

Health Data in Practice lecture series

Electronic health records:
sources of primary care
data

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Learning Objectives

At the end of this lecture you will be able to

- Describe the main electronic patient record suppliers of general practice data in the UK
- Describe the following key general practice research databases available, their geographical coverage and linkages
 - GPES
 - QResearch
 - CPRD Gold and Aurum
 - RCGP Sentinel network

GP Systems of Choice

- Enables general practices to choose the electronic patient record (EPR) system they prefer:
 - Egton Medical Information Systems (EMIS) Health: includes Enterprise and EMIS-X cloud-based systems
 - SystemOne developed by The Phoenix Partnership (TPP)
 - Vision 3 operated by In Practice Systems Limited (INPS)
 - Microtest Health
- The NHS pays for the basic system with enhancements paid for by the local commissioners of services
- The general practice EPR provides the following functionality
 - Appointment management
 - Mobile messaging to patients using SMS and video consultations
 - Structured clinical templates
 - Clinical decision support tools eg Qrisk
 - Prescribing
 - Messaging eg of pathology test requests and results
 - Document management
 - Population health management tools
 - Patient facing services eg book an appointment, order a repeat prescription, view part of own record on-line

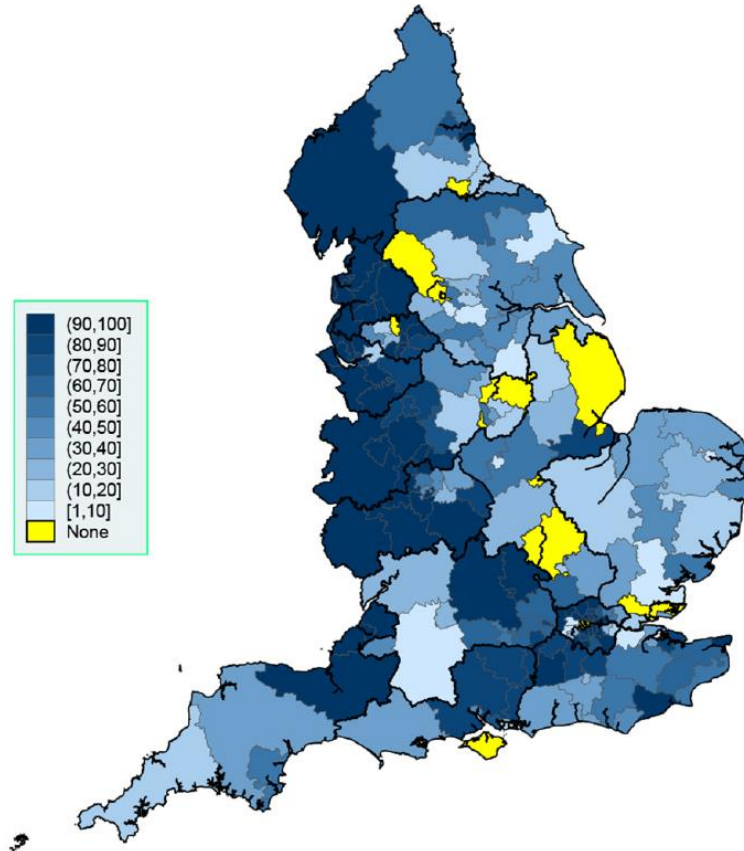
2016 comparison

	EMIS†	SystemOne	Vision V.3	Evolution
Aggregates (%)				
Number of practices	4199 (56)	2552 (34)	636 (9)	90 (1)
Number of patients	32 191 392 (56)	20 199 414 (35)	4 601 205 (8)	6 29 166 (1)
Number of GPs	18 675 (57)	11 160 (34)	2433 (7)	393 (1)
Medians (25th and 75th centiles)				
IMD 2015**	22.2 (12.1, 37.4)	22.5 (12.8, 36.8)	22.4 (12.3, 37.0)	22.7 (14.4, 31.0)
List size	6833 (4257, 10 094)	7080 (4214, 10 553)	6279 (3988, 9759)	6222 (4743, 9121)
Regional counts, NHS regions (%)				
Wessex	164 (55)	113 (38)	17 (6)	4 (1)
London	917 (68)	254 (19)	182 (13)	1 (0)
Yorkshire and the Humber	186 (25)	544 (74)	5 (1)	0 (0)
Cumbria and the North East	270 (59)	172 (38)	12 (3)	0 (0)
Cheshire and Merseyside	353 (92)	19 (5)	8 (2)	2 (1)
North Midlands	260 (54)	216 (45)	2 (0)	2 (0)
West Midlands	496 (76)	96 (15)	58 (9)	0 (0)
Central Midlands	156 (28)	378 (69)	16 (3)	0 (0)
East	112 (21)	413 (77)	4 (1)	4 (1)
South West	225 (59)	86 (22)	7 (2)	65 (17)
South East	303 (56)	96 (18)	145 (27)	1 (0)
South central	227 (55)	129 (31)	57 (14)	3 (1)
Greater Manchester	310 (65)	36 (8)	123 (26)	8 (2)
Lancashire	220 (100)	0 (0)	0 (0)	0 (0)

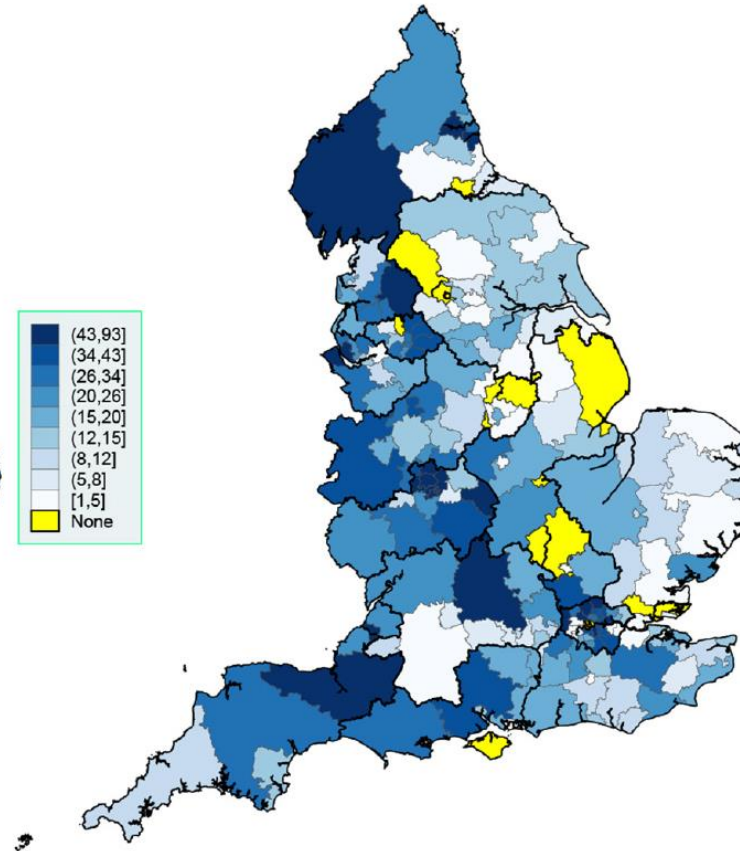
Kontopantelis E, Stevens RJ, Helms PJ, *et al.* Spatial distribution of clinical computer systems in primary care in England in 2016 and implications for primary care electronic medical record databases: a cross-sectional population study. *BMJ Open* 2018;8:e020738.
doi:10.1136/bmjopen-2017-020738

EMIS Health

Percentage of patient population share



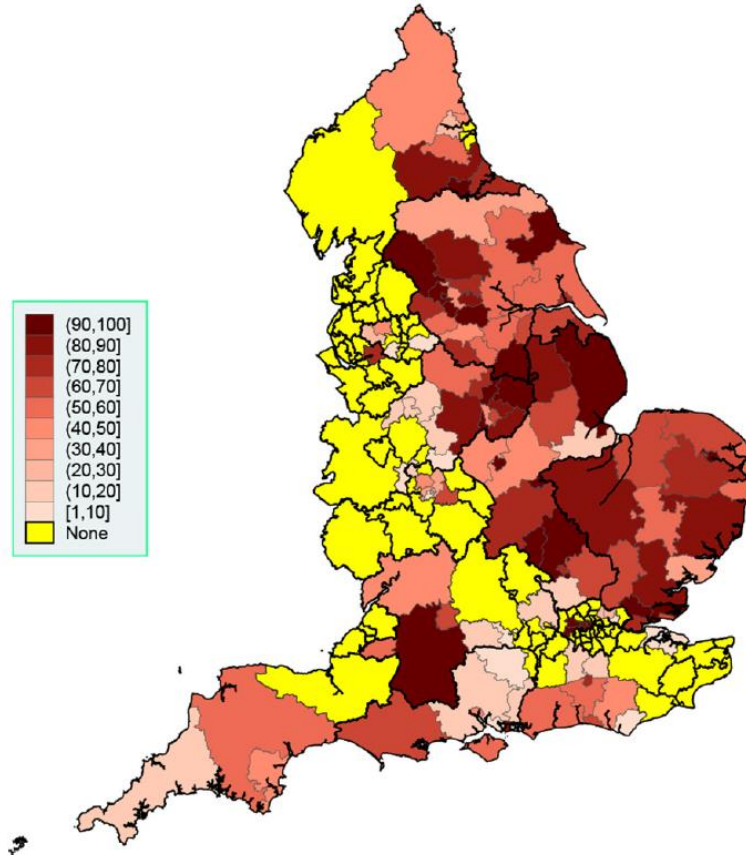
Number of general practices



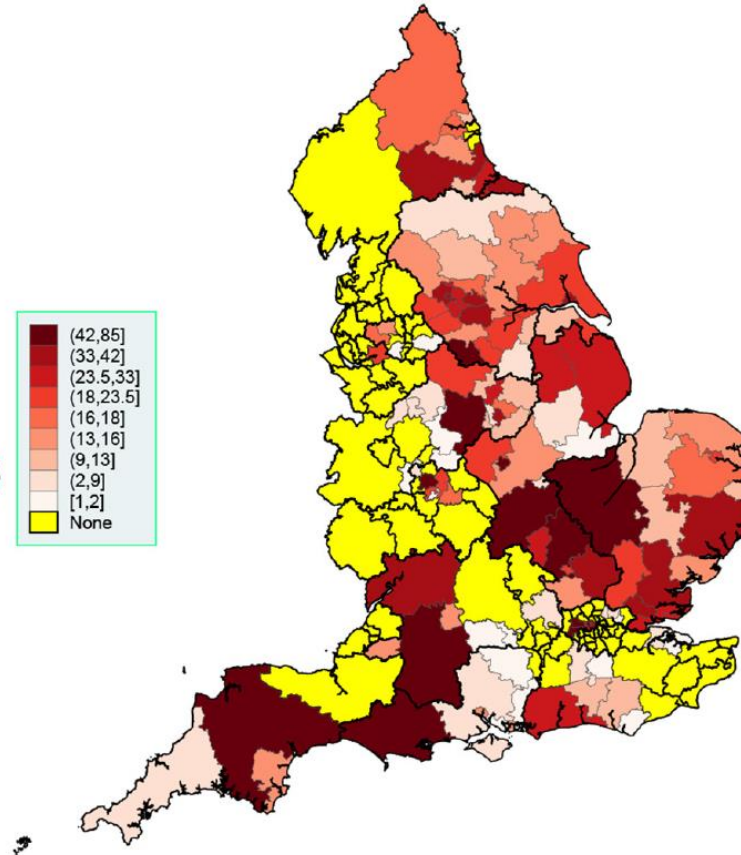
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SystemOne

Percentage of patient population share



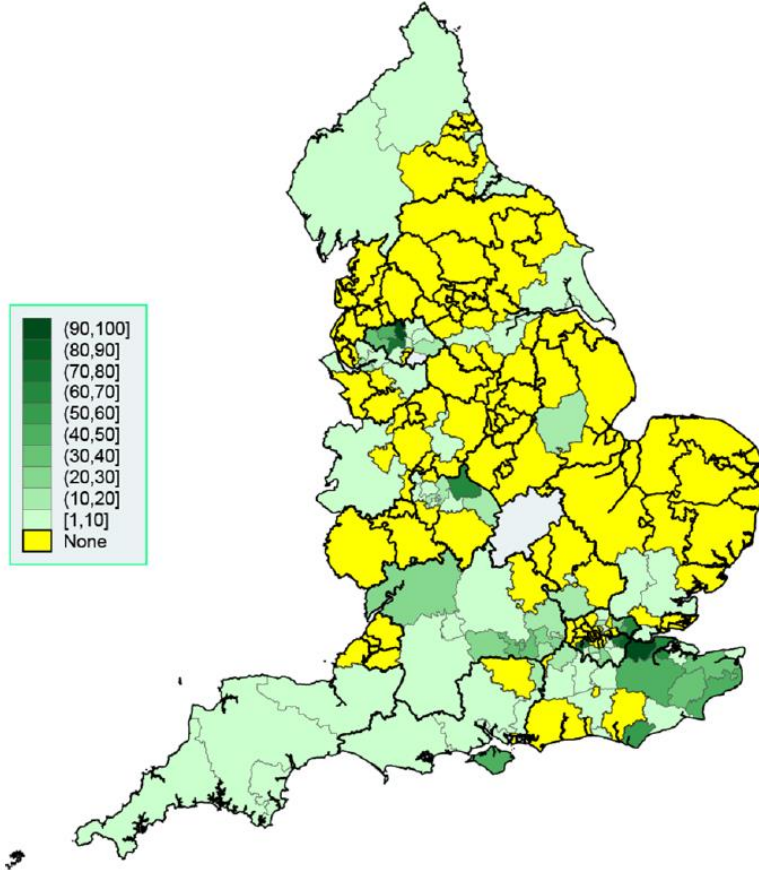
Number of general practices



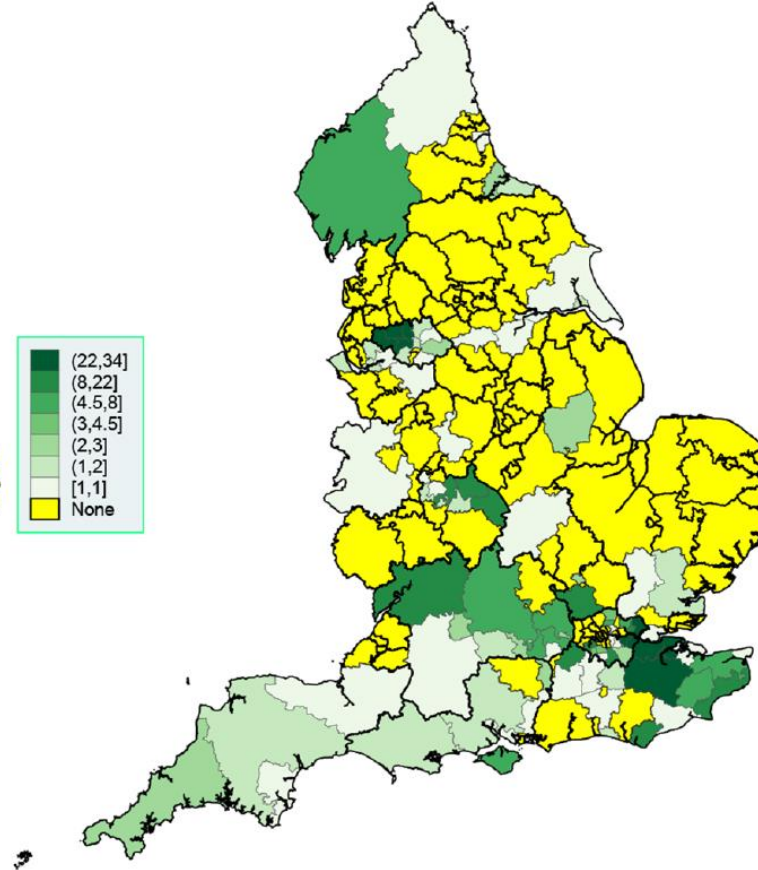
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Vision

Percentage of patient population share



Number of general practices



Kontopantelis E, Stevens RJ, Helms PJ, *et al.* Spatial distribution of clinical computer systems in primary care in England in 2016 and implications for primary care electronic medical record databases: a cross-sectional population study. *BMJ Open* 2018;8:e020738. doi:10.1136/bmjopen-2017-020738

GP2GP

- The General Medical Services GP Contract requires practices to use GP2GP for transferring electronic health records.
- With GP2GP, the record arrives straight after the registration. In comparison, paper medical records can take weeks or months to arrive.
- A request for the electronic health record is generated when a new patient is correctly registered at their new practice
- 99% of England's 7,581 practices are live with GP2GP
- In research terms this means continuity of record independent of GP EPR systems

Questions???



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England only: General Practice Extraction Service (GPES)

- Operated by NHS Digital (England)
- collects information for a wide range of purposes, including providing GP payments.
- works with the Calculating Quality Reporting Service (CQRS) and GP clinical systems as part of the GP Collections service
- GPES can collect 2 different types of information:
 - effectively anonymised data that doesn't reveal an individual's identity
 - patient-identifiable data (PID), that may identify an individual, such as a name, date of birth or postcode
- PID data is only used when information is permitted by law or supports direct benefits to patient care.
- To support the response to the coronavirus outbreak, NHS Digital has been legally directed to collect a specific set of patient data from GP practices in England on a fortnightly basis for the duration of the coronavirus pandemic (<https://digital.nhs.uk/coronavirus/gpes-data-for-pandemic-planning-and-research>)

England only: Qresearch (1)

- QResearch is a not for profit collaboration between the University of Oxford and EMIS
- Comprises approx. 35 million patient records (version 43) between 1990 and 2018, from 1616 GP practices in England. In 2020, the database expanded to include 2530 practices across England
- Includes those who have died (2.15million), left the practice (19.54 million) and those who are still registered (13.10 million)

		Ethnic Group	Numbers of patients
• East Midlands	1.54 million		
East of England	1.67 million	White or not recorded	31.1 million
London	9.23 million	Indian	568,845
North East	0.99 million	Pakistani	393,749
North West	5.07 million	Bangladeshi	288,863
South Central	4.55 million	Other Asian	402,416
South East	3.16 million	Caribbean	243,517
South West	3.49 million	Black African	634,953
West Midlands	3.47 million	Chinese	231,418
Yorkshire and humber	1.65 million	Other group	899,523

Qresearch (2)

Linked to

- National Cancer Registry (NCRAS)
 - 1,122,467 incident cancers 1990-2017
- Civil Registration Mortality Data
 - 1.8 million deaths 1997-2017
- Hospital Episode System data
 - 105 million hospital admissions and 0.5 billion outpatient attendances 1997-2019
- Intensive Care National Audit & Research Centre (ICNARC) Case Mix Programme
- PHE Second Generation Surveillance System (SGSS) – laboratory data on infectious diseases since January 2020 only
- See <https://www.qresearch.org/data/> for summary of data available
- Access requests via website and review by QResearch Scientific Committee
<https://www.qresearch.org/information/information-for-researchers/>

Clinical Practice Research Datalink (CPRD)

- CPRD is jointly sponsored by the Medicines and Healthcare products Regulatory Agency (MHRA) and the National Institute for Health Research (NIHR), as part of the Department of Health and Social Care
- CPRD collects de-identified patient data from a network of volunteer GP practices across the UK
- Established in 1987 as the Value Added Medical Products (VAMP) dataset, then the General Practice Research Database (GPRD) in 1993, then CPRD Gold (Vision practices) in 2012
- Includes practices from across UK
- Average duration of follow-up 5.1 years
- CPRD Aurum developed in 2017 based on EMIS practices
- Holds data on 50 million patients, including 16 million currently registered patients.

Clinical Practice Research Datalink (CPRD GOLD)

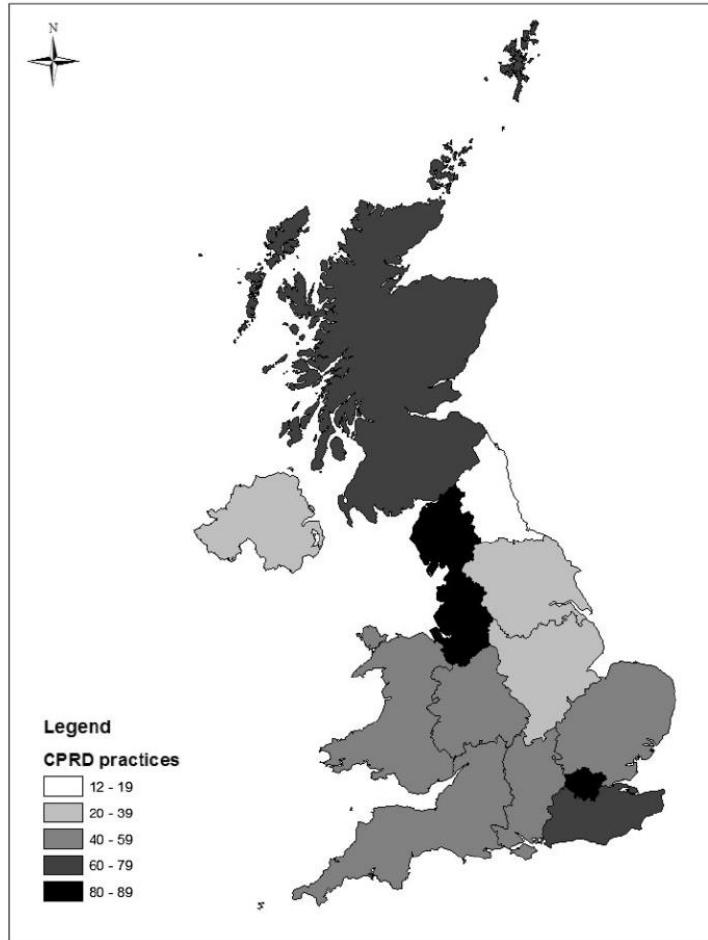


Figure 1. Distribution of 674 CPRD practices by region in England, and in Wales, Scotland and Northern Ireland.

January 2014:

674 practices contributing 4.4 million current patients ~6.9% of population of England

Median follow up:

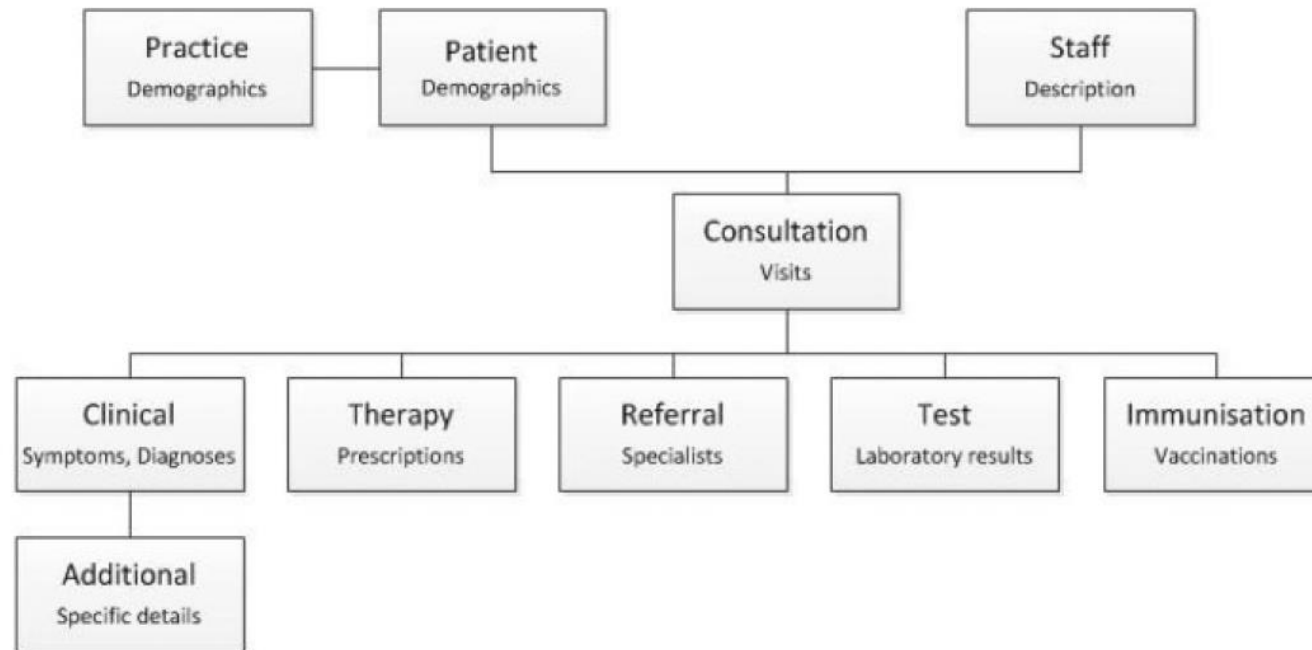
- 5.1 years for all patients

Updated on monthly basis

416 (74%) practices agree to linkage

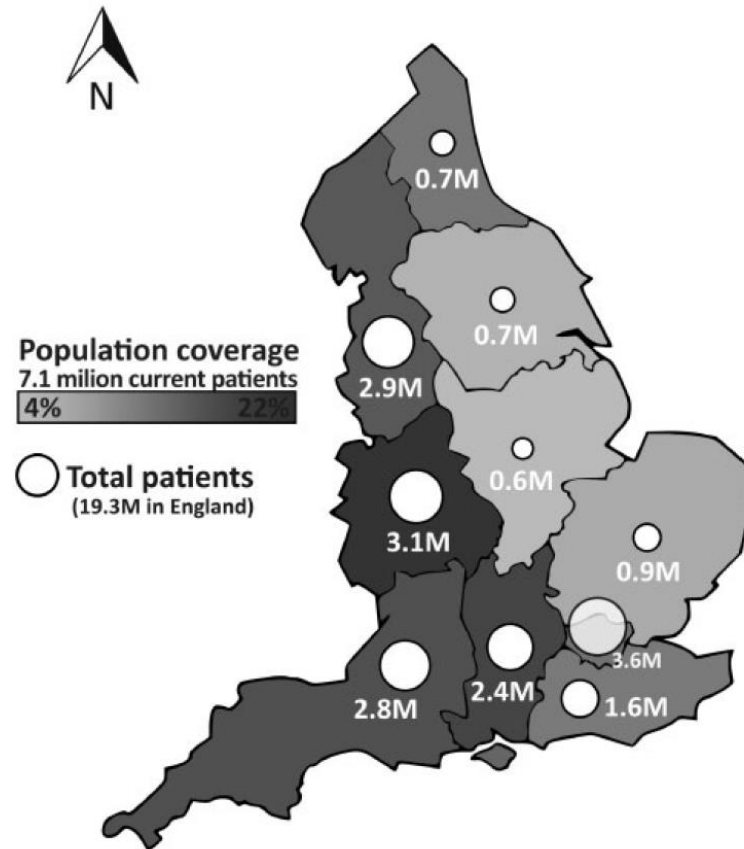
Herrett E, Gallagher AM, Bhaskaran K, Forbes H, Mathur R, van Staa T, Smeeth L. Data Resource Profile: Clinical Practice Research Datalink (CPRD). *Int J Epidemiol.* 2015 Jun;44(3):827-36. doi: 10.1093/ije/dyv098.

Clinical Practice Research Datalink (CPRD GOLD)



Herrett E, Gallagher AM, Bhaskaran K, Forbes H, Mathur R, van Staa T, Smeeth L. Data Resource Profile: Clinical Practice Research Datalink (CPRD). *Int J Epidemiol.* 2015 Jun;44(3):827-36. doi: 10.1093/ije/dyv098.

Clinical Practice Research Datalink (CPRD Aurum)



September 2018:

738 practices contributing 7 million current patients ~13% of population of England

Median follow up:

- 4.2 years for all patients
- 9.1 years for current patients

Northern Ireland due to contribute from 2019

Updated on monthly basis

Wolf A, Dedman D, Campbell J, Booth H, Lunn D, Chapman J, Myles P. Data resource profile: Clinical Practice Research Datalink (CPRD) Aurum. *Int J Epidemiol.* 2019 Dec 1;48(6):1740-1740g. doi: 10.1093/ije/dyz034.

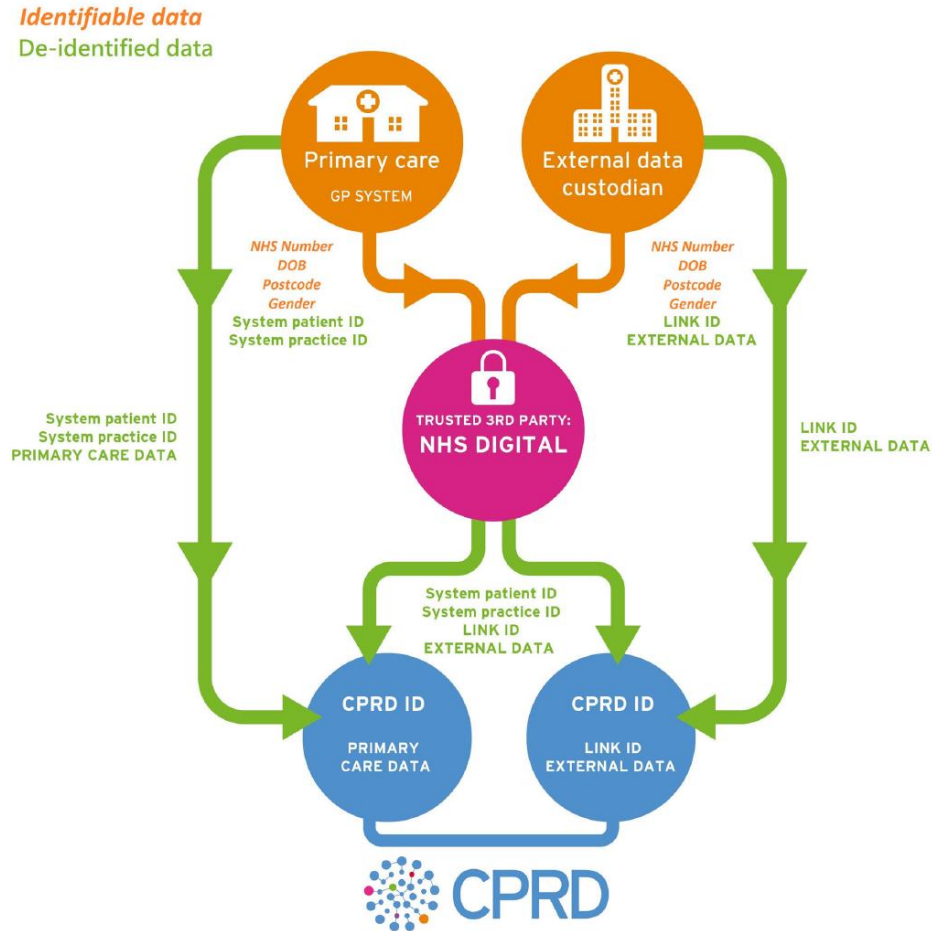
Clinical Practice Research DataLink (CPRD Aurum)

Linkage dataset	Coverage ^a	Key information (including coding/scoring system)
ONS Death Registration Data	1998–2018	Date, place, and causes of death (ICD)
Hospital Episode Statistics (HES)		
Admitted Patient Care	1997–2017	Diagnoses (ICD) and procedures (OPCS)
Outpatient	2003–2017	Diagnoses (ICD) data
Accident & Emergency	2007–2017	Diagnoses (A&E codes) data
Diagnostic Imaging Dataset	2012–2017	Imaging tests data
PROM	2009–2017	Quality of life & condition-specific scales
National Cancer Registration and Analysis Service		
Cancer registration	1990–2015	Diagnoses (ICD) and tumour site
Systemic Anti-Cancer Treatment	2014–2015	Procedures and outcomes (ICD & OPCS)
National Radiotherapy Dataset	2012–2015	Procedures (ICD & OPCS)
Cancer Patient Experience Survey	2010–2013	Self-reported cancer patient data
Mental Health Services Data Set	2007–2015	Diagnoses (ICD), functioning (HoNOS)
Small area-level data		
Index of Multiple Deprivation	2004–2015	Patient or practice data, including domains
Townsend Index	2001	Patient-level deprivation data
Carstairs Index	2011	Practice-level deprivation data
Rural Urban Classification	2011	Practice-level classification

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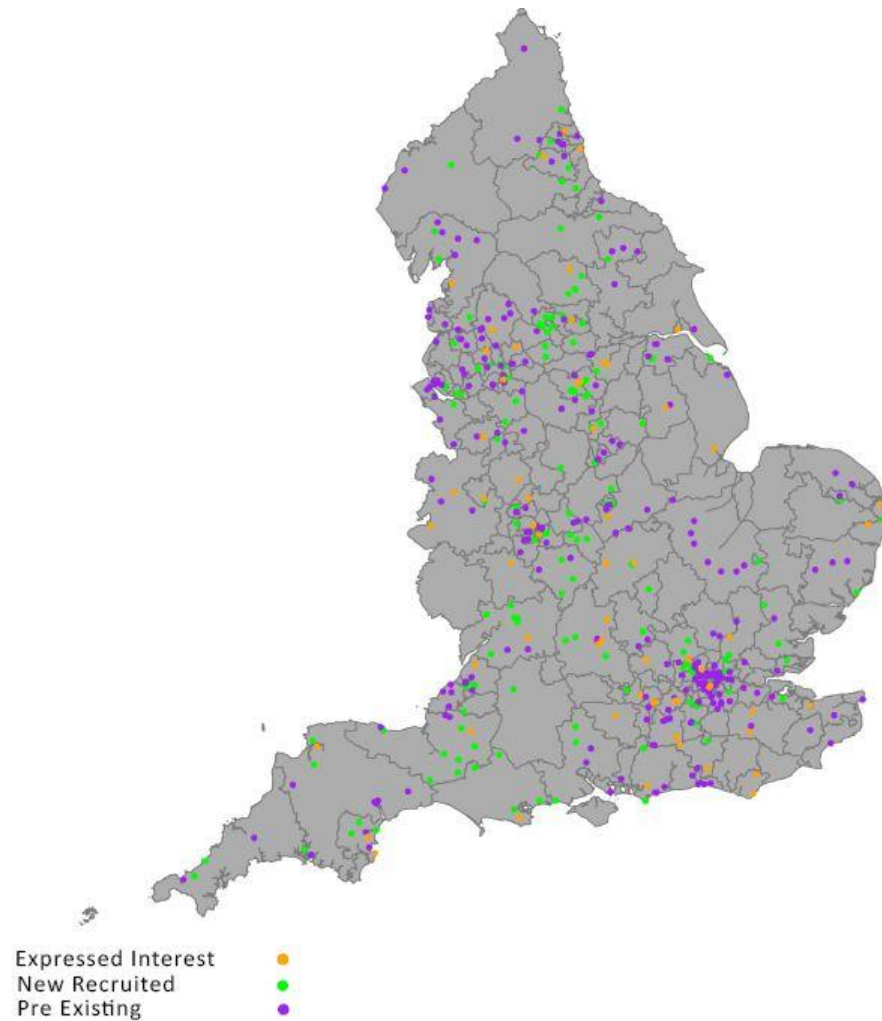


Clinical Practice Research DataLink (CPRD)



Padmanabhan S, Carty L, Cameron E, Ghosh RE, Williams R, Strongman H. Approach to record linkage of primary care data from Clinical Practice Research Datalink to other health-related patient data: overview and implications. Eur J Epidemiol, 2018.

RCGP Research and Surveillance Centre Sentinel Network



Over 500 'spotter' practices

Established in 1964 to provide weekly returns of data with focus on influenza and other acute illnesses

Updated twice weekly

Practices can also provide microbiological samples

Data Access on case by case basis

Correa A, Hinton W, McGovern A, van Vlymen J, Yonova I, Jones S, de Lusignan S. *BMJ Open*. 2016 Apr 20; 6(4):e011092. Epub 2016 Apr 20.

<https://clininf.eu/index.php/rcgp-rsc/>

Questions???



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Key points

- General practice data are a valuable resource and widely used in research
- They provide national coverage of primary care use and can be linked to other datasets
- A number of primary care research databases are available with varying geographical and EPR coverage
- Linkage to hospital data and patient registries provide additional depth of information which can enrich primary care data
- Free text is not available
- Data is not real-time usually current to last month
- Follow up periods in research databases may cease should patient register with non-participating practice

Tutorial

We will discuss the paper comparing disease prevalences estimated from different data sources with reference to STROBE checklist

You will be assigned an exercise to bring for discussion at next week's tutorial based on today's lecture

This slide set will be made available to you on QMPlus together with a reading list