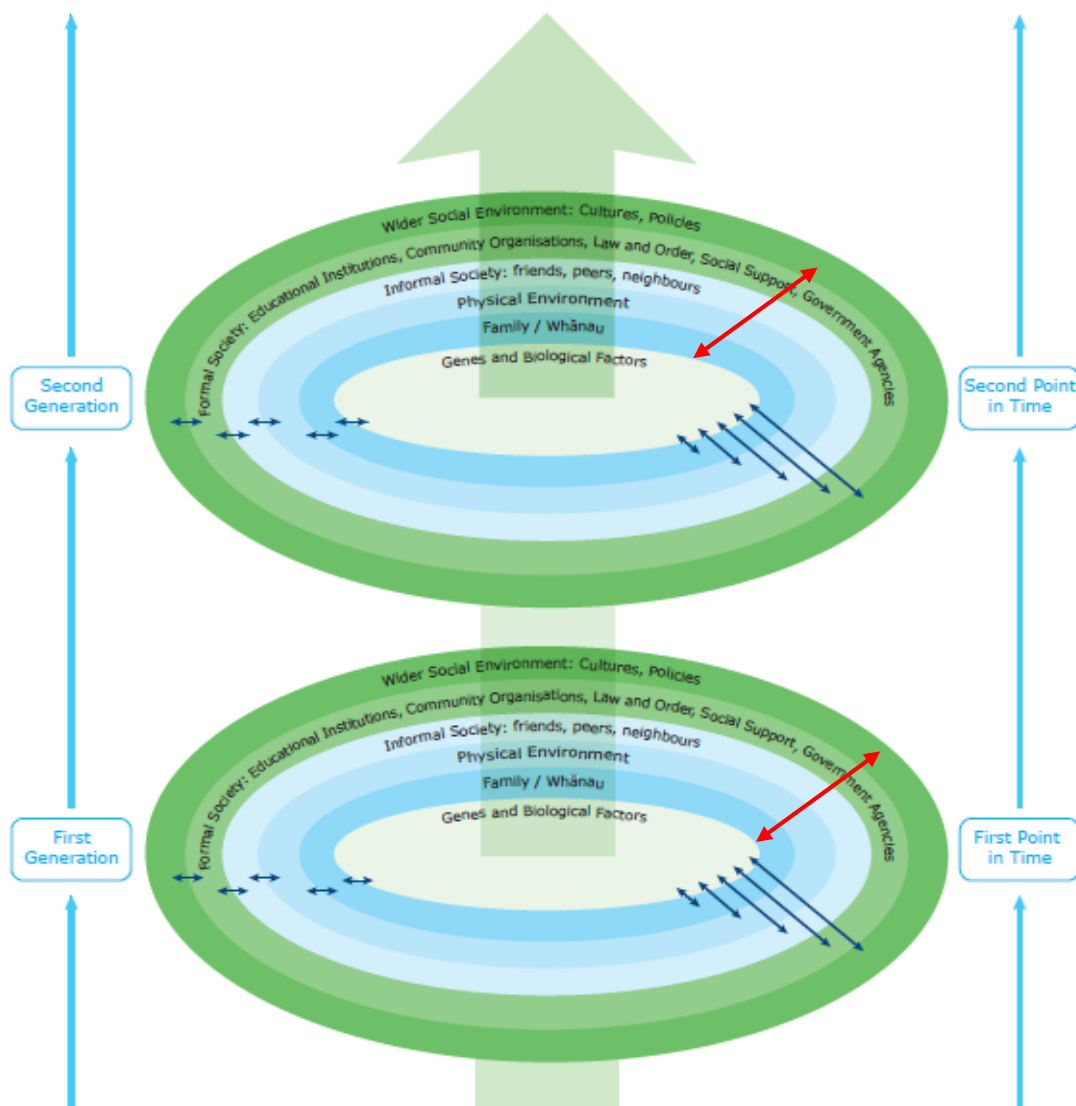
- Aim to explore feasibility of conducting harmonized analysis across three international longitudinal studies which were established “independently”
- Developed an aligned harmonized post hoc analysis plan
- Used an existing NZ model for early wellbeing – and 2 shared timepoints (testing feasibility)
- Perinatal variables harmonized across studies and contexts
- Wellbeing (outcome) proxied by SDQ (shared)
- Project established 2016 with seed funding from NZ government agency - competitive grant for strategic collaborations

Context for harmonization

- Established relationships between Growing Up study PIs
- Prior harmonization (trial in 2012)
- Similar socio-political contexts
- Life course approach to child development shared
- Child in context of their families
- Social determinants of wellbeing
- Translation to inform policy explicit in design from outset



Shared conceptual frameworks – context matters



The cohorts (3 of the 5 in GUH)

- *Growing Up in New Zealand (GUiNZ)*

- Wave 0: pregnancy – mother
- Wave 1: 9 months – child and mother
- Wave 4: 4.5 years – child



- Growing up in Scotland (GUS)

- Wave 1: 10 months
- Wave 5: 4.9 years

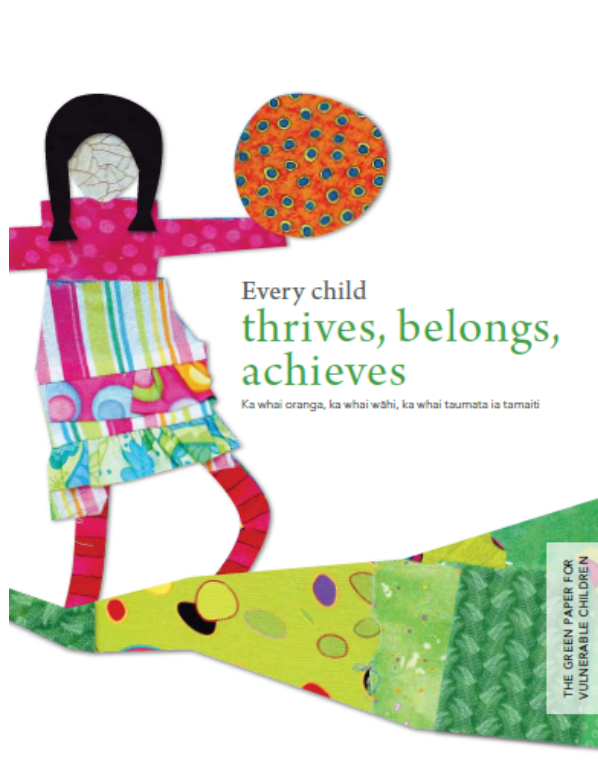


- Growing up in Ireland

- Wave 1: 9 months
- Wave 3: 5 years



Focus on early life vulnerability (NZ)



Proximal Family Variables

- Maternal depression (antenatal using EPDS>12)
- Maternal physical wellbeing (poor or fair)
- Maternal smoking in pregnancy (after first trimester)
- Maternal age (teenage pregnancy)

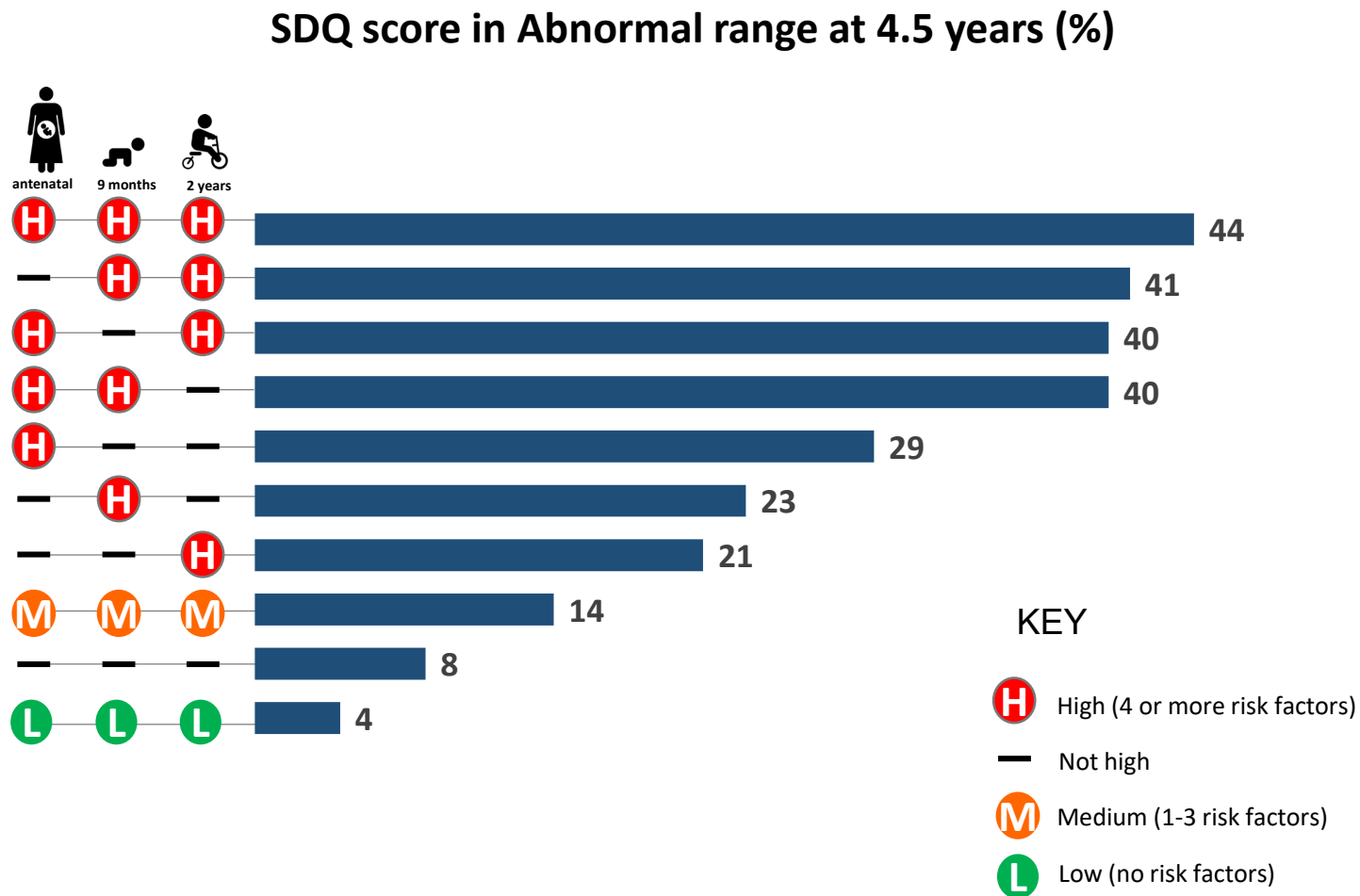
Distal Family Variables

- Relationship status (no partner/single)
- Maternal education (no secondary school qualification)
- Financial stress (regular money worries)

Home environment

- Area level Deprivation
- Unemployment (mother not in work or on parental leave)
- Tenure (public rental)
- Income tested benefit (yes/no)
- Overcrowding (≥ 2 per bedroom)

Impact of cumulative vulnerability on behavioural (SDQ) scores at 4 years - NZ



Variables (harmonized) across 3 cohorts

Infancy – perinatal and first year of life

- Smoking reported during pregnancy/currently
- Mother's general self-reported health
- Mother's long-standing health problem (disability)
- Mother's highest level of education
- *Mother's relationship status (living with a partner)*
- *Mother's ethnicity*

Pre-school – 4.5 to 5 years

- Child's development proxied by SDQ scores (consistent)

Harmonized: Maternal health

	GUINZ	GUS	GUI
Baseline (9-12 months)	N=6,846	N = 5,217	N = 11,134
Smoking in pregnancy			
No	89.2 (5,514)	75.9 (3,876)	83.0 (9,245)
Yes	10.7 (664)	24.1 (1,232)	17.0 (1,887)
Maternal self-reported health			
Excellent	22.7 (1,448)	19.4 (1,014)	30.6 (3,404)
Very good	40.8 (2,606)	38.7 (2,020)	39.6 (4,414)
Good	26.9 (1,714)	27.0 (1,410)	23.2 (2,582)
Fair	7.9 (503)	11.7 (610)	5.8 (645)
Poor	1.7 (110)	2.4 (127)	0.8 (88)
Disability			
Yes	4.1 (263)	16.1 (833)	11.4 (1,270)
No	95.8 (6,118)	83.9 (4,355)	88.6 (9,861)

Harmonized: Maternal education and *relationship status*

	GUINZ	GUS	GUI
Baseline (infancy)	N=6,846	N = 5,217	N = 11,134
Maternal relationship			
Living with a partner	91.5 (5,841)	81.3 (4,239)	87.8 (9,775)
Not living with a partner	8.5 (541)	18.7 (978)	12.2 (1,359)
Maternal education			
Lower secondary or less	7.2 (491)	16.8 (873)	11.7 (1,306)
Higher secondary level	23.9 (1,627)	25.8 (1,344)	19.2 (2,133)
Post-secondary level	30.6 (2,082)	30.2 (1,572)	32.8 (3,654)
Degree or higher	38.2 (2,603)	27.2 (1,414)	36.2 (4,031)

Harmonized: *Maternal ethnicity*

<i>Growing Up in NZ</i>	New Zealand European	53.0 (3,608)
	Maori	14.0 (950)
	Pacific	14.7 (1,001)
	Asian	14.7 (1,003)
	Other	3.5 (241)
Growing up in Ireland	Irish	79.1 (8,810)
	Other white	13.8 (1,533)
	African or black	3.4 (377)
	Chinese or Asian	2.8 (315)
	Other	0.5 (55)
Growing up in Scotland	White	96.2 (5,014)
	Other	3.8 (199)

Child “Wellbeing” (SDQ) at school entry

	GUiNZ	GUS	GUI
Baseline	N=6,846	N = 5,217	N = 11,134
Gender			
Boys	51.5 (3,528)	51.4 (2,683)	51.0 (5,679)
Girls	48.5 (3,319)	48.6 (2,534)	49.0 (5,455)
Follow-up (at 4-5 years)	N=6,151	N = 3,786	N = 8,996
SDQ – total difficulties			
Normal (0-13)	79.7 (4,905)	89.1 (3,374)	89.6 (8,063)
Borderline (14-16)	9.9 (606)	6.3 (238)	5.8 (519)
Potentially problematic (17-40)	8.3 (509)	4.6 (174)	4.6 (414)

Harmonized analyses – 2 part

- Linear regression model applied across 3 cohorts (Part 1 - not shown further here)
- Cluster analysis – harmonized variables applied (Part 2)
- Shared SDQ as proxy wellbeing outcome
- Analysis independently undertaken for each dataset (data protection and data access issues)
- Comparison of outputs from 3 final models
- Discussion re utility of comparative analyses (within and across contexts)
- Review of feasibility and utility of harmonization



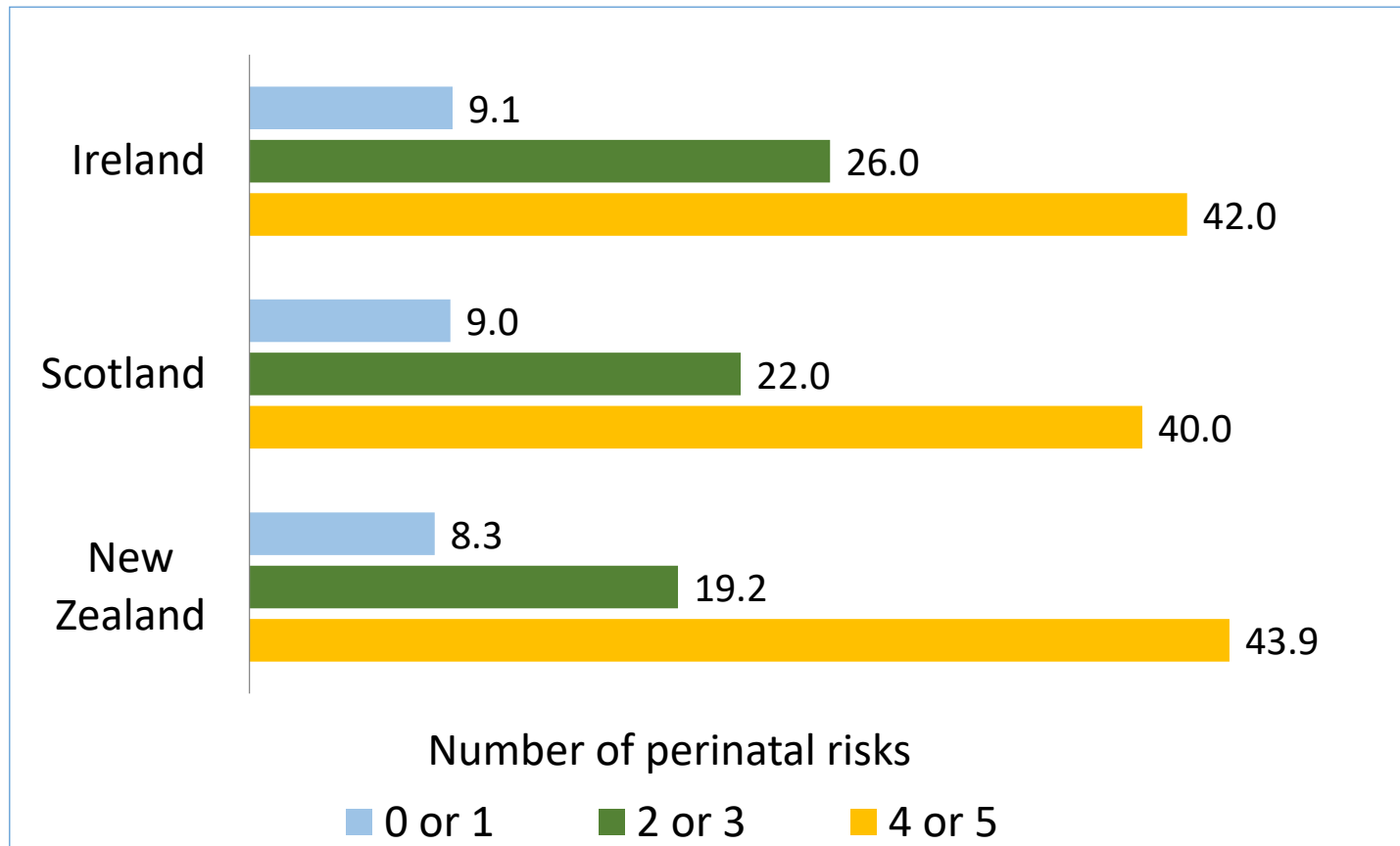
Harmonized risk model (Part 2) - applying clustering and accumulation framework

Growing Up in New Zealand

Vulnerability Report 2: Transitions in exposure
to vulnerability in the first 1000 days of life
2015



Growing Up
in New Zealand



Percentage of children with potentially problematic SDQ scores by exposure to number of perinatal risk factors

Comparative outputs from harmonized analyses (Parts 1 & 2)

Perinatal variables association with SDQ – consistency:

Strong

Mother's relationship status (living with a partner)

Mother's general self-reported health



Mixed

Mother's highest level of education



Moderate

Smoking reported during pregnancy/currently



Poor

Mother's long-standing health problem (disability)

Mother's ethnicity

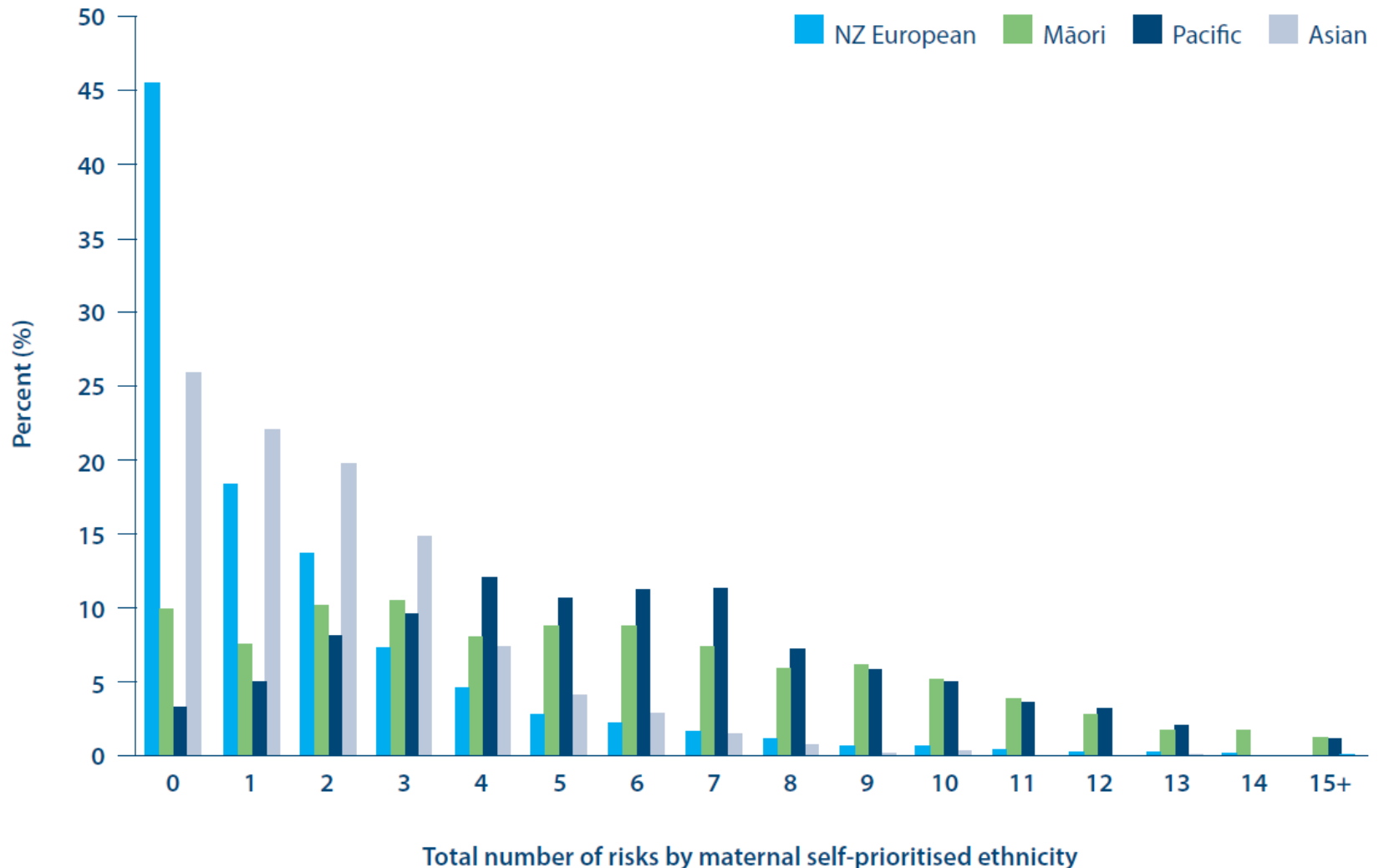
Context matters: Ethnic identity in GUiNZ



- Ethnic identity (mother, partner, intended for child) and development over time
- Multiple levels of ethnicity collected – self-prioritised and able to be externally prioritised
- Cultural values, beliefs and expectations
- Cultural practices
- Cultural capital
- National identity
- Sense of self
- Influence of other cultures on the individual
- Attitudes about others
- Discrimination – perceived and context
- Religiosity/Spirituality
- Community capital



Perinatal Risks are not equally distributed by maternal ethnicity (GUiNZ)



Lessons learned – where to.....

- Post hoc harmonisation is feasible and facilitates comparison of key perinatal influences on developmental outcomes across contexts
- Detail and context however can be hidden/lost in the process of harmonization (variables and models)
- A priori harmonisation may be more useful – but context specific information important for effective translation
- Additional steps required to consider population contexts and policy environment (cf earlier breastfeeding analyses in 2012)
- Harmonisation useful but not sufficient for policy development - requires context specific demographics and analyses, distribution of risk factors (clustering included), burden in specific population as well as “what works”

Acknowledgements



Results 1: Growing up in Scotland

	B	Std. error	Beta	Sig
Constant	5.38	.19		.00
Partner – no	1.43	.21	.11	.00
Disability – yes	0.38	.21	.03	.08
Smoking – yes	1.21	.19	.12	.00
Mother's health (base excellent)				
- poor or fair	2.13	.27	.16	.00
- good	1.47	.21	.14	.00
- very good	0.59	.19	.06	.00
Ethnicity (base White)				
- Other	1.94	.45	.07	.00
Education (base Degree)				
- Low secondary or less	0.75	.33	.04	.02
- Secondary	0.46	.18	.04	.01
- Diploma	-0.24	.17	-.03	.15
Child gender - boy	1.21	.14	.13	.00

Note: $R^2 = .323$

Results 2: Growing up in Ireland

	B	Std. error	Beta	Sig
Constant	5.07	.12		.00
Partner – no	1.97	.17	.13	.00
Disability – yes	0.75	.16	.05	.00
Smoking – yes	0.73	.14	.06	.00
Mother's health (base excellent)				
- poor or fair	1.90	.23	.10	.00
- good	1.19	.14	.06	.00
- very good	0.61	.12	.06	.00
Ethnicity (base Irish)				
- Other white	0.42	.15	.03	.01
- African or other black	-0.65	.29	-.02	.03
- Other	0.86	.29	.03	.00
Education (base Degree)				
- Low secondary or less	1.29	.18	.08	.00
- Secondary	0.85	.14	.07	.00
- Diploma	0.53	.12	.05	.00
Child gender - boy	1.10	.10	.12	.00

Note: $R^2 = .284$

Results 3: *Growing Up in New Zealand*

	B	Std. error	Beta	Sig
Constant	6.39	.15		.00
Partner – no	1.44	.24	.08	.00
Disability – yes	0.43	.30	.02	.15
Smoking – yes	1.53	.23	.09	.00
Mother's health (base excellent)				
- poor or fair	1.18	.50	.03	.02
- good	0.97	.16	.09	.00
- very good	0.21	.14	.02	.14
Ethnicity (base NZ European)				
- Maori	1.71	.20	.12	.00
- Pacific	3.93	.20	.26	.00
- Asian	1.61	.19	.11	.00
- Other	0.13	.34	.01	.71
Education (base Degree)				
- Low secondary or less	2.63	.30	.12	.00
- Secondary	1.53	.17	.13	.00
- Diploma	1.25	.15	.12	.00
Child gender - boy	0.72	.12	.08	.00

Note: $R^2 = .436$