

Heat and Children's Health

Dr. Zhiwei Xu
School of Public Health
The University of Queensland

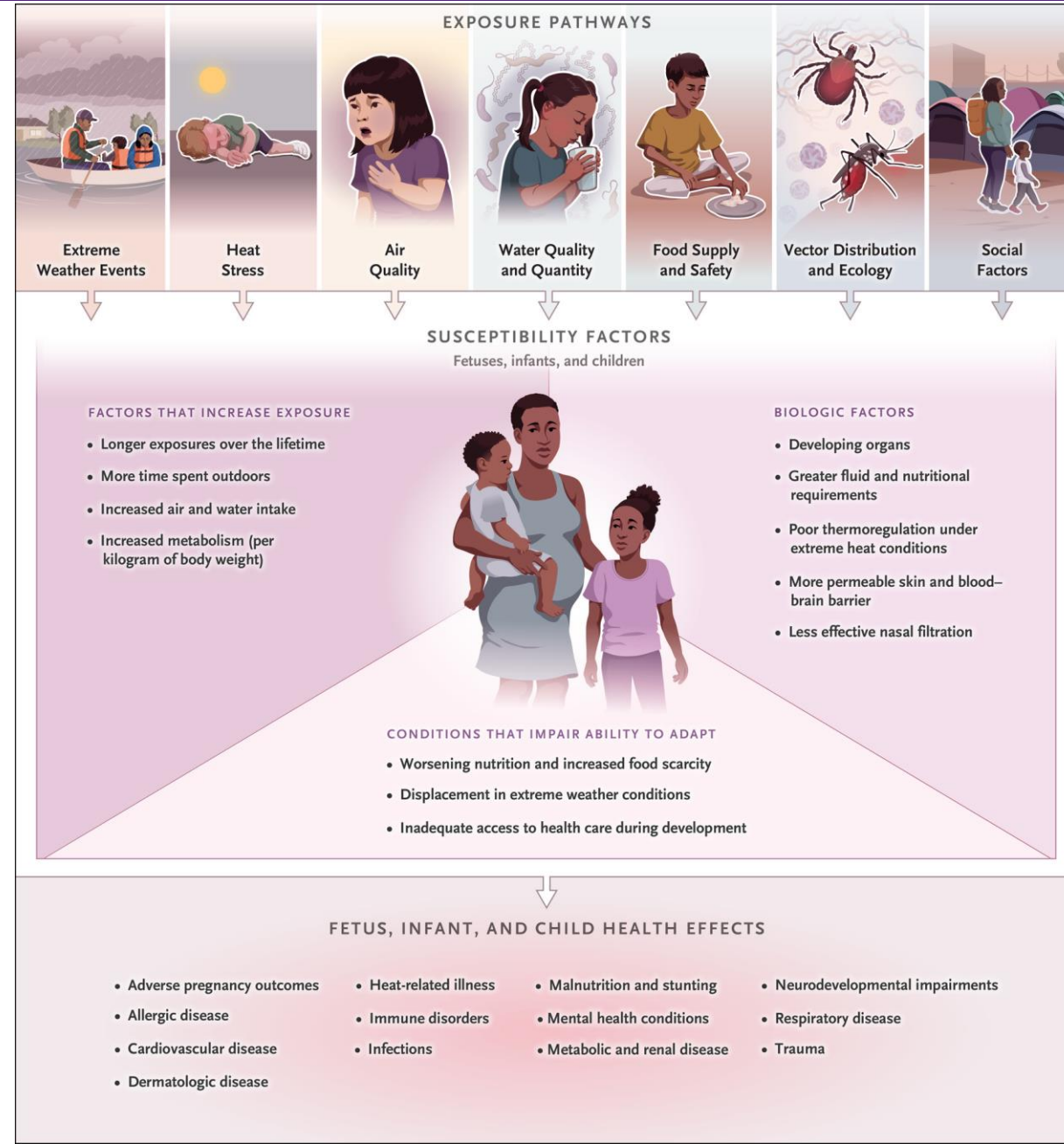
- Climate change and children's health

- Heat and children's health

- Literature review and empirical research

- Heat adaptation to protect children

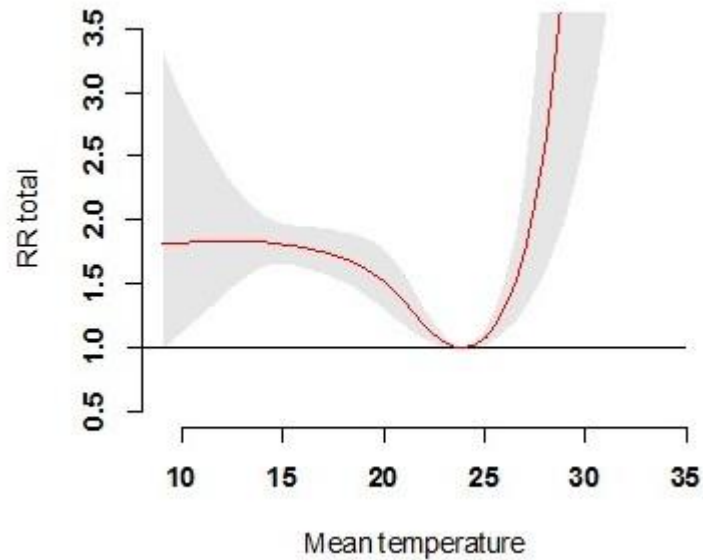
Climate change and children's health



Perera F, Nadeau K. *N Engl J Med.* 2022; 386(24):2303-2314

- **Physiological modality:** children have a greater body surface area-to-mass ratio compared to adults
- **Metabolic modality:** children's greater metabolic rate may render them more sensitive to heat
- **Behaviour modality:** compared with adults, children spend more time outdoors and participate in more vigorous activities
- **Self-care ability modality:** children, especially infants, cannot take care of themselves
- **Life expectancy modality:** more expected future years of life provide them with more time for exposure to heat

High temperature and paediatric hospitalizations



Diseases	Heat effect (Relative risk (95% CI))	
	Lag 0–1	Lag 0–13
Total paediatric hospitalizations	1.07(1.04,1.10)*	1.34(1.24,1.46)*
Intestinal infectious diseases	1.06(1.01,1.12)*	1.18(0.98,1.43)
Endocrine, nutritional and metabolic diseases	1.01(0.84,1.23)	1.34(0.78,2.31)
Nervous system diseases	1.06(1.01,1.13)*	1.04(0.64,1.69)
Respiratory diseases	1.11(1.05,1.16)*	1.67(1.46,1.92)*
Digestive system diseases	1.07(0.98,1.17)	0.99(0.84,1.18)
Genitourinary system diseases	0.91(0.82,1.02)	0.99(0.77,1.29)

Review article

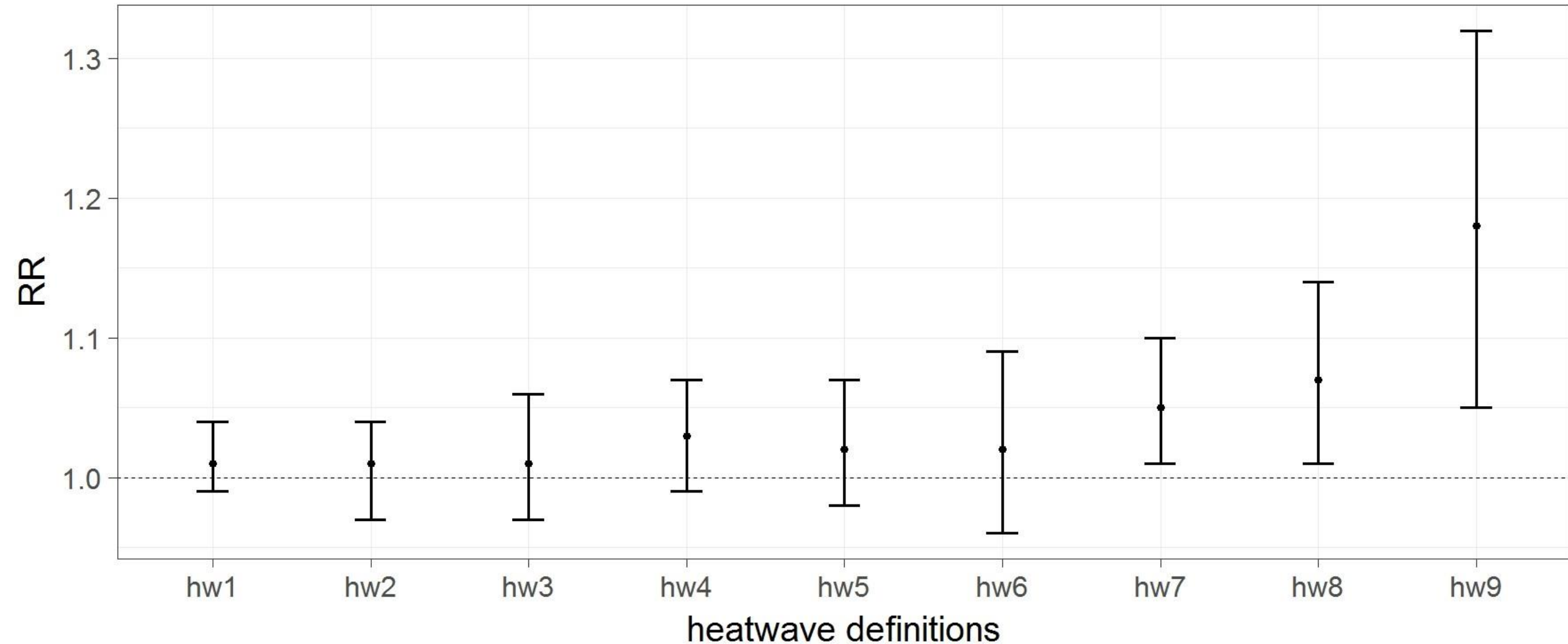
Impact of heatwave on mortality under different heatwave definitions: A systematic review and meta-analysis



Zhiwei Xu ^a, Gerard FitzGerald ^a, Yuming Guo ^b, Bin Jalaludin ^{c,d}, Shilu Tong ^{a,*}

Heatwave definitions	Specific definitions
hw1	90 th percentile & 2 days
hw2	90 th percentile & 3 days
hw3	90 th percentile & 4 days
hw4	95 th percentile & 2 days
hw5	95 th percentile & 3 days
hw6	95 th percentile & 4 days
hw7	97 th percentile & 2 days
hw8	97 th percentile & 3 days
hw9	97 th percentile & 4 days

Heatwave and infants' hospital admissions under nine definitions



Who is more vulnerable?

	Heatwave definitions		
	97 th percentile & 2 days	97 th percentile & 3 days	97 th percentile & 4 days
Girls	1	1	1
Boys	1.05 (0.92,1.19)	1.02 (0.87,1.20)	0.97 (0.78,1.20)
Neither aboriginal nor Torres Strait Islander origin	1	1	1
Aboriginal but not Torres Strait Islander origin	1.02 (0.74,1.41)	1.08 (0.73,1.60)	1.11 (0.71,1.70)
Torres Strait Islander origin	0.94 (0.30,3.00)	0.99 (0.24,4.04)	0.98 (0.45,2.65)
Both aboriginal and Torres Strait Islander origin	1.43 (0.53,3.89)	1.72 (0.54,5.46)	1.56 (0.58,4.98)
High SEIFA	1	1	1
Middle SEIFA	0.97 (0.81,1.16)	1.00 (0.80,1.25)	0.85 (0.64,1.13)
Low SEIFA	1.03 (0.88,1.22)	1.03 (0.84,1.26)	0.93 (0.71,1.20)

Thanks

Dr. Zhiwei Xu
School of Public Health
The University of Queensland

xzw1011@gmail.com