Child Injury: Does Home Matter?

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Background

Majority of injuries to children under 5 occur at home

Parental supervision and environmental modification are important for reducing home injuries

Evidence of the benefits of safety devices in reducing related injuries (e.g. pool fences on drowning rates)

Research has started on broader relationship between overall home safety practices and childhood injury

Study Aim




Examine the relationship between home risk and injury in Australian children under 5 years

Home risk:

Hazardous structural features (i.e. stairs, decks, pools) and Absence of safety equipment and practices.

Injury:

Data linkage - ICD-10-AM Injuries from ED and Hospital Admissions data, Queensland, Australia.

Environments for Healthy Living Study

Longitudinal birth cohort study following health/social outcomes of children born in South East Queensland, Australia

Pregnant women were recruited at 3rd trimester antenatal clinic appointments

Recruitment occurred between 2006-2011

Baseline survey data was collected and consent obtained for data linkage to the child's hospital and ED records for the following 8 years.

Environments for Healthy Living
Griffith Study of Population Health

Home Injuries Project

Nested Cohort

Recruited from within the existing EFHL cohort

- Children 2-4 years of age
- Total number of eligible families = 1,249
- Completed additional Home Risk Survey

Home Risk: Injury Prevention Survey

Self-report home risk survey conducted in 2013-14
(Validation study conducted in 2012)

Developed from three tools:

- **Home Safety Factsheet** *(Children's Hospital, Westmead)*
- **Safe Home** *(Swansea/Cardiff University, Public Health Wales, Child Accident Prevention Trust, RoSPA , FireKills)*
- **Home Safety Questionnaire** *(Watson, Kendrick & Coupland)*

Home Risk: Injury Prevention Survey

Injury Domain	Questions	
Burns/ Electrocutions	Safety Switches Safety Plugs Hot water set at 50° c	Safety guards around heaters/fires Working smoke alarms
Falls	Non-slip mats/handrails in bath Window locks and guards Stair safety	Deck and Balcony safety Woodchip/Rubber under play equipment
Poisons	Unlocked medicines, chemicals and cleaning products stored above 1.5m	Locks on garage and garden sheds
Drowning	Pool fencing and footholds	Fishpond covering
Driveway Accidents	Fencing between play area and driveway	Fencing between play area and street

Home Risk Score

Generic safety items (e.g. smoke alarms) scored as:

- present or absent

Items relating to physical feature (stairs, decks) were scored as:

- Potential risk not on the property
- Feature exists but all safety guidelines met
- Feature exists, one or more guidelines not met

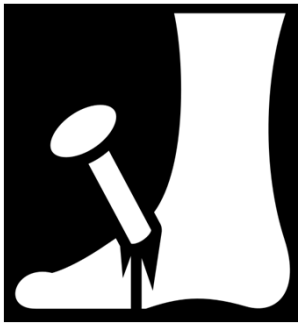
Scores summed for the 5 injury domains & weighted to ensure equal contribution to the final score (range 18-46)

Higher Score = Higher Risk

Multiple imputation methods used for missing data

Data Linkage: Injury events

Injury presentations were extracted from:



- Qld Emergency Department Information System (EDIS: Public Hospitals)
- Qld Hospital Admitted Patients Data Collection (QHAPDC: Public & Private)

Classification of injury was based on ICD-10-AM:

- Chapter 19 Injury and Poisoning (S00-T98)
- Chapter 20 External Causes (U50-Y98), excluding late effects of injury

Outcome of interest: total number of injury “episodes of care”

Data Analysis

Person-years follow-up

Zero-inflated Poisson Regression was used to calculate Rate Ratios

- Exposure (Home Risk Score)
- Outcome (Count of Injury Related Episodes of Care)

Model covariates

CHILD FACTORS	Gender, Age (Person-Years).
MATERNAL FACTORS	Maternal education, Maternal age, Smoking during pregnancy, High risk alcohol and drug use during pregnancy.
HOUSEHOLD FACTORS	Marital status, Home ownership, Household income, Partner's employment status, Number of other children in household.

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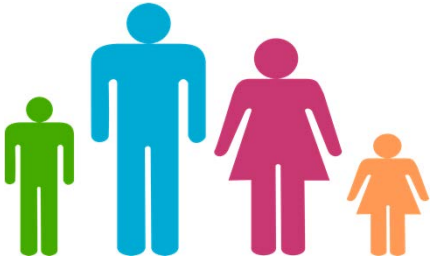
Results: Sample Characteristics



562 households, 566 child participants - 4 sets of twins (45% response rate)

- Maternal age: 16 – 52 years (mean 30.8 years)
- Maternal education: 15% not completed school, 60.4% school or trade, 24.6% tertiary study
- 7.9% sole parent families
- 45.6% households in the 4th/5th highest income quintiles
- 52% children male

131 children (23.1%) experienced a hospital treated injury (8.9 injuries/100 PYs).

83% of injuries occurred in the home (inpatient records only)

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Results

Children with the lowest home risk scores had almost twice the injury rate of children with the highest home risk scores (RR = 1.90; CI 1.15-3.14)

Home Risk ⟷ **Child Injury**

	Children with a hospital treated injury	Rate of child injury episodes of care
Lowest risk quartile (N=146)	46 (31.3%)	11.7/100PYs
2nd quartile (N=135)	27 (19.9%)	9.1/100PYs
3rd quartile (N=142)	33 (22.9%)	9.2/100PYs
Highest risk quartile (N=139)	25 (18.0%)	5.7/100PYs

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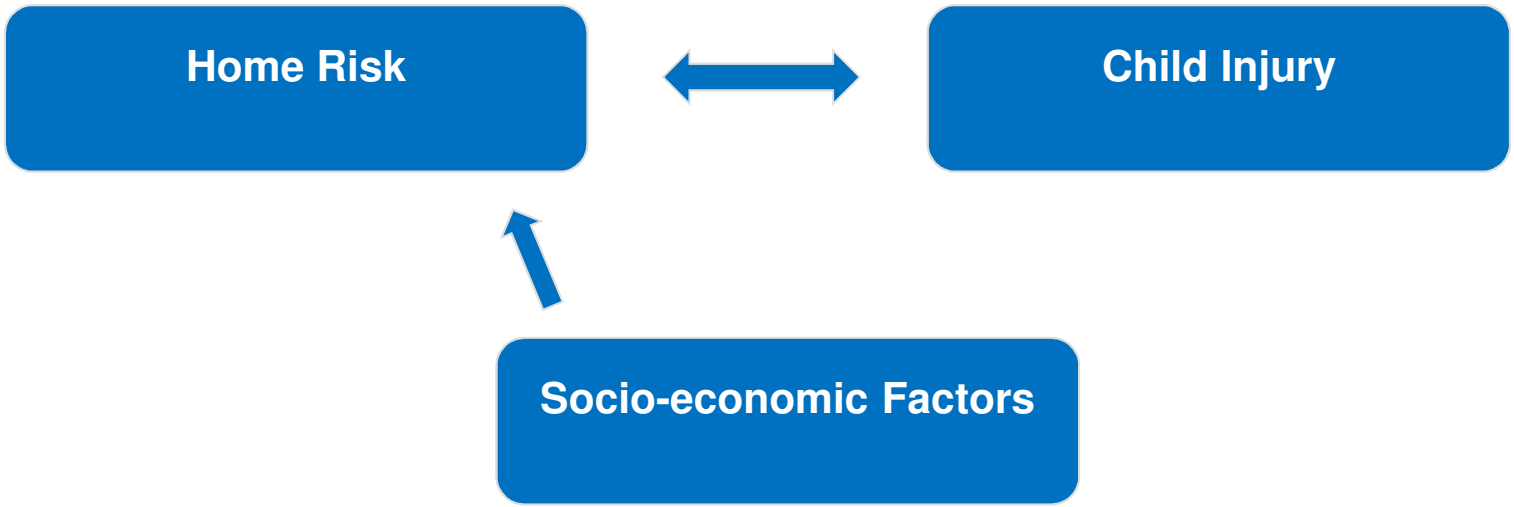

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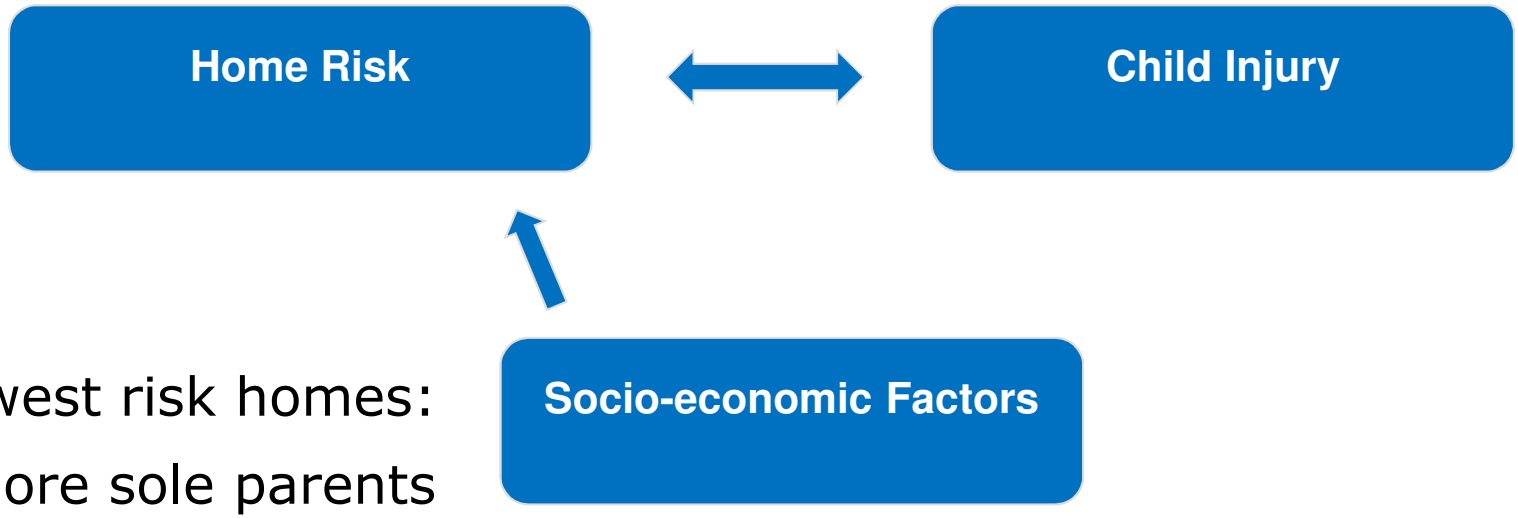

Lowest risk homes:

- More sole parents
- Lower maternal education
- Younger maternal age
- Lower household income

Low Risk Homes

Measure assessed structural features/safety equipment

Did not include broader measures of home risk (i.e. household chaos or parental supervision)

Structural features of low risk homes

- Predominately single storey houses
- Fewer stairs, decks, balconies and pools

Consistent with lower cost dwellings, and by extension, lower income households

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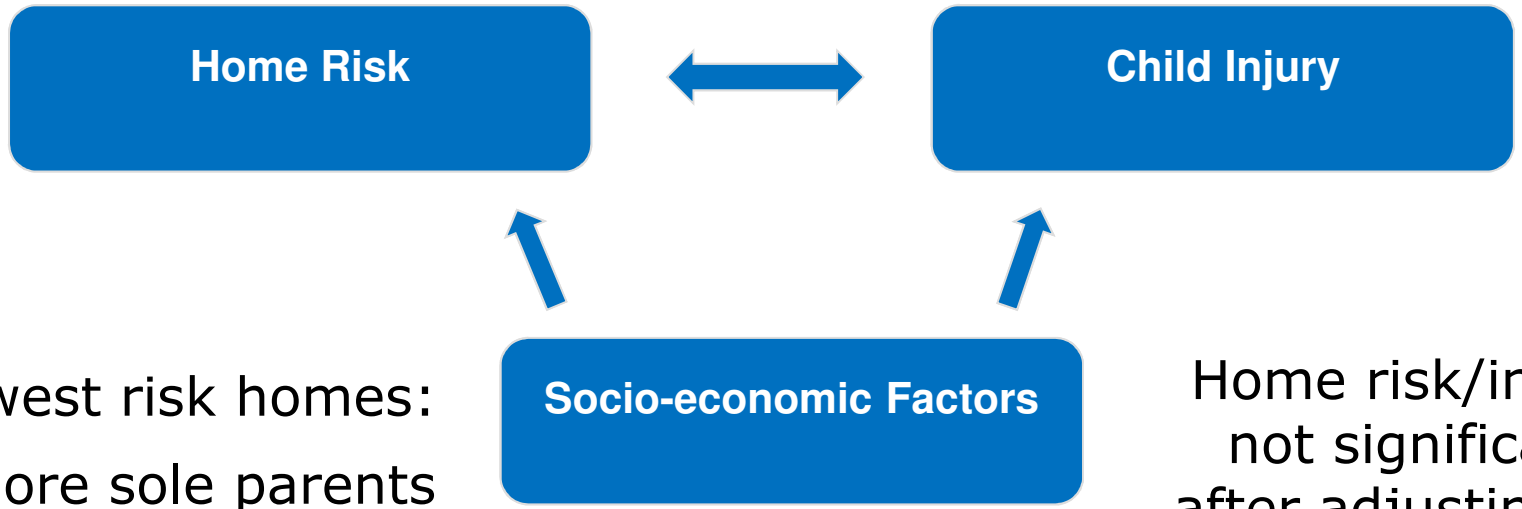

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Home risk/injury not significant after adjusting for SES.

Adj RR=1.60 (95% CI 0.96-2.66)

Strengths

- Injury data based on state-wide linkage of hospital records
- Linked data combined with detailed survey data
- Home risk assessed using validated questionnaire

Limitations

- Findings relate to injuries severe enough to require hospital treatment only
- Cause of injury data only available for inpatient data
- Home risk assessed at 1 point in time
- Response rate and sample size

Conclusions

Child Injury: Does Home Matter?

Yes home matters, but it is not the only factor that matters…

- Children from socio-economically deprived families had higher rates of injury, despite living in physical environments that contained substantially fewer injury risks.
- Need for continued efforts to implement societal-wide, long-term, policy and practice changes to address the socio-economic differentials in child health outcomes.

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