



# Missing pieces of the puzzle

Louisa Jorm, 24 April 2015

Never Stand Still

Medicine

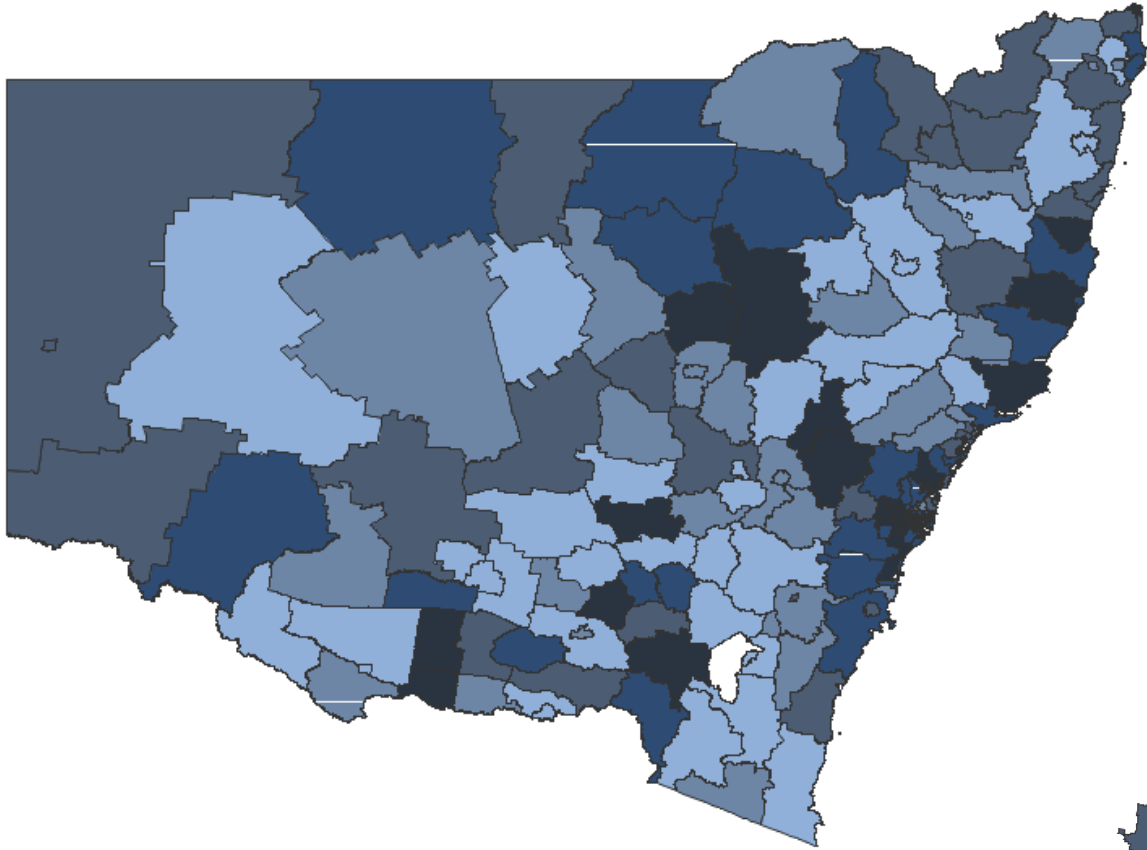
Centre for Big Data Research in Health



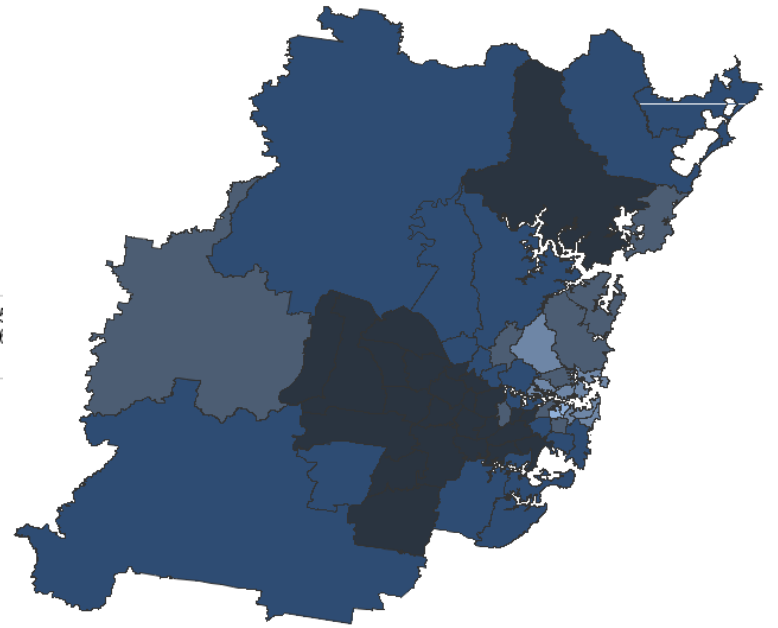
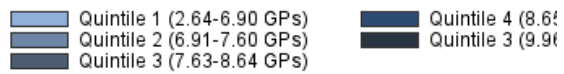
CENTRE FOR  
BIG DATA RESEARCH  
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# Missing pieces of the puzzle

- Accessible small area workforce data
- Service level data
  - practices, hospitals
- Delivery of programs and services
  - what, when, by whom and how

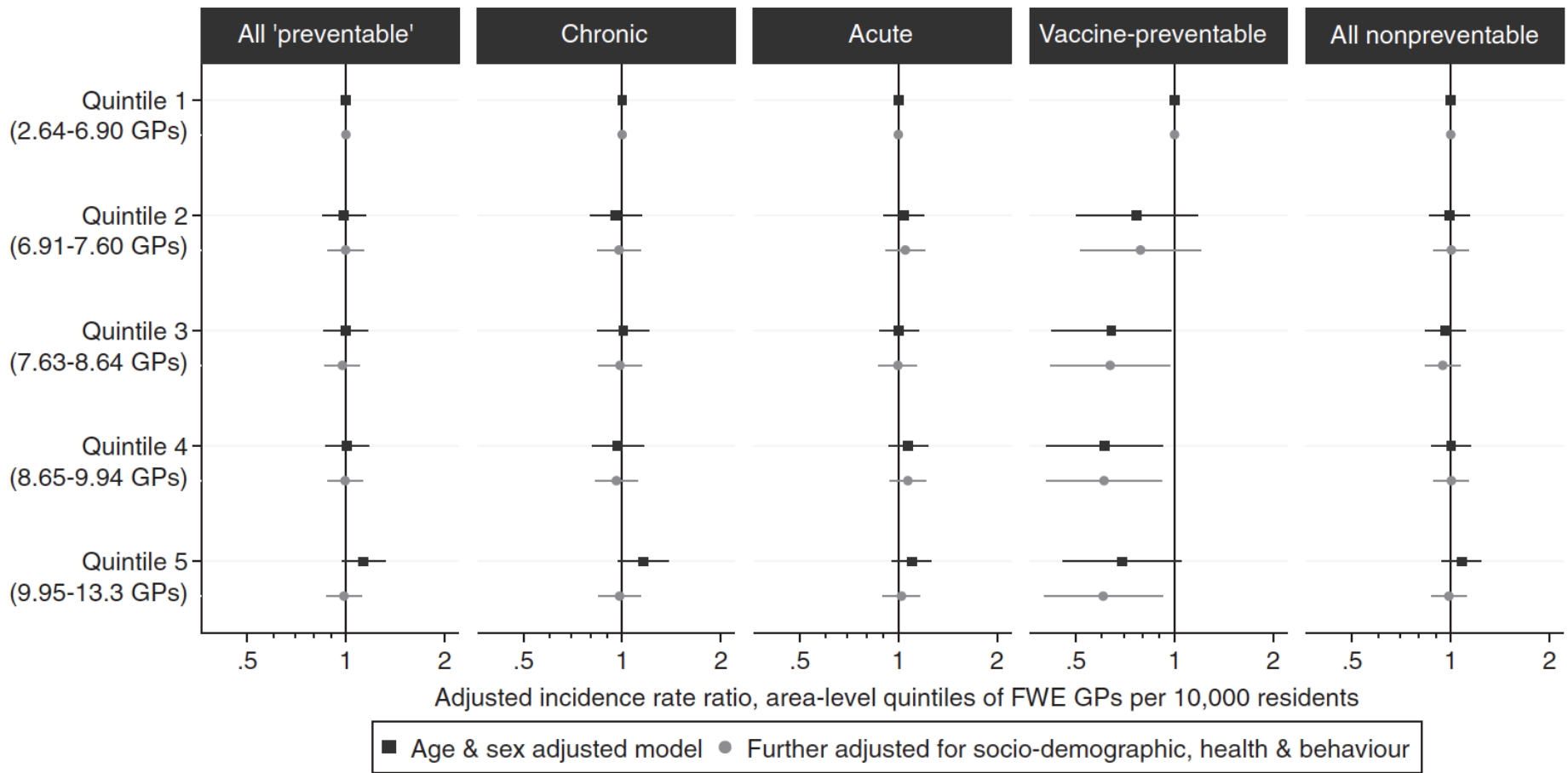


Quintiles of number of FWE GPs per 10,000



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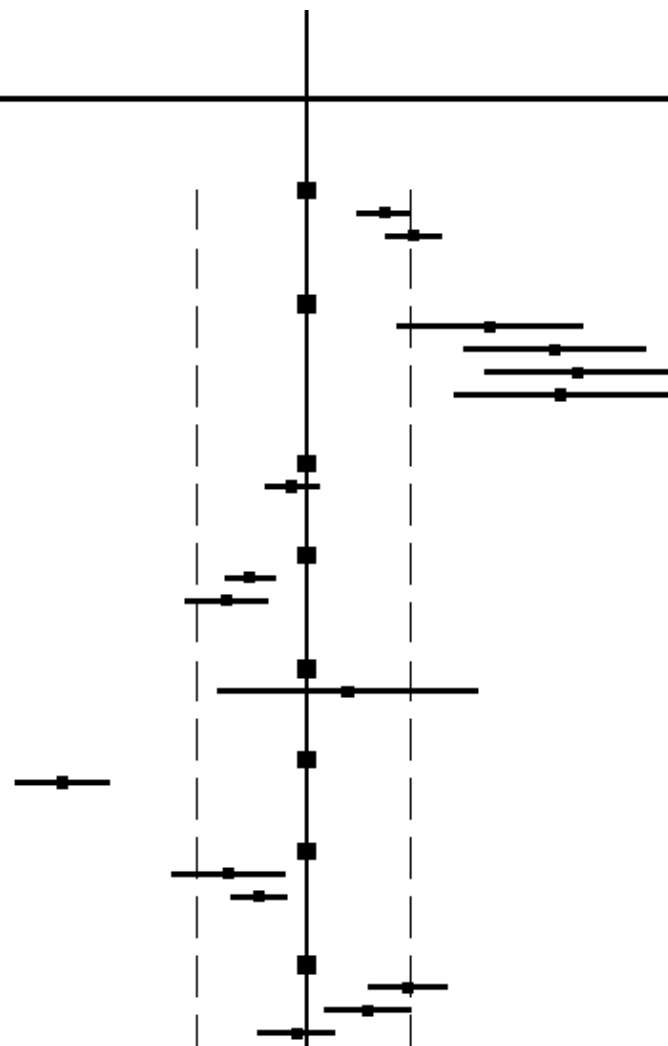


**FIGURE 1.** Association between quintiles of the density of full-time workload equivalent (FWE) general practitioners (GPs) per capita within Statistical Local Areas, with the rate of preventable and “nonpreventable” hospitalizations, from multilevel Poisson models adjusted for age and sex, and further adjusted for personal sociodemographic, health, and behavioral characteristics.

Falster MO, Jorm LR, Douglas KA, Blyth FM, Elliott RF, Leyland AH. Sociodemographic and health characteristics, rather than primary care supply, are major drivers of geographic variation in preventable hospitalizations in Australia. *Medical Care* 2015;53(5):436-445.

# Influence of continuity of primary care on statin adherence

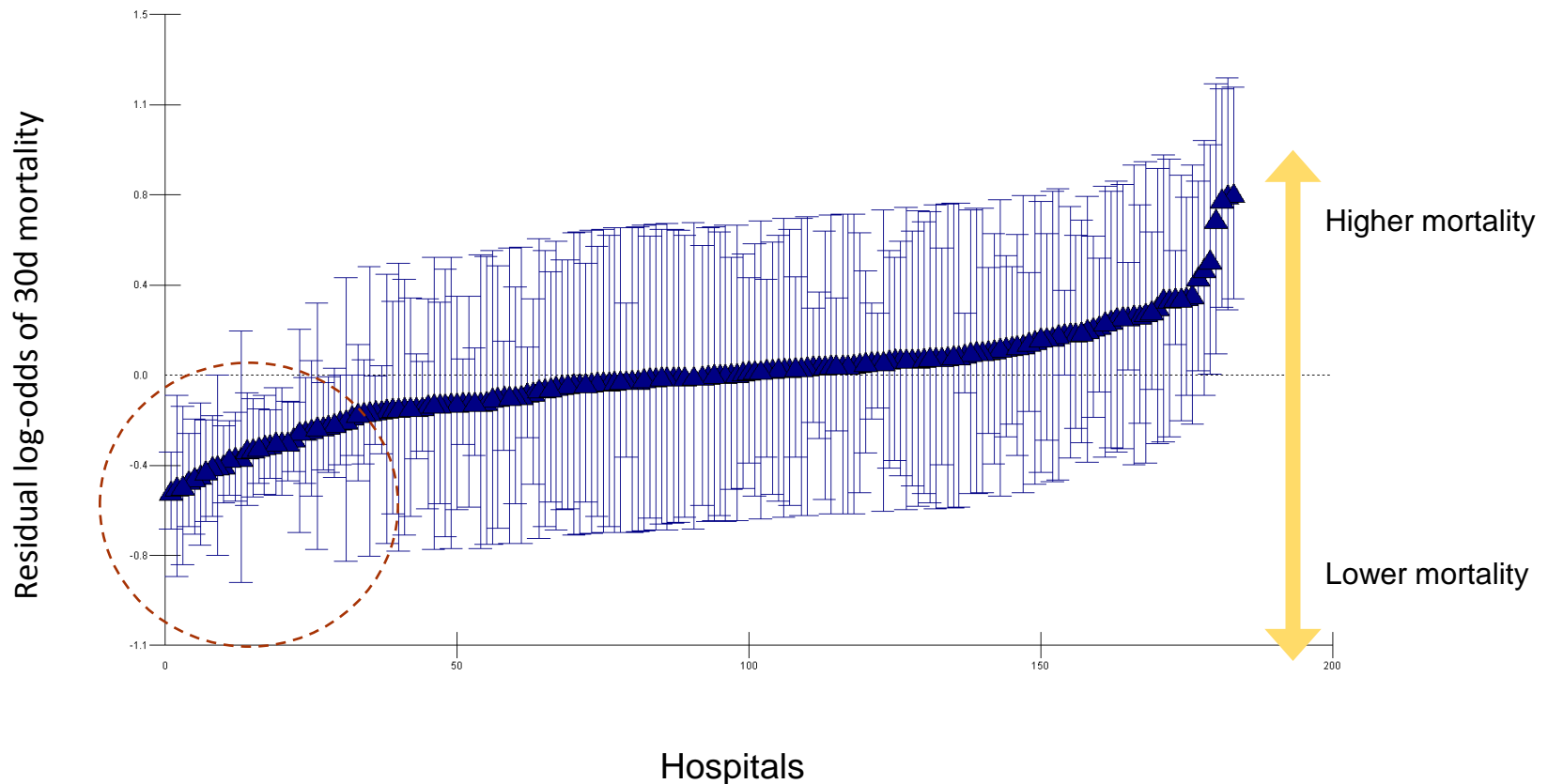
Variable	Persons	Adherent	Relative Risk	RR	(95% CIs)
	N	n (% of N)			
Total cohort	36,144	28,889 (79.9%)	-	-	-
Usual provider index					
Low	12,122	9,354 (77.2%)	1.00	(ref)	
Middle	12,149	9,825 (80.9%)	1.04	(1.02 - 1.05)	
High	11,873	9,710 (81.8%)	1.05	(1.04 - 1.06)	
Age					
45-54 years	1,150	756 (65.7%)	1.00	(ref)	
55-64 years	6,088	4,632 (76.1%)	1.09	(1.04 - 1.14)	
65-74 years	15,996	12,929 (80.8%)	1.12	(1.08 - 1.17)	
75-84 years	11,362	9,341 (82.2%)	1.14	(1.09 - 1.19)	
85+ years	1,548	1,231 (79.5%)	1.13	(1.07 - 1.18)	
Gender					
Males	17,586	14,222 (80.9%)	1.00	(ref)	
Females	18,558	14,667 (79.0%)	0.99	(0.98 - 1.01)	
Highest education qualification					
Did not complete high school	17,812	14,374 (80.7%)	1.00	(ref)	
High school or equivalent	13,685	10,866 (79.4%)	0.97	(0.96 - 0.98)	
University or higher	3,664	2,866 (78.2%)	0.96	(0.94 - 0.98)	
Aboriginal status					
Non-Aboriginal	34,925	27,929 (80.0%)	1.00	(ref)	
Aboriginal	271	213 (78.6%)	1.02	(0.96 - 1.08)	
Language spoken at home					
English only	32,353	26,227 (81.1%)	1.00	(ref)	
Language other than English	3,791	2,662 (70.2%)	0.89	(0.87 - 0.91)	
Partnership status					
Married or partnered	24,979	20,179 (80.8%)	1.00	(ref)	
Single	1,804	1,372 (76.1%)	0.96	(0.94 - 0.99)	
Widowed or separated	9,112	7,143 (78.4%)	0.98	(0.96 - 0.99)	
Private health insurance					
None	4,341	3,392 (78.1%)	1.00	(ref)	
Private (extras)	12,388	10,199 (82.3%)	1.05	(1.03 - 1.07)	
Private (no extras)	5,373	4,390 (81.7%)	1.03	(1.01 - 1.05)	
Health care card	14,042	10,908 (77.7%)	1.00	(0.98 - 1.01)	



# Residual variation in 30-day mortality after AMI across hospitals

...after accounting for patient characteristics

*2.8% of the variation in 30-day mortality is variation at the hospital level. This can be interpreted as a Median Odds Ratio of 1.4*



**Table 4 Adjusted odds ratios for selected hospital covariates for 30-day and 365-day mortality multilevel models**

	30-day mortality			365-day mortality		
	AOR	95% CI	p-value	AOR	95% CI	p-value
<b>Added into adjusted<sup>a</sup> model separately</b>						
Remoteness of hospital <sup>b</sup>						
Major city (ref)	1.00		<.001	1.00		<.001
Inner regional	1.15	0.94-1.41		1.16	0.97-1.39	
Outer regional	1.56	1.26-1.94		1.54	1.27-1.87	
Remote/very remote	1.83	1.19-2.81		1.79	1.22-2.61	
Average acute admissions per year						
Less than 1200	2.03	1.57-2.62	<.001	1.98	1.58-2.49	<.001
1200-3899	1.72	1.39-2.13		1.55	1.28-1.88	
3900-7084	1.36	1.08-1.70		1.32	1.07-1.62	
7085-18399	1.14	0.96-1.35		1.14	0.97-1.34	
18400 or more (ref)	1.00			1.00		
On-site angiography						
Yes	0.74	0.64-0.86	<.001	0.72	0.63-0.83	<.001
No (ref)	1.00			1.00		

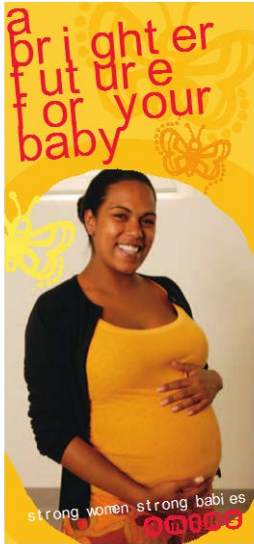
AOR, adjusted odds ratios; CI, confidence interval. Ref, referent group in the analysis.

<sup>a</sup> Adjusted for Aboriginal status, age, sex, year of admission, comorbidities, remoteness of residence, socio-economic status, and a random hospital intercept, with hospital covariates added in one at a time to the model.

<sup>b</sup> Accessibility/Remoteness Index of Australia (ARIA+) based on hospital postcode.

Randall DA, Jorm LR, Lujic S, et al. Mortality after admission for acute myocardial infarction in Aboriginal and non-Aboriginal people in New South Wales, Australia: a multilevel data linkage study. *BMC Public Health* 2012;12:281.

# Seeding Success: monitoring the impact of 'real world' programs and services using linked population data



RQ 3. For Aboriginal mothers and their children, were:

- i. pregnancy and birth outcomes, and
- ii. early childhood development outcomes

better in areas where an **Aboriginal Maternal and Infant Health Service** was established compared with similar areas?



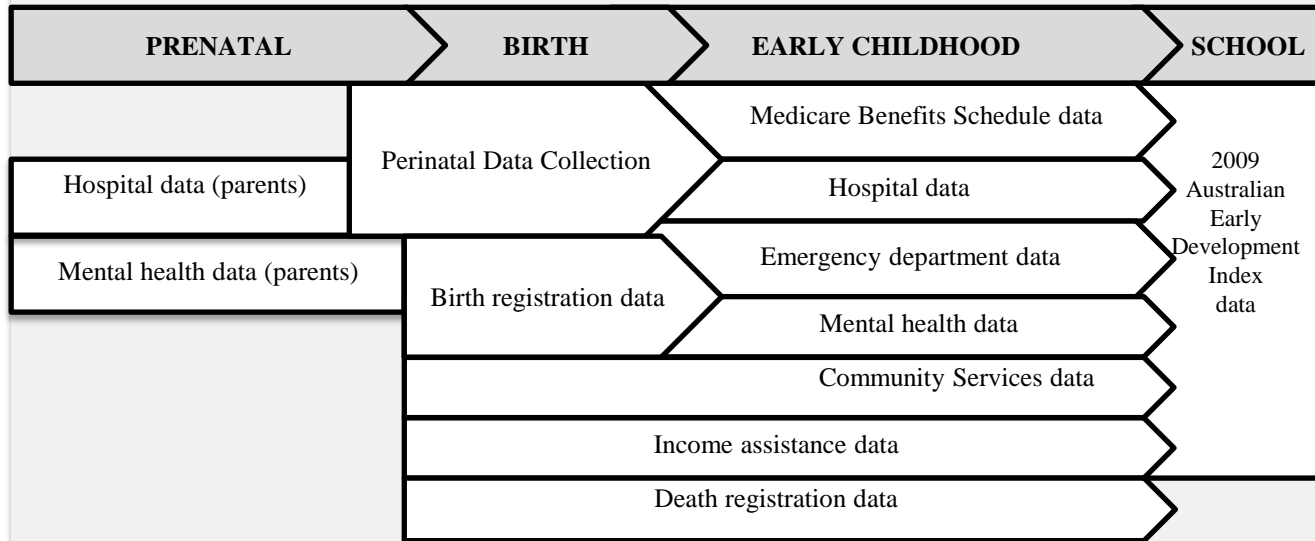
RQ 4. For children who participated in the **Brighter Futures program**, were their:

- i. health,
- ii. development, and
- iii. child protection outcomes

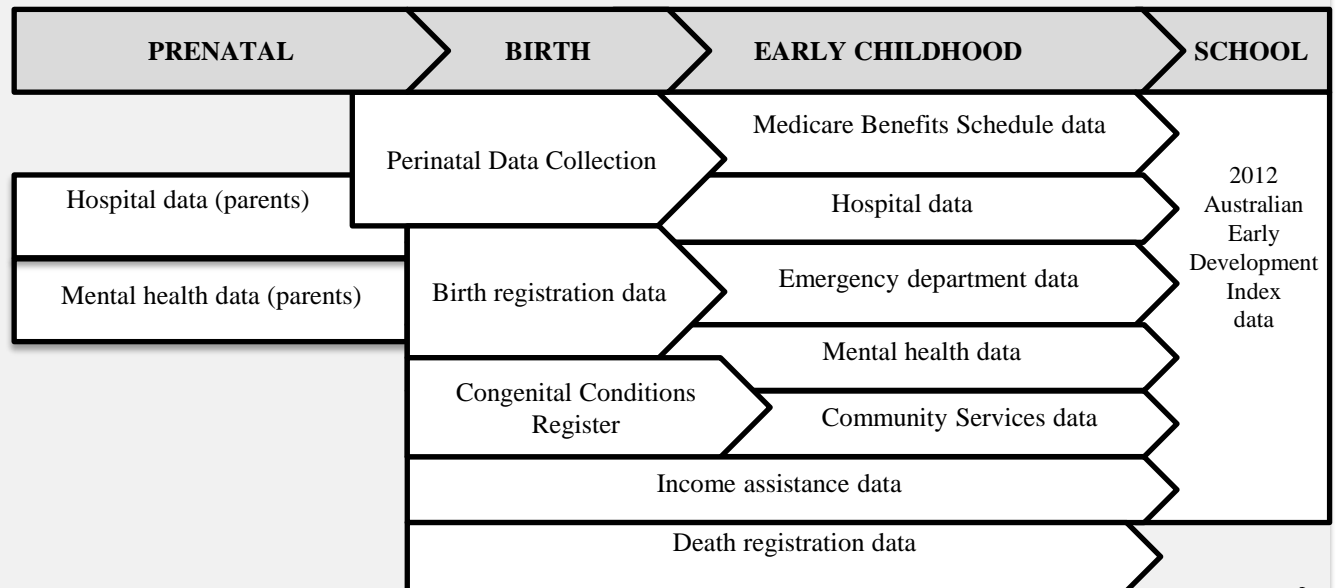
during early childhood better than similar children who did not participate in the program?



**SCHOOL STARTER POPULATION 2009**



**SCHOOL STARTER POPULATION 2012**



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