



# Towards an international definition framework of rare diseases

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## Estimating cumulative point prevalence of rare diseases: analysis of the Orphanet database

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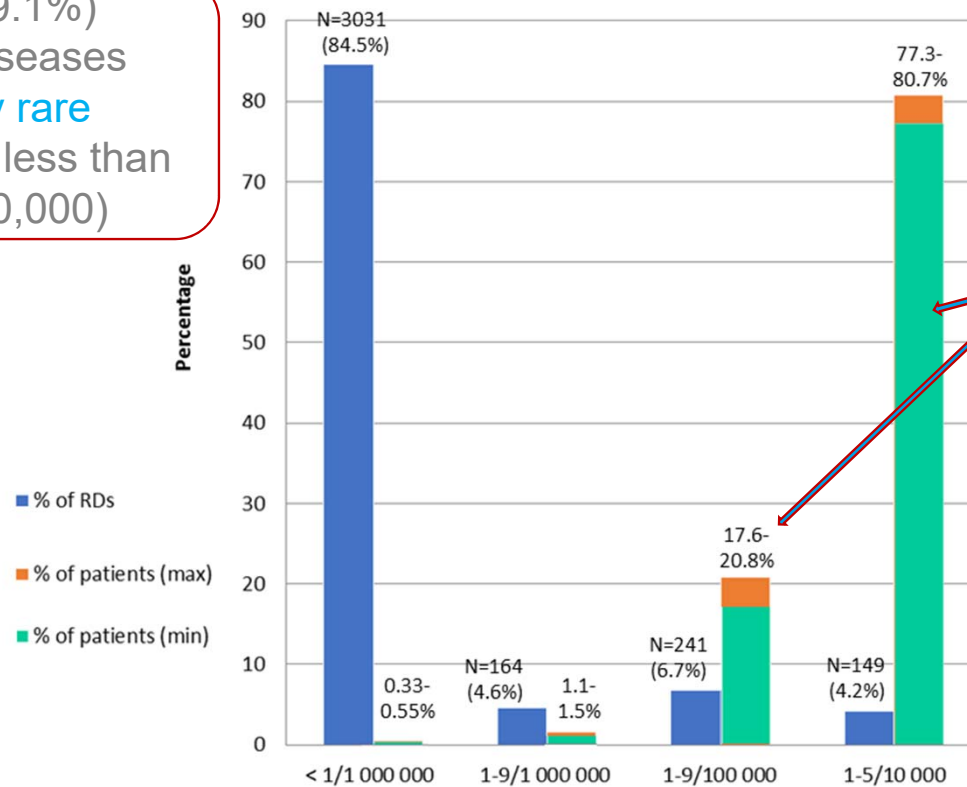
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### Abstract

Rare diseases, an emerging global public health priority, require an evidence-based estimate of the global point prevalence to inform public policy. We used the publicly available epidemiological data in the

# Estimating Prevalence and Patient Numbers

Most (89.1%) of rare diseases are **very rare** (prevalence less than 1 per 100,000)



Almost all of the people with rare disease (>98%) have **one of the 390 most prevalent diseases** (more common than 1 per 100,000)

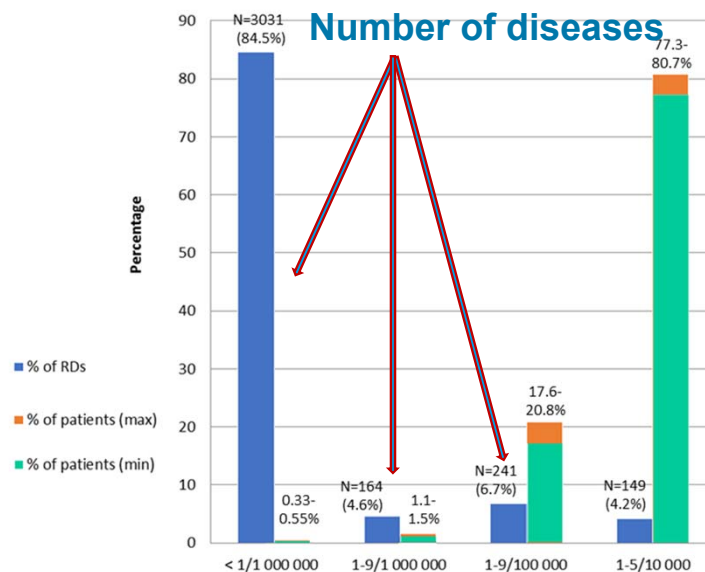
Setting strategies based on the more prevalent diseases allows to create the framework of expertise to serve patients with the rarest diseases

To leave no-one behind.



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# Most definitions describe the same diseases



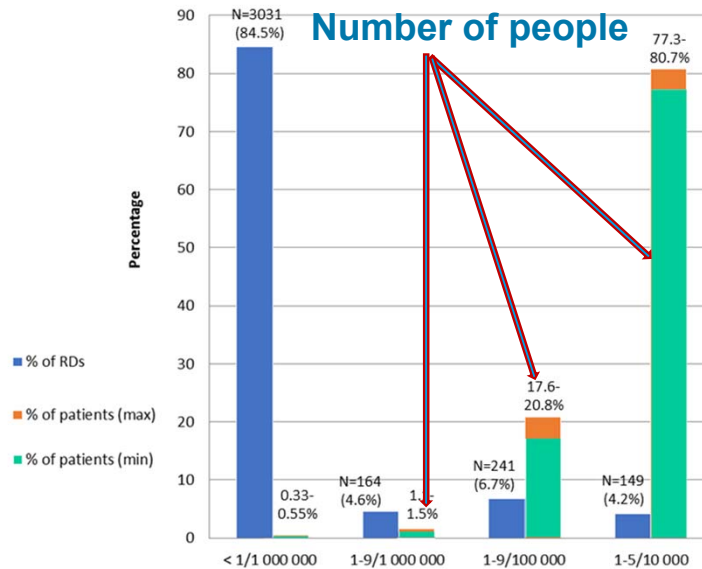
Different National Rare Disease definitions...

...mostly describe the same rare diseases

Country / Continent	RD Prevalence definition per 100 000	<1/1 000 000	1-9/1 000 000	1-9/100 000	1-5/10 000
Korea [10]	5	✓	✓	+/-	-
Australia [11]	10	✓	✓	✓	+/-
Taiwan [12]	10	✓	✓	✓	+/-
Japan [13]	40	✓	✓	✓	✓
EU [4]	50	✓	✓	✓	✓
China [14]	76	✓	✓	✓	✓
USA [9]	80	✓	✓	✓	✓

Sources: : Inserm / Estimating cumulative point prevalence of rare diseases: analysis of the Orphanet database

# Uniform definition would enable comparisons



Different National Rare Disease definitions...

... vary widely in the patients that they include - some definitions exclude 80% of people with rare diseases

Country / Continent	RD Prevalence definition per 100 000	<1 /1 000 000	1-9 /1 000 000	1-9 /100 000	1-5 /10 000
Korea [10]	5	✓	✓	+/-	-
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EU [4]	50	✓	✓	✓	✓
China [14]	76	✓	✓	✓	✓
USA [9]	80	✓	✓	✓	✓

➤ a standardized definition would help comparability

Sources: : Inserm / Estimating cumulative point prevalence of rare diseases: an analysis of the Orphanet database

# Call to better define rare diseases

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## How many rare diseases are there?

A lack of robust knowledge of the number of rare diseases and the number of people affected by them limits the development of approaches to ameliorate the substantial cumulative burden of rare diseases. Here, we call for coordinated efforts to more precisely define rare diseases.

Melissa Haendel , Nicole Vasilevsky, Deepak Unni, Cristian Bologa, Nomi Harris, Heidi Rehm, Ada Hamosh, Gareth Baynam, Tudor Groza, Julie McMurry, Hugh Dawkins, Ana Rath, Courtney Thaxon, Giovanni Bocci, Marcin P. Joachimiak, Sebastian Köhler, Peter N. Robinson, Chris Mungall & Tudor I. Oprea 

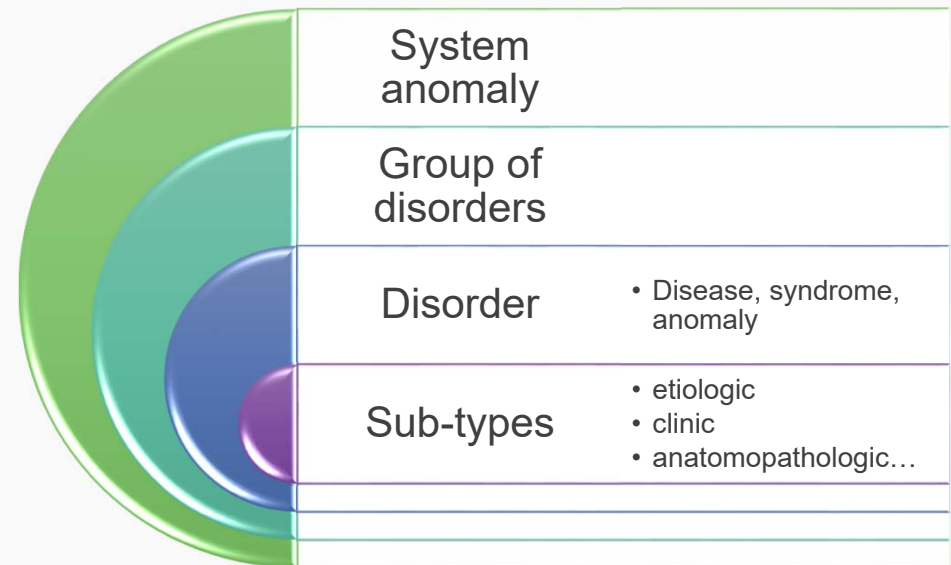
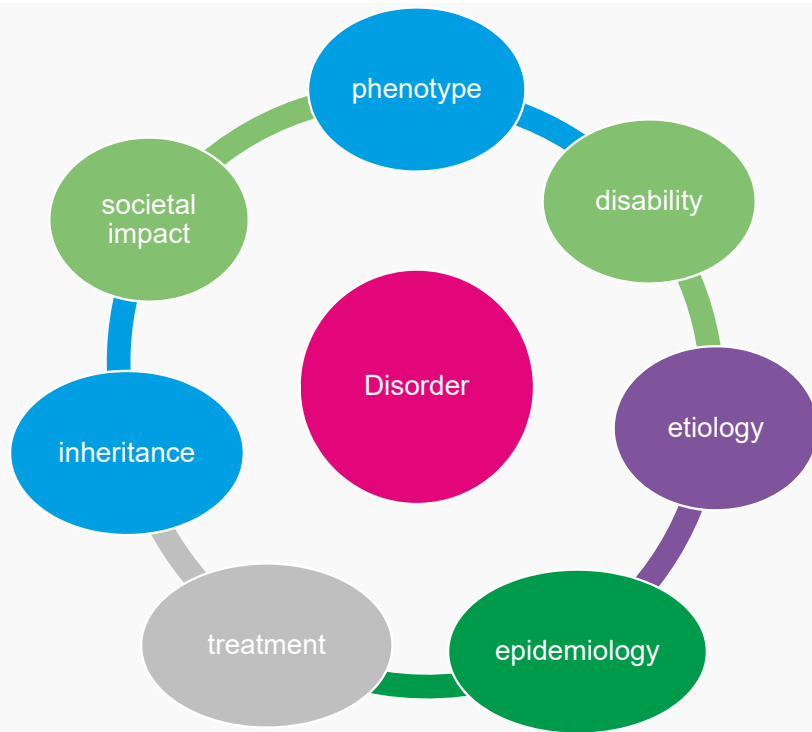
  



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# How to define a disorder?

- A « disorder » is an object with multiple dimensions
- A « disorder » is an object we isolate within a continuum



« The definition of the disease has exhausted the definers. »

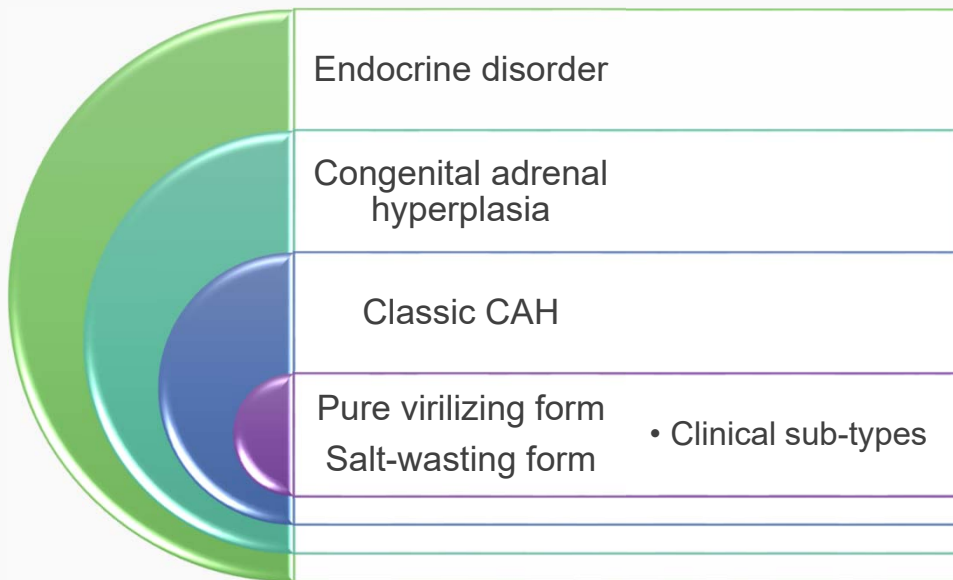
Claude Bernard (1813-1878), *Principes de médecine expérimentale*.



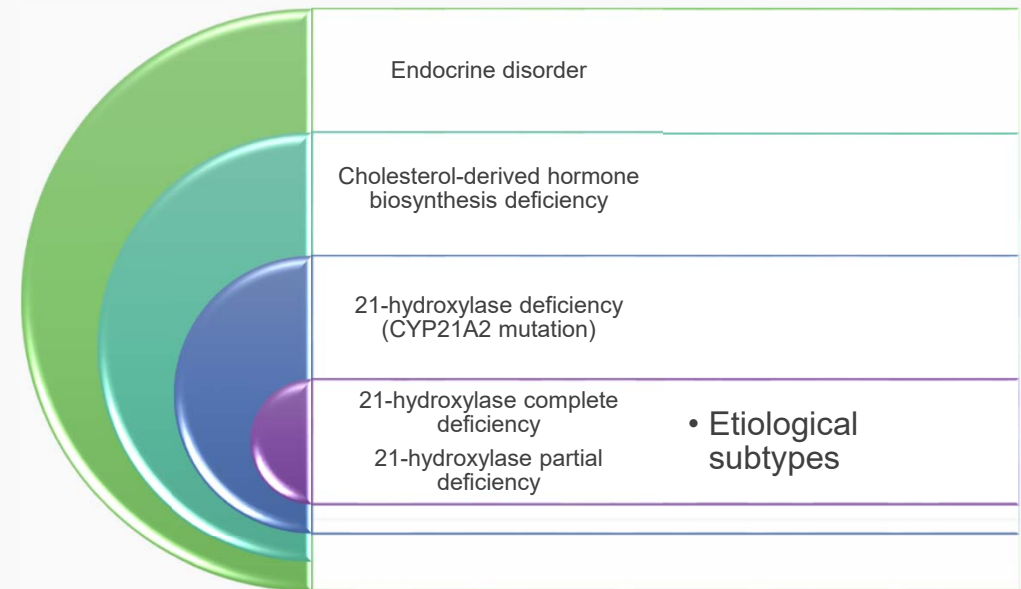


# Define a disorder is adopt a point of view ...

Adopting a clinical point of view



Adopting an etiological point of view



... then focus on the level of interest for us.



# A common definition for what?

**To make patients visible in health care systems** : need for a common language

For that we need to **give a name** to each disease and for that we need to define what is a rare disease

Clinical definition = **inclusive** definition

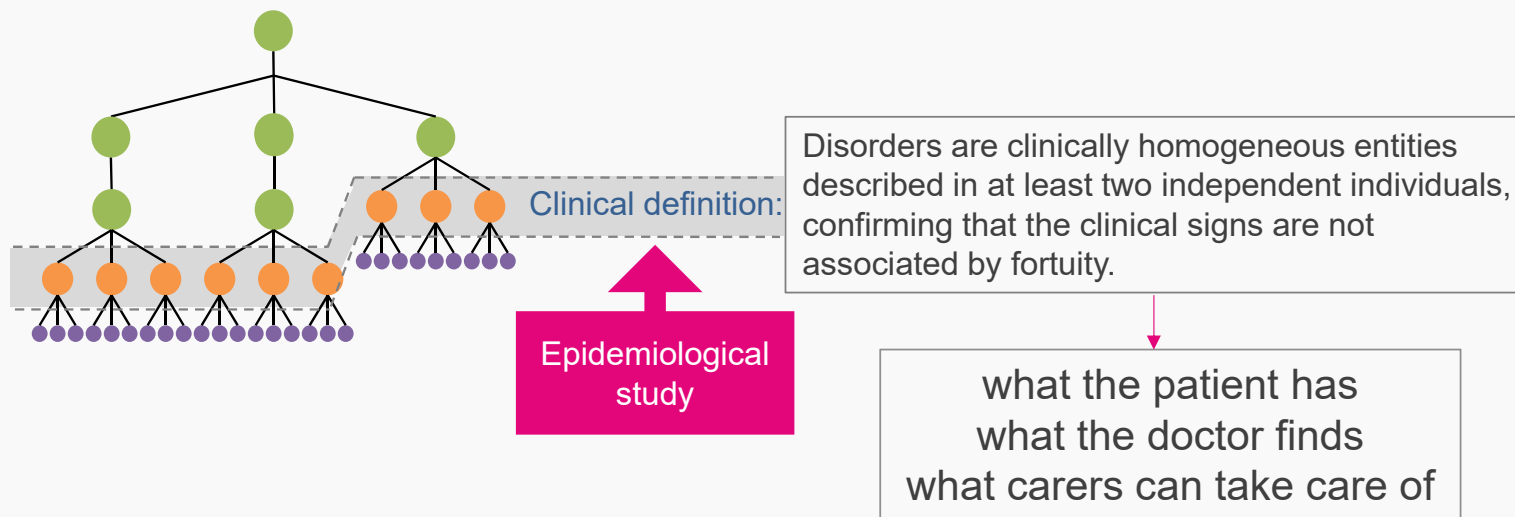
- what the patient has
- what the doctor finds
- what carers can take care of

Best because it applies to every single rare disease regardless of the level of knowledge on the disease, or the cause

Enable to quantify rare diseases = + 6000 in Orphanet database



# Give a name to each rare disease



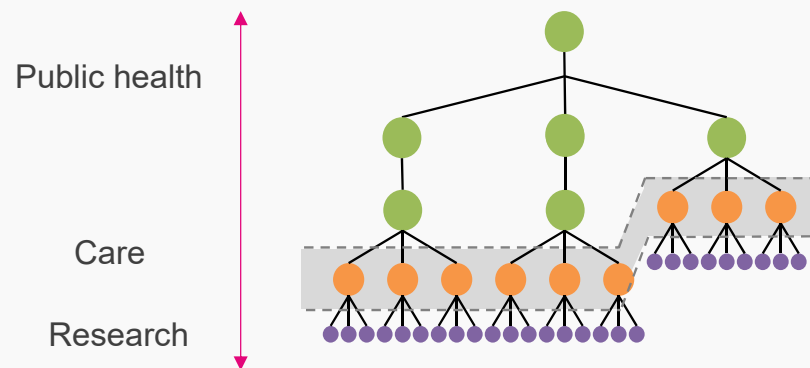
Adopting a common definition allows to have a common language



# Making patients visible to take action

Integrating a RD-specific codification in health information systems allows for

- Measuring the population burden of RD
- Focusing service delivery on specific patient' needs
- Commissioning health and social services appropriately
- Identify patients for clinical research



Orphacodes\* are being adopted in many places for coding and registries (EU, AU, JP...)

Exist in 9 languages and counting  
Mapped to other medical terminologies (interoperability)

Specific extensions can be derived to adapt to diverse prevalence-based definitions

## Adopting a common language for global and cross-sector interactions

\*Orphanet nomenclature of RD. [http://www.orphadata.org/cgi-bin/rare\\_free.html#crossmodal](http://www.orphadata.org/cgi-bin/rare_free.html#crossmodal)

# A definition that is Conceptual & Consensual

Framework of definition needs to be:

- **Evidence-based** with a Public Health objective
- Not prescriptive in terms of prevalence
- **Conceptual:**
  - Recognising that there will be different prevalence thresholds according to national contexts
  - Recognising that diagnostic and therapeutic fields are fast evolving
- **Consensual**
  - Reach agreement between patients, clinicians, geneticists



# Towards a framework of an operational description: RDI Action Plan 2020-2021

**Objective:** RDI and WHO lay down a framework of an operational description of RD and prevalence and incidence figures

**Activities 2020:**

- Put together an RDI Ad hoc group composed of some Experts Faculty, ICD-11 RD Task Force and RDI Advocacy Committee (under the RDI Council)
- RDI Ad hoc group to define the scope of a paper which provides the operational functional description, terminology and prevalence and incidence figures
- Partner with INSERM, a collaborative centre of WHO for ICD, and Orphanet, leader of ICD-11 RD Task Force
- Bibliographic review and analysis
- State of play in term of definitions, prevalence, incidence, population
- Review and adoption by Ad hoc group
- Consultations with WHO at each step

