SMA Expanded Dataset

Annual Report: Year 3

July 2022

Prepared by:

Project Manager: Julie Bohill

Project Co-ordinator: Jess Page

Contents

Executive Summary

This report will summarise progress made during the third year of the TREAT-NMD Expanded SMA Dataset Implementation Project (May 21–April 22) and details the key objectives and achievements during this period. Of the twelve registries invited to join the project in year 3, five registries agreed to participate and four of these have been actively engaged to date. Registries recruited in previous years, have made significant progress in adopting the SMA core dataset during this reporting period.

TREAT-NMD requested an extension to the project end date and was approved by Biogen in early 2022. The one year no-cost extension, which will now be referred to as year 4, will provide continued support and guidance to existing registries, deliver additional networking opportunities for curators and final call to new registries to join the project. The new project end date is May 2023, when the final report will be delivered.

1. Introduction

Following a pilot study in September 2018, TREAT-NMD expanded the SMA core dataset for collection by its global network of SMA Registries. The purpose of the expansion was to better inform on the natural history of SMA, provide context to understand the safety and effectiveness of new treatments, and support post marketing surveillance (PMS) for emerging new treatments in the market.

The results from the 2018 pilot study informed the final contents of the dataset as well as a plan for a 3-year phased implementation project. So far, we have engaged with 10 registries (Pilot), 8 registries in both Years 1 & 2, and 5 registries joined in Year 3.

This report will:

- Highlight progress made by newly recruited Year 3 registries
- Summarise progress made by Pilot, Year 1 & Year 2 registries
- Report on the Global Registries Platform (GRP) implementation
- Outline plans for year ahead (Year 4)

2. Deliverables

Table 1: Year 3 key deliverables

Deliverable	Due	Completion date
D10: Financial bursaries available for year 3 registries (not receiving direct Biogen funding)	M25 (June 2021)	Complete
D11: Year 3 workshop for dataset implementation support/harmonisation	M28 (Sept 2021)	20- 05-2021
D12: Year 3 Project Report	M36 (May 2022)	15-07-2022

D10: Financial Bursaries

SMA registries in the TREAT-NMD network were asked to significantly increase their data collection activities to comply with the expanded SMA Dataset. Work of this nature often has considerable time and/or cost implications. The Biogen funding has enabled us to financially support registries with the additional work involved and has been most welcomed by the participating registries.

Up to €8,000 (EURO) per registry is available as a bursary payment, payable in 2 parts (part A and part B) of €4,000 each.

Part A: 50% (€4,000) is available when the registry starts work on implementing the expanded SMA Dataset (available immediately if work has already begun)

Part B: 50% (€4,000) is available when the registry provides:

1. Evidence that data collection has begun for all relevant mandatory data items (e.g a copy of the new registry questionnaire or case report form).

2. Feedback (provided in Part B of the Bursary Request Form) on:
    a. Benefits of / issues with the expanded dataset
    b. Suggested improvements for the expanded dataset
    c. The process of implementation and support received.

The number of registries who have received financial support is summarised in table 3 below:

Table 2: Bursary Payments

Participating registries by project Year	Part A Paid	Part B Paid	Total payments
Pilot registries	2	1	€12,000
Year 1 – 8 registries	4	3	€28,000
Year 2 – 8 registries	6	3	€36,000
Year 3 - 5 registries	3	0	€12,000
Totals	**15**	**7**	**€88,000**

To date, €88,000 has been awarded to participating TGDOC registries in recognition of their involvement in the collection of the expanded dataset.

- 15 registries have been /are being processed for Part A payment – these registries committed to work towards adopting the dataset for collection of SMA patient data
- 7 registries have received both payments (Part A & B) – these registries have evidenced they are now collecting the SMA core dataset.
- 1 registry has not yet applied; a reminder has been issued
- 1 registry applied but unable to process the payment due to economic banking restrictions
- Special consideration was given to two pilot registries as funding was not received directly into the registries. This was approved in advance by Biogen.

In the Year 2 report, registries reported that the actual cost of implementation of V2 dataset was far greater than €8,000 provided. Most reported a high amount allocated for IT costs. The implementation of the Global Registries Platform (GRP) during 2021 has provided a choice to registries not seen before, and 7 registries (new and existing) have agreed to adopt this free to use platform. They are still eligible for the bursary payment and this funding can then be used to support staff costs or fund the training of physiotherapists and clinicians. Registries continue to report they are extremely grateful for the financial support, and it is a valuable incentive, particularly for registries with limited resources who would not otherwise be able to participate in this project.

D11: Year 3 –Workshop

As a result of the Covid pandemic and the resulting travel restrictions, it was agreed to host three virtual workshops, delivered between the 19-20 May 2021. The focus of these workshops was to provide training and expert guidance to support curator understanding. It was decided to deliver a workshop targeted at the TREAT-NMD core datasets - SMA, DMD & LGMD. The rationale behind this was that many TGDOC registries have responsibility for managing more than one neuromuscular disease registry. Delivering a common presentation, allowed us to address common concepts and avoid duplication of information. This was also considered to be a more efficient and effective use of curator time. The workshop key objectives were as follows:

- Provide a general overview of the core datasets structure and general principles.
- Explain the components of the dataset such as data item, value ID, longitudinal item, episode, reference period etc.
- Present examples of implementation of complex data items per disease (LGMD, DMD and SMA)
- Promote networking and sharing of experience amongst the curators

The workshop was attended by approx. 70 curators from across the globe and was favourably received. The key conclusions arising from the workshop were as follows:

- Presenting the datasets as a technical specification requires additional educational activity by TREAT-NMD. It is a new concept for most registries and is a change of approach that will require a structured training programme to address the more complex issues.
- TREAT-NMD need to develop training material to ensure the correct understanding of the core datasets. In this sense we should offer workshops based on feedback received through the specification tool on topics of interest to registries.
- As most TGDOC registries are involved in more than one dataset implementation project, consideration needs to be given to ensure streamlining of process, revision, and training to avoid duplication of information.
- More disease specific sessions looking at individual data items relevant to that disease would be beneficial to the registries.

The Year 3 workshop report and video recording of the workshop is available to view via the TREAT-NMD web page.

D12: Year 3 Report

As defined in the Contract for Research, the annual report will address the following key areas:

a. Update to deliverables from previous years
b. Summary of activities and progress made in Year 3
c. Data analysis demonstrating registry progress towards collection of quality data among increasing numbers of SMA patients - % level of mandatory/non-mandatory data collection, highlighting issues around problematic data item collection, outcome measures and access to therapies
d. Confirmation of target registries for Year 4
e. focus on summarizing high level data and trends in terms of participation and data collection elements.

In preparation for this report, Biogen were consulted for any specific areas of interest or focus and this was included in e) above.

To inform this report, the Curator Report Surveys, completed in Year 2, were re-issued (Appendix 1) and registries asked to update changed information only. This approach was well-received by curators as it reduced the amount of effort involved and they were invited to contact TREAT-NMD if any issues required further explanation. New registries joining in Year 3, were unfamiliar with this data collection exercise, therefore a telephone call was scheduled to provide them with additional support and answer any questions.

Updates to Deliverables from previous years:

All deliverables from previous years have been completed and reported in the Year 1 and 2 annual reports. There will however be an update on D4: SMA Dataset Revision Process and this will be addressed in section 4.3

3. Proof of concept

Theme 1: General overview of registries

3.1 Year 3 registries - summary

In previous years, a group meeting was held with all new participants to introduce them to the project, the core dataset and structure, and highlighting financial support available. As registries have joined on a more sporadic basis during year 3, it has not been possible to organise a group session and so we have worked at individual registry level. At the introductory meeting we introduce the dataset project and a member of the TREAT-NMD Global Registries Platform (GRP) team would provide a demonstration of the benefits of the in-house platform. In addition, where it was identified that a registry collected data on more than one NMD, the relevant TREAT-NMD dataset project manager would also join the call. This one-to-one approach has been possible due to the smaller number of registries in Year 3 and has enabled us to develop a good working relationship with the registries, discuss specific curator challenges and we have then arranged regular follow-up meetings to assess progress.

5 registries agreed to participate during Year 3 of the project from Asia, Middle East and Africa with two of these registries agreeing to adopt the GRP as their input platform.

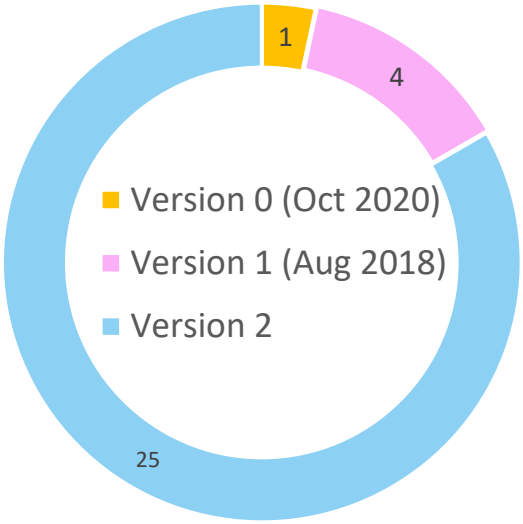
3.2 All registry progress update (covers registry data from Pilot, Year1, Year 2 & Year3)

Since 2019, we have formally invited 41 registries to join the expanded SMA core dataset and to date, 31 registries have agreed to participate (n10 pilot study, n8 Year 1, n8 Year 2, n5 Year 3). As anticipated, it has become increasingly difficult over time to engage with registries. Most registries who were willing and able to join the project, did so in the early stage of the project and experience is showing that the less developed registries are not able to engage in the later stages of the project. These registries tend to have more limited resources or capacity to meet the additional workload and challenges associated with adopting the expanded dataset. However, as the SMA module of the GRP is now available, these registries have the option of using this free platform for data collection

activities which has proved very appealing to smaller under-resourced registries with limited IT resource capacity.

We can report that significant progress has been during 2021/22 in respect of core dataset adoption. All Year 1 & Year 2 participating registries (n=25) have confirmed that their data collection forms now comply with the SMA core dataset – figure 1 shows the version of the dataset adopted by each registry.

Figure 1: No's of registries adopting which version of the dataset



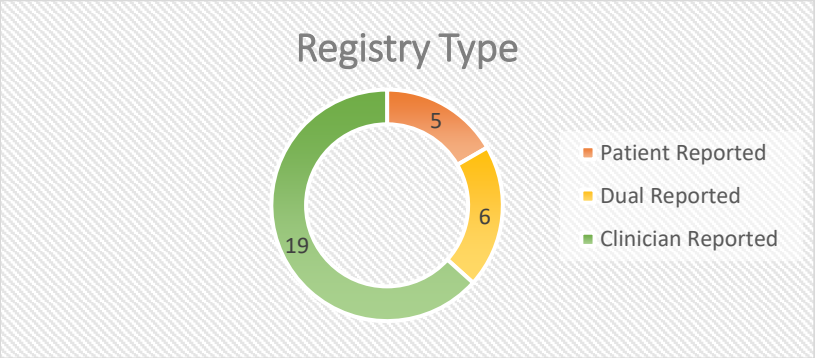
Source of Registry Data & Type of Registry

For the 30 registries represented in this report the primary means of data collection are as follows:

- 8 use a bespoke software platform
- 3 use REDCap
- 1 use Clarum
- 7 use Excel / Access
- 1 uses Google Docs
- 8 use the Global Registries platform (launched June 2021)
- 2 use other methods (SQL server in Azure and Compos)

The frequency of data updates in each registry varies significantly, ranging from every visit (e.g every few months for treated patients) to a minimum of once per year.

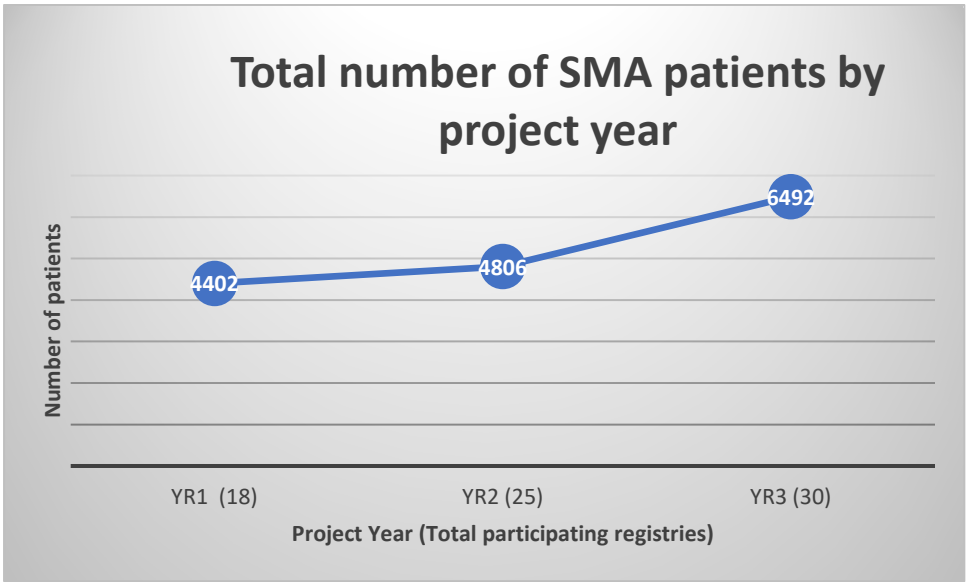
Figure 2: Split by Registry Type (patient/clinician/dual reported)



Registry Patient Numbers

In Year 3, there was a steep increase in the number of SMA patients due to a large registry joining the project. Across the 30 registries surveyed, the number of patients has grown from 4,402 in year 1 to 6,492 in year 3. The size of the registries varies enormously from < 10 patients to those with over 1,500 patients. Of the 6,446 patients covered by this project, 68% of them had data collected according to version 2.

Figure 3: SMA patients by project year



Participating registries have been grouped into 6 categories according to the number of patient records held. Table 3 shows the number of registries in each category and reflects that 73% registries hold data on less than 250 SMA patients.

Table 3: Patient Groups

Group	Group 1 < 50 patients	Group 2 51-100 patients	Group 3 101 – 250 patients	Group 4 251-500 patients	Group 5 501 -750 patients	Group 6 >751 nts
Number Registries	10	5	7	4	2	2
%	33%	17%	23%	13%	7%	7%

Theme 2: Dataset compliance

There has been a steady improvement in data compliance levels, and we acknowledge the continued hard work and effort made by registries to achieve this. 4 registries now collect all mandatory and non-mandatory data items with a further 11 registries reporting collection rate between 90-99%.

Figure 4: Dataset compliance across all 30 registries

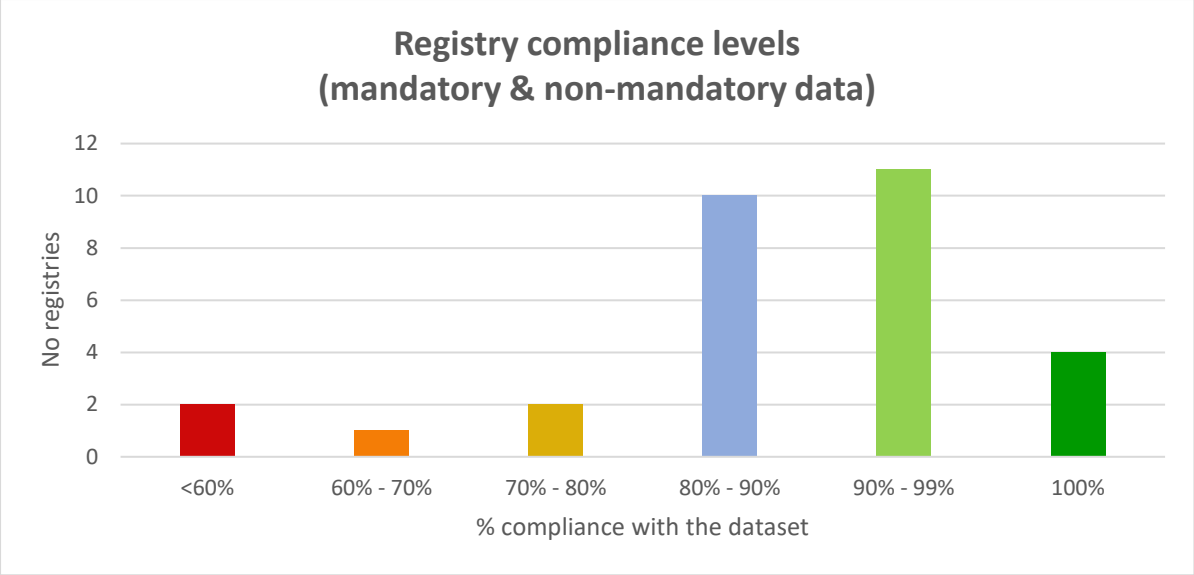


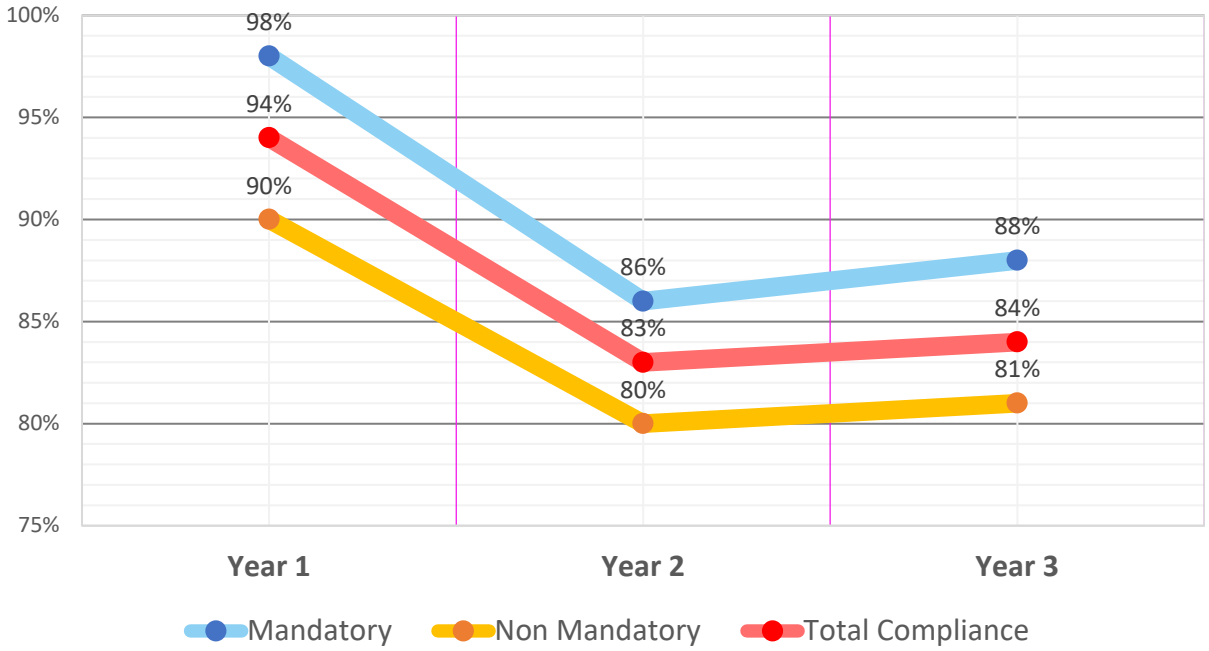
Table 4 below looks in more detail at what is collected by each type of registry (patient, clinician or dual reported), we can report that all registries collect a higher % of mandatory items in comparison to non-mandatory items, this is expected given the higher importance placed on these items. The analysis includes a registry still collecting V0 of the dataset and a dual reported registry based at a genetic testing centre and collecting only a limited set of data at baseline with no patient follow-up. If, we remove these two registries from the results, the overall compliance level increases to **90%** compared to 84% as shown below.

Table 4: Average dataset compliance across all Pilot, Year1, 2 & 3 registries.

	Patient Reported (n= 5)	Clinical Reported (n=19)	Dual Reported (n=6)	All Data (n=30)
Mandatory	94%	86%	89%	88%
Non-Mandatory	75%	80%	88%	81%
Total Compliance	**85%**	**83%**	**88%**	**84%**

In figure 5, we see the changes in compliance levels over the three years of the project and in year 3, we see a small increase in dataset compliance levels from those reported in year 2. Further work is required with registries to better understand those reason(s) for non-collection of data and provide support where appropriate. This will be addressed as part of the next Dataset Revision process.

Figure 5: Dataset compliance by project year – total compliance, mandatory, non-mandatory



.

The current version of the SMA core dataset (V2) was launched in June 2020 and registries are more familiar with it alongside the new data structure which complies with FAIR data principles. Whilst many registries report their data collection forms give them the capacity to collect V2 data, they also report certain data items cannot be collected for a variety of reasons.

Table 5 below, shows the data items most frequently NOT being collected. During the next dataset revision process, this information will be used to support discussion and review of the core datasete . If items remain, they may be re-classified from a mandatory to non-mandatory category or improvement of the description in the dataset specification or additional training may be provided to support curators. Registries have reported difficulty with collecting 'Episode Records' and so this is recognised as a future training need.

Table 5: Most common data items NOT being collected

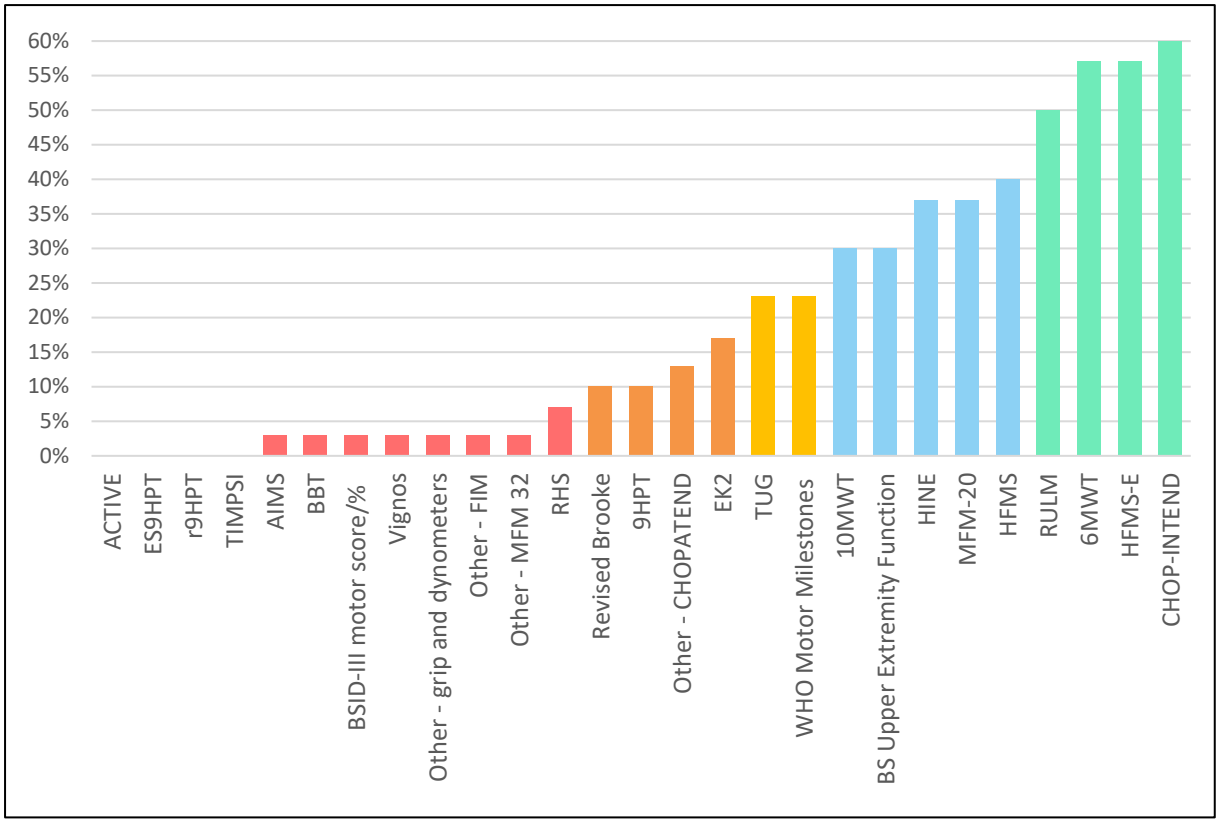
	Data Item	# Registries not collecting
Mandatory Items	Peak cough flow (CR)	14
	Patient Global Impression of Severity (CR) (PR)	17
	Patient Global Impression of Improvement (CR) (PR)	16
Non-Mandatory Items	Cause of death	11
	Cause of death classification	11
	SMN2 variant c859GtoC	18
	SMN2 variant c859GtoC testing method	19
	Head circumference	17
	Jaw contractures	12
	Cobb angle	11
	Anti-AAV9 Antibody test result	15
	Anti-AAVp antibody test days before administration	16
	Allopathic drug episode	10

Theme 3: Motor Outcome Measures

There continues to be a natural consensus emerging across registries on motor outcome measures with the most used being CHOP-INTEND, HFMS-E, RULM, and 6MWT. The survey completed by curators has identified the following:

- 25 registries (with a clinician reported element) report they collect motor outcome measures
- 5 registries do not collect any outcome measures – of these 4 were patient-reported registries and 1 dual-reported registry
- 4 motor measures are not being used (ACTIVE, ES9HPT, r9HPT, TIMPSI)
- Based on the 25 survey responses, an average of ***6.9*** motor outcome measures are collected
- This compares with an average of 4.9 in year 1 and ***7.6*** in year 2 and represents a 41% increase in the average number of motor outcome measures collected per registry since 2019. The increase is likely to be related to several factors; increased therapy availability and the requirement to collect data for regulators and payers. TREAT-NMD dataset mandates each clinician-reported registry must collect at least one motor outcome measure and one patient reported outcome.

Figure 6: Motor outcome measures collected by registry (clinician and dual reported)



Improved access to training on motor measures for physiotherapists and clinicians has been a consistent theme in this area. This year we have been able to address this by directing TREAT-NMD registries to the online **OPEN-TACT** on-line educational resource. This has been developed by Anna Mayhew, funded by NorthStar and hosted via the MDUK website and available globally upon request. This training material supports physiotherapy assessment and is a valuable tool for those identifying patients with neuromuscular disease, providing support to patients, and recommending specific outcome measures. We will continue to direct curators to this valuable resource if they indicate they are struggling with in-country training.

TREAT-NMD have recognised the value of driving consensus for the preferred motor outcome measures and have agreed to establish a taskforce with representation from across TGDOC registries and key opinion leaders and stakeholders. For the final project report, we will provide an update on the work of this group.

Theme 4: Disease – modifying therapy availability

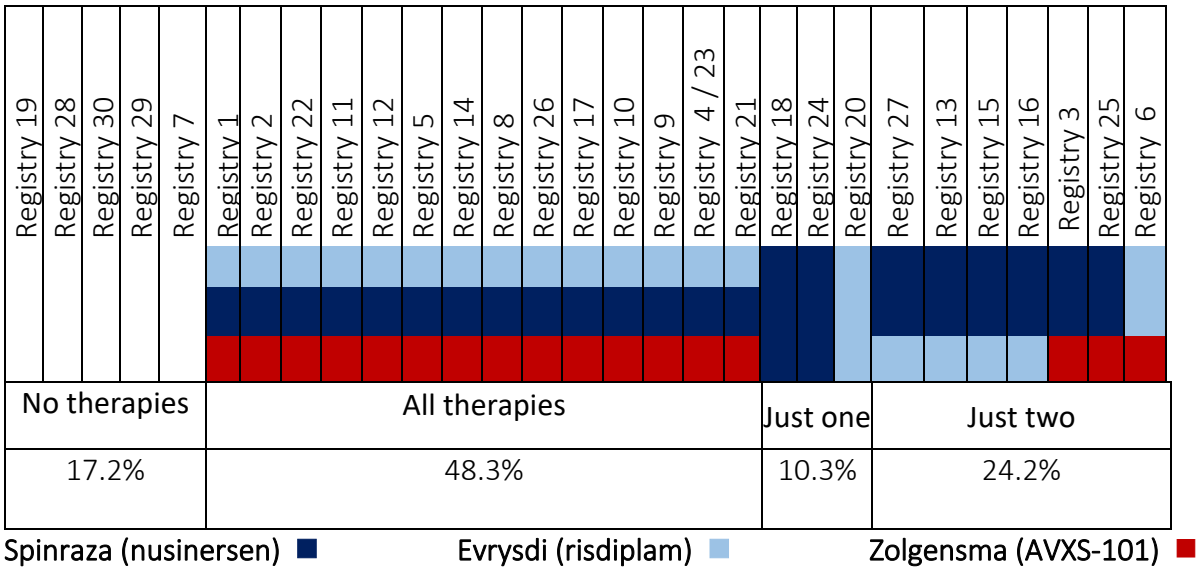
The global reach of the TREAT-NMD network is reflected in the fact that 29 countries are represented by the 30 participating SMA registries (two registries exist in one of the countries). As new therapies come to market, it is encouraging to see more countries with access to one or more treatment options, however 4 countries report no access to any therapies. These countries indicate that patients can obtain treatment overseas if they're able to arrange funding themselves. There is an improving picture of access to therapies compared to what was reported last year's Annual report - 50% counties now report access to all three therapies for patients: Spinraza (nusinersin), Evrysdi (risdiplam) and

Zolgensma (AVXS-101) compared to 23% in 2021 and 77% have access to two or more therapies compared to 58% in 2021.

The emergence of new therapies to market, provides a clear reminder to registries of the need to collect data in a standardised format, complying with the structure of a global core dataset to inform post-marketing surveillance and natural history studies.

Fig 7: Therapy access across participating registries countries:*

Percentage of registries with access to each therapy:



* Data presented is from a curator survey carried out in May 2022 and reflects what registry PI's have reported regarding therapy access in their own country. Access is defined as any DMT availability at all irrespective of reimbursement restrictions or route of access.

Theme 5: Registry Challenges

From the curator survey, registries were asked to comment on their key challenges and steps taken to address these. This information highlights the main areas of difficulty at the grassroots level. The most frequent concerns are summarized as follows:

Reported challenges

- **Size of the dataset -** many registries commented it was too large and that it was proving very difficult to collect all items from both the clinical perspective and the time taken to collect the information when patients are in clinic.
- **Impact on patients/ caregivers** – the collection forms are extensive to be filled out by families, patients become impatient, with many questions appearing to be the same. This is an extra burden on caregivers and further compounded for those with more than one child with SMA.
- **Patient Engagement** – more visibility of access to global programs / trials would lead to improved patient engagement

- **difficulties engaging with clinicians** who did not understand the rationale or value in requesting the level of data. It was reported that whilst patients *may kno*w the present and previous states for a condition, such as feeding tube usage, this may noy always be the case for clinicians who don't have the complete medical records to reliably tell whether an individual has used a feeding tube.
- **Episode data collection.** The retrospective collection of the start date and stop date for different episode topics has not been possible for some registries due to the cost of data collection. Some registries report the movement from **longitudinal data** to **episodes** is too challenging and time consuming and requesting this is not mandatory (apart from DMT related questions)
- **Dataset version update** .... as version 1 was only in place for one year, some registries were unable to adopt version 2 as quickly as they would have liked.
- **IT issues –** the cost and time taken to adapt existing platforms prevents the registry from progressing as quickly as they would like

Reported benefits of collecting the core dataset and actions taken

- Government is now using registry to measure intervention outcomes
- Registry involved at national level to build consensus for monitoring
- clinic is filling in most of the record with the information from the medical history
- large network stimulates smaller registries like ours to move forward
- being on the register is a condition of using the DMT
- Improving communication with all clinicians involved in SMA patient care.
- Being part of the network helps to keep us updated to the relevant issues

4. Looking ahead to Year 4

The approval from Biogen for a one-year extension has been most welcome and enabled us to continue to provide support and guidance to existing registries, engage with new registries and identify trends / issues relating to data collection activities. In the final year of this project, we will focus on the following:

4.1 **Dataset Workshop**

We will hold an in-person SMA dataset workshop on 7th December 2022 in Vancouver, Canada and this will coincide with the TREAT-NMD conference and Annual Curators Meeting taking place on the 8-10 December. This will be the first face-face meeting for SMA curators since the meeting in Leiden in 2019.

The workshop will provide a much-needed opportunity for curators to network face to face and we will review the core dataset, discuss data items proving difficult to collect and share best practice on how to better engage with clinicians and patients. We will focus on how TREAT-NMD can support registry curators going forward to address key challenges and maintain patient level engagement. We will invite curators to suggest key topic items for consideration and this will be discussed in the coming months with the SMA sub-group leads (Victoria Hodgkinson, Canada and Miriam Rodriquez, New Zealand).

4.2 Year 4 Target Registries

Invites have been issued to new TGDOC registries and three countries have agreed to participate. Initial kick-off meetings have commenced with 2 registries, and we will continue on-boarding new SMA registries during the year. Registries will also be offered a demonstration of the Global Registries Platform to see if this is a suitable means of data collection.

In August 2021, a virtual meeting was held by TREAT-NMD for ALAME countries (Latin American Alliance) to introduce them to the global registry network and the core datasets. This event was well-attended with translators supporting those non-English speaking countries. Progress since has been slow, but more focus will be given in the coming months to expand collaboration and we are being supported in our efforts by a curator who is the legal representative of the Latin American Alliance.

4.3 Dataset Revision Process - update

A formal Dataset Revision Process (the 'Revision Process') was undertaken March - October 2020. This resulted in the publication of version 2 of the SMA Core Dataset in October 2020 with a subsequent update in August 2021 (version 2.1). The current dataset can be accessed via the TREAT-NMD website and the ***Change Log*** describes the updates between versions and dates implemented.

Within the TREAT-NMD SMA data specification, users can '*Report an Issue*' directly from the system which then feeds into the **Redmine Project Management System (PMS**). This on-line tool allows users to submit direct feedback, whether it be seeking further clarification of an item, highlighting problems, or suggesting improvement. Collecting and managing user feedback in such a controlled manner has been effective and we've responded to 73 items of feedback to date. Any suggestions for changes to the data items which are not considered to be immediate updates or corrections, are then managed by the relevant Dataset Project Manager and this feeds into the next revision cycle for consideration by the Dataset Revision Working Group.

The Year 2 report described in detail the expansion of the SMA dataset and how it was developed via extensive stakeholder consultation (over 700 items of feedback considered) and it brought about many improvements over the previous version (V1). However, it was recognised that the process adopted was extremely difficult to manage, overly labour-intensive and time-consuming for all those involved.

For the reasons outlined above, we plan to review the Dataset Revision Process as outlined in the 2021 annual report. As new datasets are developed for other neuromuscular diseases, it will be necessary to develop a harmonised approach to dataset revision which has a common timeline. The reasoning is that there are several registries who collect data on multiple diseases and there exist many common data items across the various datasets. Therefore, careful consideration needs to be given to the potential impact and workload on curators when implementing any future revisions. Initial discussions have now commenced between the Dataset Project Managers (SMA, DMD & LGMD) and Marcel Heidemann (IT data expert) about how to manage this process going forward to ensure,

- datasets remain responsive and relevant to the rapidly changing drug landscape
- the dataset meets the requirements of all key stakeholders (industry, regulatory, patient, clinician, curator)

- the dataset enables us to capture good quality, standardised data to inform natural history studies and post marketing surveillance
- changes are minimised, wherever possible, to reduce the burden and cost on registries
- ensure continued registry engagement to collect the core dataset

Work will commence on a revised process and this will be circulated to TGDOC executive group, key stakeholders, and opinion leaders for comment. It is anticipated that the new dataset revision process will be ready to share with TGDOC registries at the TGDOC Annual Curators Meeting in December. This will then be shared in the final report to Biogen.

4.4 Communications and support

We have continued with a structured communication and support approach in year 3 through the TGDOC newsletter and 1-2-1 meetings with new registries. Following the recent appointment of the Dataset Co-ordinator we can improve availability of direct support from the project team

Table 6: Year 4 key events / milestones:

Date	Title of Event	Details	Target Audience
March 2022	Online curator Surveys issued	Data collection to inform the annual report,	All participating SMA registry curators
Monthly	Support Calls	Virtual Drop-in Sessions (2nd Tues each month)	Primarily Year 4 Curators, other registries invited
June 2022	TREAT-NMD SMA Masterclass	Virtual Meeting	Clinicians, researchers, and industry
July 2022	Annual Project Report (Year 3)	Written report	Biogen
Oct 2022	European Scientific Congress on SMA	In person conference and poster - Barcelona	SMA Clinicians, researchers, and industry
Dec 2022	SMA Dataset workshop, Conference TGDOC Curators Meeting	In person - Vancouver	SMA Clinicians, researchers, and industry
Jan 2023	Deliverable: Dataset Workshop Report	Written report	Biogen
Feb 2023	Online curator survey issued	Data collection to inform the final report,	All participating SMA registry curators
May 2023	Project Closure	Final Report delivered	Biogen

4.5 Year 4 Deliverables

Table 7: Biogen – Year 4 deliverables

Deliverable	Due	Completion date
D13 Dataset Workshop and report	M45	
D14. Final project report	M48	

Following the dataset working in December 2022, a report will be produced and shared with Biogen in M45, this will be referred to as D13. The final project report will now be referred to as D14.

5. Additional considerations

5.1 Global Registries Platform.

One of the most notable things to report this year is the launch of the bespoke TREAT-NMD Global Registries Platform (GRP). For TGDOC member registries, this is a free-to-use cloud-based platform which enables registries to collect patient data according to the TREAT-NMD core datasets. Since its implementation in June 2021, 8 SMA registries have fully implemented the GRP system as their primary means of patient data collection. This is of particular benefit for registries with limited finance, who were unable to fund, often expensive IT software updates to existing platforms.

TREAT-NMD are also engaging with registries which will continue to use their existing data collection platforms to provide a safe and efficient means of data submission to facilitate TREAT-NMD Global Registry enquiries

Future developments are planned for the platform which include the ability to personalise reports, collect additional data items which may be registry-specific but not part of the core dataset and automatic ability to migrate existing patient records into the platform. To date, the feedback received from registries who have moved across to the GRP, has been very favourable. The next major step is to transfer de-identified patient level data from the secure registry area into the TREAT-NMD Data Warehouse for interrogation.

5.2 Dataset Videos

One of the recommendations arising from the May 2021 dataset workshop was the need to develop training material to ensure the correct understanding of the core datasets. This is often regarded as complex for registries, particularly those where English is not a first language. For this reason, three short videos were produced which provide an easy-to-follow introduction to the dataset by explaining what it is and is not and introducing a new registry to the terminology and structure of the dataset. These videos have proved popular with new registries, and we direct them here following the initial on-boarding meeting. The videos can be viewed via the TREAT-NMD website.

5.3 Project team coverage

Julie Bohill joined the project in August 2021 to replace Jo Bullivant as Project Manager and during Q3/Q4 2021 a period of familiarisation with the project and dataset followed. Unfortunately, the Project Co-ordinator was absent shortly after Julie joined and left the project in January 2022. The replacement Project Co-ordinator Jess Page joined the project on 4th July and has recently graduated from Newcastle University with an MRes in Neuromuscular Disease so she will be a great asset to the team.

5.4 TGDOC Membership

TGDOC membership requires C*ore* members to adopt the expanded dataset within 12 months of the latest version being implemented. If a registry is unable to comply with this requirement, then

membership is amended to A*ffiliate level* status. Our experience to date has shown that, for the vast number of registries, the 12-month timeframe is not achievable and there is considerably more work and effort involved than was initially anticipated. The TGDOC Executive Group have therefore reviewed this timeline and given approval for registries to adopt the core dataset within 24 months to maintain core membership status.

5.5 SMA Sub-Group Leads

Over the past 3 years, we have been fortunate to work with two excellent sub-group leads - Victoria Hodgkinson, (National Program Manager for the Canadian Neuromuscular Disease Registry) and Miriam Rodrigues a genetic counsellor (Membership Services Manager at the Muscular Dystrophy Association of New Zealand). They have brought valuable expertise, knowledge, and enthusiasm to foster a global network of SMA registries and we would like to acknowledge their contribution. Victoria and Miriam are now stepping down from these positions and we are currently looking to recruit into these roles.

5.6 Publications

A publication is being prepared outlining the development of the TREAT-NMD Core Datasets in collaboration with the DMD and LGMD core dataset project teams. The methodology will focus on the consensus-building, decision-making, and standardisation processes, and illustrate how TREAT-NMD has evolved the technique to learn from experience and adapt according to the needs of the different disease areas. We are anticipating a draft will be ready for review in the next couple of months pending publication.

5.7 Abstracts & Posters

Several abstracts and posters have been submitted and chosen for conference poster presentation.

- WMS conference Sept 2021 - poster submitted September 2021 with a focus on the power of the data held within the TREAT-NMD Global SMA Registry (Appendix 4)
- CureSMA June 2022 abstract was accepted for poster presentation (Appendix 3)
- 3rd International European Scientific Congress SMA to be held on the 21-23 October 2022. Selected for poster presentation.

6. Conclusion

We are pleased to conclude that significant progress has been made during year 3 with 75% of participating registries (25 of 30) now reporting that their data collection forms comply with the expanded core dataset. The level of data compliance remains high and shows a slight improvement on year 2 with 88% compliance with the **mandatory data** items. There is a slight increase in **overall compliance** level to 84% (mandatory & non-mandatory) in year 3, rising to 90% when the two outliers are removed.

Feedback from some curators suggest that the current dataset of 154 data items (117 mandatory and 37 non-mandatory items) may be too large. Collection of data is time-consuming and costly and registries report challenges collecting this from both patients and clinicians. This will be considered in the next dataset revision as we look to strike a balance between collecting sufficient data to meet the requirements of natural history studies, post-marketing surveillance and regulators, whilst being mindful not to over-burden those collecting data.

In the past 12 months, a key development has been the increase in the global availability of the three treatment therapies. Of these 26 countries now report some level of access to either Spinraza, Zolgensma or Risdiplam and 50% of registries report having access to all three therapies. This highlights to the community (curators, clinicians, patients) the need to collect high-quality standardised data to support post-marketing surveillance.

We continue to be encouraged by the commitment and continued effort shown by curators and continued involvement in the project. We look forward to meeting with many of them at our SMA Dataset workshop in Vancouver in December. We hope this will be an excellent opportunity to network, discuss how to improve data quality and data collection practices and learn from each other. This will be during the final year of the project, and we hope to onboard several new registries during this period.

The project team and the TGDOC Chairs would like to express thanks to Biogen for funding this important initiative, approving the one-year extension and for their continuing on-going support of the work. The final project report will be delivered May 2023.

Project Contacts

Any questions or feedback about this process or the SMA Dataset itself can be directed to:

- Julie Bohill (SMA Expanded Dataset Project Manager) at Julie.bohill@newcastle.ac.uk
- Jess Page (SMA Dataset Project Co-ordinator) at Jess.Page@newcastle.ac.uk

Appendix 1: Curator Call Survey

Jisc Online surveys

Year 2 Report Survey

Response ID	Completion date	

1	Please provide the following information:	
1.1	Registry curator name	
1.1.a		
1.2	Please confirm your registry name	
1.2.a		

2	Please select which term best describes the coverage of your registry:	
2_a	Please specify:	
2_b	In which country/countries is your registry based?	

3	Are you receiving any direct funding from Biogen to support your Registry's data collection activities?	
3.a	Have you applied for your SMA Dataset Bursary?	
3.a.i	How has it helped (or how will it help) you to implement the SMA Core Dataset in your registry?	
3,a,ii	Please tell us why?	

4	'Has your registry completed the new TGDOC Membership process?	
4_a	Please specify:	

5	Please provide the number of living patients included in this registry, under each version of the dataset. (only provide the most recent data for each patient, e.g. patient 33 has data in v2 and historical data in v1, only include them as a total against v2)	
5.1	SMA Type 0	
5,1,a	v0 (2009)	
5,1,b	v1 (2018)	
5.1.c	v2 (2020)	
5.1.d	Total	
5.2	SMA Type 1	
5,2,a	v0 (2009)	
5,2,b	v1 (2018)	
5,2,c	v2 (2020)	
5,2,d	Total	
5.3	SMA Type 2	
5.3.a	v0 (2009)	
5.3.b	v1 (2018)	
5.3.c	v2 (2020)	
5.3.d	Total	
5.4	SMA Type 3a	
5,4,a	v0 (2009)	
5,4,b	v1 (2018)	
5,4,c	v2 (2020)	
5,4,d	Total	
5.5	SMA Type 3b	
5.5.a	v0 (2009)	
5.5.b	v1 (2018)	
5.5.c	v2 (2020)	
5.5.d	Total	
5.6	SMA Type 3 (if sub-type not known)	
5,6,a	v0 (2009)	
5,6,b	v1 (2018)	
5,6,c	v2 (2020)	
5,6,d	Total	
5.7	SMA Type 4	
5.7.a	v0 (2009)	
5.7.b	v1 (2018)	
5.7.c	v2 (2020)	
5.7.d	Total	

5.8	Unspecified type but genetically confirmed
5.8.a	v0 (2009)
5.8.b	v1 (2018)
5.8.c	v2 (2020)
5.8.d	Total
5.9	Total
5.9.a	v0 (2009)
5.9.b	v1 (2018)
5.9.c	v2 (2020)
5.9.d	Total

6	Please explain your data collection process (Review of clinical notes? Clinicians complete 'live' in clinic? Clinicians send paper forms to Curator? Patients enter data online? Curator telephones patients?)
6.a	How often do you try to update individual patient data?
6.a.i	Please specify:
6.a.ii	Please tell us how often the visits are.
6.a.iii	Please provide more details.

7	How do you manage data from patients lost to follow up, and how long do you keep it in your registry?

8	What system do you currently use to collect/store your data?
8.a	please specify
8.b	Are you waiting for the URP (Universal Registry Platform) to become available for your registry to use?
8.b.i	What is the decision process for your registry in using the URP? e.g. impact assessment needed, ethics committee review...

9	Which version of the SMA Core Dataset do your current data collection forms comply with?
9.a	If you have not yet implemented version 2, when do you expect to do this?

For questions 10-24 you only need to pick out the items which your registry is NOT currently collecting. Please give a brief reason for each one:

10	Privacy-preserving record linkage
10.1	First name at birth (CR) (PR)
10.1.a	
10.1.b	Reason not collecting
10.2	Last name at birth (CR) (PR)
10.2.a	
10.2.b	Reason not collecting
10.3	Full date of birth (CR) (PR)
10.3.a	
10.3.b	Reason not collecting
10.4	Sex at birth (CR) PR)
10.4.a	
10.4.b	Reason not collecting
10.5	Country of birth (CR) (PR)
10.5.a	
10.5.b	Reason not collecting
10.6	Place of birth (CR) (PR)
10.6.a	
10.6.b	Reason not collecting

11	Demographics
11.1	Date of birth (CR) (PR)
11.1.a	
11.1.b	Reason not collecting
11.2	Sex (CR) (PR)
11.2.a	
11.2.b	Reason not collecting
11.3	Country of residence (CR) (PR)
11.3.a	
11.3.b	Reason not collecting
11.4	Is family member affected (CR) (PR)

11.4.a	
11.4.b	Reason not collecting
11.5	Affected family member relation
11.5.a	
11.5.b	Reason not collecting
11.6	Affected family member sex
11.6.a	
11.6.b	Reason not collecting
11.7	Affected family member side
11.7.a	
11.7.b	Reason not collecting

12	Living status
12.1	Alive (CR) (PR)
12.1.a	
12.1.b	Reason not collecting
12.2	Date of death
12.2.a	
12.2.b	Reason not collecting
12.3	Cause of death code
12.3.a	
12.3.b	Reason not collecting
12.4	Cause of death classification
12.4.a	
12.4.b	Reason not collecting

13	Genetic diagnosis
13.1	Genetic confirmation (CR) (PR)
13.1.a	
13.1.b	Reason not collecting
13.2	Screening
13.2.a	
13.2.b	Reason not collecting

5 / 451

13.3	Genetic Report (CR) (PR)
13.3.a	
13.3.b	Reason not collecting
13.4	SMN1 variant (CR) (PR)
13.4.a	
13.4.b	Reason not collecting
13.5	SMN1 variant HGVS (CR) (PR)
13.5.a	
13.5.b	Reason not collecting
13.6	SMN1 testing method
13.6.a	
13.6.b	Reason not collecting
13.7	SMN2 copy number (CR) (PR)
13.7.a	
13.7.b	Reason not collecting
13.8	SMN2 copy number testing method
13.8.a	
13.8.b	Reason not collecting
13.9	SMN2 variant c859GtoC
13.9.a	
13.9.b	Reason not collecting
13.10	SMN2 variant c859GtoC testing method
13.10.a	
13.10.b	Reason not collecting

14	Clinical Observations
14.1	Symptom onset (CR) (PR)
14.1.a	
14.1.b	Reason not collecting
14.2	Symptom onset date (CR) (PR)
14.2.a	
14.2.b	Reason not collecting
14.3	SMA type (CR) (PR)

6 / 451

14.3.a	
14.3.b	Reason not collecting
14.4	Clinician Global Impression of Severity (CR) - baseline
14.4.a	
14.4.b	Reason not collecting
14.5	Clinician Global Impression of Improvement (CR) - follow-up
14.5.a	
14.5.b	Reason not collecting
14.6	Height
14.6.a	
14.6.b	Reason not collecting
14.7	Height measurement method
14.7.a	
14.7.b	Reason not collecting
14.8	Weight
14.8.a	
14.8.b	Reason not collecting
14.9	Head circumference
14.9.a	
14.9.b	Reason not collecting
14.10	Shoulder contractures
14.10.a	
14.10.b	Reason not collecting
14.11	Elbow contractures
14.11.a	
14.11.b	Reason not collecting
14.12	Wrist contractures
14.12.a	
14.12.b	Reason not collecting
14.13	Finger contractures
14.13.a	
14.13.b	Reason not collecting

14.14	Hip contractures
14.14.a	
14.14.b	Reason not collecting
14.15	Knee contractures
14.15.a	
14.15.b	Reason not collecting
14.16	Ankle contractures
14.16.a	
14.16.b	Reason not collecting
14.17	Jaw contractures
14.17.a	
14.17.b	Reason not collecting

15	Scoliosis
15.1	Scoliosis diagnosis (CR) (PR)
15.1.a	
15.1.b	Reason not collecting
15.2	Cobb angle
15.2.a	
15.2.b	Reason not collecting
15.3	Scoliosis surgery performed (CR) (PR)
15.3.a	
15.3.b	Reason not collecting
15.4	Scoliosis surgery date
15.4.a	
15.4.b	Reason not collecting

16	Motor function
16.1	Motor ability (CR) (PR)
16.1.a	
16.1.b	Reason not collecting
16.2	Motor ability status (CR) (PR)
16.2.a	

16.2.b	Reason not collecting
16.3	Motor ability observed in clinic (CR) (PR)
16.3.a	
16.3.b	Reason not collecting
16.4	Motor ability episode (CR) (PR)
16.4.a	
16.4.b	Reason not collecting

17	Wheelchair usage
17.1	Wheelchair usage (CR) (PR)
17.1.a	
17.1.b	Reason not collecting
17.2	Wheelchair usage episode (CR) (PR)
17.2.a	
17.2.b	Reason not collecting
17.3	Wheelchair usage frequency (CR) (PR)
17.3.a	
17.3.b	Reason not collecting

18	Nutrition
18.1	Feeding tube usage (CR) (PR)
18.1.a	
18.1.b	Reason not collecting
18.2	Feeding tube usage episode (CR) (PR)
18.2.a	
18.2.b	Reason not collecting
18.3	Feeding tube usage type (CR) (PR)
18.3.a	
18.3.b	Reason not collecting

19	Pulmonary Function
19.1	Invasive ventilation usage (CR) (PR)
19.1.a	
19.1.b	Reason not collecting
19.2	Invasive ventilation episode (CR) (PR)
19.2.a	
19.2.b	Reason not collecting
19.3	Invasive ventilation duration (CR) (PR)
19.3.a	
19.3.b	Reason not collecting
19.4	Non-invasive ventilation usage (CR) (PR)
19.4.a	
19.4.b	Reason not collecting
19.5	Non-invasive ventilation episode (CR) (PR)
19.5.a	
19.5.b	Reason not collecting
19.6	Non-invasive ventilation duration (CR) (PR)
19.6.a	
19.6.b	Reason not collecting
19.7	Airway clearance assistance
19.7.a	
19.7.b	Reason not collecting
19.8	Pulmonary function test performed (CR) (PR)
19.8.a	
19.8.b	Reason not collecting
19.9	Forced vital capacity volume (CR)
19.9.a	
19.9.b	Reason not collecting
19.10	Forced vital capacity percentage (CR)
19.10.a	
19.10.b	Reason not collecting
19.11	Peak cough flow (CR)
19.11.a	
19.11.b	Reason not collecting

20	Disease-modifying therapies (DMT)

20.1	DMT received (CR) (PR)
20.1.a	
20.1.b	Reason not collecting
20,2	DMT episode (CR) (PR)
20,2,a	
20,2,b	Reason not collecting
20,3	DMT (CR) (PR)
20,3,a	
20,3,b	Reason not collecting
20,4	DMT status (CR) (PR)
20,4,a	
20,4,b	Reason not collecting
20,5	DMT single administration date (CR) (PR)
20,5,a	
20,5,b	Reason not collecting
20,6	DMT stopping reason (CR)
20,6,a	
20,6,b	Reason not collecting
20,7	DMT dosage value (CR)
20,7,a	
20,7,b	Reason not collecting
20,8	DMT dosage unit (CR)
20,8,a	
20,8,b	Reason not collecting
20,9	DMT administration route (CR)
20,9,a	
20,9,b	Reason not collecting
20,10	DMT administration intervals
20,10,a	
20,10,b	Reason not collecting
20,11	DMT administration schedule deviation (CR)
20,11,a	
20,11,b	Reason not collecting
20,12	DMT administration schedule deviation reason (CR)
20,12,a	
20,12,b	Reason not collecting
20,13	DMT corticosteroid administration duration (CR)
20,13,a	
20,13,b	Reason not collecting
20,14	DMT corticosteroid drug (CR)
20,14,a	
20,14,b	Reason not collecting
20,15	Anti-AAV9 Antibody test result
20,15,a	
20,15,b	Reason not collecting
20,16	Anti-AAVp antibody test days before administration
20,16,a	
20,16,b	Reason not collecting

21	Medication and rehabilitation
21,1	Allopathic drug usage (CR) (PR)
21,1,a	
21,1,b	Reason not collecting
21,2	Allopathic drugs (CR) (PR)
21,2,a	
21,2,b	Reason not collecting
21,3	Other allopathic drugs (CR) (PR)
21,3,a	
21,3,b	Reason not collecting
21,4	Allopathic drug episode
21,4,a	
21,4,b	Reason not collecting
21,5	Allopathic drug
21,5,a	
21,5,b	Reason not collecting

21.6	Other allopathic drug
21.6.a	
21.6.b	Reason not collecting
21,7	Rehabilitative interventions usage (CR) (PR)
21,7,a	
21,7,b	Reason not collecting
21,8	Rehabilitative interventions (CR) (PR)
21.8.a	
21.8.b	Reason not collecting

22	Hospitalisations and comorbidities
22,1	Hospitalisation occurred (CR) (PR)
22,1,a	
22,1,b	Reason not collecting
22,2	Hospitalisation type (CR) (PR)
22.2.a	
22.2.b	Reason not collecting
22.3	Hospitalisation nights (CR) (PR)
22.3.a	
22.3.b	Reason not collecting
22,4	Hospitalisation acute reason code (CR)
22,4,a	
22,4,b	Reason not collecting
22,5	Hospitalisation acute reason classification (CR)
22.5.a	
22.5.b	Reason not collecting
22.6	Hospitalisation planned reason (CR)
22.6.a	
22.6.b	Reason not collecting
22.7	Hospitalisation SAE (CR)
22.7.a	
22,7,b	Reason not collecting
22,8	Hospitalisation SAE DMT (CR)
22.8.a	
22.8.b	Reason not collecting
22.9	Comorbidities diagnosed (CR) (PR)
22,9,a	
22,9,b	Reason not collecting
22,10	Comorbidity episode (CR) (PR)
22,10,a	
22,10,b	Reason not collecting
22,11	Comorbidity code (CR) (PR)
22.11.a	
22.11.b	Reason not collecting
22.12	Comorbidity classification (CR) (PR)
22.12.a	
22,12,b	Reason not collecting
22,13	Comorbidity SAE (CR) (PR)
22,13,a	
22,13,b	Reason not collecting
22,14	Comorbidity SAE DMT (CR) (PR)
22.14.a	
22.14.b	Reason not collecting

23	Clinical research
23,1	Clinical trial participation (CR) (PR)
23,1,a	
23.1.b	Reason not collecting
23,2	Clinical trial name (CR) (PR)
23.2.a	
23.2.b	Reason not collecting
23.3	Clinical trial drug (CR) (PR)
23.3.a	
23.3.b	Reason not collecting
23,4	Other registry participation
23,4,a	

23.4.b	Reason not collecting
23.5	Other registry
23.5.a	
23.5.b	Reason not collecting

24	Electrophysiology and biomarkers
24.1	CMAP performed
24.1.a	
24.1.b	Reason not collecting
24.2	DEXA performed
24.2.a	
24.2.b	Reason not collecting
24.3	Muscle imaging performed
24.3.a	
24.3.b	Reason not collecting

25	Which motor outcome measure(s) are you collecting?
25.a	Please specify:
25.b	Please provide the reason.

26	If no motor measure is taken at a visit, do you collect the reason?
26.a	Please provide the reason:

27	Please tell us if your registry is not currently collecting the following PROMS data items and the reason why:
27.1	Patient Global Impression of Severity (CR) (PR) - baseline
27.1.a	
27.1.b	Reason not collecting
27.2	Patient Global Impression of Improvement (CR) (PR) - follow-up
27.2.a	
27.2.b	Reason not collecting

28	Which (if any) patient-reported outcome measures (PROMs) are
28.a	Please specify:
28.b	Please tell us the reason

29	What is the status of disease-modifying therapy availability in your country?
29.1	Spinraza (nusinersen)
29.1.a	Available:
29.1.b	Access:
29.1.c	Eligibility:
29.2	Evrysdi (risdiplam)
29.2.a	Available:
29.2.b	Access:
29.2.c	Eligibility:
29.3	Zolgensma (AVXS-101)
29.3.a	Available:
29.3.b	Access:
29.3.c	Eligibility:

30	What has been your biggest challenge with the expanded SMA Core Dataset?

31	How are you tackling this?

32	In what ways has your registry benefitted from participation in the SMA Dataset Pilot/Implementation project?

Appendix 2: Data being collected by registry

Appendix 2 – Total registries participating by project year

Registry	Participation	Current dataset usage
Registry 1	Pilot	Version 2
Registry 2	Pilot	Version 1
Registry 3	Pilot	Version 1
Registry 4	Pilot	Version 2
Registry 5	Pilot	Version 2
Registry 6	Pilot	Version 1
Registry 7	Pilot	Version 0
Registry 8	Pilot	Version 2
Registry 9	Pilot	Version 2
Registry 10	Pilot	Version 1
Registry 11	Year 1	Version 2
Registry 12	Year 1	Version 2
Registry 13	Year 1	Version 2
Registry 14	Year 1	Version 2
Registry 15	Year 1	Version 2
Registry 16	Year 1	Version 2
Registry 17	Year 1	Version 2
Registry 18	Year 1	Version 2
Registry 19	Year 2	Version 2
Registry 20	Year 2	Version 2
Registry 21	Year 2	Version 2
Registry 22	Year 2	Version 2
Registry 23	Year 2	Version 2
Registry 24	Year 2	Version 2
Registry 25	Year 2	Version 2
Registry 26	Year 2	Version 2
Registry 27	Year 3	Version 1
Registry 28	Year 3	Version 2
Registry 29	Year 3	Version 2
Registry 30	Year 3	Version 2
Registry 31	Year 3	Version 1[1]

[1] This registry was unable to participate in the curator registry survey in Year 3

Appendix 3 – Cure SMA 2022 poster - TREAT-NMD SMA Core Dataset; an Important Tool for Post-Marketing Surveillance

TREAT-NMD Neuromuscular Network

TREAT-NMD Core Dataset for SMA: A Consensus-Driven Expansion to Support Post-Marketing Surveillance

Julie Bohill[1,2], Joanne Bullivant[2], Joanna Das[2], Ben Porter[2], Victoria Hodgkinson[3], Miriam Rodrigues[4], Neil Bennett[1], Nina Barišić[5], Anna Bedoshvili[6], Vesna Brankovic[7], Marjan Cosyns[8], Anne-Berit Ekström[9], Rasha El Sherif[10], Robin Forbes[11], Maria Grazia Cattinari[12], Ipek Gürbüz[13], Jana Haberlová[14], Sahar Hassanein[15], Marcel Heidemann[16], Marlène Jagut[6], Veronika Karcagi[17], Kristina Kastreva[18], Teik-Beng Khoo[19], Andrea Klein[20], Natella Kostandyan[21], Anna Kostera-Pruszczyk[22], Anna-Karin Kroksmark[9], Anna Lusakowska[22], Chiara Marini-Bettolo[2,23], Vitaliy Matyushenko[24], Ieva Micule[25], Vedrana Milic Rasic[7], Lindsay Murphy[2], Damjan Osredkar[26], Beatrix Pálmafy[17], Sankaran Suresh Kumar[29], Nana Tatishvili[27], Simone Thiele[28], Eduardo F Tizzano[12], Venkataraman Vishwanathan[29], David Allison[1], Anna Ambrosini[30], Michela Guglieri[2,23], Volker Straub[2,23] and Craig Campbell[31], on behalf of the Treat-NMD SMA Global Registry Network

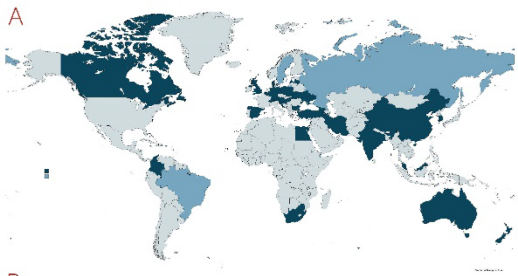
Introduction:

The TREAT-NMD Alliance is a global, independent network governed by an Executive Committee of academics, clinicians and patient representatives facilitating collaborative research in neuromuscular disease (NMD).

Having developed a range of infrastructures, the network aims to accelerate drug development, provide new therapies to patients swiftly and improve standards of diagnosis and care.
One such infrastructure is the Global Registry Network, a federated network of independent, national (or regional) patient registries that together collect data on 9,758 Spinal Muscular Atrophy (SMA) patients from 35 countries worldwide.

Utilising the Global Registry Network to capture real world evidence (RWE) to support Post Marketing Surveillance (PMS) studies is of increasing interest to stakeholders.

A



B

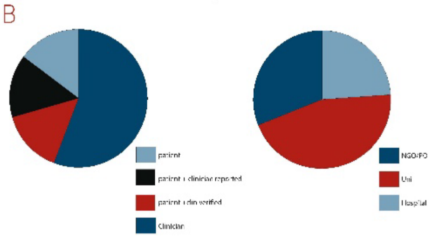


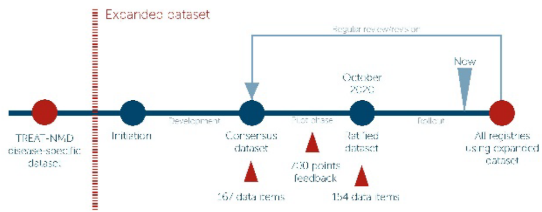
Figure 1

(A) The TREAT-NMD SMA Global Registry Network includes 35 registries (dark blue shows registry country) across 4 continents. Countries shaded light blue show prospective members. Image: mapchart.net. (B) Breakdown of TGRN member registries by data collection model, and type of organisation responsible for registries.

Results:

To facilitate collection of longitudinal data suitable for PMS, a working group was established that included clinicians, patient representatives, and registry curators to produce a TREAT-NMD Expanded Core SMA Dataset.

Dataset items and a data dictionary were agreed through stakeholder engagement and reviewed to evaluate the feasibility of data collection and implementation into registry platforms.
The initial expanded dataset included 167 data items. A review generated 700 feedback points from registries, clinicians, and other stakeholders. This feedback, coupled with a FAIR data analysis and an IT and dataset modelling exercise, led to the finalised TREAT-NMD Expanded Core SMA Dataset released in October 2020.



This reduced the total data items to 154, increasing standardisation and harmonisation with international standards, and also defined permitted values and structure for data items. The finalised dataset is FAIR compatible, and has an increased focus on RWE and Patient-Reported Outcome Measures to support future PMS studies.

15 registries within the Global Registries Network have fully adopted the expanded dataset and 16 are working toward adoption. Registries report improved data quality and utilisation; however, adoption of the expanded dataset was challenging for many registries. A formalised dataset review process has now been established to minimise future disruption. This will combine continuous feedback collection with regular biannual review to ensure that changes to the dataset can be easily adopted by registries, while supplying the RWE needed to support PMS studies and other enquiries.

Conclusions:

Provision of RWE by patient registries is key for PMS studies. The Expanded Core SMA Dataset and Global Registry Network ensure that TREAT-NMD is well-placed to provide this data. A key criteria for joining the Global Registry Network is collection of all mandatory data items. Recognising the challenges of adopting an expanded dataset, TREAT-NMD offers registry bursaries and the option of using a freely available Global Registry Platform including the expanded dataset.

The dataset review process must provide a clearly defined pathway to future dataset updates. This will provide relevant and useable data while limiting the burden on registries. Since identical data items appear across TREAT-NMD datasets, a standardised revision approach will minimise impact on registries collecting data across NMDs.

TREAT-NMD SMA Dataset

The TREAT-NMD Expanded Core Dataset for SMA (which includes a list of fields, data dictionary and example questions) is freely available to any organisation/system collecting data on SMA patients.

The dataset is suitable for patient- or clinician-reported registries and compatible with Privacy Preserving Record Linkage (PPRL) tools. The dataset's content and example screenshots are shown on the right.

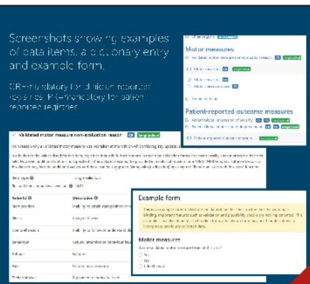
Scan to download full details of the dataset

SMA Dataset Contents

- Demographics
- Privacy preserving record linkage
- Clinical observations
- Genetic diagnosis
- Living status
- Motor function
- Wheelchair usage
- Scoliosis
- Pulmonary function
- Disease-modifying treatment
- Nutrition
- Hospitalisations and comorbidities
- Clinical research
- Medication and rehabilitation
- Motor measures
- Patient reported outcome measures
- Electrophysiology and biomarkers

Screenshots showing examples of data items, a dictionary entry and example form.

CR = mandatory for clinician reported registries, PR = mandatory for patient-reported registries



Appendix 4: World Muscle Society 2021 Poster - TREAT-NMD SMA Core Dataset; an Important Tool for Postmarketing Surveillance