Adverse Childhood Experiences in Scottish Children's Lives: Results from the GUS Cohort

Alexandra Blair (PhD candidate, U de Mtl)

John Frank

Louise Marryat PhD (Farr PDF, SCPHRP)

Usher Institute
Population Health Sciences & Informatics

@lmarryat

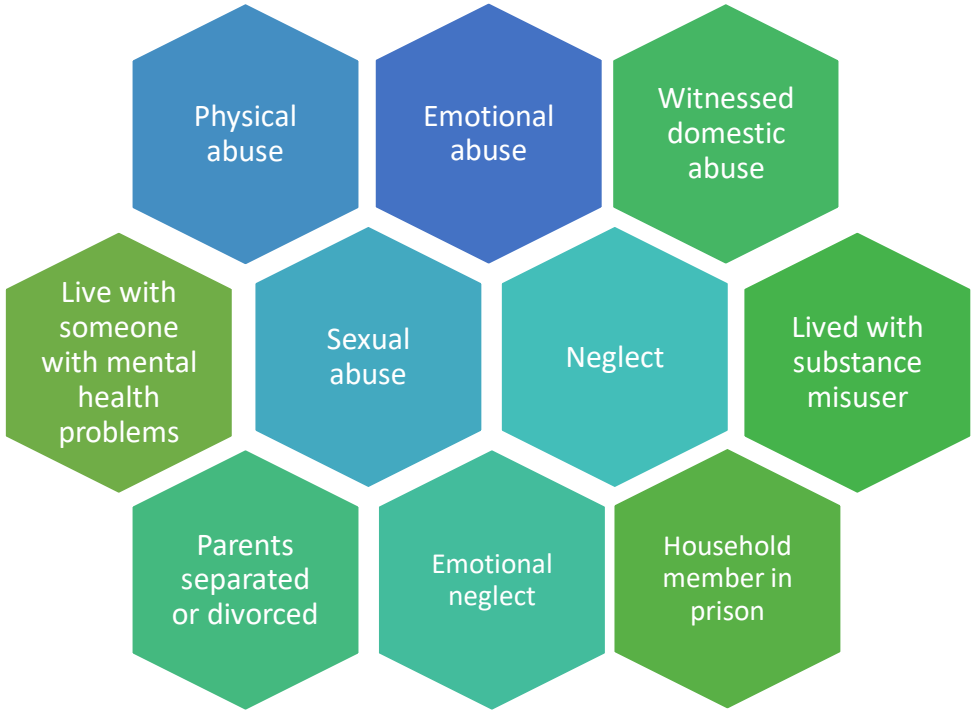
THE UNIVERSITY of EDINBURGH

SCPHRP
Scottish Collaboration for Public Health Research and Policy

Farr
The Farr Institute @ Scotland

Usher Institute
Population Health Sciences & Informatics
www.ed.ac.uk/usher
@EdinUniUsher

What are Adverse Childhood Experiences?



Usher Institute
Population Health Sciences & Informatics
www.ed.ac.uk/usher
@EdinUniUsher

Study 1 (currently under peer review)

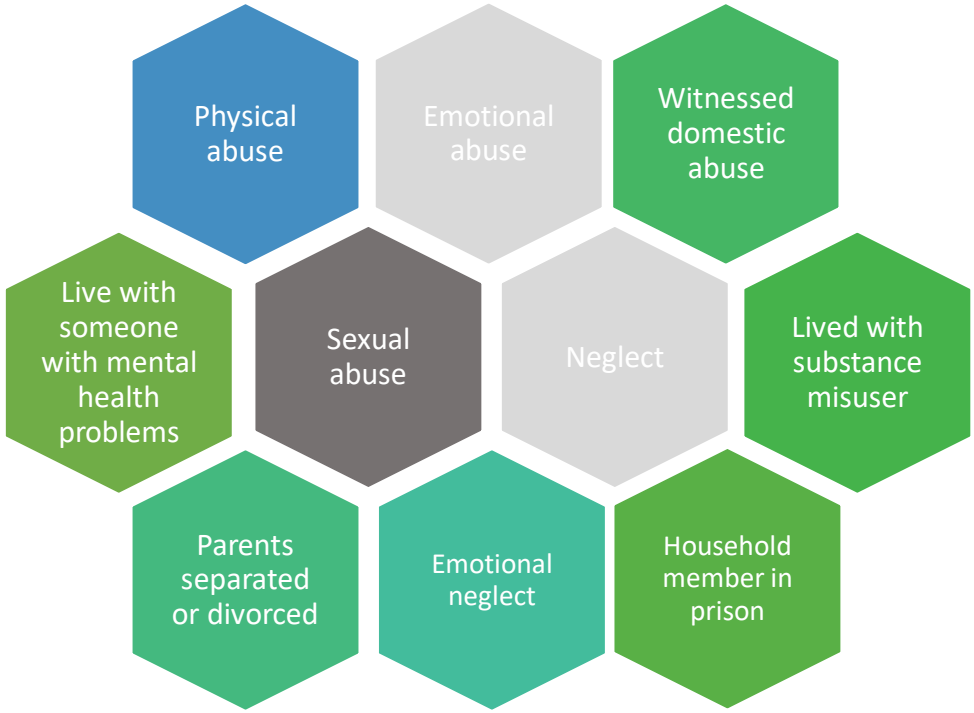
AIM: to explore to what extent ACEs could be gathered using prospective cohort data, and what prevalence levels look like in this general population of Scottish children.

RESEARCH QUESTIONS:

1. What are the levels of ACEs in the general population of Scottish children?
2. What factors predict a) having any ACEs and b) having more ACEs in the general population?
3. To what extent does relative poverty account for the burden of ACEs in Scotland?

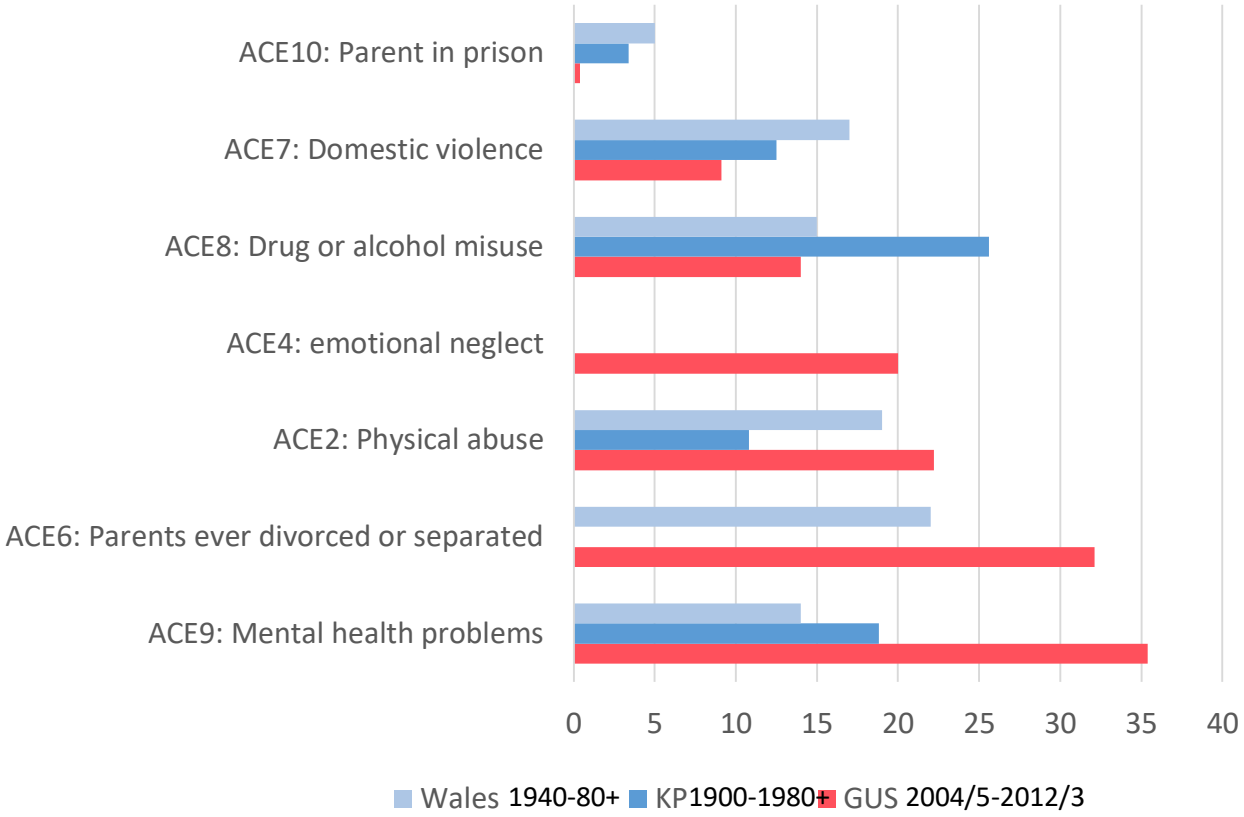
Usher Institute
Population Health Sciences & Informatics
www.ed.ac.uk/usher
@EdinUniUsher

Data availability



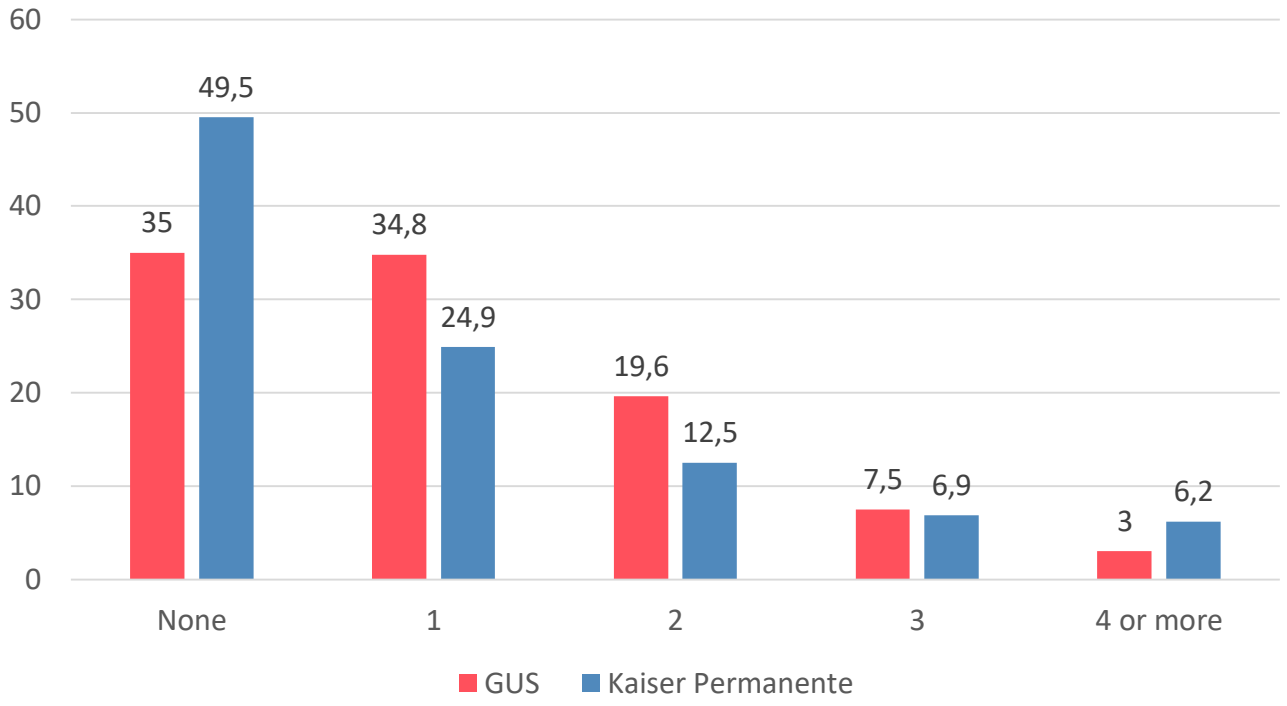
Usher Institute
Population Health Sciences & Informatics
www.ed.ac.uk/usher
@EdinUniUsher

Levels of selected ACEs by cohort



Usher Institute
Population Health Sciences & Informatics
www.ed.ac.uk/usher
@EdinUniUsher

Levels of ACEs across two cohorts (many decades apart – GUS born 2004/5; KP born 1904-1977, mean 1940)



Ns: GUS – 3119; KP - 8056

Usher Institute
Population Health Sciences & Informatics
www.ed.ac.uk/usher
@EdinUniUsher

Children's odds of having 3+ ACEs at age 8 were associated with…

Being male (O.R.=1.5)*

Having a mother aged <20 at the birth of 1st child (O.R.=2.1)*

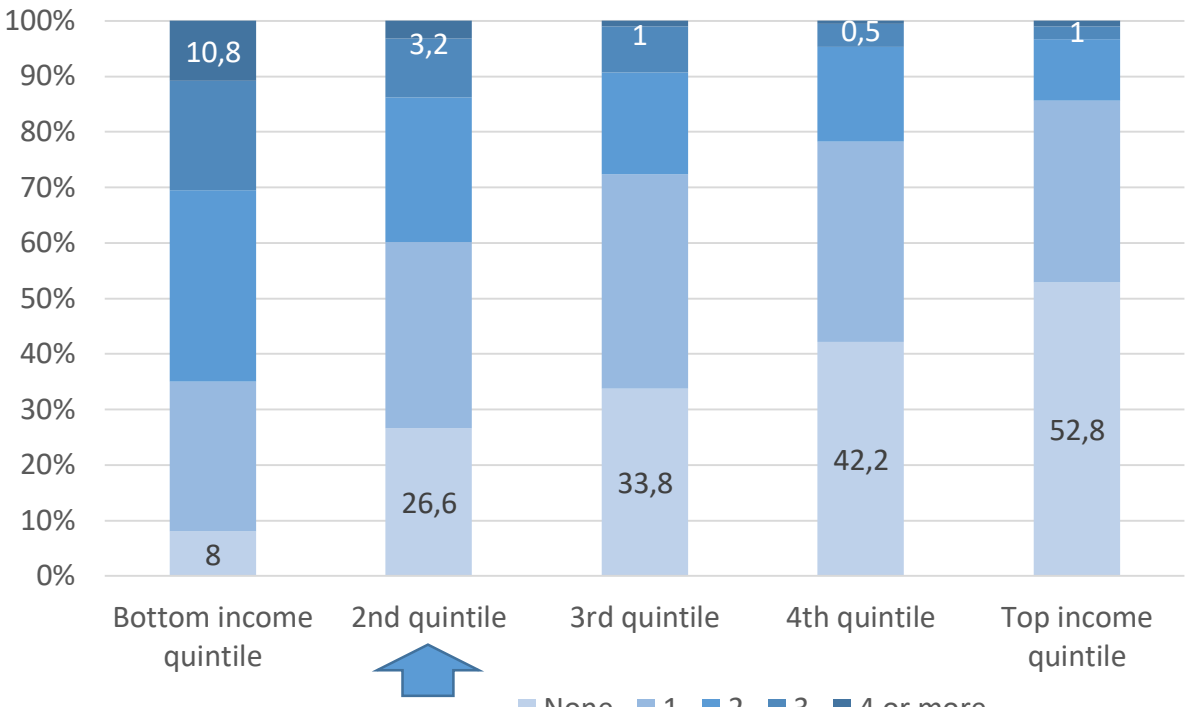
Living in a household in lowest income band (O.R.=6.5)*

Living in an urban area (O.R.=1.8)*

*p<0.05

Usher Institute
Population Health Sciences & Informatics
www.ed.ac.uk/usher
@EdinUniUsher

ACE scores by equivalised family income at sweep 1



£10,250 Poverty Cutoff in 2005-6

Income doesn't explain everything however…

- Calculated the Population Attributable Risk(PAR)
- 'the proportion of the health outcome in an entire population, which is attributable to the exposure'
- Exposure = below relative poverty line; high risk of adverse health outcome= 3+ ACEs
- Results suggest that in 22% of cases where children experience 3+ ACEs, this experience can be directly attributed to poverty
- Moving children above poverty line would decrease the proportion of children experiencing 3+ ACEs from 10% to 7.8%

Usher Institute
Population Health Sciences & Informatics
www.ed.ac.uk/usher
@EdinUniUsher

Study 2 (currently under peer review)

Can community resources help mitigate the effects of household poverty on ACE incidence?

RESEARCH QUESTION:

1. Is the relationship between household poverty and the cumulative incidence of adverse childhood experiences modified b families' access to community resources?

This study uses the same sample as study 1.

Objectives

1. **Effect modification:** Assess whether the association between household income and 8-year cumulative ACE incidence is modified by households' access to:
    - Non-precarious housing
    - Transportation services
    - Breastfeeding counselling
    - Childcare services
    - A local public park or playpark (among urban residents)

2. **Proportion eliminated:** Assess the extent to which income inequalities in 8-year cumulative ACE incidence could be eliminated if access to the identified resources were available to all

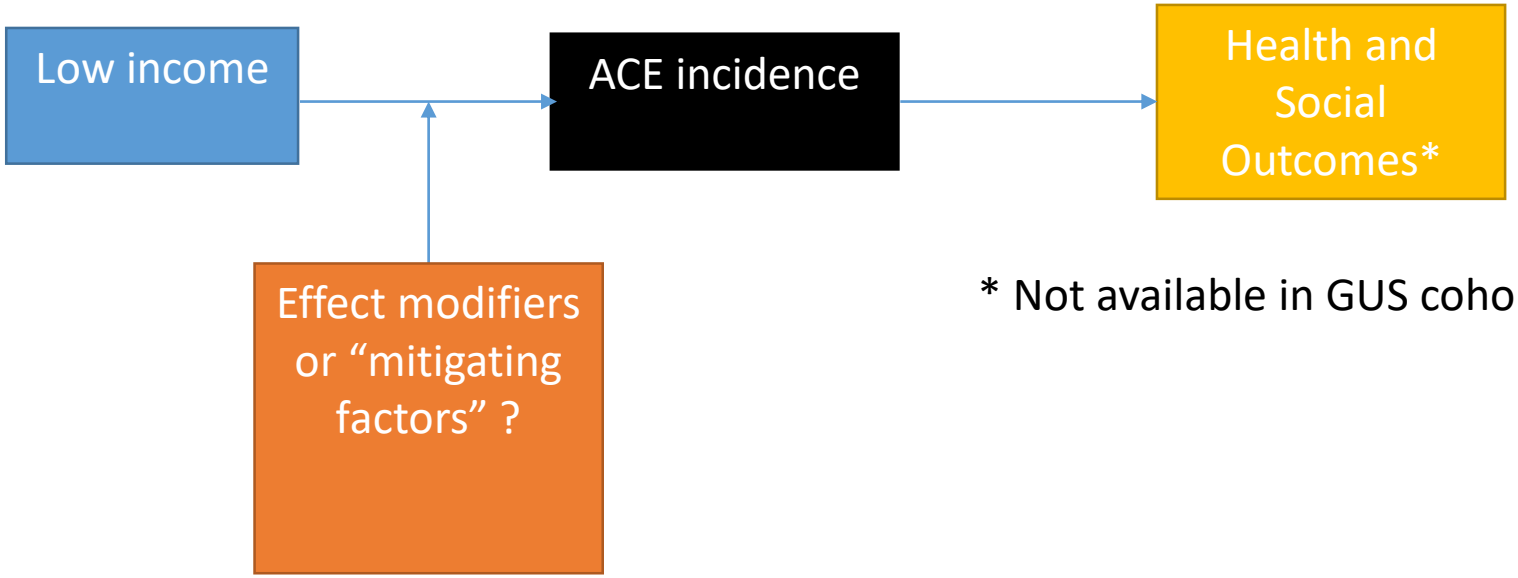
Analyses

- **Objective 1: Protective effects of resources?**
  - Inverse probability-weighted (IPW) identity-link Poisson regression models, stratified by income

- **Objective 2: Proportion of inequality eliminated?**
  - Inverse probability-weighted (IPW) identity-link Poisson regression models
    - **Total effect** (TE) of income on ACE incidence
    - **Controlled direct effect** (CDE) if all had the resource
    - **Proportion eliminated** (PE) = (TE- CDE) / TE

VanderWeele 2009

Background to study 2



* Not available in GUS cohort yet

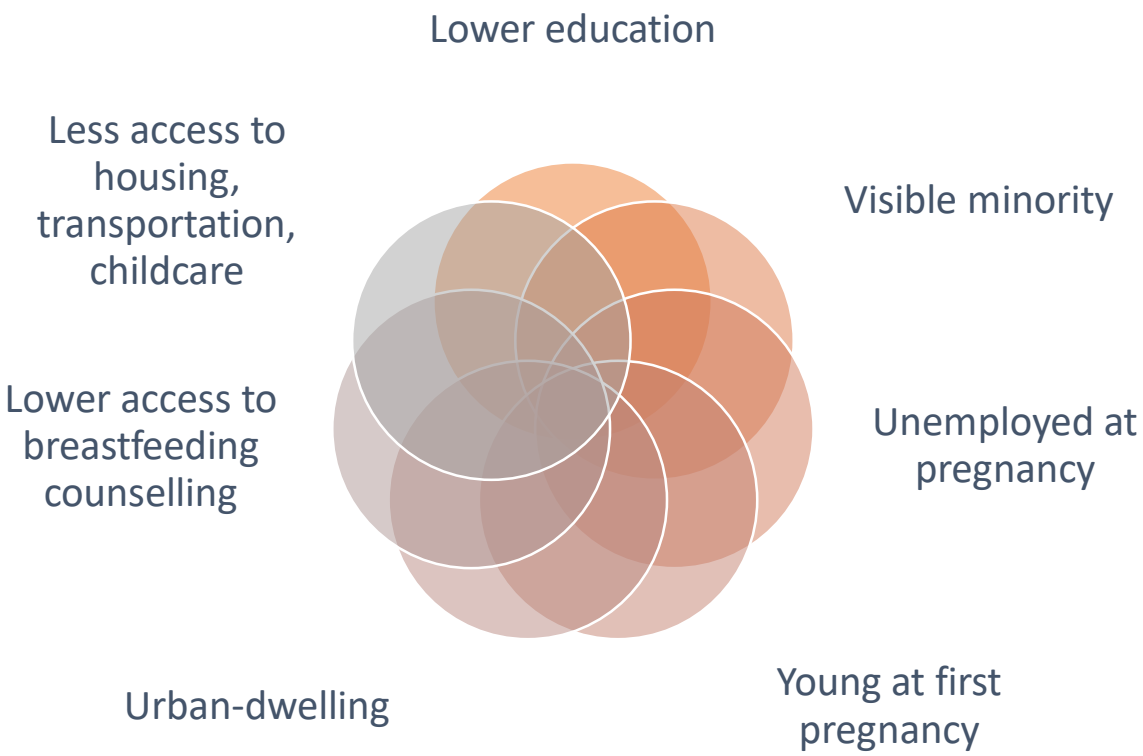
The experience of low-income can vary according to the relative generosity of state investment in benefits, policies and resources (simplified DAG)

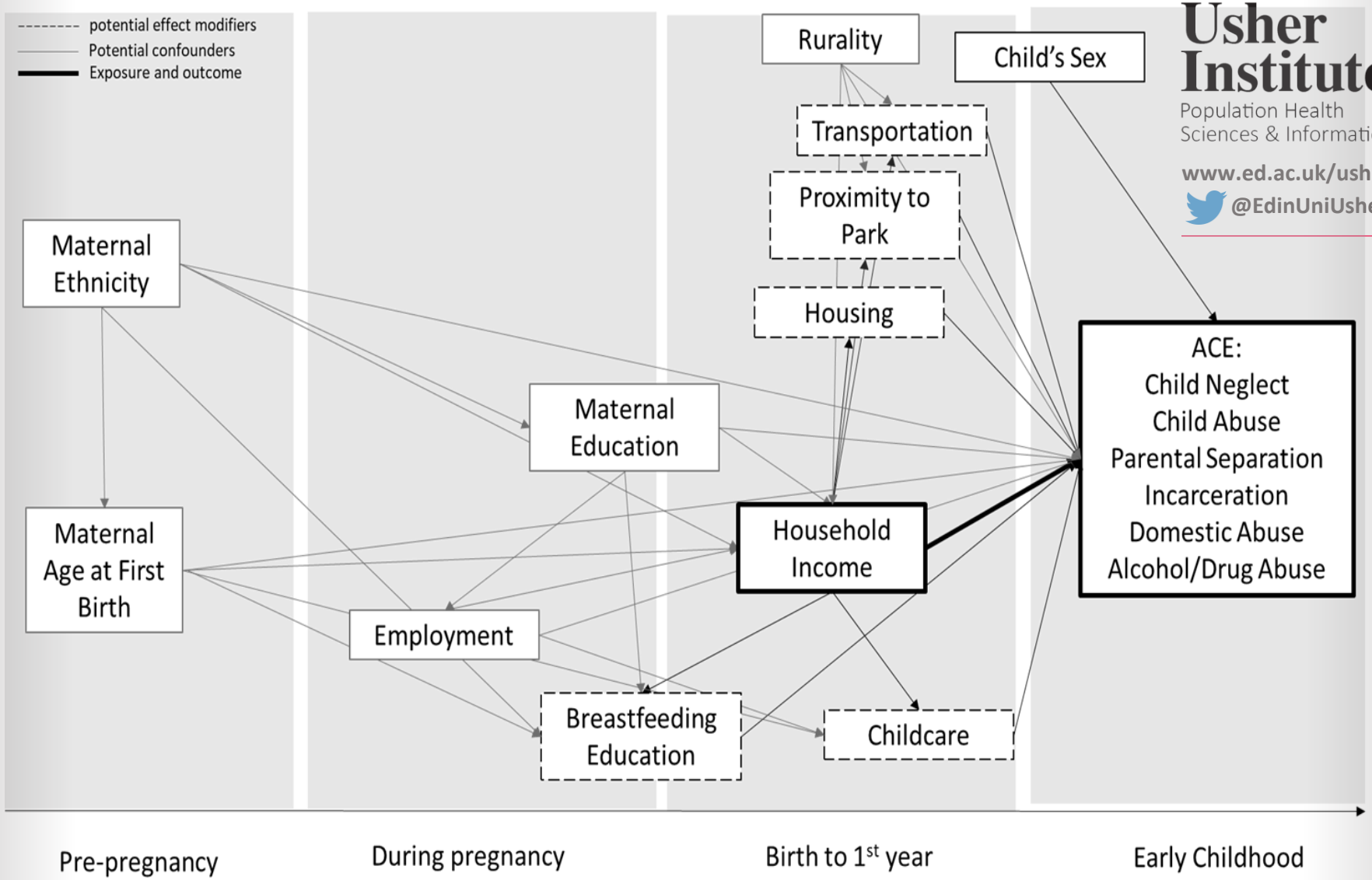
(Bambra & Eikemo 2009, Bambra 2011, O'Campo et al. 2015)

Descriptive results

Usher Institute
Population Health Sciences & Informatics
www.ed.ac.uk/usher
@EdinUniUsher

- **Low-income households characteristics:**

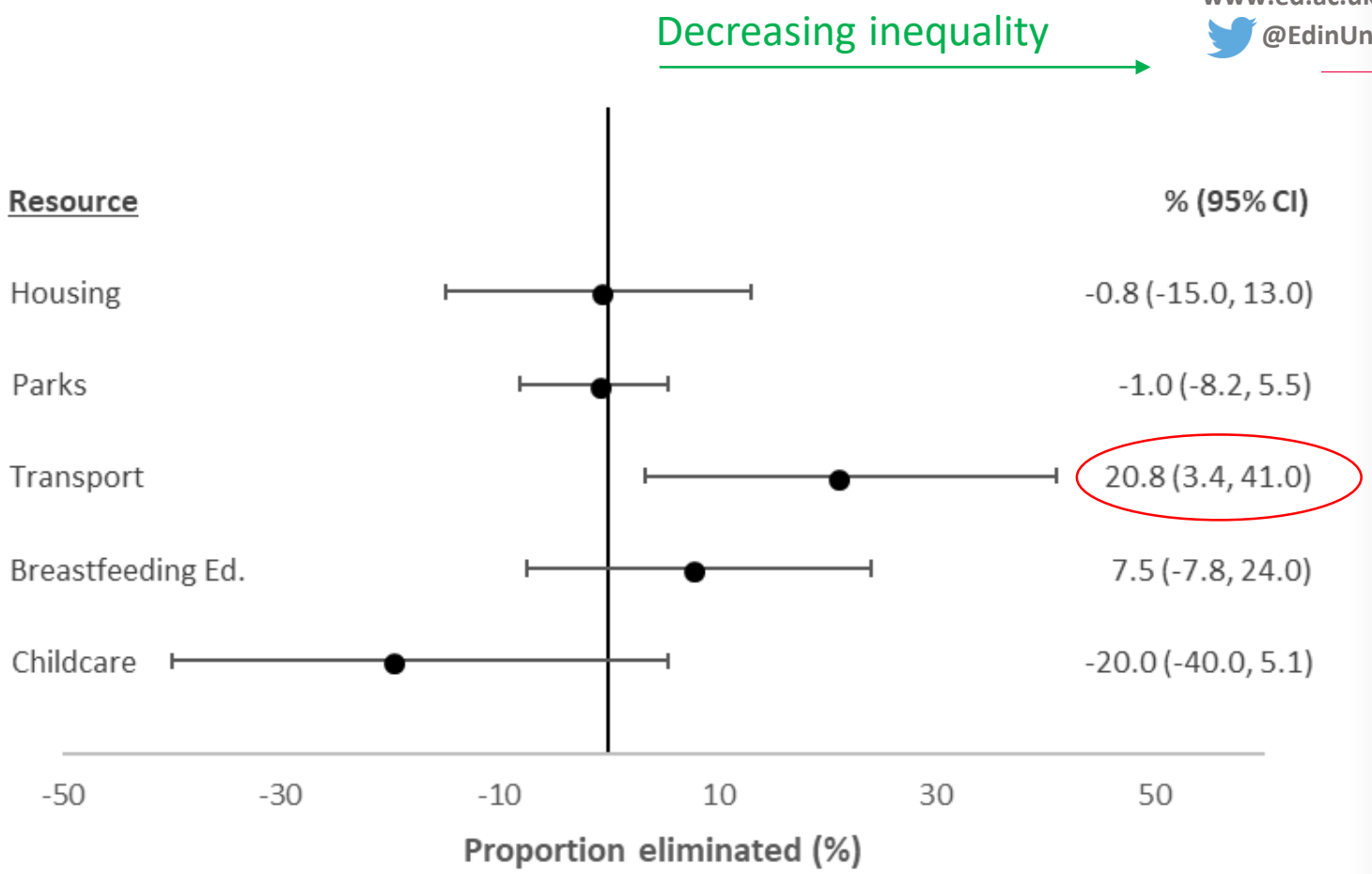




Full DAG of the association between GUS household income and ACE incidence by age 8 years

Proportion eliminated: **3 or more ACEs**

Usher Institute
Population Health Sciences & Informatics
www.ed.ac.uk/usher
@EdinUniUsher

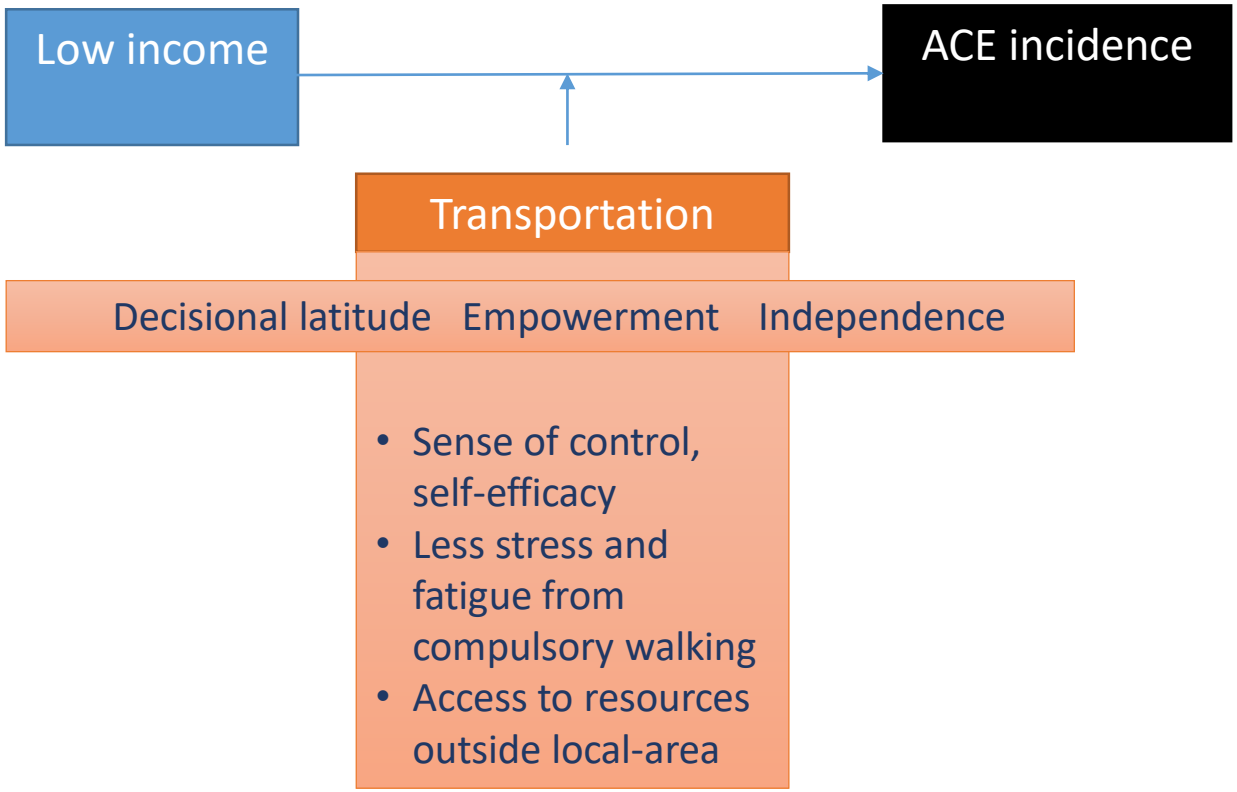


Proportion of income-based inequality in 8-year cumulative ACEs (= >/3) eliminated if all families fully exposed to mediator (excess relative risk scale)

Mediators	Proportion eliminated (%, 95% CI)
Park proximity	-1.0 (-8.2, 5.5)
Housing	0.8 (-15.0, 13.0)
Transportation	**20.8 (3.4, 41.0) * p< 0.05**
Breastfeeding Education	7.5 (-7.8, 24.0)
Childcare	-20.0 (-39.0, 5.1)

- **Interpretation:** The % of the relative income inequality in cumulative ACE incidence that could be eliminated by providing the amenity/service identified as a mediator (left column) to all families in the community (1. VanderWeele TJ. *Explanation in Causal Inference: Methods for Mediation and Interaction.* Oxford: Oxford University Press, 2015. 2. VanderWeele TJ. Mediation analysis: A practitioner's guide. *Ann Rev Public Health* 2016; 37(1):17-32)

How do we interpret these results?



Syme 1996, Markovich 2011, Bostock 2001, Bambra 2007, Fairburn 2005, Dieterich 2013, Chapman 2004

Usher Institute
Population Health Sciences & Informatics
www.ed.ac.uk/usher
@EdinUniUsher

Conclusions

- Two-thirds of Scottish children have 1+ ACE by age 8 (based on an undercount in GUS data)
- Compares unfavourably with previous studies
- Measurement differences and differences in eras/cultures make it hard to compare directly
- Clear that many Scottish children are experiencing far from ideal childhoods
- Few experiencing 4+ ACEs – the strong predictor of later negative outcomes
- Experience of ACEs was moderately associated with living in poverty
- Improved access to transportation could limit the impact of poverty on adversity in childhood – replication studies needed.

Usher Institute
Population Health Sciences & Informatics
www.ed.ac.uk/usher
@EdinUniUsher

Acknowledgements

- Principal author Dr Louise Marryat (Farr Fellow, 2016-) and Alexandra Blair (Visiting PhD student, 2017)
- Children and families who participated, & continue to participate, in GUS
- The GUS team at ScotCen and CRFR, particularly Paul Bradshaw and Lesley Kelly
- Sara Dodds, Scottish Government
- SCPHRP's core grant from MRC and CSO; Farr@Scotland; and the Canadian Institutes of Health Research, who funded the work

Any questions or comments?