



# Using patient records to improve health

Presented by Hattie Boulton, Primary Care Recruitment Manager

Longton Health Centre Patient Participation Group

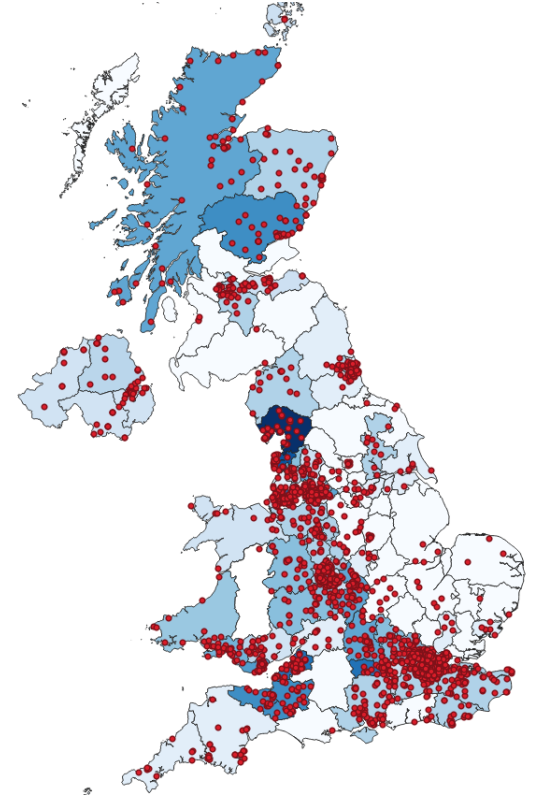
14/03/2022

# What is CPRD?



Medicines & Healthcare products  
Regulatory Agency

- CPRD (Clinical Practice Research Datalink)
- Part of Medicines and Healthcare products Regulatory Agency (MHRA) – public funding and not for profit, UK Government scientific research service
- Providing clinically coded patient and prescribing data for improving patient lives, medicines safety, public health research
- Working with GP practices for over 30 years
- >2,200 practices (~1 in 4) across the UK participate
- Practices sign up, patients can opt out



# Vaccine Safety – Whooping Cough / Pertussis



Joint Committee on Vaccination and Immunisation (JCVI) now recommend vaccination from 16 weeks

Impact on patient care

Primary care general practice



How can we reduce the incidence of whooping cough in newborns?



Medicines & Healthcare products Regulatory Agency

Clinical and drug safety guidelines

CPRD primary care data



Hypothesis: Is the pertussis vaccine associated with adverse outcomes for mother or baby during pregnancy?

CPRD research studies



RESEARCH

Safety of pertussis vaccination in pregnant women in UK: observational study

# Benefits for GPs contributing data to CPRD



Opportunity to contribute to evidence based medicine  
e.g. MHRA monitoring safety of COVID-19 vaccines



Improve delivery of patient care by receiving individual  
practice and patient-level drug safety prescribing reports



Practices can take part in clinical trials



Opportunity for patients to get involved with research

# CPRD – Doing Research Differently

## Established approaches to locating suitable patients



Print advertising



Social media



Contacting previously known Investigators



Local volunteer databases e.g. Covid Registry

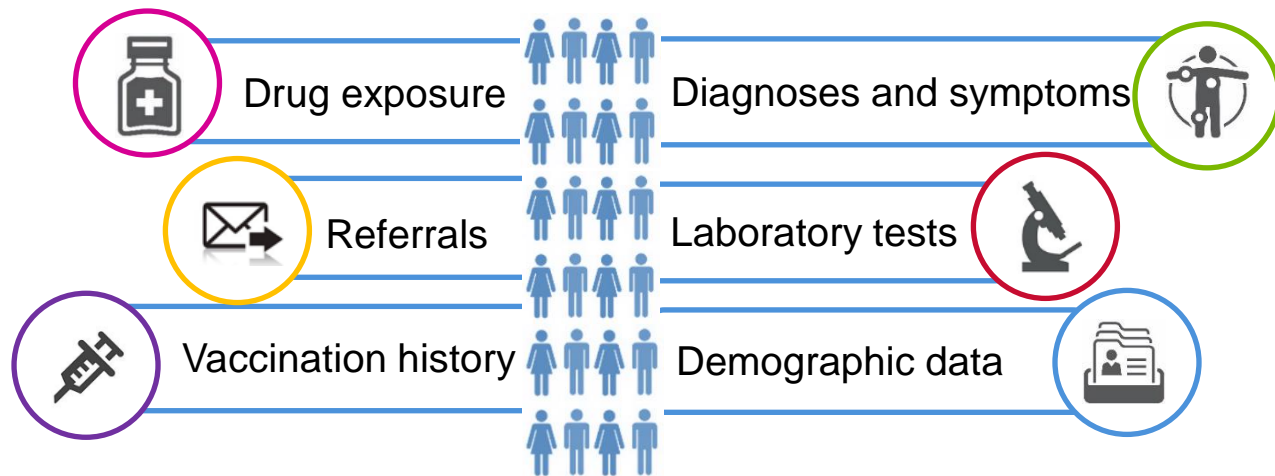
- Many trials don't recruit enough patients
- Who is included – and who misses out?

# Cradle to grave information on UK population's health



- Universal healthcare provider free at point of care
- ~98% of 66m UK population registered at GP practice
- Primary care electronic health records (EHR) from GP practices are a rich source longitudinal representative population data
- Powerful tool for studying population health

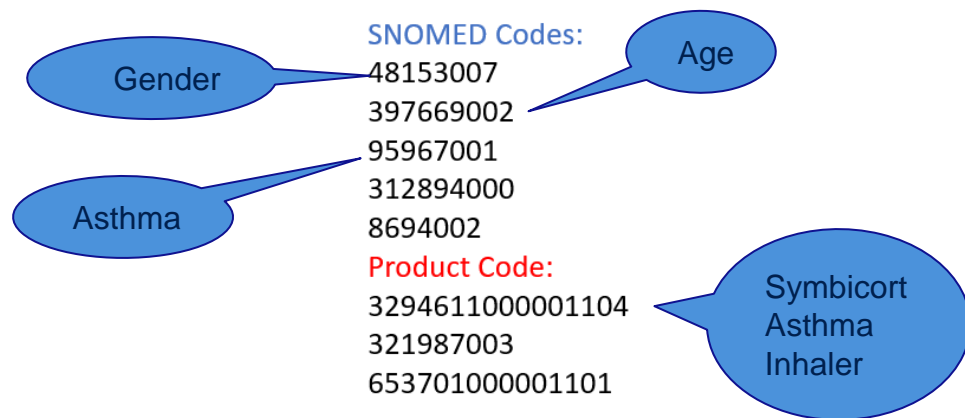
# All coded data collected from GP EHR except patient identifiers



Don't collect name, address, full date of birth, NHS Number or text notes

# What does this data look like?

GP input (SNOMED Codes)



Researcher View

epatid	vmid	gender	yob	mob	marital	famnum
6551	20696	1	146	0	2	10347
9551	17219	2	179	0	1	8674
12551	20739	1	163	0	2	8997
5551	11601	1	133	0	6	4957
7551	14421	2	189	0	6	6984
2551	6307	2	184	0	6	2651
3551	18852	2	155	0	2	9335
1551	20294	2	168	0	1	10169
8551	0	2	177	0	1	4161
10551	0	1	143	0	4	12827
11551	0	2	179	0	2	14458
4551	0	2	130	0	0	18828
10096	1547	1	162	0	6	9569
14096	1888	1	193	0	6	10623



# Impact of CPRD data on public health

Over 2,900 clinical studies, resulting in improvements such as:

- 2020 – highlighting need to prioritise cancer survivors for COVID vaccination
- 2017 – Rotavirus vaccine – reduced hospitalisation for infants
- 2016 – Benefits of flu vaccine for patients with Type-II diabetes
- 2014 – proving safety of whooping cough vaccine in pregnancy
- 2012 – safer blood pressure guidelines for diabetics, reducing deaths
- 2004 – proving no link between combined MMR and autism

# CPRD safeguarding anonymised patient data



GP practice opts-in to sharing patient EHR

De-identified coded data

CPRD

Anonymised data



Approved researcher



**BMA approved Data Protection Assessment for GP practices joining CPRD**



**Patient opt-out respected**



**NHS Data Security and Protection Toolkit**



**Research Ethics Committee approval**



**Data security standards & due diligence checks on all users**



**Bona fide researchers only**



**Public health research only**



**Research Data Governance Committee review requests**



**Checks to ensure data released protects confidentiality**

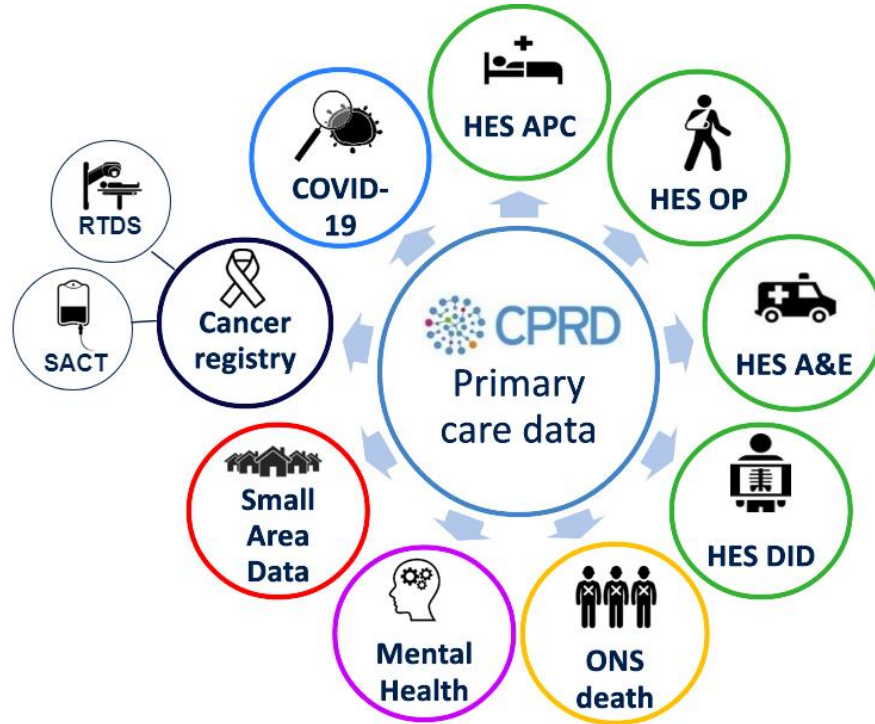


**Contractual terms and conditions**

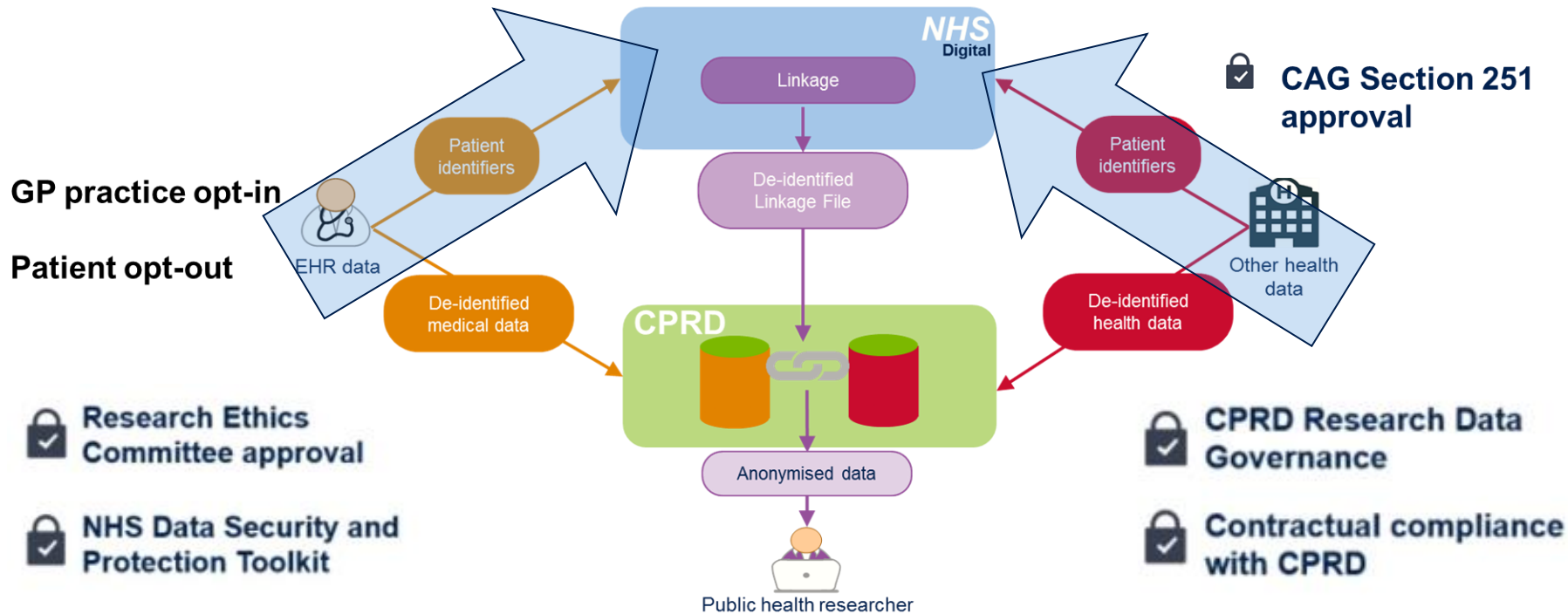


**User audit to ensure compliance**

# Extending scope of research through linkage



# Data linkage enabled by NHS Digital



# Who uses the data?

- CPRD data is used for public health research by medicines regulators such as the MHRA, government organisations with public health responsibilities, academic researchers and pharmaceutical companies
- Regulatory requirement for pharmaceutical companies to monitor the safety of their medicines
- Pharmaceutical companies use CPRD for drug safety monitoring
- Supports public health research by universities and charities
- This then enables clinical guidelines to better reflect the population, and the NHS to deliver better treatment

# Transparency



Home News Public Data Our services General Practitioner Transparency information Bibliography

## Approved studies using CPRD Data

ISAC Approval Date	Title
05/08/2020	Excess mortality during the COVID-19 pandemic
31/07/2020	Indirect acute effects of the COVID-19 pandemic on physical and psychological morbidity in the UK
30/07/2020	An investigation of excess mortality and end-of-life morbidity patterns before and during the COVID-19 pandemic. A retrospective analysis using primary care data
30/07/2020	Using linked primary care and viral surveillance data to develop risk stratification models to inform management of severe COVID-19
08/07/2020	Descriptive analysis of patterns of primary care demand in England during the COVID-19 pandemic
07/07/2020	Primary care service use towards end of life among patients who died before and during the COVID-19 epidemic: a nationwide cohort study using the Clinical Practice Research DataLink
01/07/2020	Evaluation of the drivers in heterogeneity in unplanned hospital admissions and mortality in frail and multimorbidity elderly patients before and during/after COVID-19
18/06/2020	Risk factors and outcomes of COVID-19 in individuals with Down syndrome
12/06/2020	Assessing factors associated with the COVID-19 risk in people with asthma
09/06/2020	Risk factors for and long-term outcomes in people with covid-19 admitted to hospital in England
02/06/2020	Clinical contact with health services for mental illness and self-harm before, during and after the COVID-19 pandemic



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## Bibliography

Author Title Type [ Year ]

Export 2588 results: BibTex RTF Tagged MARC XML RIS

### 2020

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# CPRD - Summary

- Sharing clinically coded patient data helps directly improve patient care
- Practices taking part contribute to MHRA Drug Safety Updates, NICE guidelines and clinical research
- Patient data shared with the MHRA does not allow us to identify you
- Taking part in CPRD does not cost your practice time or money, or impede their offering appointments

Questions welcome

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# CPRD (Clinical Practice Research Datalink)

- Part of the |  Medicines & Healthcare products Regulatory Agency
- UK Government, not for profit organisation
- Work with ~25% of the 8,800 GP Practices in the UK
- Collect clinically coded data on patients in volunteer practices
- Why does this matter?

# Cycle of Evidence

NICE guidelines now recommend that patients presenting with blood in the urine over 40 years should be referred for further tests to rule out bladder cancer



Impact on patient care

Primary care general practice



Could persistent urinary tract infections indicate a more serious condition?



CPRD primary care data



Aim: To identify common primary care symptoms that are strong indicators of bladder cancer

CPRD research studies

Clinical and drug safety guidelines



**NICE** National Institute for Health and Care Excellence

Suspected cancer: recognition and referral

NICE guideline [NG12] Published date: June 2015



Br. J. Gen. Pract. 2012 Sep; 62(602): e598-e604.  
Published online 2012 Aug 28. doi: 10.3399/bjgp12X654560

PMCID: PMC3426598

Clinical features of bladder cancer in primary care

# How are electronic health records used in research?

## Example of type 2 diabetes (T2D)



Measure the frequency of disease

e.g. How many people have a new diagnosis of T2D?



Describe how patients use medication

e.g. How many people with T2D are prescribed metformin, two therapies or insulin?



Compare medicine effectiveness

e.g. Is treatment with metformin more effective than glipizide in controlling blood sugars?



Drug and vaccine safety

e.g. Does metformin have more side effects than glipizide?



Describe outcomes of ill-health

e.g. Is the risk of heart disease among patients with T2D higher than among non-diabetics?



Inform clinical guidance development or evaluation

e.g. Do clinicians follow clinical guidelines when prescribing medication for T2D?

# Vaccine Safety – Combined MMR

