Public Health England

Protecting and improving the nation's health

National Disease Registration Service: Rare Disease Registration

National Disease Registration Webinar

November 2020

Presenters

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Objectives of this webinar

- An introduction to NDRS's work on rare diseases
- Putting national rare disease registration into context – what are the benefits for patients and stakeholders
- What can be achieved through partnership working – the Registration of Complex Rare Diseases - Exemplars in Rheumatology Project (RECORDER)

Rare disease registration introduction

Public Health England	
Health Improvement Directorate	
National Disease Registration Service (NDRS)	
National Congenital Anomaly and Rare Disease Registration Service (NCARDRS)	National Cancer Registration & Analysis Service (NCRAS)
Rare disease team	Congenital anomaly team

Department of Health

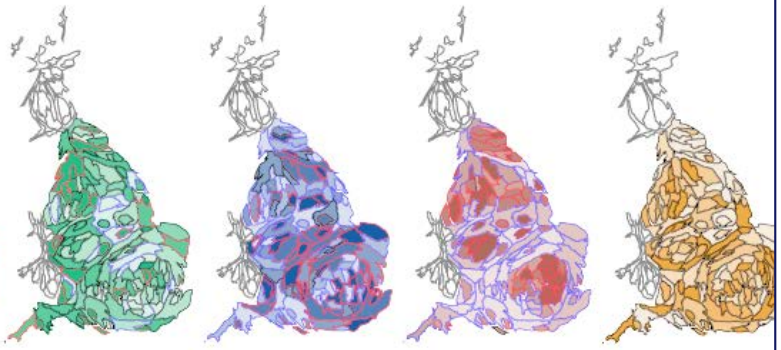
The UK Strategy for Rare Diseases

The Scottish Government

DHSSPS

Annual Report of the Chief Medical Officer

Volume One, 2011
On the State of the Public's Health



NCARDRS – key deliverables

- **Support and empower patients** and their carers, by providing a national register of their disease or disorder.
- Provide a **resource for clinicians** to support high quality clinical practice.
- Provide **epidemiology and monitoring** of the frequency, nature, cause and outcomes of these disorders.
- **Support research** into congenital anomalies and rare diseases.
- **Inform the planning and commissioning** of public health and health and social-care provision.
- Provide a resource to **monitor, evaluate and audit** health and social-care services, including the efficacy and outcomes of screening programmes.

Section 251, NHS Act 2006

- NCARDRS has legal permission to collect information about all confirmed or suspected rare disease patients without consent under Section 251 of the NHS Act 2006 (Control of Patient Information)
- Activity must have a medical purpose
- Activity must be in the public interest or in the interests of improving patient care
- Must be compliant with DPA/GDPR
- Impracticable to obtain consent and anonymised information cannot be used
- Undergo yearly review with Confidentiality Advisory Group (CAG) of the Health Research Authority (HRA)
- Patient can opt out at any time and their wishes are respected

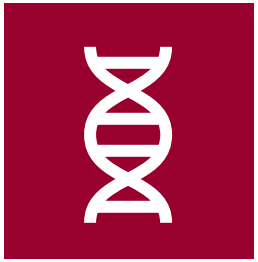
Orphanet rare designation ¦ <1:2000 population at risk

Rare diseases data collection

- Enormous task
- Limited resources
- Not mandatory
- Pragmatic, project-based
- Emphasis on high case ascertainment with small dataset
- Multiple data sources
- Linkage with PHE-held datasets

NCARDRS Rare disease areas of focus

Later onset conditions
- Rare rheumatology disease
- Histiocytic disease
- Liver disease
- Rare dermatology



Molecular diagnostic data
- Pilot project completed
- Mitochondrial disease

Inherited metabolic disorders (IMD)
- Specialised services patients
- Newborn blood spot IMDs
- Mitochondrial disease

Congenital anomalies
- Increased granular coding
- Post neonatal diagnoses

Collaborations
- Academics
- Patient groups/registries
- Clinicians & clinical networks
- Consented & 251 studies
- Other government agencies

Linkage to PHE datasets
- HES
- Mortality data
- Cancer outcomes
- Prescribing data

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COVID-19

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Access to NDRS data

- Formal requests to the Office for Data Release

  Contact: ODR@phe.gov.uk
- Partnership working
  - Fund PHE staff
  - Sponsored external staff with PHE honorary contracts

  ✓ Must align with PHE's objectives to improve the nation's health

  ✓ Expect to deliver synergistic benefits

NCARDRS: Examples of ongoing partnerships

Condition(s)	Partner(s)	Type
Inherited metabolic disorders (IMDs)	IMD Highly Specialised Services	Ascertainment
Haemophagocytic lymphohistiocytosis (HLH)	University of Nottingham, supported by HASC and Histio UK	Ascertainment, epidemiology
Wilson Disease	Wilson Disease Special Interest Group	Ascertainment, epidemiology
Alpha 1 antitrypsin deficiency	King's College London	Ascertainment, epidemiology
Mitochondrial disease	Cambridge University	Ascertainment, epidemiology
Rare autoimmune rheumatic disease (RECORDER)	University of Nottingham	Ascertainment, epidemiology
Multiple Systems Atrophy	Multiple Systems Atrophy (MSA) Trust	Patient self-registration

Rare disease registration into context

Rare disease registration into context

Rare disease registration into context

The clinical context

The clinical context

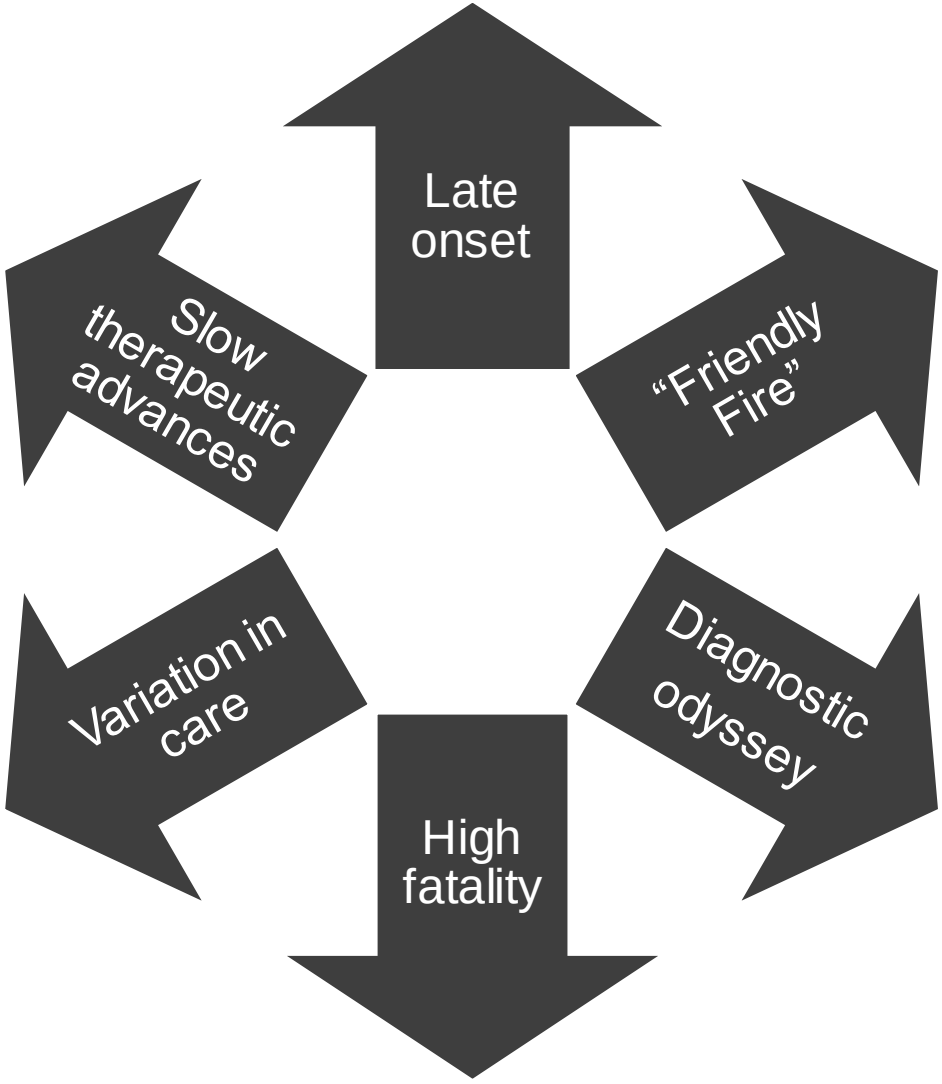
Path to diagnosis

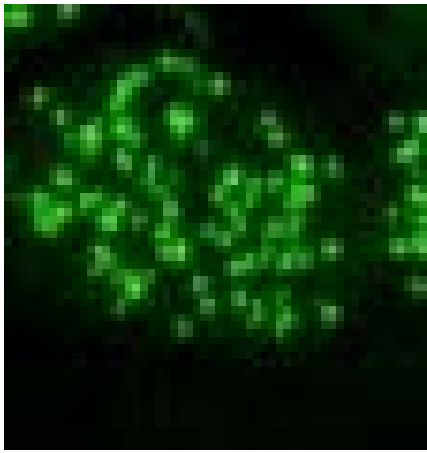
Inform high quality care

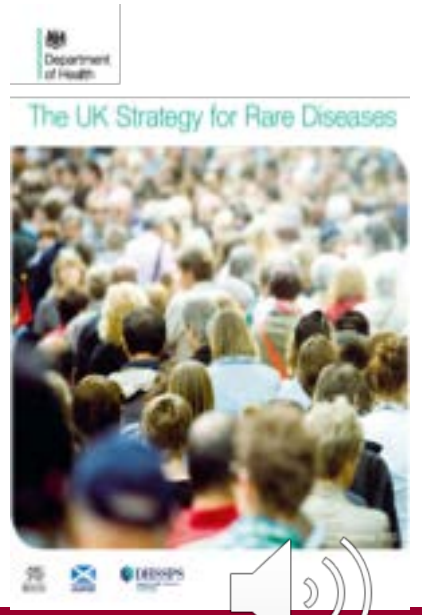
Deliver better outcomes

Maximising clinical relevance

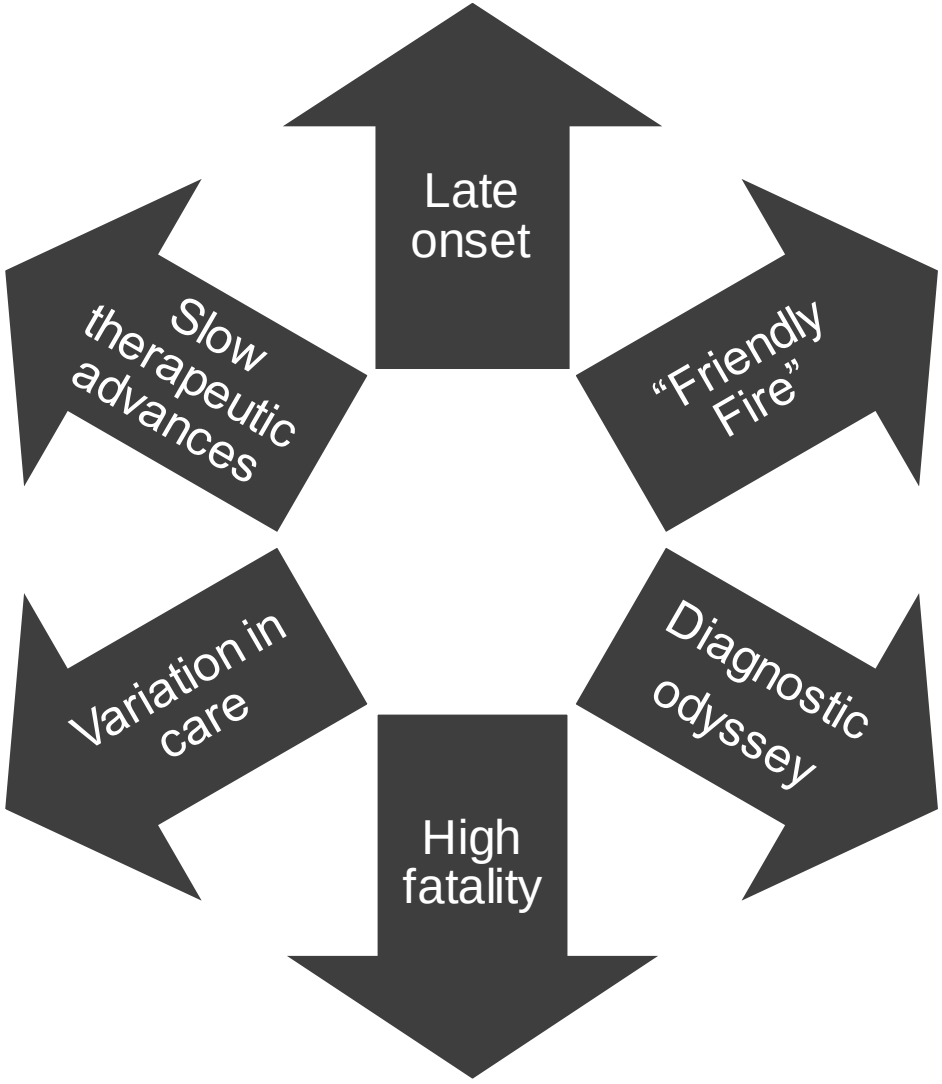
Rare autoimmune diseases

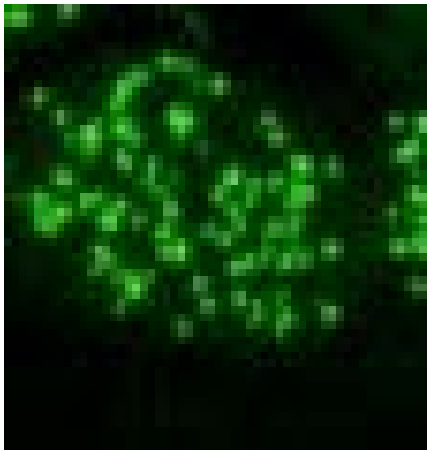


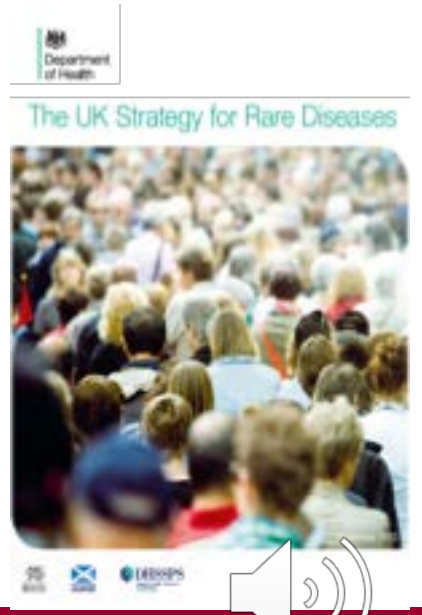




Rare autoimmune diseases

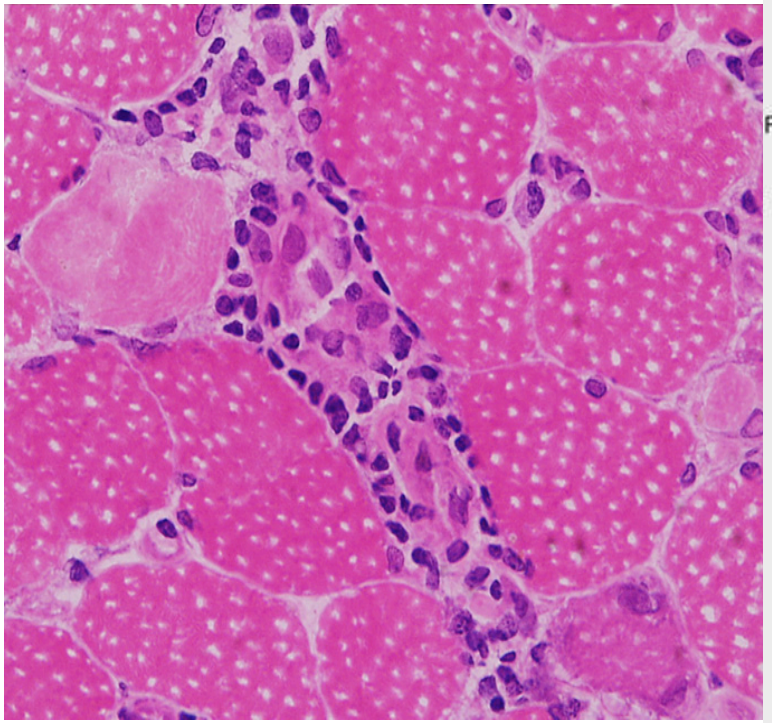


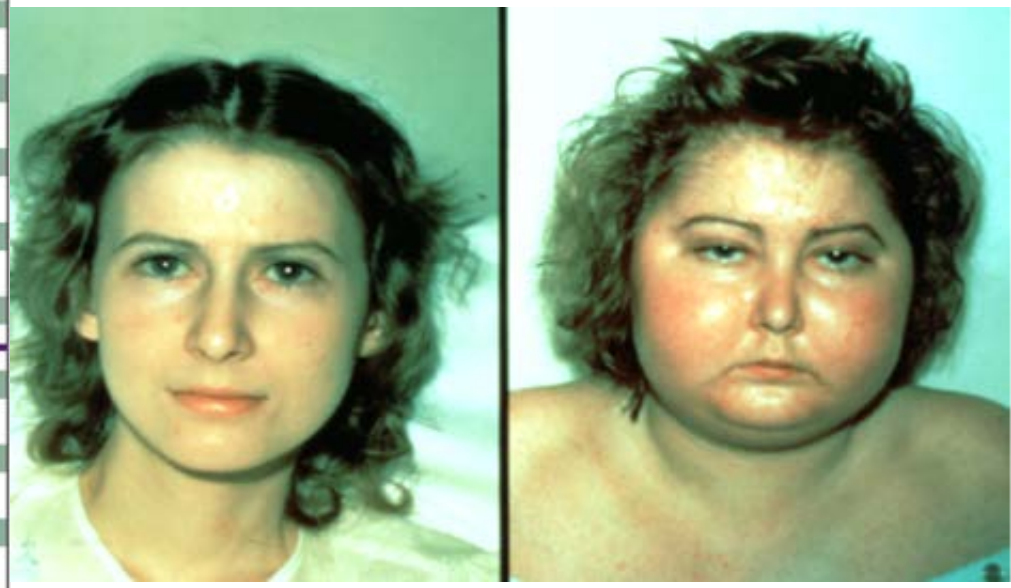




Rare single organ autoimmune disease

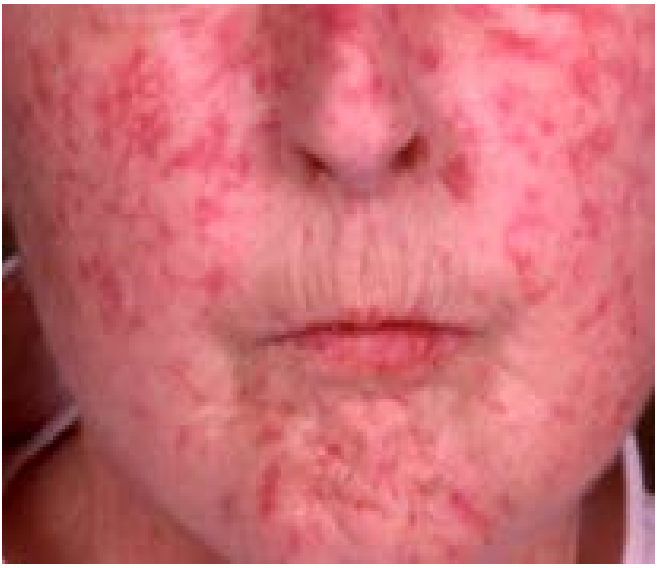
Myositis

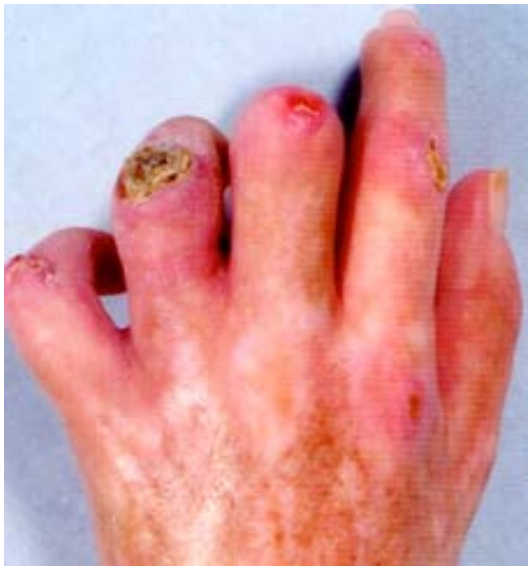


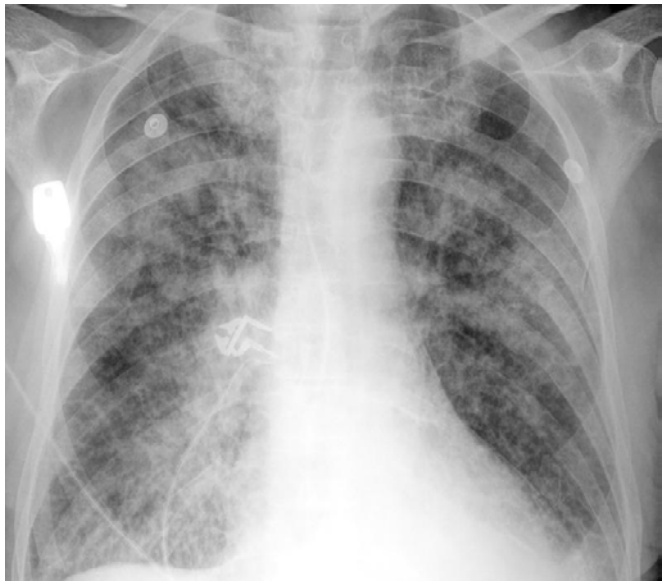


Rare multiple organ autoimmune disease

Scleroderma

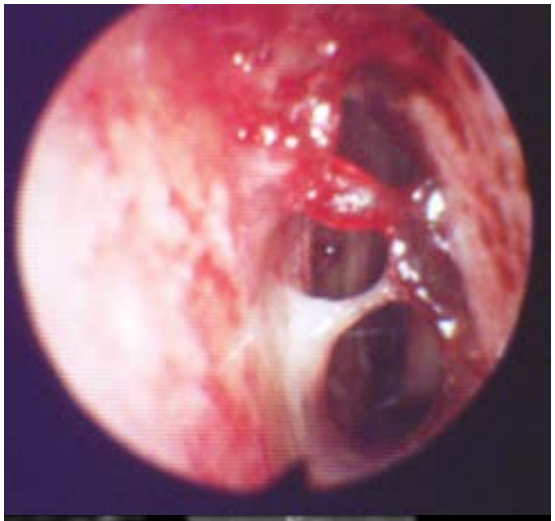


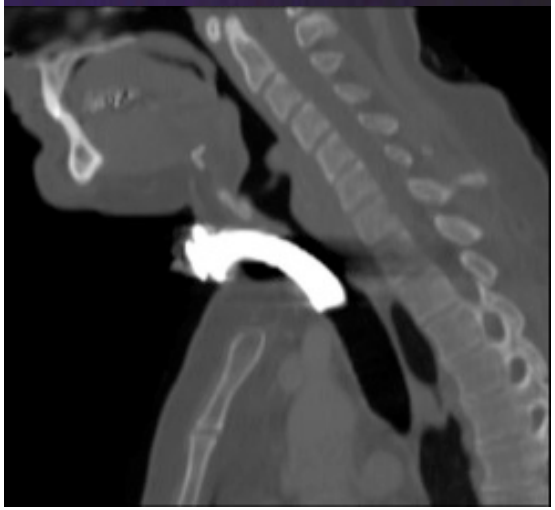


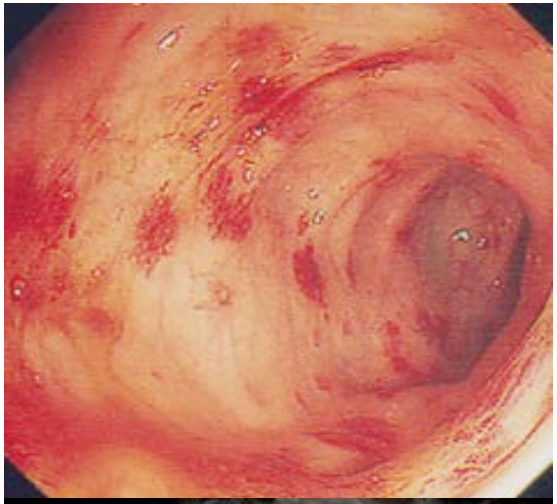


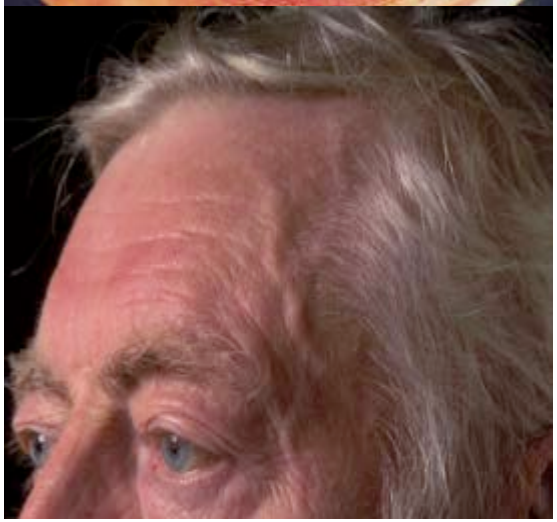
Rare multisystem autoimmune disease

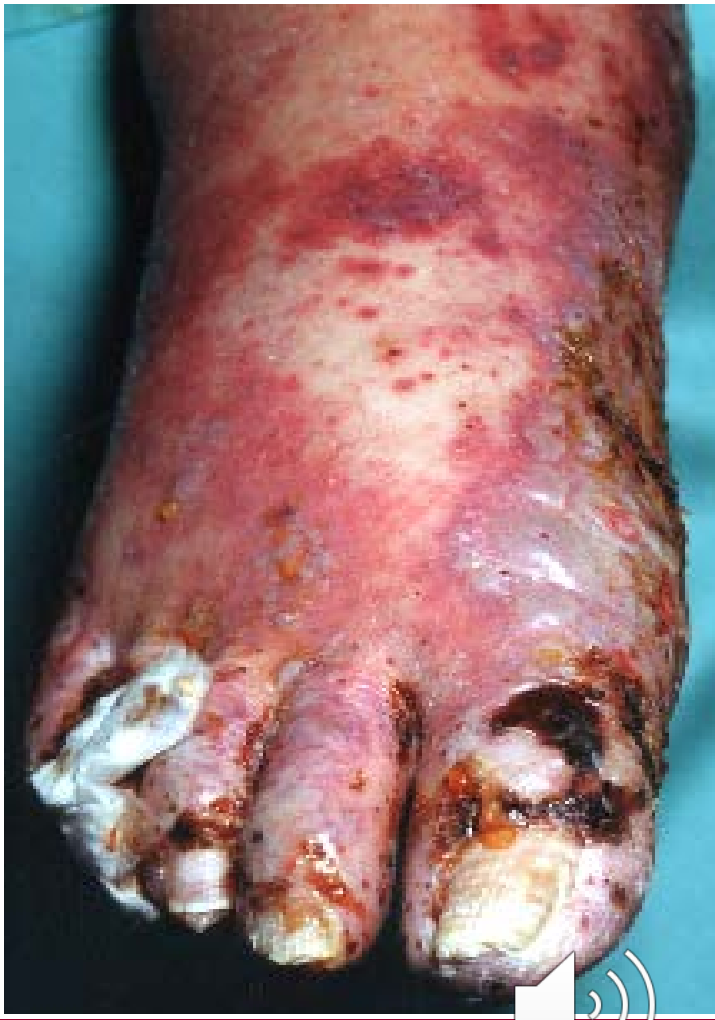
Vasculitis and Lupus

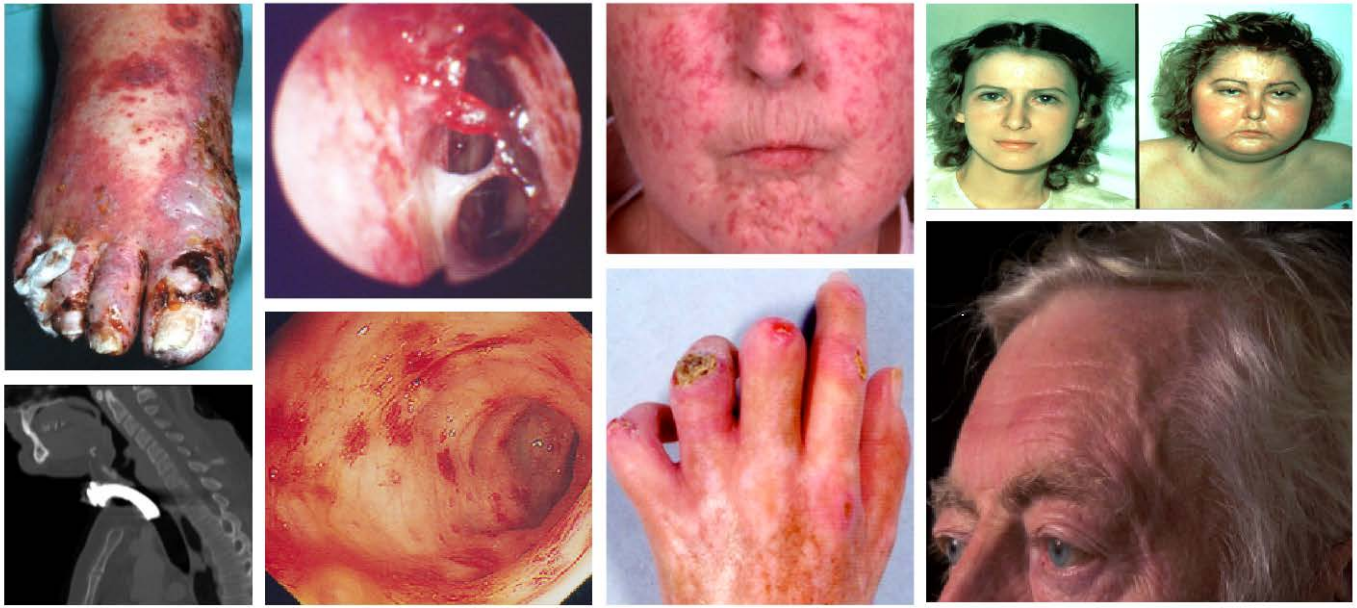






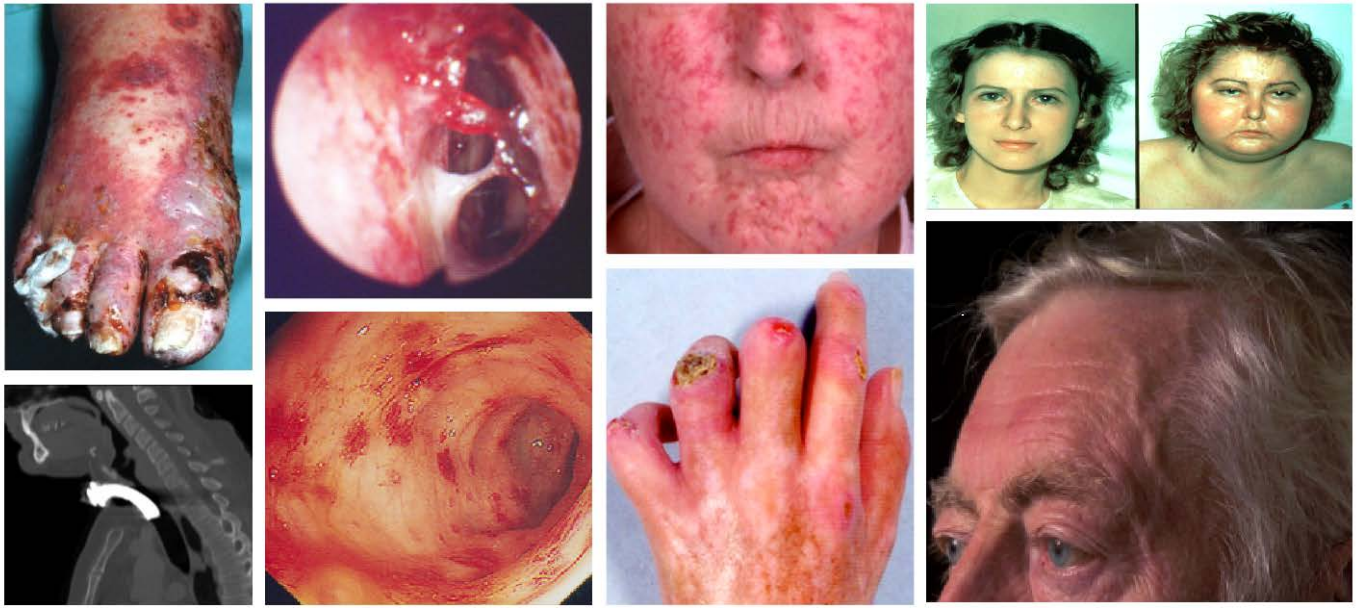






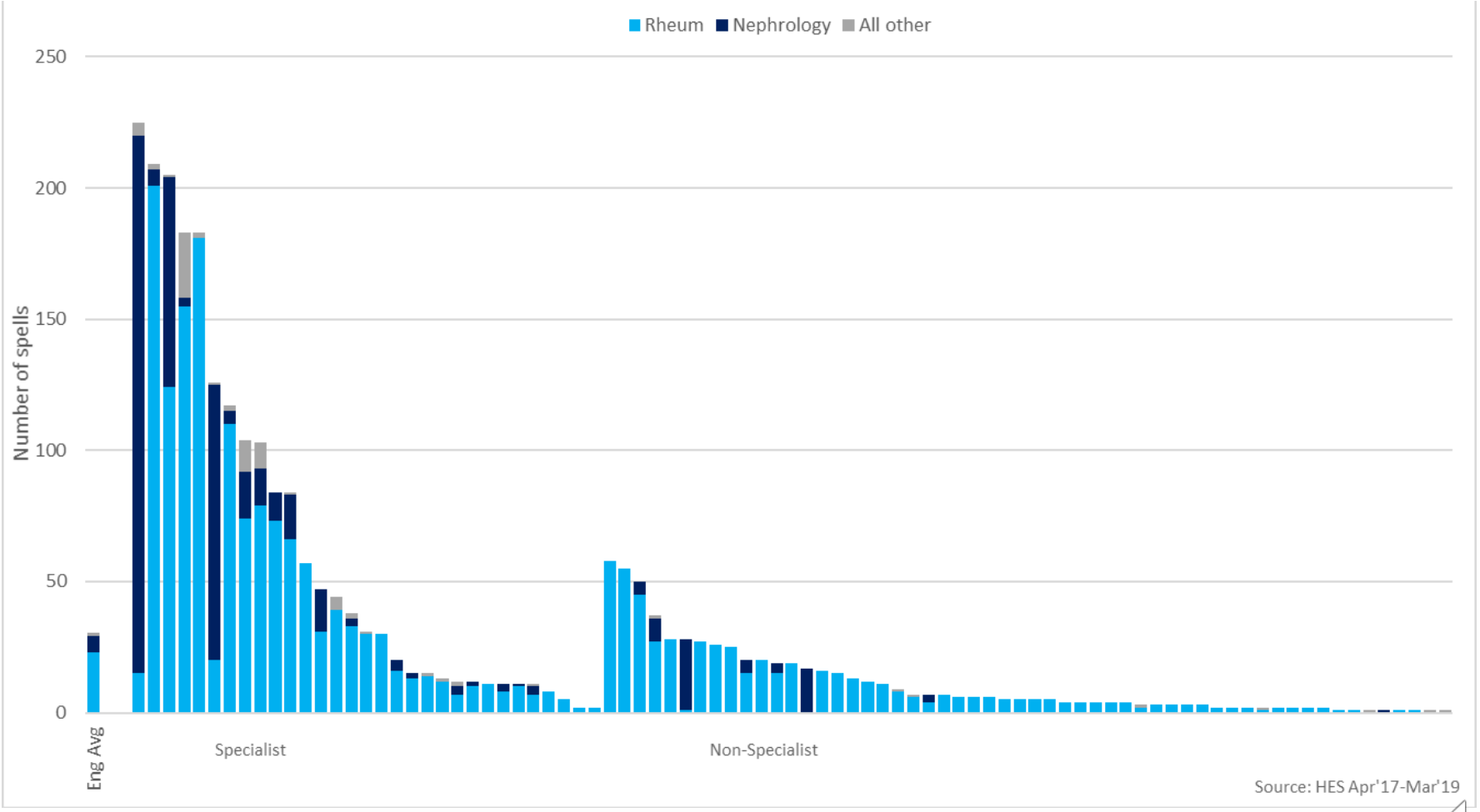
Clinical Commissioning Policy: Rituximab for the treatment of ANCA-associated vasculitis Reference: NHS England A13/P/a

The RECORDER project



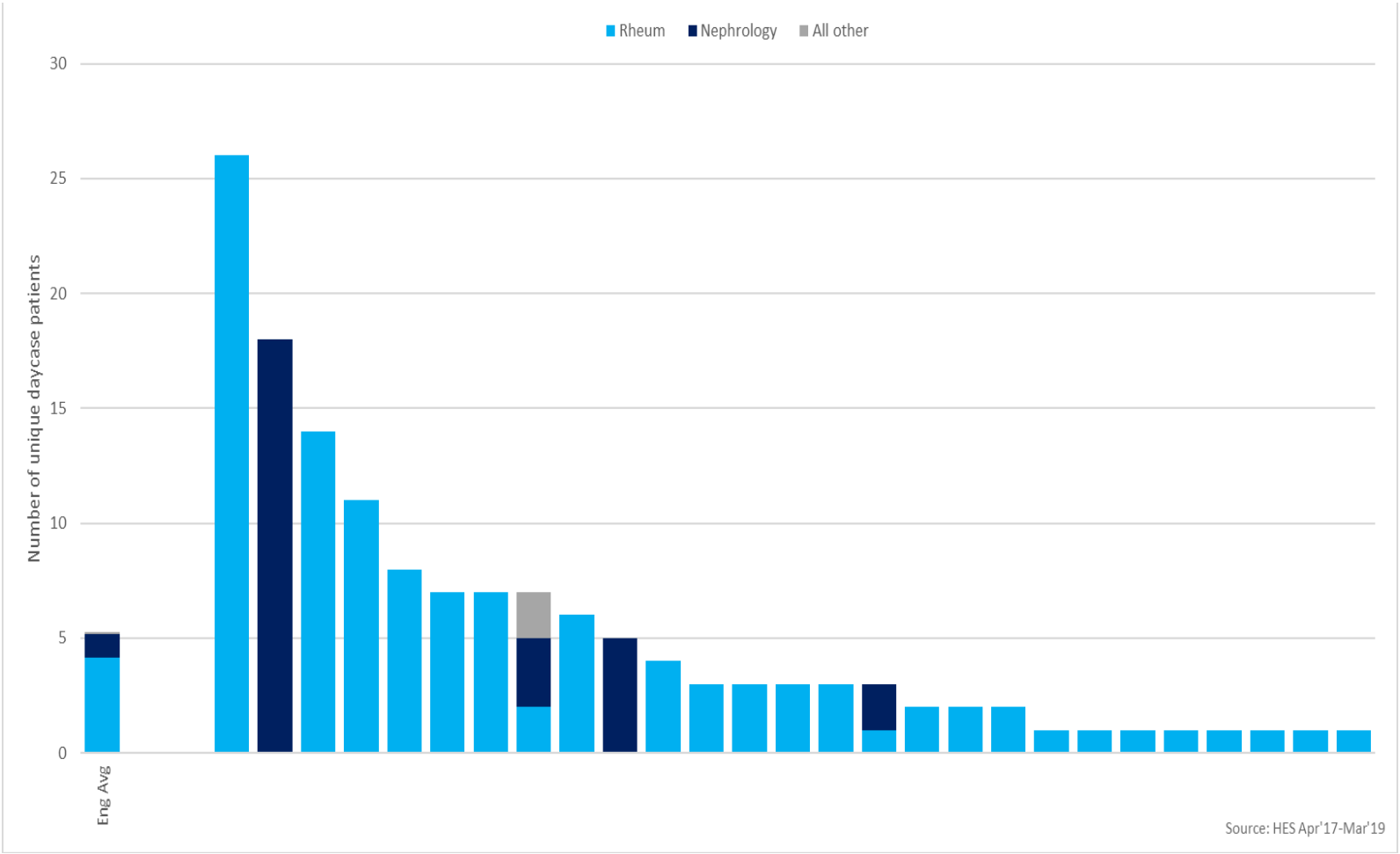
- Exemplar for rare non-genetic late onset conditions
- Ability to identify within routinely collected data (extensive work)
- Single national commissioner (NHS England)
- Variation in care (evaluated by GIRFT)
- On the cusp of major innovations

Biologic drugs: one rare autoimmune disease



GETTING IT RIGHT FIRST TIME

Biologic drugs: one rare autoimmune disease



GETTING IT RIGHT FIRST TIME

The clinical context

Rare disease registration into context

NHS England

Clinical Commissioning Policy: Rituximab for the treatment of ANCA-associated vasculitis
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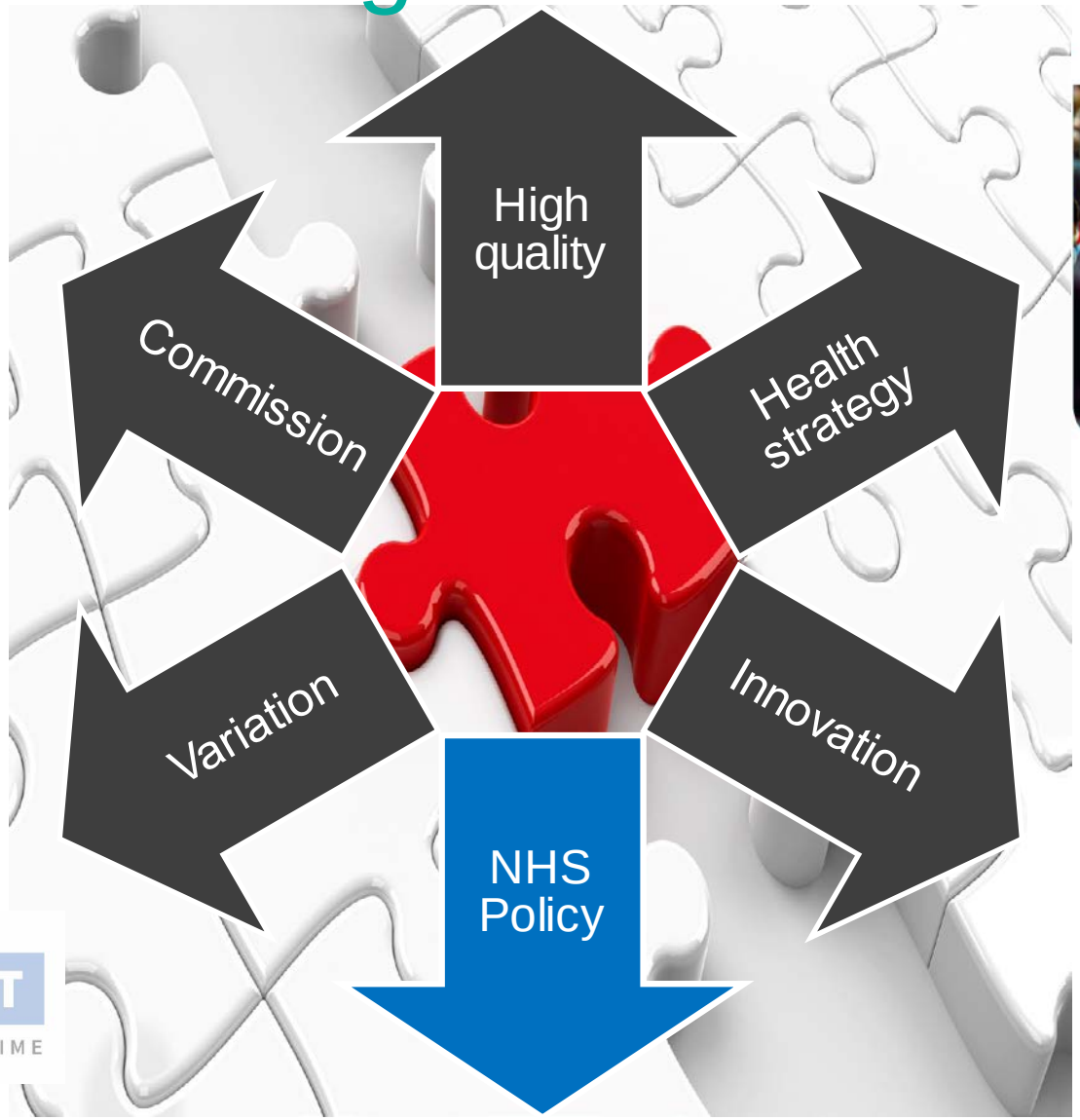


Department of Health

The UK Strategy for Rare Diseases

GIRFT
GETTING IT RIGHT FIRST TIME

The clinical context

University of Nottingham
UK | CHINA | MALAYSIA

Public Health England

What can be achieved through partnership working? The Registration of Complex Rare Diseases - Exemplars in Rheumatology Project (RECORDER)

Fiona Pearce, University of Nottingham

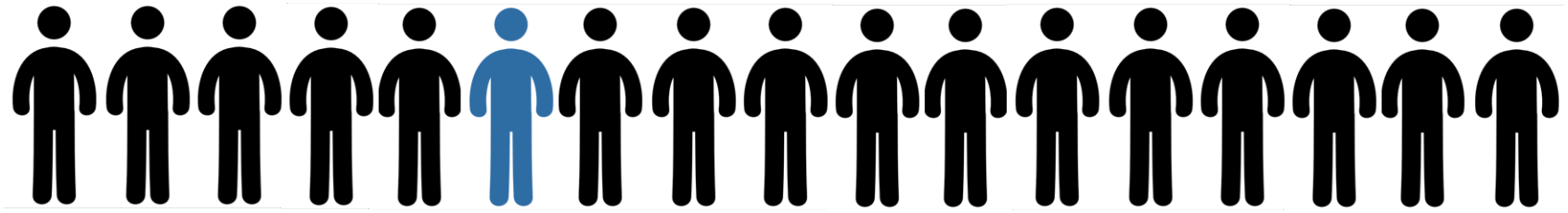
NDRS Rare Disease Webinar

25 November 2020

Registration of Complex Rare Diseases - Exemplars in Rheumatology

Each rare disease affects fewer than **1 in 2,000 people**

In the UK, **1 in 17 people** will be affected by a rare disease



Health outcomes are poor

Research is difficult

Registration of Complex Rare Diseases - Exemplars in Rheumatology

Public Health England

RECORDER Project Aims

- Deliver registration
- Enable epidemiology
- Discover outcomes
- Identify variation
- Support innovation
- Empower all

Data

Public Health England

Linkage to PHE datasets

- ✓ HES
- ✓ Mortality data
- • Cancer outcomes
- ✓ Prescribing data
- ✓ COVID-19 results

University of Nottingham
UK | CHINA | MALAYSIA

Public Health England

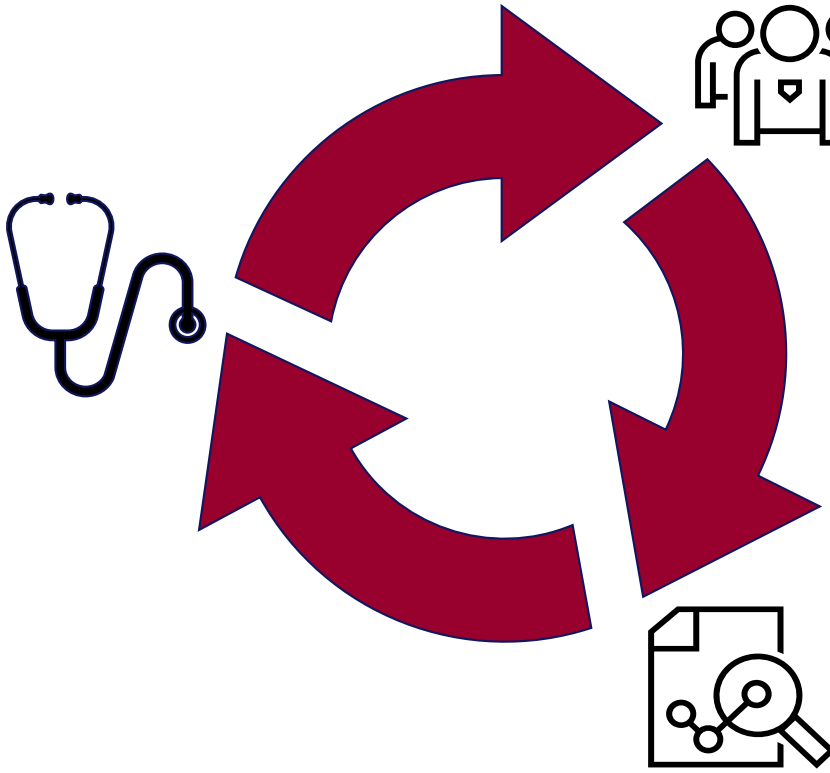
Risk of death during the 2020 UK COVID-19 epidemic among people with Rare Autoimmune Rheumatic Diseases

https://www.medrxiv.org/content/10.1101/2020.10.09.20210237v3

Data

Public Health England

Hospital Episode Statistics



Patient Demographic Service

ONS Mortality Data

Risk of death during the 2020 UK COVID-19 epidemic among people with Rare Autoimmune Rheumatic Diseases

Public Health England

Study design

Cohort study

Coded diagnoses for Rare autoimmune rheumatic diseases identified from Hospital Episode Statistics (2003 onwards)

Main outcome measure: age-standardised mortality rates (ASMRs) for all-cause death

ONS published data were used for general population mortality rates

Validation results

Public Health England

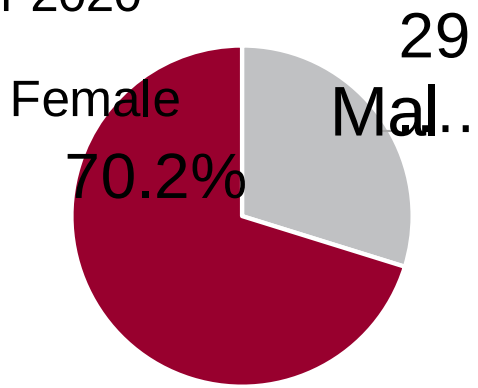
RAIRD	ICD-10 codes	No. of cases validated in notes	No. of confirmed cases	PPV	weighting in our cohort	Contribution to weighted PPV
Giant cell arteritis	M315, M316	65	53	**81.5%**	0.2206	18.0%
Systemic Lupus Erythematosus	M321, M328, M329	37	31	**83.8%**	0.2159	18.1%
Juvenile Idiopathic Arthritis	M080, M082, M083, M084, M089	40	40	**100.0%**	0.1252	12.5%
Arteritis unspecified	I776	38	25	**65.8%**	0.1205	7.9%
Polymyositis	M332, M608, M609, G724	38	33	**86.8%**	0.101	8.8%
Scleroderma	M340, M341, M348, M349	38	33	**86.8%**	0.0627	5.4%
ANCA-Associated Vasculitis	M301, M313, M317	220	189	**85.9%**	0.0408	3.5%
Glomerular disorder in a systemic connective tissue disorder	N085	36	32	**88.9%**	0.0281	2.5%
Behcet's disease	M352	36	26	**72.2%**	0.0283	2.0%
Respiratory disorder in other diffuse connective tissue disorder	J991	38	34	**89.5%**	0.0167	1.5%
Dermatomyositis	M331, M339	40	38	**95.0%**	0.0142	1.3%
Polyarteritis Nodosa	M300, M308	32	29	**90.6%**	0.019	1.7%
Renal tubulo-interstitial disorder in systemic connective tissue disorder	N164	7	7	**100.0%**	0.0066	0.7%
Takayasu arteritis	M314	63	50	**79.4%**	0.0046	0.4%
Juvenile Dermatomyositis	M330	15	15	**100.0%**	0.0028	0.3%
All RAIRDs	All	743	635	**85.5% (95% CI 82.7-87.9)**	1	**84.7%**

Risk of death during the 2020 UK COVID-19 epidemic among people with Rare Autoimmune Rheumatic Diseases

Public Health England

Findings

- 168,691 people with RAIRD alive on 1st March 2020
- Median age: 61.7 (IQR 41.5-75.4) years



- During March-April 2020:
  - 1,815 (1.1%) died of any cause

Risk of death during the 2020 UK COVID-19 epidemic among people with Rare Autoimmune Rheumatic Diseases

Public Health England

Age-standardised mortality rates (ASMR)

Per 100,000 person-years

March & April	RAIRD	General population
2020	**3669** (3500-3838)	**1361** (1354-1369)
2015-2019	**2554** 1.44 times (1.42-1.45)	**983** 1.38 times (1.37-1.39)

Risk of death during the 2020 UK COVID-19 epidemic among people with Rare Autoimmune Rheumatic Diseases

Public Health England

Sex specific mortality rates

Sex-specific deaths and mortality rates in England during March and April 2015-2020 among people with RAIRD compared to the general population

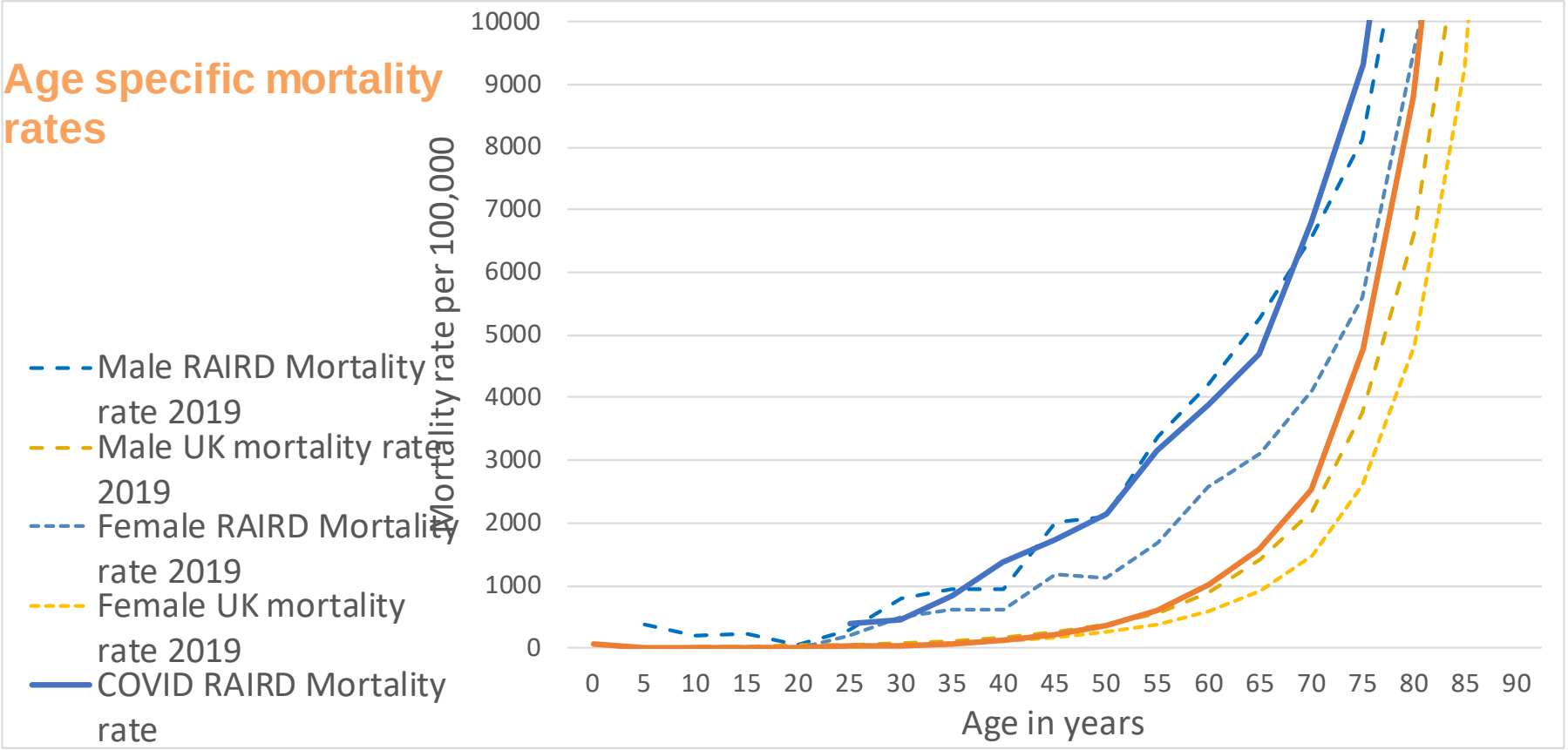
Sex	Number of deaths	Number of people	RAIRD Age standardised mortality rate	England age-sex standardised mortality rate
Males	675	50,311	**4025.4** (3721.7-4329.0)	**1626.7** (1613.8-1639.6)
Females	1140	118,379	**4242.1** (3995.9-4488.4)	**1150.7** (1141.5-1159.9)

Applying the European standard population which is not disaggregated by sex, (meaning it assumes equal numbers of males and females, and identical distributions by age for males and for females) means the age-sex standardised mortality rates are higher than the age-standardised mortality rate for this distribution of data.

Risk of death during the 2020 UK COVID-19 epidemic among people with Rare Autoimmune Rheumatic Diseases

Public Health England

Age specific mortality rates



Take home messages

Public Health England

People with RAIRD had an increased risk of dying during COVID-19 from age 35 years onwards, whereas in the general population it increased from the age of 55 onwards.

Women had a greater increase in their risk of death during COVID-19 compared to men.

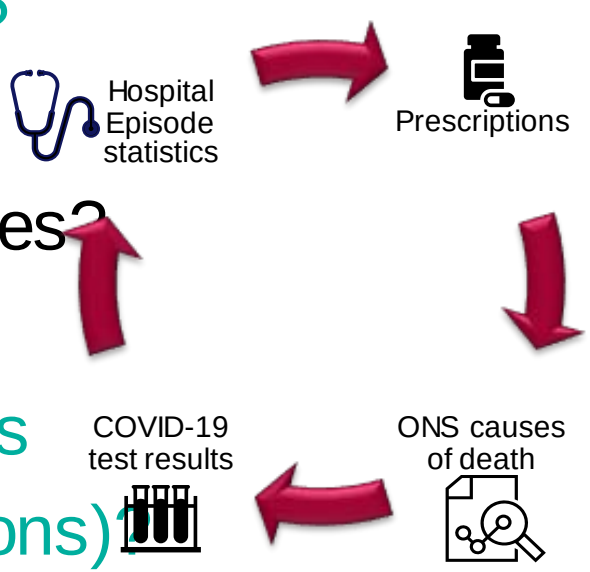
The risk of working age people with RAIRD dying during COVID-19 was similar to that of someone 20 years older in the general population.

Next steps

Public Health England

Why is there increased mortality?

- Due to COVID-19 infection?
- Disruption to healthcare services?



Can we identify modifiable factors that are protective (e.g. medications)?

Registration of Complex Rare Diseases - Exemplars in Rheumatology

Public Health England

RECORDER Project Aims

- Deliver registration
- Enable epidemiology
- Discover outcomes
- Identify variation
- Support innovation
- Empower all

Empower All

PHE

NHS England

NHS Improvement

DH rare diseases team

Patients

Clinicians

Pharma

Acknowledgements

RECORDER

Dr Peter Lanyon

Dr Megan Rutter

Dr Emily Peach

Public Health England

- Jeanette Aston
- Mary Bythell
- Sarah Stevens
- PHE Registration Staff

Other collaborators

- Dr Reem Al-Jayyousi
- Dr Chetan Mukhtyar
- Dr Richard Watts
- Dr Bridget Griffiths
- Dr Mithun Chakravorty
- Dr Cattleya Godsave
- Dr Jen Hannah

Public Health England

SUPPORTED BY NIHR | National Institute for Health Research

VIFOR PHARMA

British Society for Rheumatology

VASCULITIS UK


University of
Nottingham
UK | CHINA | MALAYSIA
Public Health
England
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