orphanet

KNOW THE RARE

FOR BETTER CARE

The rare disease and orphan drug database bridging healthcare and research

www.orpha.net

RÉPUBLIQUE FRANÇAISE
Liberté
Égalité
Fraternité

Inserm
La science pour la santé
From science to health

Co-funded by the Health Programme of the European Union

elixir
Core Data Resource

IRDiRC
RECOGNIZED RESOURCES

THE HUMAN VARIOME PROJECT
RECOMMENDED SYSTEM

Global Alliance for Genomics & Health
Collaborate. Innovate. Accelerate.

Orphanet in numbers

Database content and website

- A network of **42 countries in Europe and beyond**
- A freely accessible website available in **9 languages**
- **41.8 million pages viewed** in 2021
- **5.1 million PDF documents** downloaded in 2021
- Orphanet & ORDO - **IRDiRC Recognized Resources** and **HVP Recommended Systems**
- **Orphadata Science –** An **ELIXIR Core Data Resource**

Diseases

6,197 **rare disorders with unique identifiers : ORPHAcodes**
4,248 **genes linked to 3,821 rare disorders**
4,329 **disorders annotated with HPO terms**
5,810 **disorders annotated with point prevalence data**

Rare disease summaries in 13 languages

6,675	English
4,579	French
6,012	Spanish
5,295	Italian
4,029	German
5,639	Dutch
1,149	Portuguese
1,803	Polish
420	Greek
478	Russian
176	Finnish
113	Japanese
103	Slovak

Directory of expert resources* in the Orphanet network

26,882 Professionals referenced in the database
2,840 Patient organisations and **28** National Alliances for Rare Diseases
8,400 Expert centres
1,633 Medical laboratories dedicated to diagnosis
44,897 Diagnostic tests
9,708 Research projects
8,592 Clinical trials
893 Patient registries
200 Variant databases
168 Biobanks

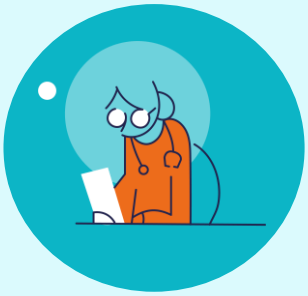
** individual resources outside of networks unless otherwise stated*

Data unless stated differently from Orphanet 2021 Activity Report (database content in December 2021-January 2022)

Users

Around **1,65 million visitors per month** from **238 countries**

35 % health professionals
38 % patients, families and support groups
As well as **students, researchers, clinical coders, industry, policy makers.**
Most appreciated products: disease summary texts on diseases, clinical signs associated to a rare disease, classifications of rare diseases, functional consequences of rare diseases (disabilities), epidemiological data*



* Annual Orphanet Users' Survey 2022

Know the rare for better care

Orphanet was established in France in 1997 at the advent of the internet in order to gather scarce knowledge on rare diseases* so as to improve the diagnosis, care and treatment of patients with rare diseases. This initiative became a European endeavour from 2000, supported by grants from the European Commission (EC): Orphanet has gradually grown to a network of 42 countries, within Europe and across the globe.

Orphanet continues to face new challenges resulting from a rapidly evolving political, scientific, and informatics landscape. It is now crucial to help all audiences access quality information amongst the plethora of information available online, to provide the means to identify rare disease patients and to contribute to generating knowledge by producing massive, computable, re-usable scientific data.

** A rare disease in the Orphanet database is one with a prevalence of not more than 1 per 2000 inhabitants in Europe, as defined in Regulation (EC) N°141/2000 of the European Parliament and of the Council of 16 December 1999 on orphan medicinal products*

A global network improving **visibility**, **awareness**, **information** and **knowledge** in the field of rare diseases

CREATION

1997

42

COUNTRIES

110

PEOPLE

KNOW THE RARE FOR BETTER CARE: OUR COMMITMENT TO THE COMMUNITY

- **Contribute to improving knowledge on rare diseases**
- **Provide high-quality information on rare diseases, and ensure equal access to knowledge for all stakeholders**
- **Maintain the Orphanet rare disease nomenclature (ORPHAcodes), essential in improving the visibility of rare diseases in health and research information systems**

WORKING ACROSS BORDERS

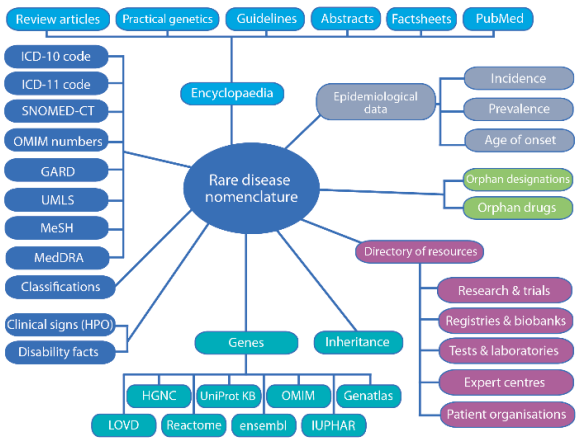
Orphanet is **a multi-stakeholder, global network of 42 countries**, coordinated by the INSERM (French National Institute for Health and Medical Research) in Paris.

The INSERM **coordinating team maintains the knowledge base** as well as core resources such as the Orphanet rare disease **nomenclature** (each with a unique ORPHAcode), **classifications**, **encyclopaedia**, and the **Orphanet Ontology of Rare Diseases**. Countries in the network contribute to the database of **expert resources** in each country and to the **encyclopaedia**. The website is available in 9 languages.

Orphanet and ORDO are IRDiRC Recognized Resources and HVP Recommended Systems. Orphadata Science is an ELIXIR Core Data Resource.

Orphanet's core activity is funded by the INSERM, the French Ministry of Health, and the EC. Orphanet's national activities are financed by the EC, national institutions and/or specific contracts (see Activity Report).

Orphanet is governed by a Management Board of Network members, overseen by a multi-stakeholder International Scientific Advisory Board.



A knowledge base centred around a unique, clinical rare disease nomenclature, cross-referenced with other resources

Our key objectives

IMPROVING VISIBILITY

In a global community, we need to understand each other, although we may not speak the same language. A stable nomenclature, cross-referenced with other international terminologies is therefore essential.

In order to improve the visibility of rare diseases in information systems, **Orphanet has developed, and maintains, a unique, multi-lingual nomenclature of rare diseases,** around which the rest of our relational database is structured. Each disease is assigned a unique **ORPHAcode**: integrating these codes in health and research information systems is essential in ensuring rare diseases are visible and that different systems can work together. This nomenclature is aligned with other terminologies: OMIM, ICD, SNOMED-CT, MedDRA, UMLS, MeSH, GARD. **This cross-referencing is a key step towards the interoperability of databases.** A project, **RD-CODE**, was ran from 2019 to 2022 to support Member States in their implementation of the nomenclature in health information systems. In 2021 the **first human readable mapping of SNOMED CT to Orphanet** was released on Orphadata, thanks to a 6-year collaboration with SNOMED International.

Rare diseases patients are scattered across the globe, as are rare disease experts. Orphanet **provides visibility to experts and patients by providing access to a directory of expert services in 36 countries by disease**, such as centres of expertise, laboratories and diagnostic tests, patient organisations, research projects and clinical trials. **This data promotes networking, tackles isolation and helps foster appropriate referrals.**

PROVIDING INFORMATION

To **serve the needs of a global audience**, Orphanet draws on the **expertise of professionals from across the world**, Orphanet produces an **encyclopaedia of rare diseases**, progressively translated into the **9 languages** of the database (English, French, Spanish, Italian, German, Dutch, Czech, Portuguese, Polish) with texts also freely available in Greek, Slovak, Japanese, Finnish and Russian online.

Orphanet **integrates and provides access to quality information produced around the world**, such as clinical practice guidelines and information tailored to the general public.

GENERATING KNOWLEDGE

To **develop and curate the scientific data** in the Orphanet database, Orphanet works with **experts from around the globe**, from health care professionals and researchers including ERNs, to patient representatives and professionals from the medical -social sector.

The wealth of data in Orphanet and **the way this data is structured allows additional knowledge to be generated**, helping to piece together data that can sometimes seem like pieces of an irresolvable puzzle. **Integration of data adds value and renders it interpretable.**

- **Orphanet provides standards for rare disease identification,** notably via the **Orphanet nomenclature**, an essential key for interoperability.
- **Orphanet provides integrated, re-usable data** essential for research on the www.orphadata.org platform and as a **structured vocabulary for rare diseases, the Orphanet Ontology of Rare Diseases** (ORDO). **Orphadata Science is an ELIXIR Core Resource** for the life science data community. Orphanet also provides **HPO-ORDO Ontological Module** (HOOM) provides a bridge between the Human Phenotype Ontology and ORDO.

ordo
Orphanet Rare Disease Ontology

HOOM
HPO & ORDO Ontological Module

orphadata

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Core Data Resource

These key resources contribute to improving the **interoperability of data** on rare diseases across the globe and **across the fields of health care and research**. They are being integrated in several bioinformatics projects and infrastructures around the world in order to **improve diagnosis and treatment**.

Orphanet is committed to networking with partners across the globe order to help **piece together the parts of this puzzle**.

Informing policy & research

ORPHANET DATA INFORMING RARE DISEASE POLICY – ORPHANET DATA RESPONDING TO POLICY NEEDS

Orphanet plays a key role in informing rare disease policy and responding to policy needs. Between 2015-2018 Orphanet coordinated the European Joint Action on Rare Diseases (RD-Action) **www.rd-action.eu**, and currently co-leads a pillar of the European Joint Programme Co-fund on Rare Diseases: as such **Orphanet and its data is key to informing healthcare and research policy.** The presence of Orphanet in our partner countries has also proved to be an important catalyst in the improving the awareness of rare diseases, in particular as regards the national political agenda.

A **virtuous, symbiotic cycle has evolved, connecting Orphanet's data and rare diseases policy**:

- Orphanet **informs policy** by providing aggregated data (Orphanet Report Series), and data for annual **reports on the State of the Art of rare disease policies in Europe**, and the **State of Play of rare disease research.** Orphanet data has proved indispensable in **implementing policy measures**, such as the official designation of centres of expertise for rare diseases at national level by identifying where experts and expertise is located in a country.

- Orphanet's data can **respond to policy needs**: for example, data on laboratories carrying out diagnostic tests for rare diseases in Orphanet has evolved in order to facilitate cross-border testing. It has served as one of the core sources for the Rare2030 Participatory Foresight study, to **inform future policy scenarii** in the field of rare diseases and craft recommendations to reach community-agreed goals.

- In 2009, the Council of the European Union recommended that all EU Member States develop **national plans or strategies** to structure their response to the challenges presented by rare diseases. National contribution to the Orphanet network was recommended, and as a result many **national plans or strategies developed to date mention Orphanet and ORPHA codification as key measures.**
- Orphanet is also cited in the **EU Cross-Border Healthcare Directive (2011)** as a key resource to assist *« health professionals […] in correct diagnosis of rare diseases».*
- **Orphanet's activities and resources are also supported by a number of key policy recommendations** issued by expert committees at the European Commission, on topics such as codification of rare diseases, centres of expertise, European Reference Networks and cross-border genetic testing.
- In 2017, Orphanet was recognised as having a **de facto monopoly** in its field in the 2018 Work Plan of the European Union's Third Health Programme (2014-2020), notably for its unique nomenclature of rare diseases. From 2018 it is the recipient of a Direct Grant from CHAFEA, the executive body of DG Santé.
- A solution to assure the **sustainability of Orphanet** is currently under discussion at the Steering Group on Health Promotion, Disease Prevention and Management of Non-Communicable Diseases.
- In 2021, the **Rare2030 Policy Foresight project** included in its final recommendations support to Orphanet and use of Orphanet resources in a number of the different themes and associated recommendations.
- In 2021, the first **Resolution of the United Nations** on Persons Living with a RD encouraged, amongst other priorities, Member States and UN Agencies to collect, analyse and disseminated data on RD. ORPHAcodes are essential to achieving this goal.

AT THE CROSSROADS OF THE RARE DISEASES WORLD: ORPHANET AS AN INTEGRATED PLATFORM

Orphanet is at the crossroads of multiple spheres implicated in issues arising from the rare disease challenge. Its role as an integrated, global platform is to **build the bridges necessary to help advance policy, healthcare and research by delivering global information, data and knowledge.** As such, Orphanet's networking capacity is key in **bringing together different countries and different languages**, as well as the **different types of expertise** emanating from different domains (healthcare, research, genetics, medical – social sector, patient organisations).

The scientific and informatics revolution underway offers **possibilities to further integrate data in Orphanet to facilitate the connection between the worlds of healthcare and research:** it is in this context that Orphadata has been designated an ELIXIR Core Data Resource. This same revolution also offers opportunities for Orphanet to become truly global and better respond to needs of users' across the world and across stakeholder groups.

Orphanet assumes this role in the **European Joint Programme Co-Fund on Rare Diseases**, coordinated by INSERM, in which it co-coordinated Pilar 2, aimed at improving **coordinated access to data and services** for the research community.

2021 Highlights

END OF ORPHANETWORK DIRECT GRANT

The Orphanet Direct Grant, co-funded by the European Commission, ended in June 2021. Amongst the final results were:

- Orphanet Nomenclature production and update
- Curation of the Orphanet Knowledge Base
- Consolidation of Orphanet's position in Member States
- Consolidation of cooperation with European Reference Networks (ERNs)
- Work towards a sustainability model for Orphanet
- Reinforcement of Orphanet's position as an essential infrastructure in the RD Ecosystem

The Orphanet Data for Rare Diseases Direct Grant (OD4RD) is a one-year project that started in 2022 co-funded by the European Commision's EU4Health programme that follows up on the work of the previous Direct Grant. OD4RD continues funding the nomenclature production in English and some scientific content, but will be innovative in terms of national hub development and IT services development. This will help increase the quality of data generated about RD patients by disseminating best practices for coding with ORPHAcodes, and to provide the means to generate accurate data for exploitation and analysis by ERNs (with whom collaboration will be formalized), hospitals and decision makers, notably to improve their understanding of RD activities.

AVAILABILITY IN ADDITIONAL LANGUAGES

2021 saw the launch of the Czech version of the Orphanet website, bringing the number of languages to 9.

Orphanet also made available its nomenclature of rare diseases in Turkish and Chinese, bringing the number of languages to 11. These datasets are available on Orphadata.

COLLABORATION WITH EUROPEAN REFERENCE NETWORKS FOR RARE DISEASES

In order to improve rare disease knowledge generation and dissemination, Orphanet collaborates with European Reference Networks (ERNs) for rare diseases. This common endeavour aims to improve rare diseases patients' lives by increasing knowledge and providing equal access to the pool of expertise provided by the ERNs. The coordination of complementary activities was a key action of the EC Direct Grant supporting Orphanet and will be a core component of the future Orphanet Direct Grant OD4RD (start 2022). Work in 2021 focused on the following key areas:

European Reference Networks

Share. Care. Cure.

- **Improve the Orphanet nomenclature of rare diseases to provide stakeholders with a common, controlled language as a basis to improve the identification of patients and aid access to diagnosis and care, to better structure and optimise rare disease data, and to improve the interoperability between health information systems and research data.** Several groups of diseases have been revised and finalised so far, including the Orphanet classifications of rare eye diseases (ERN-EYE), primary lymphedema (VASCERN), rare kidney diseases (ERKNet), inherited epidermolysis bullosas (ERNSKIN), as well as anorectal malformations (eUROGEN). Collaborations are also underway with other ERNs, including ERN BOND, ERN CRANIO, MetabERN, EpiCARE, VASCERN, ITHACA, and RITA.
- **Revise and enlarge the Orphanet encyclopedia of rare diseases:** by the end of 2021, 222 texts have been revised in collaboration with ERNs.
- **Prove a directory of healthcare, patient support and research activities related to RD**: work continued to represent all ERNs' activities.
- **Communicate on ERN activities to the RD community**: A dedicated section of OrphaNews International provides a showcase, with an edition dedicated to resources provided by ERNs concerning COVID-19 and RD.

2021 Highlights

NEW TOOLS TO PROMOTE ORPHANET AND ADVOCATE FOR SUSTAINABILITY

Orphanet continues its endeavours to achieve a sustainability model to ensure its longevity, spearheaded by its Sustainability Task Force, composed of members of the Orphanet Network.

In 2021 the Task Force called on Agent Majeur, a French scientific communications agency in order to craft a number of tools to help Orphanet Network Members make Orphanet better known and advocate at National level for support towards its sustainability goals. These tools include a new slogan reflecting Orphanet's missions and objectives ("Know the rare for better care"), associated visuals, slideshows for different audiences, and a short, animated video presentation to convey Orphanet's missions as regards its end users. The agency also provided a number of coaching sessions to Orphanet Network Members to best prepare them in their meetings with local and regional authorities.

RD-CODE FINAL PROJECT OUTCOMES

RD-CODE (www.rd-code.eu/), co-funded by the Third Health Programme, started on January 2019 and ended in December 2021. The objective of this project is to **support Member States in improving gathering information on rare diseases in a standardized and consistent way through the implementation of ORPHAcodes.**

Starting with countries that had not yet introduced ORPHA codification yet, but that are already actively committed to doing so, **this project aimed to demonstrate real-world implementation to guide other countries** in the future.

Amongst the resources and tools made available are:

- A **video** explaining the benefits of using ORPHAcodes in Health Information Systems
- A suite of **ORPHA tools**, including the Orphanet nomenclature files for coding purposes, and APIs and tools to aide implementation and coding decision-making (http://www.rd-code.eu/tools/)
- A **virtual helpdesk** with information on the nomenclature and page dedicated to answering questions on nomenclature content and integration in health information systems.
- A new **ORPHAcode to capture remaining undiagnosed patients** after full investigation.

In addition to these tools, **support services, and information resources, guidelines and recommendations** have been developed and refined within the project according to real-world use of ORPHAcodes. A lessons-learned leaflet and public report have also been issued. These are indispensable tools to guarantee the appropriate use of the coding resources allowing comparability across countries and settings.

EUROPEAN JOINT PROGRAMME CO-FUND ON RARE DISEASES

The European Joint Programme on Rare Diseases (EJP RD; http://www.ejprarediseases.org/) brings over 130 institutions from 35 countries: to create a **comprehensive, sustainable ecosystem** allowing a virtuous circle **between research, care and medical innovation** to **improve the impact, reuse and funding of RD research**.

The Orphanet Network is a partner, and co-leads activities around **coordinated access to data and services** within this programme. Orphanet is developing its catalogue of research data, and provides **training modules on the Orphanet nomenclature and ORDO**. A series of **national training sessions** were organised and led by Orphanet national teams: in 2021 these took place in Italy, Spain and Norway. The first version of a **web-based RD research analysis platform** open to Orphanet partners and IRDiRC funders was made available.

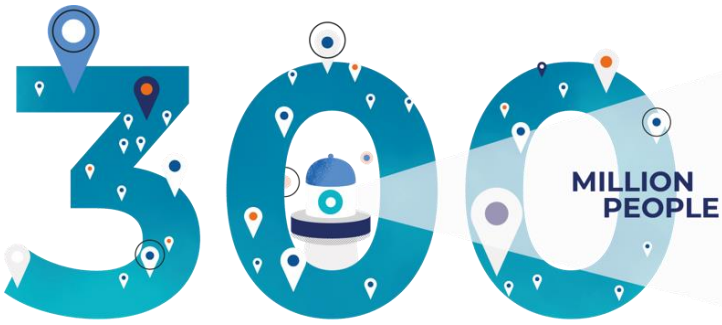
Our commitment to the global RD community

Rare diseases know no borders, and the challenges faced by over 300 million people living with rare diseases share commonalities across many different diseases and regions of the world. No nation, no continent can tackle the challenges around the diagnosis, treatment and care of people living with rare diseases alone.

This challenge is a global one, and all stakeholders must cooperate at a global level in order to address the challenge and provide answers. The synergies resulting from cooperation across all stakeholder groups and across all continents are essential in this effort.

Global data is essential for global policies. Orphanet will continue to fulfil its missions at the service of the global community by:

- **Ensuring equality of access to high quality information, essential in the empowerment of people living with rare diseases, and in the generation and improvement of scientific knowledge on rare diseases**
- **Promoting a common language and the means to integrate data on rare diseases in order to tackle the fragmentation of research into rare diseases**
- **Providing data essential for rare disease policy development, and remaining attentive to the needs of stakeholders in terms of rare disease data**



"The Orphanet Consortium supports the work of the NGO Committee for Rare Diseases, and will, to the best of its ability, support the endeavour to improve the recognition and inclusion of rare diseases into the UN Sustainable Development Goals, and to strengthen the voice of research and medical institutions in all subsequent UN policy discussions around rare diseases."

Orphanet Management Board, 4 November 2016

For more information about our objectives, achievements and partnerships, consult the annual Orphanet Activity Report at www.orpha.net

Get involved!

There are different ways you can help Orphanet improve its services for the rare disease community:

- **Contribute:** make your activities related to RD visible and register via Orphanet's homepage
- **Curate:** experts are encouraged to give their feedback on our data through the suggest an update button
- **Sustain:** sponsor one of Orphanet's activities
- **Give your feedback:** participate in our annual users' survey

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