The New Zealand Neuromuscular Disease Registry; five years and a thousand patients

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Background

The New Zealand Neuromuscular Disease Registry has been recruiting for five years with a view to improved treatments for patients with neuromuscular disorders.

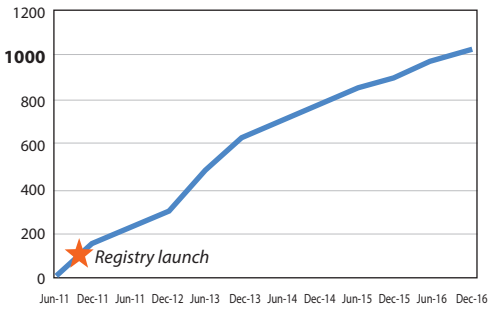
Primary aim: to enable participation in research including clinical trials and natural history studies.
Developing aim: to obtain molecular confirmation of diagnoses, where applicable.

Methods

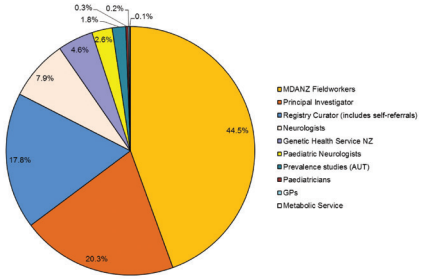
To achieve these aims the NZ NMD Registry operates as a nationwide longitudinal opt-in registry for both children and adults living with neuromuscular disease in NZ. Led by a principal investigator, who is a consultant neurologist and managed by a genetic counsellor who is the Registry Curator, demographic, pre-specified, disease-specific clinical and genetic information is collected, curated and regularly updated. More recently patient self-reported data has been incorporated for some disorders. Data are stored securely with some data for specific disorders; Duchenne muscular dystrophy, spinal muscular atrophy, myotonic dystrophy, facioscapulohumeral muscular dystrophy and Charcot-Marie-Tooth disease being housed on secure platforms provided by overseas collaborators.

Results

Referrals to the NZ NMD Registry



Sources of Referral to the NZ NMD Registry



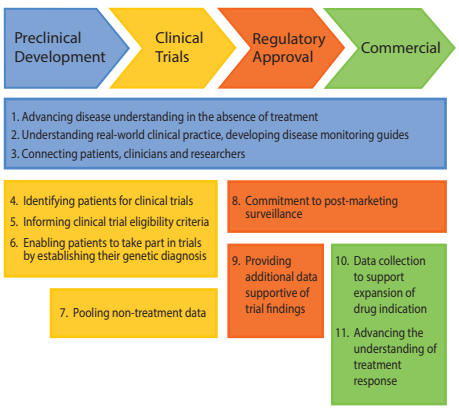
Characteristics of NZ NMD Registry Participants

Neuromuscular Disorder	Total no. of patients	% Molecular Diagnosis	Mean Age years (range)	% Female
Myopathies				
Myotonic dystrophy type 1	168	80	45.0 (1 - 84)	55
Myotonic dystrophy type 2	11	100	59.7 (35 - 71)	55
Duchenne muscular dystrophy	73	93	14.7 (3 - 39)	0
Becker muscular dystrophy	42	74	37.1 (6 - 71)	0
Manifesting carrier of dystrophinopathy	7	86	43.7 (16 - 79)	100
Facioscapulohumeral muscular dystrophy	70	66	49.6 (19 - 81)	40
Limb girdle muscular dystrophy	58	28	48.9 (10 - 79)	50
Emery-Dreifuss muscular dystrophy	8	63	33.0 (17 - 49)	25
Ion channel disorders (myotonia congenita, periodic paralysis, ATS)	17	82	35.6 (3 - 81)	18
Congenital muscular dystrophies & myopathies	32	39	26.0 (3 - 76)	53
Mitochondrial myopathies	17	53	51.7 (31 - 77)	53
Inclusion body myositis	34	not applicable	57.3 (43 - 92)	56
Neuropathies				
Charcot-Marie-Tooth disease	136	40	51.4 (6 - 89)	54
Hereditary Sensory & Autonomic Neuropathy	3	100	41.0 (21 - 65)	67
Anterior horn cell diseases				
Spinal muscular atrophy	42	88	23.1 (4 - 81)	48
Kennedy's disease	8	100	54.9 (29 - 71)	0
Ataxias				
Spinocerebellar ataxia	50	65	62.8 (37 - 83)	35
Friedreich ataxia	36	64	39.9 (16 - 67)	47
Cerebellar ataxia, neuropathy & vestibular areflexia syndrome (CANVAS)	19	0	71.2 (53 - 92)	67
Hereditary spastic paraplegia				
Hereditary spastic paraplegia	25	36	38.0 (8 - 89)	40
Neurocutaneous disorders				
Neurofibromatosis type 1	16	50	30.8 (3 - 73)	50
Tuberous Sclerosis	4	75	34 (20 - 44)	75
Other neuromuscular disorders				
Other neuromuscular disorders e.g myasthenia gravis, polymyositis	34	not applicable	63 (15 - 85)	70
Other genetic neuromuscular disorders e.g Pompe disease	109	9	40.7 (4 - 71)	31
Overall	**1019**	**58%**	**44.0 (1 to 92)**	**44**

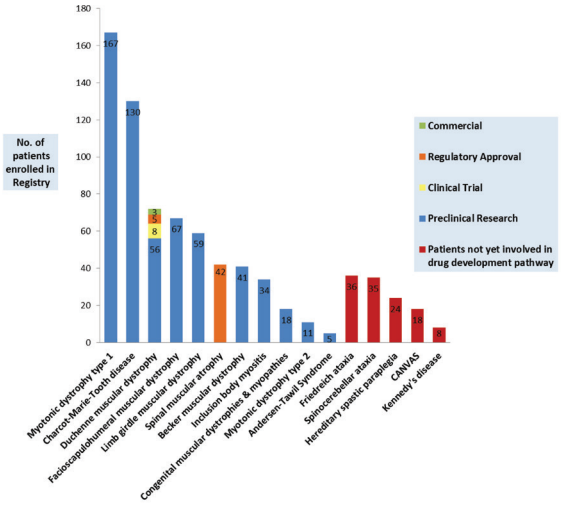
Only 58% of people enrolled in the Registry have a molecular diagnosis. A lack of molecular diagnosis limits access to treatment, genetic counselling and research, a goal of the Registry is to gain sufficient funding so that it can facilitate access to genetic testing for patients who are not able to access testing through the usual pathways.

Discussion

Bogard Model of Registry Development



NZ NMD Registry Development



A registry's role is dynamic and should be responsive to the changing needs of its stakeholders, as illustrated in the Bogard model of registry development. In five years the NZNMD Registry has evolved from carrying out roles important during preclinical drug development, such as Advancing disease understanding in the absence of treatment and Connecting patients with researchers, to performing vital work in the clinical trial arena by Identifying patients for clinical trials, and Informing study eligibility criteria. For DMD and SMA we are now considering the role of Post-marketing surveillance. The role of Providing additional data supportive of trial findings has been performed for a new SMA treatment and, as new drugs for both DMD and SMA enter the commercial market, we anticipate the later roles of Data collection to support expansion of drug indication and Advancing the understanding of treatment response becoming important to the Registry

Conclusion

We have demonstrated that an overarching registry serving all neuromuscular diseases managed by a single project team is effective. Factors that influence registry design: Population size, health-system structure, clinician interest and make-up of patient support organisations.

The Registry has changed the face of neuromuscular research in NZ. Important factors in achieving this are

- the integral involvement of the patient support organisation and
- the minimal dependence upon clinicians, which can only occur with dedicated registry staff.

By contributing data to natural history and feasibility studies, assisting in recruitment and advising researchers the Registry is now facilitating almost all neuromuscular research currently taking place in NZ.

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