# PHENOTYPE DISTRIBUTION AND DIFFERENTIAL DISEASE BURDEN IN MULTIPLE SCLEROSIS: REAL-WORLD DATA FROM THE APOLO STUDY

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## INTRODUCTION

Multiple Sclerosis (MS) is a highly heterogeneous disease, with distinct clinical phenotypes associated with different prognosis, disease progression and treatment needs.

**Objective:** APOLO (Assessment of Phenotype Outcomes and Longitudinal Observation in MS) study aimed to estimate the prevalence and describe the characteristics of MS phenotypes, providing essential data for clinical practice and healthcare planning in Spain.

## MATERIALS AND METHODS

Multicenter observational study with 2-year retrospective data collection (2023-2025) from e-medical records and surveys to patients in programmed visits. A total of 1,289 patients were randomly selected from each MS database from 29 Spanish hospitals. Data on sociodemographic, clinical, and treatment patters were collected.

### Inclusion criteria

- Aged ≥ 18, diagnosed with MS, according to the 2017 McDonald criteria or later [1], 2 years before index date.
- Record of at least two EDSS scores in the observational period.
- Documented relapse history during the observational period.
- Population assigned to the health district.

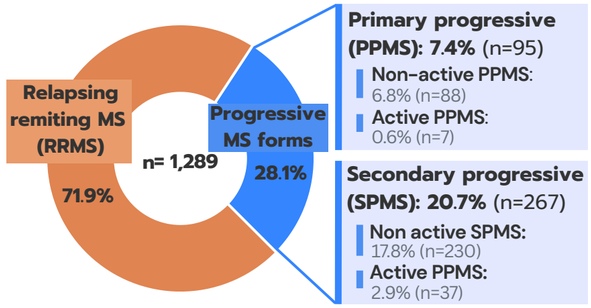
### Exclusion criteria

- Patients who died during the study period.
- Diagnosis of clinically/radiologically isolated syndrome without confirmation of MS.
- Patients referred from other healthcare centers.

## RESULTS

### a Sociodemographic and clinical characteristics

*Figure 1. MS phenotype distribution*




** Activity is defined by the presence of clinical relapses and/or MRI activity*

*Table 1. Patient profile based on phenotype*

| | Total | RRMS | PPMS | SPMS |
|---|---|---|---|---|
| Age | 48.4 (11.6) | 45.5 (10.9) | 57.3 (10.3) | 55.3 (9.3) |
| Female | 69.7 % | 71.8 % | 55.8 % | 67.0 % |
| Years from diagnosis | 13.6 (9.0) | 12.0 (8.2) | 10.3 (8.2) | 20.1 (9.0) |
| EDSS | 2.9 (2.2) | 1.8 (1.3) | 5.2 (1.5) | 5.5 (1.6) |
| Caregiver need | 15.3 % | 2.9 % | 36.9 % | 50.6 % |
| Medical leave | 13.1 % | 8.5 % | 17.9 % | 27.3 % |
| Years of medical leave | 8.4 (9.1) | 5.6 (5.5) | 7.7 (7.6) | 11.3 (11.3) |

*Quantitative data are expressed on mean (SD)*

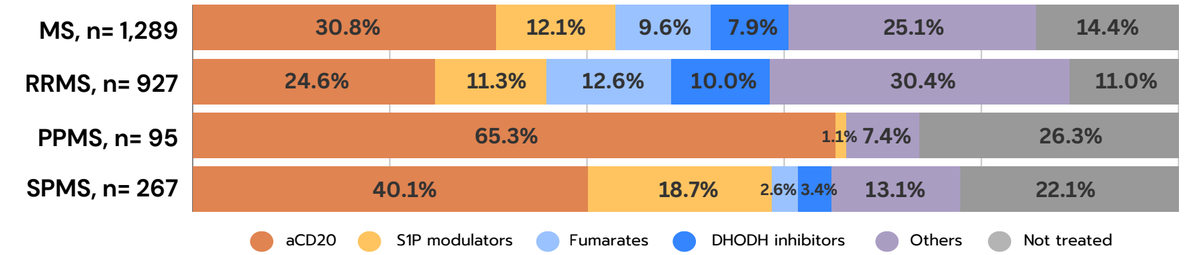
### b Progression and activity during the observational period

- Disease progression was observed in 18.6% of patients (92.5% was independent of relapse activity).
- Activity was observed in 21.3% of patients (confirmed by only relapses in 20.5%, confirmed by only image 56.3%, and 23.1% confirmed by relapses and image).

### c Current treatment patterns

- Overall, 85.6% received treatment (89.0% RRMS, 73.7% PPMS and 77.9% SPMS).
- The therapeutic group most prescribed was antiCD20, 30.8% (24.6% in RRMS; 65.3% in PPMS; 40.1% in SPMS).

*Figure 2. Currently active treatment groups*




## CONCLUSIONS

- Disability accumulation in MS is largely driven by relapse-independent progression (92.5%), highlighting the need to move beyond relapse-focused strategies toward therapies targeting disability progression.
- Nearly 3 in 10 patients present with progressive MS, which is associated with a greater disease burden. These patients are twice as likely to remain untreated compared with RRMS, underscoring a major unmet need and the importance of timely phenotype reassessment and access to targeted therapies.

### CONFLICTS OF INTEREST

This study was sponsored by Sanofi.

Celia Oreja-Guevara has received speaker and consultation fees from Alexion, Amgen, Biogen Idec, BMS, Juvise, Merck, Novartis, Roche, Sanofi-Genzyme, Sandoz, Viatris and Neuraxpharm.
Inés González-Suárez has received honoraria for speaking engagements and has participated in advisory boards for Bristol Myers Squibb, Neuraxpharm, Roche, Sanofi, Merck, and Biogen. These activities are unrelated to the present work.
Sara Eichau Madueño has received speaker honoraria and consultancy fees from Novartis, Merck, Sandoz, Sanofi Genzyme, Roche, Janssen, Bristol Myers Squibb, and Almirall.
Susana Otero-Romero has received speaking and consulting honoraria from Genzyme, Biogen-Idec, Novartis, Roche, MSD, Moderna, GSK, UCB; as well as research support from Novartis and GSK.
Marta Calvo Díez and Clara Engroba Teijeiro are employees of Sanofi and own stock options.
Araceli Casado Gómez and Paula Castro Albarrán are employees of Pharmacoeconomics & Outcomes Research Iberia (PORIB), a consultant company which has received financial support from Sanofi to conduct the development of the present work.
Jose E. Meca-Lallana has received honoraria as a consultant, as a chairman or lecturer in meetings and has participated in clinical trials and other research projects promoted by Alexion, Almirall, Amgen, Biogen, Bristol-Myers-Squibb, Johnson & Johnson, Juvisé, Merck, Merz Therapeutics, Neuraxpharm, Novartis, Roche, Sandoz, Sanofi and UCB.

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### REFERENCES

1. Thompson AJ, Banwell BL, Barkhof F, et al. Diagnosis of multiple sclerosis: 2017 revisions of the McDonald criteria. Lancet Neurol. 2018;17(2):162-173. doi:10.1016/S1474-4422(17)30470-2

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