Diseases without prevalence data available but with published cases

Disease Name	Number of published cases
Klippel trenaunay weber syndrome	1000
Whipple disease	1000
Incontinentia pigmenti	750
Aicardi syndrome	500
CADASIL	500
Li-Fraumeni syndrome	400
Silver-Russell, syndrome	400
Castleman disease	400
Cutis marmorata telangiectatica congenita	300
Möbius syndrome	300
Alström syndrome	300
Kabuki syndrome	300
Ondine syndrome	300
Job syndrome	250
Kearns-Sayre syndrome	223
Xanthomatosis cerebrotendinous	200
Cockayne syndrome	200
Gunther disease	200
Cogan syndrome	200
Kimura disease	200
Alpha thalassemia-mental retardation, X linked	164
McCune-Albright syndrome	158
Denys-Drash syndrome	150
Cohen syndrome	100
Seckel syndrome	100
CINCA syndrome	100
Larsen syndrome	100
Macrophagic myofasciitis	100
Capillary leak syndrome	57
Waardenburg-Shah syndrome	50
Peters-plus syndrome	50
Coffin-Siris syndrome	40
Acrocallosal syndrome, Schinzel type	34
Pallister-Killian, syndrome	30
Aicardi-Goutieres syndrome	30
CHILD syndrome	30
Schinzel-Giedion midface retraction syndrome	30

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EURORDIS
European Organisation for Rare Diseases

orphanet

RARE DISEASES IN NUMBERS

Preliminary report from an on going bibliographic study initiated by Eurordis in partnership with Orphanet

Study rationale

- Very little documented information on the epidemiology of rare diseases
- Important to estimate the total number of affected people and the prevalence per disease
- Need to assess the natural history of rare diseases to adapt care and monitor improvements

Study objectives

- To assess the prevalence in Europe of each rare disease
- To document the age of onset, the life expectancy and the mode of inheritance

Method

Selection of rare disease
(for the purposes of the current report)

- A selection of rare diseases focussing on the more common ones according to the literature review to date
- The most frequently requested pages on the Orphanet website

Search strategy

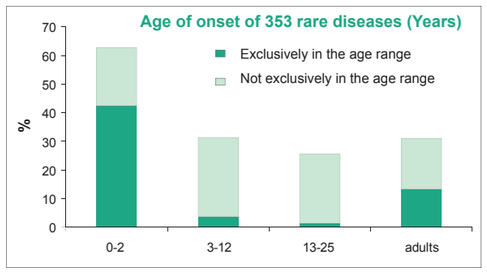
- Several data sources:
  Websites: Orphanet, e-medicine, geneclinics and OMIM
- Medline was consulted using the search algorithm :
  "Disease names" AND
  [Epidemiology[MeSH:NoExp] OR
  Incidence[Title/abstract] OR
  Prevalence[Title/abstract] OR
  Epidemiology[Title/abstract]
- Medical books, grey literature and reports from experts were also some important sources of available data.

Limitations of the study

- Exact prevalence rate is difficult to obtain from the available data sources
- Low level of consistency between studies
- Poor documentation of methods used
- Confusion between incidence and prevalence
- Confusion between incidence at birth and life long incidence.

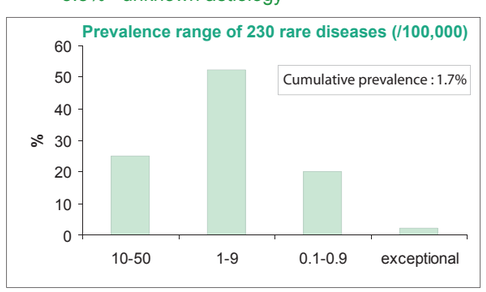
Results

Preliminary results from the analysis of 359 rare diseases
Not all data were available for every disease
More results will be available in a few month's time



Mode of inheritance of 359 rare diseases

- 26.5% autosomal dominant inheritance
- 28.1% autosomal recessive inheritance
- 7% X-linked inheritance
- 10% several modes of inheritance
- 13.4% multigenic/multifactorial diseases
- 8.1% sporadic diseases
- 5.8% unknown aetiology



Life expectancy of 323 rare diseases

- 37.5% normal lifespan
- 25.7% potentially lethal at birth or before 5 years of age
- 36.8% reduced lifespan,depending on the severity, penetrance or type (child, juvenile or adult types for example) of the disease

Disease name	Estimated prevalence (/100 000)
Brugada syndrome	50
Protoporphyria, erythropoietic	50
Guillain-Barre syndrome	47,5
Melanoma, familial	46,8
Autism, genetic types	45
Tetralogy of Fallot	45
Scleroderma	42
Great vessels transposition	32,5
Focal dystonia	30
Marfan syndrome	30
Non-Hodgkin malignant lymphoma	30
Retinitis pigmentosa	27,5
Gelineau disease	26
Myeloma, multiple	26
Alpha-1 antitrypsin deficiency	25
Diaphragmatic hernia, congenital	25
Juvenile arthritis, idiopathic	25
Neurofibromatosis type 1	25
Oesophageal atresia	25
Polycythemia vera	25
Charcot-Marie-Tooth disease	24
Polycystic kidney disease, recessive type	23
VATER association	23
Coffin-Lowry syndrome	22,5
Rendu-Osler-Weber disease	21,25
Dermatitis herpetiformis	20,2
Atresia of small intestin	20
Duodenal atresia	20
Ehlers-Danlos syndrome, classic type	20
Hirschsprung disease	20
Microdeletion 22q11	20
Spherocytosis hereditary	20
Turner syndrome	20
Cardiomyopathy, familial dilated	17,5
Breast cancer, familial	17
MELAS syndrome	16
Leucinosis	15,6
Acyl-CoA dehydrogenase, medium chain, deficiency of	15
Lennox-Gastaut syndrome	15
Fragile X syndrome	14,25
Primary biliary cirrhosis	13,5
Stickler syndrome	13,5
Williams syndrome	13,3
Willebrand disease	12,5
Gastroschisis	12
Microphthalmia	12
Omphalocele	12
Sarcoidosis	12
MURCS association	11,25
Stargardt disease	11,25
Glioblastoma	11
Multiple endocrine neoplasia type 1	11
Prader-Willi syndrome	10,7
Alopecia totalis	10,5
Nephroblastoma	10,1
Cystic fibrosis	10
Duane syndrome	10
Neuroblastoma	10
Hodgkin disease	9,4
Dermatomyositis	9,25
Polymyositis	9,25
Tuberous sclerosis	8,8
Congenital adrenal hyperplasia	8,5
Rett syndrome	8,2
Angelman syndrome	8
Cataract, total congenital	7,9
Hyperlipidemia type 3	7,8
Hemophilia	7,7
Trisomy 18	7,7
Behcet disease	7,5
Immunodeficiency, common variable	7,5
Microscopic polyangiitis	7,5
Idiopathic torsion dystonia	7,25
Oculocutaneous albinism	7,15
Facioscapulohumeral muscular dystrophy	7
Holoprosencephaly	7
Sclerosing cholangitis	7
Sotos syndrome	7
Galactosemia	6,6
Optic atrophy, Leber type	6,5
Osteogenesis imperfecta	6,5
Smith-Lemli-Opitz syndrome	6,5
Amyotrophic lateral sclerosis	6
Treacher-Collins syndrome	6
Tay-Sachs disease	5,75
Pheochromocytoma	5,5
Retinoblastoma	5,4
Rubinstein-Taybi syndrome	5,4
Alzheimer disease, familial	5,3
Zollinger-Ellison syndrome	5,3
Cornelia de Lange syndrome	5,25
Familial adenomatous polyposis	5,25
Huntington disease	5,25
Acromegaly	5
Fructose intolerance	5
Primary ciliary dyskinesia	5
Supranuclear palsy, progressive	5
Porphyria, acute intermittent	5
Sickle cell anemia	4,8
Deletion 5p	4,6
Myasthenia gravis	4,55
Achondroplasia	4,5
Steinert myotonic dystrophy	4,5
Ceroid lipofuscinosis, neuronal	4
Phenylketonuria	4
Smith-Magenis syndrome	4
Wilson disease	4
Muscular dystrophy limb girdle type 2A, Erb type	3,8
CDG syndrome	3,75
Niemann-Pick A disease	3,75
Propionic acidemia	3,75
Waardenburg syndrome type 1, type2 and type 3	3,75
Beckwith-Wiedemann syndrome	3,65
Adrenoleukodystrophy, X-linked	3,5
Goldenhar syndrome	3,5
Usher syndrome	3,5
Muscular dystrophy, Duchenne and Becker type	3,4
Multiple endocrine neoplasia, type 2	3,3
Systemic mastocytosis	3,3
Von Hippel-Lindau disease	3,25
Polyarteritis nodosa	3,07
Friedreich ataxia	3
Poland anomaly	3
Proximal spinal muscular atrophy	3
Saethre-Chotzen syndrome	3
Wegener granulomatosis	3
Kennedy disease	2,8
Cystinosis	2,75
Amaurosis congenita of Leber	2,5
BOR syndrome	2,5
Bullous pemphigoid	2,5
Kartagener syndrome	2,5
Niemann-Pick B disease	2,5
Pseudoxanthoma elasticum	2,5
Leigh disease	2,25
Peutz-Jeghers syndrome	2,2
Autosomal dominant spinocerebellar ataxia	2,15
Albinism ocular	2
Alport syndrome	2
Crouzon disease	2
Deletion 4p	2
Klippel feil syndrome	2
Langerhans cell histiocytosis	2
Nail-patella syndrome	2
Persistent hyperinsulinemic hypoglycemia of infancy	2
Aniridia, sporadic	1,75
Fabry disease	1,75
Variegata porphyria	1,7
Budd-Chiari syndrome	1,5
Darier disease	1,5
X-linked severe combined immunodeficiency, T- B+	1,5
Bile ducts paucity, syndromic form	1,4
Cat-eye syndrome	1,35
Apert syndrome	1,25
Spastic paraplegia, familial	1,25
Adult Onset Still's disease	1,23
Pierre Robin syndrome	1,2
Glycogen storage disease type 2	1,1
Mucopolysaccharidosis type 3	1,1
Zellweger syndrome	1,1
Nephronophtisis	1,05
3-hydroxyacyl-CoA dehydrogenase, long chain, deficiency of	1
Albers-Schonberg disease	1
Angioneurotic edema	1
Ataxia telangiectasia	1
Chondrodysplasia punctata, rhizomelic type	1
Coloboma, ocular	1
Emery-Dreifuss muscular dystrophy, X-linked	1
Fanconi anemia	1
Gaucher disease	1
Gorlin syndrome	1
Holt-Oram syndrome	1
Hypokaliemic periodic paralysis	1
Isovaleric acidemia	1
Mucopolysaccharidosis type 1	1
Nemaline myopathy	1
Neuroendocrine tumor	1
Thomsen and Becker disease	1
Churg-Strauss syndrome	0,9
Ellis Van Creveld syndrome	0,9
Joubert-Boltshauser syndrome	0,85
Bardet-Biedl syndrome	0,8
Ebstein anomaly	0,75
Hyperkaliemic periodic paralysis	0,75
Krabbe disease	0,75
Mucolipidosis type 2	0,75
Albright hereditary osteodystrophy	0,72
Menkes syndrome	0,7
Niemann-Pick C disease	0,7
Glycogen storage disease type 4	0,6
Alpha-sarcoglycanopathy	0,57
Beta-sarcoglycanopathy	0,57
Delta-sarcoglycanopathy	0,57
Gamma-sarcoglycanopathy	0,57
Tetrasomy 18p	0,55
Neurofibromatosis type 2	0,5
Xeroderma pigmentosum	0,5
Agammaglobulinemia X-linked	0,45
Christ-Siemens-Touraine syndrome	0,45
Cowden syndrome	0,45
Werner syndrome	0,45
Glutaryl-CoA dehydrogenase deficiency	0,4
Homocystinuria due to cystathionine beta-synthase deficiency	0,4
Mucopolysaccharidosis type 4	0,4
Lesch-Nyhan syndrome	0,38
Pfeiffer syndrome	0,38
Severe combined immunodeficiency T- B-	0,35
Anemia congenital hypoplastic, Blackfan-Diamond type	0,32
Alkaptonuria	0,3
Lissencephaly, type 1, due to LIS 1 anomalies	0,3
Lipodystrophy, Berardinelli type	0,25
Progeria	0,25
Granulomatous disease, chronic	0,2
Jeune syndrome	0,2
Nanism due to growth hormone resistance	0,2
Neurodegeneration with brain iron accumulation (NBIA)	0,2
Creutzfeldt-Jakob disease	0,19
Lowe syndrome	0,19
Mucopolysaccharidosis type 6	0,16
CHARGE association	0,14
Metachromatic leukodystrophy	0,13
Bartter syndrome	0,12
Muscular dystrophy fukuyama type Walker-warburg syndrome Muscle eye brain disease	0,12
Ewing sarcoma	0,1
Hypercholesterolemia, familial (homozygous form)	0,1
Fibrodysplasia ossificans progressiva	0,08
Dopa-responsive dystonia	0,05
Tyrosinemia type 1	0,05
Factor XIII deficiency, congenital	0,04
Perinatal hypophosphatasia	0,03