

Adverse childhood experiences: a focus on maltreatment (neglect and abuse), disentangling associated developmental trajectories and long-term outcomes in the 1958 British birth cohort

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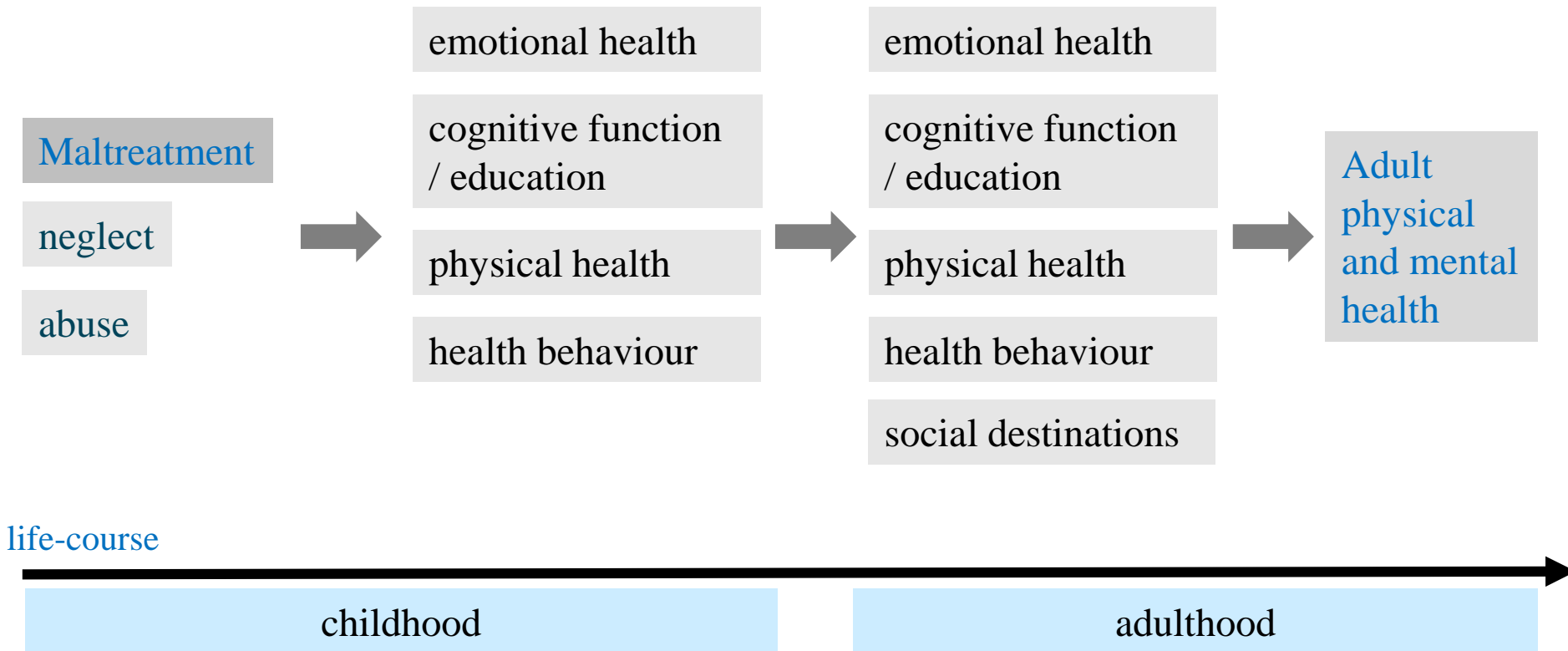
Chris Power

Are specific childhood maltreatments associated with adult living standards at 50y?

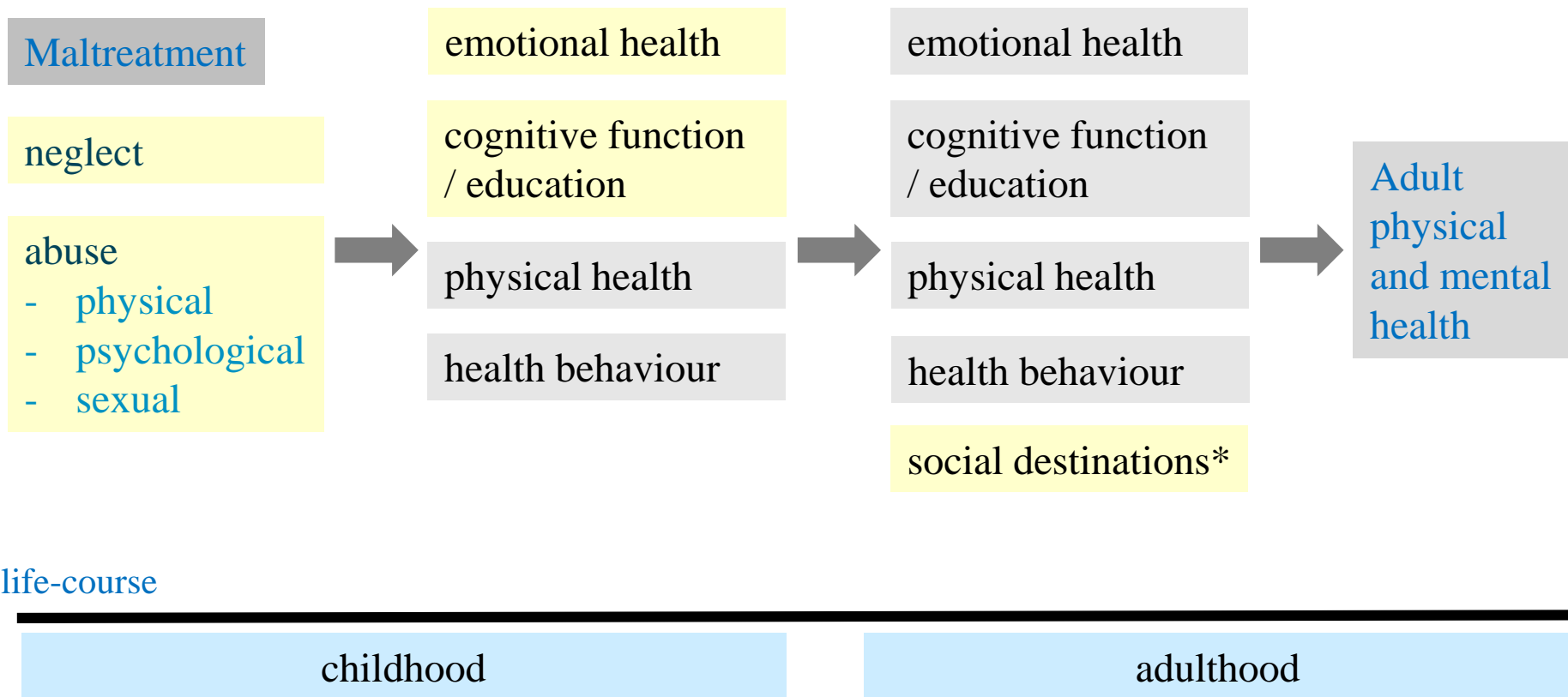
Snehal M Pinto Pereira
Leah Li, Chris Power



Public Health
Research Consortium



- Understand the range of long-term outcomes related to child maltreatment
- What pathways are involved?
- Are these pathways common or specific?



*Adult living standards e.g.

- Education
- NEET: not in employment, education or training
- social mobility

Aims

To establish:

- extent to which child maltreatment are associated with adult living standards
- mediating pathways: adolescent cognition; mental health

National child development study,1958-2008

All born one week in England, Scotland and Wales



N~18,000

N~8,000

Birth	7y	11y	16y	23y	33y	42y	45y	50y
1958	1965	1969	1974	1981	1991	2000	2003	2008

*Neglect
(parent & teacher
report)*

*Recalled
abuse
(0-16y)*

*Cognitive tests
& behaviours*

*Economic
outcomes*

*Childhood SEP, parental
education, household amenities,
crowding & tenure, birthweight,
birth order etc*

Neglect prospective: at 7y and 11y

- child looks undernourished, scruffy or dirty (T)
 - hardly ever takes outings with mother (P)
 - hardly ever takes outings with father (P)
 - mother has little interest in education (T)
 - father has little interest in education (T)
-

T: teacher-report

P: parent-report

abuse by parent self-report at 45y

Sexual - I was sexually abused

Physical - I was physically abused: punched, kicked, hit, beaten with an object, needed medical treatment

Psychological - I was verbally abused; suffered humiliation, ridicule, bullying, mental cruelty

- co-occurrence of child maltreatment
- disentangling from other early life adversities linked to later health outcomes
 - socio-economic position
 - low birthweight

Neglect	prospective: at 7y and 11y	Prevalence
	- child looks undernourished, scruffy or dirty (T)	
	- hardly ever takes outings with mother (P)	
	- hardly ever takes outings with father (P)	~10%
	- mother has little interest in education (T)	
	- father has little interest in education (T)	

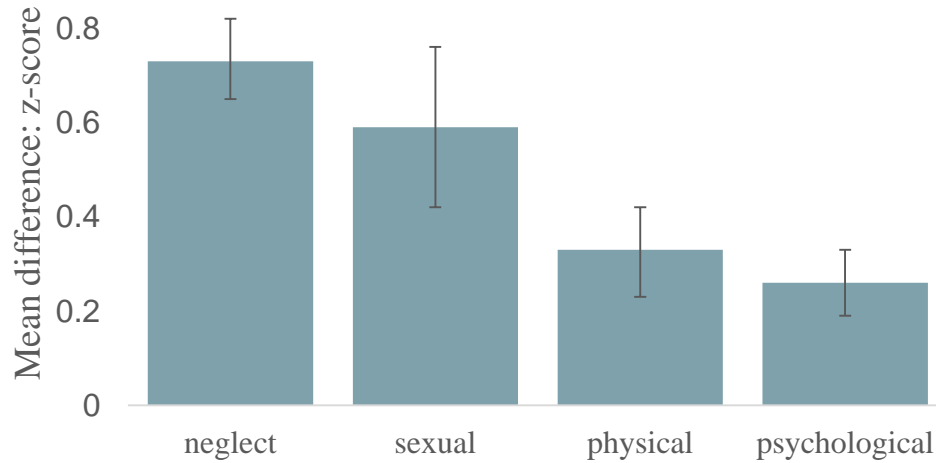
T: teacher-report
P: parent-report

abuse by parent	self-report at 45y	Prevalence
Sexual	- I was sexually abused	1.4%
Physical	- I was physically abused: punched, kicked, hit, beaten with an object, needed medical treatment	5.6%
Psychological	- I was verbally abused; suffered humiliation, ridicule, bullying, mental cruelty	9.6%

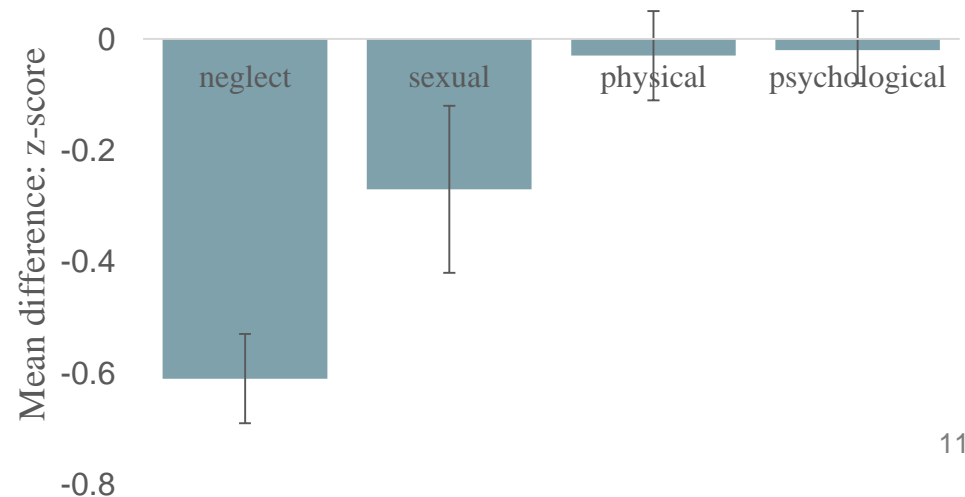
Non-sexual abuse

Association between: child maltreatments & potential mediators

16y mental health

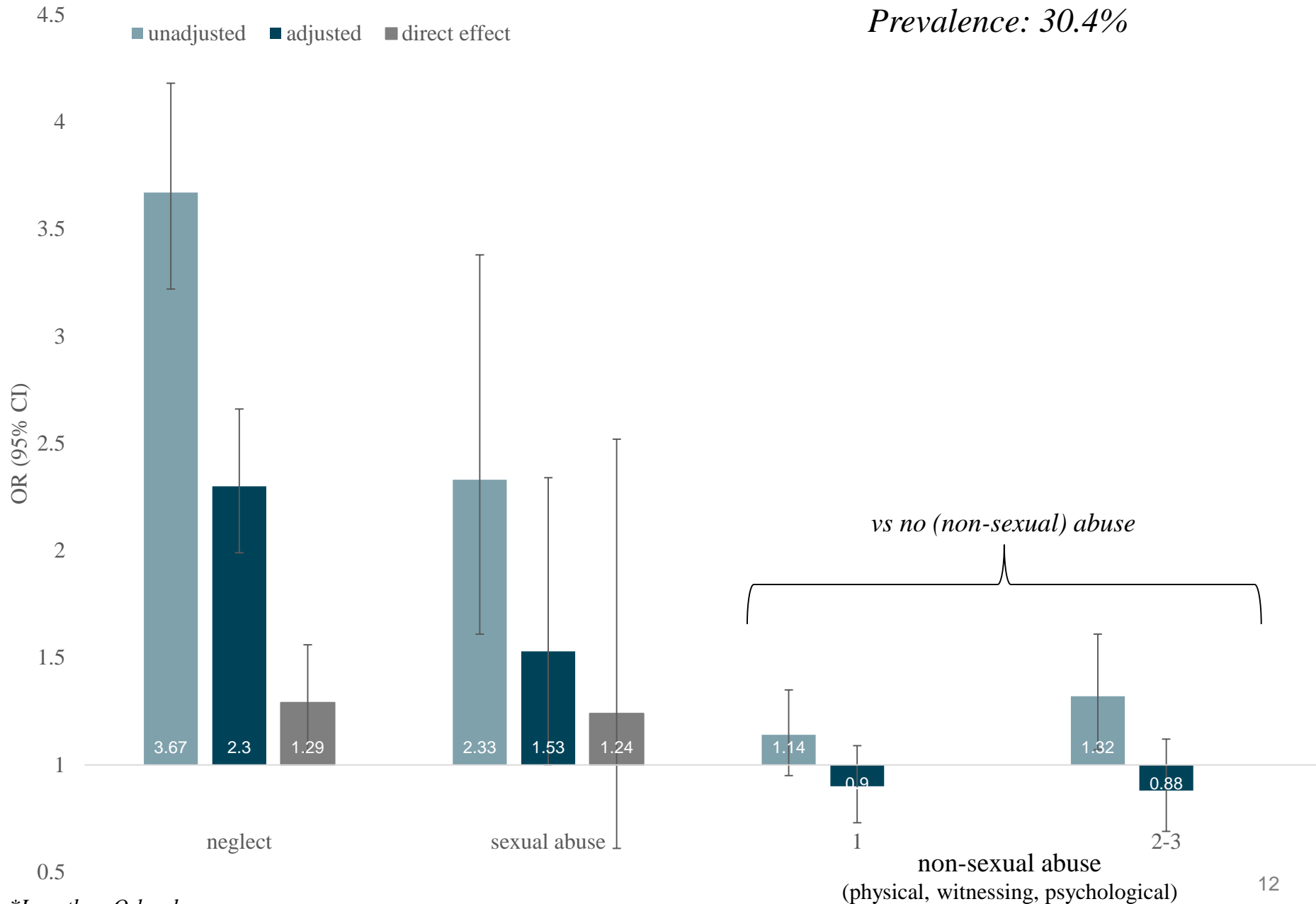


16y cognition



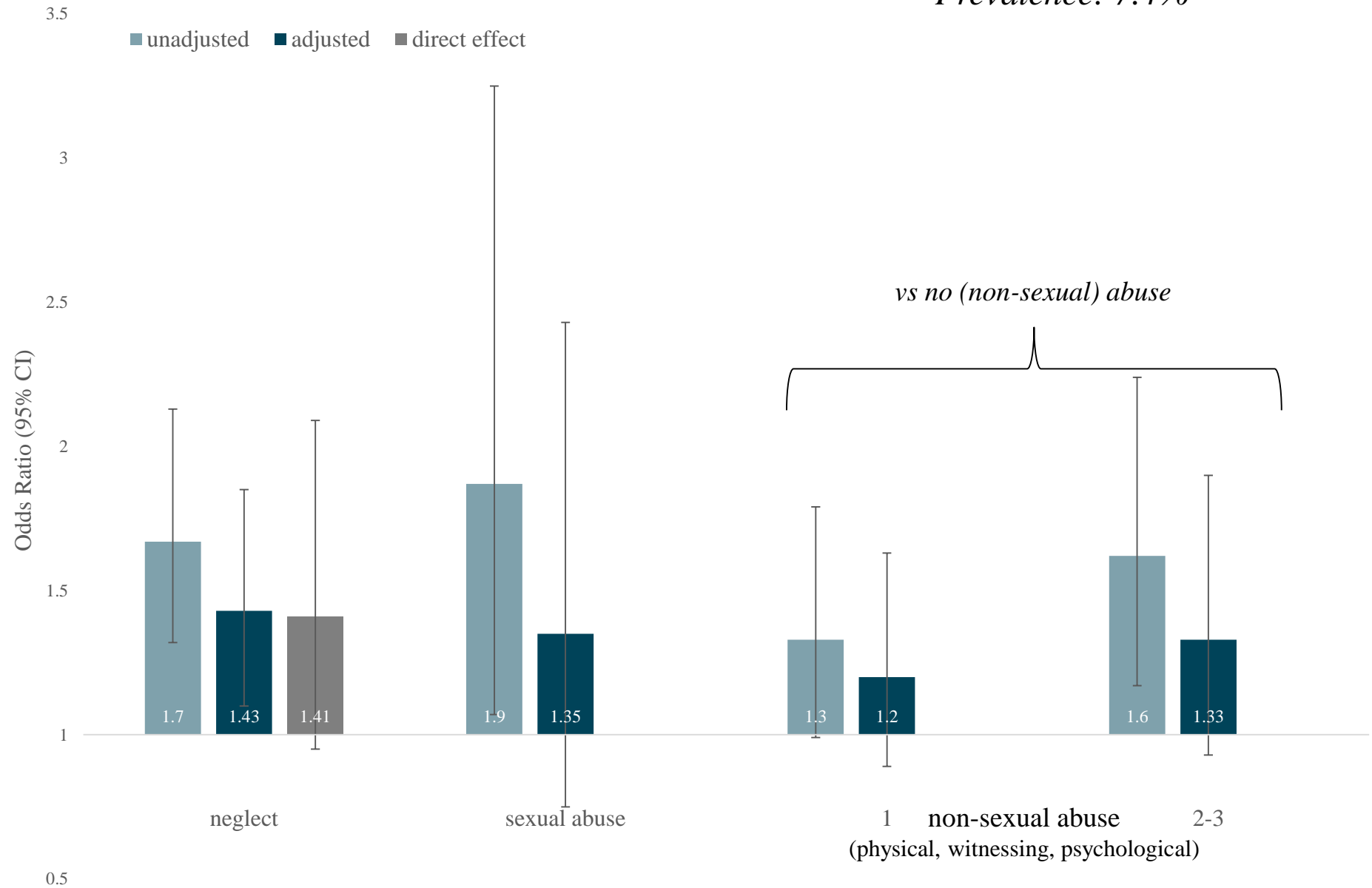
Poor qualifications*

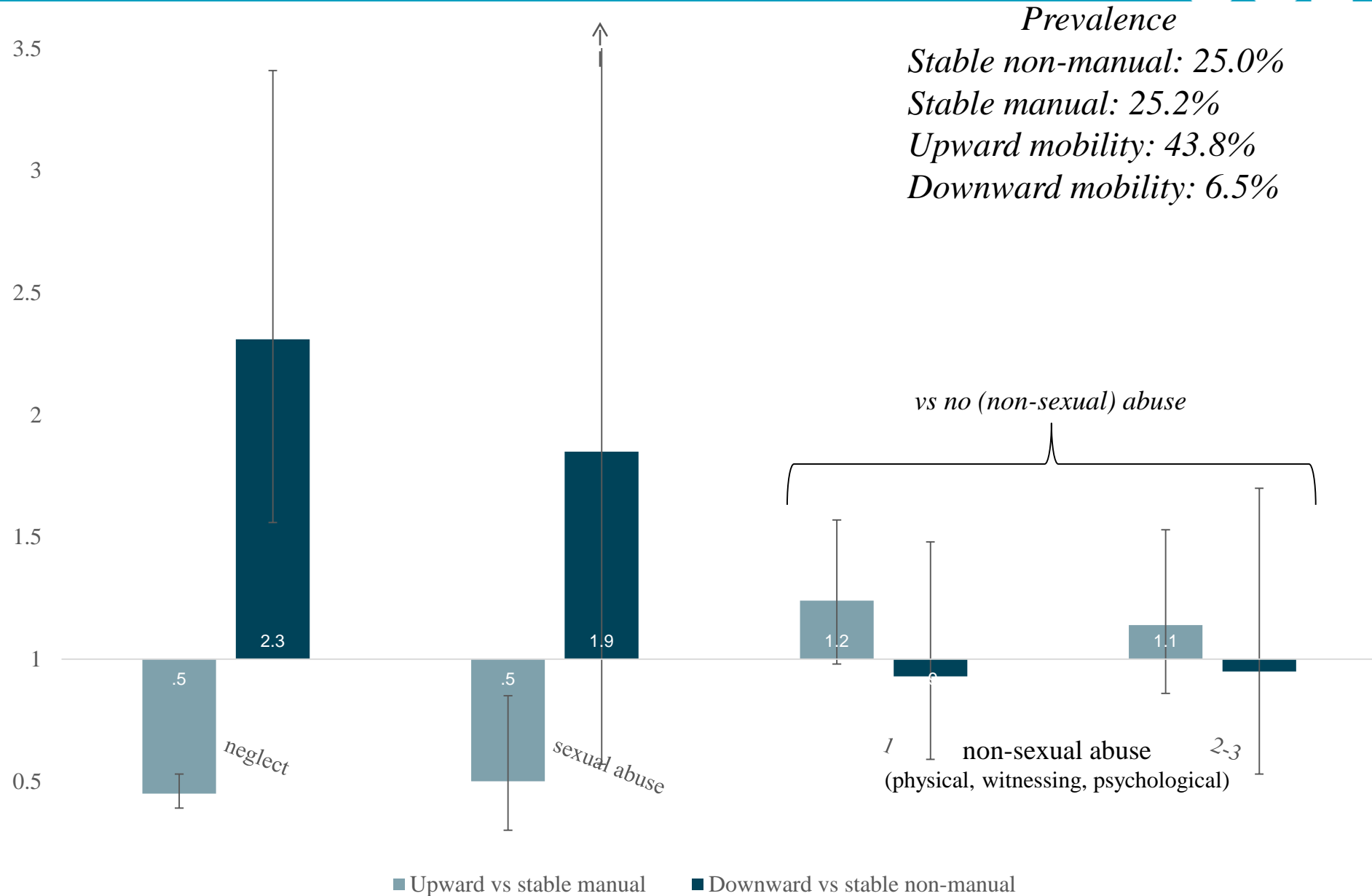
Prevalence: 30.4%



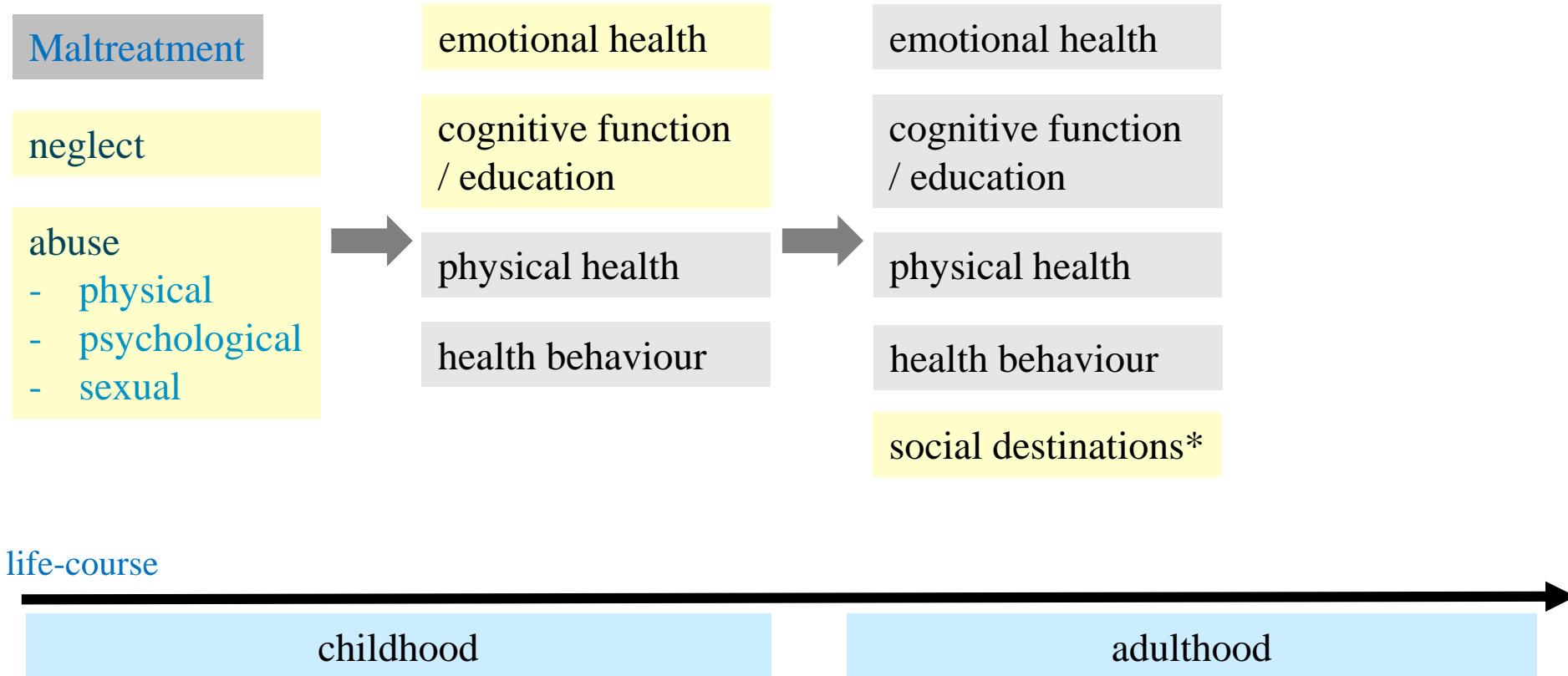
Not in employment, education or training

Prevalence: 7.4%





Are *specific* childhood maltreatments associated with adult living standards at 50y?



*Adult living standards e.g.

- Education
- NEET: not in employment, education or training
- social mobility

definition

Physical abuse Intentional use of physical force or implements against a child that results in (or has the potential) physical injury.

Psychological abuse Intentional behaviour that conveys to a child that h/she is worthless, flawed, unloved, unwanted, endangered, or valued only in meeting another's needs. Harmful (unintentional) parent-child interactions

Sexual abuse any completed/attempted sexual act, sexual contact, or non-contact sexual interaction with a child by a caregiver.

indicators

Physical abuse by a parent (punched, kicked or hit or beaten with an object, or needed medical treatment)

Psychological abuse by a parent (verbally abused or humiliated, ridiculed, bullied/mental cruelty)

Sexual abuse by a parent

Key points

- IORW condenses information on OR between exposure and mediators into a weight
- The weight, (i.e. inverse exposure-mediator OR) used to estimate direct effects via weighted regression
- Applying the weight renders the exposure and mediator independent, deactivating indirect pathways involving the mediator(s).

Assumptions

- no unmeasured confounding of (conditioning on preexposure confounders):
 - exposure on mediator
 - mediator on outcome,
 - exposure on the outcome

Additional assumption:

- No confounding variables of mediator-outcome relationship affected by exposure



60 years
of our lives:

A scientific conference
celebrating the National
Child Development Study at 60

60 Years of Our Lives Conference

Thursday 08 March 2018

The economic cost of child maltreatment in the UK

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Elena Pizzo

NSPCC

Background and aim

- ❑ Child maltreatment (CM) can result in short and long-term adverse **health, social and economic consequences**.
 - ❑ Including physical injury, mental health problems, behavioural problems and lower levels of adult economic well-being.
- ❑ Several studies from the USA, Asia and New Zealand and very **few studies in the UK** that estimate the cost of CM, but no lifetime costs.
- ❑ Aim of the study was to calculate new estimates of the **lifetime costs per victim** of non-fatal and fatal child maltreatment from a **societal perspective** in the UK using an **incidence-based approach**.
- ❑ This study can be used in **economic evaluations** of CM intervention/prevention activities to quantify the **costs saved** from **reducing** the number of **maltreated children**.

Literature

1. Studies based on UK data: 69

- Several datasets used (many NCDS)
- Various definitions of child maltreatment
- Range of outcomes considered
- Wide range of covariates controlled for

2. Studies published in economics journals: 9

- Most use National Longitudinal Study of Adolescent Health (AddHealth)
- Common identification strategy: siblings or twins fixed-effects design
- Similar set of definitions of CM and covariates controlled for

3. Cost Studies: 26, very few UK

- Various cost perspectives
- Incidence- versus prevalence-based approaches
- All forms of abuse versus specific forms of abuse
- Range of cost components included



Data #1: National Child Development Study

- ❑ Retrospective measures of child maltreatment, asked in the biomedical sweep at age 44/45.
- ❑ Our definitions determined after consultation with the Advisory Group convened by the NSPCC for this study.
- ❑ We constructed a “**global**” **measure**, where CM was said to have occurred if the individual reports having experienced any of the following forms of child maltreatment = 20.6%.
 1. **Neglect**. An individual was defined as having been neglected in childhood if he/she reports that any of the three following conditions is true, as compared to none of them being true:
 - “Mother (or mother figure) a little or not at all affectionate towards me up to age 16” = 36.6%
 - “Father (or father figure) a little or not at all affectionate towards me up to age 16” = 17.3%
 - “I was neglected up to age 16” = 2.5%

2. **Emotional abuse.** An individual was defined as having been emotionally abused in childhood if he/she reports that any of the three following conditions is true, as compared to none of them being true.

- “I was verbally abused by a parent (or parent figure) up to age 16” = 8.0%
- “I suffered humiliation, ridicule, bullying or mental cruelty from a parent (or parent figure) up to age 16” = 7.1%
- “I witnessed physical or sexual abuse of others in my family up to age 16” = 6.0%

3. **Physical abuse.** An individual was defined as having been physically abused in childhood if he/she reports yes to “I was physically abused by a parent – punched, kicked or hit or beaten with an object, or needed medical treatment up to age 16” = 6.0%

4. **Sexual abuse.** An individual is defined as having been sexually abused in childhood if he/she reports yes to “I was sexually abused by a parent (or parent-figure)” = 1.5%

Data #2: English Longitudinal Study of Ageing

- ❑ ELSA includes retrospective measures of child maltreatment (physical abuse and neglect only), which were asked in the life history module in wave 3.
- ❑ Our definitions again determined after consultation with the Advisory Group convened by the NSPCC.
- ❑ We constructed a **“global” measure**, where child maltreatment is said to have occurred if the individual reports having experienced any of the following forms of child maltreatment = 23.8%.
 1. **Neglect**. An individual was defined as having been neglected in childhood if he/she answers “agree or strongly agree” to the question “Mother (mother figure) or Father (father figure) seemed emotionally cold to me”: =13.8% and = 16.0%.
 2. **Physical Abuse**. An individual was defined as having been physically abused in childhood if he/she answers yes to “When you were aged under 16, were you physically abused by your parents” = 3.5%.

Econometric Analysis

- We estimated the association of our measure of CM with an extensive set of outcomes.
 - **Physical Health Problems:** Obesity, Hypertension, Diabetes, Cancer.
 - **Mental Health Problems (diagnosis):** Any type, Anxiety, Depression.
 - **Healthy Behaviours:** Heavy Drinking (consuming 2 or more alcoholic drinks a day), Smoking, Heavy Smoking (25 cigarettes per day or more).
 - **Labour Market Outcomes:** Employment, Weekly Earnings (if Employed), Disability benefits.
- We ran various specifications testing the sensitivity of the results to different set of *predetermined* covariates:
 - Background socioeconomic characteristics;
 - Circumstances and behaviours during pregnancy.
- In our full specification, we also controlled for other Adverse Childhood Experiences (ACEs) collected in the same sweep.

Summary of Results

□ NCDS

- Unable to detect significant impact on physical measures (except, impact of physical abuse on obesity).
- Persistent, sizeable and significant effects on **mental health**, with the more negative consequences associated with sexual abuse.
- Significant effect on **smoking** (all three forms of abuse) but not on drinking.
- Significant effect on **employment** (all three forms of abuse) but not on earnings .

□ ELSA

- Very similar findings to NCDS except with regards **problem drinking** (significant impact).

How did this inform the cost analysis?

- We used the findings from the analysis of the **global measure** of CM
 - Small numbers of cases for some types of maltreatment meant the analysis was underpowered.
 - May be overlap between different types of CM making it difficult to attribute costs to individual types of maltreatment.
 - Preference of the Advisory Group and funder not to distinguish by type of maltreatment.
- **Preferred the NCDS** results over the ELSA results as the former included more types of CM (the only exception heavy drinking).
- We used the coefficients from the **most saturated econometric model**.
- Included **impacts** from the econometric analysis on: Anxiety, Depression, Smoking, Alcohol abuse, Employment.

Overview of cost analysis methods

- Lifetime costs per victim of fatal and non-fatal maltreatment from a **societal perspective**.
- Analysis based on **published evidence** and **econometric analysis** of NCDS and ELSA data using an **incidence-based** approach.
- Due to data limitations the cost is for **overall maltreatment** and not by type (neglect, physical, emotional or sexual) or severity.
- We used published estimates from **previous cost of illness** studies and data **specific to the UK**.
- We assumed that average age at which CM starts is **6 years** (DfE, 2016).
- Costs estimated in **2015 UK£** and expressed in **present value terms**:
 - Discounting: 3.5% annual rate for future costs up to 30 years (declining rate thereafter) .
- Our estimates are **conservative** - extensive **sensitivity analyses** were performed.

Summary of results

Discounted lifetime costs per victim of non-fatal child maltreatment: central estimate

Cost type	Value (£)	95% Uncertainty Interval
Unplanned hospital admissions for injuries	120	(83, 141)
Short-term mental health problems	18,553	(9,758, 29,833)
Short-term health-related costs	18,673	(9,841, 29,974)
Anxiety	954	(311, 2,094)
Depression	5,145	(1,782, 10,740)
Smoking	528	(100, 1,461)
Alcohol abuse	537	(148, 1,262)
Long-term health-related costs	7,164	(2,341, 15,558)
Criminal justice system costs incurred by perpetrators	4,316	(2,509, 6,165)
Social care costs	38,132	(22,679, 53,346)
Special education costs	7,068	(2,162, 14,455)
Reduced employment	14,037	(5,364, 26,010)
Total	89,390	(44,896, 145,508)

All costs are discounted and in 2015 UK£.

Lifetime costs of fatal CM



- Include **health care costs** associated with fatal injuries; and, lifetime costs of **lost productivity**
- Health care costs:
 - we used published data on cost of fatal and penetrating trauma injuries in the UK.
- Lost productivity costs:
 - we used the **human capital approach** and multiplied figures for mean annual earnings by age (ONS 2014) with employment rates by age (from age 16 to 67; (Official Statistics 2016)).
 - The earnings figures were discounted to present value terms and inflated assuming a constant annual increase in earnings of 2% (McCrone 2008).
 - The employment-adjusted earnings figures were summed across the lifetime to provide an estimate of total lifetime earnings accounting for the likelihood of employment.

The average discounted lifetime cost of fatal child maltreatment was estimated to be **£940,758** per victim.

Summary

- There is little evidence of the lifetime cost of child maltreatment in the UK.
- We used rich, representative UK data to estimate the effect of child maltreatment on a range of outcomes.
- We found that having experienced any form of child maltreatment was associated with worse mental health outcomes, smoking behaviour, alcohol use, lower probability of employment, and greater welfare dependence.
- We detected no robust effects of child maltreatment on physical health, heavy smoking and wages.
- Using these and other data we calculated that the discounted lifetime costs per victim of non-fatal child maltreatment in the UK were estimated as **£89,390** per victim (95% uncertainty interval £44,896 to £145,508).
- The discounted lifetime cost per death from child maltreatment in the UK was estimated to be **£940,758**.
- There was uncertainty in these estimates due to data limitations.

Our findings are conservative

- ❑ **Some impacts** of CM found to be important in previous studies were **not available** in our data (e.g., days off work, premature mortality, drug use) so we did not analyse them.
- ❑ There was considerable **uncertainty** in available data and where this arose we made conservative assumptions.

Further work

- Econometric analyses to investigate maltreatment by parties **other than the primary caregivers**.
- Evaluate separately the costs of **different types of child maltreatment** (e.g., physical, emotional and sexual abuse, neglect) - although unlikely to be straightforward!
- **Repeat our analysis in future** when better data are available.
- Further research would be beneficial to evaluate the **cost-effectiveness of interventions** to reduce child maltreatment.

Why is this study useful?

- This study can be used in **economic evaluations** of CM intervention/prevention activities to quantify the **costs saved** from **reducing** the number of **maltreated children**.
- Our research identifies the **different components** of the lifetime costs of child maltreatment and the **size** of the contribution of each sector in society (e.g. social care).
- Baseline for future research: hopefully the limitations of our work will galvanize others into action!

Acknowledgments

- This research was funded by the NSPCC
- This report would not have been possible without the input of the Advisory Group:
- A huge thank you to Helen Fisher, John Devaney, Chris Cuthbert, Haroon Chowdry, Andrew James, Jon Brown, Alan Wardle, Pam Miller and Sonja Jütte for their time and input.

Thank you!

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The full report is available on the NSPCC website at: <https://www.nspcc.org.uk/services-and-resources/research-and-resources/2017/economic-cost-child-maltreatment-united-kingdom-preliminary-study/>

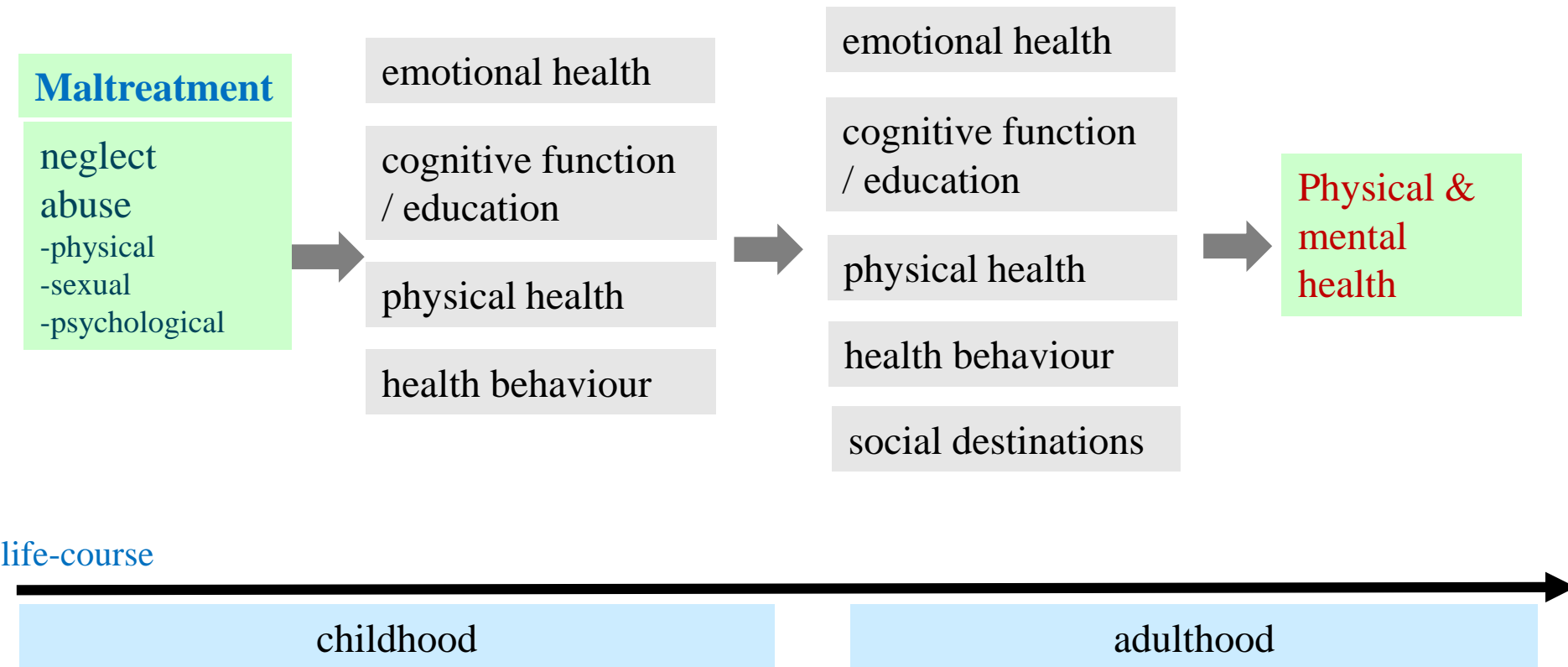
Child maltreatments, physical development and adult cardiometabolic markers

Leah Li

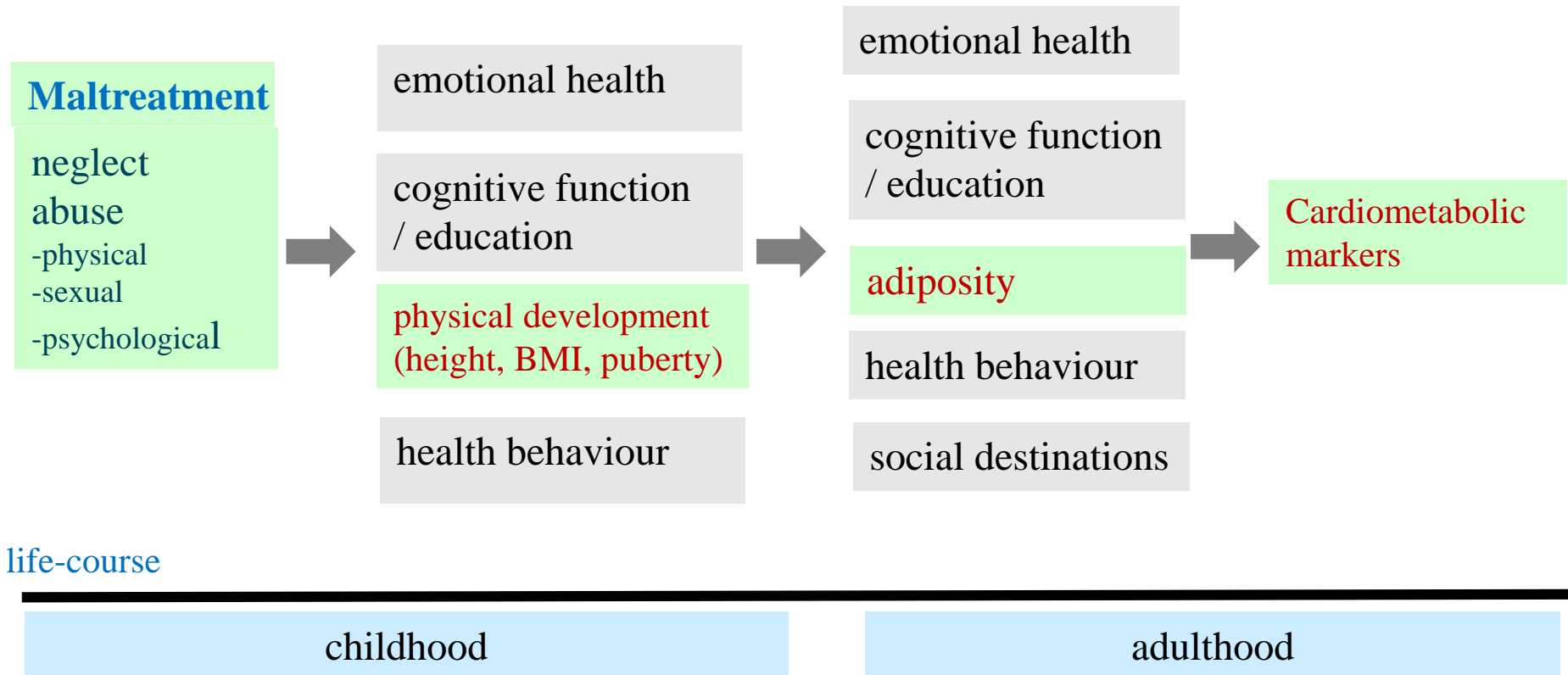
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Public Health
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- Understand the range of long-term outcomes related to child maltreatment
- What pathways are involved?
- Are these pathways common or specific?



- child maltreatment:
 - child abuse & neglect
- outcomes:
 - Height (7y, 11y, 16y, adult)
 - Puberty (11y, 16y)
 - BMI (7y, 11y, 16y, 23y, 33y, 45y, 50y)
 - Cardiometabolic markers (45y) – BP, lipids, HbA1c, obesity

Aims

To investigate the extent to which specific forms of maltreatment were associated with child-to-adult body sizes (i.e. height & BMI), pubertal development, and cardiometabolic markers in mid-adulthood

National child development study,1958-2008

All born one week in England, Scotland and Wales



N~18,000

N~8,000

Birth	7y	11y	16y	23y	33y	42y	45y	50y
1958	1965	1969	1974	1981	1991	2000	2003	2008

*Neglect
(parent & teacher
report)*

*Recalled
abuse
(0-16y)*

Puberty

Child-to-adult height

*Smoking,
psychological
distress,
educational
attainment,
SEP*

Child-to-adult BMI

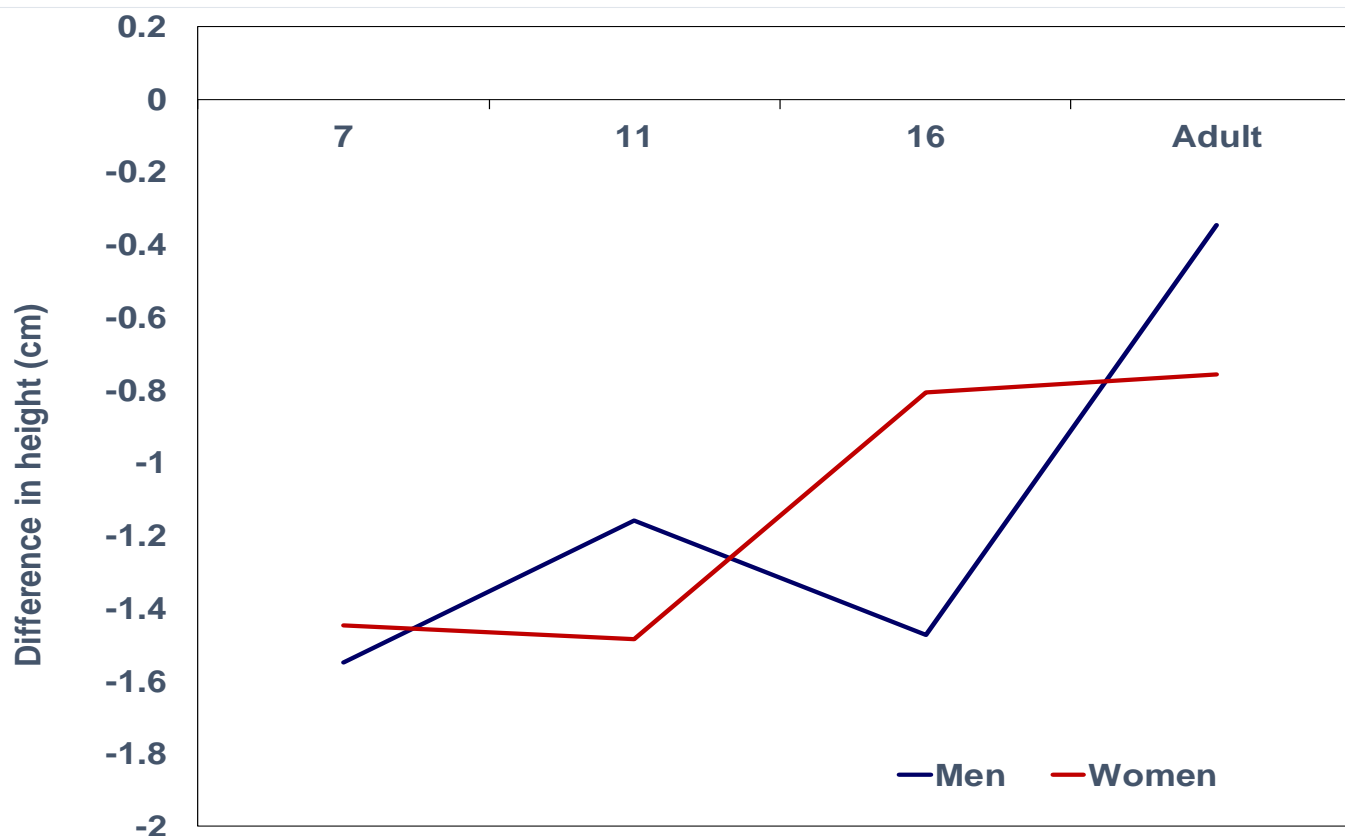
*Childhood covariates depending on the
outcome of interest, e.g. confounders,
and factors affect outcome measures*

Cardiometabolic
markers

Neglect	Questions asked (at 7y and 11y)
	constructed from: <ul style="list-style-type: none">- child looks undernourished, scruffy or dirty (T)- hardly ever takes outings with mother (P)- hardly ever takes outings with father (P)- mother has little interest in education (T)- father has little interest in education (T)- mother hardly ever read to/with the child (P)- father hardly ever read to/with the child (P)
Neglect (10%) (prospective)	
	T: teacher-report P: parent-report
Abuse by a parent	Questions asked (at 45y)
Physical (6%)	- I was physically abused by a parent (punched, kicked, hit, beaten with an object, needed medical treatment)
Sexual (1.5%)	- I was sexually abused by a parent
Psychological (10%)	- I was verbally abused by a parent; suffered humiliation, ridicule, bullying, mental cruelty from a parent

Childhood maltreatment and child-to-adult height trajectories

Deficit in average height at ages 7, 11 and 16y and in adulthood associated with child neglect in the 1958 birth cohort*



difference for the most neglected at 7y (score \geq 3 vs score=0) adjusted for parental height, birthweight, and social factors.

Source: Denholm et al (2013). Int J Epidemiol

Difference in height SDS

<i>Males</i>	7	11	16	Adult
<i>Neglect score (0-7) (reported at 7y)</i>	-0.06(0.01)	-0.05(0.01)	-0.05(0.01)	-0.03(0.01)

<i>Females</i>	7	11	16	Adult
<i>Neglect score (0-7) (reported at 7y)</i>	-0.05(0.01)	-0.05(0.01)	-0.04(0.01)	-0.03(0.01)

† estimated from multivariate response models, adjusted for parental height, birthweight, maternal smoking, social class, infant feeding, household crowding, tenure, amenities, disability

Source: Denholm et al (2013). Int J Epidemiol

Difference in height SDS

<i>Males</i>	7	11	16	Adult
<i>Neglect score (0-7) (reported at 7y)</i>	-0.06(0.01)	-0.05(0.01)	-0.05(0.01)	-0.03(0.01)
Psychological abuse	-0.08(0.05)	-0.05(0.05)	-0.01(0.06)	0.02(0.05)
Physical abuse	-0.11(0.06)	-0.12(0.06)	-0.06(0.07)	-0.02(0.06)
Sexual abuse	-0.07(0.21)	-0.09(0.23)	-0.26(0.22)	-0.17(0.20)

<i>Females</i>	7	11	16	Adult
<i>Neglect score (0-7) (reported at 7y)</i>	-0.05(0.01)	-0.05(0.01)	-0.04(0.01)	-0.03(0.01)
Psychological abuse	0.00(0.04)	0.03(0.05)	0.08(0.04)	0.08(0.04)
Physical abuse	-0.02(0.06)	0.01(0.07)	0.03(0.06)	0.06(0.06)
Sexual abuse	-0.08(0.09)	0.09(0.10)	0.08(0.09)	0.12(0.09)

† estimated from multivariate response models, adjusted for parental height, birthweight, maternal smoking, social class, infant feeding, household crowding, tenure, amenities, disability

Source: Denholm et al (2013). Int J Epidemiol

Childhood maltreatment and pubertal development

Pubertal stage rated at 11y & 16y

<u>Males</u>	11y	16y
Genitalia	Tanner stage (1=preadolescent to 5=adult)	
Pubic hair	Tanner stage	Absent/sparse/intermediate/adult
Facial hair		Absent/sparse/adult
Voice change		Age of voice change
<u>Females:</u>		
Breast	Tanner stage	
Pubic hair	Tanner stage	
Menarche		Age of menarche

Pubertal measures

<u>Males</u>	Early	Intermediate	Late
Genitalia (11y)	3-5 (<u>16.8%</u>)	2 (<u>45.1%</u>)	1 (<u>38.1%</u>)
Pubic hair (11&16y)	≥2 (11y) & adult (16y), or 4/5 (11y) & intermediate (16y) (<u>16.1%</u>)	1 (11y) & adult (16y), 2/3(11y) & intermediate /sparse (16y), or 4 (11y) & sparse (16y) (<u>40.4%</u>)	1 (11y) & intermediate/sparse (16y), or absent (16y) (<u>43.5%</u>)
Facial hair (16y)	Adult (<u>8.8%</u>)	Sparse/intermediate (<u>53.9%</u>)	Absent (<u>37.4%</u>)
Voice change	≤12y (<u>10.2%</u>)	13-14y (<u>44.0%</u>)	≥15y (<u>45.8%</u>)
<u>Females</u>			
Menarche	≤11y (<u>16.1%</u>)	12-13y (<u>56.8%</u>)	≥14y (<u>27.1%</u>)
Breast (11y)	3-5 (<u>27.9%</u>)	2 (<u>35.9%</u>)	1 (<u>36.2%</u>)
Pubic hair (11y)	3-5 (<u>22.1%</u>)	2 (<u>36.5%</u>)	1 (<u>41.4%</u>)

Relative risk ratio of early or late (vs intermediate) development

Age of menarche	Early developers	Late developers
Neglect score (0-7) (reported at 7y)	1.01	1.13 (P<0.05)

Breast development		
Neglect score (0-7) (reported at 7y)	0.98	1.06 (P<0.05)

Pubic hair		
Neglect score (0-7) (reported at 7y)	0.99	1.04 (P<0.10)

† models fitted using multiple imputation, adjusted for age of assessment, ethnicity, maternal smoking, social class, infant feeding, household crowding, tenure and amenities, and maternal age of menarche (for menarche only)

Source: Li et al (2014). Int J Epidemiol

Relative risk ratio of early or late (vs intermediate) development

Age of menarche	Early developers	Late developers
Neglect score (0-7) (reported at 7y)	1.01	1.13 (P<0.05)
Physical	1.06	1.08
Sexual	1.86	1.66
Psychological	1.06	1.38
Breast development		
Neglect score (0-7) (reported at 7y)	0.98	1.06 (P<0.05)
Physical	1.12	1.04
Sexual	1.00	1.14
Psychological	1.08	1.14
Pubic hair		
Neglect score (0-7) (reported at 7y)	0.99	1.04 (P<0.10)
Physical	1.21	1.09
Sexual	0.98	1.13
Psychological	1.04	1.07

† models fitted using multiple imputation, adjusted for age of assessment, ethnicity, maternal smoking, social class, infant feeding, household crowding, tenure and amenities, and maternal age of menarche (for menarche only)

Relative risk ratio of early or late (vs intermediate) development

Genitalia development	Early developers	Late developers
Neglect score (0-7) (reported at 7y)	1.05	1.04 (p<0.10)

Pubic hair		
Neglect score (0-7) (reported at 7y)	1.03	1.07 (p<0.05)

Facial hair		
Neglect score (0-7) (reported at 7y)	0.93	1.04 (p<0.10)

Voice change		
Neglect score (0-7) (reported at 7y)	1.05	1.14 p<0.05)

† models fitted using multiple imputation, adjusted for age of assessment, ethnicity, maternal smoking, social class, infant feeding, household crowding, tenure and amenities

Source: Li et al (2014). Int J Epidemiol

Relative risk ratio of early or late (vs intermediate) development

Genitalia development	Early developers	Late developers
Physical	1.20	1.03
Sexual	2.15	2.01
Psychological	1.12	1.01
Pubic hair		
Physical	1.14	1.24
Sexual	1.67	1.94
Psychological	1.13	1.22
Facial hair		
Physical	0.83	0.92
Sexual	1.03	1.42
Psychological	1.11	1.05
Voice change		
Physical	0.99	1.24
Sexual	0.94	0.88
Psychological	1.17	1.12

† models fitted using multiple imputation, adjusted for age of assessment, ethnicity, maternal smoking, social class, infant feeding, household crowding, tenure and amenities

Source: Li et al (2014). Int J Epidemiol

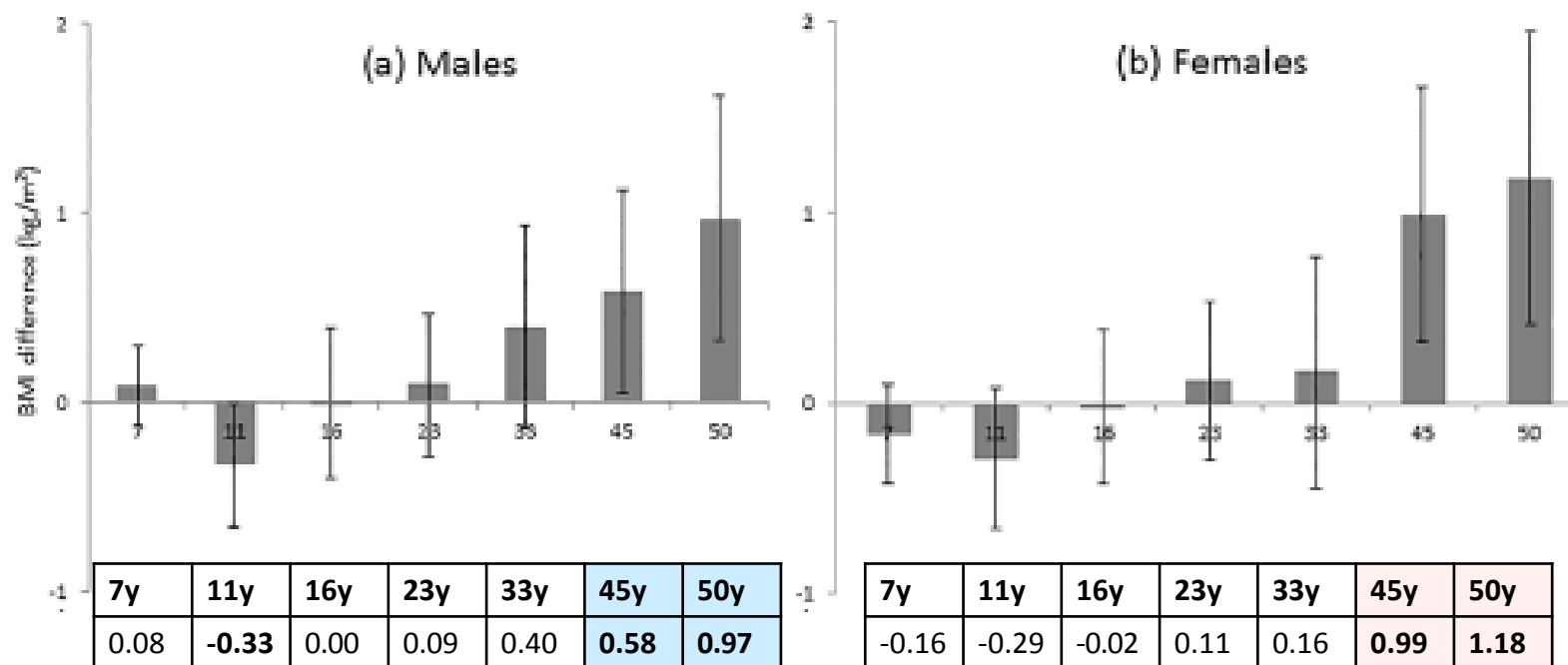
Neglect was associated with delayed pubertal development on several markers:

In females late menarche and late breast development; in males late voice change and late pubic hair growth

Sexual abuse was associated with early as well as late menarche.

Childhood maltreatment and life course BMI trajectories

Difference in mean BMI from 7-50y by physical abuse in the 1958 birth cohort



Source: Power et al (2015). PLoS ONE.

Difference in mean BMI (kg/m²) 7-50y in the 1958 birth cohort

Males	7y	11y	16y	23y	33y	45y	50y
Physical	0.08	-0.33	0.00	0.09	0.40	0.58	0.97
Sexual	0.18	1.15	0.69	0.93	0.13	-0.13	0.10
Females							
Physical	-0.16	-0.29	-0.02	0.11	0.16	0.99	<u>1.18</u>
Sexual	-0.14	-0.36	-0.27	0.27	-0.42	0.33	<u>1.09</u>

† Neglect score ≥ 2 at 7 and/or 11y

Source: Power et al (2015). PLoS ONE.

Difference in mean BMI 7-50y in the 1958 birth cohort

Males	7y	11y	16y	23y	33y	45y	50y
Neglect †	-0.08	-0.11	0.01	0.54	0.36	0.55	0.69
Physical	0.08	-0.33	0.00	0.09	0.40	0.58	0.97
Sexual	0.18	1.15	0.69	0.93	0.13	-0.13	0.10
Females							
Neglect †	0.04	0.03	0.29	0.65	0.78	1.15	1.40
Physical	-0.16	-0.29	-0.02	0.11	0.16	0.99	<u>1.18</u>
Sexual	-0.14	-0.36	-0.27	0.27	-0.42	0.33	<u>1.09</u>

† Neglect score ≥ 2 at 7 and/or 11y

Difference in mean BMI 7-50y in the 1958 birth cohort

Males	7y	11y	16y	23y	33y	45y	50y
Neglect †	-0.08	-0.11	0.01	0.54	0.36	0.55	0.69
Physical	0.08	-0.33	0.00	0.09	0.40	0.58	0.97
Sexual	0.18	1.15	0.69	0.93	0.13	-0.13	0.10
Psychological	0.17	-0.12	0.03	0.09	0.18	0.23	0.41
Females							
Neglect †	0.04	0.03	0.29	0.65	0.78	1.15	1.40
Physical	-0.16	-0.29	-0.02	0.11	0.16	0.99	<u>1.18</u>
Sexual	-0.14	-0.36	-0.27	0.27	-0.42	0.33	<u>1.09</u>
Psychological	-0.15	-0.17	-0.07	-0.01	-0.20	0.41	0.61

† Neglect score ≥ 2 at 7 and/or 11y

OR for obesity 7-50y in the 1958 birth cohort

Males	7y	11y	16y	23y	33y	45y	50y
Neglect †	0.64	1.17	1.86	2.34	1.17	1.22	1.35
Physical	0.90	0.35	0.33	0.45	1.28	1.31	1.50
Sexual	0	5.44	4.11	3.54	1.04	1.48	1.44
Psychological	1.29	0.76	1.02	1.02	1.21	1.15	1.36
Females							
Neglect †	0.99	1.41	2.08	2.34	1.48	1.39	1.54
Physical	0.67	0.31	0	0.51	1.07	1.48	1.73
Sexual	0	0	0.88	0.83	0.92	1.15	1.75
Psychological	1.35	1.37	0.75	0.79	0.93	1.15	1.44

† Neglect score ≥ 2 at 7 and/or 11y

Childhood maltreatment and cardiometabolic markers in mid-adulthood

- Outcomes - cardiometabolic markers at 45y (BP, lipids, HbA1c, obesity)
- Intermediate factors - child-to-adult BMI, adult SEP, lifestyles, mental health.

Mean difference

<u>Neglect</u>	Mod 1	+BMI7& 45	+adult SEP	+lifestyle factors	+depressive symptoms
BMI	0.53		0.30	0.50	0.50
Waist (cm)	1.23		0.59	1.09	1.14
HDL(F)	-0.05	-0.03	-0.02	-0.02	-0.04
Triglycerides(%)	3.9	2.2	2.4	2.4	3.4
HbA _{1c} (%)†	1.2	1.0	0.7	0.7	1.1
<u>Physical</u>					
BMI	0.72		0.71	0.79	0.66
Waist (cm)	1.29		1.25	1.32	1.04
HDL(F)	-0.06	-0.04	-0.06	-0.04	-0.05
HbA _{1c} (%)(M)	2.5	2.1	2.4	1.9	2.3
<u>Sexual</u>					
HbA _{1c} (%)†	2.4	2.2	1.8	1.2	2.0
<u>Psychological</u>					
HDL	-0.04	-0.04	-0.04	-0.02	-0.03

Mod 1: includes sex, birthweight-for-gestation, childhood SEP (social class, housing tenure, crowding), family history of diabetes (for HbA_{1c}), factors affecting measurement

Source: Li et al (2018).

OR for elevated levels

<u>Neglect</u>	Model 1	+BMI7& 45	+adult SEP	+lifestyle factors	+depressive symptoms
Obesity	1.16		1.06	1.13	1.15
Central obesity	1.15		1.05	1.13	1.13
<u>Physical</u>					
Obesity	1.36		1.36	1.38	1.33
Central obesity	1.38		1.38	1.39	1.34
LDL	1.25	1.21	1.24	1.16	1.21
<u>Sexual</u>					
LDL	1.41	1.41	1.38	1.26	1.34
<u>Psychological</u>					
Triglycerides	1.21	1.22	1.21	1.18	1.15

Mod 1: includes sex, birthweight-for-gestation, childhood SEP (social class, housing tenure, crowding), family history of diabetes (for HbA1c), and factors affecting measurement

Source: Li et al (2018).

Summary

- Neglect was associated with delayed physical growth with some catch-up growth, late pubertal markers, increased adult obesity risk (not childhood), and poor lipid and HbA_{1c} profile in mid-adulthood.
- Child abuse was not associated with height growth or pubertal timing, except sexual abuse with early/late menarche in girls.
- Physical/sexual abuse were associated with faster BMI gains, increased risk of adult obesity and poorer lipid/HbA_{1c} profiles (mediated by adult lifestyle factors). Associations were modest but independent of early life factors

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Specific associations?

child maltreatment and adult mental health, cognition
and physical functioning

Chris Power

Snehal M Pinto Pereira, Leah Li



Public Health
Research Consortium

Maltreatment

neglect

abuse

- physical
- psychological
- sexual

emotional health

cognitive function
/ education

physical health

health behaviour

emotional health

cognitive function
/ education

physical health

health behaviour

social destinations

Adult
physical /
mental
function

life-course

childhood

adulthood

To establish:

- whether specific childhood maltreatments are associated with adult
 - mental health
 - cognition,
 - physical functioning

1958 British birth cohort, 1958-2008

All born one week in England, Scotland and Wales



N~18,000

N~8,000

Birth	7y	11y	16y	23y	33y	42y	45y	50y
1958	1965	1969	1974	1981	1991	2000	2003	2008

*Neglect
(parent & teacher
report)*

*Recalled
abuse
(0-16y)*

*Smoking, psychological distress,
educational attainment, SEP*

*Cognitive tests,
socio-emotional
behaviours*

*Cognitive
tests, mental
health &
physical
function
(SF-36)*

*Child SEP, birthweight, birth order,
household amenities, crowding &
tenure, child physical impairment,
parental education, chronic &
psychiatric illness*

neglect

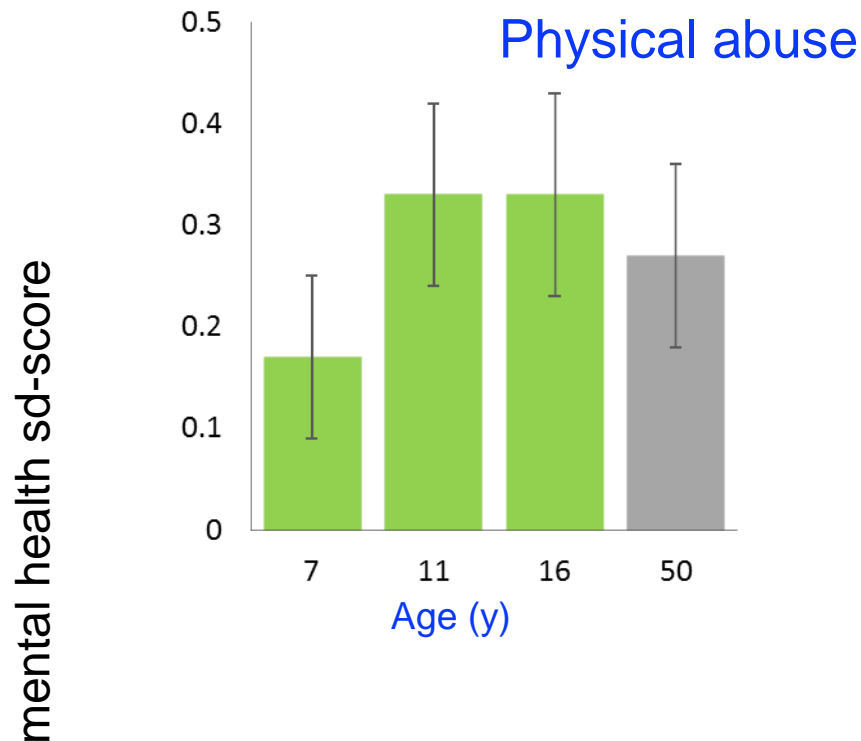
prospective - at 7y and 11y

- child looks undernourished, scruffy or dirty (T)
 - outings (hardly ever) with mother/ father (P)
 - little interest in education of mother/ father (T)
 - read to/with child (hardly ever) by mother/ father (P)
-

abuse by parent

self-report at 45y

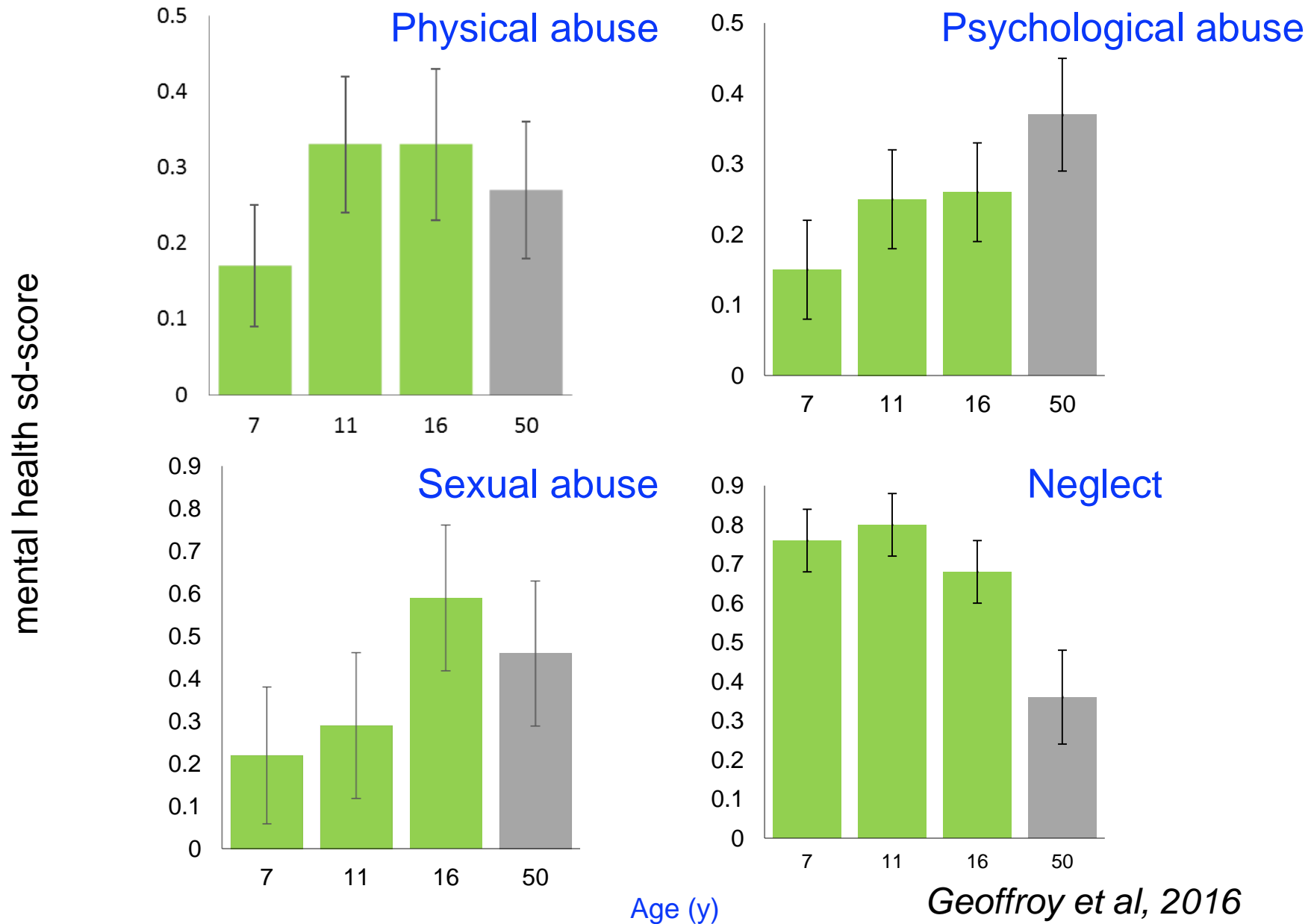
- | | |
|---------------|--|
| sexual | - I was sexually abused |
| physical | - I was physically abused: punched, kicked, hit, beaten with an object, needed medical treatment |
| psychological | - I was verbally abused; suffered humiliation, ridicule, bullying, mental cruelty |
| witnessing | - I witnessed physical or sexual abuse of others in my family |
-

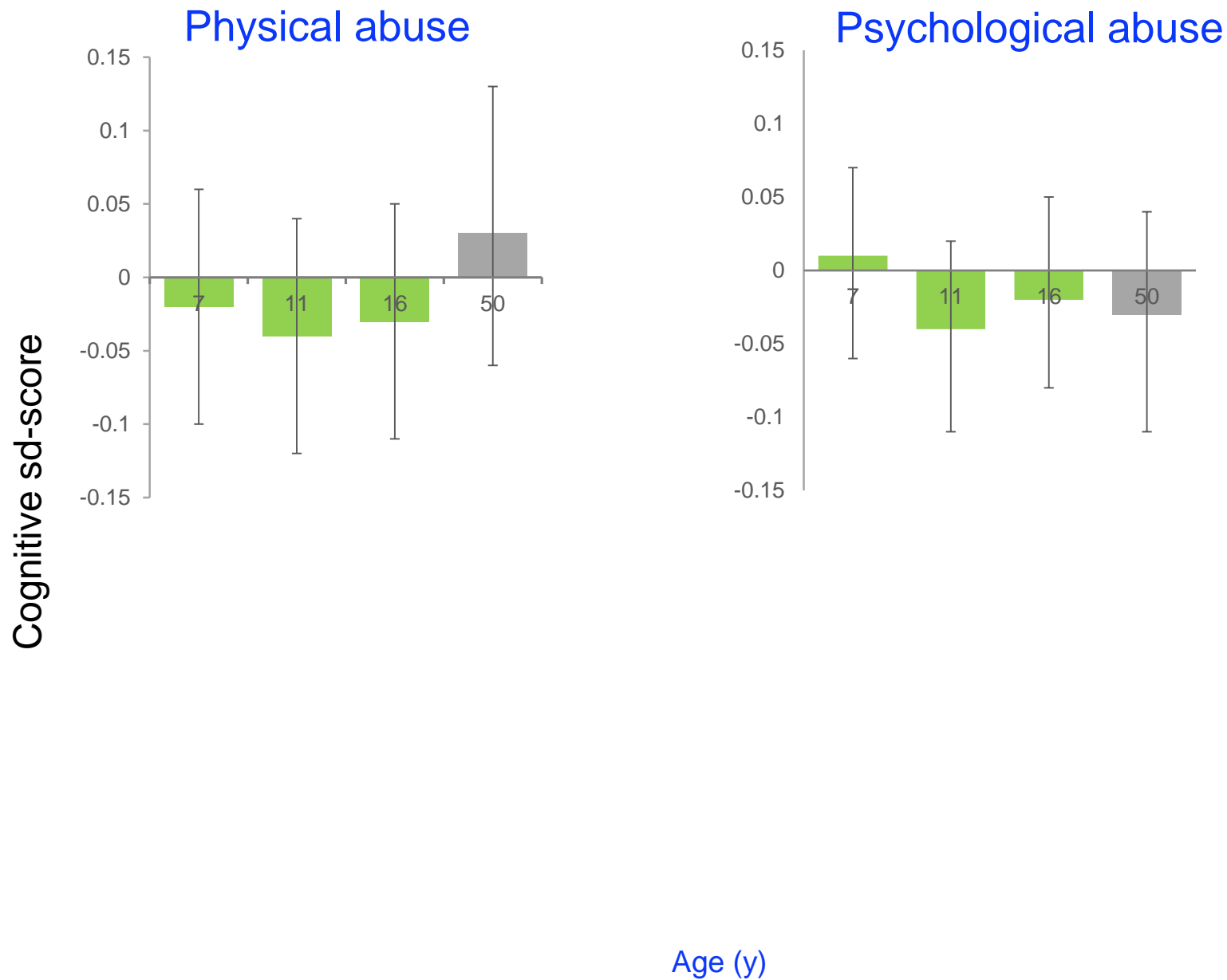


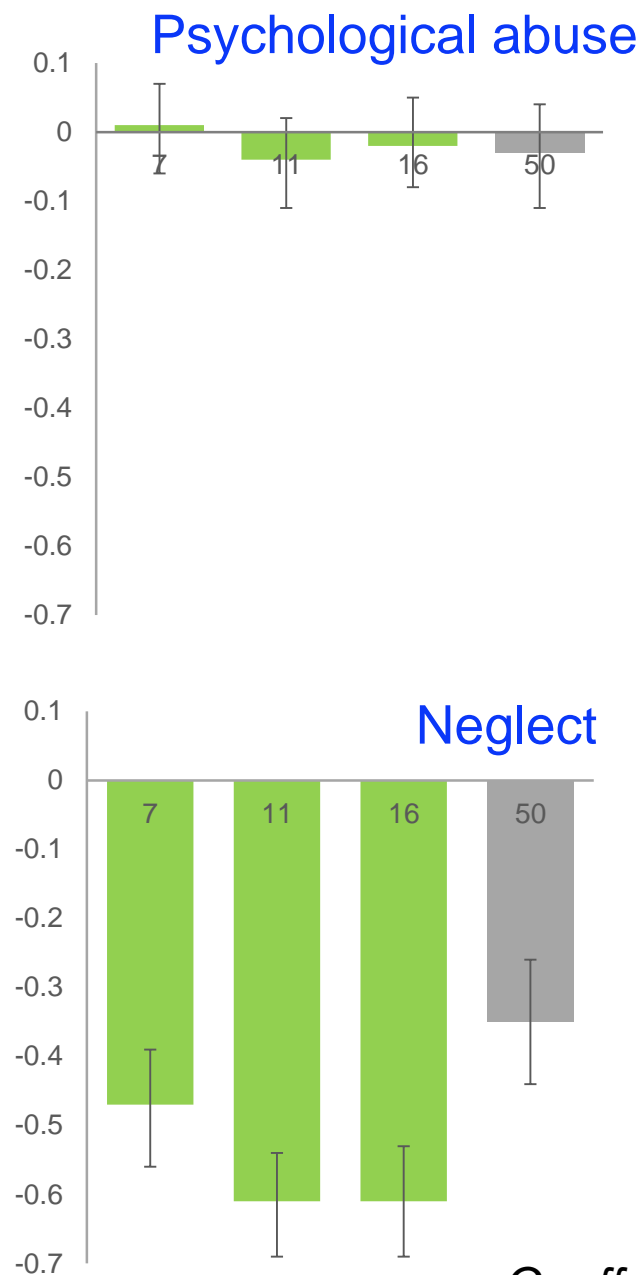
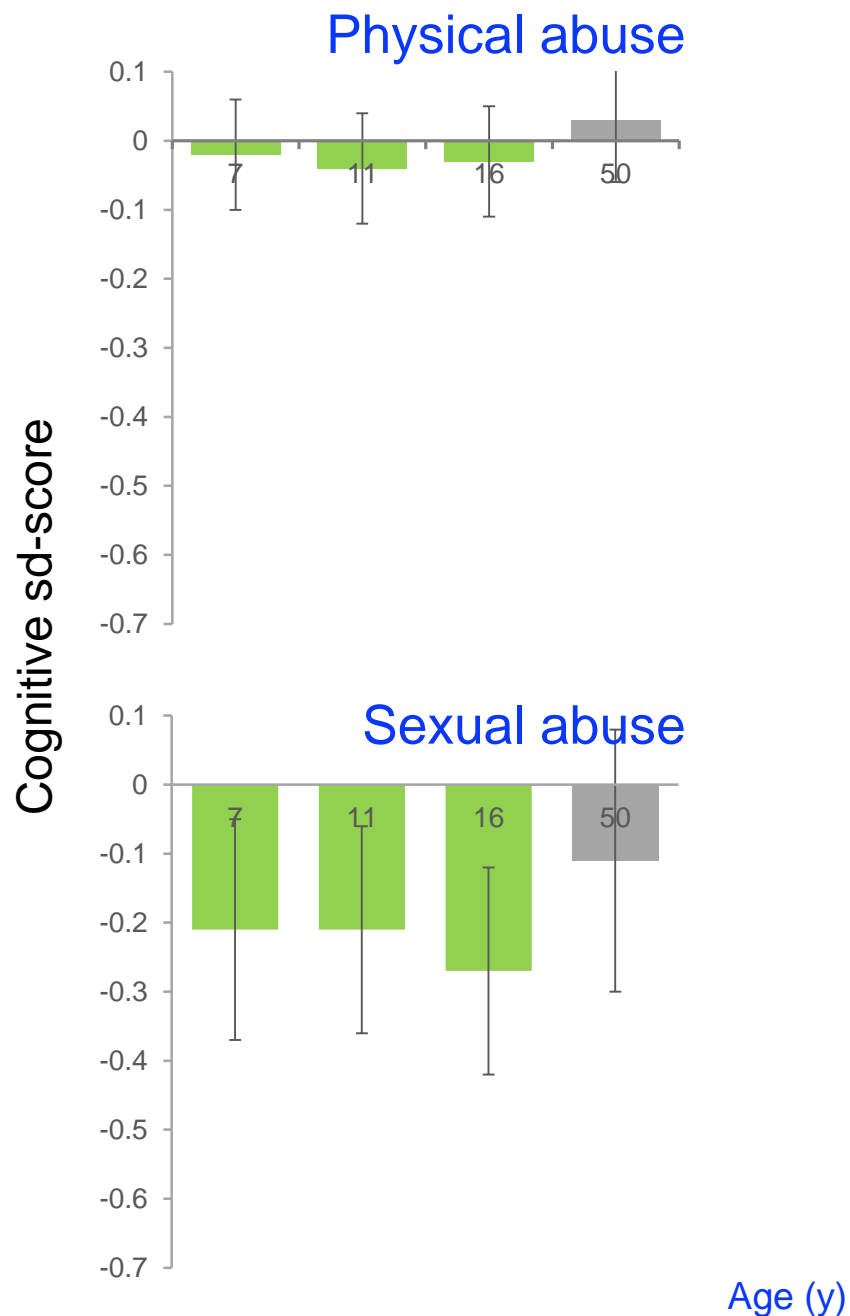
Difference in mean sex-standardised SD-scores (exposed v unexposed)

Adj birth-weight, maternal smoking in pregnancy, birth order, maternal age, class at birth, mother's/father's education, household amenities.

Geoffroy et al, 2016



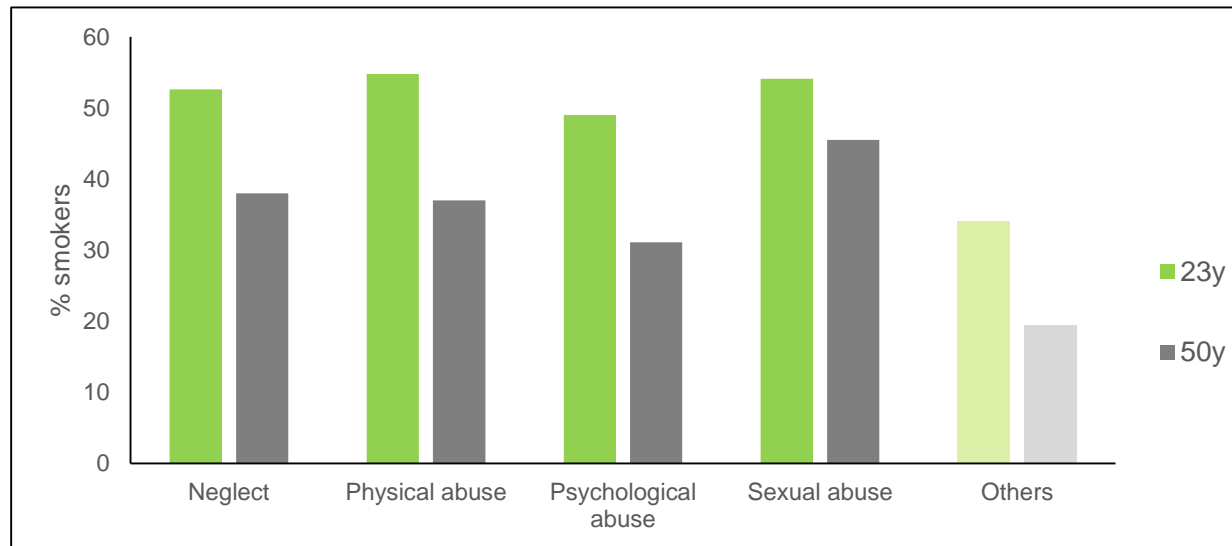




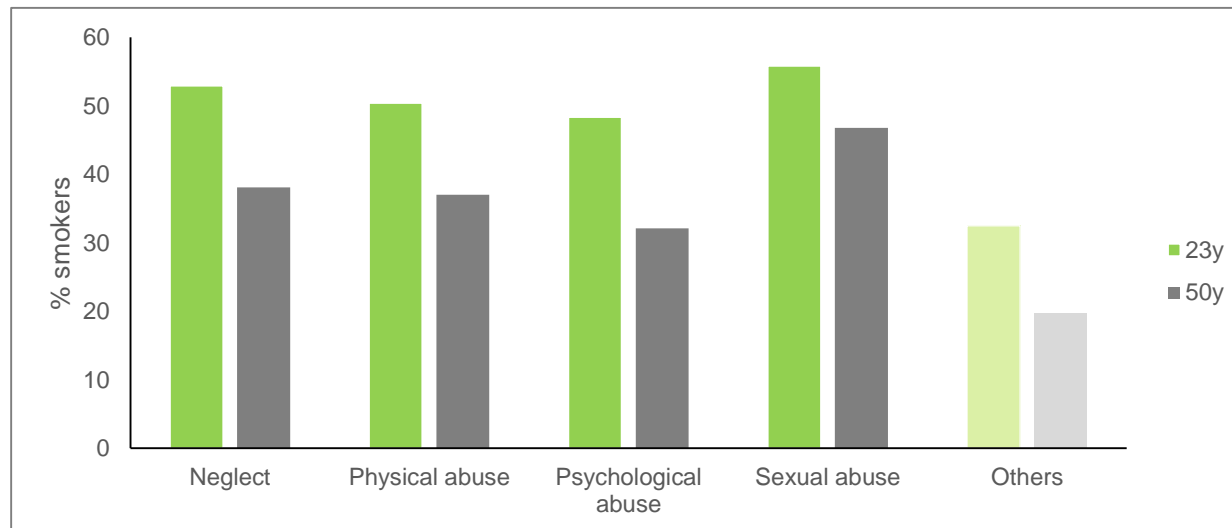
- child maltreatments are associated with adult
 - mental health neglect and abuse to 50y
 - cognition neglect to 50y; less for abuse

Child maltreatment: % daily smoking at age 23 & 50y

Men



Women



currently ≥ 1 cigarettes /day; 'others' are non-neglect or abuse

Power et al. 2015

– physical functioning

limitations, e.g. lifting, carrying groceries, climbing stairs, bending, kneeling, stooping and walking moderate distances

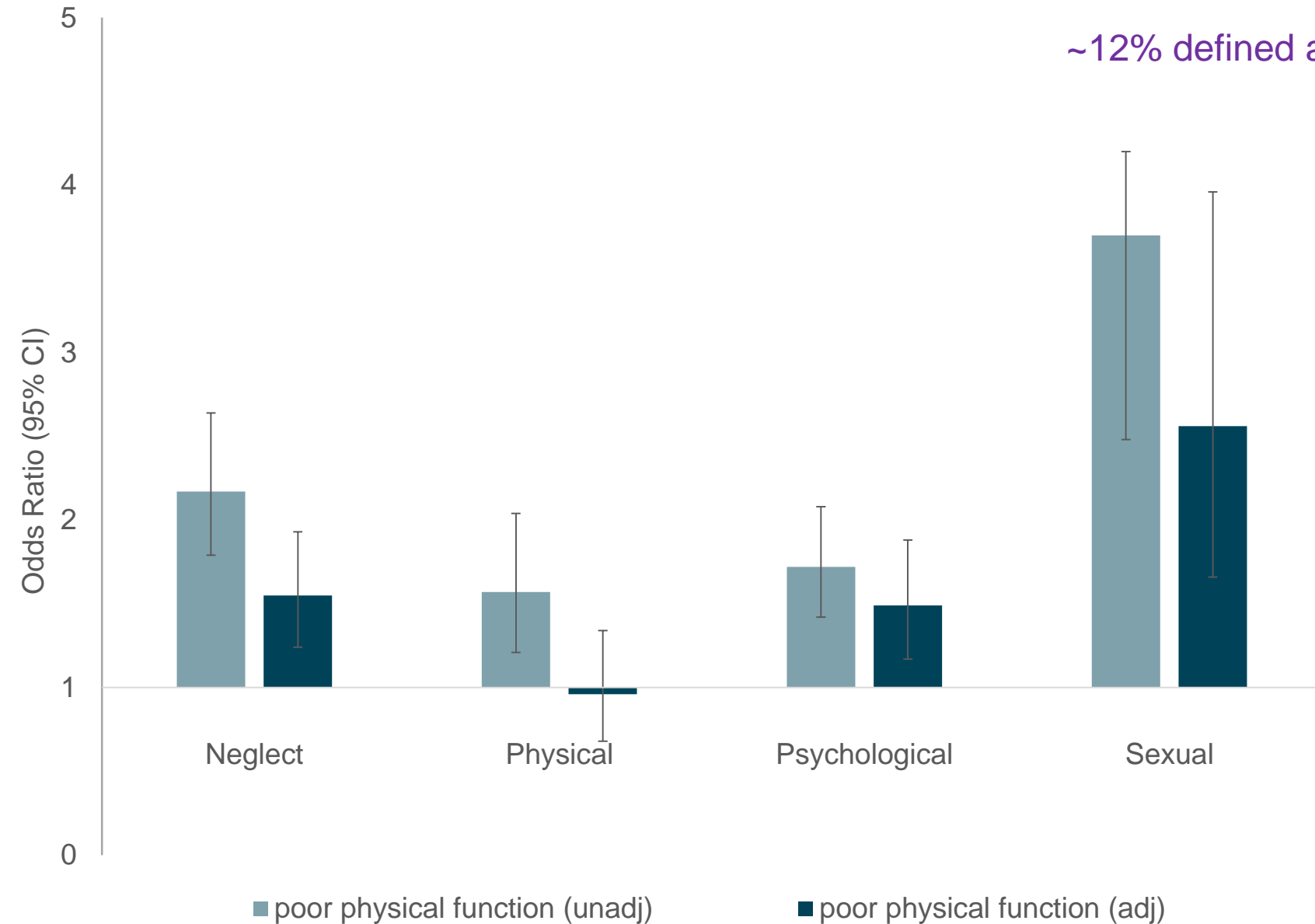
Short Form-36 at 50y: ~12% defined as poor

Aims:

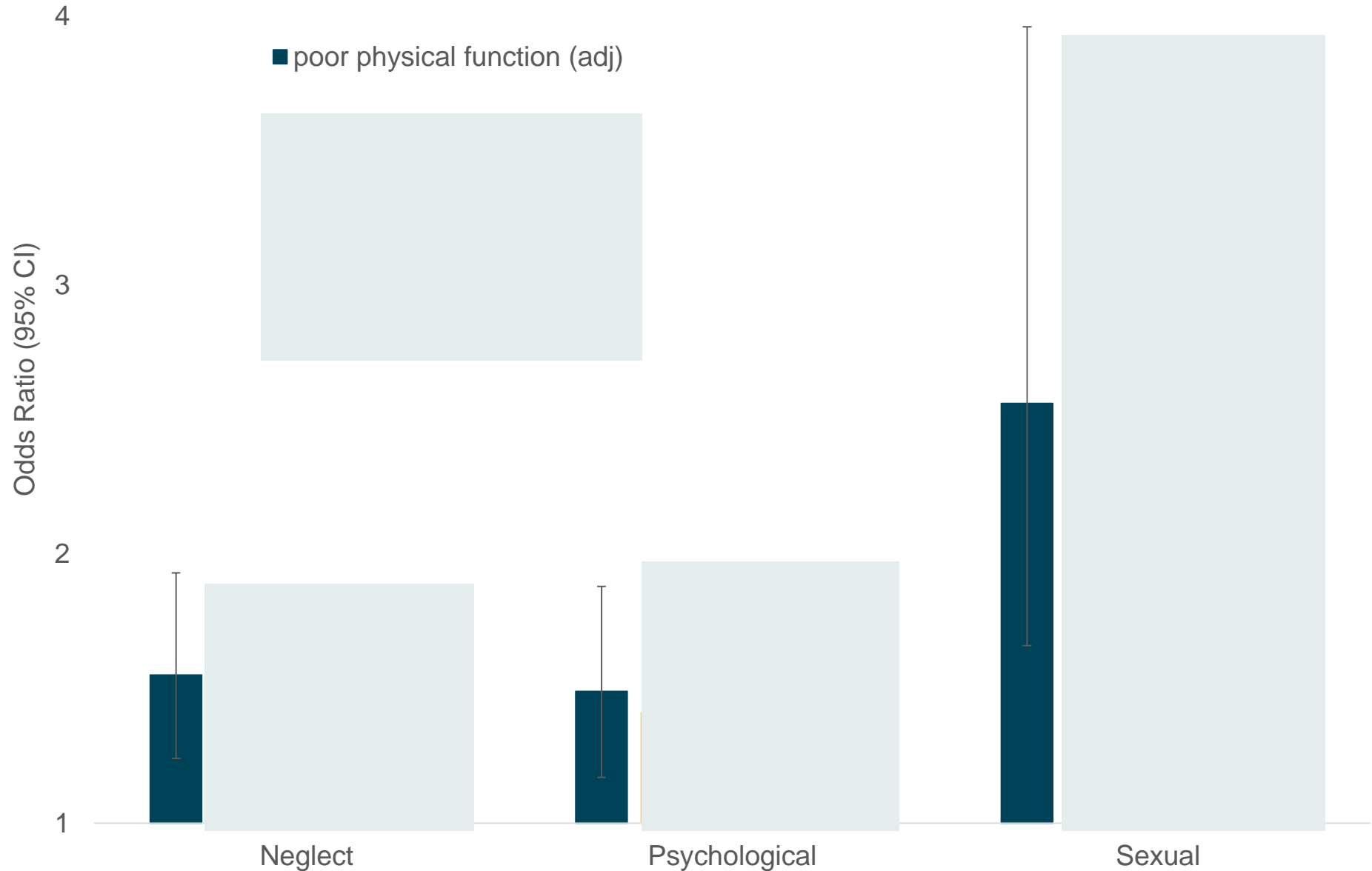
- child maltreatment associations
- mediating factors: education, mental health, adult smoking, socioeconomic position (SEP)

OR for poor physical functioning

~12% defined as poor



OR for poor physical functioning



- **long-term associations:** child neglect, psychological & sexual abuse & poor physical functioning at 50y
 - **independent** of several other early life factors
 - intermediary factors
 - adult SEP for neglect and sexual abuse
 - adult psychological distress for psychological abuse
- **magnitude of associations**
 - comparable to mental health

- specific associations (mostly)
- poorer development trajectories
 - height growth, adiposity gain, emotional and cognitive development
 - important in immediate term and formative re future health/wealth in adulthood
- social mobility /adult living standards
 - child neglect & sexual abuse
- adult smoking & poor health (45y obesity, blood lipids/ glucose; 50y poor physical functioning & self-rated health)
 - child neglect and sexual abuse
 - key determinants of serious disease, disability and death, and are therefore important burdens for individuals and for society, particularly in the context of ageing populations.

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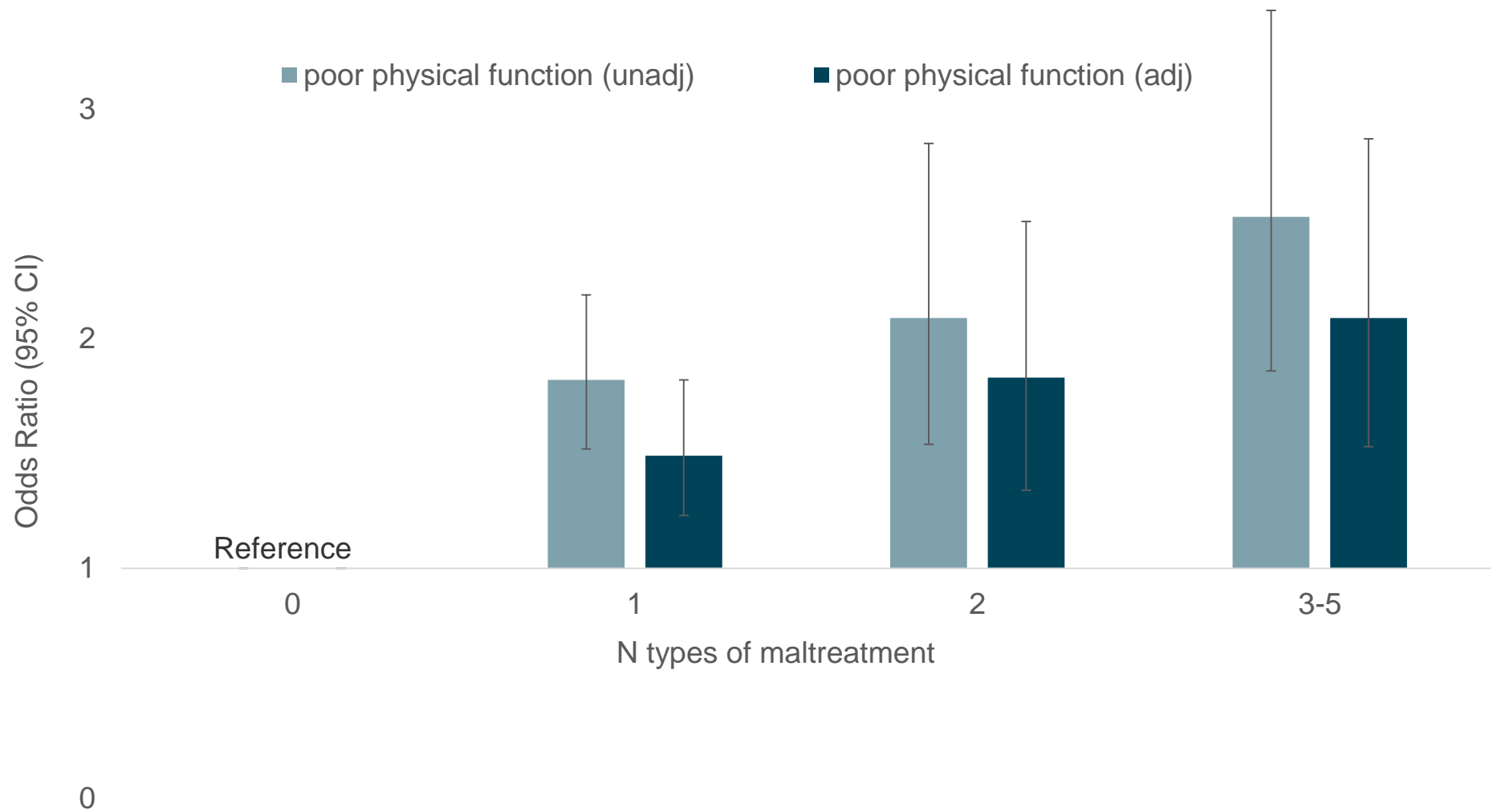
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definition

Physical abuse Intentional use of physical force or implements against a child that results in (or has the potential) physical injury.

Psychological abuse Intentional behaviour that conveys to a child that h/she is worthless, flawed, unloved, unwanted, endangered, or valued only in meeting another's needs. Harmful (unintentional) parent-child interactions

Sexual abuse any completed/attempted sexual act, sexual contact, or non-contact sexual interaction with a child by a caregiver.

indicators

Physical abuse by a parent (punched, kicked or hit or beaten with an object, or needed medical treatment)

Psychological abuse by a parent (verbally abused or humiliated, ridiculed, bullied/mental cruelty)

Sexual abuse by a parent