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Adverse Childhood Experiences (ACEs) across Merseyside

Nature, prevalence, and associations with health and wellbeing, health risk behaviours, violence, and community safety and cohesion

Findings from the Merseyside Violence and Community Safety (MerVCom) Survey

Zara Quigg, Charley Wilson, Nadia Butler, Ann-Marie Farrugia, Rebecca Bates, Mark A Bellis, Geraldine O'Driscoll

MERSEYSIDE Violence Reduction Partnership

LIVERPOOL JOHN MOORES UNIVERSITY
PUBLIC HEALTH
World Health Organization Collaborating Centre for Violence Prevention

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Zara Quigg[1], Charley Wilson[1], Nadia Butler[1], Ann-Marie Farrugia[1], Rebecca Bates[1], Mark A Bellis[1], Geraldine O'Driscoll[2]

[1]School of Public and Allied Health/Public Health Institute, Liverpool John Moores University, Liverpool. [2]Merseyside Violence Reduction Partnership/Merseyside Police, Liverpool.

For further information contact Zara Quigg z.a.quigg@ljmu.ac.uk

About this report

This report forms part of a suite of outputs from the MerVCom Survey. Other reports include:

1. The Merseyside Violence and Community Safety (MerVCom) Survey. A representative household survey of adults to understand community safety and cohesion, violence victimisation, and adverse childhood experiences.
2. Perceptions of Community Safety, Violence and Neighbourhood Cohesion, and Bystander Attitudes across Merseyside.
3. Adulthood Violence Victimisation across Merseyside. Nature, prevalence, and associations with health and wellbeing, health risk behaviours, ACEs, and community safety and cohesion.
4. Local authority reports, one for each of the five local authorities in Merseyside (Knowsley, Liverpool, Sefton, St Helens and Wirral) providing data at a local authority level.

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- Merseyside residents who gave their time to take part in the MerVCom survey.
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- BMG Research who carried out the data collection on behalf of LJMU/MVRP.
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- Image credits: Photo by Patricia Prudente on Unsplash.

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Contents

Adverse Childhood Experiences (ACEs) across Merseyside

Nature, prevalence, and associations with health, health risk behaviours, and community safety and cohesion

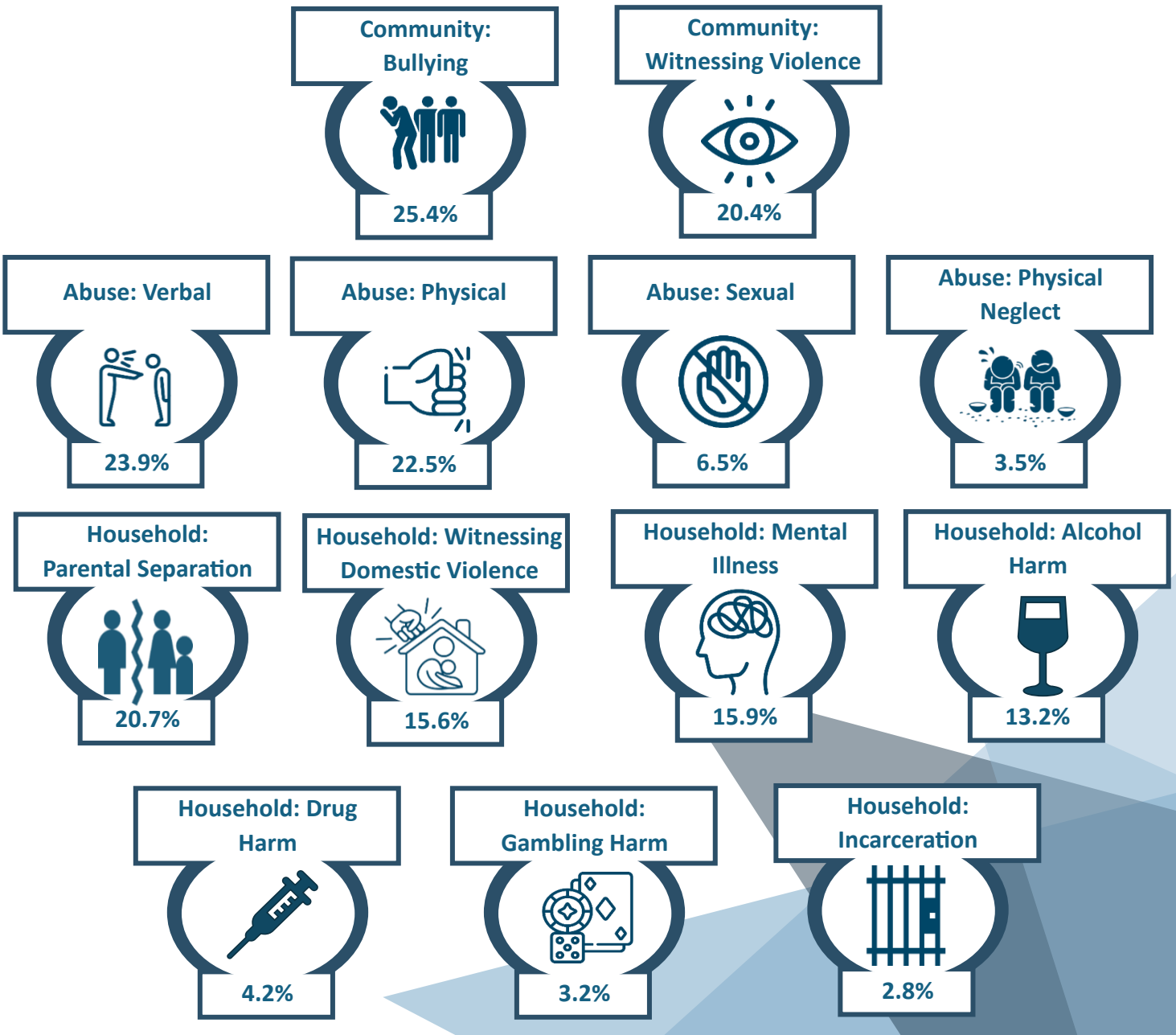
The MerVCom survey is a population-level representative household survey of adults (aged 18+ years) who are residents in Merseyside. The survey aims to better understand community feelings of safety and cohesion, and perceptions and experiences of violence (including ACEs) across Merseyside, and relationships of these with health and wellbeing, and other outcomes. This report forms part of a suite of outputs from the MerVCom survey, and specifically examines experiences of ACEs. The survey was carried out between November 2023 and April 2024. The total sample size of the survey was 5,395.

Extent and nature

Adjusted ACE count for adults in Merseyside*^

0	1	2-3	4+
50.1%	18.9%	18.8%	12.2%

Adjusted prevalence of thirteen individual ACEs for adults in Merseyside*



Increased risk in those experiencing 4+ ACEs^ vs. experiencing 0 ACEs

(controlling for age, sex, ethnicity and deprivation)

Health and health risk behaviours

Alcohol (current, 5+ drinks on one occasion at least weekly)	1.4x
Smoking and/or vaping (current daily)	2.0x
Use of any drug (past 12 months)	8.4x
Gambling-related harm (of those who gambled in past 12 months)	4.0x
Poor general health (current)	1.5x
Low mental wellbeing (current)	2.6x

Criminal justice exposure and violence victimisation

Been arrested (ever)	5.2x
Been incarerated (ever)	6.2x
Violence victimisation (since age 18 years)	9.7x
Violence victimisation (past year)	6.8x

Perceived prevalence of violence

Violence is common in **their neighbourhood**	1.8x
Violence is common in **Merseyside**	1.3x

Employment

Unemployed (current)	1.9 x

Adulthood relationships

Does NOT feel close to adults that they live with	1.9x
Does NOT feel close to relatives that they do not live with	2.5x
Does NOT have close or good friends	1.9x

Perceptions of personal safety

Feel unsafe from violence in **Merseyside generally**	2.4x
Feel unsafe from violence in **their neighbourhood**	2.9x

Neighbourhood cohesion

Low levels of overall neighbourhood cohesion	1.8x
Low levels of neighbourhood influence	2.1x

Negative childhood experiences

Excluded from school (up to age 18)	8.4 x
No trusted adult support (up to age 18 years)	9.6x
NOT engaged in any extracurricular/ community activities (up to age 18 years)	1.2x
NOT have a trusted friend (up to age 18 years)	3.9x

* Adjusted for population level socio-demographics - sex, age, ethnicity and deprivation.

^ Based on nine individual ACEs included in the national England ACE survey

Conclusion and Recommendations

Conclusion

The MerVCom survey highlights that ACEs are common in Merseyside and likely experienced at higher levels compared to England. Critically, ACEs are significantly associated with increased risks of a range of negative outcomes across the lifecourse, with impacts on health and risk-taking behaviours, socio-economic prospects, community safety, violence, and criminal justice exposure. ACEs and trauma are cross-cutting issues that require responses from political leaders, the community, and multi-agency partners who support children, families, and communities. Across Merseyside there is clear commitment to preventing and responding to ACEs and trauma, evidenced in the accompanying review of current ACE and trauma-informed practices (McCoy et al, 2025). Local and national policy makers, services, practitioners, and communities should use the evidence in this report and the review, alongside wider data and evidence to advocate for increased investment in preventing and responding to ACEs and trauma. Critically, policymakers and practitioner must ensure investment is tailored to the needs of the local community, targeted towards those who need it most, and has a strong focus on early intervention.

Key recommendations

These recommendations should be read alongside the recommendations for developing a trauma responsive Merseyside presented in McCoy et al, 2025.

1. Establish clear leadership and buy-in for developing an ACE and trauma-responsive Merseyside from political leaders, key partners (with director, strategic, and senior roles), and critically the community. This includes statutory and non-statutory partners across health and social care, public health, safeguarding, education, youth and family services, criminal justice, and academia.

2. Set up a Merseyside multiagency task and finish group, to develop a strategy and action plan for becoming a truly ACE and trauma-responsive region. This group should identify clear roles and remits for stakeholders across the system, and accountability for actions to drive the agenda forward.

3. Develop local authority level ACE and trauma-responsive task and finish groups, to enhance place-based approaches that meet the needs of the local community, whilst contributing to Merseyside becoming a truly trauma-responsive region.

4. Use evidence from the MerVCom survey and wider data sources to advocate for increased investment in ensuring the children of Merseyside are given the best start in life. This includes prioritising early intervention and building resilience and capacity in families and communities to mitigate the impacts of ACEs and trauma and break the intergenerational transmission of ACEs.

5. The availability of local data means that local partners are in a unique position to understand the impact of ACEs on individuals and communities, and which groups are most at-risk. The data presented in this report should be used to develop more nuanced and targeted prevention activity and direct provision towards areas and groups most at-risk.

6. Ensure local responses to ACEs and trauma consider the existing evidence base on what works to prevent and respond to ACEs (see box 2 in main report; [21]) and incorporate research and evaluation to build understanding of what works to prevent and respond to ACEs and trauma across Merseyside, and beyond.

1. Introduction

Across the last two decades, knowledge on Adverse Childhood Experiences (ACEs) and their potential long-term impacts on people's lives and the wider community has grown substantially [1]. (Correspondingly, preventing ACEs, mitigating associated impacts, enhancing factors that protect people from harm, and building resiliency against the impacts of ACEs and trauma, are now key priorities across communities, governments, and third sector organisations globally [1, 2]. (ACEs refer to potentially traumatic events that occur during childhood including all forms of child maltreatment and growing up in a household or community suffering from adverse harms. There is now strong evidence that ACEs can have immediate negative effects on children's development, leading to potentially long-lasting and profound impacts into adulthood. Research consistently shows that ACEs are associated with increased risks of engagement in health risk behaviours (e.g. violence, harmful alcohol consumption, drug use, smoking), poor health and wellbeing (e.g. chronic disease, mental health issues), exposure to the criminal justice system, and socioeconomic prospects (e.g. education attainment, employment) across the lifecourse [3, 4]. Critically, the more ACEs a person experiences, the higher their risk of poor outcomes [3]. Furthermore, these longer-term impacts can mean that those who have experienced ACEs may be vulnerable to exposing their children to ACEs [5].

Across many countries, regions, and communities, enhanced understanding of ACEs has been critical in advocating for and implementing prevention policies, strategies, and interventions to reduce levels of ACEs, support affected individuals and families, and promote healthier, more resilient communities [1, 6, 7, 8]. In the United Kingdom, studies have illustrated the nature and prevalence of ACEs across England [3] Wales [9] and Scotland [10] and the associations with poor outcomes across the lifecourse. UK evidence is also emerging on the importance of enhancing protective factors to mitigate the impacts of ACEs [11, 12]. Collectively, these studies have enhanced the UK evidence on ACEs and combined with wider data on childhood trauma (e.g. administrative data) and population level harms (e.g. public health outcomes framework), they have been used to drive ACE and trauma prevention policy and practice [13, 14, 7, 8, 15]. Given the diversity of communities across the UK, enabling local areas to understand the extent, nature, and impacts of ACEs across their local communities is vital for ensuring that preventing and responding to ACEs is high on the agenda. This is critical, so policy and practice can consider the local experiences of ACEs and trauma, leading to better outcomes for children, families, and communities.

Across Merseyside (Northwest England), the Merseyside Violence Reduction Partnership (MVRP) has a vital role in supporting local communities and statutory and third sector partners to prevent and response to ACEs and trauma (see Box 1). To drive evidence-based policy and practice across Merseyside, the MVRP, in collaboration with Liverpool John Moores University, implemented the Merseyside Violence and Community Safety (MerVCom) Representative Household Survey in 2024/25. The MerVCom survey is a population-level representative household survey of adults (aged 18+ years). It aimed to enhance understanding of community feelings of safety and cohesion, and perceptions and experiences of violence, including ACEs, across Merseyside, and relationships of these with health and wellbeing and other outcomes. This report forms part of a suite of outputs from the MerVCom survey and examines the prevalence of ACEs amongst residents. Further, it illuminates the complex interplay between ACEs and health and wellbeing, health risk behaviours, employment and educational outcomes, violence victimisation, criminal behaviour, relationships, and perceptions of community safety, violence and neighbourhood cohesion.

By providing a region-wide outlook on the outcomes for those who have experienced ACEs, the authors hope that the data can serve as a model for addressing the widespread and deeply rooted impacts of ACEs across the Merseyside Region. It seeks to guide the development of mental health services, educational programmes, and wider community initiatives designed to build resilience, promote recovery, address disparities, and disrupt cycles of intergenerational trauma, ultimately contributing to a healthier, safer, and more equitable future for the people of Merseyside.

Box 1: The Merseyside Violence Reduction Partnership (MVRP) ACE and trauma-informed practice work programme

The MVRP are committed to creating violence-free communities in Merseyside, ensuring better life choices for young people and their families. By adopting a public health approach, MVRP aims to work with communities, to address the underlying causes of violence and promote preventative factors. The MVRP are focused on intervening in a positive way to help young people and families from before birth to young adulthood. Given the wealth of evidence ACEs, a key theme of the MVRP work programme is to enhance understanding of the impacts of ACEs and trauma across the lifecourse, and to build a trauma-responsive Merseyside. It does this through:

- Investing in programmes that aim to provide children with the best start in life and forge greater bonds with families. It is widely recognised that strong family relationships are critical in reducing offending and re-offending, the impact of violence, and the impact of ACEs.
- Implementing research to support early intervention by more accurately understanding the nature, prevalence, impacts and risk factors for ACEs, (i.e. this study).
- Reviewing the current ACE and trauma-informed practice across Merseyside and bringing partners together to build a more effective trauma-responsive Merseyside.
- Delivering trauma-informed training to public sector partners to understand how psychological trauma can impact individuals and the implications for their services (see https://www.merseysidevrp.com/our-projects/trauma-informed-training/).

1.1 Aims and objectives

The aims of the current study are to:

- Estimate the prevalence of ACEs across Merseyside (including ACE count and individual ACEs).
- Identify the sociodemographics associated with ACEs.
- Examine the association between ACEs and health and wellbeing, health risk behaviours, education and employment, violence and criminal justice exposure.
- Examine the association between perceptions of safety and prevalence of violence, and neighbourhood cohesion.
- Examine the association between ACEs and resilience factors in adulthood and childhood.

1. Methods

2.1 Data source

Data for the current study was drawn from a cross-sectional representative survey of adults aged 18+ who were residents in households across Merseyside, carried out between November 2023 and April 2024. The MerVCom survey was a face-to-face and online survey in which residents of Merseyside were asked about their perceptions of community safety and cohesion, perceptions and experiences of violence (including ACEs) across Merseyside, and health and wellbeing. Surveys were completed online by the participant, or face-to-face with a trained interviewer using computer assisted personal interviewing (CAPI) technology. For respondents who completed the survey face-to-face, questions that asked respondents about ACEs, general health and mental wellbeing, health-risk behaviours, and violence victimisation, were self-completed by the respondents (respondents were handed the tablet used to fill in the survey) to preserve confidentiality. Further details on the survey sample design and methods can be found elsewhere [16]. The survey utilised a random quota sampling approach to select 110 Lower Super Output Areas (LSOAs) stratified by English Index of Multiple Deprivation (IMD) quintiles, age, and sex, across the five Local Authorities in Merseyside. The total sample size of the survey was 5,395. Overall, 1,215 participants (22.5%) completed the survey online and 4,180 participants (77.5%) completed the survey face-to-face with trained interviewers. Ethical approval for the study was granted by Liverpool John Moores Research Ethics Committee (23/PHI/050).

2.2 Measures

2.2.1 ACEs:

Participants were asked whether they had experienced ACEs before the age of 18, using a 13-item ACE measure adapted from the ACE International Questionnaire (ACE-IQ) [2] (see Appendix Table A1). The measure included questions about exposure to physical, verbal, or sexual abuse and household stressors (e.g. witnessing domestic violence or living with someone who had issues with alcohol or drug use, mental illness). It also included experiences of bullying, witnessing community violence, and physical neglect. Respondents could answer “yes”, “no”, or “prefer not to say” for each item. To allow for consistency and comparison with other national surveys, nine out of the 13 ACEs (excluding parental gambling harm, bullying, witnessing community violence, and physical neglect) responses were summed to calculate the number of ACEs an individual had experienced (i.e. ACE count). This total was categorised into four groups: 0 ACEs, 1 ACE, 2-3 ACEs, and 4 or more ACEs. To ensure a minimum count for each ACE, responses of “prefer not to say” were recoded as “no”.

2.2.2 Sociodemographics:

Sociodemographic characteristics included: sex (male, female); age (years: 18-24, 25-34, 35-44, 45-54, 55-64, 65+); ethnicity (White, other ethnicities); and deprivation quintile (1 most deprived; 5 least deprived).

2.2.3 Gambling harm:

Assessment of gambling harm was measured using the Problem Gambling Severity Index Short Form [17]. The PGSI-SF asks three questions about participants feelings around their gambling behaviours, answered on a four-point scale (0=never, 1=sometimes, 2=most of the time, 3=almost always). Scores for each item are later summed, and participants categorised as 0=no gambling harm, 1=low-risk/harm gambling, 2-3=moderate-risk/harm gambling, and 4+=most severe harm from gambling. For the analysis, scores were dichotomised into 0=no gambling-related harm and 1+=any gambling-related harm [18]. Participants who responded “prefer not to say” for any of the three PGSI-SF items were classified as having missing data and were excluded from the analysis.

2.2.4 Smoking tobacco and use of e-cigarettes/vapes: Smoking tobacco and use of e-cigarettes/vapes was measured using two items asking how often participants had smoked/used e-cigarettes/vapes. Response options included never, once or twice, used to but do not currently, occasionally but not daily, daily, or prefer not to say. Responses were grouped into smoking tobacco on a daily basis or not and using e-cigarettes on a daily basis or not. Additionally, a variable was created to indicate if participants smoked tobacco and/or used e-cigarettes on a daily basis or not. For each of these outcomes, "prefer not to say" responses were coded as missing and were excluded from the analyses.

2.2.5 Alcohol use: Alcohol use was measured using one item on how often participants had five or more alcoholic drinks on one occasion. Response options included never, less than monthly, weekly, daily or almost daily, or prefer not to say. Responses were grouped into drinking five or more drinks containing alcohol on at least a weekly basis (included weekly, daily, and almost daily), or not. "Prefer not to say" responses were coded as missing and were excluded from the analyses.

2.2.6 Drug use: The survey measured use of any drugs in the past 12 months that were not prescribed by a doctor or medical professional including: cannabis, powder cocaine, nitrous oxide, heroin/crack cocaine, ecstasy, amphetamines, psychedelics, GHB, mephedrone, and ketamine. Response options included no - never, yes – in the past year, yes – but not in the past year, or prefer not to say. Responses were grouped into ever using any drug (included yes – in the past year or yes – ever responses to any of the drugs), ever using any drug except cannabis (included yes – in the past year or yes – ever responses to any of the drugs except for cannabis), using any drug in the past year (included yes – in the past year responses only to any of the drugs), and using any drug except cannabis in the past year (included yes – in the past year responses only to any of the drugs except for cannabis). For each of these outcomes, "prefer not to say" responses were coded as missing and were excluded from the analyses.

2.2.7 Mental wellbeing: The Short Warwick-Edinburgh Mental Wellbeing Scale (SWEMWBS; [19, 20] was used to assess participants' mental wellbeing. This validated scale comprises seven items that evaluate an individual's current mental wellbeing, each rated on a 5-point scale (1=none of the time, 2=rarely, 3=some of the time, 4=often, 5=all of the time.) Total raw scores range from 7 to 35, with higher scores indicating greater mental wellbeing. These raw scores are converted into metric scores using a standard conversion table [20]. To identify low mental wellbeing, scores were dichotomised, with low mental wellbeing defined as more than one standard deviation (5.18) below the mean (24.97), thus low mental wellbeing was categorising as scores of <19.80. Participants who responded "prefer not to say" for any of the seven SWEMWBS items were classified as having missing data and were excluded from the analysis.

2.2.8 General health: The EQ-VAS (part of the EQ-5D-5L instrument; [21, 22] was used to assess participants' general health. The EQ-VAS is a self-reported measure that uses a vertical visual scale ranging from 0 to 100, where 0 represents "the worst health you can imagine" and 100 represents "the best health you can imagine".[1] For this survey, poor general health was defined as a score more than one standard deviation (22.39) below the mean (73.21), with poor general health categorised as scores of <50.83. "Prefer not to say" responses were coded as missing and were excluded from the analyses.

[1] In this study, the EQ-VAS was adapted by removing the visual component of the scale, asking participants to report their score directly on a scale from 0 to 100.

2.2.9 Adulthood violence victimisation: Adulthood violence victimisation was measured using seven items and included whether after the age of 18 years the individual experienced at least one of the following types of violence: physical violence; psychological abuse and coercive control; stalking and harassment; indecent exposure; unwanted sexual touching; sexual assault; forced sexual assault of another individual. Response options were yes, no, and prefer not to say. "Prefer not to say" responses were combined with no responses.

2.2.10 Criminal justice exposure: Criminal justice exposure included if the participant had ever been arrested and/or ever spent a night in prison or jail in the UK. Participants were asked "Have you ever been arrested in the UK?" and "Have you ever spent a night in prison or jail in the UK?". Response options were yes, no, and prefer not to say. "Prefer not to say" responses were coded as missing and were excluded from the analyses.

2.2.11 Feelings of safety: Participants were asked to what extent they felt safe in their neighbourhood and across Merseyside generally. Participants could respond for each setting on a five-point scale (1=very unsafe, 2=unsafe, 3=neither safe nor unsafe, 4=safe, 5=very safe). Responses were grouped into feeling unsafe (included unsafe and very unsafe) or not, in their own neighbourhood and in Merseyside generally. For each of these outcomes, "prefer not to say" responses were coded as missing and were excluded from the analyses.

2.2.12 Perceptions of violence: Participants were asked to what extent they think violence is common in their neighbourhood and across Merseyside generally. Participants could respond for each statement on a four-point scale (1=not at all common, 2=not very common, 3=fairly common, 4=very common). Responses were grouped into thinking that violence is common (included fairly common and very common) or not, in their own neighbourhood and in Merseyside generally. For each of these outcomes, "prefer not to say" responses were coded as missing and were excluded from the analyses.

2.2.13 Neighbourhood cohesion: The Brief Sense of Community Scale [23] was used to measure participants feelings of neighbourhood cohesion. This scale uses 8-items with participants indicating on a five-point scale to what extent they agree with each item (1=strongly disagree, 2=disagree, 3=neither agree nor disagree, 4=agree, 5=strongly agree). Items on the Brief Sense of Community Scale can be summed and the mean taken to give an overall score, specific items can also be summed together and the mean taken to give four subscale scores: needs fulfilment (2-items), group membership (2-items), influence (2-items), and emotional connection (2-items). Higher scores on the overall scale and each of these subscales indicate greater levels of neighbourhood cohesion. For the overall score and each subscale, scores were dichotomised to indicate low scores, as more than one standard deviation below mean scores.[2]

2.2.14 Childhood and adulthood relationships: Participants were asked if while they were growing up before the age of 18, how often there was an adult in their life who they could trust and talk to about any personal problems (trusted adult), and did they have friends in their life who they could trust and talk to about any personal problems (trusted friend). Response options included never, sometimes, always, and prefer not to say. Responses were grouped into always having a trusted adult or trusted friend, or not. Participants were also asked while they were growing up, before the age of 18, were they engaged in any extra-curricular or community activities (e.g. sports clubs/teams; dance, drama, or arts clubs; cubs, brownies, scouts, guides; volunteering; etc.). Response options included

[2] Low overall neighbourhood cohesion=<2.65; low needs fulfilment=<2.71; low group membership=<2.72; low influence=<2.08; low emotional connection=<2.59.

yes, no, and prefer not to say. For each of these outcomes, “prefer not to say” responses were coded as missing and were excluded from the analyses.

Participants were also asked to what extent they agree that they are close to others in their life in adulthood, including adults they live with, relatives they do not live with, and having close or good friends. Response options included strongly disagree, disagree, neither agree nor disagree, agree, strongly agree, and prefer not to say. Responses were grouped into feeling close (included strongly agree and agree) or not, to adults they live with, relatives they don’t live with, and friends. For each of these outcomes, “prefer not to say” responses were coded as missing and were excluded from the analyses.

2.2.15 School exclusions:

Participants were asked if they ever had been excluded from school up to the age of 18 years. Response options were never, yes (fixed-term exclusion(s)/suspension(s)), yes (permanent exclusion(s)), and prefer not to say. “Prefer not to say” responses were coded as missing and were excluded from the analyses.

2.2.16 Employment status:

Participants were asked about their current employment status. Response options included: employed – full time; employed – part time; student; self-employed; unemployed; cannot work due to health reasons; retired; looking after home or family; other; prefer not to say. “Prefer not to say” responses were coded as missing and were excluded from the analyses.

2.3 Data analyses

Quantitative analyses were undertaken in SPSS (v.28). To estimate the prevalence of ACE count and individual ACEs, at Merseyside, local authority, and ward level, best fit binary logistic regression models were used. These generate modelled risks (estimated marginal means) for each outcome for all combinations of individual characteristics (age, sex) and LSOA of residence properties (ethnicity profile, quintile of deprivation, local authority). These modelled risks were applied to the resident population of each geography according to its demographic and LSOA characteristics. Chi-square for Independence (with Continuity Correction) was used to explore associations between ACEs and sociodemographics, and other outcomes (e.g. health and wellbeing, health risk behaviours etc.). Logistic regression was then used to examine the relationship between ACE count and outcomes of interest. This types of analyses allows examination of the relationship between ACEs and outcomes of interest while accounting for effect sociodemographics (sex, age, ethnicity, and deprivation) may have on these associations.

2.4 Reporting conventions

The following caveats and conventions should be considered when interpreting the findings in this report.

- Figures presented throughout the report are sample level data unless otherwise stated in which case they are adjusted (modelled) data.
- Reported statistical associations are significant if their p-value is less than 0.05 (i.e. <0.05). P values help understand whether given results are due to chance. Low p-values suggest findings are likely meaningful and not due to chance.
- As with all cross-sectional population surveys, findings represent an association only and do not imply causation in any direction.
- Findings in tables and figures may not sum to 100% due to rounding.

3. Findings

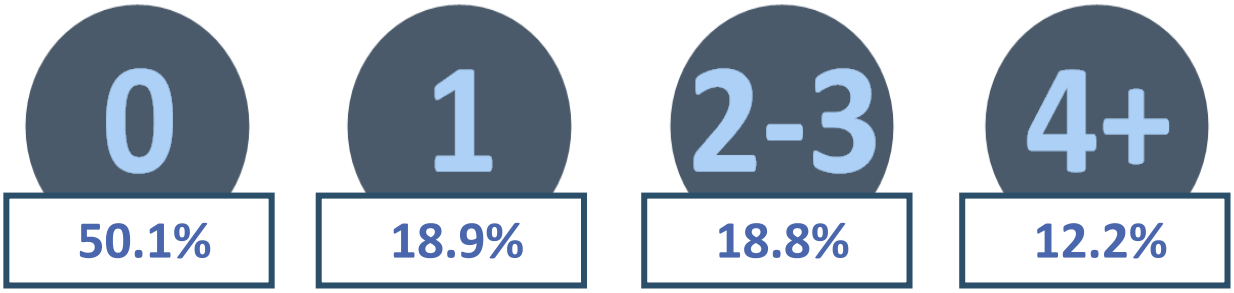
3.1 Extent and nature of ACEs in Merseyside

Prevalence figures in this section are based on adjusted (modelled) data (see Section 2.3/2.4).

3.1.1 ACE count

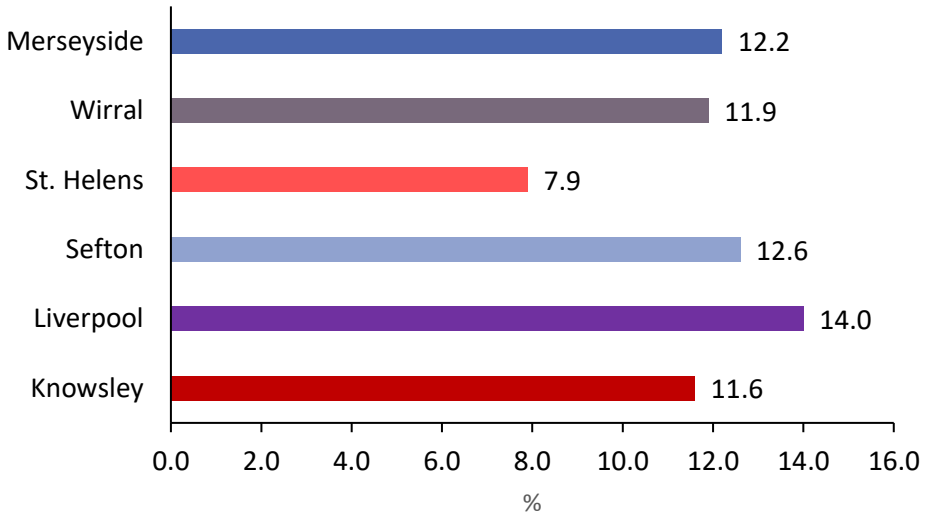
The prevalence of those experiencing different numbers of ACEs (ACE count) was calculated using nine of the thirteen ACEs (i.e. verbal, physical, and sexual abuse; household mental illness; alcohol abuse; drug abuse; incarceration; witnessing domestic violence; and parental separation). Using adjusted data, half (50.1%) of Merseyside residents experienced no ACEs, 18.9% experienced one ACE, 18.8% experienced two to three ACEs, and just over one in ten (12.2%) Merseyside residents experienced 4+ ACEs (Figure 1).

Figure 1: Adjusted prevalence of ACE count amongst adults in Merseyside



The adjusted prevalence of experiencing 4+ ACEs varied by local authority area and by ward within each local authority area (see Figures 2/3 and Appendix Table A2/A3).

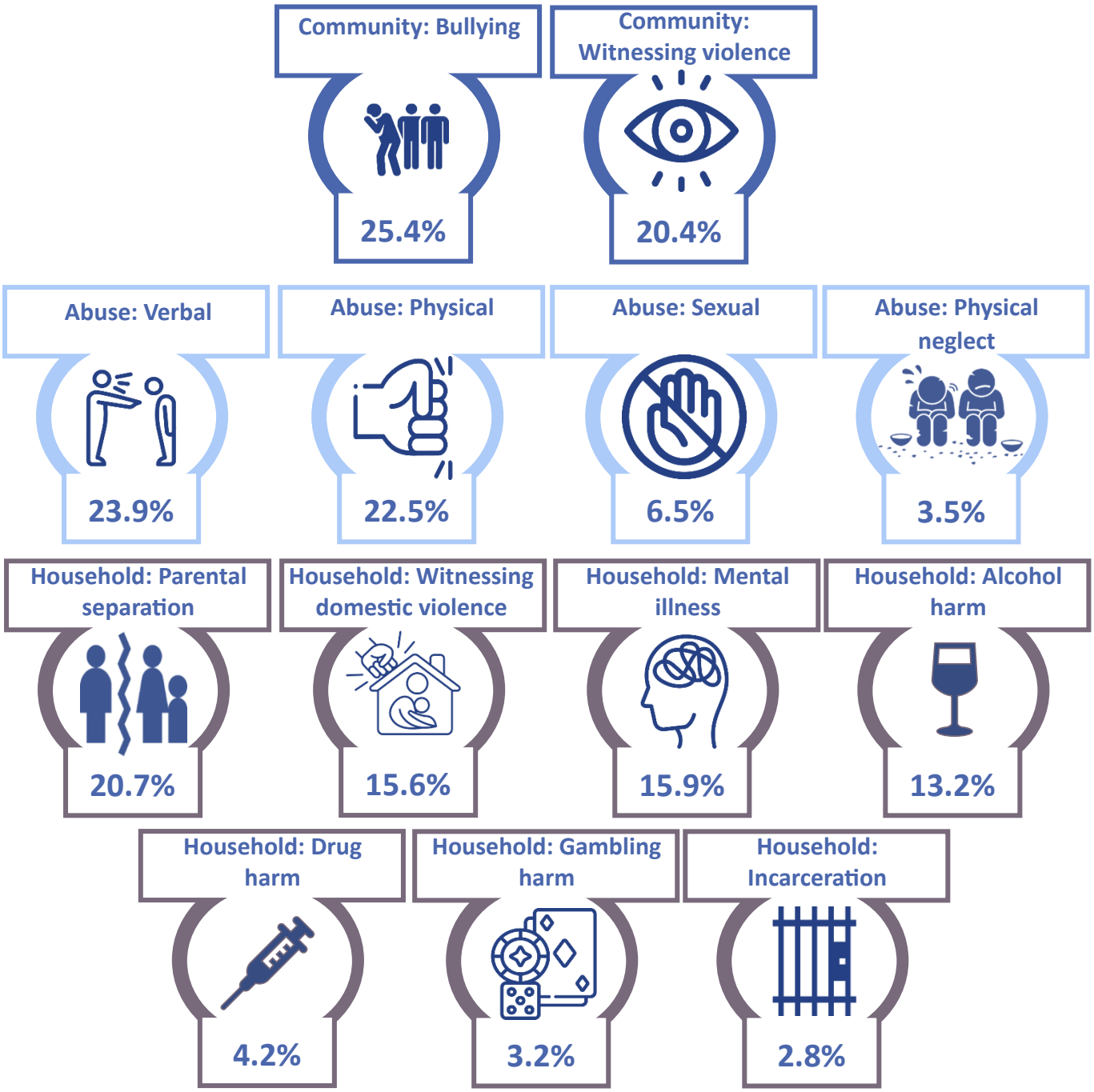
Figure 2: Adjusted prevalence of 4+ ACEs, adults in Merseyside, by local authority area



3.1.2 Individual ACEs

Figure 3 shows the adjusted prevalence of all thirteen individual ACEs (see Appendix Table A4/A5 for local authority/ward level data). The most common ACE was bullying (25.4%). Over a fifth of adults in Merseyside are estimated to have experienced verbal abuse (23.9%), physical abuse (22.5%), parental separation (20.7%), and witnessed violence in the community (20.4%). More than one in ten adults in Merseyside are estimated to have experienced living with a household member who had a mental illness (15.9%) or experienced alcohol harms (13.2%) and witnessed domestic violence (15.6%). Less than one in ten adults in Merseyside are estimated to have experienced sexual abuse (6.5%), living with a household member who experienced drug harms (4.2%), gambling harms (3.2%), or was incarcerated (2.8%), and physical neglect (3.5%).

Figure 3: Adjusted prevalence of the thirteen individual ACEs, adults in Merseyside



3.2 Comparisons between prevalence of ACEs in Merseyside and national surveys

ACE count prevalence for nine ACEs[3] for Merseyside (using adjusted data) and national estimates from England, Wales, and Scotland are shown in Figure 4 [3, 10]. In Merseyside, just over half (50.1%) of residents had experienced no ACEs. This was lower than in England (53.65%) and Wales (54.4%) nationally, and higher than in Scotland (29.0%).

- Just over one in ten (12.2%) Merseyside residents had experienced 4+ ACEs. This is higher than the prevalence of experiencing 4+ ACEs in England nationally (8.3%), like the proportion in Wales (13.6%), and lower than in Scotland (15.0%).

Figure 4: Adjusted prevalence of ACEs in adults in Merseyside, and prevalence from national studies in England, Wales and Scotland [3, 10]

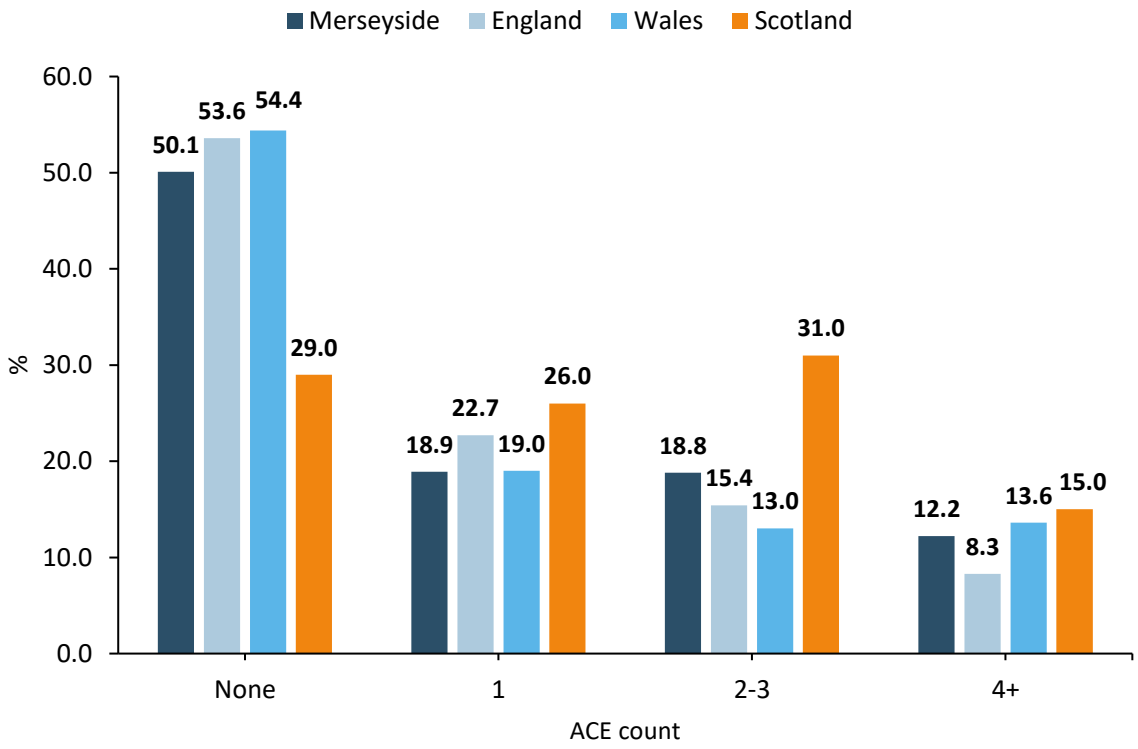
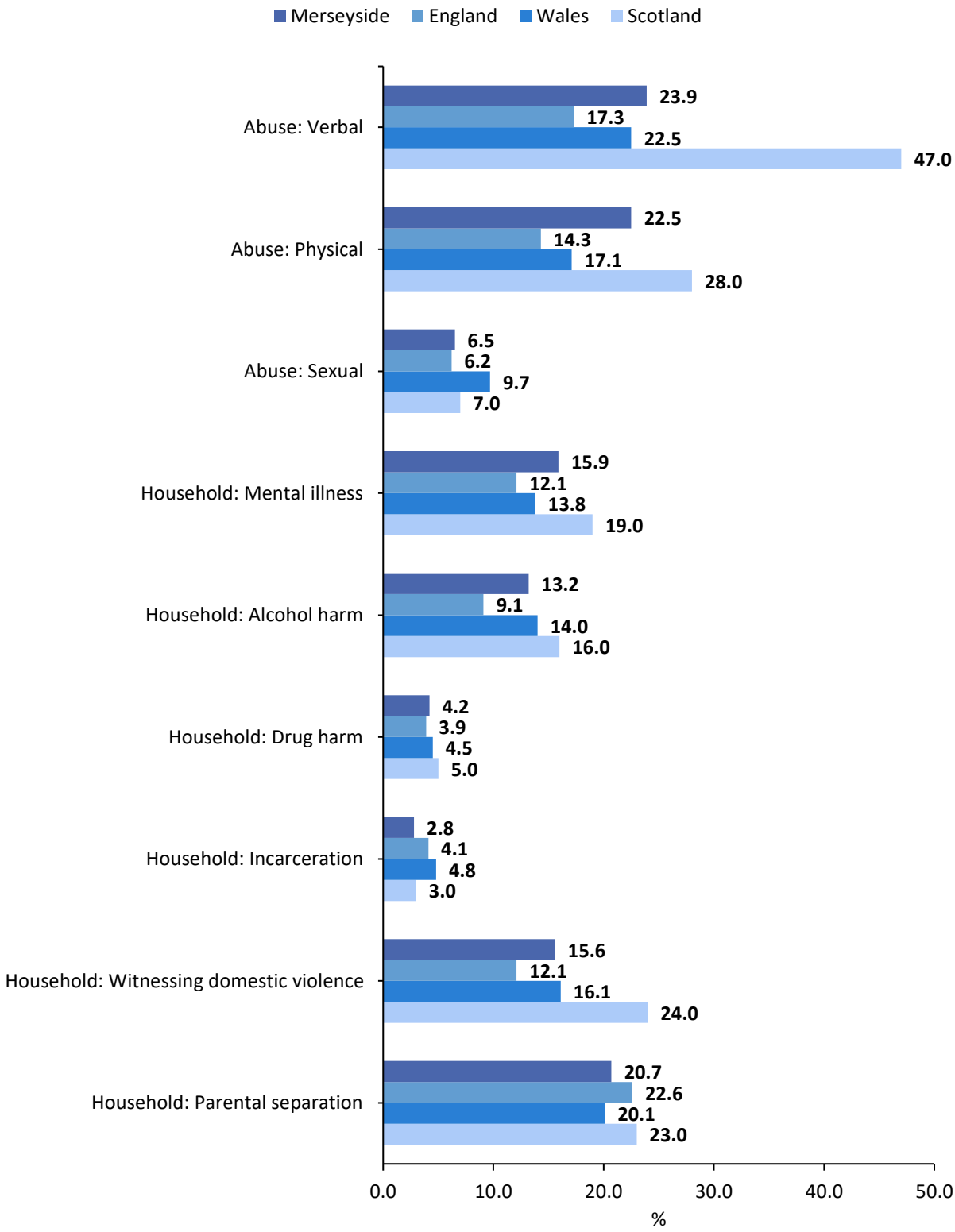


Figure 5 shows the adjusted prevalence of nine different types of ACEs in Merseyside compared to the prevalence nationally for England, Wales, and Scotland.

[3] Including physical, verbal, and sexual abuse, household mental illness, alcohol harm, drug harm, incarceration, witnessing domestic abuse, and parental separation.

Figure 5: Adjusted prevalence of individual ACEs in adults Merseyside, and prevalence from national studies in England, Wales and Scotland [3, 10].



3.3 ACEs and sociodemographics

3.3.1 ACE count and sociodemographics

Table 1[4] shows the unadjusted prevalence of ACE count by sociodemographics. In bivariate analyses, there were significant associations between ACE count and age group (p<0.001), sex (p<0.001), ethnicity (p<0.001), and deprivation (p<0.001).

- **Age group:** The lowest prevalence of experiencing no ACEs was among those aged 25-34 years (43.3%), and the highest was amongst those aged 65+ years (56.4%). The highest prevalence of experiencing 4+ ACEs was among those aged 25-34 years (17.2%), and the lowest was amongst those aged 65+ years (6.4%).
- **Sex:** While there were relatively similar proportions of males (51.4%) and females (49.1%) reporting no ACEs, a higher proportion of females (13.8%) had 4+ ACEs than males (9.7%).
- **Ethnicity:** A higher proportion of those from other non-White backgrounds experienced no ACEs (61.5%) than those from White backgrounds (49.2%), and a slightly higher proportion of those from White backgrounds experienced 4+ ACEs (12.0%) than those from other non-White backgrounds (10.1%).
- **Deprivation:** The lowest prevalence of experiencing no ACEs was among those who lived in the most deprived areas (47.3%), and the highest was among those in the least deprived areas (58.3%). The highest prevalence of experiencing 4+ ACEs was among those who lived in the most deprived areas (14.6%), and the lowest was among those who lived in the least deprived areas (quintile 3-5: 8.8%, 8.7%, 8.8% respectively).

Table 1: ACE count by sociodemographic factors

		None % (n)	1 % (n)	2-3 % (n)	4+ % (n)	p
Age group (years)	18-24	53.0 (269)	17.5 (89)	15.0 (76)	14.6 (74)	<0.001
	25-34	43.3 (345)	19.1 (152)	20.5 (163)	17.2 (137)	
	35-44	49.8 (471)	19.9 (188)	17.8 (168)	12.5 (118)	
	45-54	45.7 (343)	17.6 (132)	20.6 (155)	16.1 (121)	
	55-64	49.3 (501)	19.3 (196)	21.5 (219)	9.9 (101)	
	65+	56.4 (763)	19.7 (266)	17.5 (237)	6.4 (86)	
Sex	Male	51.4 (1313)	19.7 (503)	19.2 (489)	9.7 (248)	<0.001
	Female	49.1 (1389)	18.4 (521)	18.7 (529)	13.8 (389)	
Ethnicity	Any White background	49.2 (2455)	19.5 (974)	19.2 (958)	12 (598)	<0.001
	Any other non-White background	61.5 (232)	13.3 (50)	15.1 (57)	10.1 (38)	
Deprivation quintile	1 (most deprived)	47.3 (1174)	19.0 (470)	19.2 (475)	14.6 (361)	<0.001
	2	48.7 (416)	18.9 (161)	21.1 (180)	11.4 (97)	
	3	51.7 (434)	21.7 (182)	17.9 (150)	8.8 (74)	
	4	55.0 (459)	18.1 (151)	18.2 (152)	8.7 (73)	
	5 (least deprived)	58.3 (225)	16.3 (63)	16.6 (64)	8.8 (34)	

[4] See also Appendix Table A6.

When controlling for all other sociodemographics (using multinomial logistic regression), relationships between ACE count and each individual sociodemographic remained. Experience of 4+ ACEs was significantly higher in those living in the most deprived area, all age groups compared to those aged 65+ years, those from White ethnic backgrounds, and amongst females.

3.3.2 Individual ACEs and sociodemographics[5]

In bivariate analyses using sample data, there were significant differences in the prevalence of reporting different types of ACEs by sex (Table 2). Females were significantly more likely to report experiencing verbal abuse ($p<0.05$), sexual abuse ($p<0.001$), household parental separation ($p<0.001$), household mental illness ($p<0.001$), and household alcohol harm ($p<0.001$) compared to males. Whilst males were significantly more likely to report experiencing physical abuse ($p<0.001$) and witnessing violence in their community ($p<0.001$) compared to females.

Table 2: Prevalence of individual ACEs by sex, significant associations only

	♂ Male % (n)	♀ Female % (n)	p
Abuse: Verbal	22.0% (561)	24.8% (701)	<0.05
Abuse: Physical	25.5% (651)	20.7% (586)	<0.001
Abuse: Sexual	4.0% (102)	8.8% (250)	<0.001
Household: Parental separation	17.1% (436)	23.1% (652)	<0.001
Household: Mental illness	11.0% (280)	19.6% (553)	<0.001
Household: Alcohol harm	11.3% (288)	14.6% (414)	<0.001
Community: Witnessing violence	23.5% (601)	17.3% (488)	<0.001

There were significant associations between age group and experiencing different types of ACEs (Table 3). Prevalence of experiencing verbal abuse (<0.001), physical abuse (<0.001), sexual abuse (<0.01), physical neglect (<0.001), household incarceration (<0.001), and witnessing violence within the community, were all highest amongst those in the 45-54 age group. Whilst experiencing household mental illness (<0.001), household alcohol harm (<0.001), household drug harm (<0.001), household gambling harm (<0.05), and bullying in their community (<0.001) was highest amongst those aged 25-34 years old. Prevalence of household parental separation (<0.001) and witnessing domestic violence in the household was highest amongst those aged 18-24 year and 55-64 years retrospectively.

[5] See Appendix Table A7.

Table 3: Prevalence of individual ACES by age group, significant associations only

	18-24 years % (n)	25-34 years % (n)	35-44 years % (n)	45-54 years % (n)	55-64 years % (n)	65+ years % (n)	p
Abuse: Verbal	25.2 (128)	29.6 (236)	23.7 (224)	30.5 (229)	21.6 (220)	16.6 (225)	<0.001
Abuse: Physical	11.0 (56)	20.3 (162)	21.6 (204)	28.6 (215)	26.5 (269)	24.5 (331)	<0.001
Abuse: Sexual	4.5 (23)	5.5 (44)	4.8 (45)	8.1 (61)	7.5 (76)	7.5 (101)	<0.01
Abuse: Physical neglect	3.7 (19)	5.1 (41)	2.4 (23)	5.2 (39)	2.2 (22)	2.4 (32)	<0.001
Household: Parental separation	29.9 (152)	32.2 (257)	25.3 (239)	21.4 (161)	15.7 (160)	8.8 (119)	<0.001
Household: Witnessing domestic violence	10.8 (55)	16.3 (130)	14.8 (140)	18.4 (138)	18.5 (188)	13.9 (188)	<0.001
Household: Mental illness	21.3 (108)	23.6 (188)	17.8 (168)	18.4 (138)	12.5 (127)	7.8 (106)	<0.001
Household: Alcohol harm	13.0 (66)	18.9 (151)	14.4 (136)	16.5 (124)	11.7 (119)	7.8 (106)	<0.001
Household: Drug harm	7.1 (36)	8.7 (69)	4.3 (41)	4.7 (35)	2.2 (22)	0.8 (11)	<0.001
Household: Gambling harm	3.9 (20)	4.8 (38)	2.4 (23)	3.3 (25)	3.0 (31)	2.2 (30)	<0.05
Household: Incarceration	3.9 (20)	3.6 (29)	1.8 (17)	4.1 (31)	2.4 (24)	1.6 (22)	<0.001
Community: Bullying	21.9 (111)	28.1 (224)	25.4 (240)	32.2 (242)	27.0 (275)	21.3 (288)	<0.001
Community: Witnessing violence	19.1 (97)	23.6 (188)	22.0 (208)	27.0 (203)	20.4 (207)	13.9 (188)	<0.001

There were significant associations between ethnicity and experiencing different types of ACEs (Table 4). Prevalence of verbal abuse (<0.01), household mental illness (<0.01), household alcohol harm (<0.05), community bullying (<0.001), and witnessing violence in the community (<0.05) were all higher amongst respondents who identified as being from a white ethnicity.

Table 4: Prevalence of individual ACES by ethnicity, significant associations only

	White % (n)	Other ethnicities % (n)	p
Abuse: Verbal	23.9 (1192)	17.8 (67)	<0.01
Household: Mental illness	15.9 (793)	10.1 (38)	<0.01
Household: Alcohol harm	13.4 (667)	9.0 (34)	<0.05
Community: Bullying	26.3 (1311)	17.0 (64)	<0.001
Community: Witnessing violence	20.5 (1024)	15.9 (60)	<0.05

There were significant associations between deprivation and experiencing different ACEs. Verbal abuse (<0.001), physical neglect (<0.05), household parental separation (<0.001), witnessing domestic violence in the household (<0.001), household mental illness (<0.001), household alcohol harm (<0.001), household drug harm (<0.001), household incarceration (<0.001), and witnessing violence in the community (<0.001) were all highest amongst those from the most deprived areas and generally decreased in the least deprived areas.

Table 5: Prevalence of individual ACES by deprivation, significant associations only

	Most deprived - 1 % (n)	2 % (n)	3 % (n)	4 % (n)	Least deprived - 5 % (n)	p
Abuse: Verbal	26.0 (645)	24.5 (209)	22.0 (185)	17.1 (143)	21.5 (83)	<0.001
Abuse: Physical neglect	4.1 (102)	2.8 (24)	2.6 (22)	2.3 (19)	2.6 (10)	<0.05
Household: Parental separation	24.5 (607)	20.3 (173)	17.5 (147)	13.4 (112)	13.2 (51)	<0.001
Household: Witnessing domestic violence	17.8 (441)	16.4 (140)	12.5 (105)	13.4 (112)	11.1 (43)	<0.001
Household: Mental illness	17.6 (436)	16.6 (142)	13.1 (110)	12.5 (104)	11.7 (45)	<0.001
Household: Alcohol harm	15.7 (389)	12.9 (110)	9.5 (80)	10.9 (91)	8.8 (34)	<0.001
Household: Drug harm	5.4 (134)	3.2 (27)	3.1 (26)	2.2 (18)	2.6 (10)	<0.001
Household: Incarceration	4.1 (101)	1.2 (10)	1.9 (16)	1.7 (14)	0.5 (2)	<0.001
Community: Witnessing violence	23.5 (583)	18.5 (158)	18.5 (155)	16.9 (141)	14.2 (55)	<0.001

3.4 ACEs and health and wellbeing, health risk behaviours, school exclusions, unemployment, violence, and criminal justice exposure

Participants were asked about their engagement in several health risk behaviours (i.e. smoking tobacco and e-cigarette/vape use, alcohol consumption, drug use, and gambling), their health and wellbeing, employment, violence victimisation, exposure to the criminal justice system, and school exclusions.[6]

Increased risk in adults experiencing 4+ ACEs vs. 0 ACEs

Controlling for sex, age, ethnicity, and deprivation

Health risk behaviours	Smoking and/or e-cigarettes/vaping (current, daily)	**2.0x**
	Alcohol (current, 5+ drinks on one occasion at least weekly)	**1.4x**
	Gambling related harm (any past year, of those who gambled in past 12 months)	**4.0x**
	Drug use (any, past year)	**8.4x**
Health and wellbeing	Low mental wellbeing (current)	**2.6x**
	Poor general health (current)	**1.5x**
Education and employment	Excluded from school (ever)	**8.4x**
	Unemployed (current)	**1.9x**
Adult violence victimisation	Violence victimisation (since age 18 years)	**9.7x**
	Violence victimisation (past year)	**6.8x**
Criminal justice exposure	Been arrested (ever)	**5.2x**
	Been incarerated (ever)	**6.2x**

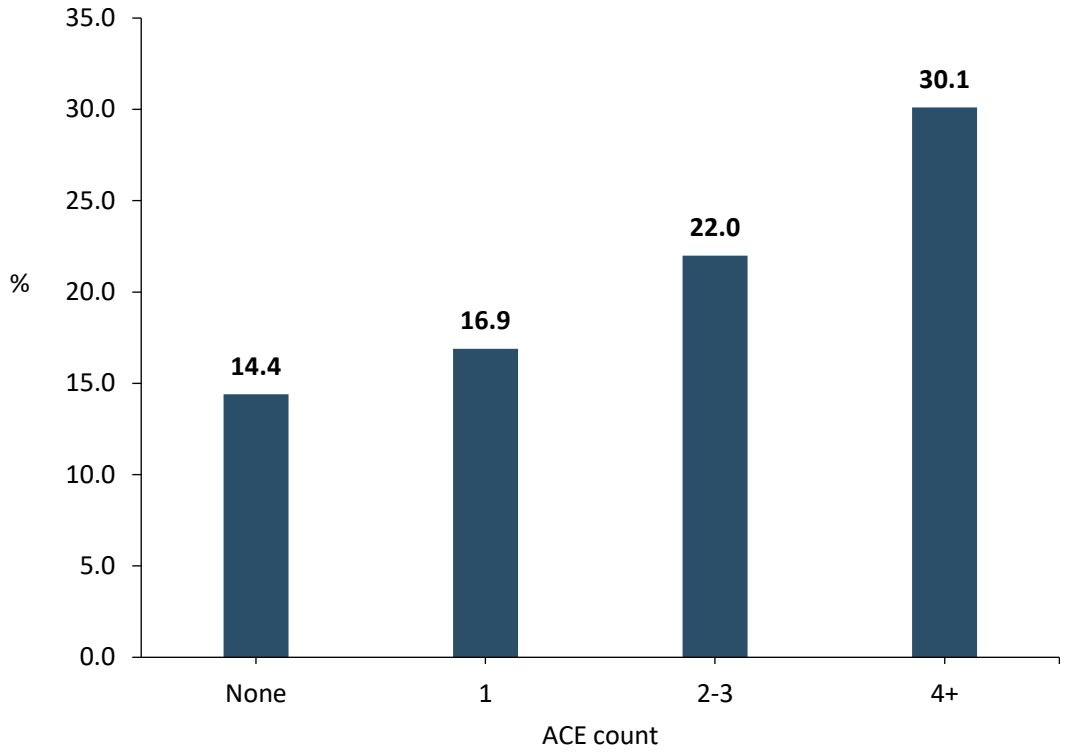
[6] See Appendix Table A8-A13 for all tables.

3.4.1 Tobacco smoking and/or using e-cigarettes/vapes

Just under one in five (18.2%) participants were currently smoking tobacco and/or using e-cigarettes/vapes daily. [7]

There was a significant association between ACE count and tobacco smoking and/or e-cigarette/vape use, with a higher prevalence of daily tobacco smoking and/or e-cigarette/vape use as ACE count increases (0 ACEs, 14.4%; 1 ACE, 16.9%; 2-3 ACEs, 22.0%; 4+ ACEs, 30.1%; p<0.001; Figure 6). While controlling for sociodemographics, the association between experiencing ACEs and daily tobacco smoking and/or e-cigarette/vape use remained significant. Those who experienced 4+ ACEs were around twice as likely (AOR=2.05, 95% CIs [1.66, 2.54]) to use e-cigarettes/vapes or smoke tobacco daily than those with no ACEs, and those with 2-3 ACEs were 1.5 times more likely (AOR=1.53, 95% CIs [1.27, 1.86]). There was no significant difference between smoking or e-cigarette/vape use and one ACE, compared to those experiencing no ACEs.

Figure 6: Prevalence of daily tobacco smoking and/or e-cigarette/vape use by ACE count



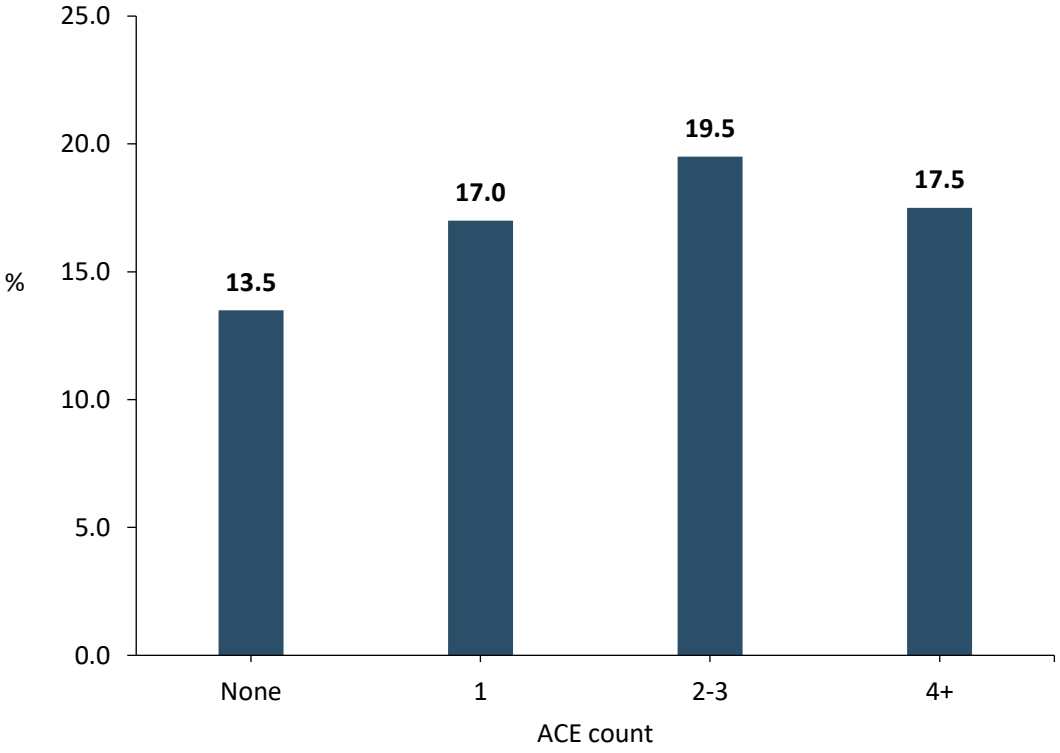
[7] 12.0% were current daily smokers. 8.4% were current daily users of e-cigarettes or vapes.

3.4.2 Alcohol consumption

15.8% of participants were drinking 5+ drinks on one occasion on a weekly basis.[8]

There was a significant association between ACE count and alcohol consumption, with the highest prevalence of and consuming 5+ drinks on one occasion on a weekly basis observed among those with 2-3 ACEs (0 ACEs, 13.5%; 1 ACE, 17.0%; 2-3 ACEs, 19.5%; 4+ ACEs, 17.5%; p<0.001; Figure 7). While controlling for sociodemographics, the association between experiencing ACEs and having 5+ drinks on one occasion on a weekly basis remained significant. Those who experienced 2-3 ACEs were 1.5 times more likely (AOR=1.54, 95% CIs [1.26, 1.87]) to have 5+ drinks on one occasion on a weekly basis than those with no ACEs, those with 4+ ACEs were 1.4 times more likely (AOR=1.45, 95% CIs [1.14, 1.85]), and those with one ACE were 1.3 times more likely (AOR=1.30, 95% CIs [1.06, 1.60]).

Figure 7: Prevalence of 5+ drinks on one occasion on a weekly basis by ACE count



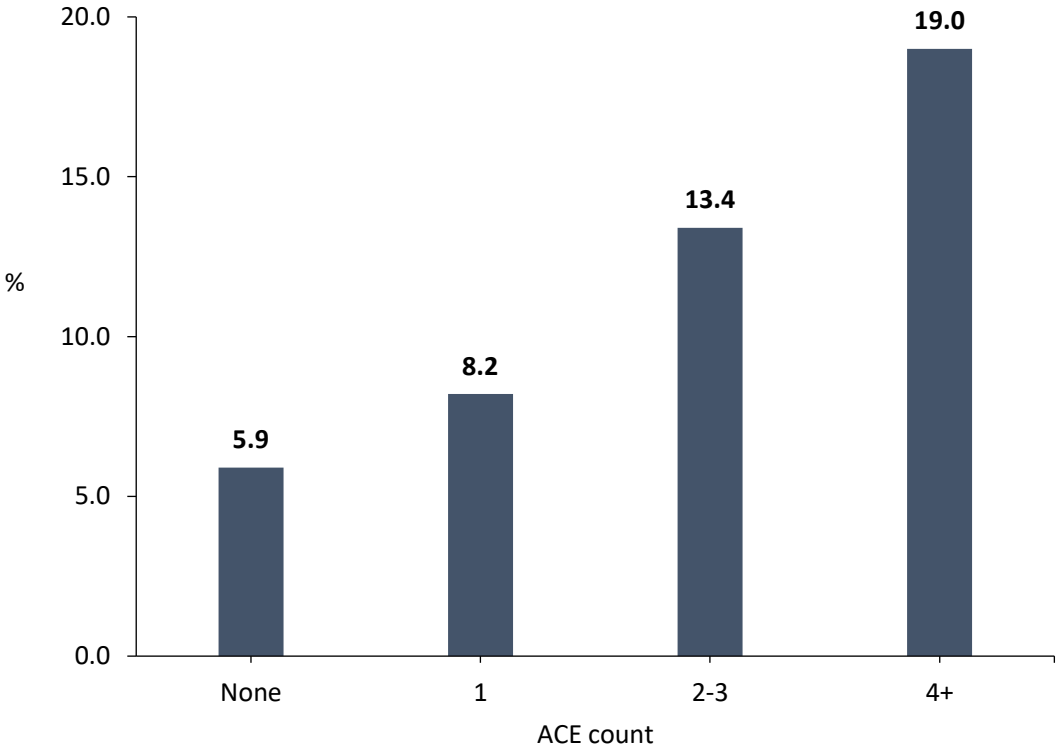
[8] 40.4% did so monthly or less, and 43.9% of participants never drink 5+ drinks on one occasion.

3.4.3 Gambling related harm

Of those who gambled in the past 12 months,[9] 10.0% experienced gambling related harm.

There was a significant association between ACE count and gambling related harm, with a higher prevalence of gambling related harm as ACE count increases (0 ACEs, 5.9%; 1 ACE, 8.2%; 2-3 ACEs, 13.4%; 4+ ACEs, 19.0%; p<0.001; Figure 8). While controlling for sociodemographics, the association between experiencing ACEs and experiencing gambling related harm remained significant. Those who experienced 4+ ACEs were nearly 4.0 times more likely (AOR=3.97, 95% CIs [2.46, 6.41]) to experience gambling related harm than those with no ACEs, and those with 2-3 ACEs were 2.7 times more likely (AOR=2.71, 95% CIs [1.75, 4.20]). There was no significant difference between gambling related harm and one ACE, compared to those experiencing no ACEs.

Figure 8: Prevalence of gambling related harm by ACE count



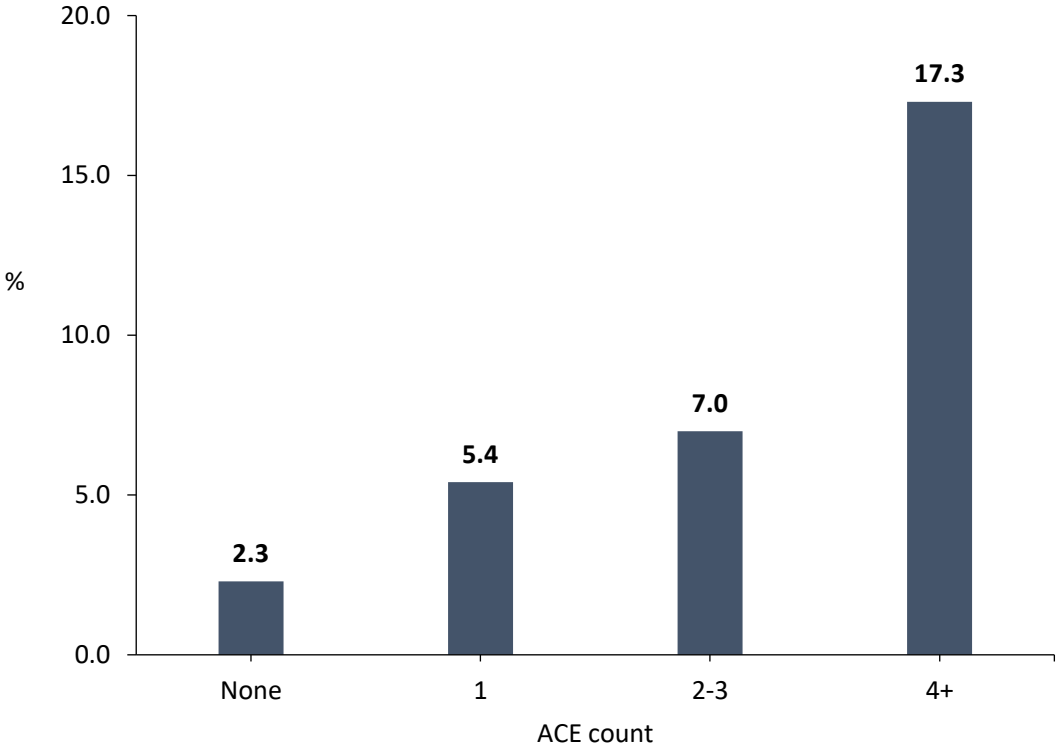
[9] 32.3% of participants engaged in any form of gambling in the past 12 months.

3.4.4 Drug use

5.6% of participants had used any drug in the past 12 months.[10]

There was a significant association between ACE count and any past year drug use, with a higher prevalence of past year drug use as ACE count increases (0 ACEs, 2.3%; 1 ACE, 5.4%; 2-3 ACEs, 7.0%; 4+ ACEs, 17.3%; p<0.001; Figure 9). While controlling for sociodemographics, the association between experiencing ACEs and past year drug use remained significant. Those who experienced 4+ ACEs were over eight times more likely (AOR=8.36, 95% CIs [5.88, 11.90]) to use any drug in the past year than those with no ACEs, those with 2-3 ACEs were over three times more likely (AOR=3.49, 95% CIs [2.41, 5.05]), and those with one ACE were over twice as likely (AOR=2.57, 95% CIs [1.74, 3.78]).

Figure 9: Prevalence of any past year drug use by ACE count



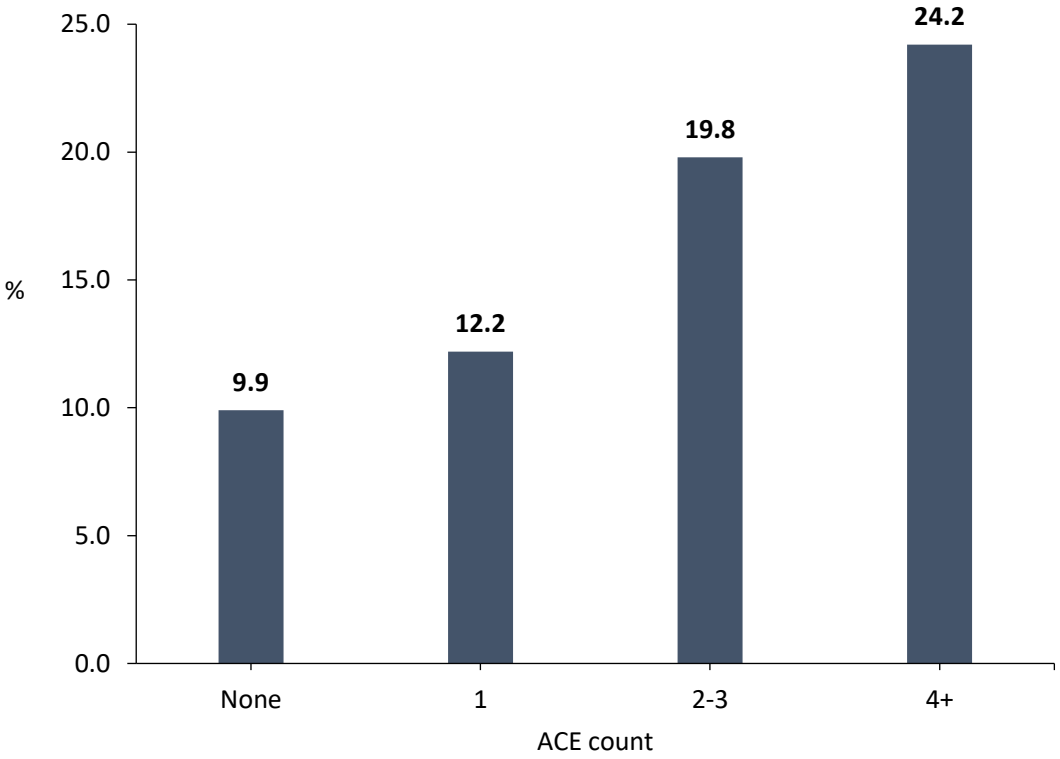
[10] The most used drug in the past year was cannabis (4.9%), followed by cocaine powder (1.5%), ecstasy (1.0%), ketamine (0.9%), psychedelics (0.8%), nitrous oxide (0.4%), amphetamines (0.2%), heroin or crack cocaine (0.2%), GHB (0.2%), and mephedrone (0.1%). Since age 18 years, 19.1% of participants had used any drug, and 10.3% had used any drug excluding cannabis (see also Appendix Table A9).

3.4.5 Low mental wellbeing

Overall, 14.1% of participants currently experienced low mental wellbeing.

There was a significant association between ACE count and mental wellbeing, with generally a higher prevalence of low mental wellbeing as ACE count increases (0 ACEs, 9.9%; 1 ACE, 12.2%; 2-3 ACEs, 19.8%; 4+ ACEs, 24.2%; p<0.001; Figure 10). While controlling for sociodemographics, the association between experiencing ACEs and low mental wellbeing remained significant. Those who experienced 4+ ACEs were 2.6 times more likely (AOR=2.59, 95% CIs [2.06, 3.27]) to experience low mental wellbeing than those with no ACEs, and those with 2-3 ACEs were 2.1 times more likely (AOR=2.18, 95% CIs [1.77, 2.68]). There was no significant difference between low mental wellbeing and one ACE, compared to those experiencing no ACEs.

Figure 10: Prevalence of low mental wellbeing by ACE count

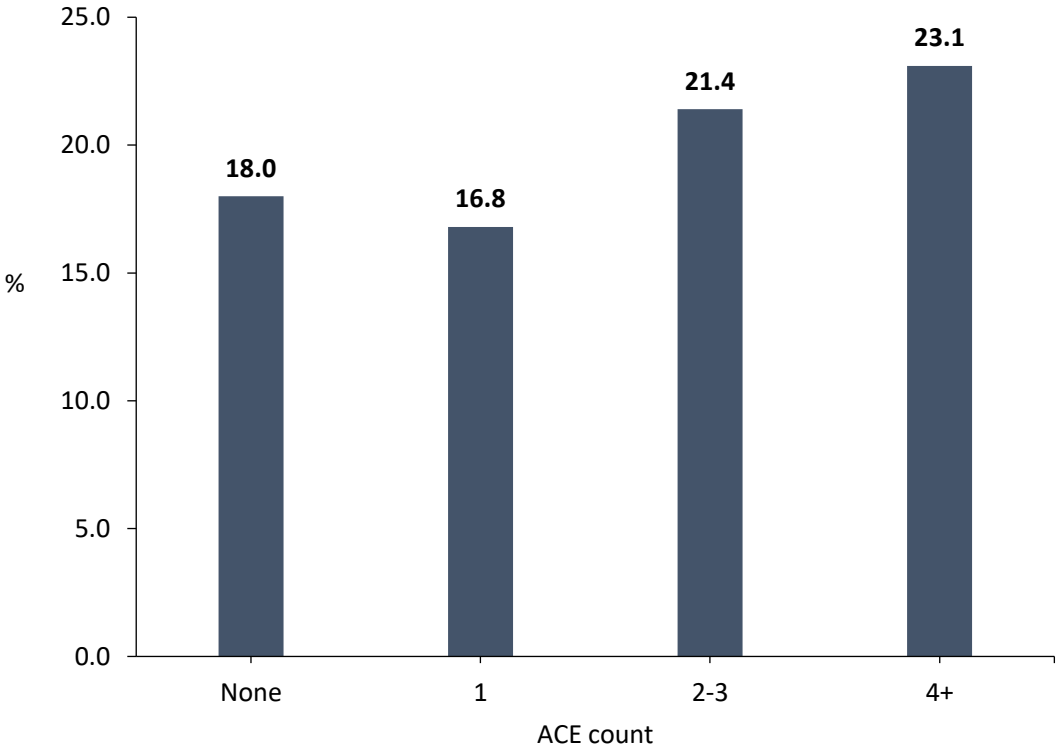


3.4.6 Poor general health

Overall, 19.0% of participants currently experienced poor general health.

There was a significant association between ACE count and general health, with generally a higher prevalence of poor general health as ACE count increases (0 ACEs, 18.0%; 1 ACE, 16.8%; 2-3 ACEs, 21.4%; 4+ ACEs, 23.1%; p<0.01; Figure 11). While controlling for sociodemographics, the association between experiencing ACEs and poor general health remained significant. Those who experienced 4+ ACEs were nearly 1.5 times more likely (AOR=1.48, 95% CIs [1.48, 1.18]) to experience poor general health than those with no ACEs, and those with 2-3 ACEs were 1.2 times more likely (AOR=1.26, 95% CIs [1.04, 1.53]). There was no significant difference between poor general health and one ACE, compared to those experiencing no ACEs.

Figure 11: Prevalence of poor general health by ACE count

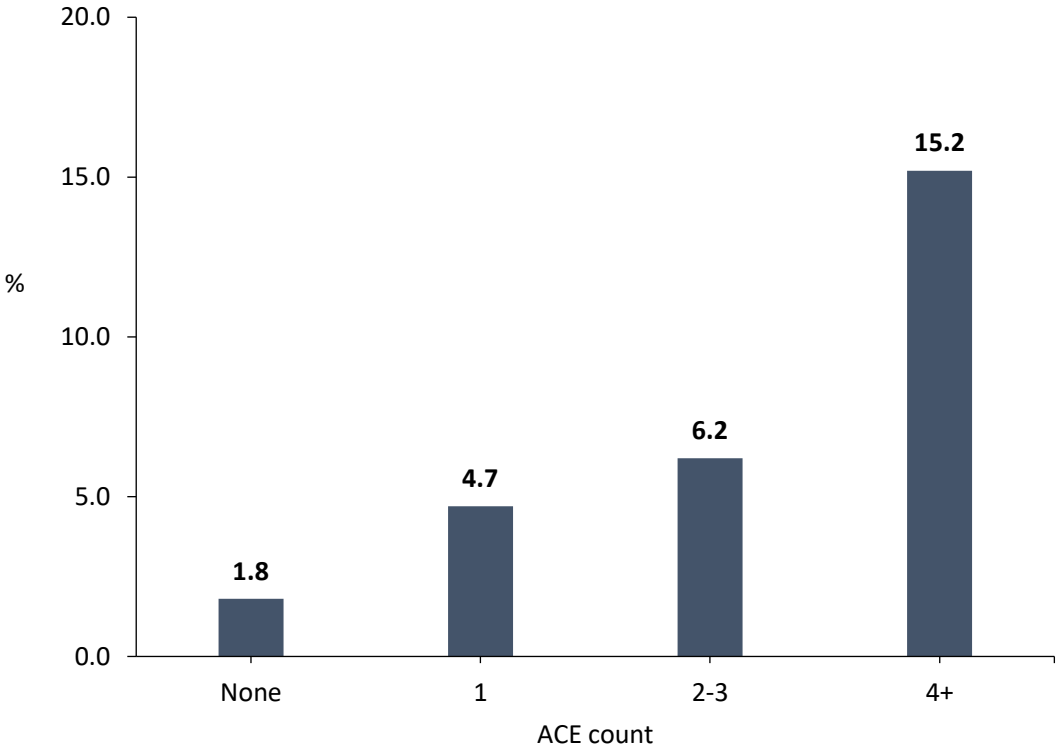


3.4.7 School exclusion

Overall, 4.8% of participants had ever been excluded from school while growing up.

There was a significant association between ACE count and having been excluded from school, with a prevalence of school exclusions as ACE count increases (0 ACEs, 1.8%; 1 ACE, 4.7%; 2-3 ACEs, 6.2%; 4+ ACEs, 15.2%; p<0.001; Figure 12). While controlling for sociodemographics, the association between experiencing ACEs and school exclusions remained significant. Those who experienced 4+ ACEs were over eight times more likely (AOR=8.40, 95% CIs [5.79, 12.18]) to have been excluded from school than those with no ACEs, those who experienced 2-3 ACEs were over three times more likely (AOR=3.35, 95% CIs [2.27, 4.95]), and those with one ACE were over twice as likely (AOR=2.49 95% CIs [1.65, 3.77]).

Figure 12: Prevalence of school exclusion by ACE count

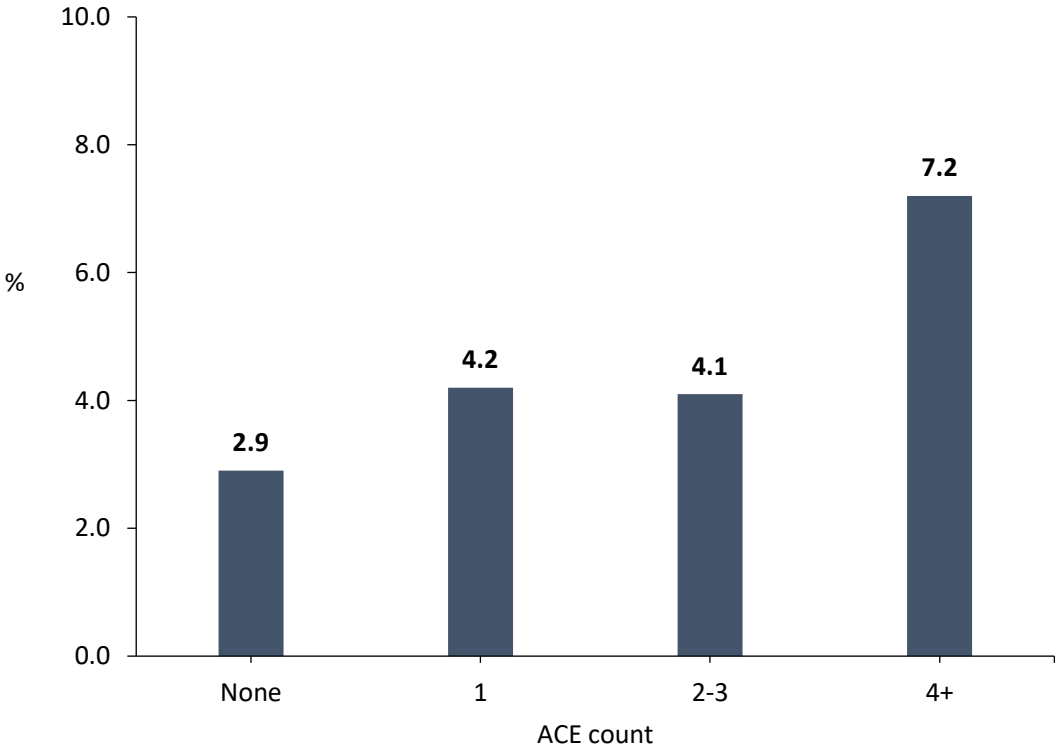


3.4.8 Unemployment

Overall, 3.9% of participants were currently unemployed.

There was a significant association between ACE count and employment status, with the highest prevalence of unemployment amongst those with 4+ ACEs and the lowest amongst those with no ACEs (0 ACEs, 2.9%; 1 ACE, 4.2%; 2-3 ACEs, 4.1%; 4+ ACEs, 7.2%; p<0.01; Figure 13). While controlling for sociodemographics, the association between experiencing ACEs and being unemployed remained significant. Those who experienced 4+ ACEs were 1.9 times more likely (AOR=1.92, 95% CIs [1.26, 2.92]) to be unemployed than those with no ACEs. However, those who experienced 2-3 ACEs, or one ACE, were not significantly more likely to be unemployed than those who experienced no ACEs.

Figure 13: Prevalence of unemployment by ACE count

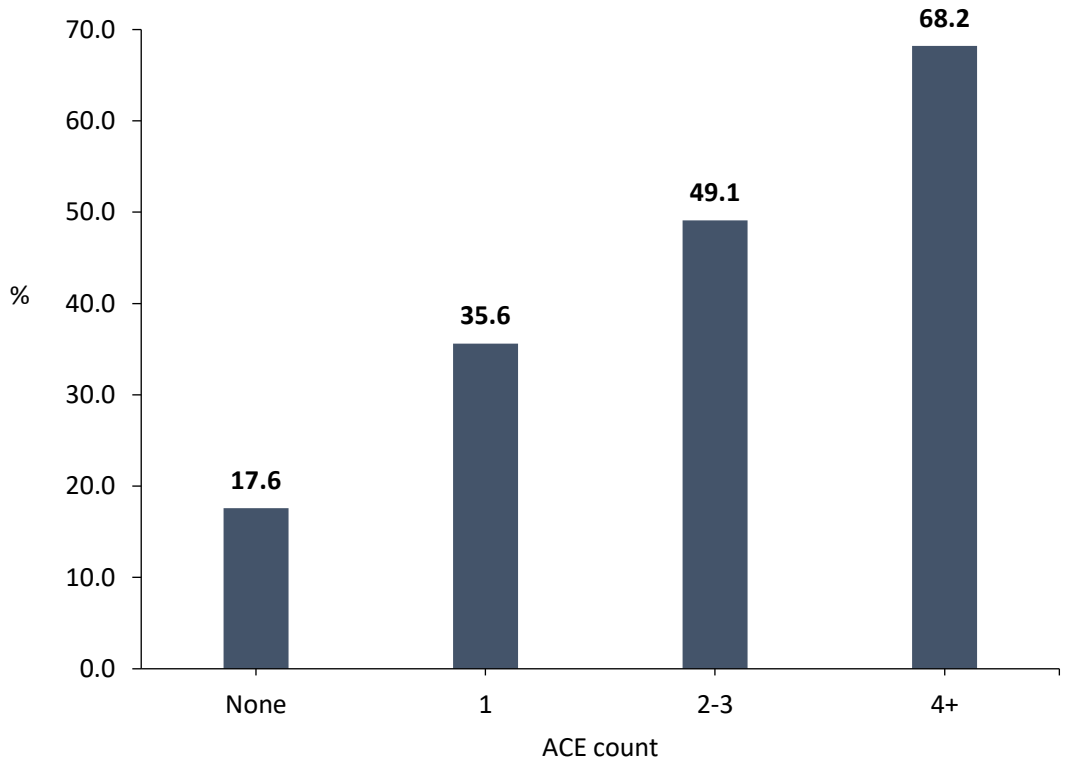


3.4.9 Violence victimisation since 18 years old

Overall, a third (32.9%)[11] of adults across Merseyside had experienced any violence victimisation since the age of 18 years.

There was a significant association between ACE count and ever having experienced violence since age 18 years, with a higher prevalence as ACE count increases (0 ACEs, 17.6%; 1 ACE, 35.6%; 2-3 ACEs, 49.1%; 4+ ACEs, 68.2%; p<0.001; Figure 14). While controlling for sociodemographics, the association between ACEs and ever experiencing violence since age 18 years remained significant. Those who experienced 4+ ACEs were over nine times more likely (AOR=9.74, 95% CIs [7.99, 11.88]) to have experienced violence since age 18 years, than those with no ACEs, those with 2-3 ACEs were over four times more likely (AOR= 4.39, 95% CIs [3.74, 5.15]), and those with one ACE were over twice as likely (AOR=2.53, 95% CIs [2.15, 2.98]).

Figure 14: Prevalence of violence victimisation since 18 years old by ACE count



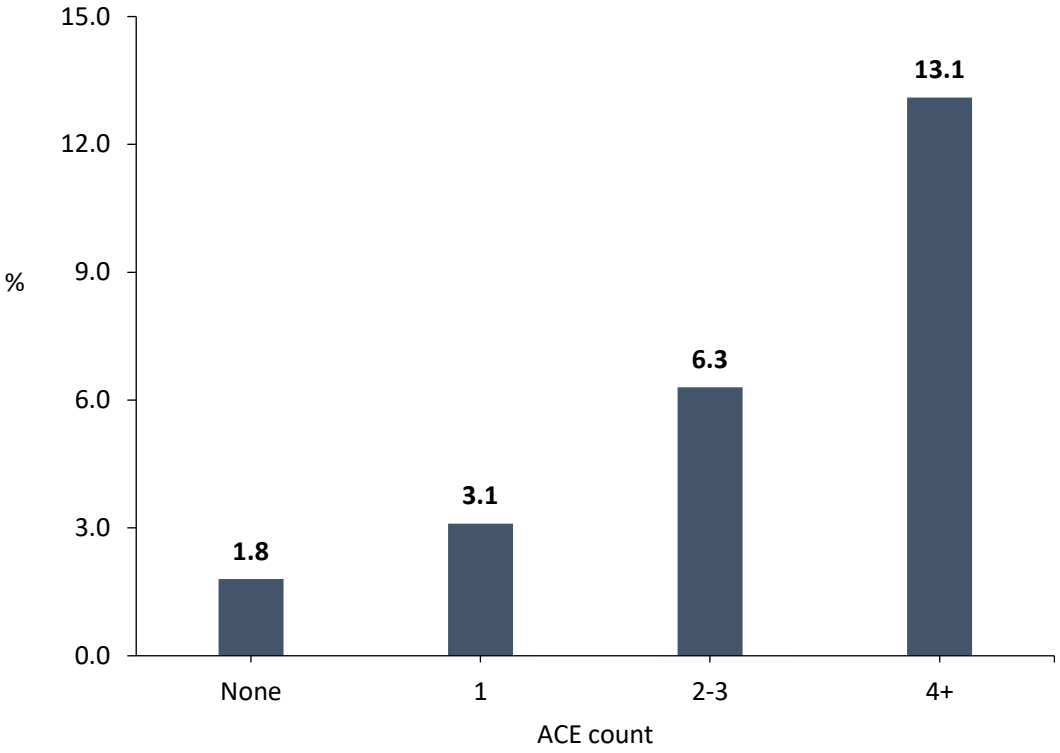
[11] Data presented here are based on adjusted (modelled) data. For more information see the adult violence victimisation report [25] .

3.4.10 Violence victimisation in the past year

Overall, 4.3%[12] of participants had experienced any violence victimisation in the past year.

There was a significant association between ACE count and having experienced violence in the past year, with a higher prevalence as ACE count increases (0 ACEs, 1.8%; 1 ACE, 3.1%; 2-3 ACEs, 6.3%; 4+ ACEs, 13.1%; p<0.001; Figure 15). While controlling for sociodemographics, the association between ACEs and experiencing violence in the past year remained significant. Those who experienced 4+ ACEs were over six times more likely (AOR=6.78, 95% CIs [4.66, 9.86]) to have experienced violence in the past year than those with no ACEs, those with 2-3 ACEs were over three times more likely (AOR=3.57, 95% CIs [2.43, 5.24]), and those with only one ACE were over 1.7 times more likely (AOR=1.71, 95% CIs [1.09, 2.70]).

Figure 15: Prevalence of violence victimisation in the past year by ACE count



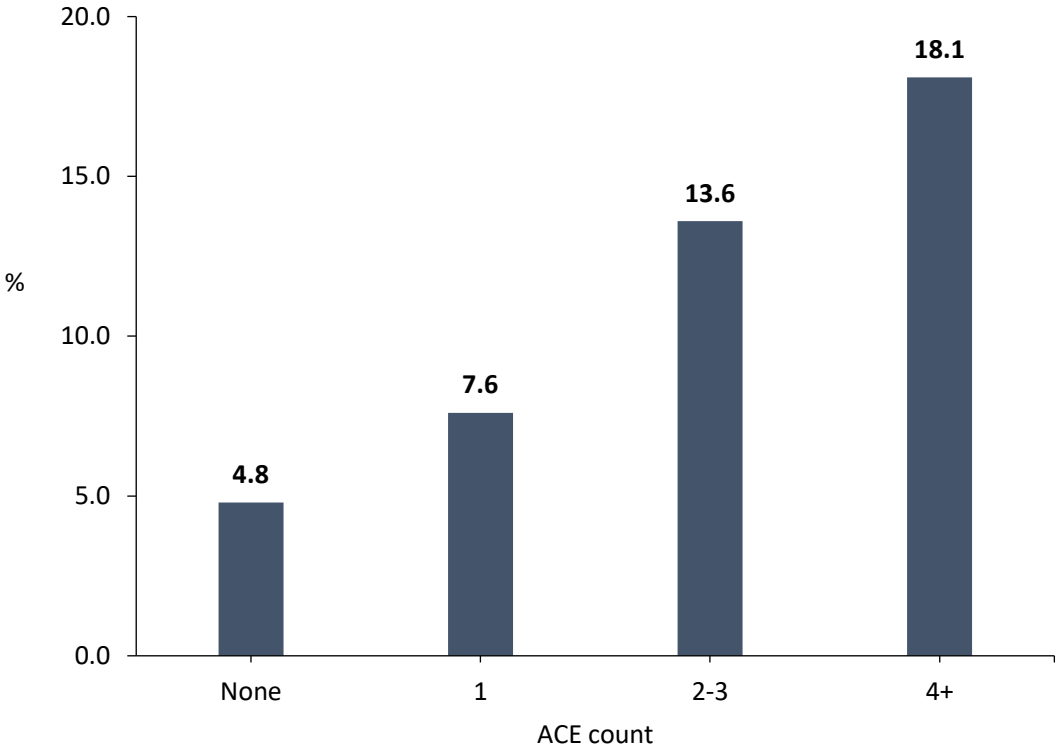
[12] Data presented here are based on adjusted (modelled) data. For more information see the adult violence victimisation report [25].

3.4.11 Arrest history

Overall, 8.6% of participants had ever been arrested.

There was a significant association between ACE count and having ever been arrested, with a higher prevalence as ACE count increases (0 ACEs, 4.8%; 1 ACE, 7.6%; 2-3 ACEs, 13.6%; 4+ ACEs, 18.1%; p<0.001; Figure 16). While controlling for sociodemographics, the association between experiencing ACEs and having been arrested remained significant. Those who experienced 4+ ACEs were over five times more likely (AOR=5.15, 95% CIs [3.85, 6.88]) to have ever been arrested than those with no ACEs, those with 2-3 ACEs were nearly three times more likely (AOR=2.97, 95% CIs [2.27, 3.87]), and those with only one ACE were 1.5 times more likely (AOR=1.55, 95% CIs [1.15, 2.10]).

Figure 16: Prevalence of ever being arrested by ACE count

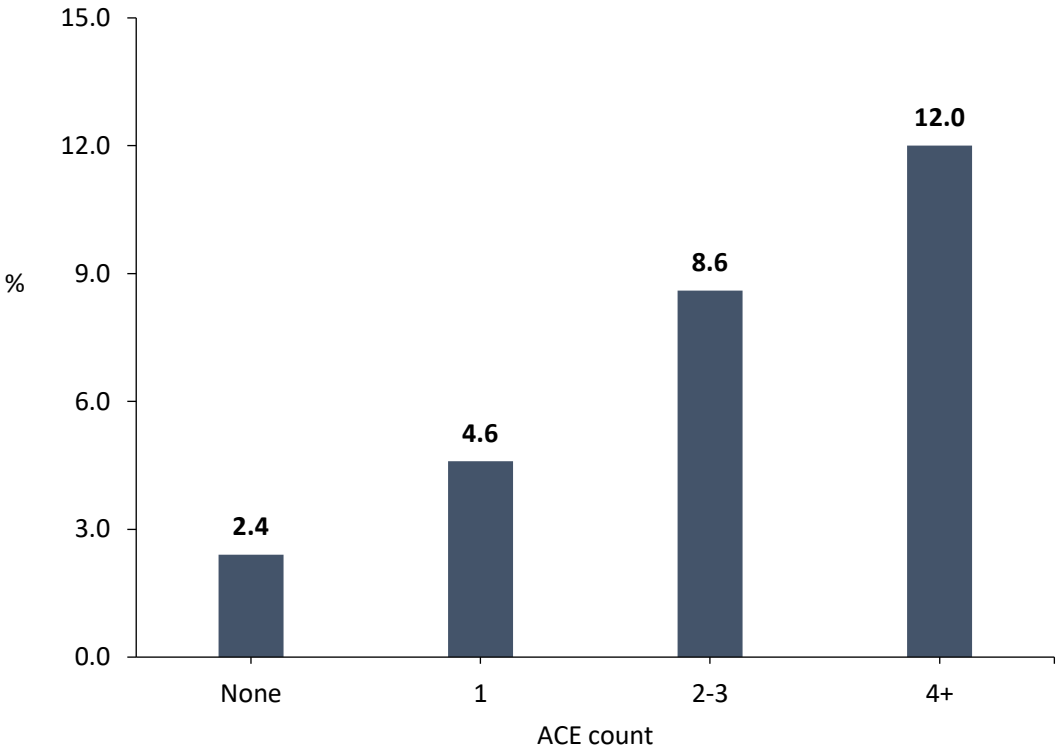


3.4.12 Incarceration history

Overall, 5.2% of participants had ever been incarcerated.

There was a significant association ACE count and having ever been incarcerated, with a higher prevalence of having ever been incarcerated as ACE count increases (0 ACEs, 2.4%; 1 ACE, 4.6%; 2-3 ACEs, 8.6%; 4+ ACEs, 12.0%; p<0.001; Figure 17). While controlling for sociodemographics, the association between experiencing ACEs and having ever been incarcerated remained significant. Those who experienced 4+ ACEs were over six times more likely (AOR=6.16, 95% CIs [4.27, 8.87]) to have ever been incarcerated than those with no ACEs, those with 2-3 ACEs were over three times more likely (AOR=3.50, 95% CIs [2.49, 4.93]), and those with one ACE were 1.8 time more likely (AOR=1.83, 95% CIs [1.24, 2.71]).

Figure 17: Prevalence of ever being incarcerated by ACE count



3.5 Associations between experiencing ACEs and perceptions of safety and prevalence of violence, and neighbourhood cohesion

Participants were asked about their perceptions of safety, prevalence of violence, and neighbourhood cohesion.[13]

Increased risk in adults experiencing 4+ ACES vs. 0 ACEs

Controlling for age, sex, ethnicity, and deprivation

Personal safety from violence / prevalence of violence	Feel unsafe from violence in Merseyside generally	**2.4x**
	Feel unsafe from violence in their neighbourhood	**2.9x**
	Violence is common in Merseyside generally	**1.3x**
	Violence is common in their neighbourhood	**1.8x**
Neighbourhood cohesion	Low levels of overall neighbourhood cohesion	**1.8x**
	Low levels of neighbourhood needs fulfilment	**1.5x**
	Low levels of neighbourhood group membership	**1.6x**
	Low levels of neighbourhood influence	**2.1x**
	Low levels of neighbourhood emotional connection	**1.7x**

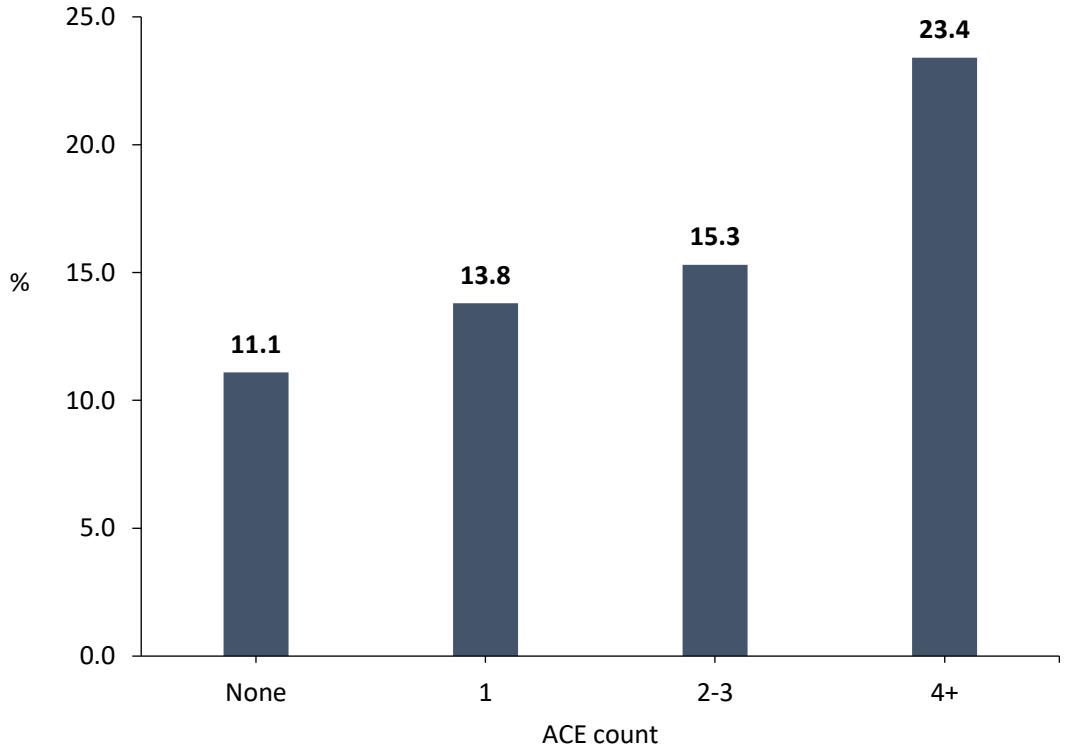
[13] See Appendix Table A14-A16 for all tables.

3.5.1 Perceptions of personal safety from violence

Overall, 13.9% of participants felt personally unsafe from violence in Merseyside generally, with a smaller proportion (6.4%) feeling personally unsafe from violence in their neighbourhood.

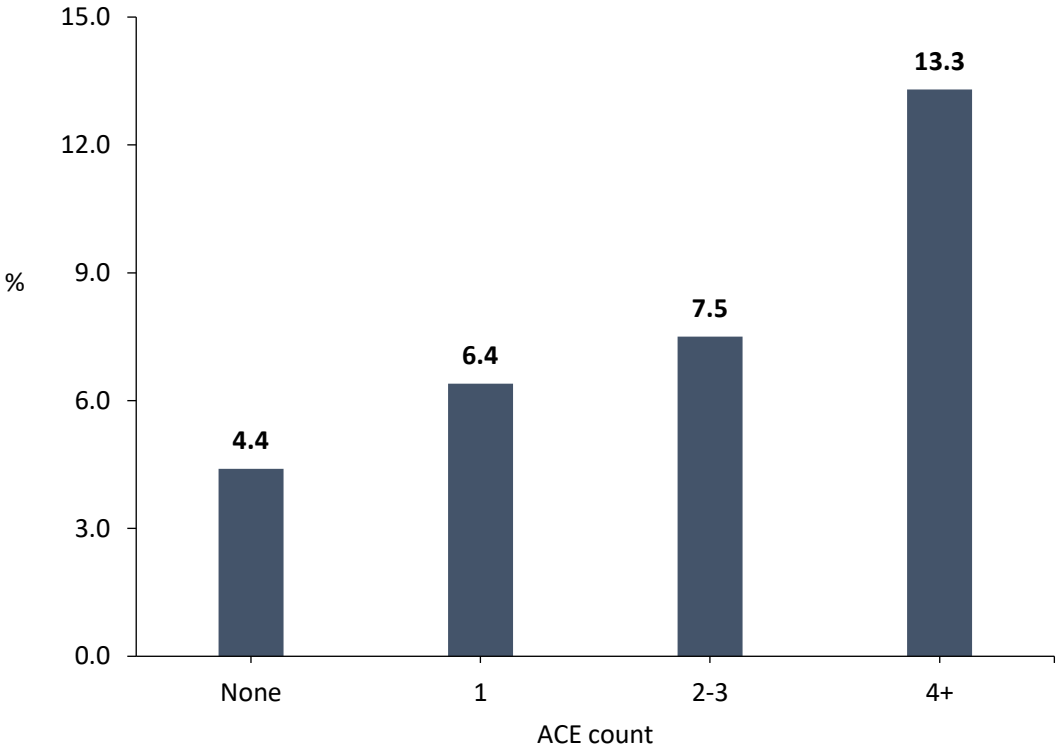
There was a significant association between ACE count and feeling personally unsafe from violence in Merseyside generally, with a higher prevalence of feeling unsafe as ACE count increases (0 ACEs, 11.1%; 1 ACE, 13.8%; 2-3 ACEs, 15.3%; 4+ ACEs, 23.4%; p<0.001; Figure 18). While controlling for sociodemographics, the association between experiencing ACEs and feeling personally unsafe from violence in Merseyside generally remained significant. Those who experienced 4+ ACEs were 2.4 times more likely (AOR=2.40, 95% CIs [1.90, 3.01]) to feel unsafe from violence in Merseyside generally than those with no ACEs, those who experienced 2-3 ACEs were 1.4 times more likely (AOR=1.45, 95% CIs [1.17, 1.79]), and those who experienced one ACE were 1.2 times more likely (AOR=1.26, 95% CIs [1.01, 1.57]).

Figure 18: Prevalence of feeling personally unsafe from violence in Merseyside generally by ACE count



There was also a significant association between ACE count and feeling personally unsafe from violence in the neighbourhood, with a higher prevalence of feeling unsafe as ACE count increases (0 ACEs, 4.4%; 1 ACE, 6.4%; 2-3 ACEs, 7.5%; 4+ ACEs, 13.3%; p<0.001; Figure 19). While controlling for sociodemographics, the association between experiencing ACEs and feeling personally unsafe from violence in the neighbourhood remained significant. Those who experienced 4+ ACEs were 2.9 times more likely (AOR=2.94, 95% CIs [2.16, 4.00]) to feel unsafe from violence in their neighbourhood than those with no ACEs, those with 2-3 ACEs were 1.7 times more likely (AOR 1.71, 95% CIs [1.26, 2.32]), and those who experienced one ACE were 1.4 times more likely (AOR 1.44, 95% CIs [1.05, 1.98]).

Figure 19: Prevalence of feeling personally unsafe from violence in neighbourhood by ACE count

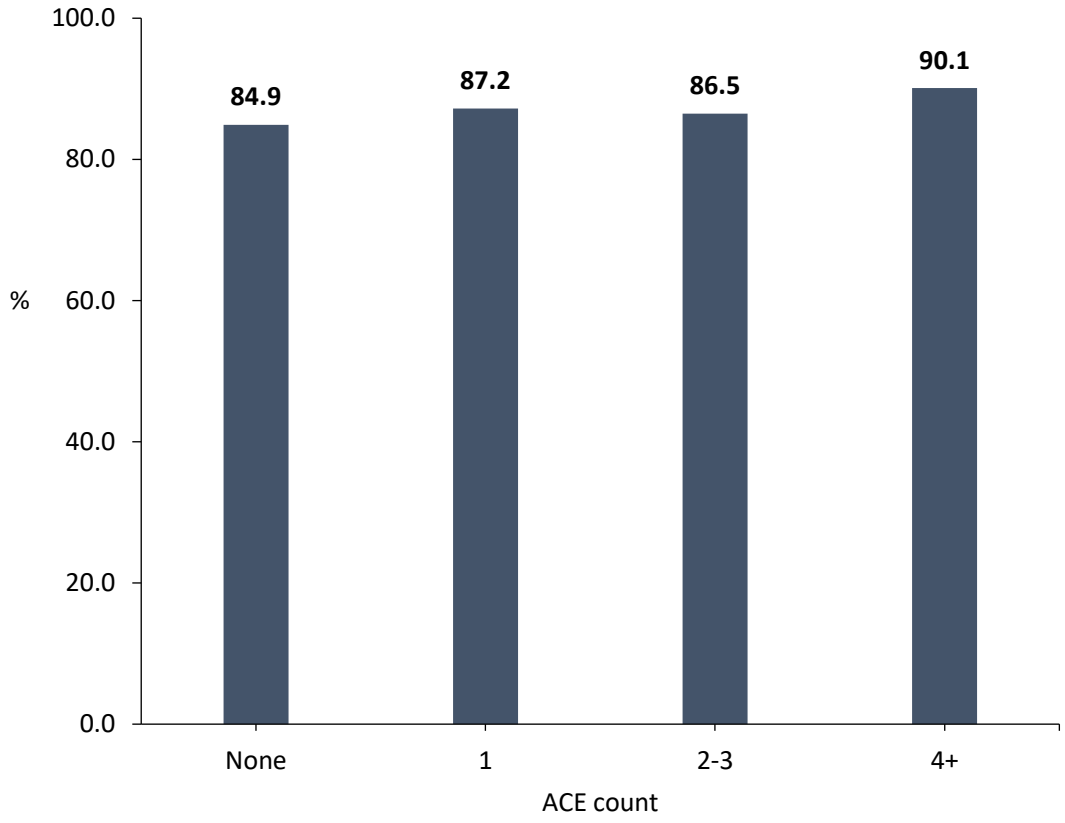


3.5.2 Perceptions of the prevalence of violence

The majority (86.3%) of participants thought that violence is common in Merseyside generally, with a far smaller proportion (34.8%) thinking that violence is common in their neighbourhood.

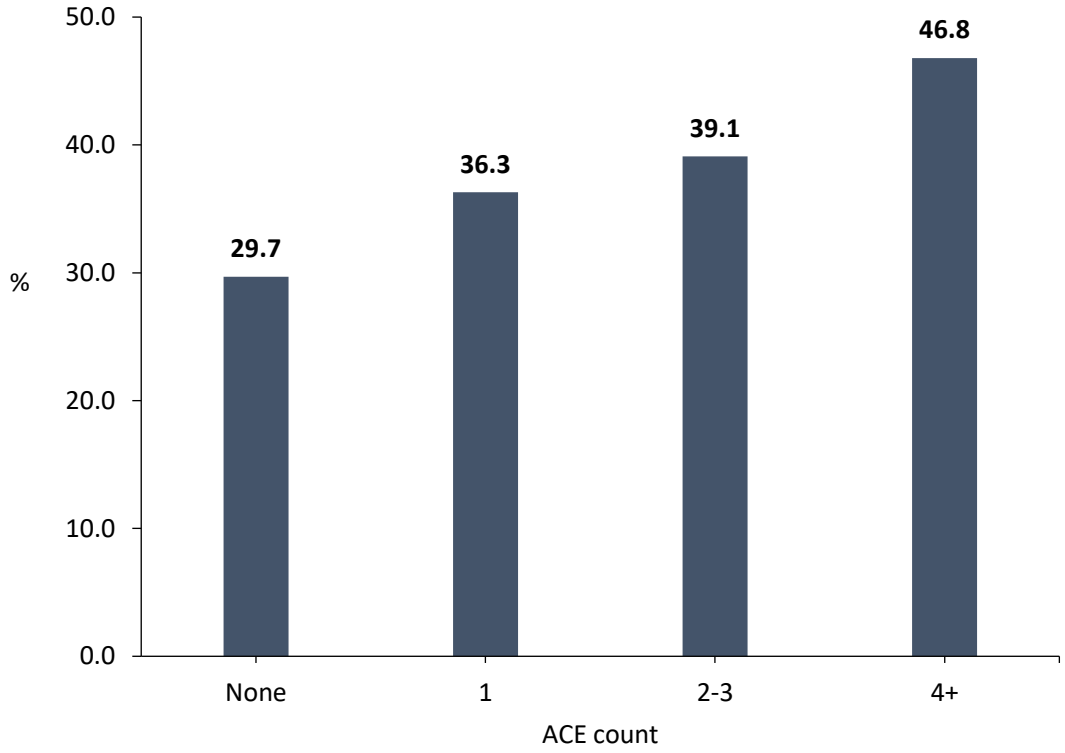
There was a significant association between ACE count and perceiving violence is common in Merseyside generally, with the highest prevalence amongst those with 4+ ACEs and lowest amongst those with no ACEs (0 ACEs, 84.9%; 1 ACE, 87.2%; 2-3 ACEs, 86.5%; 4+ ACEs, 90.1%; $p<0.01$; Figure 20). While controlling for sociodemographics, the association between experiencing ACEs and thinking that violence is common in Merseyside generally was no longer significant.

Figure 20: Prevalence of perceiving violence is common in Merseyside generally by ACE count



There was also a significant association between ACE count and thinking violence is common in their neighbourhood, with generally a higher prevalence of thinking violence is common as ACE count increases (0 ACEs, 29.7%; 1 ACE, 36.3%; 2-3 ACEs, 39.1%; 4+ ACEs, 46.8%; p<0.001; Figure 21). While controlling for sociodemographics, the association between experiencing ACEs and thinking violence is common in your neighbourhood remained significant. Those who experienced 4+ ACEs were nearly 1.8 times as likely (AOR=1.78, 95% CIs [1.48, 2.14]) to think violence is common in their neighbourhood than those with no ACEs, those with 2-3 ACEs were nearly 1.5 times more likely (AOR=1.47, 95% CIs [1.26, 1.72]), and those with only 1 ACE were 1.3 times more likely (AOR 1.35, 95% CIs [1.15, 1.58]).

Figure 21: Prevalence of perceiving violence is common in neighbourhood by ACE count



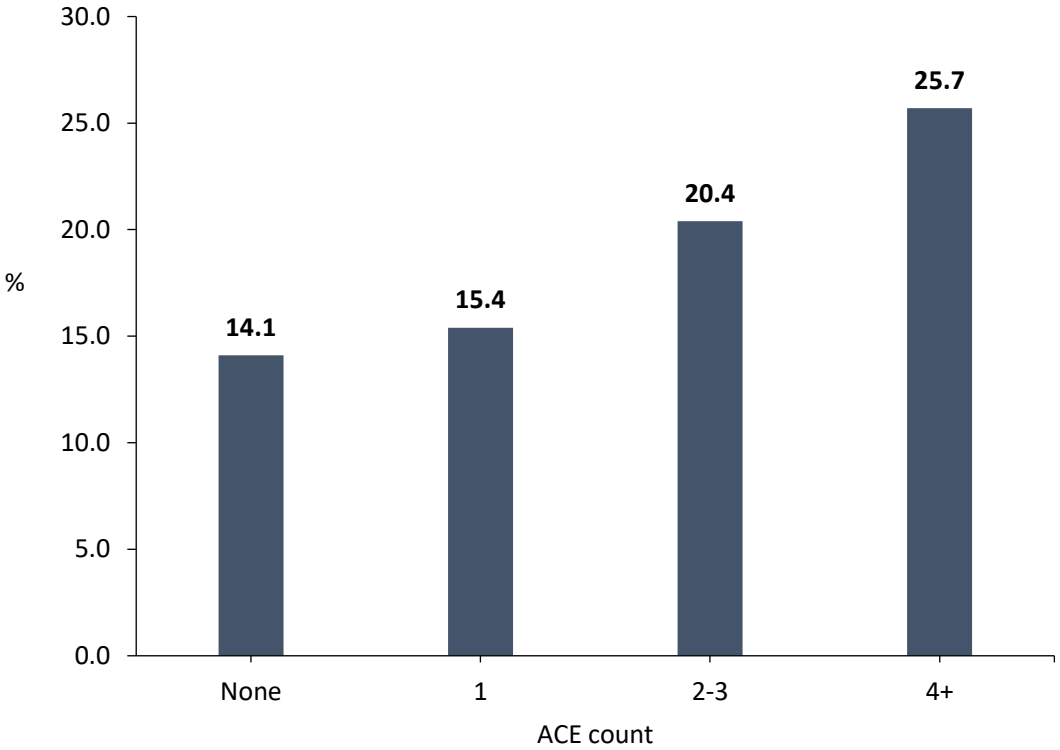
3.5.3 Neighbourhood cohesion

Overall neighbourhood cohesion

Overall, 17.0% of participants had low levels of overall neighbourhood cohesion.

There was a significant association between ACE count and having low levels of overall neighbourhood cohesion, with generally a higher prevalence as ACE count increases (0 ACEs, 14.1%; 1 ACE, 15.4%; 2-3 ACEs, 20.4%; 4+ ACEs, 25.7%; p<0.001; Figure 22). While controlling for sociodemographics, the association between experiencing ACEs and having low levels of overall neighbourhood cohesion remained significant. Those who experienced 4+ ACEs were over 1.8 times more likely (AOR=1.84, 95% CIs [1.48, 2.28]) to have low levels of overall neighbourhood cohesion than those with no ACEs, and those who experienced 2-3 ACEs were 1.5 times more likely (AOR=1.52, 95% CIs [1.26, 1.84]). Those who experienced one ACE were not significantly more likely to have low levels of overall neighbourhood cohesion than those who experienced no ACEs.

Figure 22: Prevalence of low levels of overall neighbourhood cohesion by ACE count

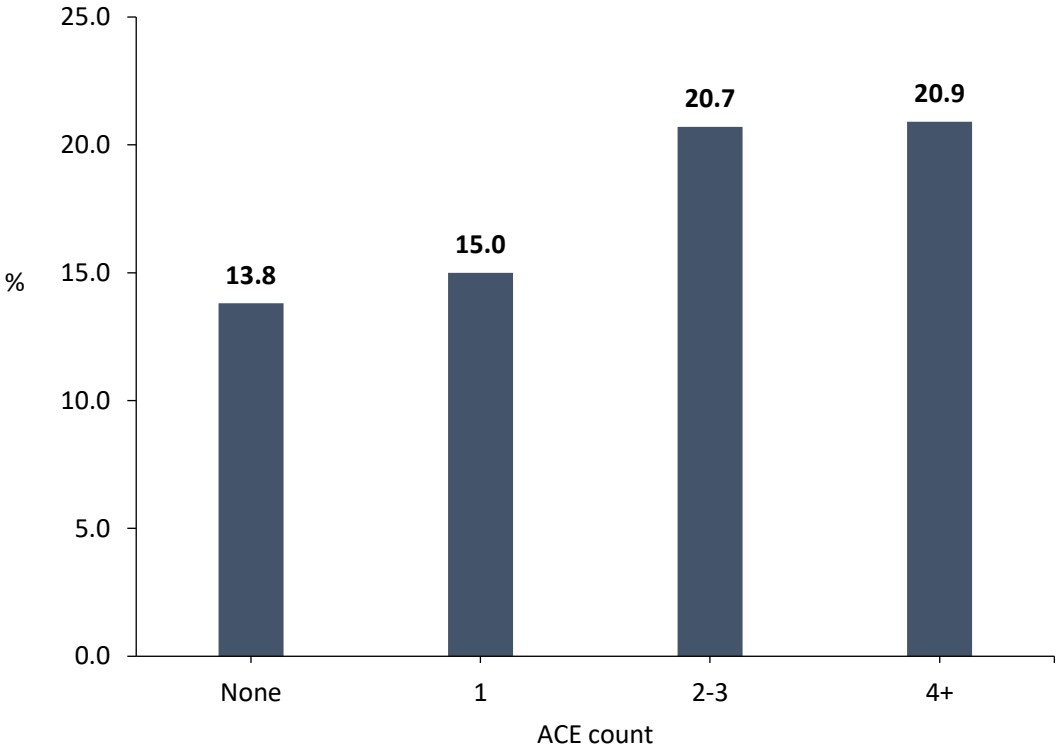


Neighbourhood needs fulfilment

Overall, 16.2% of participants had low levels of neighbourhood needs fulfilment.

There was a significant association between ACE count and having low levels of neighbourhood needs fulfilment, with generally a higher prevalence as ACE count increases (0 ACEs, 13.8%; 1 ACE, 15.0%; 2-3 ACEs, 20.7%; 4+ ACEs, 20.9%; p<0.001; Figure 23). While controlling for sociodemographics, the association between experiencing ACEs and having low levels of neighbourhood needs fulfilment remained significant. Those who experienced 4+ ACEs were nearly 1.5 times more likely (AOR=1.49, 95% CIs [1.19, 1.87]) to have low levels of neighbourhood needs fulfilment than those with no ACEs, and those who experienced 2-3 ACEs were 1.6 times more likely (AOR=1.60, 95% CIs [1.32, 1.94]). Those who experienced one ACE were not significantly more likely to have low levels of neighbourhood needs fulfilment than those who experienced no ACEs.

Figure 23: Prevalence of low levels of neighbourhood needs fulfilment by ACE count

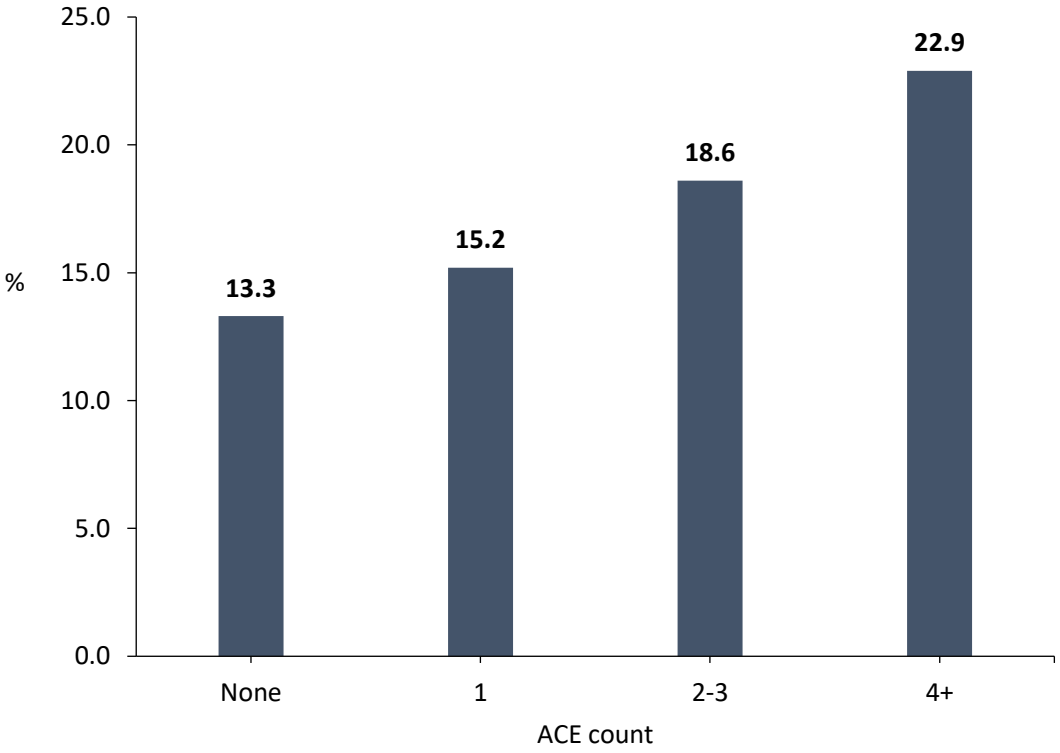


Neighbourhood group membership

Overall, 15.8% of participants had low levels of neighbourhood group membership.

There was a significant association between ACE count and having low levels of neighbourhood group membership, with generally a higher prevalence of having low neighbourhood group membership as ACE count increases (0 ACEs, 13.3%; 1 ACE, 15.2%; 2-3 ACEs, 18.6%; 4+ ACEs, 22.9%; p<0.001; Figure 24). While controlling for sociodemographics, the association between experiencing ACEs and having low levels of neighbourhood group membership remained significant. Those who experienced 4+ ACEs were 1.6 times more likely (AOR=1.67, 95% CIs [1.34, 2.09]) to have low levels of neighbourhood group membership than those with no ACEs, and those who experienced 2-3 ACEs were 1.4 times more likely (AOR=1.44, 95% CIs [1.18, 1.75]). Those who experienced one ACE were not significantly more likely to have low levels of neighbourhood group membership than those who experienced no ACEs.

Figure 24: Prevalence of low levels of neighbourhood group membership by ACE count

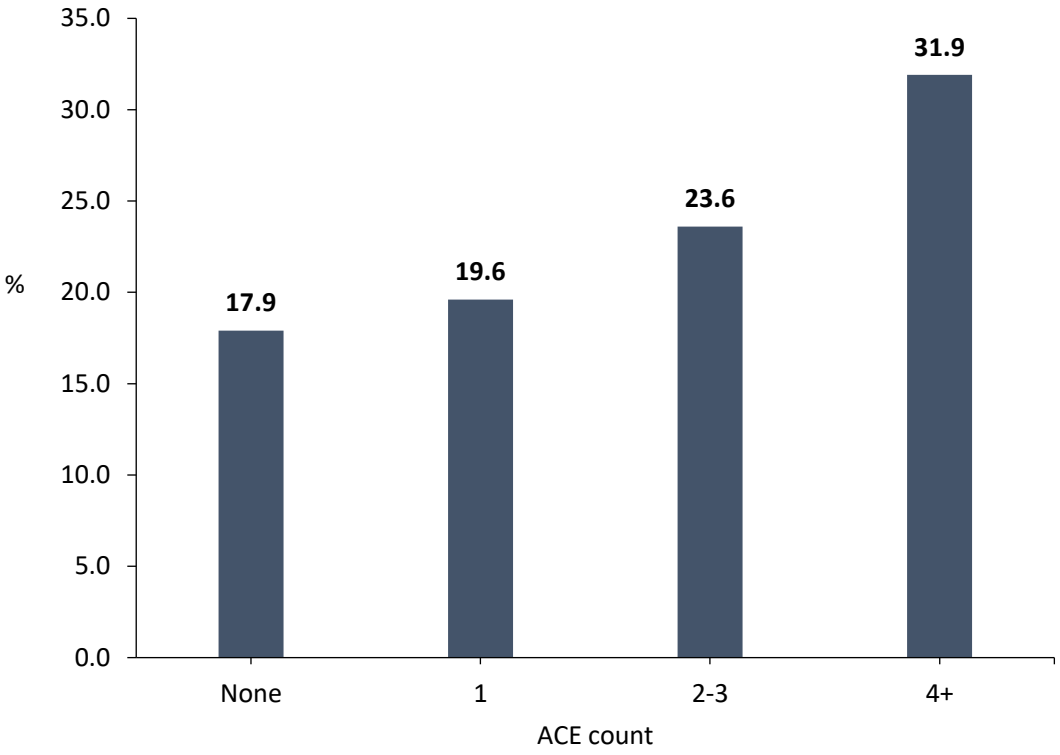


Neighbourhood influence

Overall, 21.0% of participants had low levels of neighbourhood influence.

There was a significant association between ACE count and having low levels of neighbourhood influence, with generally a higher prevalence of having low neighbourhood influence as ACE count increases (0 ACEs, 17.9%; 1 ACE, 19.6%; 2-3 ACEs, 23.6%; 4+ ACEs, 31.9%; p<0.001; Figure 25). While controlling for sociodemographics, the association between experiencing ACEs and having low levels of neighbourhood influence remained significant. Those who experienced 4+ ACEs were over twice as likely (AOR=2.13, 95% CIs [1.74, 2.60]) to have low levels of neighbourhood influence than those with no ACEs, and those who experienced 2-3 ACEs were 1.4 times more likely (AOR=1.45, 95% CIs [1.21, 1.74]). Those who experienced one ACE were not significantly more likely to have low levels of neighbourhood influence than those who experienced no ACEs.

Figure 25: Prevalence of low levels of neighbourhood influence by ACE count

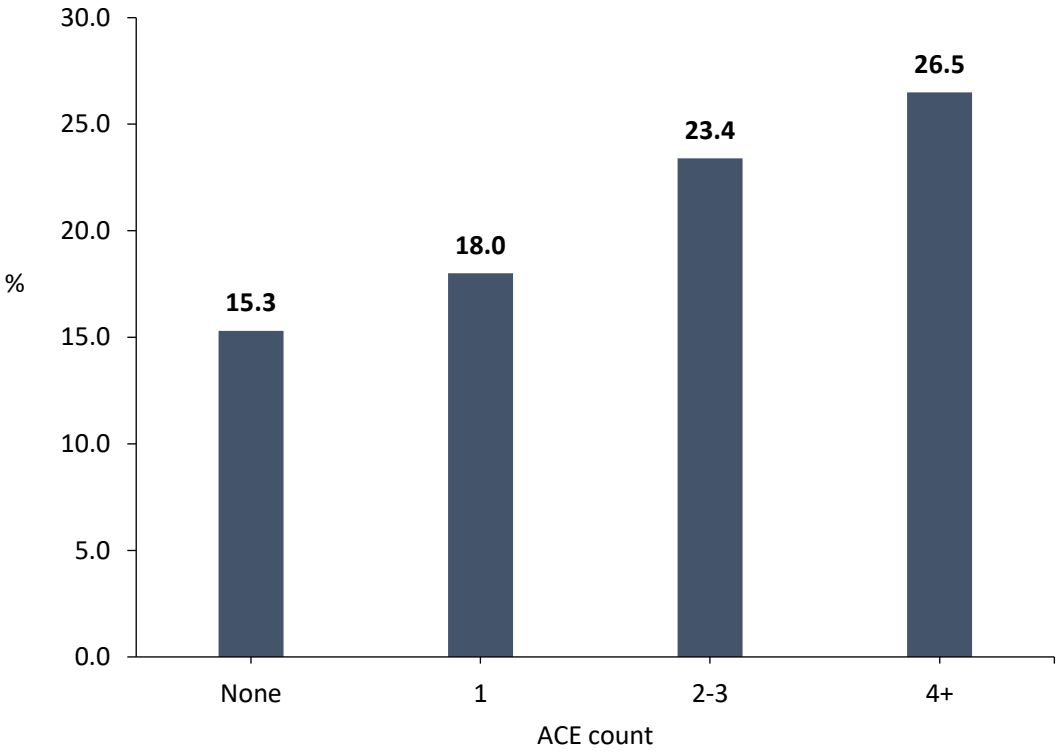


Neighbourhood emotional connection

Overall, 18.7% of participants had low levels of neighbourhood emotional connection.

There was a significant association between ACE count and having low levels of neighbourhood emotional connection, with generally a higher prevalence of having low neighbourhood emotional connection as ACE count increases (0 ACEs, 15.3%; 1 ACE, 18.0%; 2-3 ACEs, 23.4%; 4+ ACEs, 26.5%; p<0.001; Figure 26). While controlling for sociodemographics, the association between experiencing ACEs and having low levels of neighbourhood emotional connection remained significant. Those who experienced 4+ ACEs were 1.7 times more likely (AOR=1.73, 95% CIs [1.40, 2.14]) to have low levels of neighbourhood emotional connection than those with no ACEs, and those who experienced 2-3 ACEs were 1.6 times more likely (AOR=1.64, 95% CIs [1.36, 1.97]). Those who experienced one ACE were not significantly more likely to have low levels of neighbourhood emotional connection than those who experienced no ACEs.

Figure 26: Prevalence of low levels of neighbourhood emotional connection by ACE count



3.6 Associations between experiencing ACEs and resilience factors in adulthood and childhood[14]

Participants were asked about their relationships in adulthood and childhood, and engagement during childhood in extra-curricular or community activities.

Increased risk in adults experiencing 4+ ACES vs. 0 ACEs

Controlling for age, sex, ethnicity, and deprivation

Adulthood reletaionship closeness	NOT feeling close to adults that they live with	**1.9x**
	NOT feeling close to relatives that they do not live with	**2.5x**
	NOT having close or good friends	**1.9x**
Childhood reletaionships and activities	NOT have a trusted adult	**9.6x**
	NOT have a trusted friend	**3.9x**
	NOT engage in any extra-curricular or community activities	**1.2x**

[14] See Appendix Table A17-A18 for all tables.

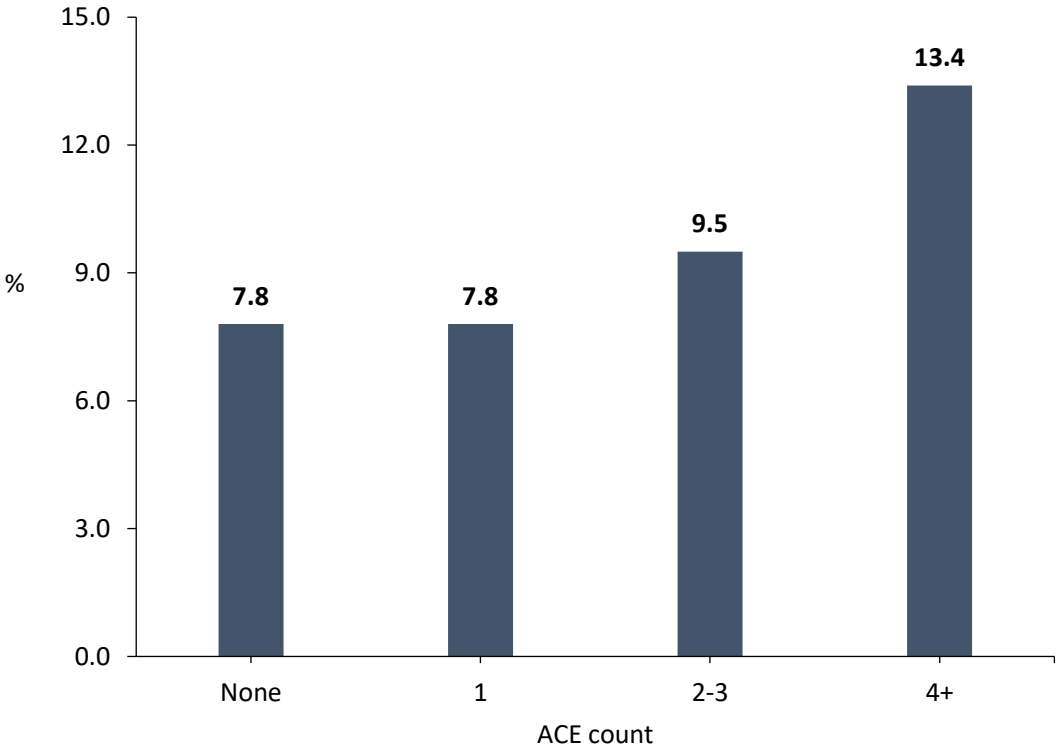
3.6.1 Adulthood relationships

Do not feel close to the adults that they live with

Overall, 8.8% of participants indicated that they do not feel close to the adults that they live with.

There was a significant association between ACE count and not feeling close to adults that an individual lives with, with generally a higher prevalence of not feeling close to adults they live with as ACE count increases (0 ACEs, 7.8%; 1 ACE, 7.8%; 2-3 ACEs, 9.5%; 4+ ACEs, 13.4%; p<0.001; Figure 27). While controlling for sociodemographics, the association between experiencing ACEs and not feeling close to adults individuals live with remained significant. Those who experienced 4+ ACEs were nearly 1.9 times more likely (AOR=1.88, 95% CIs [1.39, 2.56]) to not feel close to adults they live with than those with no ACEs. Those who experienced 2-3 ACEs or one ACE were not significantly more likely to not feel close to adults they live with than those who experienced no ACEs.

Figure 27: Prevalence of not feeling close to adults individuals live with by ACE count

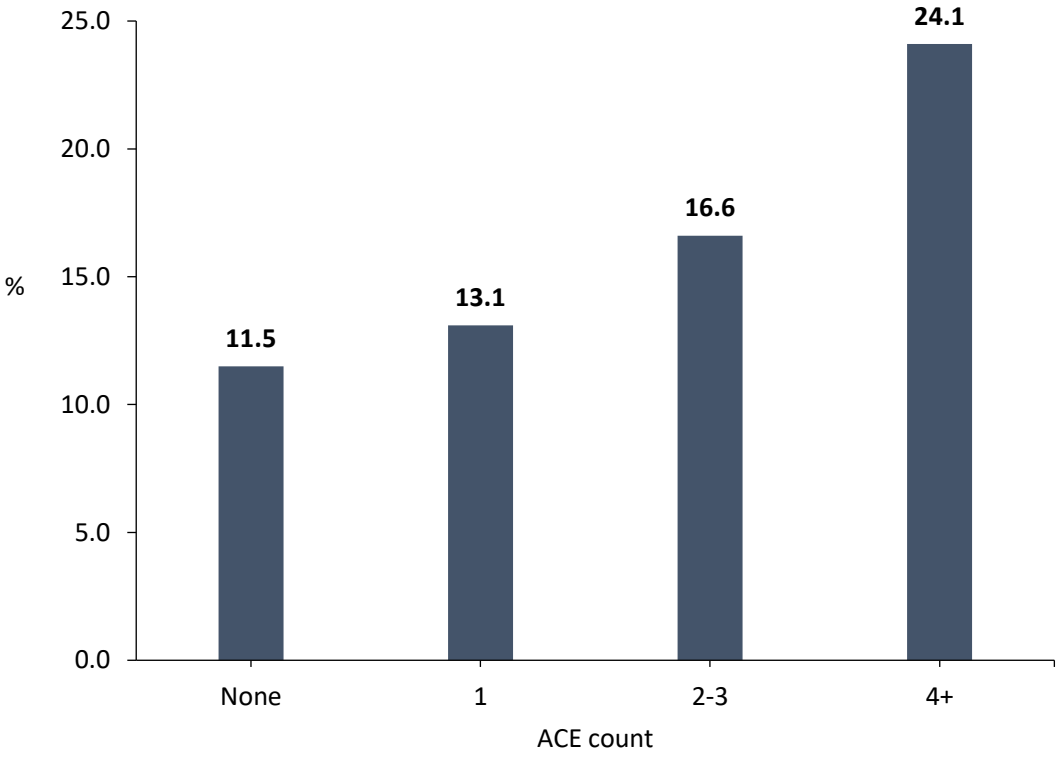


Do not feel close to relatives

Overall, 14.2% of participants indicated that they do not feel close to relatives (that they do not live with).

There was a significant association between ACE count and not feeling close to relatives (that they do not live with), with generally a higher prevalence of not feeling close to relatives that they do not live with as ACE count increases (0 ACEs, 11.5%; 1 ACE, 13.1%; 2-3 ACEs, 16.6%; 4+ ACEs, 24.1%; p<0.001; Figure 28). While controlling for sociodemographics, the association between experiencing ACEs and not feeling close to relatives that an individual does not live with remained significant. Those who experienced 4+ ACEs were 2.5 times more likely (AOR=2.52, 95% CIs [2.01, 3.17]) to not feel close to relatives that they do not live with than those with no ACEs, and those who experienced 2-3 ACEs were 1.5 times more likely (AOR=1.54, 95% CIs [1.25, 1.90]). Those who experienced one ACE were not significantly more likely to not feel close to relatives that they do not live with than those who experienced no ACEs.

Figure 28: Prevalence of not feeling close to relatives (that they do not live with) by ACE count

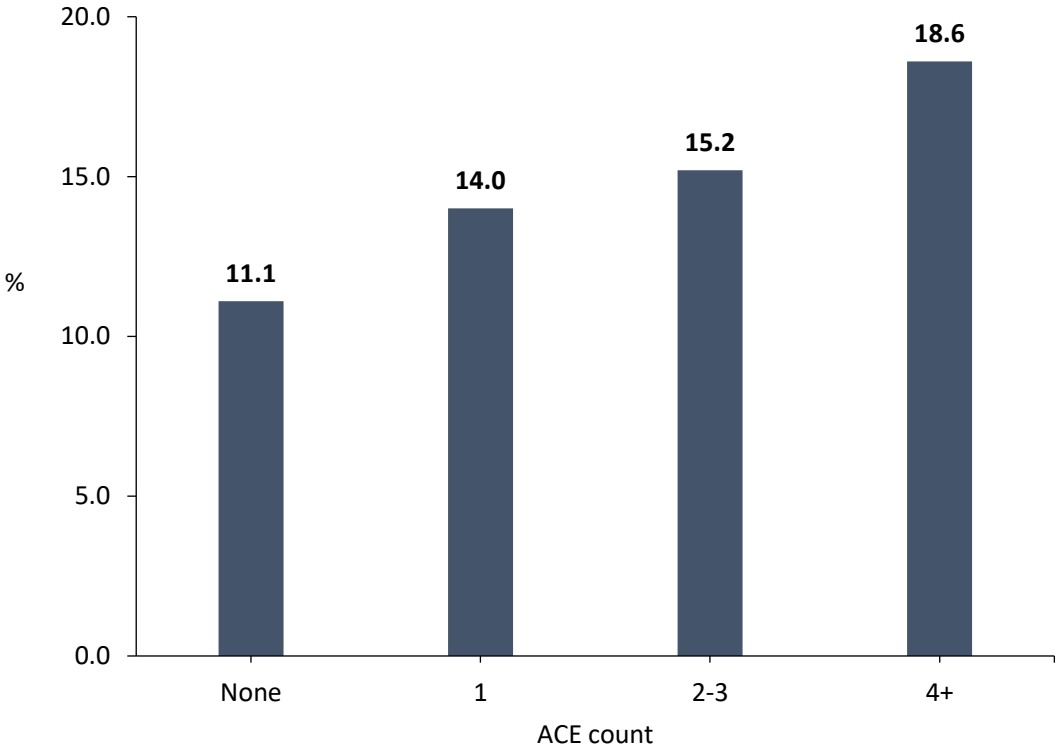


Do not have close or good friends

Overall, 13.3% of participants indicated that they do not have close or good friends.

There was a significant association between ACE count and not having close or good friends, with generally a higher prevalence of not having close or good friends as ACE count increases (0 ACEs, 11.1%; 1 ACE, 14.0%; 2-3 ACEs, 15.2%; 4+ ACEs, 18.6%; p<0.001; Figure 29). While controlling for sociodemographics, the association between experiencing ACEs and not having close or good friends remained significant. Those who experienced 4+ ACEs were 1.9 times more likely (AOR=1.89, 95% CIs [1.49, 2.41]) to not have close or good friends than those with no ACEs, those who experienced 2-3 ACEs were 1.4 times more likely (AOR=1.46, 95% CIs [1.18, 1.81]), and those who experienced one ACE were 1.3 times more likely (AOR=1.31, 95% CIs [1.06, 1.63]).

Figure 29: Prevalence of not having close or good friends by ACE count



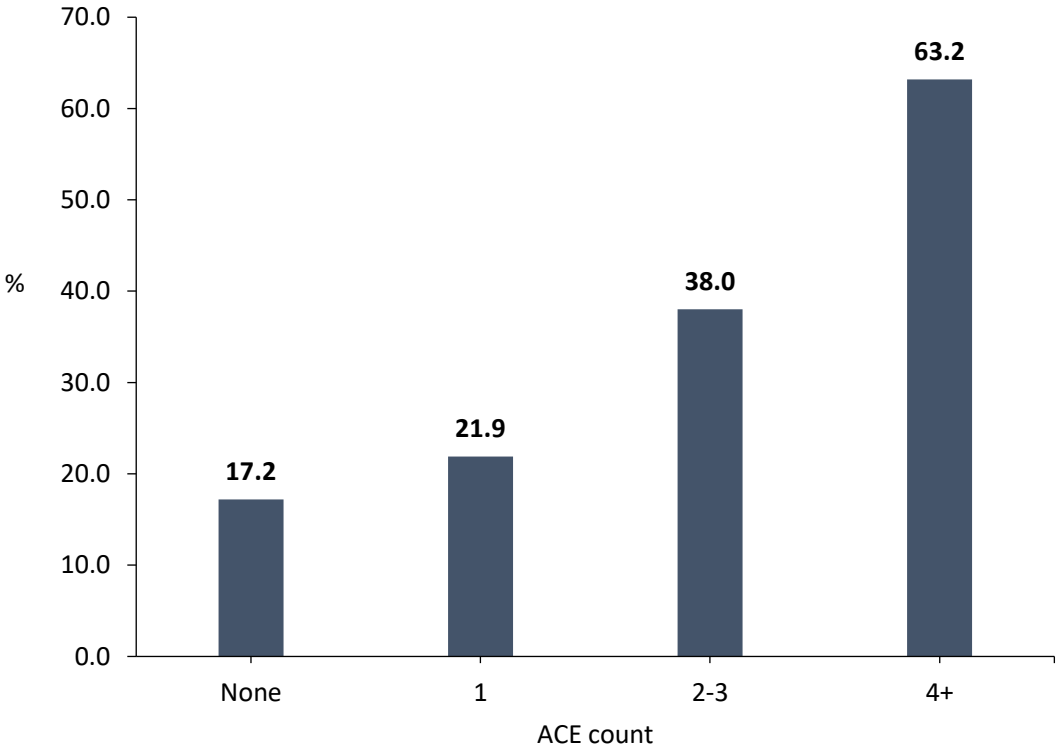
3.6.2 Childhood relationships

Trusted adult

Overall, 27.8% of participants did not always have a trusted adult in their lives in childhood.

There was a significant association between ACE count and not always having a trusted adult, with generally a higher prevalence of not always having a trusted adult as ACE count increases (0 ACEs, 17.2%; 1 ACE, 21.9%; 2-3 ACEs, 38.0%; 4+ ACEs, 63.2%; p<0.001; Figure 30). While controlling for sociodemographics, the association between experiencing ACEs and not always having a trusted adult remained significant. Those who experienced 4+ ACEs were nearly 9.6 times more likely (AOR=9.56, 95% CIs [7.83, 11.69]) to not always have a trusted adult than those with no ACEs, those who experienced 2-3 ACEs were 3.1 times more likely (AOR=3.09, 95% CIs [2.61, 3.65]), and those who experienced one ACE were 1.4 times more likely (AOR=1.41, 95% CIs [1.17, 1.70]).

Figure 30: Prevalence of not always having a trusted adult by ACE count

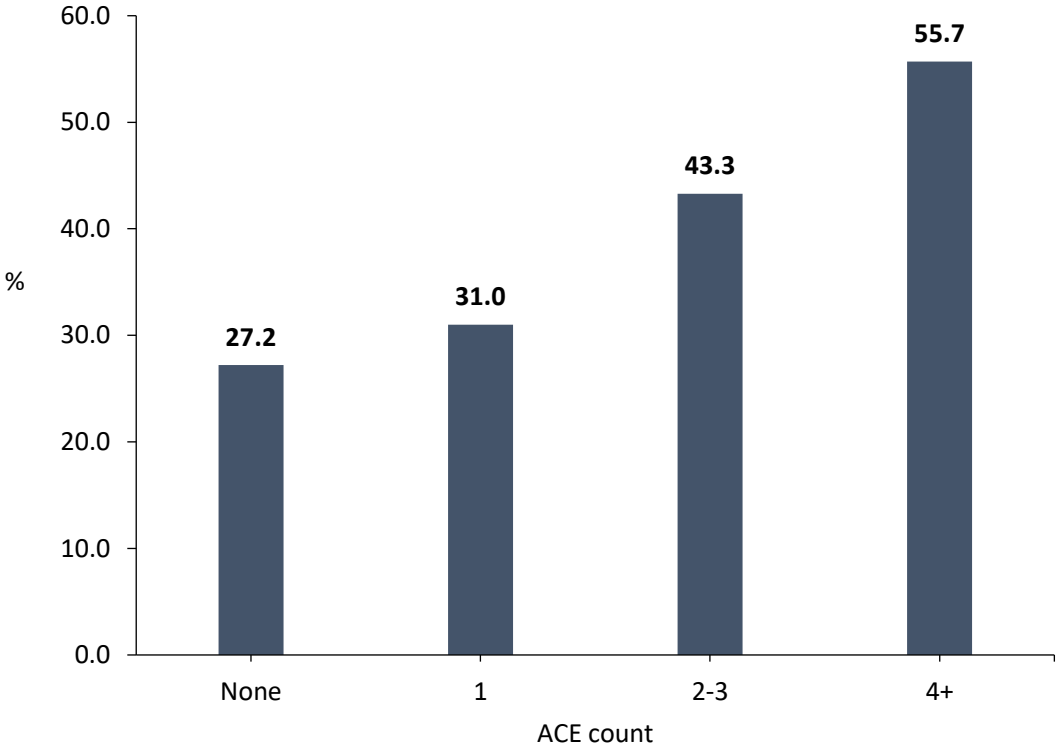


Trusted friend

Overall, 34.5% of participants did not always have a trusted friend in their lives in childhood.

There was a significant association between ACE count and not always having a trusted friend, with generally a higher prevalence of not always having a trusted friend as ACE count increases (0 ACEs, 27.2%; 1 ACE, 31.0%; 2-3 ACEs, 43.3%; 4+ ACEs, 55.7%; p<0.001; Figure 31). While controlling for sociodemographics, the association between experiencing ACEs and not always having a trusted friend remained significant. Those who experienced 4+ ACEs were 3.9 times more likely (AOR=3.91, 95% CIs [3.24, 4.71]) to not always have a trusted friend than those with no ACEs, those who experienced 2-3 ACEs were over 2.1 times more likely (AOR=2.14, 95% CIs [1.83, 2.50]), and those who experienced one ACE were over 1.2 times more likely (AOR=1.23, 95% CIs [1.04, 1.44]).

Figure 31: Prevalence of not always having a trusted friend by ACE count

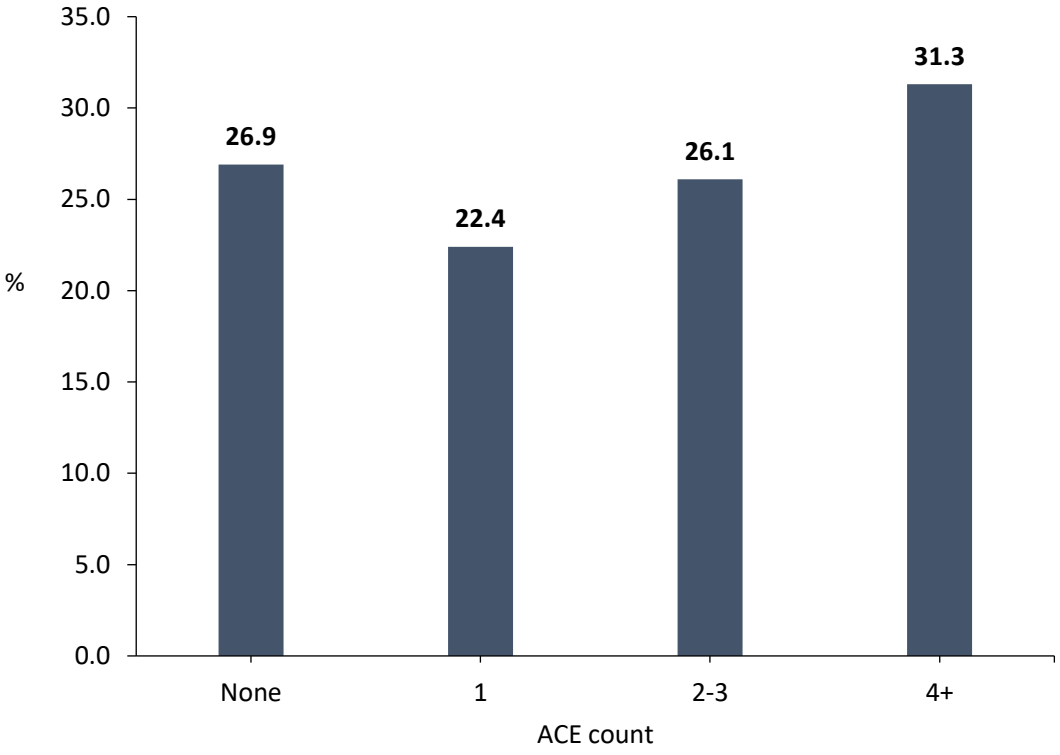


Extra-curricular or community activities

Overall, 26.4% of participants were not engaged in any extra-curricular or community activities in childhood.

There was a significant association between ACE count and not engaging in any extra-curricular or community activities, with the highest prevalence of not having engaged in any extra-curricular or community activities amongst those with 4+ ACEs (0 ACEs, 26.9%; 1 ACE, 22.4%; 2-3 ACEs, 26.1%; 4+ ACEs, 31.3%; p<0.001; Figure 32). While controlling for sociodemographics, the association between experiencing ACEs and not engaging in any extra-curricular or community activities remained significant. Those who experienced 4+ ACEs were over 1.2 times more likely (AOR=1.23; 95% CIs [1.01, 1.50]) to not engage in any extra-curricular or community activities in childhood than those with no ACEs. Those who experienced 2-3 ACEs were not significantly more likely to not engage in any extra-curricular or community activities than those who experienced no ACEs. Those who experienced one ACE were less likely (AOR=0.78, 95% CIs [0.65, 0.92]) to not engage in any extra-curricular or community activities than those with no ACEs.

Figure 32: Prevalence of not engaging in any extra-curricular or community activities by ACE count



4. Key findings and recommendations

For the first time, this study provides evidence of the extent and nature of ACEs across adults in Merseyside, and the associated impacts of childhood adversity on health and wellbeing, health risk behaviours, socio-economic prospects, violence and criminal justice exposure, and community safety and cohesion. The provision of local data on ACEs provides communities, multi-agency partners, and policymakers with vital evidence to inform the development and targeting of approaches and interventions that not only aim to prevent ACEs and trauma, but also mitigate their impacts across the lifecourse. This section summarises key findings from the survey and recommendations for enhancing the prevention and response to ACEs and trauma across Merseyside and beyond.

4.1 Extent and nature of ACEs across Merseyside

Across Merseyside, nearly half (49.9%) of adults are estimated to have experienced at least one ACE and over one in ten (12.2%) have experienced 4+ ACEs (based on the nine ACEs included in the national England ACE study [3]). Our study shows that the prevalence of 4+ ACEs amongst adults in Merseyside is higher than the prevalence identified across England in 2014 [3]. Further, the study shows that there are variations in the prevalence of ACEs across local authorities in Merseyside and within local authorities (see Appendices).

The survey examined 13 individual ACEs, including nine ACEs typically included in ACE surveys and four additional ACEs identified as important in international literature and across Merseyside partners. Across the 13 individual ACEs, the most common ACEs that participants reported were bullying (25.4%), verbal abuse (23.9%), physical abuse (22.5%), parental separation (20.7%), and witnessing violence in the community (20.4%). Examination of individual ACEs shows that the prevalence of physical abuse and verbal abuse in Merseyside is higher than the prevalence identified across England in 2014 [3]. Furthermore, several household adversities were higher in Merseyside compared to England. This includes growing up in a household where someone has a mental illness or is misusing alcohol, or where domestic violence is present.

These data demonstrate the importance of the availability of local data on ACEs to understand local population experiences more effectively, and to ensure that interventions are targeted towards groups and communities most at risk of harms relating to ACEs and trauma across Merseyside.

4.2 Relationships between ACEs and health and wellbeing, health risk behaviours, school exclusion, unemployment, violence, and criminal justice exposure

Like wider literature, our study shows that experience of 4+ ACEs is significantly associated with experiencing a range of negative outcomes across the lifecourse [4]. Accounting for sex, age, ethnicity, and deprivation, compared to those experiencing zero ACEs, those experiencing 4+ ACEs were significantly more likely to currently smoke tobacco/vape daily, binge drink alcohol at least weekly, and to have experienced any gambling-related harm or used drugs in the past year. They were also more likely to currently experience low mental well-being or poor general health. Associations with employment and education were also identified, with increased risks of having ever been excluded from school or being currently unemployed. Finally, our study found significant associations with increased risks of violence victimisation (ever, since age 18 years; and in the past year) and having ever been arrested or incarcerated. This demonstrates how ACEs and trauma are cross-cutting issues that requires coordinated, multi-agency, and multi-component responses across the lifecourse.

4.3 Relationships between ACEs and perceptions of safety and prevalence of violence, and neighbourhood cohesion

Our study is one of very few studies that examines experience of 4+ ACEs and perceptions of community safety, violence and cohesion, and relationship closeness. Accounting for sex, age, ethnicity, and deprivation, compared to those experiencing zero ACEs, those experiencing 4+ ACEs were significantly more likely to feel unsafe in Merseyside and the neighbourhood where they live, and perceive violence to be common in Merseyside and the neighbourhood where they live. Further, they were also more likely to report low levels of neighbourhood cohesion. This means that those experiencing 4+ ACEs are more likely to perceive that they need to set an example in their own behaviour for what they expect in others, and it's their responsibility to intervene when they notice an aggressive or potentially violent situation.

4.4 Relationships between ACEs and resilience factors in adulthood and childhood

Emerging evidence shows that the presence of childhood and adulthood resiliency resources can mitigate the impacts of ACE across the lifecourse [1, 12]. Resiliency refers to individuals, families, or communities' ability to cope with and adapt to stressors and trauma and recover from difficult experiences [12]. Childhood and adulthood resiliency resources can include approaches that build individual's skills in self-regulation and executive functioning (e.g. through community or extracurricular activities) and trusted relationships (e.g. having a trusted adult or friend in childhood, feeling close to others). Similar to other studies, our study found that those experiencing ACEs reported lower childhood and adulthood resiliency resources. Accounting for sex, age, ethnicity, and deprivation, compared to those experiencing zero ACEs, those experiencing 4+ ACEs were significantly more likely to not have a trusted adult or friend during childhood, and to have not engaged in any extra-curricular or community activities. Further, during adulthood they were significantly less likely to feel close to adults they live with or other relatives they do not live with, and to not have close or good friends. This shows how those who are experiencing ACEs and trauma are disadvantaged further by not having access to childhood and adulthood resiliency resources that may help them in recovering from trauma. Building resiliency amongst individuals, families and communities is critical for supporting the prevention of ACEs and mitigating the impacts of trauma across the lifecourse [1].

4.5 Building an ACE and trauma-responsive region

Given the wealth of evidence on ACEs, a key MVRP priority is to enhance understanding of the impacts of ACEs and trauma across the lifecourse, and to build a trauma-responsive Merseyside (see Box 1). To accompany the report presented here, the MVRP commissioned LJMU to review current ACE and trauma-informed practices across Merseyside, and to bring partners together to build a more effective trauma-responsive Merseyside [24]. The findings from the review are presented in McCoy et al, 2025 [24] and demonstrate that across Merseyside, an array of strategies and interventions to prevent and response to ACEs and trauma exist, all with the aim of enhancing the health and wellbeing of children, families, and the wider community, and reducing the impacts on wider society. The review shows that developing a truly trauma-responsive system across Merseyside requires a strong collaborative multiagency approach that includes communities. Strategic and political buy-in is required across Merseyside and within local authorities and organisations to show commitment to, and investment in this approach. This is critical in demonstrating clear messages of support amongst communities and ensuring that collectively partners and communities can effectively prevent and respond to ACEs and trauma and enhance positive outcomes for current and future generations.

Conclusion

The MerVCom survey highlights that ACEs are common in Merseyside and likely experienced at higher levels compared to England. Critically, ACEs are significantly associated with increased risks of a range of negative outcomes across the lifecourse, with impacts on health and risk-taking behaviours, socio-economic prospects, community safety, violence, and criminal justice exposure. ACEs and trauma are cross-cutting issues that require responses from political leaders, the community and multi-agency partners who support children, families, and communities. Across Merseyside there is clear commitment to preventing and responding to ACEs and trauma, evidenced in the accompanying review of current ACE and trauma-informed practices [24]. Local and national policymakers, services, practitioners, and communities should use the evidence in this report and the review, alongside wider data and evidence to advocate for increased investment in preventing and responding to ACEs and trauma. Critically, policymakers and practitioner must ensure investment is tailored to the needs of the local community, targeted towards those who need it most, and has a strong focus on early intervention.

Key recommendations

These recommendations should be read alongside the recommendations for developing a trauma responsive Merseyside presented in McCoy et al, 2025 [24].

1. Establish clear leadership and buy-in for developing an ACE and trauma-responsive Merseyside from political leaders, key partners (with director, strategic and senior roles), and critically the community. This includes statutory and non-statutory partners across health and social care, public health, safeguarding, education, youth and family services, criminal justice, and academia.

2. Set up a Merseyside multiagency task and finish group to develop a strategy and action plan for becoming a truly ACE and trauma-responsive region (using findings from this report and McCoy et al, 2025 [24]). This group should identify clear roles and remits for stakeholders across the system, and accountability for actions to drive the agenda forward.

3. Develop local authority level ACE and trauma-responsive task and finish groups to enhance place-based approaches that meet the needs of the local community, whilst contributing to Merseyside becoming a truly trauma-responsive region.

4. Use evidence from the MerVCom survey and wider data sources to advocate for increased investment in ensuring the children of Merseyside are given the best start in life. This includes prioritising early intervention and building resilience and capacity in families and communities to mitigate the impacts of ACEs and trauma and break the intergenerational transmission of ACEs.

5. The availability of local data means that local partners are in a unique position to understand the impact of ACEs on individuals and communities, and which groups are most at-risk. The data presented in this report should be used to develop more nuanced and targeted prevention activity and direct provision towards areas and groups most at-risk.

6. Ensure local responses to ACEs and trauma consider the existing evidence base on what works to prevent and respond to ACEs (see box 2 in main report; [1]) and incorporate research and evaluation to build understanding of what works to prevent and respond to ACEs and trauma across Merseyside, and beyond.

Box 2: Recommendations for evidenced based approaches for preventing and mitigating the impacts of ACEs

Adapted from: Tackling Adverse Childhood Experiences (ACEs). State of the Art and Options for Action [1].

1. Develop policies and strategies that promote the social determinants of health and human rights, address inequalities in health and gender, and aim to alter norms, behaviours, and environments that promote ACEs.
    - E.g. public awareness-raising and education programmes on ACEs and trauma, empowerment programmes for women and girls, and programmes to alter harmful social and cultural norms that promote ACEs.
2. Strengthen families and develop/maintain safe, stable, nurturing relationships and environments for children, families, and wider communities.
    - E.g. parenting programmes that educate and support parents and caregivers and strengthening economic support for families.
3. Provide education and opportunities to develop life skills that help deal with stress, negative emotions, and conflict.
    - E.g. pre-school enrichment programmes, school-based violence prevention or life skills development programmes, and training of professionals to raise awareness of child maltreatment.
4. Implement response and support services that aim to reduce the impact that adversity has on children and adults.
    - E.g. counselling and therapeutic approaches, pharmacological treatment, interventions to counter toxic stress and improve biological functioning, and support for specific ACEs such as child sexual exploitation response programmes, support for survivors/perpetrators of IPV, and screening and brief intervention for parental substance use.
5. Implement multi-component programmes that combine different strategies to address multiple risk factors at the same time.
    - E.g. Multi-component family programmes that combine parental, youth, and family skills building.
6. Build resilience. Strategies that can help to build resilience are often similar to those used to prevent ACEs from occurring.
    - E.g. parenting programmes, mentoring interventions, school-based programmes that develop life skills, psychological support to deal with the negative impacts of ACEs, and community-based programmes that strengthen local resources and relationships.
7. Implement trauma-informed practice (TIP) to support individuals affected by ACEs and avoid re-traumatisation.
8. Implement research and evaluation to understand what effective multi-sectoral approaches to preventing ACEs and building TIP look like, and their impacts, to promote the development and implementation of evidence-based responses across the lifecourse.

5. References

[1] Bellis, M.A., Wood, S., Hughes, K., Quigg, Z. and Butler, N. (2023) *Tackling Adverse Childhood Experiences (ACEs): State of the Art and Options for Action.* Available at: https://www.ljmu.ac.uk/-/media/phi-reports/pdf/2023-01-state-of-the-art-report-eng.pdf [Accessed 16 Sep. 2024].

[2] World Health Organization (2020) *Adverse Childhood Experiences International Questionnaire.* World Health Organization. Available at: https://www.who.int/publications/m/item/adverse-childhood-experiences-international-questionnaire-(ace-iq) [Accessed 25 Aug. 2024].

[3] Bellis, M.A., Hughes, K., Leckenby, N., Perkins, C. and Lowey, H. (2014) *National household survey of adverse childhood experiences and their relationship with resilience to health-harming behaviours in England*. BMC Med 12, 72. Available at: https://doi.org/10.1186/1741-7015-12-72 [Accessed 22 Aug. 2024].

[4] Hughes, K., Bellis, M.A., Hardcastle, K.A., Sethi, D., Butchart, A. and Mikton, C. (2017) The effect of multiple adverse childhood experiences on health: a systematic review and meta-analysis. *Lancet Public Health,* Aug;2(8):e356-e366. Available at: https://doi.org/10.1016/s2468-2667(17)30118-4 [Accessed 22 Aug. 2024].

[5] Hughes, M. and Cossar, J. (2016) The Relationship between Maternal Childhood Emotional Abuse/Neglect and Parenting Outcomes: A Systematic Review. *Child Abuse Review,* 25(1):31-45. Available at: https://psycnet.apa.org/doi/10.1002/car.2393. [Accessed 22 Aug. 2024].

[6] Centers for Disease Control and Prevention (CDC) (2021) *Adverse Childhood Experiences Prevention Strategy.* Available at: https://www.cdc.gov/aces/media/pdfs/ACEs-Strategic-Plan_Final_508.pdf [Accessed 13 Sep. 2024].

[7] Quigg, Z., Harrison, R., Butler, N., Bates, R., Harris, J., Timpson, H. (2022*) Evaluation of a system wide approach to implementing routine enquiry about adversity in childhood (REAChTM) across Nottinghamshire (Final report).* Available at: https://www.ljmu.ac.uk/-/media/phi-reports/pdf/2023-03-nottinghamshire-reach-service-evaluation.pdf [Accessed 10 Aug. 2024].

[8] Quigg, Z., Wilson, C., McCoy, E. and Butler, N. (2024) The impact of adverse childhood experience and trauma-informed practice training for police in two regions in the United Kingdom. *The Police Journal: Theory, Practice and Principles.* Available at: https://doi.org/10.1177/0032258X241258388. [Accessed 1 Aug. 2024].

[9] Bellis, M.A., Ashton, K., Hughes, K., Ford, K., Bishop, J. and Paranjothy, S. (2016) *Welsh Adverse Childhood Experiences (ACE) Study: Adverse Childhood Experiences and their impact on health-harming behaviours in the Welsh adult population.* Available at: https://www.ljmu.ac.uk/~/media/phi-reports/pdf/2016_01_adverse_childhood_experiences_and_their_impact_on_health_harming_behaviours_in_the.pdf. [Accessed 6 Aug. 2024].

[10] Scottish Government (2019) *The Scottish Health Survey 2019 edition.* Scottish Government. Available at: https://www.gov.scot/publications/scottish-health-survey-2019-volume-1-main-report/pages/11/ .[Accessed 11 Sep. 2024].

[11] Bellis, M.A., Hardcastle, K., Ford, K.. Ashton, K., Quigg, Z. (2017) Does continuous trusted adult support in childhood impart life-course resilience against adverse childhood experiences - a retrospective study on

adult health-harming behaviours and mental well-being. *BMC Psychiatry* 17, 110 Available at: https://doi.org/10.1186/s12888-017-1260-z [Accessed 20 Aug. 2024].

[12] Hughes K., Ford, K., Davies, A.R., Homolova L. and Bellis M.A. (2018) *Sources of resilience and their moderating relationships with harms from adverse childhood experiences.* Available at: https://common.bangor.ac.uk/system/files/uploaded_files/news/School%20of%20Healthcare%20Sciences/2018/01/ace_resilience_report_en_pdf_11162.pdf [Accessed 10 Aug. 2024].

[13] ACE Wales Hub (2022) *Trauma-Informed Wales Framework.* Available at: https://acehubwales.com/trauma-framework/ [Accessed 10 Aug. 2024].

[14] Asmussen, K., Fischer, F., Drayton, E. and McBride, T. (2020) *Adverse childhood experiences: What we know, what we don't know, and what should happen next.* Available at: https://www.eif.org.uk/report/adverse-childhood-experiences-what-we-know-what-we-dont-know-and-what-should-happen-next [Accessed 10 Aug. 2024].

[15] Scottish Government (2024) *Psychological trauma and adversity including ACEs (adverse childhood experiences).* Available at: https://www.gov.scot/publications/psychological-trauma-and-adversity/ [Accessed 1 Sep. 2024].

[16] Quigg Z., Butler N., Wilson C., Farrugia A.M., Bates R., O'Driscoll G., Millings M. and Bellis M.A. (2025) *The Merseyside Violence and Community Safety (MerVCom) Survey. A representative household survey of adults to understand community safety and cohesion, violence victimisation, and adverse childhood experiences.* Liverpool: Liverpool John Moores University/Merseyside Violence Reduction Partnership.

[17] Volberg R. and Williams R. (2012) *Developing a Short Form of the PGSI: Report to the Gambling Commission.* Birmingham: Gambling Commission. Available at: https://assets.ctfassets.net/j16ev64qyf6l/3B8AogTkdtA6LxTCs1knvK/0f6c6d5127f4037666242b345e4ca5de/Developing_a_Short_Form_of_the_PGSI.pdf [Accessed 1 Aug. 2024].

[18] Butler N., Quigg Z., Bates R., Sayle M. and Ewart H. (2019) Gambling with your health: Associations between gambling problem severity and health risk behaviours, health and wellbeing. *Journal of Gambling Studies,* 36(2), 527-538. Available at: https://doi.org/10.1007/s10899-019-09902-8 [Accessed 1 Aug. 2024].

[19] Tennant R., Hiller L., Fishwick R., Platt S., Joseph S., Weich S. (2007) The Warwick-Edinburgh Mental Well-being Scale (WEMWBS): development and UK validation. *Health and Quality of Life Outcomes,* 5. Available at: https://doi.org/10.1186/1477-7525-5-63. [Accessed 1 Sep. 2024].

[20] Stewart-Brown S., Tennant A., Tennant R., Platt S., Parkinson J. and Weich S. (2009) Internal construct validity of the Warwick-Edinburgh Mental Well-being Scale (WEMWBS): a Rasch analysis using data from the Scottish Health Education Population Survey. *Health and Quality of Life Outcomes,* 7. Available at: https://doi.org/10.1186/1477-7525-7-15. [Accessed 6 Aug. 2024].

[21] EuroQol group (1990) EuroQol: A new facility for the measurement of health-related quality of life. *Health Policy,* 16(3), 199-208. Available at: https://doi.org/10.1016/0168-8510(90)90421-9 [Accessed 7 Aug. 2024].

[22] van Reenen M. and Janssen B. (2015) *EQ-5D-5L user guide.* Rotterdam: EuroQol Research Foundation. Available at: https://www.cric.nu/wp-content/uploads/2018/04/EQ-5D-5L_UserGuide_2015.pdf [Accessed 6 Aug. 2024].

[23] Peterson, N., Speer, P. and McMillan, D. (2008) Validation of a brief sense of community scale: Confirmation of the principal theory of sense of community. *Journal of Community Psychology,* 36, 61-73. Available at: https://doi.org/10.1002/jcop.20217 [Accessed 10 Sep. 2024].

[24] E.McCoy, C. Smith and Z. Quigg (2025) *Merseyside adverse childhood experiences and trauma responsive system review*, Liverpool John Moores University, Liverpool, .

[25] Butler N., Wilson C., Farrugia A.M., Bellis M.A., O'Driscoll G. and Quigg Z. (2025) *Adulthood violence victimisation across Merseyside. Nature, prevalence, and associations with health and wellbeing, health risk behaviours, adverse childhood experiences, and community safety and cohesion.* Liverpool: Liverpool John Moores University/Merseyside Violence Reduction Partnership.

6. Appendices

Appendix 1 – MerVCom ACE survey items

Table A1 presents the survey questions and response options from the MerVCom survey used to measure ACEs in the current study report

Table A1: MerVCom ACE survey items

Question	Response options
While you were growing up before the age of 18 years…	Yes; no; prefer not to say
• Did you live with someone who was depressed, mentally ill or suicidal? • Did you live with anyone who had problems with alcohol drinking? • Did you live with anyone who used illegal street drugs or who abused medications? • Did you live with anyone who had problems with gambling? • Did you live with anyone who served time or was sentenced to serve time in a prison or young offenders' institution? • Were your parents ever separated or divorced?	
• Did your parents or adults in your home ever hit, beat, kick, or physically hurt each other in any way? • Did a parent or adult in your home ever hit, beat, kick, or physically hurt you in any way? • Did a parent or adult in your home ever swear at you, insult you, or put you down? • Did someone at least 5 years older than you (including adults) ever touch you sexually, or try to make you touch them sexually? • Did a parent or adult in your house not give you enough food when they could easily have done so, not send you to school even when it was available, or were too drunk or intoxicated by drugs to take care of you? • Did a parent or adult in your house tell you that you were not loved, tell you that they wished you had never been born, threatened to abandon you or throw you out of the family home, repeatedly belittled you to the extent that you felt worthless, or threatened to hurt you or someone close to you? • Were you bullied or a victim of violence by peers or others under the age of 18? • Did you see or hear someone in real life being beaten up, or being stabbed or shot, or threatened with a knife or gun in your neighbourhood?	Never; once; more than once; prefer not to say

Appendix 2: Data tables

Table A2: Adjusted ACE count prevalence (%) at local authority and Merseyside level

Study area	0 ACEs	1 ACE	2-3 ACEs	4+ ACEs
Knowsley	48.3	23.1	17.0	11.6
Liverpool	50.5	18.0	17.6	14.0
Sefton	49.4	18.0	20.1	12.6
St Helens	52.1	17.9	22.2	7.9
Wirral	50.0	19.6	18.5	11.9
Merseyside	50.1	18.9	18.8	12.2

Table A3: Adjusted ACE count prevalence (%) at ward level

Local authority	Ward code	Ward name	0 ACEs	1 ACE	2-3 ACEs	4+ ACEs
Knowsley	E05010935	Cherryfield	46.7	22.6	17.6	13.1
	E05010936	Halewood North	50.0	23.6	16.9	9.5
	E05010937	Halewood South	49.0	23.9	16.7	10.4
	E05010938	Northwood	46.5	22.6	17.5	13.3
	E05010939	Page Moss	46.4	22.5	17.6	13.5
	E05010940	Prescot North	48.0	23.4	17.1	11.6
	E05010941	Prescot South	51.0	22.2	15.5	11.3
	E05010942	Roby	52.4	23.8	15.8	8.0
	E05010943	Shevington	48.1	23.8	16.7	11.4
	E05010944	St Gabriels	47.8	23.2	17.1	11.9
	E05010945	St Michaels	47.7	23.1	17.0	12.1
	E05010946	Stockbridge	46.6	22.9	16.8	13.7
	E05010947	Swanside	49.3	23.9	17.0	9.8
	E05010948	Whiston and Cronton	48.4	23.0	17.4	11.1
	E05010949	Whitefield	47.5	22.6	17.8	12.1
Liverpool	E05015277	Aigburth	54.2	18.9	18.1	8.8
	E05015278	Allerton	57.4	17.0	16.7	8.9
	E05015279	Anfield	47.6	18.9	17.7	15.7
	E05015280	Arundel	51.8	16.4	16.0	15.8
	E05015281	Belle Vale	47.4	18.0	20.4	14.2
	E05015282	Broadgreen	48.1	18.1	21.0	12.8
	E05015283	Brownlow Hill	54.3	15.7	14.6	15.5
	E05015284	Calderstones	59.9	15.8	15.0	9.3
	E05015285	Canning	53.6	16.4	14.7	15.3
	E05015286	Childwall	56.2	17.8	16.6	9.3
	E05015287	Church	50.7	18.7	19.4	11.1
	E05015288	City Centre North	58.1	15.7	13.2	13.0
	E05015289	City Centre South	54.6	17.2	13.5	14.7
	E05015290	Clubmoor East	47.3	18.9	18.2	15.6
	E05015291	Clubmoor West	47.6	18.1	20.4	14.0
	E05015292	County	46.7	18.4	19.7	15.3
	E05015293	Croxteth	48.2	20.5	14.9	16.5
	E05015294	Croxteth Country Park	53.2	18.6	17.9	10.3
	E05015295	Dingle	47.9	19.5	15.6	17.0
	E05015296	Edge Hill	51.4	16.6	16.5	15.5
	E05015297	Everton East	50.0	19.1	14.6	16.3
	E05015298	Everton North	50.7	17.9	15.4	16.0

	E05015299	Everton West	51.5	16.6	16.4	15.5
	E05015300	Fazakerley East	48.8	17.2	18.2	15.8
	E05015301	Fazakerley North	51.6	17.3	18.5	12.6
	E05015302	Fazakerley West	47.0	18.9	19.1	15.1
	E05015303	Festival Gardens	50.7	18.9	17.0	13.4
	E05015304	Garston	47.0	18.1	21.0	14.0
	E05015305	Gateacre	53.0	19.6	18.3	9.1
	E05015306	Grassendale & Cressington	55.8	18.7	16.3	9.2
	E05015307	Greenbank Park	53.3	18.9	16.4	11.5
	E05015308	Kensington & Fairfield	50.8	17.2	15.2	16.7
	E05015309	Kirkdale East	47.2	19.7	16.7	16.4
	E05015310	Kirkdale West	48.4	20.8	13.3	17.4
	E05015311	Knotty Ash & Dovecot Park	47.1	18.1	20.3	14.4
	E05015312	Mossley Hill	56.0	17.4	18.0	8.6
	E05015313	Much Woolton & Hunts Cross	52.2	18.0	19.1	10.6
	E05015314	Norris Green	47.4	18.0	19.0	15.5
	E05015315	Old Swan East	48.6	17.7	19.5	14.3
	E05015316	Old Swan West	49.3	17.0	17.3	16.4
	E05015317	Orrell Park	48.1	18.7	20.0	13.1
	E05015318	Penny Lane	52.2	20.9	17.6	9.2
	E05015319	Princes Park	49.9	17.8	15.7	16.6
	E05015320	Sandfield Park	49.2	18.7	20.4	11.7
	E05015321	Sefton Park	46.5	18.2	21.0	14.3
	E05015322	Smithdown	53.1	17.5	13.8	15.6
	E05015323	Speke	46.5	18.0	20.6	15.0
	E05015324	Springwood	50.5	17.4	18.4	13.7
	E05015325	St Michael's	47.9	18.2	21.3	12.7
	E05015326	Stoneycroft	47.5	18.2	21.0	13.3
	E05015327	Toxteth	51.3	16.6	16.7	15.4
	E05015328	Tuebrook Breckside Park	47.9	20.2	13.9	18.0
	E05015329	Tuebrook Larkhill	48.0	18.4	18.3	15.3
	E05015330	Vauxhall	49.1	17.5	16.9	16.6
	E05015331	Walton	47.0	18.1	20.7	14.3
	E05015333	Waterfront South	58.3	15.6	13.2	12.8
	E05015334	Wavertree Garden Suburb	50.1	18.3	18.2	13.5
	E05015335	Wavertree Village	48.8	18.7	16.7	15.8
	E05015336	West Derby Deysbrook	48.4	18.2	21.3	12.2
	E05015337	West Derby Leyfield	51.4	17.7	19.8	11.1
	E05015338	West Derby Muirhead	55.1	18.6	16.0	10.3
	E05015339	Woolton Village	53.8	17.8	19.3	9.0

	E05015340	Yew Tree	48.0	18.2	19.2	14.6
Sefton	E05000932	Ainsdale	51.8	17.9	19.5	10.9
	E05000933	Birkdale	51.0	18.9	19.5	10.6
	E05000934	Blundellsands	53.8	18.0	18.1	10.2
	E05000935	Cambridge	49.2	18.7	20.0	12.0
	E05000936	Church	45.4	18.0	21.7	14.9
	E05000937	Derby	44.2	17.9	20.7	17.2
	E05000938	Duke's	48.9	18.1	20.0	13.0
	E05000939	Ford	45.2	17.9	21.7	15.2
	E05000940	Harington	57.3	15.7	17.2	9.8
	E05000941	Kew	47.8	18.3	21.5	12.5
	E05000942	Linacre	43.7	17.5	21.6	17.2
	E05000943	Litherland	45.9	18.6	20.8	14.8
	E05000944	Manor	49.8	17.5	20.0	12.7
	E05000945	Meols	52.8	18.0	19.0	10.2
	E05000946	Molyneux	49.9	18.6	19.9	11.7
	E05000947	Netherton and Orrell	44.9	17.6	22.3	15.2
	E05000948	Norwood	48.7	19.4	20.2	11.6
	E05000949	Park	54.1	17.2	18.7	10.0
	E05000950	Ravenmeols	53.9	17.7	18.5	9.9
	E05000951	St Oswald	45.5	17.5	21.4	15.5
	E05000952	Sudell	52.0	18.3	19.3	10.4
	E05000953	Victoria	50.9	18.0	19.9	11.1
St Helens	E05014120	Billinge & Seneley Green	56.6	17.6	20.0	5.7
	E05014121	Blackbrook	52.1	17.9	22.4	7.6
	E05014122	Bold & Lea Green	51.2	19.1	21.9	7.9
	E05014123	Eccleston	58.2	16.3	19.5	6.1
	E05014124	Haydock	51.9	18.3	22.4	7.3
	E05014125	Moss Bank	50.6	17.7	23.7	8.0
	E05014126	Newton-le-Willows East	52.3	17.3	22.1	8.3
	E05014127	Newton-le-Willows West	50.0	18.6	22.6	8.8
	E05014128	Parr	48.5	17.9	23.5	10.0
	E05014129	Peasley Cross & Fingerpost	48.4	17.8	23.5	10.3
	E05014130	Rainford	56.6	17.4	20.3	5.7
	E05014131	Rainhill	55.2	18.2	20.7	5.9
	E05014133	Sutton North West	49.7	17.8	24.0	8.5
	E05014134	Sutton South East	51.2	18.9	22.6	7.3
	E05014135	Thatto Heath	51.3	17.5	22.7	8.5
	E05014132	Town Centre	49.3	17.7	22.7	10.3
	E05014136	West Park	49.5	17.8	24.1	8.5

	E05014137	Windle	53.6	17.3	21.4	7.6
Wirral	E05000954	Bebington	51.3	19.4	18.7	10.6
	E05000955	Bidston and St James	46.5	19.5	18.8	15.2
	E05000956	Birkenhead and Tranmere	45.8	18.9	18.4	16.9
	E05000957	Bromborough	48.0	19.8	19.4	12.8
	E05000958	Clatterbridge	55.4	18.6	16.8	9.2
	E05000959	Claughton	47.5	20.3	19.5	12.6
	E05000960	Eastham	52.1	19.2	18.1	10.6
	E05000961	Greasby, Frankby and Irby	56.0	18.4	16.6	9.0
	E05000962	Heswall	57.5	17.7	15.8	8.9
	E05000963	Hoylake and Meols	54.2	19.2	17.2	9.4
	E05000964	Leasowe and Moreton East	47.5	19.9	19.3	13.3
	E05000965	Liscard	46.4	19.8	19.8	14.1
	E05000966	Moreton West and Saughall Massie	50.2	20.8	18.4	10.6
	E05000967	New Brighton	47.0	19.7	20.8	12.5
	E05000968	Oxton	50.8	20.4	18.5	10.3
	E05000969	Pensby and Thingwall	52.5	21.7	17.2	8.6
	E05000970	Prenton	49.3	19.9	18.8	12.0
	E05000971	Rock Ferry	45.6	19.7	19.5	15.2
	E05000972	Seacombe	44.9	19.4	19.8	15.8
	E05000973	Upton	48.4	19.9	19.1	12.6
	E05000974	Wallasey	51.9	19.6	18.6	10.0
	E05000975	West Kirby and Thurstaston	54.6	18.9	17.0	9.5

Table A4: Adjusted prevalence (%) of individual types of ACEs at local authority/Merseyside level

Study area	Childhood abuse				Household dysfunction							Community violence	
	Physical neglect	Physical abuse	Verbal abuse	Sexual abuse	Mental illness	Alcohol harm	Drug harm	Gambling harm	Incarceration	Domestic violence	Parental separation	Witnessing community violence	Bullying
Knowsley	4.8	23.3	24.4	4.6	15.2	14.1	4.3	3.1	2.7	16.4	21.1	21.5	26.8
Liverpool	3.9	19.1	26.8	5.9	18.7	14.9	4.5	3.9	3.4	14.2	22.1	21.0	23.8
Sefton	2.9	27.4	24.1	5.9	15.1	11.4	4.2	3.1	2.0	17.8	19.6	17.7	23.8
St Helens	2.7	28.0	19.5	5.3	10.1	8.7	3.3	1.9	1.7	17.1	16.3	15.2	25.5
Wirral	3.4	19.8	21.4	9.4	15.9	14.2	4.1	3.0	3.0	14.5	21.8	24.5	28.7
Merseyside	3.5	22.5	23.9	6.5	15.9	13.2	4.2	3.2	2.8	15.6	20.7	20.4	25.4

Table A5: Adjusted prevalence (%) of individual types of ACEs at ward level

Local authority	Ward code	Ward name	Childhood abuse				Household dysfunction							Community violence	
			Physical neglect	Physical abuse	Verbal abuse	Sexual abuse	Mental illness	Alcohol harm	Drug harm	Gambling harm	Incarceration	Domestic violence	Parental separation	Witnessing community violence	Bullying
Knowsley	E05010935	Cherryfield	5.3	24.2	25.5	4.5	16.3	16.0	5.1	3.4	3.5	18.2	23.0	23.7	26.9
	E05010936	Halewood North	3.7	23.1	22.8	4.7	13.8	12.4	3.2	2.8	1.7	14.6	18.3	19.0	27.0
	E05010937	Halewood South	4.2	22.8	23.8	4.5	14.3	13.0	3.9	2.9	2.4	15.2	20.0	20.5	27.0
	E05010938	Northwood	5.3	23.9	25.7	4.4	16.7	16.1	5.3	3.4	3.5	18.1	23.7	23.8	27.0
	E05010939	Page Moss	5.4	23.8	25.8	4.4	16.9	16.4	5.4	3.5	3.5	18.2	24.0	23.7	26.8
	E05010940	Prescot North	4.7	23.4	24.7	4.3	15.2	14.3	4.6	3.2	2.8	16.4	21.6	22.0	27.0
	E05010941	Prescot South	6.1	21.9	23.4	5.9	15.5	12.3	3.7	2.7	2.0	15.3	18.3	19.7	26.7
	E05010942	Roby	3.4	22.1	20.5	4.8	12.1	10.6	2.6	2.6	1.5	12.9	15.6	17.2	26.4
	E05010943	Shevington	4.7	22.5	24.7	4.4	15.4	14.0	4.6	3.0	2.8	15.5	21.9	22.1	27.6
	E05010944	St Gabriels	4.9	23.5	24.6	4.5	15.2	14.5	4.5	3.2	3.1	16.9	21.4	22.3	26.9
	E05010945	St Michaels	5.0	23.4	24.7	4.5	15.5	14.8	4.7	3.2	3.2	17.1	21.9	22.3	26.6
	E05010946	Stockbridge	5.6	23.7	25.7	4.5	16.3	15.9	5.3	3.5	3.6	18.0	23.7	23.8	26.5
	E05010947	Swanside	3.8	23.1	23.6	4.4	14.2	12.5	3.4	2.9	1.7	14.7	19.3	19.1	26.9
	E05010948	Whiston and Cronton	4.4	24.0	24.3	4.5	14.9	13.9	3.9	3.1	2.4	16.4	20.3	20.5	26.6
	E05010949	Whitefield	4.7	24.5	24.9	4.5	15.7	15.0	4.3	3.3	2.7	17.5	21.5	21.7	26.5
Liverpool	E05015277	Aigburth	2.2	19.2	21.9	5.6	14.4	12.2	2.5	3.4	2.1	11.3	15.1	17.7	24.6
	E05015278	Allerton	2.8	18.8	19.1	7.3	14.3	11.6	2.0	3.1	1.7	11.5	12.1	16.2	23.4
	E05015279	Anfield	3.8	20.7	28.6	5.4	18.6	17.0	5.3	4.6	4.5	15.7	24.6	24.0	24.0
	E05015280	Arundel	4.7	18.4	27.2	7.5	20.4	13.2	5.0	3.0	3.3	13.7	24.2	18.9	23.5
	E05015281	Belle Vale	3.4	21.4	27.9	5.1	18.8	17.8	4.6	4.7	4.7	16.9	22.8	23.3	24.0
	E05015282	Broadgreen	2.8	21.8	27.7	4.9	18.5	16.7	3.8	4.5	3.1	15.9	21.4	21.1	24.3
	E05015283	Brownlow Hill	4.6	12.2	27.5	6.1	23.7	12.2	4.8	3.4	1.4	10.5	25.9	15.9	21.0
	E05015284	Calderstones	4.0	17.0	21.6	7.1	14.5	10.2	2.2	2.7	1.2	10.4	11.6	14.8	23.2
	E05015285	Canning	4.9	14.9	26.2	6.8	19.9	12.3	5.6	3.0	3.5	11.7	25.7	18.1	21.6
	E05015286	Childwall	2.9	17.7	21.9	6.5	15.0	11.4	2.5	3.1	1.8	10.9	14.4	16.9	23.9
	E05015287	Church	2.5	20.0	25.4	5.1	17.2	14.8	3.5	4.0	2.7	13.4	19.6	19.8	24.7
	E05015288	City Centre North	6.1	13.2	22.1	8.1	21.4	11.1	3.7	3.0	1.3	10.4	15.4	17.8	24.3
	E05015289	City Centre South	6.4	12.1	27.5	6.7	23.1	11.0	5.2	3.2	1.9	10.6	21.9	18.6	23.2
	E05015290	Clubmoor East	3.7	20.3	28.6	5.1	18.9	17.8	5.2	4.8	4.8	16.1	24.6	24.4	23.7
	E05015291	Clubmoor West	3.3	21.5	27.7	5.0	18.6	17.6	4.6	4.6	4.7	16.9	22.5	23.3	24.0
	E05015292	County	3.6	20.9	28.9	4.9	19.8	18.4	5.4	4.9	4.8	16.5	24.7	24.6	24.5
	E05015293	Croxteth	4.3	19.8	28.3	5.5	17.2	16.5	5.2	4.9	4.6	15.2	24.1	24.7	22.7
	E05015294	Croxteth Country Park	2.9	18.9	23.5	6.4	16.1	12.8	2.9	3.5	2.5	12.4	16.6	19.0	24.8
	E05015295	Dingle	4.3	19.9	28.8	5.8	18.4	16.7	5.8	4.6	4.7	15.1	25.8	24.4	23.5

	E05015296	Edge Hill	4.1	20.2	26.2	7.4	17.7	13.6	5.5	2.8	4.4	14.1	25.7	19.3	23.2
	E05015297	Everton East	4.4	20.1	27.2	6.8	16.7	14.7	5.4	3.9	4.5	14.5	24.6	22.3	22.7
	E05015298	Everton North	5.1	20.2	26.9	7.5	17.5	14.0	4.9	3.4	4.0	15.0	22.6	21.7	23.0
	E05015299	Everton West	4.0	19.7	26.1	7.6	17.9	13.5	5.5	2.8	4.4	14.0	25.8	18.8	23.1
	E05015300	Fazakerley East	5.6	19.6	28.3	6.6	20.6	16.2	4.9	4.1	3.9	16.6	21.9	23.4	24.0
	E05015301	Fazakerley North	3.6	19.7	25.4	6.6	18.8	14.6	3.4	3.8	2.5	14.2	18.3	19.9	24.6
	E05015302	Fazakerley West	3.5	21.1	29.0	4.8	19.1	17.8	5.1	4.8	4.2	16.1	24.5	24.6	24.5
	E05015303	Festival Gardens	5.3	17.3	27.5	6.5	19.5	13.3	4.5	3.7	2.6	13.3	20.6	21.3	25.2
	E05015304	Garston	3.1	21.5	28.7	4.8	19.9	18.0	4.6	4.7	3.7	16.2	23.6	22.8	24.8
	E05015305	Gateacre	2.3	19.3	23.1	5.3	14.3	12.3	2.8	3.5	2.6	12.1	16.3	18.3	24.0
	E05015306	Grassendale & Cressington	3.3	17.7	22.2	6.8	14.9	10.7	2.4	2.9	1.8	11.0	14.2	17.4	24.3
	E05015307	Greenbank Park	2.9	16.7	26.0	4.5	16.4	13.2	3.8	4.0	2.6	11.2	20.6	18.6	22.3
	E05015308	Kensington & Fairfield	4.8	18.2	27.3	6.9	19.4	14.1	6.1	3.4	4.4	13.9	26.4	20.8	23.3
	E05015309	Kirkdale East	4.0	20.3	29.1	5.0	18.4	17.5	5.6	5.0	4.8	15.7	25.1	25.9	23.9
	E05015310	Kirkdale West	4.5	19.4	28.6	5.8	17.1	15.9	5.8	4.7	4.6	14.4	25.6	25.3	22.9
	E05015311	Knotty Ash & Dovecot Park	3.3	21.2	28.2	4.9	19.4	18.2	4.9	4.7	4.7	16.8	23.6	23.6	24.2
	E05015312	Mossley Hill	2.1	19.8	19.4	6.1	14.1	12.7	2.0	3.4	1.9	11.6	13.1	16.7	23.7
	E05015313	Much Woolton & Hunts Cross	2.6	20.3	24.1	5.7	16.6	13.8	2.8	3.8	2.0	13.4	17.2	18.1	23.9
	E05015314	Norris Green	3.7	20.9	28.5	5.6	19.6	17.6	5.3	4.4	4.7	16.2	25.1	23.3	24.2
	E05015315	Old Swan East	4.2	20.5	27.9	5.8	19.6	16.4	4.4	4.3	3.5	16.1	21.7	22.1	24.1
	E05015316	Old Swan West	6.4	18.8	28.4	7.0	21.4	15.6	5.1	3.9	3.6	16.4	21.7	23.4	24.0
	E05015317	Orrell Park	3.1	20.9	27.7	4.8	18.1	16.7	4.5	4.5	4.2	15.6	22.3	23.4	24.9
	E05015318	Penny Lane	2.2	17.1	25.2	4.7	15.9	11.7	3.4	3.5	2.4	10.4	19.4	18.9	25.6
	E05015319	Princes Park	4.3	20.1	27.5	6.9	18.0	14.8	5.9	3.5	4.5	14.3	26.4	21.7	23.4
	E05015320	Sandfield Park	2.7	21.3	26.7	5.0	17.1	15.3	3.4	4.2	3.0	14.9	19.9	20.4	24.2
	E05015321	Sefton Park	3.2	21.6	29.0	4.5	20.0	18.4	5.1	4.9	4.0	16.5	24.3	23.7	24.9
	E05015322	Smithdown	5.0	14.6	27.0	6.9	21.2	12.1	5.7	3.3	3.3	11.8	24.9	18.7	23.3
	E05015323	Speke	3.4	21.2	28.9	4.8	20.2	18.8	5.3	4.8	4.8	16.9	24.7	24.4	24.6
	E05015324	Springwood	4.3	20.2	27.4	6.8	19.3	14.5	3.6	3.8	2.8	15.7	19.2	20.8	23.9
	E05015325	St Michael's	2.5	21.2	28.4	4.6	19.8	16.8	3.8	4.6	2.2	15.0	22.7	20.3	24.7
	E05015326	Stoneycroft	2.9	22.0	28.0	4.7	18.6	17.2	4.2	4.6	3.6	16.4	22.2	22.8	24.6
	E05015327	Toxteth	4.1	20.9	26.1	7.8	17.4	13.7	5.2	2.7	4.3	14.5	24.9	19.1	23.3
	E05015328	Tuebrook Breckside Park	4.7	19.6	29.3	5.7	17.9	16.3	6.4	4.7	4.8	14.6	27.1	25.8	23.5
	E05015329	Tuebrook Larkhill	3.8	21.0	28.0	5.6	18.5	16.9	5.1	4.4	4.6	16.0	24.2	23.5	23.9
	E05015330	Vauxhall	5.5	18.2	28.4	5.9	20.8	16.0	5.8	4.3	4.2	15.2	24.2	23.3	23.3
	E05015331	Walton	3.3	21.5	28.4	4.9	19.4	18.1	4.8	4.7	4.4	16.7	23.4	23.6	24.6
	E05015333	Waterfront South	6.1	13.4	21.8	8.8	21.2	10.9	3.5	3.0	1.3	10.4	14.9	17.1	24.1
	E05015334	Wavertree Garden Suburb	4.5	19.7	26.9	6.1	18.2	14.6	4.1	3.8	3.5	15.2	19.8	22.0	24.2
	E05015335	Wavertree Village	4.9	19.3	28.6	6.0	19.7	15.5	4.9	4.4	3.0	15.0	22.8	22.6	23.7
	E05015336	West Derby Deysbrook	2.5	22.1	27.5	4.9	18.3	16.2	3.4	4.4	2.4	15.5	20.8	20.2	24.4

	E05015337	West Derby Leyfield	2.8	20.9	25.5	5.8	17.5	14.0	2.7	3.9	1.4	14.1	17.6	17.8	23.8
	E05015338	West Derby Muirhead	4.4	17.3	24.8	7.6	16.3	10.2	2.7	2.9	1.4	11.8	15.1	17.6	24.1
	E05015339	Woolton Village	2.1	21.1	21.6	5.7	14.5	13.1	2.1	3.6	1.7	12.9	14.3	16.7	23.4
	E05015340	Yew Tree	3.7	20.5	28.6	5.5	19.9	16.9	4.5	4.5	3.5	15.7	22.9	22.3	24.4
Sefton	E05000932	Ainsdale	2.6	26.9	22.1	6.2	13.5	10.1	3.2	2.8	1.6	16.3	16.7	15.8	23.3
	E05000933	Birkdale	2.5	26.3	23.1	6.0	13.9	9.7	3.4	2.7	1.5	15.4	17.7	16.5	24.5
	E05000934	Blundellsands	2.9	25.4	21.5	6.8	12.9	8.8	3.0	2.5	1.3	14.6	15.2	15.2	23.7
	E05000935	Cambridge	3.0	28.1	23.1	6.0	13.5	10.9	3.8	3.1	2.5	18.9	18.4	17.8	22.7
	E05000936	Church	3.2	29.2	26.7	5.6	17.1	13.5	5.2	3.5	2.7	20.9	23.5	20.6	24.3
	E05000937	Derby	3.8	28.8	27.7	5.6	18.1	14.6	6.4	3.8	3.4	21.8	25.9	22.4	24.0
	E05000938	Duke's	3.1	27.8	24.2	5.7	14.7	11.7	4.6	3.2	2.6	18.9	20.0	18.8	23.3
	E05000939	Ford	3.3	29.0	27.0	5.7	17.7	13.7	5.3	3.6	2.6	20.9	23.9	20.2	24.3
	E05000940	Harington	2.8	24.6	22.6	5.5	11.8	8.3	2.9	2.3	0.6	13.2	13.3	12.6	22.7
	E05000941	Kew	2.5	28.2	25.0	5.8	16.4	11.8	3.8	3.2	1.3	18.0	20.8	17.2	24.4
	E05000942	Linacre	3.7	28.9	27.9	5.4	18.8	15.2	6.7	3.8	3.6	22.3	26.5	23.0	24.5
	E05000943	Litherland	3.3	27.6	26.5	5.6	17.1	13.1	5.6	3.4	3.0	19.7	23.9	20.7	24.6
	E05000944	Manor	3.0	27.6	24.5	5.8	14.8	11.4	4.2	3.0	2.0	18.0	19.2	17.6	23.7
	E05000945	Meols	2.4	26.2	21.7	6.2	13.0	9.4	3.0	2.7	1.3	15.2	15.8	14.9	23.4
	E05000946	Molyneux	2.5	27.5	23.0	6.2	14.7	10.8	3.4	3.0	1.3	17.0	18.6	16.6	23.6
	E05000947	Netherton and Orrell	3.1	29.4	27.3	5.5	18.2	13.9	5.1	3.6	2.2	21.0	24.3	19.8	24.3
	E05000948	Norwood	2.6	26.8	24.5	5.7	15.0	10.7	4.0	2.9	1.8	16.5	20.1	17.9	24.9
	E05000949	Park	2.4	26.3	20.1	6.5	12.7	9.5	2.8	2.6	1.3	15.0	14.4	14.7	23.3
	E05000950	Ravenmeols	2.5	25.9	20.9	6.3	12.6	9.2	2.9	2.6	1.3	14.7	14.9	14.8	23.3
	E05000951	St Oswald	3.4	29.0	26.2	5.9	17.5	14.0	5.5	3.6	3.0	21.4	23.6	20.8	24.0
	E05000952	Sudell	2.4	26.3	21.5	6.2	13.5	9.8	3.2	2.8	1.4	15.4	16.6	15.7	23.7
	E05000953	Victoria	2.4	27.0	22.5	6.2	14.5	10.6	3.3	2.8	1.4	16.1	17.7	16.2	24.2
St Helens	E05014120	Billinge & Seneley Green	2.2	26.3	17.0	5.6	7.9	6.5	2.1	1.5	0.9	13.6	11.8	11.9	24.9
	E05014121	Blackbrook	2.5	28.6	18.8	5.6	9.8	8.6	3.0	1.9	1.7	17.2	15.5	14.9	25.3
	E05014122	Bold & Lea Green	2.8	27.2	20.0	5.2	10.0	8.6	3.6	1.9	2.1	16.8	17.4	16.2	26.1
	E05014123	Eccleston	2.3	25.9	16.7	5.5	8.1	6.8	2.3	1.5	0.9	13.6	11.4	11.8	24.6
	E05014124	Haydock	2.4	28.2	19.1	5.4	9.7	8.3	2.9	1.8	1.5	16.8	15.7	14.6	25.4
	E05014125	Moss Bank	2.5	29.7	20.0	5.4	10.6	9.2	3.1	2.0	1.4	18.1	16.7	15.0	25.5
	E05014126	Newton-le-Willows East	2.8	27.8	19.5	5.3	10.6	9.2	3.6	1.9	1.8	17.1	16.9	15.5	25.7
	E05014127	Newton-le-Willows West	3.0	27.7	20.8	5.1	10.9	9.5	4.2	2.0	2.3	18.1	19.0	17.1	26.0
	E05014128	Parr	3.3	29.1	21.7	5.1	11.8	10.8	4.7	2.2	2.8	20.2	20.4	18.6	25.9
	E05014129	Peasley Cross & Fingerpost	3.4	28.8	22.1	5.0	12.1	11.0	4.9	2.2	2.9	20.2	21.1	18.9	26.0
	E05014130	Rainford	2.1	27.1	15.9	5.9	7.8	6.7	1.9	1.5	1.0	14.2	11.3	11.9	24.5
	E05014131	Rainhill	2.1	26.7	17.3	5.5	8.2	6.8	2.2	1.6	1.0	14.3	12.8	12.5	24.8
	E05014133	Sutton North West	2.6	29.7	20.9	5.2	11.0	9.5	3.4	2.0	1.6	18.8	17.9	15.5	25.4
	E05014134	Sutton South East	2.4	27.9	19.9	5.1	9.9	8.2	3.1	1.8	1.4	16.5	16.6	14.8	26.0

	E05014135	Thatto Heath	2.8	28.6	19.4	5.5	10.5	9.5	3.6	2.0	2.1	18.3	17.0	16.0	25.4
	E05014132	Town Centre	4.0	28.4	21.7	5.5	11.9	10.3	4.7	2.1	2.7	20.1	19.9	18.5	25.7
	E05014136	West Park	2.6	29.6	21.1	5.1	11.2	9.6	3.4	2.1	1.5	18.7	18.2	15.6	25.7
	E05014137	Windle	2.7	27.1	19.9	5.0	9.7	8.2	3.2	1.8	1.4	15.9	15.6	14.3	25.5
Wirral	E05000954	Bebington	2.8	19.9	20.2	9.6	15.4	13.5	3.2	2.9	1.9	13.6	19.9	22.3	28.8
	E05000955	Bidston and St James	4.7	20.0	24.0	9.9	18.9	16.9	5.8	3.4	4.8	17.1	26.9	29.0	29.2
	E05000956	Birkenhead and Tranmere	6.1	19.7	24.8	10.2	20.4	17.2	6.6	3.4	4.7	17.8	27.9	30.6	29.3
	E05000957	Bromborough	3.4	20.4	22.2	9.3	17.3	15.6	4.5	3.3	3.3	15.5	24.1	26.0	29.2
	E05000958	Clatterbridge	2.9	18.5	19.1	9.3	13.0	11.2	2.8	2.5	1.4	11.6	16.2	19.7	27.9
	E05000959	Claughton	3.4	20.6	22.9	8.9	16.8	15.1	4.5	3.3	3.4	15.7	24.3	26.2	29.1
	E05000960	Eastham	3.0	19.4	20.3	9.5	14.9	13.1	3.4	2.8	2.1	13.3	19.5	22.3	28.5
	E05000961	Greasby, Frankby and Irby	2.8	18.3	18.6	9.6	12.8	11.1	2.7	2.4	1.5	11.3	15.6	19.5	28.0
	E05000962	Heswall	3.1	17.5	20.3	8.5	12.2	10.2	2.8	2.3	0.9	10.4	15.3	18.2	27.8
	E05000963	Hoylake and Meols	2.9	18.7	19.6	9.4	13.4	11.5	2.9	2.5	1.7	11.9	17.2	20.6	28.4
	E05000964	Leasowe and Moreton East	3.7	20.5	22.5	9.2	17.2	16.0	4.8	3.3	4.0	16.2	24.6	27.1	29.0
	E05000965	Liscard	3.8	21.0	23.6	8.8	17.8	16.6	5.2	3.5	4.2	17.0	26.0	28.0	28.9
	E05000966	Moreton West and Saughall	3.0	19.5	20.4	9.6	14.9	13.1	3.6	2.9	2.9	13.7	20.7	24.0	29.0
	E05000967	New Brighton	3.0	22.1	23.2	9.0	17.2	15.5	3.8	3.3	2.3	16.5	23.6	24.9	28.9
	E05000968	Oxton	2.9	19.9	19.9	9.7	14.6	13.0	3.3	2.9	2.5	13.7	19.9	23.2	28.6
	E05000969	Pensby and Thingwall	2.6	18.4	18.7	9.8	12.7	10.8	2.8	2.5	2.4	11.8	17.7	21.7	28.4
	E05000970	Prenton	3.3	20.0	22.1	9.1	16.2	14.4	4.2	3.1	3.0	14.7	22.6	24.8	29.0
	E05000971	Rock Ferry	4.2	20.4	24.2	8.7	18.8	17.6	6.1	3.6	5.1	17.3	28.0	29.8	29.2
	E05000972	Seacombe	4.3	20.9	24.6	8.7	19.3	18.4	6.4	3.7	5.3	18.1	28.8	30.4	29.3
	E05000973	Upton	3.4	20.3	21.9	9.4	16.8	15.2	4.4	3.2	3.5	15.4	23.4	25.6	28.8
	E05000974	Wallasey	2.7	20.1	18.7	10.2	14.5	13.0	2.8	2.8	2.0	13.4	18.3	22.1	28.5
	E05000975	West Kirby and Thurstaston	2.9	18.9	18.6	9.9	13.1	11.7	2.8	2.5	2.0	12.2	16.5	20.8	28.0

Table A6: Bivariate associations between ACE count and sociodemographics [15]

		ACE count			
		None	**1**	**2-3**	**4+**
Overall	**%**	50.2	19.0	18.9	11.8
	n	2708	1027	1021	639
Sex	**Male**	51.4 (1313)	19.7 (503)	19.2 (489)	9.7 (248)
	Female	49.1 (1389)	18.4 (521)	18.7 (529)	13.8 (389)
	χ²				21.238
	p				**<0.001**
Age group (years)	**18-24**	53.0 (269)	17.5 (89)	15.0 (76)	14.6 (74)
	25-34	43.3 (345)	19.1 (152)	20.5 (163)	17.2 (137)
	35-44	49.8 (471)	19.9 (188)	17.8 (168)	12.5 (118)
	45-54	45.7 (343)	17.6 (132)	20.6 (155)	16.1 (121)
	55-64	49.3 (501)	19.3 (196)	21.5 (219)	9.9 (101)
	65+	56.4 (763)	19.7 (266)	17.5 (237)	6.4 (86)
	χ²				107.939
	p				**<0.001**
Ethnicity	**Any White background**	49.2 (2455)	19.5 (974)	19.2 (958)	12.0 (598)
	Any other non-White background	61.5 (232)	13.3 (50)	15.1 (57)	10.1 (38)
	χ²				21.990
	p				**<0.001**
Deprivation quintile	**1 (most deprived)**	47.3 (1174)	19.0 (470)	19.2 (475)	14.6 (361)
	2	48.7 (416)	18.9 (161)	21.1 (180)	11.4 (97)
	3	51.7 (434)	21.7 (182)	17.9 (150)	8.8 (74)
	4	55.0 (459)	18.1 (151)	18.2 (152)	8.7 (73)
	5 (least deprived)	58.3 (225)	16.3 (63)	16.6 (64)	8.8 (34)
	χ²				54.476
	p				**<0.001**

[15] ACE count is based on 9 types of ACEs, which include – physical abuse, verbal abuse, sexual abuse, and/or household dysfunction; mental illness; alcohol abuse; drug abuse; incarceration; domestic violence; parental separation.

Table A7: Bivariate associations between individual ACE types and sociodemographics[16]

		Childhood abuse				Household dysfunction							Community violence	
		Physical neglect	Physical abuse	Verbal abuse	Sexual abuse	Mental illness	Alcohol harm	Drug harm	Gambling harm	Incarceration	Domestic violence	Parental separation	Witnessing community violence	Bullying
Overall	**%**	3.3	23.0	23.4	6.5	15.5	13.0	4.0	3.1	2.7	15.6	20.2	20.2	25.7
	n	177	1241	1265	352	837	704	215	167	143	841	1090	1092	1385
Sex	**Male**	2.8 (71)	25.5 (651)	22.0 (561)	4.0 (102)	11.0 (280)	11.3 (288)	3.4 (87)	3.0 (77)	2.5 (64)	15.8 (404)	17.1 (436)	23.5 (601)	25.5 (652)
	Female	3.7 (106)	20.7 (586)	24.8 (701)	8.8 (250)	19.6 (553)	14.6 (414)	4.5 (127)	3.2 (90)	2.8 (79)	15.4 (435)	23.1 (652)	17.3 (488)	25.6 (725)
	χ2	3.946	17.302	5.917	51.515	75.615	13.341	4.121	0.124	0.426	0.200	29.717	32.833	0.007
	p	**<0.05**	**<0.001**	**<0.05**	**<0.001**	**<0.001**	**<0.001**	**<0.05**	NS	NS	NS	**<0.001**	**<0.001**	NS
Age group (years)	**18-24**	3.7 (19)	11.0 (56)	25.2 (128)	4.5 (23)	21.3 (108)	13.0 (66)	7.1 (36)	3.9 (20)	3.9 (20)	10.8 (55)	29.9 (152)	19.1 (97)	21.9 (111)
	25-34	5.1 (41)	20.3 (162)	29.6 (236)	5.5 (44)	23.6 (188)	18.9 (151)	8.7 (69)	4.8 (38)	3.6 (29)	16.3 (130)	32.2 (257)	23.6 (188)	28.1 (224)
	35-44	2.4 (23)	21.6 (204)	23.7 (224)	4.8 (45)	17.8 (168)	14.4 (136)	4.3 (41)	2.4 (23)	1.8 (17)	14.8 (140)	25.3 (239)	22.0 (208)	25.4 (240)
	45-54	5.2 (39)	28.6 (215)	30.5 (229)	8.1 (61)	18.4 (138)	16.5 (124)	4.7 (35)	3.3 (25)	4.1 (31)	18.4 (138)	21.4 (161)	27.0 (203)	32.2 (242)
	55-64	2.2 (22)	26.5 (269)	21.6 (220)	7.5 (76)	12.5 (127)	11.7 (119)	2.2 (22)	3.0 (31)	2.4 (24)	18.5 (188)	15.7 (160)	20.4 (207)	27.0 (275)
	65+	2.4 (32)	24.5 (331)	16.6 (225)	7.5 (101)	7.8 (106)	7.8 (106)	0.8 (11)	2.2 (30)	1.6 (22)	13.9 (188)	8.8 (119)	13.9 (188)	21.3 (288)
	χ2	27.439	67.297	75.160	16.096	128.43	67.715	103.811	13.552	21.003	23.283	238.447	62.654	37.796
	p	**<0.001**	**<0.001**	**<0.001**	**<0.01**	**<0.001**	**<0.001**	**<0.001**	**<0.05**	**<0.001**	**<0.001**	**<0.001**	**<0.001**	**<0.001**
Ethnicity	**Any White background**	3.4 (167)	23.2 (1159)	23.9 (1192)	6.6 (327)	15.9 (793)	13.4 (667)	4.1 (204)	3.1 (156)	2.6 (132)	15.8 (789)	20.3 (1014)	20.5 (1024)	26.3 (1311)
	Any other non-White background	2.1 (8)	19.9 (75)	17.8 (67)	6.1 (23)	10.1 (38)	9.0 (34)	2.4 (9)	2.1 (8)	2.4 (9)	13.0 (49)	18.3 (69)	15.9 (60)	17.0 (64)
	χ2	1.674	2.228	7.354	0.121	9.091	5.867	2.671	1.200	0.093	2.129	0.904	4.651	15.976
	p	NS	NS	**<0.01**	NS	**<0.01**	**<0.05**	NS	NS	NS	NS	NS	**<0.05**	**<0.001**
Deprivation quintile	**1 (most deprived)**	4.1 (102)	23.2 (576)	26.0 (645)	6.3 (155)	17.6 (436)	15.7 (389)	5.4 (134)	3.6 (89)	4.1 (101)	17.8 (441)	24.5 (607)	23.5 (583)	25.4 (631)
	2	2.8 (24)	24.6 (210)	24.5 (209)	6.2 (53)	16.6 (142)	12.9 (110)	3.2 (27)	3.2 (27)	1.2 (10)	16.4 (140)	20.3 (173)	18.5 (158)	25.9 (221)
	3	2.6 (22)	21.4 (180)	22.0 (185)	6.3 (53)	13.1 (110)	9.5 (80)	3.1 (26)	2.5 (21)	1.9 (16)	12.5 (105)	17.5 (147)	18.5 (155)	26.8 (225)
	4	2.3 (19)	23.0 (192)	17.1 (143)	7.9 (66)	12.5 (104)	10.9 (91)	2.2 (18)	2.6 (22)	1.7 (14)	13.4 (112)	13.4 (112)	16.9 (141)	25.0 (209)
	5 (least deprived)	2.6 (10)	21.5 (83)	21.5 (83)	6.5 (25)	11.7 (45)	8.8 (34)	2.6 (10)	2.1 (8)	0.5 (2)	11.1 (43)	13.2 (51)	14.2 (55)	25.6 (99)
	χ2	10.405	2.950	29.912	3.120	22.978	33.937	25.551	4.954	38.363	24.388	67.470	34.069	0.813
	p	**<0.05**	NS	**<0.001**	NS	**<0.001**	**<0.001**	**<0.001**	NS	**<0.001**	**<0.001**	**<0.001**	**<0.001**	NS

[16] NS – Not significant.

Table A8: Bivariate associations between health risk behaviours, sociodemographics, and ACE count (a)[17]

		Tobacco	E-cigarette/vapes	Tobacco and/or E-cigarette/vapes	Alcohol
		Current daily	Current daily	Current daily	5+ drinks weekly
Overall	**%**	12.0	8.4	18.2	15.8
	n	632	445	960	831
Sex	**Male**	13.4 (336)	7.7 (191)	18.6 (463)	20.5 (512)
	Female	10.7 (296)	9.1 (253)	18.0 (496)	11.5 (318)
	χ2	9.223	3.556	0.355	80.330
	p	**<0.01**	NS	NS	**<0.001**
Age group (years)	**18-24**	11.8 (58)	19.0 (93)	24.7 (120)	16.7 (83)
	25-34	11.7 (91)	13.2 (102)	22.1 (171)	10.2 (80)
	35-44	13.8 (127)	8.9 (82)	20.2 (186)	13.4 (123)
	45-54	16.6 (122)	8.7 (64)	23.0 (168)	20.2 (148)
	55-64	14.0 (140)	6.8 (68)	19.2 (192)	21.0 (208)
	65+	6.9 (93)	2.5 (34)	9.0 (120)	14.0 (186)
	χ2	54.205	157.022	112.206	56.613
	p	**<0.001**	**<0.001**	**<0.001**	**<0.001**
Ethnicity	**Any White background**	12.1 (590)	8.6 (422)	18.6 (906)	16.5 (805)
	Any other non-White background	10.5 (38)	5.6 (20)	13.3 (48)	7.2 (26)
	χ2	0.805	4.098	6.260	21.395
	p	NS	**<0.05**	**<0.05**	**<0.001**
Deprivation quintile	**1 (most deprived)**	17.5 (424)	11.8 (284)	26.1 (628)	15.4 (372)
	2	11.6 (97)	8.0 (67)	17.2 (143)	15.9 (134)
	3	7.3 (60)	5.3 (44)	11.2 (92)	17.6 (144)
	4	5.1 (42)	3.9 (32)	8.8 (72)	14.8 (121)
	5 (least deprived)	2.3 (9)	4.7 (18)	6.5 (25)	15.8 (60)
	χ2	158.484	74.455	212.328	2.781
	P	**<0.001**	**<0.001**	**<0.001**	NS
ACE count	**0 ACEs**	9.8 (257)	5.9 (154)	14.4 (374)	13.5 (351)
	1 ACE	10.7 (109)	7.8 (79)	16.9 (172)	17.0 (173)
	2-3 ACEs	13.4 (136)	11.8 (120)	22.0 (224)	19.5 (197)
	4+ ACEs	20.6 (130)	14.5 (92)	30.1 (190)	17.5 (110)
	χ2	59.442	67.441	96.629	23.642
	p	**<0.001**	**<0.001**	**<0.001**	**<0.001**

[17] NS – Not significant.

Table A9: Prevalence of individual drug use, lifetime (18+ years) and past year

		Lifetime	Past year
Cannabis	**%**	18.0	4.9
	n	945	256
Cocaine powder	**%**	6.6	1.5
	n	347	80
Nitrous oxide	**%**	2.7	0.4
	n	143	22
Heroin or crack cocaine	**%**	0.6	0.2
	n	30	8
Ecstasy	**%**	5.7	1.0
	n	303	51
Amphetamines	**%**	3.2	0.2
	n	171	13
Psychedelics	**%**	4.8	0.8
	n	256	44
GHB	**%**	0.7	0.2
	n	38	8
Mephedrone	**%**	0.8	0.1
	n	41	6
Ketamine	**%**	2.7	0.9
	n	141	47

Table A10: Bivariate associations between health risk behaviours, sociodemographics, and ACE count (b)[18]

		Gambling		Drug use			
		Gambling participation	Any gambling harm	Any drugs ever	Any drugs ever (excl. cannabis)	Any drugs past year	Any drugs past year (excl. cannabis)
Overall	**%**	32.3	10.0	19.1	10.3	5.6	2.4
	n	1707	169	1003	541	292	124
Sex	**Male**	35.8 (895)	13.9 (123)	21.6 (533)	11.9 (294)	6.5 (160)	2.8 (70)
	Female	29.1 (808)	5.7 (46)	16.7 (465)	8.7 (243)	4.7 (130)	1.9 (53)
	χ2	27.189	30.555	19.826	14.249	8.069	4.905
	p	**<0.001**	**<0.001**	**<0.001**	**<0.001**	**<0.01**	**<0.05**
Age group (years)	**18-24**	23.0 (112)	16.4 (18)	25.6 (125)	16.3 (80)	17.0 (83)	8.8 (43)
	25-34	30.9 (240)	13.9 (33)	26.0 (200)	15.3 (118)	9.9 (76)	4.7 (36)
	35-44	34.0 (315)	13.2 (41)	22.0 (201)	12.5 (115)	5.6 (51)	2.5 (23)
	45-54	37.9 (280)	10.4 (29)	29.0 (212)	18.2 (133)	6.3 (46)	1.6 (12)
	55-64	33.4 (333)	7.3 (24)	15.6 (155)	6.1 (61)	2.3 (23)	0.7 (7)
	65+	31.6 (422)	5.7 (24)	8.1 (109)	2.5 (33)	1.0 (13)	0.2 (3)
	χ2	32.527	23.902	200.155	202.919	223.048	145.413
	p	**<0.001**	**<0.001**	**<0.001**	**<0.001**	**<0.001**	**<0.001**
Ethnicity	**Any White background**	33.7 (1653)	9.9 (163)	19.5 (949)	10.3 (504)	5.6 (272)	2.3 (113)
	Any other non-White background	13.3 (48)	10.4 (5)	13.6 (50)	9.2 (34)	5.1 (19)	3.0 (11)
	χ2	64.672	0.000	7.870	0.464	0.132	0.652
	p	**<0.001**	NS	**<0.01**	NS	NS	NS
Deprivation quintile	**1 (most deprived)**	30.3 (734)	11.9 (86)	18.9 (454)	10.2 (245)	6.8 (163)	2.8 (68)
	2	35.6 (299)	10.8 (32)	23.4 (195)	13.1 (110)	7.1 (59)	3.6 (30)
	3	31.6 (261)	6.9 (18)	17.4 (143)	10.4 (86)	3.8 (31)	1.3 (11)
	4	32.6 (266)	7.9 (21)	18.4 (151)	8.5 (70)	3.5 (29)	1.2 (10)
	5 (least deprived)	38.6 (147)	8.2 (12)	15.7 (60)	7.9 (30)	2.6 (10)	1.3 (5)
	χ2	15.399	7.766	14.488	12.687	28.236	17.991
	P	<0.01	NS	**<0.01**	**<0.05**	**<0.001**	**<0.01**
ACE count	**0 ACEs**	27.1 (709)	5.9 (41)	9.3 (244)	4.4 (116)	2.3 (59)	0.7 (19)
	1 ACE	34.9 (356)	8.2 (29)	20.8 (211)	10.4 (105)	5.4 (55)	2.6 (26)
	2-3 ACEs	40.4 (410)	13.4 (55)	27.6 (278)	16.1 (162)	7.0 (70)	3.0 (30)
	4+ ACEs	36.5 (232)	19.0 (44)	43.0 (270)	25.1 (158)	17.3 (108)	7.8 (49)
	χ2	70.797	41.074	442.718	285.214	221.503	113.803
	p	**<0.001**	**<0.001**	**<0.001**	**<0.001**	**<0.001**	**<0.001**

[18] NS – Not significant.

Table A11: Bivariate associations between mental wellbeing and general health, sociodemographics, and ACE count[19]

		Low mental wellbeing	Poor general health
Overall	**%** **n (total sample size)**	14.1 717	19.0 962
Sex	**Male**	13.2 (315)	18.0 (428)
	Female	14.8 (398)	19.9 (531)
	χ2	2.689	3.022
	p	NS	NS
Age group (years)	**18-24**	17.4 (83)	8.2 (38)
	25-34	13.8 (103)	12.7 (94)
	35-44	15.8 (143)	12.8 (114)
	45-54	15.3 (109)	18.1 (127)
	55-64	14.8 (140)	25.2 (240)
	65+	10.8 (138)	26.8 (343)
	χ2	19.477	151.813
	p	**<0.01**	**<0.001**
Ethnicity	**Any White background**	13.8 (652)	19.5 (915)
	Any other non-White background	16.9 (58)	12.9 (44)
	χ2	2.622	8.844
	p	NS	**<0.01**
Deprivation quintile	**1 (most deprived)**	18.8 (434)	25.0 (571)
	2	12.7 (104)	16.3 (132)
	3	10.6 (85)	13.4 (107)
	4	8.5 (68)	14.6 (116)
	5 (least deprived)	7.0 (26)	9.9 (36)
	χ2	88.383	103.294
	p	**<0.001**	**<0.001**
ACE count	**0 ACEs**	9.9 (246)	18.0 (444)
	1 ACE	12.2 (122)	16.8 (166)
	2-3 ACEs	19.8 (197)	21.4 (212)
	4+ ACEs	24.2 (152)	23.1 (140)
	χ2	118.717	14.861
	p	**<0.001**	**<0.01**

[19] NS – Not significant.

Table A12: Bivariate associations between school exclusions and employment status, sociodemographics, and ACE count[20]

		School exclusions	Employment status
		Ever temporary or permanently excluded from school	Currently unemployed
Prevalence (unmodelled)	**%** **n (total sample size)**	4.8 254	3.9 185
Sex	**Male**	6.2 (154)	4.9 (110)
	Female	3.6 (99)	3.0 (75)
	χ2	19.615	11.296
	p	**<0.001**	**<0.001**
Age group (years)	**18-24**	6.9 (34)	9.0 (42)
	25-34	9.8 (75)	5.6 (40)
	35-44	5.4 (49)	3.9 (32)
	45-54	6.2 (46)	6.1 (39)
	55-64	3.0 (30)	3.6 (29)
	65+	1.5 (20)	0.2 (2)
	χ2	88.911	96.548
	p	**<0.001**	**<0.001**
Ethnicity	**Any White background**	4.8 (237)	3.7 (163)
	Any other non-White background	4.1 (15)	6.3 (22)
	χ2	0.383	6.103
	p	NS	**<0.05**
Deprivation quintile	**1 (most deprived)**	6.2 (150)	6.9 (143)
	2	4.8 (40)	3.3 (25)
	3	3.5 (29)	1.1 (9)
	4	3.2 (26)	0.5 (4)
	5 (least deprived)	2.4 (9)	1.1 (4)
	χ2	23.308	98.845
	p	**<0.001**	**<0.001**
ACE count	**0 ACEs**	1.8 (48)	2.9 (69)
	1 ACE	4.7 (48)	4.2 (39)
	2-3 ACEs	6.2 (63)	4.1 (37)
	4+ ACEs	15.2 (95)	7.2 (40)
	χ2	202.757	23.490
	p	**<0.001**	**<0.001**

[20] NS – Not significant.

Table A13: Bivariate associations between violence and criminal justice exposure, sociodemographics, and ACE count (c)[21]

		Violence victimisation		Arrest history	Incarceration history
		Lifetime (since 18+ years)	Past year	Ever arrested (since 18+ years)	Ever incarcerated (since 18+ years)
Overall	**%** **n (total sample size)**	33.0 1779	4.3 230	8.6 453	5.2 274
Sex	**Male**	31.1 (793)	3.6 (93)	14.5 (358)	9.2 (227)
	Female	34.7 (980)	4.8 (137)	3.4 (94)	1.7 (47)
	χ²	7.836	4.735	205.027	148.788
	p	**<0.01**	**<0.05**	**<0.001**	**<0.001**
Age group (years)	**18-24**	26.0 (132)	10.0 (51)	3.8 (19)	1.8 (9)
	25-34	37.9 (302)	6.5 (52)	8.4 (65)	5.4 (42)
	35-44	35.1 (332)	5.1 (48)	7.9 (73)	5.0 (46)
	45-54	39.7 (298)	4.1 (31)	13.1 (96)	9.0 (66)
	55-64	33.8 (344)	2.2 (22)	10.3 (102)	6.3 (62)
	65+	27.1 (367)	1.9 (26)	7.3 (97)	3.7 (49)
	χ²	58.258	81.847	40.568	41.550
	p	**<0.001**	**<0.001**	**<0.001**	**<0.001**
Ethnicity	**Any White background**	33.6 (1675)	4.1 (202)	8.8 (432)	5.4 (262)
	Any other non-White background	24.4 (92)	6.6 (25)	4.9 (18)	2.7 (10)
	χ²	13.420	5.751	6.770	4.839
	p	**<0.001**	**<0.05**	**<0.01**	**<0.05**
Deprivation quintile	**1 (most deprived)**	33.9 (841)	5.6 (140)	10.8 (260)	6.6 (158)
	2	33.0 (282)	4.6 (39)	7.9 (66)	5.5 (46)
	3	33.7 (283)	3.1 (26)	7.5 (62)	4.5 (37)
	4	31.5 (263)	1.8 (15)	5.5 (45)	2.7 (22)
	5 (least deprived)	28.5 (110)	2.6 (10)	5.3 (20)	2.9 (11)
	χ²	5.506	29.699	31.812	24.714
	p	NS	**<0.001**	**<0.001**	**<0.001**
ACE count	**0 ACEs**	17.6 (476)	1.8 (50)	4.8 (125)	2.4 (64)
	1 ACE	35.6 (366)	3.1 (32)	7.6 (77)	4.6 (47)
	2-3 ACEs	49.1 (501)	6.3 (64)	13.6 (137)	8.6 (87)
	4+ ACEs	68.2 (436)	13.1 (84)	18.1 (114)	12.0 (76)
	χ²	772.829	175.646	154.124	125.392
	p	**<0.001**	**<0.001**	**<0.001**	**<0.001**

[21] NS- Not significant.

Table A14: Bivariate associations between perceptions of personal safety, sociodemographics, and ACE count[22]

		Perceptions of personal safety from violence	
		Personally unsafe in Merseyside generally	Personally unsafe in neighbourhood
Overall	**%** **n (total sample size)**	13.9 734	6.4 340
Sex	**Male**	10.5 (264)	4.7 (117)
	Female	16.9 (468)	8.0 (221)
	χ2	44.250	23.798
	p	**<0.001**	**<0.001**
Age group (years)	**18-24**	11.7 (58)	5.4 (27)
	25-34	10.4 (81)	6.4 (50)
	35-44	13.9 (129)	7.3 (68)
	45-54	14.4 (106)	6.4 (47)
	55-64	16.8 (168)	7.4 (74)
	65+	14.3 (189)	5.5 (73)
	χ2	17.404	5.376
	p	**<0.01**	NS
Ethnicity	**Any White background**	14.1 (691)	6.4 (312)
	Any other non-White background	11.1 (41)	6.8 (25)
	χ2	2.562	0.083
	p	NS	NS
Deprivation quintile	**1 (most deprived)**	16.2 (396)	9.1 (222)
	2	11.6 (95)	6.6 (54)
	3	14.1 (117)	3.6 (30)
	4	10.7 (88)	3.5 (29)
	5 (least deprived)	10.4 (38)	1.4 (5)
	χ2	25.031	66.211
	p	**<0.001**	**<0.001**
ACE count	**0 ACEs**	11.1 (294)	4.4 (116)
	1 ACE	13.8 (140)	6.4 (65)
	2-3 ACEs	15.3 (154)	7.5 (76)
	4+ ACEs	23.4 (146)	13.3 (83)
	χ2	65.531	69.393
	p	**<0.001**	**<0.001**

[22] NS – Not significant.

Table A15: Bivariate associations between perceptions of prevalence of violence, sociodemographics, and ACE count[23]

		Perceptions of prevalence of violence	
		Violence is common in Merseyside generally	Violence is common in neighbourhood
Overall	**%** **n (total sample size)**	86.3 4585	34.8 1858
Sex	**Male**	81.8 (2060)	30.1 (761)
	Female	90.3 (2515)	39.0 (1091)
	χ2	80.01	46.415
	p	**<0.001**	**<0.001**
Age group (years)	**18-24**	85.9 (433)	37.2 (187)
	25-34	85.8 (671)	36.1 (284)
	35-44	87.9 (820)	35.2 (331)
	45-54	88.6 (659)	38.0 (283)
	55-64	86.6 (869)	37.0 (373)
	65+	84.1 (1112)	29.4 (394)
	χ2	11.168	24.454
	p	**<0.05**	**<0.001**
Ethnicity	**Any White background**	87.3 (4300)	34.8 (1719)
	Any other non-White background	72.5 (263)	33.7 (125)
	χ2	63.085	0.179
	p	**<0.001**	NS
Deprivation quintile	**1 (most deprived)**	88.5 (2158)	44.9 (1100)
	2	86.1 (726)	33.9 (287)
	3	84.0 (698)	22.8 (190)
	4	83.1 (682)	23.3 (193)
	5 (least deprived)	84.0 (321)	23.0 (88)
	χ2	22.731	234.681
	p	**<0.001**	**<0.001**
ACE count	**0 ACEs**	84.9 (2253)	29.7 (793)
	1 ACE	87.2 (882)	36.3 (369)
	2-3 ACEs	86.5 (876)	39.1 (398)
	4+ ACEs	90.1 (574)	46.8 (298)
	χ2	12.695	80.213
	p	**<0.01**	**<0.001**

[23] NS – Not significant.

Table A16: Bivariate associations between neighbourhood cohesion, sociodemographics, and ACE count[24]

		Neighbourhood cohesion				
		Low neighbourhood needs fulfilment	Low neighbourhood group membership	Low neighbourhood influence	Low neighbourhood emotional connection	Low overall neighbourhood cohesion
Overall	**%**	16.2	15.8	21.0	18.7	17.0
	n	871	851	1123	1004	904
Sex	**Male**	15.5 (395)	15.3 (389)	21.7 (548)	18.3 (466)	16.6 (419)
	Female	16.7 (470)	16.2 (457)	20.3 (571)	18.9 (532)	17.1 (480)
	χ2	1.308	0.886	1.393	0.264	0.251
	p	NS	NS	NS	NS	NS
Age group (years)	**18-24**	18.3 (92)	19.4 (98)	22.9 (115)	24.8 (125)	20.8 (104)
	25-34	16.3 (129)	19.1 (151)	20.5 (162)	21.5 (170)	19.5 (153)
	35-44	18.8 (177)	17.5 (165)	19.0 (178)	19.4 (183)	18.4 (172)
	45-54	16.8 (125)	16.8 (126)	19.8 (148)	20.9 (156)	19.0 (141)
	55-64	16.6 (168)	15.0 (152)	21.6 (219)	18.9 (192)	16.5 (166)
	65+	13.2 (178)	11.7 (158)	21.7 (291)	13.0 (176)	12.4 (166)
	χ2	15.418	31.362	4.556	47.276	32.640
	p	**<0.01**	**<0.001**	NS	**<0.001**	**<0.001**
Ethnicity	**Any White background**	16.2 (802)	15.6 (777)	20.8 (1028)	18.5 (922)	16.7 (825)
	Any other non-White background	17.0 (64)	19.0 (71)	23.9 (89)	20.9 (78)	20.1(74)
	χ2	0.194	2.942	1.995	1.279	2.698
	p	NS	NS	NS	NS	NS
Deprivation quintile	**1 (most deprived)**	20.6 (507)	19.7 (486)	27.3 (670)	23.1 (569)	21.6 (527)
	2	16.5 (140)	17.6 (150)	19.3 (164)	20.3 (173)	17.8 (150)
	3	11.9 (100)	12.2 (102)	17.4 (146)	13.8 (116)	12.2 (102)
	4	10.8 (90)	9.7 (81)	10.1 (84)	12.7 (106)	10.6 (88)
	5 (least deprived)	8.8 (34)	8.3 (32)	15.4 (59)	10.4 (40)	9.7 (37)
	χ2	79.704	78.412	134.131	82.984	89.444
	p	**<0.001**	**<0.001**	**<0.001**	**<0.001**	**<0.001**
ACE count	**0 ACEs**	13.8 (373)	13.3 (359)	17.9 (480)	15.3 (411)	14.1 (377)
	1 ACE	15.0 (154)	15.2 (156)	19.6 (200)	18.0 (185)	15.4 (157)
	2-3 ACEs	20.7 (211)	18.6 (190)	23.6 (240)	23.4 (239)	20.4 (207)
	4+ ACEs	20.9 (133)	22.9 (146)	31.9 (203)	26.5 (169)	25.7 (163)
	χ2	37.766	42.984	66.604	62.074	59.823
	p	**<0.001**	**<0.001**	**<0.001**	**<0.001**	**<0.001**

[24] NS – Not significant.

Table A17: Bivariate associations between childhood relationships, sociodemographics, and ACE count[25]

		Not always having a trusted adult	Not always having a trusted friend	Not engaging in any extra-curricular or community activities
Overall	**%**	27.8	34.5	26.4
	n	1440	1792	1379
Sex	**Male**	28.4 (691)	38.6 (942)	24.8 (611)
	Female	27.1 (744)	30.8 (843)	27.8 (763)
	χ²	1.004	34.583	5.731
	p	NS	**<0.001**	**<0.05**
Age group (years)	**18-24**	21.3 (102)	29.5 (142)	24.6 (119)
	25-34	27.8 (211)	31.5 (239)	23.8 (183)
	35-44	24.8 (225)	32.0 (290)	26.1 (237)
	45-54	30.1 (220)	33.9 (248)	24.1 (176)
	55-64	30.9 (302)	36.0 (350)	26.4 (260)
	65+	28.2 (370)	38.8 (511)	29.8 (394)
	χ²	21.028	22.889	13.397
	p	**<0.001**	**<0.001**	**<0.05**
Ethnicity	**Any White background**	27.4 (1321)	34.5 (1662)	25.9 (1256)
	Any other non-White background	32.2 (113)	35.3 (124)	32.8 (116)
	χ²	3.470	0.064	7.916
	p	NS	NS	**<0.01**
Deprivation quintile	**1 (most deprived)**	29.1 (685)	36.2 (852)	32.1 (761)
	2	28.2 (235)	33.6 (280)	23.7 (198)
	3	25.8 (210)	34.7 (282)	22.3 (182)
	4	24.3 (197)	31.4 (254)	19.1 (155)
	5 (least deprived)	30.0 (113)	32.9 (124)	21.8 (83)
	χ²	9.697	7.057	76.227
	p	**<0.05**	NS	**<0.001**
ACE Count	**0 ACEs**	17.2 (435)	27.2 (687)	26.9 (686)
	1 ACE	21.9 (222)	31.0 (315)	22.4 (229)
	2-3 ACEs	38.0 (385)	43.3 (438)	26.1 (266)
	4+ ACEs	63.2 (398)	55.7 (352)	31.3 (198)
	χ²	604.919	225.964	16.569
	p	**<0.001**	**<0.001**	**<0.001**

[25] NS – Not significant.

Table A18: Bivariate associations between adulthood relationships, sociodemographics, and ACE count[26]

		Does not feel close to adults they live with	Does not feel close to relative they don't live with	Does not have close or good friends
Overall	**%**	8.8	14.2	13.3
	n	387	754	716
Sex	**Male**	9.1 (195)	16.4 (411)	15.5 (395)
	Female	8.3 (189)	12.3 (340)	11.3 (317)
	χ2	0.833	18.383	21.118
	p	NS	**<0.001**	**<0.001**
Age group (years)	**18-24**	9.6 (45)	16.2 (81)	10.9 (55)
	25-34	8.4 (58)	13.9 (109)	13.3 (105)
	35-44	6.4 (53)	13.3 (124)	11.9 (112)
	45-54	11.0 (71)	14.8 (109)	13.8 (103)
	55-64	7.6 (63)	16.9 (169)	13.7 (139)
	65+	10.2 (95)	11.9 (157)	14.7 (198)
	χ2	13.891	14.395	6.730
	p	**<0.05**	**<0.05**	NS
Ethnicity	**Any White background**	8.6 (350)	13.9 (680)	13.3 (659)
	Any other non-White background	9.9 (33)	18.2 (66)	13.1 (49)
	χ2	0.657	5.277	0.014
	p	NS	**<0.05**	NS
Deprivation quintile	**1 (most deprived)**	10.2 (198)	16.3 (395)	15.1 (372)
	2	9.8 (71)	13.4 (113)	12.4 (106)
	3	7.8 (56)	12.6 (105)	12.8 (107)
	4	6.7 (46)	12.0 (98)	10.2 (85)
	5 (least deprived)	4.7 (16)	11.3 (43)	11.9 (46)
	χ2	17.569	16.461	15.000
	p	**<0.01**	**<0.01**	**<0.01**
ACE count	**0 ACEs**	7.8 (176)	11.5 (305)	11.1 (300)
	1 ACE	7.8 (65)	13.1 (132)	14.0 (143)
	2-3 ACEs	9.5 (77)	16.6 (167)	15.2 (155)
	4+ ACEs	13.4 (69)	24.1 (150)	18.6 (118)
	χ2	18.135	71.814	29.724
	p	**<0.001**	**<0.001**	**<0.001**

[26] NS – Not significant.

MERSEYSIDE Violence Reduction Partnership

LIVERPOOL JOHN MOORES UNIVERSITY

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World Health Organization Collaborating Centre for Violence Prevention

For further information contact
Zara Quigg at
z.a.quigg@ljmu.ac.uk