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Supplementary appendix

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eTable 1. Information on data sources used

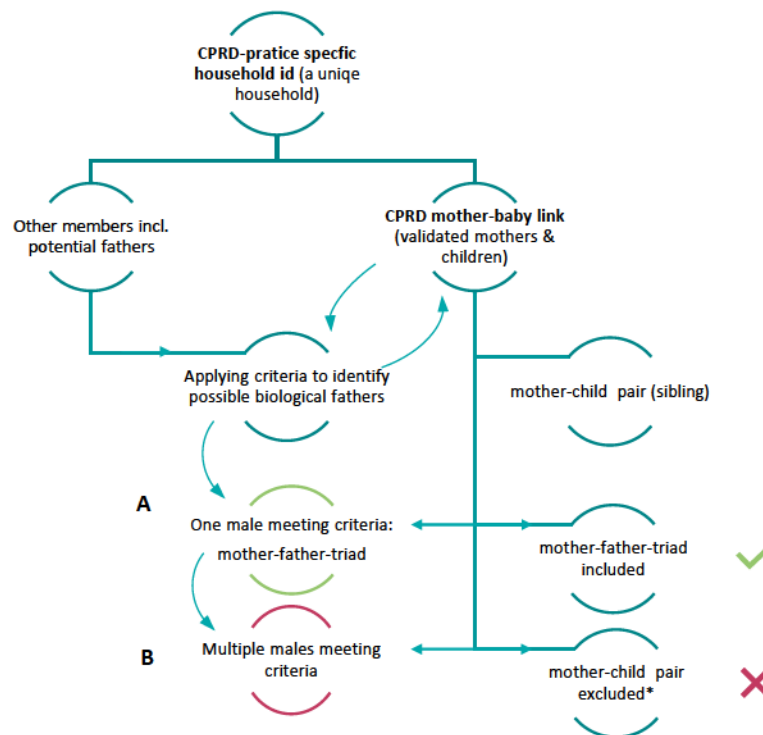
Data source & procedures	Description of the study population
Primary care: Clinical Practice Research Datalink (CPRD) GOLD & CPRD Mother Baby Link (CPRD-MBL) ^{1 2}	Most of the English population is registered with a general practice (GP). ³ CPRD GOLD is a GP database containing data from approximately 6.9% of the UK population (estimates based on the January 2014 dataset), ^{1 2} including both current and previously registered patients. In 2022 Feb, approximately 4.6% of the UK population were currently registered with a CPRD practice.* Mothers and children in CPRD GOLD are linked via practice-specific family IDs and birth and maternity variables. This " <i>mother-baby link</i> " forms a sub-cohort of CPRD (CPRD-MBL), with data refreshed every other year.
Coding system	CPRD data is recorded via Read codes (converted to " <i>medcodes</i> " and mapped SNOMED CT Concept IDs by CPRD), GEMscript product codes (mainly medication/prescriptions), BNF codes, and additional data fields linked to a code, including birthweight, test results, data from self-report measures, referrals, quantities, frequency etc.
Linkage	A subset of English general practices in the CPRD-MBL GOLD has consented to the linkage of patient-level data to other existing data sources, including HES-APC, IMD 2015 and ONS. In 2007, the CPRD-MBL contained 423 English practices consenting for linkage to other data sources. Most practices contributed data until 2014 (74.0%; 313/423 practices). The median length of practice's data contribution from birth to the last CPRD data collection date was 4.4 years (IQR: 2.4-6.8, range: 0-13.7).
Study-specific follow-up period	Minimum follow-up period: 2-months before birth to 1-year post-birth Maximum follow-up period: <i>Main analysis:</i> 1-year before birth to 2-years post-birth. <i>Sensitivity analysis:</i> 1 year before birth up to 2-years and 5-years post-birth Maximum date range of data: <i>Main analysis:</i> 2008-04-01 to 2019-01-31. <i>Sensitivity analysis:</i> 2012-04-01 to 2019-01-31.
Secondary care: Hospital Episode Statistics Admitted Patient Care (HES-APC) ⁴	We linked CPRD-GOLD to the Hospital Episodes Statistics Admitted Patient Care (HES-APC). HES-APC contains data on all NHS-funded hospital admissions in England, including over 97% of all births. ⁴ The data is coded professionally using individual discharge summaries written by the treating clinician and compiled as a database.
Coding system	Discharge summaries are transferred to clinical hospital coders who convert the information into ICD-9/10 codes and OPCS-3/4 codes according to national clinical coding standards. HES-APC contains additional admission-specific data on birth characteristics (birth weight, parity etc.), maternal age, discharge destination (e.g. psychiatric inpatient unit, foster care, death etc.) etc.
Study-specific follow-up period	Minimum follow-up period: 1 year before birth to 2 years post-birth (follow-up not dependent on GP registration) Maximum follow-up period: As above.

	<p>Maximum date range of data: 2008-04-01 to 2019-01-31.</p>
HES Accident & Emergency (A&E) ⁴	<p>We linked CPRD-GOLD to the HES Accident and Emergency (HES-A&E) and the HES Outpatient (HES OP) dataset. HES-A&E contains data from all NHS-funded A&E services in England, including Type 1 (most resource-intensive with full resuscitation facilities), Type 2, Type 3, Type 4 departments (less resource intensive) and urgent care centres with more than an average of 50 attendances per week.</p>
Coding system	<p>HES&AE provides coded data directly entered by practitioners of individual attendances. The data includes diagnoses, treatments and investigations conducted coded via ICD-10 codes, A&E specific coding systems. A smaller set of services also used Read and Snomed codes for some diagnoses. We used all the coded A&E data and have updated corresponding code lists at www.ACESinEHRs.com to include relevant HES-A&E and HES-OP-specific codes.</p>
Data quality	<p>Overall data quality and consistency in HES-A&E increased over time (62%-74% attendances captured 2007-2011; 74%-86% attendances captured 2012-2016), as it was collected on an experimental basis until 2012. Data coverage in HES-A&E increased from 2018-19. However, the data completeness for several key fields (not used in this study) has reduced since the phased introduction of the new Emergency Care Data Set (ECDS) commenced in October 2017.</p>
Study-specific follow-up period	<p>Minimum/Maximum follow-up period: 1 year before birth to 2 years post-birth (follow-up not dependent on GP registration) Maximum date range of data collection: As above.</p>
HES Outpatient (OP) ⁴ Coding system	<p>HES-OP contains individual records of all English NHS-funded outpatient appointments.</p> <p>Each record details the attendance type, service speciality (e.g., "<i>Addiction Service</i>"; "<i>Adult Mental Health Service</i>")., primary diagnosis, main procedures and interventions.</p>
Study-specific follow-up period	<p>Minimum/ Maximum follow-up period: 1 year before birth to 2 years post-birth (follow-up not dependent on GP registration) Maximum date range of data collection: As above.</p>
National English data sources: Index of Multiple Deprivation (IMD) 2019 ⁵	<p>The Index of Multiple Deprivation (IMD) 2019 is the official measure of relative deprivation for small areas in England. This study used the maternal IMD 2019 as a covariate in the prediction models.</p>
Coding system	<p>The IMD is derived from a composite score derived from seven domains (e.g. average income, crime rates etc.) for each Lower-layer Super Output Area in England (small areas/neighbourhoods). The IMD for each area is ranked against all other areas in England. Patients are linked to their corresponding "<i>small area</i>" and IMD by postcode. The ranked IMD for each area can be divided into IMD quantiles from 1 (least deprived) to 5 (most deprived).</p>
Study-specific follow-up period	<p>Minimum/maximum follow-up period: NA Maximum date range of data collection: 2015-2019 (Static)</p>

Office for National Statistics (ONS) Death registrations ⁶ Coding system	The ONS mortality register contains records of all deaths and causes of death in England. ICD-9 codes (<2001) or ICD-10 codes (>2000) are linked to a primary cause of death, with up to 15 other coded causes (and/or up to 8 neonatal causes of death).
Specific follow-up period	Minimum follow-up period: 1 year before birth up to 2 years post-birth Maximum follow-up period: As above. Maximum date range of data collection: As above
Cardiovascular disease research using linked bespoke studies and electronic health records (CALIBER) ^{7,8}	This study was carried out as part of the CALIBER© resource. CALIBER, led by the University College London Institute of Health Informatics, is a research resource providing validated electronic health record phenotyping algorithms and tools for national structured data sources. More information can be found at: https://portal.caliberresearch.org/ and https://www.ucl.ac.uk/health-informatics/research/caliber
Abbreviations: OPCS-4=Operating procedure codes, version 4; ICD-10/9=International classification of diseases, 10 th /9 th revision, BNF=British National Formulary Dictionary of Medicines and Devices	

*Please visit <https://cprd.com/> for the latest population estimates of registered patients in CPRD GOLD.

eFig 1. Household composition and paternal linkage using CPRD GOLD Mother-baby link



Linkage criteria of mother-father-child triads using the CPRD Mother baby-link

The [CPRD GOLD mother-baby link](#) (CPRD-MBL) contains all linkable mothers and children (born 1986 onwards) in CPRD GOLD linked with high validity via CPRD practice-specific household IDs (e.g., home address) and maternity records.¹ However, there is currently no validated paternal linkage of fathers in CRPD, a longstanding issue using large-scale EHRs globally (excluding Scandinavian countries) where no unique identifier of birth fathers exists.⁹

Selection criteria of fathers

To identify fathers, we followed previous study algorithms (eFig 1)¹⁰ and linked mother-child pairs in CPRD-MBL GOLD to a sole male meeting the following criteria:

1. The male has the same unique practice-specific household ID as the mother-child pair (see eFig 1), excluding any male children already included in the CPRD-MBL;
2. Aged at least 16 years old at the delivery date;
3. Less than 21 years of an age difference relative to the linked mother at birth;
4. Registered with the practice within one year after birth;
5. Matched to only one mother-child pair (eFig 1A), excluding males and mother-child pairs with multiple eligible matches (eFig 1B).*

Criteria descriptions

Criteria 1: The unique practice-specific household IDs provide the base for automatically linking patients registered with the practice living in the same household (i.e. home address). Patients can, therefore, only be part of one household per CPRD version, as patients cannot be registered with more than one home address or more than one GP at the same time.

Criterion 2-4: Aimed to match mother-child pairs with a sole male in the household likely to be the biological father by applying age restrictions (e.g., relative age to mothers at delivery dates) and time restrictions to fathers' start and end dates of practice registration. Potential fathers had to register with the practice no later than one year after the delivery date of linked the mother-baby pair to minimise linkage with a new male partner. In the current study, most selected fathers (96.3%; 91736/95290) registered with the practice (with the same household id) before the child was born. For each pair or triad, the follow-up period ends when the linked child, mother or father leaves the practice.

*We selected a random male in sensitivity analyses to examine the influence on the overall estimates when keeping mother-child pairs matched to multiple males.

eTable 2. Indicators of family adversities, child maltreatment and intimate partner violence*

Parental indicators

Parental mental health problems (MHPs; 13 indicators)

- Depression‡
- Self-harm or suicide attempts
- Anxiety disorders‡
- Obsessive-compulsive disorders
- Panic disorder (incl. agoraphobia, health anxiety)
- Posttraumatic stress disorder or acute stress disorder
- Eating disorders NOS (all others)
- Maternal anorexia nervosa
- Mental health problems NOS
- Referred to or seen by a mental health professional
- Personality disorders
- Psychosis or mental health section NOS
- Neurodevelopmental disorders†

Parental substance misuse (SM; 3 indicators)

- Severe drug misuse (likely dependence levels)‡
- Moderate drug misuse (all other)‡
- Severe alcohol misuse (incl. self-report ≥ 35 units/week for mothers, ≥ 50 units/week for fathers)§

Child and parent indicators

Adverse family environments (AFE; 12 indicators)

Characterising family conflicts, concerns recorded by a primary care practitioner about the poor social or physical home environment or about factors that might affect parenting:^{11,12}

- Parents with learning or intellectual disability
- Family disruptions and parental conflicts, NOS
- Housing problems, homelessness, forced displacement, signs of deprivation
- High-risk antenatal psychosocial presentation (e.g., most frequently coded observations: "supervision of high-risk pregnancy due to social problems" or "supervision of high-risk pregnancy due to history of insufficient antenatal care")
- Health visitors increasing concerns (e.g., multiple reports by health visitors)
- Family is cause for concern (e.g. coded observations include various concerns in parent or child such as: "life crisis", "concerned about appearance", "history of other physical trauma", "anger or aggressive behaviours", etc.)
- Parental separation
- Psychosocial health problems with lower-level intervention (e.g., social prescribing, counselling, art therapy etc.)
- Parental problems with daily living and work
- Parents with legal problems
- Unwanted or concealed pregnancy (including attempted abortion)
- Father assaulted NOS (GP record only)

Child only indicators

High-risk presentations of child maltreatment (HRP-CM; 4 indicators)§

Indicators of child injuries indicative of maltreatment, such as multiple burns, bruises or fractures in children ≤ 3 years old:

- Non-attendance of ≥ 3 child appointments within three years
- Superficial injuries, burns or fractures of multiple body parts (e.g., head, neck, limbs, etc)¹³
- Child harm by undetermined intent (drownings etc.)
- Bruising or contusions

Outcomes (excluded from the other family adversities above)

Intimate partner violence (IPV; 4 indicators)

- IPV, not otherwise specified (including physical or sexual abuse)
- Mother assaulted, not otherwise specified (hospital admission only)
- 2x algorithms: Mother assaulted + child protection recording, incident during pregnancy OR high-risk presentations §

Child maltreatment (CM; 5 indicators)

- Child protection or safeguarding
- CM not otherwise specified, including physical or sexual abuse
- Neglect (including neonatal abstinence syndrome or fetal alcohol spectrum disorders), and emotional or psychological abuse
- Social service involved (including parental imprisonment or criminal activity)
- Child in care

*We restricted the disaggregation of domain-specific indicators to indicators present in 250 or more unique children. †Neurodevelopmental disorders included attention deficit hyperactivity disorder, autism spectrum disorders, and conduct disorders. ‡Medications, interventions, and psychiatric symptoms were combined into appropriate disorder clusters using validated algorithms. §Indicators are defined by multiple rule-based algorithms, including the need to meet higher cut-off scores on a validated self-report instrument. All code lists and algorithms are freely available online (www.ACESinEHRs.com).¹³

eTable 3. Odds ratios for variables used to calculate inverse probability weights and for multiple imputation models to account for selection bias and censoring (n=198,405 children)*

Predictor of loss-to-follow-up	OR	LCI	UCI	Robust		P-value
				Std	z	
More children in the household, n	0.41	0.40	0.42	0.004	-81.65	<0.001
Birthweight, g [†]	1.00	1.00	1.00	0.000	-5.24	<0.001
Parity, n [†]	1.02	1.01	1.03	0.006	3.35	0.001
Gestational age, weeks [†]	1.01	1.00	1.01	0.003	2.82	0.005
Number of days enrolled before birth	0.99	0.99	0.99	0.000	0	<0.001
Older maternal age, years	0.96	0.96	0.97	0.001	-30.94	<0.001
Congenital anomaly (yes/no)	1.16	1.09	1.24	0.039	4.37	<0.001
Index of multiple deprivation[†]						
1 (least deprived)	Ref					
2	1.01	0.97	1.05	0.019	0.45	0.654
3	1.00	0.97	1.04	0.019	0.15	0.883
4	0.93	0.89	0.97	0.018	-3.75	<0.001
5	0.91	0.87	0.95	0.019	-4.58	<0.001
Region of general practice						
East midlands	Ref					
East of England	0.89	0.81	0.98	0.042	-2.45	0.014
London	0.72	0.66	0.79	0.034	-6.8	<0.001
North East	0.55	0.48	0.62	0.036	-9.12	<0.001
North West	0.63	0.58	0.69	0.030	-9.62	<0.001
South Central	0.82	0.75	0.9	0.037	-4.31	<0.001
South West	1.00	0.91	1.1	0.046	0.03	0.977
West Midlands	0.72	0.65	0.79	0.035	-6.86	<0.001
Yorkshire & The Humber	0.68	0.60	0.77	0.043	-6.03	<0.001
Family adversity						
IPV	1.01	0.95	1.07	0.031	0.34	0.733
Parental substance misuse	1.10	1.06	1.14	0.020	5.06	<0.001
Adverse family environments	1.00	0.96	1.03	0.020	-0.24	0.808
Parental mental health problems	0.8	0.78	0.82	0.012	-15.00	<0.001
-cons	5.41	4.25	6.89	0.665	13.74	<0.001

*We modelled all estimates using inverse probability weights (IPWs),^{14,15} to account for potential selection bias from (1) excluding mother-child pairs who registered with a GP later than two months before birth (n=28,840), (2) excluding mother-child pairs who could not be followed to their first birthday (n=40,017; see figure 1 in main paper), (3) mothers in the selected cohort registering between 1 year and 2-months before birth, and (4) mother-child pairs in the cohort who could not be followed beyond their first birthday. All the above-listed predictors and auxiliary variables were to calculate: (a) IPWs to predict any of the four criteria above, and (b) as predictors variables in multiple imputation models. [†]Denotes variables with missing data handled using multiple imputation models as described in the main paper.

eTable 4. Comparing cohort characteristics with subgroups used in sensitivity analyses by IPV, adversity and family member

	Keeping households >1 male (random selected)*											
	Cohort in primary analysis			Births 2012-2019 (HES-A&E)			Only two parent households					
	Overall cohort (n=129,948)	No IPV (n= 127,259)	IPV (n=2689; 2.1%)	Overall cohort (n=151,352)	No IPV (n=148,141)	IPV (n=3211; 2.1%)	Overall cohort (n=60,719)	No IPV (n=59,426)	IPV (n=1293; 2.1%)	Overall cohort (n=95,290)	No IPV (n=93,453)	IPV (n=1837; 1.9%)
Family adversities												
None	75190 (57.9)	74762 (58.8)	428 (15.9)	89593 (59.2)	89025 (60.1)	568 (17.7)	33696 (55.5)	33528 (56.4)	168 (13.0)	53938 (56.6)	53665 (57.4)	273 (14.9)
Any	54758 (42.11)	52497 (41.31)	2261 (84.11)	61759 (40.8)	59116 (39.9)	2643 (82.3)	27023 (44.5)	25898(43.6)	1125 (87.0)	41352 (43.4)	39788 (42.6)	1564 (85.1)
Adverse family environments	16222 (12.51)	14996 (11.81)	1226 (45.61)	18532 (12.2)	17102 (11.5)	1430 (44.5)	7145 (11.8)	6550 (11.0)	595 (46.0)	12457 (13.1)	11599 (12.4)	858 (46.7)
Parental mental health problems	35669 (27.4)	33950 (26.71)	1719 (63.91)	40487 (26.8)	38479 (26.0)	2008(62.5)	17394 (28.6)	16550 (27.8)	844(65.3)	27315 (28.7)	26113 (27.9)	1202 (65.4)
Parental substance misuse	18639 (14.31)	17549 (13.81)	1090 (40.51)	19326 (12.8)	18165 (12.3)	1161 (36.2)	11436 (18.8)	10780 (18.1)	656 (50.7)	14008 (14.7)	13238 (14.2)	770 (41.9)
Total number of adversity domains												
None	75190 (57.9)	74762 (58.7)	428 (15.9)	89593 (59.2)	89025 (60.1)	568 (17.7)	33696 (55.5)	33528 (56.4)	168 (13.0)	53938 (56.6)	53665 (57.4)	273 (14.9)
1	36310 (27.9)	35509 (27.9)	801 (29.8)	41541 (27.4)	40555 (27.4)	986 (30.7)	17602 (29.0)	17235 (29.0)	367 (28.4)	27184 (28.5)	26655 (28.5)	529 (28.8)
2	14061 (10.8)	13243 (10.4)	818 (30.4)	15540 (10.3)	14585 (9.8)	955 (29.7)	7159 (11.8)	6738 (11.3)	421 (32.6)	10747 (11.3)	10178 (10.9)	569 (31.0)
≥3	4387 (3.4)	3745 (2.9)	642 (23.9)	4678 (3.1)	3976 (2.7)	702 (21.9)	2262 (3.7)	1925 (3.2)	337 (26.1)	3421(3.6)	2955 (3.2)	466 (25.4)
Any adversity domain recorded in mother, father or child												
Neither mother, father or child	75195 (57.9)	74767 (58.8)	428 (15.9)	89599 (59.2)	89030 (60.1)	569 (17.7)	33698 (55.5)	33530 (56.4)	168 (13.0)	53939 (56.6)	53666 (57.4)	273 (14.9)
Mother or father only	38516 (29.6)	37230 (29.3)	1286 (47.8)	43911 (29.0)	42370 (28.6)	1541(48.0)	19670 (32.4)	19010 (32.0)	660 (51.0)	27666(29.0)	26902 (28.8)	764 (41.6)
Child only	4247 (3.3)	4173 (3.3)	74 (2.8)	4796(3.2)	4370 (2.9)	426 (13.3)	1748 (2.9)	1600 (2.7)	148 (11.4)	2716 (2.9)	2538 (2.7)	178 (9.7)
Mother and father only	6784 (5.2)	6385 (5.0)	399 (14.8)	6793 (4.5)	6393 (4.3)	400 (12.5)	3585 (5.9)	3372 (5.7)	213 (16.5)	6784 (7.1)	6385 (6.8)	399 (21.7)
Mother or father and child	4048 (3.1)	3724 (2.9)	324 (12.0)	1158 (0.8)	980 (0.7)	178 (5.5)	512 (0.8)	439 (0.7)	73 (5.6)	1158 (1.2)	980 (1.0)	178 (9.7)
Mother												
Family adversities												
Any	42845 (33.0)	40795 (32.1)	2050 (76.2)	48986 (32.4)	46578 (31.4)	2408 (75.0)	22010 (36.2)	20982(35.3)	1028 (79.5)	30663 (32.2)	29281 (31.3)	1382 (75.2)
Adverse family environments	11133 (8.6)	10140 (8.0)	993 (36.9)	13185 (8.7)	12011 (8.1)	1177 (36.7)	4984 (8.2)	4499 (7.6)	485 (37.5)	7824 (8.2)	7172 (7.7)	652 (35.5)
Parental mental health problems	30181 (23.2)	28609 (22.5)	1572 (58.5)	34992 (23.1)	33131 (22.4)	1861 (58.0)	14762 (24.3)	13995 (23.6)	767 (59.3)	21827 (22.9)	20772 (22.2)	1055 (57.4)
Parental substance misuse	14579 (11.2)	13661 (10.7)	918 (34.1)	15257(10.1)	14271 (9.6)	986 (30.7)	9498 (15.6)	8920 (15.0)	578 (44.7)	9955 (10.4)	9357(10.0)	598 (32.6)
Total number of adversity domains												
None	87103 (67.0)	86464 (67.9)	639 (23.8)	102366 (67.6)	101563 (68.6)	803 (25.0)	38709 (63.8)	38444 (64.7)	265(20.5)	64627 (67.8)	64172(68.7)	455 (24.8)
1	31427 (24.2)	30487 (24.0)	940 (35.0)	36286 (24.0)	35142 (23.7)	1144(35.6)	15750(25.9)	15322(25.8)	428 (33.1)	22776 (23.9)	22122 (23.7)	654 (35.6)
2	9788 (7.5)	9001 (7.1)	787 (29.3)	10949 (7.2)	10037 (6.8)	912 (28.4)	5286(8.7)	4888(8.2)	398 (30.8)	6831 (7.2)	6298(6.7)	533 (29.0)
≥3	1630 (1.3)	1307 (1.0)	323 (12.0)	1751 (1.2)	1399 (0.9)	352 (11.0)	974 (1.6)	772 (1.3)	202 (15.6)	1056 (1.1)	861 (0.9)	195 (10.6)
Any adversity domain recorded in mother and child												
Neither mother or child	82338 (63.4)	81788 (64.3)	550 (20.5)	96752 (63.9)	96061 (64.8)	691 (21.5)	36999 (60.9)	36775 (61.9)	224 (17.3)	61082 (64.1)	60687 (64.9)	395 (21.5)
Mother only	4765 (3.7)	4676 (3.7)	89 (3.3)	43551 (28.8)	41732 (28.2)	1819 (56.6)	19954 (32.9)	19137 (32.2)	817 (63.2)	27307(28.7)	26266 (28.1)	1041 (56.7)
Child only	38157 (29.4)	36594 (28.8)	1563 (58.1)	5614 (3.7)	5502(3.7)	112 (3.5)	1710(2.8)	1669 (2.8)	41 (3.2)	3545 (3.7)	3485 (3.7)	60 (3.3)
Mother and child	4688 (3.6)	4201 (3.3)	487 (18.1)	5435 (3.6)	4846 (3.3)	589 (18.3)	2056(3.4)	1845 (3.1)	211 (16.3)	3356 (3.5)	3015 (3.2)	341 (18.6)
Fathers												

Family adversities												
Any	15603 (12.0)	14889 (11.7)	714 (26.6)	15623 (10.3)	14908 (10.1)	715(22.3)	7602 (12.5)	7250(12.2)	352 (27.2)	15603 (16.4)	14889 (15.9)	714 (38.9)
Adverse family environments	4589 (3.5)	4267 (3.4)	322 (12.0)	4593 (3.0)	4271(2.9)	322 (10.0)	1938 (3.2)	1786 (3.0)	152 (11.8)	4589 (4.8)	4267(4.6)	322 (17.5)
Parental mental health problems	9888 (7.6)	9407 (7.4)	481 (17.9)	9898(6.5)	9416 (6.4)	482 (15.0)	4814(7.9)	4583 (7.7)	231 (17.9)	9888(10.4)	9407 (10.1)	481 (26.2)
Parental substance misuse	5327 (4.1)	5040 (4.0)	287 (10.7)	5336(3.5)	5049 (3.4)	287 (8.9)	2780 (4.6)	2631 (4.4)	149 (11.5)	5327(5.6)	5040 (5.4)	287 (15.6)
Total number of adversity domains												
None	114345 (88.0)	112370 (88.3)	1975 (73.4)	135729 (89.7)	133233 (89.9)	2496 (77.7)	53117 (87.5)	52176 (87.8)	941 (72.8)	79687(83.6)	78564 (84.1)	1123 (61.1)
1	11975 (9.2)	11564 (9.1)	411 (15.3)	11992 (7.9)	11580 (7.8)	412 (12.8)	5936(9.8)	5727(9.6)	209 (16.2)	11975 (12.6)	11564(12.4)	411 (22.4)
2	3055 (2.4)	2825 (2.2)	230 (8.6)	3058 (2.0)	2828 (1.9)	230 (7.2)	1402 (2.3)	1296 (2.2)	106 (8.2)	3055 (3.2)	2825 (3.0)	230 (12.5)
≥3	573 (0.4)	500 (0.4)	73 (2.7)	573 (0.4)	500 (0.3)	73 (2.3)	264(0.4)	227 (0.4)	37 (2.9)	573 (0.6)	500 (0.5)	73 (4.0)
Any adversity domain recorded in father and child												
Neither Father or child	106568 (82.0)	104976 (82.5)	1592 (59.2)	126357 (83.5)	124369 (84.0)	1988 (61.9)	50067 (82.5)	49295 (83.0)	772 (59.7)	74462 (78.1)	73547 (78.7)	915 (49.8)
Father only	7777 (6.0)	7394 (5.8)	383 (14.2)	13946 (9.2)	13424 (9.1)	522 (16.3)	6886 (11.3)	6617 (11.1)	269 (20.8)	13927 (14.6)	13406 (14.3)	521 (28.4)
Child only	13927 (10.7)	13406 (10.5)	521 (19.4)	9372 (6.2)	8864 (6.0)	508 (15.8)	3050(5.0)	2881 (4.8)	169 (13.1)	5225 (5.5)	5017 (5.4)	208 (11.3)
Father and child	1676 (1.3)	1483 (1.2)	193 (7.2)	1677 (1.1)	1484 (1.0)	193 (6.0)	716 (1.2)	633(1.1)	83 (6.4)	1676 (1.8)	1483 (1.6)	193 (10.5)
Children												
Family adversities												
Any	9535 (7.3)	8943 (7.0)	592 (22.0)	11133 (7.4)	10414 (7.0)	719 (22.4)	3814 (6.3)	3552 (6.0)	262 (20.3)	6949 (7.3)	6537(7.0)	412 (22.4)
Adverse family environments	2237 (1.7)	2026 (1.6)	211 (7.8)	2623 (1.7)	2358(1.6)	265 (8.3)	953 (1.6)	849 (1.4)	104 (8.0)	1598 (1.7)	1465 (1.6)	133 (7.2)
Child maltreatment	4868 (3.7)	3490 (2.7)	1378 (51.2)	4030 (2.7)	2575 (1.7)	1455 (45.3)	1774 (2.9)	1148(1.9)	626 (48.4)	2259(2.4)	1508 (1.6)	751 (40.9)
High-risk presentation of child maltreatment	7552 (5.8)	7119 (5.6)	433 (16.1)	8819 (5.8)	8302(5.6)	517 (16.1)	2959 (4.9)	2783 (4.7)	176 (13.6)	5547(5.8)	5231 (5.6)	316 (17.2)
Total number of adversity domains												
None	120495 (92.7)	118382 (93.0)	2113 (78.6)	140303 (92.7)	137793 (93.0)	2510 (78.2)	56953 (93.8)	55912 (94.1)	104 1(80.5)	88389 (92.8)	86953 (93.0)	1436 (78.2)
1	9117 (7.0)	8609 (6.8)	508 (18.9)	10656 (7.0)	10036 (6.8)	620 (19.3)	3620 (6.0)	3396 (5.7)	224 (17.3)	6657(7.0)	6304 (6.7)	353 (19.2)
≥2	336 (0.3)	268 (0.2)	68 (2.5)	393 (0.3)	312 (0.2)	81 (2.5)	146 (0.2)	118 (0.2)	28 (2.2)	244 (0.3)	196 (0.2)	48 (2.6)

Data in eTable 4 is n (%). IPV=Intimate partner violence. *For mother-child pairs with more than one eligible male, we selected a random male based on random sampling using 500 iterations via the "infer::rep_sample_n" function in R.

eTable 4. Comparing cohort characteristics used in sensitivity analyses by IPV adversity and family member (continued)

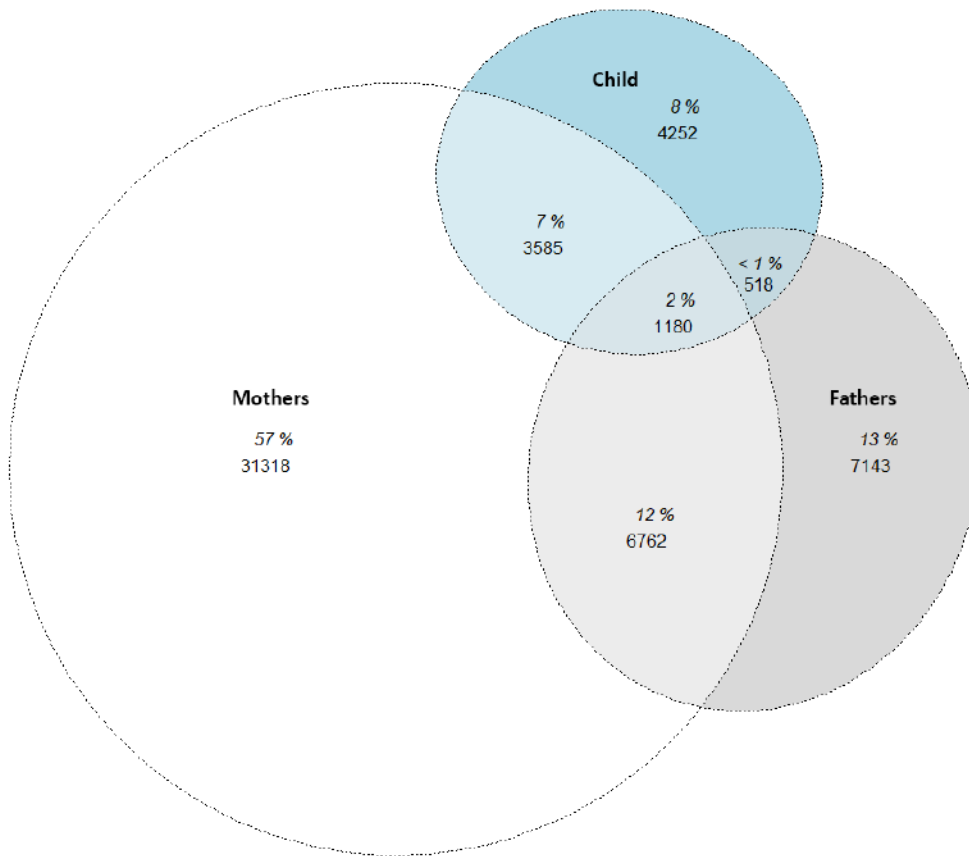
Any family member unless specified	1 year before to 5 years after birth			Expanded outcome: CM and IPV			Separate data sources: Adversity (HES/ONS only) and IPV (CPRD primary care only)		
	Overall cohort (n=129 948)	No IPV (n=126 951)	IPV (n=2997)	Overall cohort (n=129,948)	No IPV (n=123,894)	IPV and CM (n=6054)	Overall cohort (n=129 948)	No IPV (n=127 635)	IPV (n=2313)
	Family adversities								
None	66123 (50.9%)	65689 (51.7%)	434 (14.5%)	75190 (57.9%)	73944 (59.7%)	1245 (20.6%)	102311 (78.7%)	101237 (79.3%)	1074 (46.4%)
Any	63825 (49.9%)	61262 (48.3%)	2563 (85.5%)	54758 (42.1%)	49950 (40.3%)	4808 (79.4%)	27637 (21.3%)	26398 (20.7%)	1239 (53.6%)
Adverse family environments	20841 (16.0%)	19428 (15.3%)	1413 (47.%)	16222 (12.5%)	13869 (11.2%)	2353 (38.9%)	2193 (1.7%)	1963 (1.5%)	230 (9.9%)
Parental mental health problems	43228 (33.3%)	41192 (32.4%)	2036 (67.9%)	35669 (27.4%)	32060 (25.9%)	3609 (59.6%)	12934 (10.0%)	12207 (9.6%)	727 (31.4%)
Parental substance misuse	23629 (18.2%)	22231 (17.5%)	1398 (46.6%)	18639 (14.3%)	16258 (13.1%)	2381 (39.3%)	16648 (12.8%)	15815 (12.4%)	833 (36.0%)
Total number of adversity domains									
None	66123 (50.9%)	65689 (51.7%)	434 (14.5%)	75190 (57.9%)	73944 (59.7%)	1246 (20.6%)	102311 (78.7%)	101237 (79.3%)	1074 (46.4%)
1	38879 (29.9%)	38094 (30.0%)	785 (26.2%)	36310 (27.9%)	34509 (27.9%)	1801 (29.7%)	21934 (16.9%)	21218 (16.6%)	716 (31.0%)
2	18026 (13.9%)	17106 (13.5%)	920 (30.7%)	14061 (10.8%)	12316 (9.9%)	1745 (28.8%)	5086 (3.9%)	4681 (3.7%)	405 (17.5%)
≥3	6920 (5.3%)	6062 (4.8%)	858 (28.6%)	4387 (3.4%)	3125 (2.5%)	1262 (20.8%)	617 (0.5%)	499 (0.4%)	118 (5.1%)
Any adversity domain recorded in mother, father or child									
Neither mother, father or child	64744 (49.8%)	64328 (50.7%)	416 (13.9%)	75195 (57.9%)	73949 (59.7%)	1246 (20.6%)	102325 (78.7%)	101250 (79.3%)	1075 (46.5%)
Mother or father only	41104 (31.6%)	39883 (31.4%)	1221 (40.7%)	38516 (29.6%)	35883 (29.0%)	2633 (43.5%)	23321 (17.9%)	22334 (17.5%)	987 (42.7%)
Child only	5621 (4.3%)	5536 (4.4%)	85 (2.8%)	4247 (3.3%)	4049 (3.3%)	198 (3.3%)	1987 (1.5%)	1934 (1.5%)	53 (2.3%)
Mother and father only	9134 (7.0%)	8614 (6.8%)	520 (17.4%)	6784 (5.2%)	5856 (4.7%)	928 (15.3%)	1541 (1.2%)	1424 (1.1%)	117 (5.1%)
Mother or father and child	6836 (5.3%)	6364 (5.0%)	472 (15.7%)	4048 (3.1%)	3373 (2.7%)	675 (11.1%)	716 (0.6%)	649 (0.5%)	67 (2.9%)
Mother, father and child	2509 (1.9%)	2226 (1.8%)	283 (9.4%)	1158 (0.9%)	784 (0.6%)	374 (6.2%)	58 (0.0%)	44 (0.0%)	14 (0.6%)
Mothers									
Family adversities									
None	79399 (61.1%)	78752 (62.0%)	647 (21.6%)	87103 (67.0%)	85261 (68.8%)	1842 (30.4%)	107821 (83.0%)	106576 (83.5%)	1245 (53.8%)
Any	50549 (38.9%)	48199 (38.0%)	2350 (78.4%)	42845 (33.0%)	38633 (31.2%)	4212 (69.6%)	22127 (17.0%)	21059 (16.5%)	1068 (46.2%)
Adverse family environments	14351 (11.0%)	13243 (10.4%)	1108 (37.0%)	11133 (8.6%)	9343 (7.5%)	1790 (29.6%)	1258 (1.0%)	1088 (0.9%)	170 (7.3%)
Parental mental health problems	36621 (28.2%)	34761 (27.4%)	1860 (62.%)	30181 (23.2%)	26986 (21.8%)	3195 (52.8%)	11099 (8.5%)	10464 (8.2%)	635 (27.5%)
Parental substance misuse	17891 (13.8%)	16736 (13.2%)	1155 (38.5%)	14579 (11.2%)	12632 (10.2%)	1947 (32.2%)	13936 (10.7%)	13198 (10.3%)	738 (31.9%)
Total number of adversity domains									
None	79399 (61.1%)	78752 (62.0%)	647 (21.6%)	87103 (67.0%)	85261 (68.8%)	1842 (30.4%)	107821 (83.0%)	106576 (83.5%)	1245 (53.8%)
1	34947 (26.9%)	33937 (26.7%)	1010 (33.7%)	31427 (24.2%)	29366 (23.7%)	2061 (34.0%)	18195 (14.0%)	17545 (13.7%)	650 (28.1%)
2	12890 (9.9%)	11983 (9.4%)	907 (30.3%)	9788 (7.5%)	8206 (6.6%)	1582 (26.1%)	3698 (2.8%)	3337 (2.6%)	361 (15.6%)
≥3	2712 (2.%)	2279 (1.8%)	433 (14.4%)	1630 (1.3%)	1061 (0.9%)	569 (9.4%)	234 (0.2%)	177 (0.1%)	57 (2.5%)
Any adversity domain recorded in mother or child									
Neither mother or child	66017 (50.8%)	65542 (51.6%)	475 (15.8%)	82338 (63.4%)	80748 (65.2%)	1590 (26.3%)	105747 (81.4%)	104561 (81.9%)	1186 (51.3%)
Mother only	48922 (37.6%)	47245 (37.2%)	1677 (56.0%)	38157 (29.4%)	34940 (28.2%)	3217 (53.1%)	2074 (1.6%)	2015 (1.6%)	59 (2.6%)
Child only	5995 (4.6%)	5894 (4.6%)	101 (3.4%)	4765 (3.7%)	4513 (3.6%)	252 (4.2%)	21440 (16.5%)	20447 (16.0%)	993 (42.9%)

Mother and child	9014 (6.9%)	8270 (6.5%)	744 (24.8%)	4688 (3.6%)	3693 (3.0%)	995 (16.4%)	687 (0.5%)	612 (0.5%)	75 (3.2%)
Fathers									
Family adversities									
None	109271 (84.%)	107223 (84.5%)	2048 (68.3%)	114345 (88.0%)	109991 (88.8%)	4354 (71.9%)	124840 (96.1%)	122775 (95.2%)	2065 (89.3%)
Any	20677 (15.9%)	19728 (15.5%)	949 (31.7%)	15603 (12.0%)	13903 (11.2%)	1700 (28.1%)	5543 (4.3%)	5274 (4.1%)	269 (11.6%)
Adverse family environments	6323 (4.9%)	5890 (4.6%)	433 (14.4%)	4589 (3.5%)	3917 (3.2%)	672 (11.1%)	366 (0.3%)	338 (0.3%)	28 (1.2%)
Parental mental health problems	13186 (10.%)	12529 (9.9%)	657 (21.9%)	9888 (7.6%)	8712 (7.0%)	1176 (19.4%)	2267 (1.7%)	2113 (1.7%)	154 (6.7%)
Parental substance misuse	7811 (6.0%)	7379 (5.8%)	432 (14.4%)	5327 (4.1%)	4600 (3.7%)	727 (12.0%)	3567 (2.7%)	3409 (2.7%)	158 (6.8%)
Total number of adversity domains									
None	109271 (84.%)	107223 (84.5%)	2048 (68.3%)	114345 (88.0%)	109991 (88.8%)	4354 (71.9%)	124840 (96.1%)	122775 (95.2%)	2065 (89.3%)
1	15046 (11.6%)	14537 (11.5%)	509 (17.0%)	11975 (9.2%)	10987 (8.9%)	988 (16.3%)	4131 (3.2%)	3962 (3.1%)	169 (7.3%)
2	4619 (3.6%)	4312 (3.4%)	307 (10.2%)	3055 (2.4%)	2506 (2.0%)	549 (9.1%)	862 (0.7%)	796 (0.6%)	66 (2.9%)
≥3	1012 (0.8%)	879 (0.7%)	133 (4.4%)	573 (0.4%)	410 (0.3%)	163 (2.7%)	115 (0.1%)	102 (0.1%)	13 (0.6%)
Any adversity domain recorded in father or child									
Neither Father or child	97775 (75.2%)	96258 (75.8%)	1517 (50.6%)	106568 (82.0%)	103033 (83.2%)	3535 (58.4%)	122224 (94.1%)	120273 (94.2%)	1951 (84.3%)
Father only	17164 (13.2%)	16529 (13.0%)	635 (21.2%)	13927 (10.7%)	12655 (10.2%)	1272 (21.0%)	4963 (3.8%)	4735 (3.7%)	228 (9.9%)
Child only	11495 (8.8%)	10964 (8.6%)	531 (17.7%)	7777 (6.0%)	6958 (5.6%)	819 (13.5%)	2616 (2.0%)	2502 (2.0%)	114 (4.9%)
Father and child	3514 (2.7%)	3200 (2.5%)	314 (10.5%)	1676 (1.3%)	1248 (1.0%)	428 (7.1%)	145 (0.1%)	125 (0.1%)	20 (0.9%)
Children									
Family adversities									
None	114982 (88.5%)	112825 (88.9%)	2157 (72.0%)	120413 (92.7%)	115647 (93.3%)	4766 (78.7%)	127187 (97.9%)	125008 (97.9%)	2179 (94.2%)
Any	11337 (8.7%)	10625 (8.4%)	712 (23.8%)	9535 (7.3%)	8247 (6.7%)	1288 (21.3%)	2859 (2.2%)	2706 (2.1%)	153 (6.6%)
Adverse family environments	2925 (2.3%)	2649 (2.1%)	276 (9.2%)	2237 (1.7%)	1801 (1.5%)	436 (7.2%)	625 (0.5%)	571 (0.4%)	54 (2.3%)
Child maltreatment	6703 (5.2%)	5185 (4.1%)	1518 (50.7%)	4868 (3.7%)	-	4868 (80.4%)	1680 (1.3%)	1501 (1.2%)	179 (7.7%)
High-risk presentation of child maltreatment	8884 (6.8%)	8373 (6.6%)	511 (17.%)	7552 (5.8%)	6610 (5.3%)	942 (15.6%)	2204 (1.7%)	2108 (1.7%)	96 (4.2%)
Total number of adversity domains									
None	114982 (88.5%)	112825 (88.9%)	2157 (72.0%)	120495 (92.7%)	115688 (93.4%)	4807 (79.4%)	127187 (97.9%)	125008 (97.9%)	2179 (94.2%)
1	13580 (10.5%)	12890 (10.2%)	690 (23.0%)	9117 (7.0%)	8001 (6.5%)	1116 (18.4%)	2693(2.1%)	2575 (2.0%)	118 (5.1%)
≥2	1386 (1.1%)	1236 (1.0%)	150 (5.0%)	336 (0.3%)	205 (0.2%)	131 (2.2%)	68 (0.1%)	52 (0.0%)	16 (0.7%)

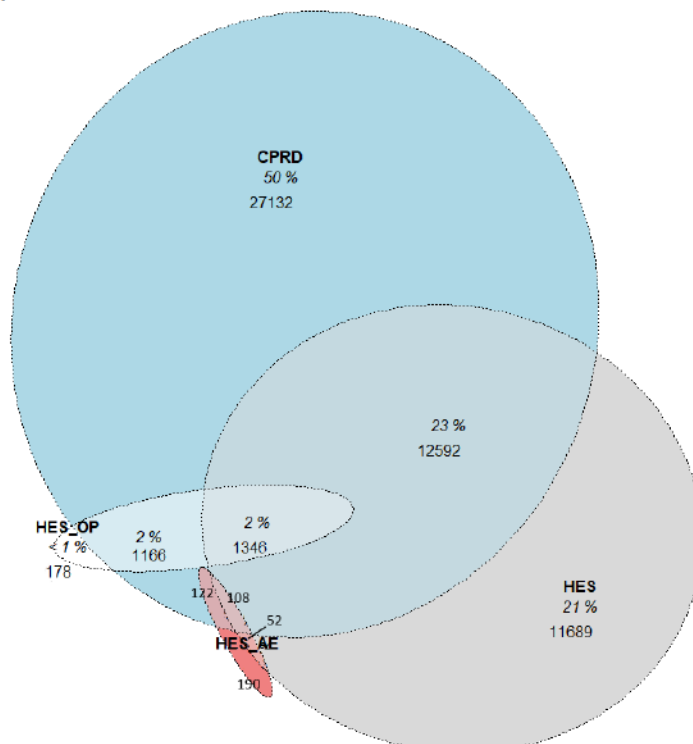
Data in eTable 4 is n (%). IPV=Intimate partner violence.

eFig 2. Venn diagram showing overlap of recorded adversities and IPV by family member and data source domains one year before and two years after birth

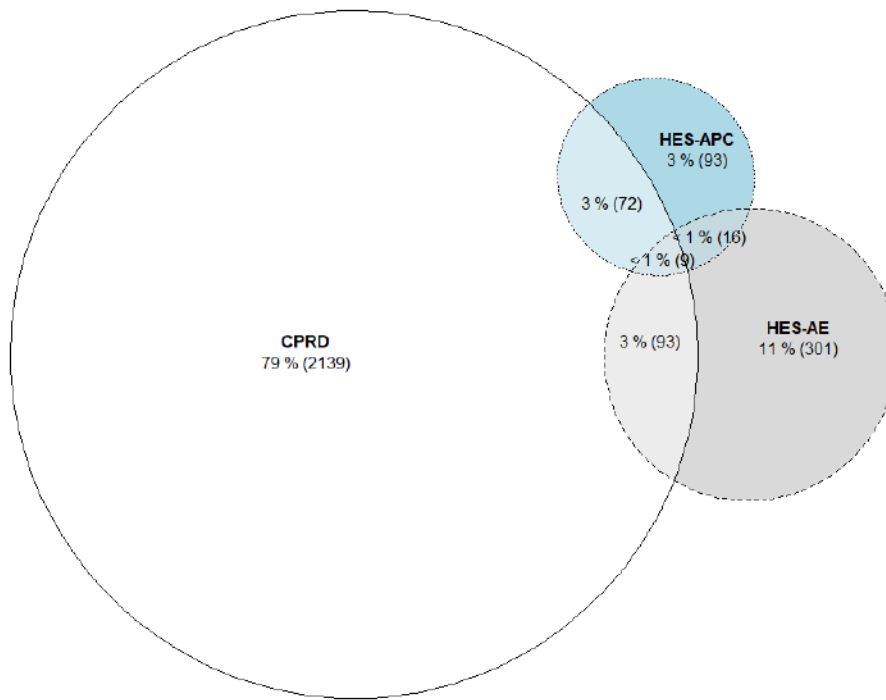
A. Adversity by family member



B. Adversity by data source



C. IPV by data source



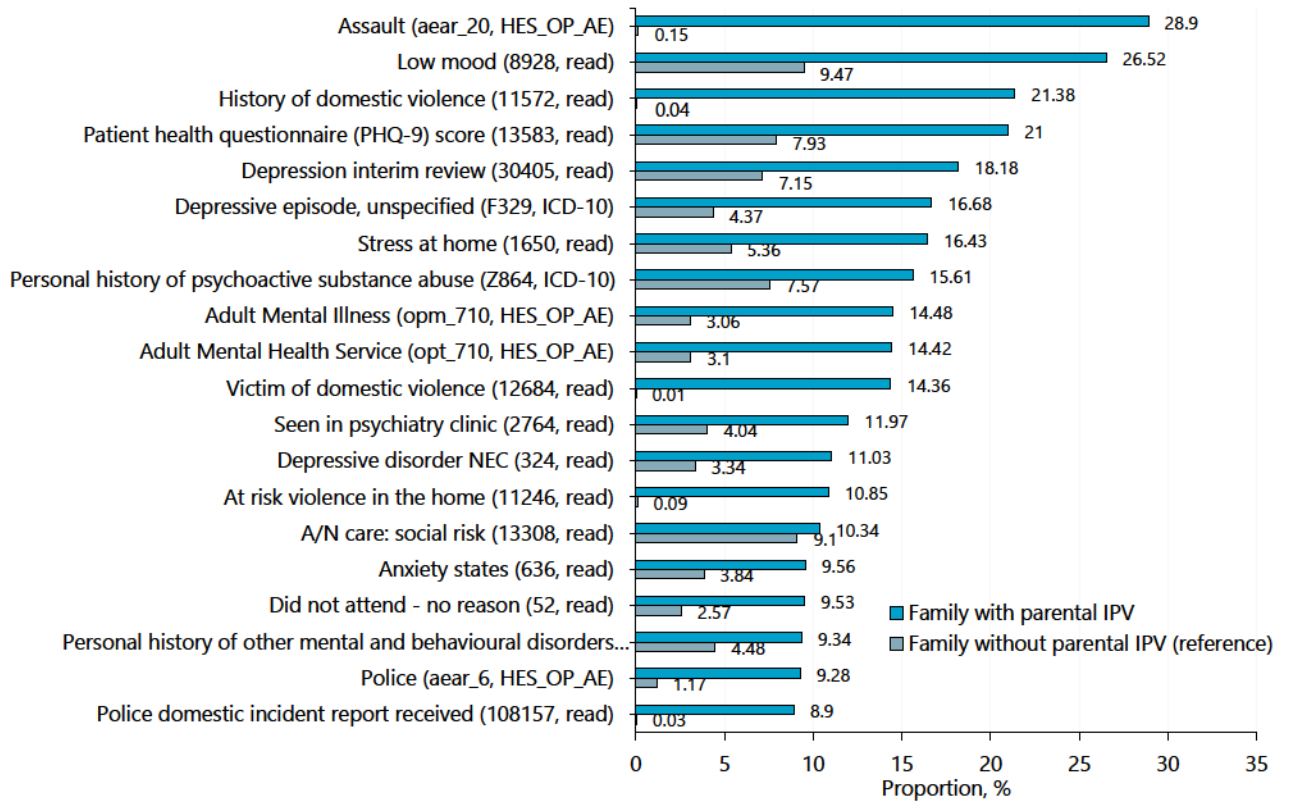
eTable 5. Odds ratios for baseline cohort characteristics associated with IPV between one year before and two years after birth

Cohort characteristics	Adjusted and weighted OR (95%CI)
Maternal age at birth, years	
≤19	8.46 (6.32-11.33)
20–39	Reference category
≥40	1.58 (1.22-2.03)
Paternal age at birth, years	
Maternal parity	
0	Reference category
1–3	1.06 (0.93-1.21)
≥4	2.78 (2.28-3.39)
Number of siblings per mother-child pair at birth	
1	Reference category
2	0.85 (0.77-0.95)
≥3	1.46 (1.18-1.80)
Index of multiple deprivation quintile	
1 (least deprived)	Reference category
2	1.33 (1.09-1.63)
3	2.00 (1.64-2.44)
4	3.28 (2.71-3.97)
5 (most deprived)	4.60 (3.78-5.60)
Location of general practice (region of England, UK)	
London	1.37 (1.17-1.60)
Northeast, northwest, and Yorkshire	1.39 (1.16-1.67)
East and West Midlands	1.08 (0.90-1.29)
East	0.83 (0.70-0.98)
Southeast, southwest, and south-central	Reference category
Child and delivery characteristics	
Multiple pregnancy	
Singleton	Reference category
Multiple (e.g., twins)	0.73 (0.49-1.10)
Gestational age at birth, weeks	
≥37	Reference category
<37	1.4 (1.18-1.67)
Birthweight, g	
≥3500	Reference category
2500-3499	1.47 (1.29-1.66)
<2500	2.28 (1.87-2.78)
Congenital anomaly	1.08 (0.83-1.40)
Birth year	
2007–12	Reference category
2013–19	1.01 (0.87-1.17)

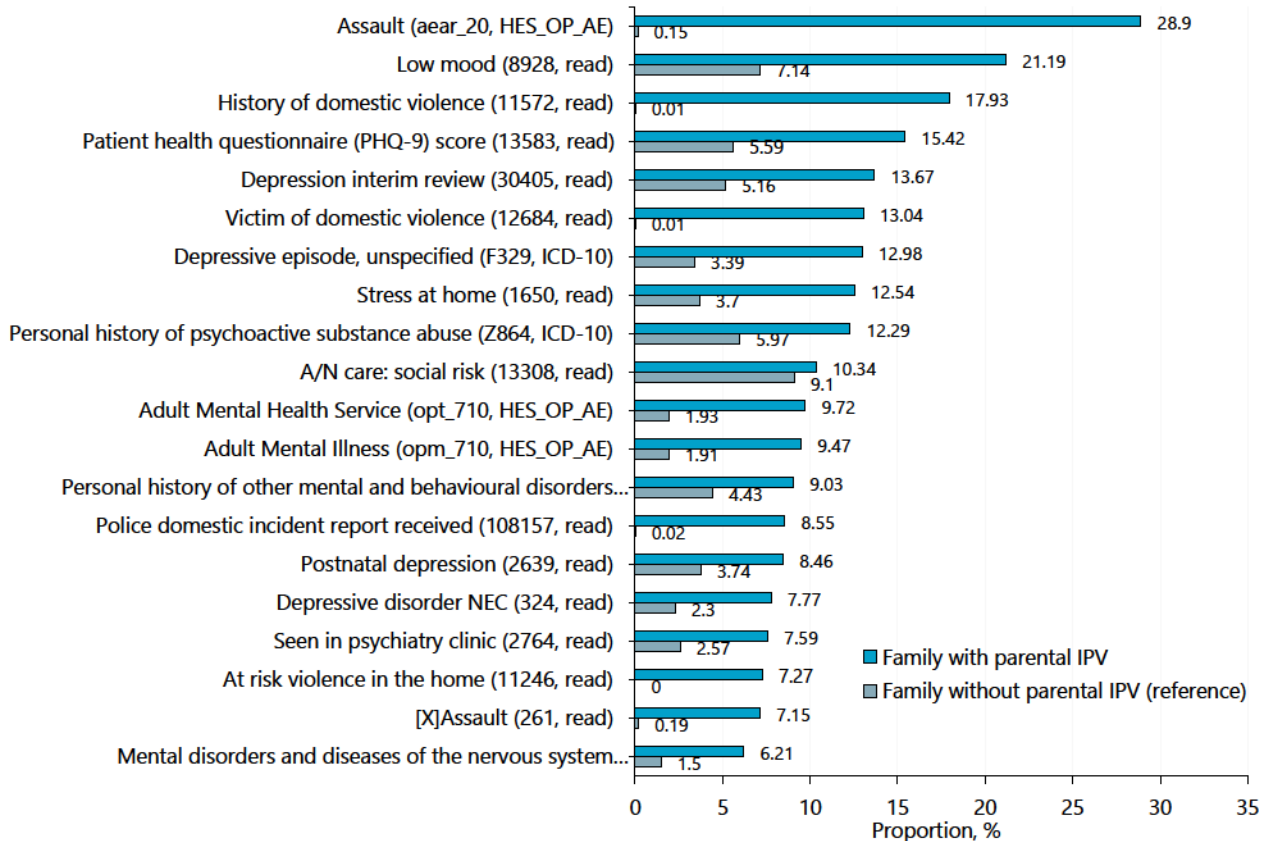
eTable 5 shows each baseline characteristic's adjusted and inverse probability weighted odds ratio associated with IPV between 1 year before birth and 2 years after birth, adjusting for children's year of birth. eTable 3 shows the variables used to calculate Inverse probability weights.

eFig 3. Top 20 most recorded adversity codes associated with IPV between one year before and two years after birth estimates by family member

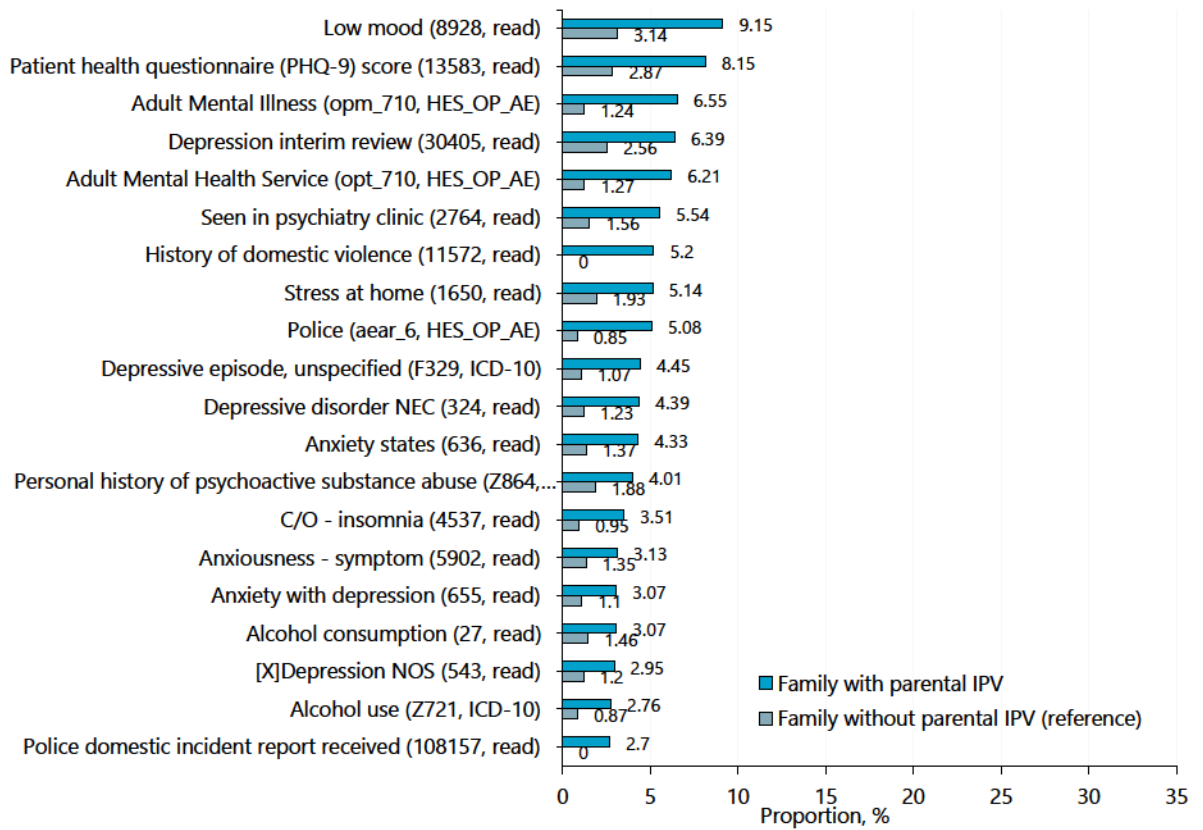
Any family member



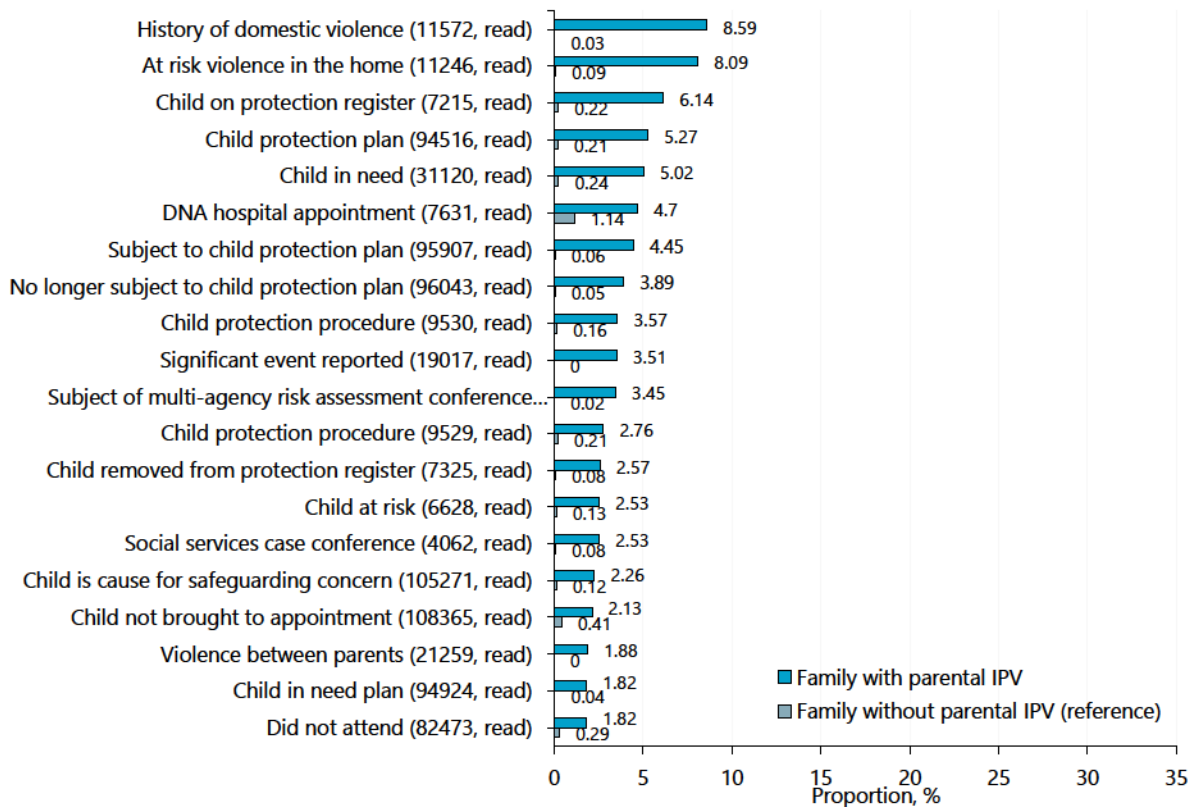
Mother



Father



Child



*Codes are combined into indicators based on multiple rule-based algorithms, including exclusions of accidental injuries, genetic predispositions (eg, bone diseases), traumatic birth injuries, transmissions of diseases from mother to child during birth, or needing to meet higher cut-off score on a validated self-report instrument.

eTable 6. Adjusted and weighted probabilities and odds ratios for IPV by combinations of different family adversities

Combination of different family adversities	Overall cohort (n=129 948)	No IPV (n= 127 259)		Probability of IPV per 100 children/parents (95% CI)	Adjusted and weighted OR (95%CI)
		No IPV (n= 127 259)	IPV (n=2689)		
None*	75190 (57.9%)	74762 (58.8%)	428 (15.9%)	0.6 (0.5-0.6)	Ref
Any one adversity	36310 (27.9%)	35509 (27.9%)	801 (29.8%)	2.2 (2-2.3)	3.7 (3.2-4.2)
Any two adversities	14061 (10.8%)	13243 (10.4%)	818 (30.4%)	6.5 (5.8-7.2)	11.6 (9.9-13.6)
AFE & parental MHPs	8673 (6.7%)	7737 (6.1%)	936 (34.7%)	11.4 (10.4-12.3)	8.47 (7.5-9.5)
AFE & SM	4061 (3.1%)	3498 (2.7%)	563 (20.9%)	14.4 (12.8-15.9)	10.1 (8.1-12.7)
AFE & HRP-CM	1785 (1.4%)	1532 (1.2%)	253 (9.4%)	15.2 (11.7-18.8)	8.99 (6.8-11.9)
Parental MHPs & parental SM	9294 (7.2%)	8464 (6.7%)	830 (30.8%)	9.6 (8.7-10.6)	6.6 (5.8-7.5)
Parental MHPs & HRP-CM	3183 (2.4%)	2875 (2.3%)	308 (11.4%)	9.6 (8.2-10.9)	5.3 (4.5-6.2)
parental SM & HRP-CM	1720 (1.3%)	1531 (1.2%)	189 (7.0%)	10.8 (8.9-12.7)	5.84 (4.7-7.2)
Any three or more adversities	4387 (3.4%)	3745 (2.9%)	642 (23.9%)	15.1 (13.6-16.5)	29.6 (25.3-34.8)
AFE & parental MHPs & parental SM	2953 (2.3%)	2468 (1.9%)	485 (18.0%)	9.6 (8.7-10.6)	11.36 (9.8-13.2)
AFE & parental MHPs & parental SM & HRP-CM	491 (0.4%)	384 (0.3%)	107 (4.0%)	21 (15.9-26)	12.5 (9.2-17.1)

Abbreviations: AFE= Adverse family environment, HRP-CM=High-risk presentations of child maltreatment in children ≤3y; MHPs=mental health problems; SM=Substance misuse

eTable 7. Adjusted and weighted probabilities and odds ratios for IPV according to specific indicators of adversity (grouped by domain)

Family adversity domain and indicator	Overall cohort (n=129,948)	No IPV (n=127,259)	IPV (n=2689)	awOR (95%CI)	Probability of IPV in 100 (95% CI)
No family adversity	75190 (57.9%)	74762 (58.8%)	428 (15.9%)	-	0.57 (0.50-0.63)
Adverse family environments					
Family disruptions and parental conflicts, NOS	5846 (4.5%)	5242 (4.1%)	604 (22.5%)	2.1 (2.0-2.3)	13.5 (11.7-15.2)
Family is cause for concern	2331 (1.8%)	2086 (1.6%)	245 (9.1%)	1.8 (1.5-2.1)	12.2 (9.3-15.2)
Parental problems with daily living and work	2641 (2.0%)	2433 (1.9%)	208 (7.7%)	1.4 (1.2-1.6)	8.3 (7.0-9.7)
Health visitor increasing concern	1772 (1.4%)	1627 (1.3%)	145 (5.4%)	1.8 (1.5-2.1)	12.3 (9.3-15.2)
Housing problems, signs of deprivation	895 (0.7%)	774 (0.6%)	121 (4.5%)	1.9 (1.6-2.2)	13.3 (9.9-16.7)
Unwanted or concealed pregnancy (including attempted abortion)	1540 (1.2%)	1434 (1.1%)	106 (3.9%)	1.2 (1.0-1.5)	7.2 (5.6-8.7)
High-risk antenatal psychosocial presentation	820 (0.6%)	725 (0.6%)	95 (3.5%)	1.9 (1.6-2.2)	12.7 (9.3-16.1)
Parent with legal problems	1255 (1.0%)	1177 (0.9%)	78 (2.9%)	1.4 (1.1-1.7)	8.3 (6.0-10.6)
Parental separation	697 (0.5%)	631 (0.5%)	66 (2.5%)	1.6 (1.2-2.0)	10.3 (6.9-13.7)
Psychosocial health problem with lower-level intervention	718 (0.6%)	665 (0.5%)	53 (2%)	1.5 (1.1-1.9)	9.4 (6.0-12.7)
Parental learning or intellectual disability	379 (0.3%)	343 (0.3%)	36 (1.3%)	2.0 (1.4-2.5)	14.5 (7.7-21.2)
Father assaulted NOS (GP record only)	265 (0.2%)	244 (0.2%)	21 (0.8%)	1.1 (0.6-1.6)	6.4 (3.6-9.3)
Parental mental health problems					
Depression	24724 (19%)	23388 (18.4%)	1336 (49.7%)	1.5 (1.4-1.6)	6.3 (5.8-6.7)
Referred/seen by a mental health professional	11165 (8.6%)	10421 (8.2%)	744 (27.7%)	1.5 (1.4-1.7)	8.0 (7.2-8.8)
Anxiety disorders	11213 (8.6%)	10634 (8.4%)	579 (21.5%)	1.1 (1.0-1.3)	6.0 (5.2-6.7)
Mental health problems NOS	6397 (4.9%)	6023 (4.7%)	374 (13.9%)	1.2 (1.0-1.4)	6.5 (5.6-7.3)
Self-harm or suicide attempts	1605 (1.2%)	1381 (1.1%)	224 (8.3%)	2.2 (2.0-2.4)	16.8 (13.9-19.6)
Sleep-wake disorders	2434 (1.9%)	2272 (1.8%)	162 (6%)	1.5 (1.3-1.8)	9.3 (7.3-11.3)
Psychosis (incl. mental health sections)	1707 (1.3%)	1562 (1.2%)	145 (5.4%)	1.7 (1.4-2.0)	11.0 (8.4-13.7)
Panic disorder (incl. agoraphobia, health anxiety)	1606 (1.2%)	1489 (1.2%)	117 (4.1%)	1.4 (1.1-1.7)	8.2 (5.8-10.6)
Posttraumatic stress disorder (incl. ASD)	1019 (0.8%)	910 (0.7%)	109 (3.8%)	1.7 (1.4-2.0)	11.0 (8.1-13.9)
Personality disorders	400 (0.3%)	338 (0.3%)	62 (2.3%)	2.4 (2.0-2.9)	20.8 (13.8-27.9)
Neurodevelopmental disorders	342 (0.3%)	317 (0.3%)	25 (0.9%)	1.2 (0.5-1.9)	7.1 (3.7-10.5)
Eating disorders	457 (0.4%)	431 (0.3%)	26 (1%)	1.0 (0.5-1.5)	6.1 (3.2-8.9)
Obsessive-compulsive disorders	478 (0.4%)	455 (0.4%)	23 (0.9%)	0.7 (0.1-1.2)	4.3 (2.2-6.4)
Parental substance misuse					
Moderate drug misuse (all other)	15721 (12.1%)	14783 (11.6%)	938 (34.9%)	1.5 (1.3-1.6)	7.0 (6.3-7.7)
Severe drug misuse (likely dependence levels)	2516 (1.9%)	2196 (1.7%)	320 (11.9%)	2.2 (2.0-2.4)	16.5 (14.2-18.9)
Severe alcohol misuse	3343 (2.6%)	3097 (2.4%)	246 (9.2%)	1.8 (1.6-2.0)	11.8 (9.4-14.2)
High-risk presentations of maltreatment in children ≤3y					
≥3 non-attendances of child appointments within 3 years	4017 (3.1%)	3711 (2.9%)	306 (11.4%)	1.5 (1.3-1.7)	8.7 (6.8-10.5)
Bruising and contusions in children	835 (0.6%)	770 (0.6%)	65 (2.3%)	1.2 (0.8-1.5)	6.9 (4.7-9.0)
Superficial injuries of multiple body parts (e.g., head, neck, face etc)	923 (0.7%)	875 (0.7%)	48 (1.8%)	1.1 (0.8-1.5)	6.7 (4.3-9.1)
Child harm by undetermined intent (drownings etc.)	458 (0.4%)	418 (0.3%)	40 (1.5%)	1.5 (1.0-1.9)	9.1 (5.6-12.6)

ASD=Acute stress disorder, IPV=Intimate partner violence, NOS=Not otherwise specified. *We restricted disaggregation of domain-specific indicators to indicators present in 250 or more unique children. Ordered by ascending prevalence, high to low. †Neurodevelopmental disorders include ADHD, autism spectrum disorders, and conduct disorders. ‡Medications, interventions, and psychiatric symptoms were combined into appropriate disorder clusters using validated algorithms.¹³ §Indicators are defined by multiple rule-based algorithms, including age restrictions in years (upper age cut-off denoted in brackets), exclusions of accidental injuries, genetic predispositions (eg, bone diseases), traumatic birth injuries, transmissions of diseases from mother to child during birth, or need to meet higher cut-off score on a validated self-report instrument. All code lists and algorithms are freely available online (www.ACESinEHRs.com).¹³

eTable 8. Adjusted and weighted prevalence estimates and odds ratios of parental physical and mental health comorbidities (Global Burden of Disease classification scheme) among families with and without IPV one year before and two years after birth

	Overall cohort (n=129,948)		No IPV (n=127,259)		IPV (n=2689)		Relative risk	
	n	Adjusted & weighted Prevalence,% (95% CI)	n	Adjusted & weighted Prevalence,% (95% CI)	n	Adjusted & weighted Prevalence,% (95% CI)	Adjusted & weighted OR (95%CI)	Adjusted & weighted mean difference prevalence, %
Mother or father								
Any parental mental health problem ¹	35669	27.1% (26.8%-27.4%)	33950	26.3% (25.9%-26.6%)	1719	64.2% (61.5%-66.9%)	5.0 (4.5-5.7)	37.9% (35.2%, 40.6%)
Any parental depression	24724	18.7% (18.4%-19.0%)	23388	18.0% (17.7%-18.3%)	1336	49.9% (47.2%-52.6%)	4.5 (4.0-5.1)	31.8% (29.1%-34.6%)
Any parental substance misuse problems	18639	14.1% (13.9%-14.4%)	17549	13.6% (13.3%-13.8%)	1090	40.0% (37.2%-42.7%)	4.4 (3.9-5.0)	26.4% (23.7%, 29.1%)
Any parental physical health comorbidity	95515	73.4% (73.1%-73.7%)	93349	73.2% (72.9%-73.6%)	2166	79.4% (76.7%-82.0%)	1.4 (1.2-1.7)	6.1% (3.5%, 8.8%)
Mothers								
Any mental health problem¹	30181	23.0% (22.7%-23.4%)	28609	22.2% (21.9%-22.6%)	1572	58.4% (55.7%-61.2%)	4.9 (4.4-5.5)	36.3% (33.5%, 39.0%)
Depression	21081	16.1% (15.8%-16.4%)	19863	15.4% (15.2%-15.7%)	1218	45.5% (42.8%-48.2%)	4.6 (4.1-5.1)	30.1% (27.4%, 32.8%)
Any substance misuse ³	14579	11.2% (11.0%-11.4%)	13661	10.7% (10.5%-10.9%)	918	34.3% (31.6%-37%)	4.6 (4.0-5.2)	23.6% (20.9%, 26.3%)
Moderate drug misuse (all other)	13288	10.2% (10.2%-10.4%)	12476	9.7% (9.5%-9.9%)	812	30.3% (27.7%-32.9%)	4.3 (3.7-4.9)	20.6% (18.0%, 23.2%)
Referred/seen by a mental health professional	8377	6.5% (5.3%-6.7%)	7780	6.1% (5.9%-6.3%)	597	23.9% (21.6%-26.3%)	4.9 (4.3-5.5)	17.9% (15.5%, 20.2%)
Anxiety disorders	8665	6.6% (6.4%-6.8%)	8201	6.3% (6.1%-6.5%)	464	17.1% (15.1%-19.2%)	3.1 (2.6-3.6)	10.8% (8.7%, 12.9%)
Mental health problems NOS	6348	4.9% (4.7%-5.1%)	5977	4.7% (4.5%-4.9%)	371	13.8% (12%-15.6%)	3.3 (2.8-3.9)	9.1% (7.3%, 10.9%)
Severe drug misuse (likely dependence)	1450	11.6% (10.8%-12.4%)	1218	1.0% (0.9%-1.1%)	232	8.5% (7.2%-9.8%)	9.2 (7.7-11.1)	7.5% (6.2%-8.8%)
Self-harm or suicide attempts ¹⁰	1043	0.8% (0.8%-0.9%)	869	0.7% (0.7%-0.8%)	174	5.9% (4.9%-6.9%)	8.5 (7.0-10.4)	5.2% (4.1%, 6.2%)
Severe alcohol misuse	1153	0.9% (0.8%-1.0%)	1025	0.8% (0.7%-0.9%)	128	4.8% (3.7%-5.9%)	6.1 (4.8-7.9)	4.0% (2.9%, 5.0%)
Sleep-wake disorders	1400	10.4% (1.0%-1.1%)	1289	1.0% (0.9%-1%)	111	4.2% (3.1%-5.2%)	4.5 (3.4-5.8)	3.2% (2.2%, 4.2%)
Psychosis (incl. mental health sections)	1100	0.8% (0.8%-0.9%)	1004	0.8% (0.7%-0.8%)	96	4.2% (3.1%-5.3%)	5.6 (4.2-7.5)	3.4% (2.3%, 4.5%)
Any physical health comorbidity	82145	63.4% (63%-63.7%)	80148	63.1% (62.8%-63.5%)	1997	73.4% (70.7%-76.1%)	1.6 (1.4-1.8)	10.3% (7.6%, 12.9%)
Diabetes and endocrine diseases ¹³	48592	38.0% (37.6%-38.3%)	47421	37.9% (37.5%-38.2%)	1171	42.8% (40.1%-45.5%)	1.2 (1.1-1.4)	5.0% (2.3%, 7.7%)
Chronic pain ^{2*}	32126	24.5% (24.2%-24.8%)	31031	24.2% (23.8%-24.5%)	1095	39.4% (36.5%-41.6%)	2.0 (1.8-2.2)	14.9% (12.3%, 17.4%)
Other-noncommunicable diseases ^{4†}	35208	26.9% (26.5%-27.2%)	34252	26.7% (26.3%-27%)	956	35.9% (33.2%-38.7%)	1.5 (1.4-1.7)	9.3% (6.5%, 12%)
Chronic respiratory diseases ¹²	22624	16.8% (16.5%-17%)	21923	16.6% (16.3%-16.9%)	701	24.7% (22.5%-26.9%)	1.7 (1.5-1.9)	8.1% (5.9%, 10.3%)
Digestive diseases ^{8‡}	12967	9.9% (9.7%-10.2%)	12584	9.8% (9.6%-10.1%)	383	14.5% (12.8%-16.3%)	1.6 (1.3-1.8)	4.7% (2.9%, 6.5%)
Cardiovascular and circulatory diseases ⁹	13264	10.6% (10.3%-10.8%)	13003	10.6% (10.3%-10.9%)	261	9.8% (8.3%-11.2%)	0.9 (0.8-1.1)	-0.8% (-2.3%, 0.6%)
Nutritional deficiencies ¹⁸	1106	7.8% (7.6%-8.1%)	1082	7.8% (7.6%-8%)	24	9.5% (8.1%-10.8%)	1.2 (1.1-1.4)	1.7% (0.3%, 3%)
Neurological disorders ^{5§}	886	0.7% (0.6%-0.7%)	857	0.7% (0.6%-0.7%)	29	1.1% (0.6%-1.6%)	1.7 (1.0-2.7)	0.5% (-0.1%, 1.0%)
Musculoskeletal disorders ²	745	0.6% (0.5%-0.6%)	725	0.6% (0.5%-0.6%)	20	0.7% (0.3%-1%)	1.2 (0.7-2.0)	0.1% (-0.2%, 0.5%)
Neoplasms ⁶	703	0.5% (0.5%-0.6%)	687	0.5% (0.5%-0.6%)	16	0.4% (0.2%-0.6%)	0.8 (0.5-1.4)	-0.1% (-0.3%, 0.1%)
Fathers								
Any mental health problem¹	9888	7.3% (7.2%-7.5%)	9407	7.1% (6.9%-7.3%)	481	17.8% (15.7%-19.7%)	2.8 (2.4-3.2)	10.6% (8.6%, 12.6%)
Depression	5803	4.3% (4.1%-4.4%)	5508	4.1% (4.0%-4.3%)	295	10.7% (9%-12.3%)	2.8 (2.3-3.3)	6.6% (4.9%, 8.2%)
Any substance misuse ³	5327	3.9% (3.8%-4.0%)	5040	3.8% (3.6%-3.9%)	287	9.9% (8.5%-11.3%)	2.8 (2.4-3.3)	6.2% (4.7%, 7.6%)

Moderate drug misuse (all other)	3208	2.3% (2.2%-2.4%)	3011	2.2% (2.1%-2.3%)	197	6.9% (5.6%-8.1%)	3.3 (2.7-4.0)	4.7% (3.4%, 5.9%)
Referred/seen by a mental health professional	3356	2.5% (2.4%-2.6%)	3137	2.4% (2.3%-2.5%)	219	8.1% (6.7%-9.5%)	3.6 (3.0-4.4)	5.7% (4.3%, 7.1%)
Anxiety disorders	3073	2.3% (2.2%-2.4%)	2928	2.2% (2.1%-2.3%)	145	6.0% (4.6%-7.4%)	2.8 (2.2-3.7)	3.8% (2.4%, 5.2%)
Mental health problems NOS [#]	55	-	<7 [#]	-	<7 [#]	-	4.6 (1.1-18.9)	-
Severe drug misuse (likely dependence)	1151	0.9% (0.8%-0.9%)	1042	0.8% (0.7%-0.8%)	109	4.0% (3.0%-5.0%)	5.3 (4.1-7.0)	3.3% (2.2%, 4.3%)
Self-harm or suicide attempts ¹⁰	592	0.4% (0.4%-0.5%)	526	0.4% (0.3%-0.4%)	66	2.1% (1.5%-2.7%)	5.7 (4.2-7.7)	1.7% (1.2%, 2.3%)
Severe alcohol misuse	2266	1.7% (1.6%-1.7%)	2137	1.6% (1.5%-1.7%)	129	4.3% (3.4%-5.1%)	2.8 (2.2-3.4)	2.7% (1.8%, 3.5%)
Sleep-wake disorders	1084	0.8% (0.8%-0.9%)	1027	0.8% (0.7%-0.9%)	57	2.2% (1.3%-3.1%)	2.6 (1.7-4.1)	1.3% (0.4%, 2.2%)
Psychosis (incl. mental health sections)	626	0.5% (0.4%-0.5%)	574	0.4% (0.4%-0.5%)	52	2.0% (1.3%-2.7%)	4.6 (3.1-6.8)	1.6% (0.8%, 2.3%)
Any physical health comorbidity	42768	32.3% (32%-32.7%)	41946	32.4% (32.0%-32.7%)	822	29.6% (27.2%-32.0%)	0.9 (0.8-1.0)	-2.8% (-5.2%, -0.4%)
Diabetes and endocrine diseases ¹³	24664	19.0% (18.7%-19.3%)	24224	19.1% (18.8%-19.3%)	440	16.1% (14.1%-18%)	0.8 (0.7-0.9)	-3.0% (-4.9%, -1.1%)
Chronic pain ^{2*}	16563	12.4% (12.1%-12.6%)	16177	12.3% (12.1%-12.6%)	386	14.3% (12.5%-16.2%)	1.2 (1.0-1.4)	2.0% (0.1%, 3.9%)
Other-noncommunicable diseases ^{4†}	4532	3.5% (3.3%-3.6%)	4428	3.5% (3.3%-3.6%)	104	3.8% (2.9%-4.7%)	1.1 (0.8-1.4)	0.3% (-0.6%, 1.2%)
Chronic respiratory diseases ¹²	12317	9.0% (8.8%-9.3%)	12066	9.0% (8.8%-9.3%)	251	9.3% (7.8%-10.8%)	1.0 (0.9-1.2)	0.0% (0.0%, 0.0%)
Digestive diseases ^{8‡}	4532	4.8% (4.6%-4.9%)	4428	4.7% (4.6%-4.9%)	104	5.7% (4.6%-6.7%)	1.2 (1.0-1.5)	0.9% (-0.1%, 2.0%)
Cardiovascular and circulatory diseases ⁹	4013	2.9% (2.8%-3.1%)	3945	2.9% (2.8%-3.1%)	68	2.6% (1.7%-3.5%)	0.9 (0.6-1.3)	-0.3% (-1.2%, 0.6%)
Nutritional deficiencies ¹⁸	387	0.3% (0.3%-0.3%)	378	0.3% (0.3%-0.3%)	9	0.2% (0.1%-0.4%)	0.8 (0.4-1.7)	-0.1% (0.2%, 0.1%)
Neurological disorders ^{5§}	574	0.4% (0.4%-0.5%)	553	0.4% (0.4%-0.5%)	21	0.7% (0.4%-1.1%)	1.8 (1.0-2.9)	0.3% (-0.1%, 0.7%)
Musculoskeletal disorders ²	676	0.5% (0.4%-0.6%)	660	0.5% (0.4%-0.6%)	16	0.5% (0.2%-0.8%)	1.0 (0.6-1.7)	0.0% (-0.3%, 0.3%)
Neoplasms ⁶	417	0.3% (0.3%-0.3%)	<7 [#]	-	<7 [#]	-	0.6 (0.3-1.5)	-

eTable 8 shows the ten selected parental physical health comorbidities and the two parental mental health problems (including sub-indicators) classified according to Global Burden of Disease (GBD) classification scheme (level 2-3 causes), with the exception the chronic pain indicator which is composite variable of the GBD conditions "low back pain", "neck pain" and chronic pain*. We provide GBD 2019 rankings in superscripts next to each conditions representing rankings for the disability-adjusted life years among females and males aged 15-49 in the UK (see arrow diagram at: <https://vizhub.healthdata.org/gbd-compare/>).

*Chronic pain included any specific diagnosis of chronic pain, specialist pain clinic referrals, prescriptions for higher potency pain analgesics or continuous pain episodes lasting longer than three months.

†Other non-communicable diseases included gynaecological diseases, oral disorders, endocrine, metabolic, blood, and immune disorders.

‡Digestive diseases included cirrhosis, gallbladder and biliary diseases, upper digestive diseases and inflammatory bowel syndrome.

§Neurological disorders included epilepsy, multiple sclerosis, and motor neuron disease.

#Data not provided as the minimum cell count must be ≥5-7 as per CPRD data governance.

We provide the complete list of sub-conditions and corresponding code lists online (www.ACESinEHRs.com).¹³

eMethods 2. Chronic pain (CP) algorithm

We defined CP using a developed hierarchical algorithm,¹⁶ prioritising any first specific diagnosis of CP, specialist pain clinic referrals, or prescriptions for higher potency pain analgesics lasting longer than three months (e.g., morphine) recorded via Read codes (GP data) or ICD-10 codes (hospital admissions).¹⁷ The algorithm then identified CP cases using a broader code list of candidate CP indicators, drug prescriptions (e.g., adjuvant co-analgesics, weak opioids) and continuous pain episodes.¹⁸ The code list of CP indicators was reviewed by a clinical expert (Consultant in Anaesthesia and Pain Medicine), and systematically tested for relevance based on their consistent risk association with specific CP diagnoses (i.e. acting as an internal reference standard). Continuous pain episodes were defined as two or more pain recordings with a minimum of 90 days apart and a maximum of 300 days apart. We adapted this time interval from a previous validation study identifying CP in EHRs of adults.¹⁹ The event date of the first pain-related recording defined the start of the episode. The complete code list of pain-related codes is available at www.ACEsinEHRs.com.

eTable 9. Results from six sensitivity analyses: adjusted and weighted probabilities and odds ratios of adversities associated with IPV

Any family member unless specified	Adjusted & weighted probability (95% CI)				Adjusted & weighted OR (95% CI)			
	Main cohort analysis	Keeping households			Main cohort analysis	Keeping households		
		>1 male (random selected)*	Births 2012-2019 (HES-A&E)	Only two parent households		>1 male (random selected)*	Births 2012-2019 (HES-A&E)	Only two parent households
None vs Any family adversity	0.01 (0.01-0.01)	0.01 (0.01-0.01)	0.01 (0.00-0.01)	0.01 (0.00-0.01)	<i>Ref</i>	<i>Ref</i>	<i>Ref</i>	<i>Ref</i>
Adverse family environments	0.04 (0.04-0.05)	0.04 (0.04-0.05)	0.04 (0.04-0.05)	0.04 (0.04-0.04)	7.7 (6.8-8.8)	7.69 (6.84-8.64)	9.73 (8.01-11.82)	7.98 (6.84-9.32)
Parental mental health problems	0.01 (0.01-0.01)	0.01 (0.01-0.01)	0.01 (0.01-0.01)	0.01 (0.01-0.01)	<i>Ref</i>	<i>Ref</i>	<i>Ref</i>	<i>Ref</i>
Parental substance misuse	0.08 (0.07-0.09)	0.08 (0.07-0.09)	0.09 (0.08-0.11)	0.07 (0.06-0.08)	6.3 (5.6-7.1)	6.51 (5.84-7.25)	8.22 (6.96-9.7)	6.18 (5.47-6.99)
	0.01 (0.01-0.01)	0.01 (0.01-0.01)	0.01 (0.01-0.01)	0.01 (0.01-0.01)	<i>Ref</i>	<i>Ref</i>	<i>Ref</i>	<i>Ref</i>
	0.05 (0.05-0.06)	0.05 (0.05-0.05)	0.05 (0.05-0.05)	0.05 (0.04-0.05)	5.0 (4.4-5.6)	5.07 (4.54-5.66)	4.65 (3.85-5.63)	5.25 (4.64-5.93)
	0.02 (0.01-0.02)	0.02 (0.01-0.02)	0.01 (0.01-0.02)	0.01 (0.01-0.01)	<i>Ref</i>	<i>Ref</i>	<i>Ref</i>	<i>Ref</i>
	0.06 (0.06-0.07)	0.06 (0.06-0.07)	0.06 (0.05-0.06)	0.06 (0.05-0.06)	4.3 (3.9-4.9)	4.33 (3.86-4.86)	4.38 (3.71-5.18)	4.44 (3.92-5.03)
Total number of different family adversity domains								
None	0.01 (0.01-0.01)	0.01 (0.01-0.01)	0.01 (0.00-0.01)	0.01 (0.00-0.01)	<i>Ref</i>	<i>Ref</i>	<i>Ref</i>	<i>Ref</i>
1	0.02 (0.02-0.02)	0.02 (0.02-0.02)	0.02 (0.02-0.02)	0.02 (0.02-0.02)	3.7 (3.2-4.2)	3.94 (3.46-4.48)	4.59 (3.72-5.66)	3.97 (3.33-4.73)
2	0.06 (0.06-0.07)	0.07 (0.06-0.07)	0.06 (0.05-0.08)	0.06 (0.05-0.06)	11.6 (9.9-13.6)	11.88 (10.23-13.81)	14.58 (11.38-18.68)	11.69 (9.78-13.98)
≥3	0.15 (0.14-0.16)	0.15 (0.14-0.17)	0.16 (0.14-0.18)	0.14 (0.12-0.16)	29.6 (25.3-34.8)	30.24 (25.99-35.19)	39.81 (31.55-50.24)	32.36 (26.64-39.31)
Adversities recorded in mother, father or child								
Neither mother, father or child	0.01 (0.01-0.01)	0.01 (0.01-0.01)	0.00 (0.00-0.01)	0.01 (0.00-0.01)	<i>Ref</i>	<i>Ref</i>	<i>Ref</i>	<i>Ref</i>
Mother or father only	0.03 (0.03-0.04)	0.04 (0.03-0.04)	0.03 (0.03-0.04)	0.03 (0.02-0.03)	6.0 (5.3-6.9)	6.19 (5.48-7)	7.37 (6.06-8.97)	5.53 (4.69-6.53)
Child only	0.02 (0.01-0.02)	0.02 (0.01-0.02)	0.02 (0.01-0.03)	0.02 (0.01-0.02)	2.9 (2.1-3.9)	2.9 (2.18-3.86)	4.79 (2.95-7.79)	3.18 (2.12-4.77)
Mother and father only	0.06 (0.05-0.07)	0.06 (0.05-0.07)	0.07 (0.06-0.08)	0.06 (0.05-0.07)	10.9 (9.2-12.9)	11.19 (9.46-13.24)	15.08 (11.77-19.34)	13.24 (10.91-16.07)
Mother or father and child	0.09 (0.07-0.11)	0.09 (0.07-0.11)	0.10 (0.06-0.13)	0.07 (0.06-0.08)	16.9 (13.3-21.5)	16.53 (13.19-20.73)	22.75 (14.67-35.3)	14.83 (11.6-18.97)
Mother, father and child	0.15 (0.12-0.18)	0.16 (0.13-0.19)	0.16 (0.11-0.22)	0.16 (0.13-0.19)	30.6 (23.7-39.5)	31.13 (24.03-40.32)	41.53 (27.39-62.98)	36.74 (27.87-48.43)
Mothers								
None vs Any family adversity	0.01 (0.01-0.01)	0.01 (0.01-0.01)	0.01 (0.01-0.01)	0.01 (0.01-0.01)	<i>Ref</i>	<i>Ref</i>	<i>Ref</i>	<i>Ref</i>
Adverse family environments	0.05 (0.05-0.05)	0.05 (0.05-0.05)	0.05 (0.04-0.05)	0.05 (0.04-0.05)	7.1 (6.4-8)	7.23 (6.5-8.04)	7.95 (6.7-9.44)	6.94 (6.07-7.93)
Parental mental health problems	0.02 (0.01-0.02)	0.01 (0.01-0.02)	0.01 (0.01-0.01)	0.01 (0.01-0.01)	<i>Ref</i>	<i>Ref</i>	<i>Ref</i>	<i>Ref</i>
Parental substance misuse	0.10(0.09-0.11)	0.09 (0.09-0.1)	0.11 (0.09-0.13)	0.09 (0.08-0.09)	7.0 (6.2-7.9)	7.12 (6.35-7.98)	8.84 (7.36-10.6)	6.75 (5.92-7.69)
	0.01 (0.01-0.01)	0.01 (0.01-0.01)	0.01 (0.01-0.01)	0.01 (0.01-0.01)	<i>Ref</i>	<i>Ref</i>	<i>Ref</i>	<i>Ref</i>
	0.06 (0.05-0.06)	0.05 (0.05-0.06)	0.05 (0.05-0.06)	0.05 (0.05-0.05)	4.8 (4.3-5.4)	4.98 (4.47-5.55)	4.38 (3.68-5.23)	4.89 (4.33-5.53)
	0.02 (0.02-0.02)	0.02 (0.02-0.02)	0.01 (0.01-0.02)	0.01 (0.01-0.02)	<i>Ref</i>	<i>Ref</i>	<i>Ref</i>	<i>Ref</i>
	0.07 (0.06-0.08)	0.07 (0.06-0.08)	0.06 (0.06-0.07)	0.06 (0.06-0.07)	4.6 (4-5.1)	4.51 (3.99-5.1)	4.44 (3.77-5.22)	4.55 (3.97-5.21)

Total number of different family adversity domains								
None	0.01 (0.01-0.01)	0.01 (0.01-0.01)	0.01 (0.01-0.01)	0.01 (0.01-0.01)	<i>Ref</i>	<i>Ref</i>	<i>Ref</i>	<i>Ref</i>
1	0.03 (0.03-0.03)	0.03 (0.03-0.03)	0.03 (0.02-0.03)	0.03 (0.03-0.03)	4.1 (3.6-4.8)	4.41 (3.89-5.01)	4.6 (3.68-5.74)	4.32 (3.72-5.01)
2	0.09 (0.08-0.1)	0.09 (0.08-0.10)	0.08 (0.07-0.09)	0.08 (0.07-0.09)	12.9 (11.2-14.8)	13.24 (11.52-15.15)	13.37 (10.96-16.31)	12.88 (10.9-15.22)
≥3	0.20 (0.17-0.22)	0.20 (0.18-0.23)	0.21 (0.18-0.24)	0.19 (0.15-0.22)	32.2 (26.8-38.7)	34.01 (28.21-41)	40.89 (32.16-51.98)	32.46 (25.43-41.45)
Adversities recorded in mother or child								
Neither mother or child	0.01 (0.01-0.01)	0.01 (0.01-0.01)	0.01 (0-0.01)	0.01 (0.01-0.01)	<i>Ref</i>	<i>Ref</i>	<i>Ref</i>	<i>Ref</i>
Mother only	0.04 (0.04-0.05)	0.04 (0.04-0.05)	0.04 (0.04-0.05)	0.04 (0.04-0.04)	6.5 (5.8-7.4)	6.7 (5.98-7.49)	7.72 (6.5-9.18)	6.39 (5.55-7.37)
Child only	0.02 (0.01-0.02)	0.02 (0.01-0.02)	0.02 (0.02-0.03)	0.02 (0.01-0.03)	2.9 (2.2-3.8)	2.86 (2.18-3.75)	4.4 (2.92-6.62)	3.02 (2.11-4.32)
Mother and child	0.11 (0.10-0.13)	0.11 (0.09-0.13)	0.12 (0.09-0.15)	0.11 (0.09-0.12)	18.7 (15.5-22.6)	18.38 (15.29-22.1)	23.65 (16.81-33.26)	18.84 (15.49-22.91)
Fathers								
None vs	0.02 (0.02-0.02)	0.02 (0.02-0.02)	0.02 (0.02-0.02)	0.01 (0.01-0.01)	<i>Ref</i>	<i>Ref</i>	<i>Ref</i>	<i>Ref</i>
Any family adversity	0.05 (0.04-0.05)	0.05 (0.04-0.05)	0.05 (0.04-0.06)	0.05 (0.04-0.05)	2.6 (2.3-2.9)	2.7 (2.4-3.04)	2.9 (2.43-3.46)	3.56 (3.14-4.03)
Adverse family environments	0.02 (0.02-0.02)	0.02 (0.02-0.02)	0.02 (0.02-0.02)	0.02 (0.02-0.02)	<i>Ref</i>	<i>Ref</i>	<i>Ref</i>	<i>Ref</i>
Parental mental health problems	0.07 (0.06-0.08)	0.07 (0.06-0.08)	0.09 (0.07-0.11)	0.07 (0.06-0.08)	3.7 (3.2-4.3)	3.83 (3.27-4.49)	4.74 (3.74-6.01)	4.53 (3.84-5.33)
Parental substance misuse	0.02 (0.02-0.02)	0.02 (0.02-0.02)	0.02 (0.02-0.02)	0.02 (0.01-0.02)	<i>Ref</i>	<i>Ref</i>	<i>Ref</i>	<i>Ref</i>
	0.05 (0.05-0.06)	0.05 (0.05-0.06)	0.06 (0.04-0.07)	0.05 (0.05-0.06)	2.6 (2.3-3.1)	2.79 (2.37-3.28)	2.79 (2.25-3.46)	3.25 (2.75-3.83)
Total number of different family adversity domains								
None	0.02 (0.02-0.02)	0.02 (0.02-0.02)	0.02 (0.02-0.02)	0.01 (0.01-0.01)	<i>Ref</i>	<i>Ref</i>	<i>Ref</i>	<i>Ref</i>
1	0.04 (0.03-0.04)	0.04 (0.03-0.04)	0.04 (0.03-0.05)	0.04 (0.03-0.04)	2.0 (1.7-2.3)	2.07 (1.77-2.4)	2.24 (1.8-2.79)	2.73 (2.33-3.19)
2	0.07 (0.06-0.08)	0.07 (0.06-0.09)	0.08 (0.06-0.10)	0.07 (0.06-0.09)	4.1 (3.4-4.8)	4.31 (3.63-5.11)	4.73 (3.64-6.14)	5.67 (4.75-6.76)
≥3	0.13 (0.1-0.17)	0.14 (0.10-0.18)	0.15 (0.10-0.21)	0.14 (0.1-0.18)	7.9 (5.7-11)	8.68 (6.15-12.23)	9.85 (6.38-15.21)	11.42 (8.08-16.14)
Adversities recorded in father or child								
Neither father or child	0.02 (0.02-0.02)	0.02 (0.01-0.02)	0.02 (0.01-0.02)	0.01 (0.01-0.01)	<i>Ref</i>	<i>Ref</i>	<i>Ref</i>	<i>Ref</i>
Father only	0.04 (0.03-0.04)	0.04 (0.03-0.04)	0.04 (0.04-0.05)	0.04 (0.03-0.04)	2.4 (2.2-2.8)	2.52 (2.22-2.87)	2.86 (2.4-3.41)	3.3 (2.88-3.79)
Child only	0.06 (0.05-0.07)	0.05 (0.04-0.06)	0.06 (0.04-0.09)	0.04 (0.03-0.05)	3.6 (3-4.5)	3.57 (2.96-4.32)	4.43 (3.06-6.41)	3.53 (2.9-4.3)
Father and child	0.12 (0.10-0.14)	0.12 (0.1-0.14)	0.13 (0.09-0.17)	0.12 (0.10-0.14)	8.4 (6.7-10.5)	8.64 (6.86-10.88)	9.49 (6.65-13.54)	11.28 (8.9-14.29)
Children								
None vs	0.02 (0.02-0.02)	0.02 (0.02-0.02)	0.02 (0.02-0.02)	0.02 (0.02-0.02)	<i>Ref</i>	<i>Ref</i>	<i>Ref</i>	<i>Ref</i>
Any family adversity	0.07 (0.06-0.08)	0.07 (0.06-0.07)	0.08 (0.06-0.1)	0.06 (0.05-0.07)	3.9 (3.4-4.6)	3.86 (3.32-4.48)	4.51 (3.44-5.92)	4.06 (3.48-4.73)
Adverse family environments	0.02 (0.02-0.02)	0.02 (0.02-0.02)	0.02 (0.02-0.02)	0.02 (0.02-0.02)	<i>Ref</i>	<i>Ref</i>	<i>Ref</i>	<i>Ref</i>
High-risk presentations of child maltreatment	0.10 (0.08-0.12)	0.10 (0.08-0.11)	0.11 (0.08-0.15)	0.09 (0.07-0.11)	4.9 (4-6.1)	5.14 (4.2-6.31)	6.17 (4.49-8.47)	5.09 (3.9-6.64)
	0.02 (0.02-0.02)	0.02 (0.02-0.02)	0.02 (0.02-0.02)	0.02 (0.02-0.02)	<i>Ref</i>	<i>Ref</i>	<i>Ref</i>	<i>Ref</i>
	0.07 (0.05-0.08)	0.06 (0.05-0.07)	0.07 (0.05-0.09)	0.06 (0.05-0.07)	3.4 (2.8-4.1)	3.33 (2.78-3.97)	3.73 (2.61-5.32)	3.64 (3.09-4.29)
	0.01 (0.01-0.01)	0.01 (0.01-0.01)	0.01 (0.01-0.01)	0.01 (0.01-0.01)	<i>Ref</i>	<i>Ref</i>	<i>Ref</i>	<i>Ref</i>

CM (excluded from any adversity)	0.29 (0.28-0.31)	0.30 (0.28-0.31)	0.30 (0.28-0.33)	0.25 (0.23-0.27)	38.1 (33.9-43)	39.1 (34.94-43.76)	41.19 (34.36-49.38)	32.31 (28.42-36.72)
Total number of different family adversity domains								
0	0.02 (0.02-0.02)	0.02 (0.02-0.02)	0.02 (0.02-0.02)	0.02 (0.02-0.02)	<i>Ref</i>	<i>Ref</i>	<i>Ref</i>	<i>Ref</i>
1	0.06 (0.06-0.07)	0.06 (0.05-0.07)	0.07 (0.05-0.09)	0.06 (0.05-0.07)	3.6 (3.1-4.3)	3.54 (3.01-4.16)	4.10 (3.04-5.54)	3.67 (3.11-4.32)
≥2	0.17 (0.13-0.22)	0.18 (0.13-0.22)	0.20 (0.12-0.28)	0.18 (0.13-0.24)	10.8 (8-14.7)	11.72 (8.6-15.97)	13.53 (8.16-22.44)	13.56 (9.19-20.02)

Abbreviations: AFE=Adverse family environment; HRP-CM=High-risk presentations of child maltreatment in children ≤3y; IPV=Intimate Partner Violence; MHPs=mental health problems; SM=Substance misuse

eTable 10. Results from six sensitivity analyses: adjusted and weighted probabilities and odds ratios of adversities associated with IPV (continued)

	Adjusted & weighted probability (95% CI)				Adjusted & weighted OR (95% CI)			
	Main cohort analysis	Longer follow-up: 1 year before to 5 years after birth	Expanded outcome: CM/IPV	Separate data sources: Adversity (HES/ONS only) and IPV (CPRD primary care only)	Main cohort analysis	Longer follow-up: 1 year before to 5 years after birth	Expanded outcome: CM/IPV	Separate data sources: Adversity (HES/ONS only) and IPV (CPRD primary care only)
Any family member unless specified								
None vs	0.01 (0.01-0.01)	0.01 (0.01-0.01)	0.02 (0.02-0.02)	0.01 (0.01-0.01)	Ref	Ref	Ref	Ref
Any adversity	0.04 (0.04-0.05)	0.04 (0.04-0.04)	0.09 (0.09-0.1)	0.05 (0.04-0.05)	7.7 (6.8-8.8)	6.6 (5.8-7.6)	6.45 (5.96-5.5)	4.83 (4.31-5.42)
Adverse family environments	0.01 (0.01-0.01)	0.01 (0.01-0.02)	0.03 (0.03-0.03)	0.02 (0.02-0.02)	Ref	Ref	Ref	Ref
Parental mental health problems	0.08 (0.07-0.09)	0.07 (0.07-0.08)	0.15 (0.15-0.16)	0.11 (0.09-0.14)	6.3 (5.6-7.1)	5.1 (4.5-5.7)	5.38 (4.97-5.82)	7.65 (5.8-10.08)
Parental substance misuse	0.01 (0.01-0.01)	0.01 (0.01-0.01)	0.03 (0.03-0.03)	0.01 (0.01-0.02)	Ref	Ref	Ref	Ref
	0.05 (0.05-0.06)	0.05 (0.05-0.05)	0.11 (0.1-0.11)	0.06 (0.05-0.06)	5.0 (4.4-5.6)	4.4 (3.9-4.9)	4.35 (4.04-4.68)	4.27 (3.75-4.86)
	0.02 (0.01-0.02)	0.02 (0.01-0.02)	0.03 (0.03-0.04)	0.01 (0.01-0.01)	Ref	Ref	Ref	Ref
	0.06 (0.06-0.07)	0.06 (0.06-0.07)	0.14 (0.13-0.14)	0.05 (0.05-0.06)	4.3 (3.9-4.9)	4.0 (3.6-4.5)	4.46 (4.12-4.83)	4.09 (3.57-4.68)
Total number of different family adversity domains								
None	0.01 (0.01-0.01)	0.01 (0.01-0.01)	0.02 (0.02-0.02)	0.01 (0.01-0.01)	Ref	Ref	Ref	Ref
1	0.02 (0.02-0.02)	0.02 (0.02-0.02)	0.05 (0.05-0.05)	0.04 (0.03-0.04)	3.7 (3.2-4.2)	3.3 (2.8-3.8)	3.17 (2.9-3.47)	3.64 (3.14-4.21)
2	0.06 (0.06-0.07)	0.06 (0.05-0.06)	0.13 (0.12-0.14)	0.08 (0.07-0.09)	11.6 (9.9-13.6)	8.9 (7.6-10.5)	8.98 (8.11-9.94)	8.32 (7.16-9.67)
≥3	0.15 (0.14-0.16)	0.13 (0.11-0.14)	0.30 (0.28-0.32)	0.20 (0.16-0.24)	29.6 (25.3-34.8)	21.9 (18.7-25.5)	25.58 (22.73-28.79)	24.26 (18.47-34.86)
Adversities recorded in mother, father or child								
Neither mother, father or child	0.01 (0.01-0.01)	0.01 (0.01-0.01)	0.02 (0.02-0.02)	0.01 (0.01-0.01)	Ref	Ref	Ref	Ref
Mother or father only	0.03 (0.03-0.04)	0.03 (0.03-0.03)	0.07 (0.07-0.07)	0.05 (0.04-0.05)	6.0 (5.3-6.9)	4.9 (4.2-5.6)	4.52 (4.14-4.93)	4.64 (4.09-5.26)
Child only	0.02 (0.01-0.02)	0.01 (0.01-0.02)	0.05 (0.04-0.05)	0.03 (0.02-0.04)	2.9 (2.1-3.9)	2.2 (1.7-2.8)	2.84 (2.37-3.41)	2.79 (1.98-3.93)
Mother and father only	0.06 (0.05-0.07)	0.06 (0.06-0.07)	0.15 (0.13-0.16)	0.08 (0.06-0.09)	10.9 (9.2-12.9)	10.3 (8.7-12.3)	10.1 (8.98-11.37)	7.99 (6.31-10.13)
Mother or father and child	0.09 (0.07-0.11)	0.07 (0.06-0.08)	0.18 (0.16-0.20)	0.09 (0.06-0.11)	16.9 (13.3-21.5)	12.1 (9.7-15)	12.71 (10.92-14.8)	8.99 (6.46-12.51)
Mother, father and child	0.15 (0.12-0.18)	0.12 (0.10-0.14)	0.33 (0.29-0.37)	0.31 (0.11-0.51)	30.6 (23.7-39.5)	20.6 (16.7-25.6)	28.6 (23.63-34.61)	42.76 (16.9-108.18)
Mothers								
None vs	0.01 (0.01-0.01)	0.01 (0.01-0.01)	0.02 (0.02-0.02)	0.01 (0.01-0.01)	Ref	Ref	Ref	Ref
Any adversity	0.05 (0.05-0.05)	0.04 (0.04-0.05)	0.10 (0.1-0.11)	0.05 (0.05-0.06)	7.1 (6.4-8)	5.9 (5.2-6.6)	5.38 (5-5.78)	4.7 (4.17-5.3)
Adverse family environments	0.02 (0.01-0.02)	0.02 (0.02-0.02)	0.04 (0.03-0.04)	0.02 (0.02-0.02)	Ref	Ref	Ref	Ref
Parental mental health problems	0.10 (0.09-0.11)	0.08 (0.07-0.09)	0.17 (0.16-0.18)	0.15 (0.10-0.19)	7.0 (6.2-7.9)	5.3 (4.7-6)	5.55 (5.08-6.07)	9.83 (6.98-13.84)
	0.01 (0.01-0.01)	0.01 (0.01-0.01)	0.03 (0.03-0.03)	0.01 (0.01-0.02)	Ref	Ref	Ref	Ref
	0.06 (0.05-0.06)	0.05 (0.05-0.06)	0.11 (0.11-0.12)	0.06 (0.05-0.06)	4.8 (4.3-5.4)	4.3 (3.9-4.8)	4.11 (3.82-4.42)	4.06 (3.56-4.64)

Parental substance misuse	0.02 (0.02-0.02) 0.07 (0.06-0.08)	0.02 (0.02-0.02) 0.07 (0.06-0.07)	0.04 (0.03-0.04) 0.14 (0.13-0.15)	0.01 (0.01-0.02) 0.06 (0.05-0.06)	Ref 4.6 (4-5.1)	Ref 4.1 (3.7-4.6)	Ref 4.45 (4.09-4.86)	Ref 4.19 (3.64-4.83)
Total number of different family adversity domains								
None	0.01 (0.01-0.01)	0.01 (0.01-0.01)	0.02 (0.02-0.02)	0.01 (0.01-0.01)	Ref	Ref	Ref	Ref
1	0.03 (0.03-0.03)	0.03 (0.03-0.03)	0.07 (0.06-0.07)	0.04 (0.04-0.05)	4.1 (3.6-4.8)	4.0 (3.5-4.6)	3.43 (3.15-3.74)	3.56 (3.06-4.14)
2	0.09 (0.08-0.1)	0.08 (0.07-0.08)	0.17 (0.16-0.18)	0.10 (0.09-0.11)	12.9 (11.2-14.8)	10.2 (8.9-11.7)	9.62 (8.76-10.57)	9.58 (8.14-11.29)
≥3	0.20 (0.17-0.22)	0.16 (0.14-0.17)	0.37 (0.33-0.41)	0.25 (0.18-0.31)	32.2 (26.8-38.7)	22.9 (19.3-27.1)	27.56 (23.17-32.77)	27.92 (19.28-40.43)
Adversities recorded in mother or child								
Neither mother or child	0.01 (0.01-0.01)	0.01 (0.01-0.01)	0.02 (0.02-0.02)	0.01 (0.01-0.01)	Ref	Ref	Ref	Ref
Mother only	0.04 (0.04-0.05)	0.04 (0.04-0.04)	0.09 (0.08-0.09)	0.05 (0.05-0.06)	6.5 (5.8-7.4)	5.8 (5.1-6.5)	4.96 (4.58-5.37)	4.65 (4.11-5.26)
Child only	0.02 (0.01-0.02)	0.02 (0.01-0.02)	0.05 (0.05-0.06)	0.03 (0.02-0.04)	2.9 (2.2-3.8)	2.2 (1.7-2.7)	2.85 (2.42-3.36)	2.7 (1.96-3.73)
Mother and child	0.11 (0.10-0.13)	0.09 (0.08-0.1)	0.22 (0.2-0.24)	0.11 (0.07-0.14)	18.7 (15.5-22.6)	13.7 (11.6-16.3)	14.58 (12.86-16.53)	10.59 (7.43-15.08)
Fathers								
None vs	0.02 (0.02-0.02)	0.02 (0.02-0.02)	0.04 (0.04-0.04)	0.02 (0.02-0.02)	Ref	Ref	Ref	Ref
Any adversity	0.05 (0.04-0.05)	0.05 (0.04-0.05)	0.11 (0.11-0.12)	0.05 (0.04-0.06)	2.6 (2.3-2.9)	2.6 (2.3-2.9)	3.13 (2.88-3.4)	3.12 (2.59-3.76)
Adverse family environments	0.02 (0.02-0.02) 0.07 (0.06-0.08)	0.02 (0.02-0.02) 0.07 (0.06-0.08)	0.04 (0.04-0.05) 0.16 (0.14-0.17)	0.02 (0.02-0.02) 0.09 (0.05-0.12)	Ref 3.7 (3.2-4.3)	Ref 3.6 (3.0-4.2)	Ref 3.99 (3.54-4.51)	Ref 5.11 (3.2-8.18)
Parental mental health problems	0.02 (0.02-0.02) 0.05 (0.05-0.06)	0.02 (0.02-0.02) 0.05 (0.05-0.06)	0.04 (0.04-0.04) 0.13 (0.12-0.14)	0.02 (0.02-0.02) 0.08 (0.06-0.09)	Ref 2.6 (2.-3)	Ref 2.6 (2.3-3.0)	Ref 3.29 (2.99-3.61)	Ref 4.63 (3.65-5.87)
Parental substance misuse	0.02 (0.02-0.02) 0.05 (0.05-0.06)	0.02 (0.02-0.02) 0.05 (0.05-0.06)	0.04 (0.04-0.05) 0.14 (0.12-0.15)	0.02 (0.02-0.02) 0.05 (0.04-0.06)	Ref 2.6 (2.3-3.1)	Ref 2.6 (2.3-3.0)	Ref 3.41 (3.06-3.79)	Ref 2.66 (2.12-3.33)
Total number of different family adversity domains								
None	0.02 (0.02-0.02)	0.02 (0.02-0.02)	0.04 (0.04-0.04)	0.02 (0.02-0.02)	Ref	Ref	Ref	Ref
1	0.04 (0.03-0.04)	0.04 (0.03-0.04)	0.09 (0.08-0.09)	0.04 (0.03-0.05)	2.0 (1.7-2.3)	2.0 (1.7-2.3)	2.32 (2.1-2.56)	2.53 (2.04-3.16)
2	0.07 (0.06-0.08)	0.07 (0.06-0.08)	0.19 (0.17-0.2)	0.09 (0.06-0.12)	4.1 (3.4-4.8)	3.9 (3.3-4.6)	5.55 (4.85-6.36)	5.53 (3.87-7.9)
≥3	0.13 (0.1-0.17)	0.12 (0.09-0.15)	0.31 (0.26-0.36)	0.13 (0.05-0.21)	7.9 (5.7-11)	6.9 (5.4-8.9)	10.87 (8.52-13.89)	8.45 (4.2-17)
Adversities recorded in father or child								
Neither father or child	0.02 (0.02-0.02)	0.02 (0.01-0.02)	0.03 (0.03-0.04)	0.02 (0.02-0.02)	Ref	Ref	Ref	Ref
Father only	0.04 (0.03-0.04)	0.04 (0.04-0.04)	0.09 (0.09-0.1)	0.05 (0.04-0.06)	2.4 (2.2-2.8)	2.6 (2.3-3)	2.96 (2.7-3.24)	3.02 (2.5-3.64)
Child only	0.06 (0.05-0.07)	0.05 (0.04-0.06)	0.11 (0.10-0.12)	0.04 (0.03-0.05)	3.6 (3-4.5)	3.1 (2.6-3.7)	3.51 (3.1-3.98)	2.77 (2.18-3.51)
Father and child	0.12 (0.10-0.14)	0.09 (0.08-0.11)	0.26 (0.23-0.29)	0.16 (0.06-0.27)	8.4 (6.7-10.5)	6.3 (5.3-7.5)	10.03 (8.55-11.78)	11.54 (5.42-24.58)
Children								
None vs	0.02 (0.02-0.02)	0.02 (0.02-0.02)	0.04 (0.04-0.04)	0.02 (0.02-0.02)	Ref	Ref	Ref	Ref
Any adversity	0.07 (0.06-0.08)	0.07 (0.06-0.07)	0.14 (0.13-0.15)	0.07 (0.05-0.08)	3.9 (3.4-4.6)	3.5 (3.0-4.0)	3.86 (3.5-4.26)	4.02 (3.34-4.85)
Adverse family environments	0.02 (0.02-0.02) 0.10 (0.08-0.12)	0.02 (0.02-0.02) 0.10 (0.08-0.13)	0.05 (0.04-0.05) 0.20 (0.18-0.23)	0.02 (0.02-0.02) 0.09 (0.06-0.11)	Ref 4.9 (4-6.1)	Ref 5.0 (3.9-6.6)	Ref 5.36 (4.65-6.19)	Ref 5.09 (3.64-7.12)
	0.02 (0.02-0.02)	0.02 (0.02-0.02)	0.04 (0.04-0.04)	0.02 (0.02-0.02)	Ref	Ref	Ref	Ref

High-risk presentations of child maltreatment	0.07 (0.05-0.08)	0.07 (0.06-0.08)	0.13 (0.12-0.14)	0.05 (0.03-0.06)	3.4 (2.8-4.1)	3.1 (2.6-3.7)	3.29 (2.93-3.68)	2.63 (2-3.46)
CM (excluded from any adversity)	0.01 (0.01-0.01)	0.01 (0.01-0.01)	NA	0.02 (0.02-0.02)	<i>Ref</i>	<i>Ref</i>	NA	<i>Ref</i>
	0.29 (0.28-0.31)	0.23 (0.22-0.25)	NA	0.11 (0.09-0.13)	38.1 (33.9-43)	24.4 (21.8-27.2)	NA	7.21 (5.88-8.83)
Total number of different family adversity domains								
0	0.02 (0.02-0.02)	0.02 (0.02-0.02)	0.04 (0.04-0.04)	0.02 (0.02-0.02)	<i>Ref</i>	<i>Ref</i>	<i>Ref</i>	<i>Ref</i>
1	0.06 (0.06-0.07)	0.05 (0.05-0.06)	0.13 (0.12-0.14)	0.05 (0.04-0.06)	3.6 (3.1-4.3)	2.8 (2.4-3.1)	3.48 (3.13-3.86)	2.69 (2.1-3.44)
≥2	0.17 (0.13-0.22)	0.12 (0.07-0.16)	0.37 (0.31-0.43)	0.23 (0.12-0.34)	10.8 (8-14.7)	6.8 (4.5-10.4)	13.79 (10.47-18.17)	16.83 (9.02-31.37)

Data is adjusted and weighed probability or odds ratios. Estimates may differ from the main paper due to rounding. Abbreviations: AFE=Adverse family environment, CM=child maltreatment, IPV=Intimate Partner Violence, MHPs=mental health problems, SM=Substance misuse

eTable 11. The RECORD statement – checklist of items, extended from the STROBE statement, that should be reported in observational studies using routinely collected health data

	Item No.	STROBE items	Location in RECORD items manuscript where items are reported	Location in manuscript where items are reported
Title and abstract				
	1	(a) Indicate the study's design with a commonly used term in the title or the abstract (b) Provide in the abstract an informative and balanced summary of what was done and what was found	Title and abstract RECORD 1.1: The type of data used should be specified in the title or abstract. When possible, the name of the databases used should be included. RECORD 1.2: If applicable, the geographic region and timeframe within which the study took place should be reported in the title or abstract. RECORD 1.3: If linkage between databases was conducted for the study, this should be clearly stated in the title or abstract.	Title and abstract Title and abstract Title and abstract
Introduction				
Background rationale	2	Explain the scientific background and rationale for the investigation being reported		4, 5-6
Objectives	3	State specific objectives, including any prespecified hypotheses		2, 5-6
Methods				
Study Design	4	Present key elements of study design early in the paper		Abstract, 5-15, figure 1
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection		Abstract, 6-12, figure 1, Supplementary eTable1
Participants	6	<i>Cohort study</i> - Give the eligibility criteria, and the sources and methods of selection of participants. Describe methods of	RECORD 6.1: The methods of study population selection (such as codes or algorithms used to identify subjects) should be listed in detail. If	Abstract, 6-12, figure 1, Supplementary eTable1, etable 3-4

		<p>follow-up <i>Case-control study</i> - Give the eligibility criteria, and the sources and methods of case ascertainment and control selection. Give the rationale for the choice of cases and controls <i>Cross-sectional study</i> - Give the eligibility criteria, and the sources and methods of selection of participants</p> <p><i>Cohort study</i> - For matched studies, give matching criteria and number of exposed and unexposed <i>Case-control study</i> - For matched studies, give matching criteria and the number of controls per case</p>	<p>this is not possible, an explanation should be provided.</p> <p>RECORD 6.2: Any validation studies of the codes or algorithms used to select the population should be referenced. If validation was conducted for this study and not published elsewhere, detailed methods and results should be provided.</p> <p>RECORD 6.3: If the study involved linkage of databases, consider use of a flow diagram or other graphical display to demonstrate the data linkage process, including the number of individuals with linked data at each stage.</p>	
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable.	RECORD 7.1: A complete list of codes and algorithms used to classify exposures, outcomes, confounders, and effect modifiers should be provided. If these cannot be reported, an explanation should be provided.	Abstract, box 1, 7-10, table 1-2, supplementary etable 5. Code lists and measures by indicators and adversity domains provided online .
Data sources/ measurement	8	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group		box 1, 7-10, table 1-2, Supplementary eTables 2-5.
Bias	9	Describe any efforts to address potential sources of bias		12, Supplementary eTables 2-5
Study size	10	Explain how the study size was arrived at		5-6, fig 1
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen, and why		9-12, box 1, Supplementary eTable 2-5. Frameworks, code lists and measures by grouped indicators provided online .
Statistical methods	12	Describe all statistical methods, including those used to control for confounding Describe any methods used to examine subgroups and interactions		10-12, Supplementary eTable 2

		<p>Explain how missing data were addressed</p> <p><i>Cohort study</i> - If applicable, explain how loss to follow-up was addressed</p> <p><i>Case-control study</i> - If applicable, explain how matching of cases and controls was addressed</p> <p><i>Cross-sectional study</i> - If applicable, describe analytical methods taking account of sampling strategy</p> <p>Describe any sensitivity analyses</p>		
Data access and cleaning methods	..		<p>RECORD 12.1: Authors should describe the extent to which the investigators had access to the database population used to create the study population.</p> <p>RECORD 12.2: Authors should provide information on the data cleaning methods used in the study.</p>	<p>21, Supplementary eTable 1</p> <p>All algorithms provided online</p>
Linkage	..		<p>RECORD 12.3: State whether the study included person-level, institutional-level, or other data linkage across two or more databases. The methods of linkage and methods of linkage quality evaluation should be provided.</p>	<p>6-7, figure 1, Supplementary eTable 1 + specific references provided</p>
Results				
Participants	13	<p>Report the numbers of individuals at each stage of the study (<i>e.g.</i>, numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed)</p> <p>Give reasons for non- participation at each stage.</p> <p>Consider use of a flow diagram</p>	<p>RECORD 13.1: Describe in detail the selection of the persons included in the study (<i>i.e.</i>, study population selection) including filtering based on data quality, data availability and linkage. The selection of included persons can be described in the text and/or by means of the study flow diagram.</p>	<p>figure 1 (flow diagram), 5-7, Supplementary eTable 1,</p>
Descriptive data	14	<p>Give characteristics of study participants (<i>e.g.</i>, demographic, clinical, social) and information on exposures and potential confounders</p> <p>Indicate the number of participants with</p>		<p>Table 1</p>

		missing data for each variable of interest <i>Cohort study</i> - summarise follow-up time (e.g., average and total amount)	
Outcome data	15	<i>Cohort study</i> - Report numbers of outcome events or summary measures over time <i>Case-control study</i> - Report numbers in each exposure category, or summary measures of exposure <i>Cross-sectional study</i> - Report numbers of outcome events or summary measures	14-16, Supplementary eTables 2-4
Main results	16	Give unadjusted estimates and, if applicable, confounder- adjusted estimates and their precision (e.g., 95% confidence interval). Make clear which confounders were adjusted for and why they were included Report category boundaries when continuous variables were categorized If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period	14-16, figs 2-4, Table 2, Supplementary eTables 2-4
Other analyses	17	Report other analyses done— e.g., analyses of subgroups and interactions, and sensitivity analyses	12, 16, Supplementary eTables 2-4
Discussion			
Key results	18	Summarise key results with reference to study objectives	17-18
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias	RECORD 19.1: Discuss the implications of using data that were not created or collected to answer the specific research question(s). Include discussion of misclassification bias, unmeasured confounding, missing data, and changing eligibility over time, as they pertain to the study being reported. 19

Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence	17-19
Generalisability	21	Discuss the generalisability (external validity) of the study results	17-19, 20
Other Information			
Funding	22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based	12, 22
Accessibility of protocol, raw data, and programming code	..	RECORD 22.1: Authors should provide information on how to access any supplemental information such as the study protocol, raw data, or programming code.	Methods for implementations are referenced in-text where relevant: www.ACEsinEHRs.com + github. CPRD ISAC Protocol is available on request.

*Reference: Benchimol E, Smeeth L, Guttman A, Harron K, Moher D, Petersen I, Sørensen HT, von Elm E, Langan SM, the RECORD Working Committee. The Reporting of studies Conducted using Observational Routinely-collected health Data (RECORD) Statement. *PLoS Medicine* 2015; n press. *Checklist is protected under Creative Commons Attribution ([CC BY](https://creativecommons.org/licenses/by/4.0/)) license.

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