

Patterns of Concomitant Medication Use Among Adult Patients Receiving Cannabidiol: Longitudinal Evaluation of Prescription Data From the German Insight Health Database

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Objective

- To evaluate patterns of concomitant medication use among adult patients prescribed with cannabidiol (CBD; Epidyolex®, 100 mg/mL oral solution) in Germany

Conclusions

- Patients had a high polypharmacy burden, with most having multiple neurological treatments (ATC-N) and antiseizure medication (ASM) prescriptions around the time of CBD prescribing, which may reflect the complexity of managing epilepsy and co-occurring conditions
- The observed decreases in ATC-N and ASM prescriptions may suggest an easing in polypharmacy burden over the observed CBD treatment period. These decreases did not coincide with increased prescribing in the other comedication classes assessed
- As this was a descriptive analysis without a comparator group or adjustment for confounding factors, data should be interpreted with caution; alternative explanations may include disease progression, evolving prescribing practices, and other unmeasured factors

References: 1. European Medicines Agency. Epidyolex® 100 mg/mL oral solution: summary of product characteristics. 2026. Available from: https://www.ema.europa.eu/en/documents/product-information/epidyolex-epar-product-information_en.pdf (Accessed 19 August 2026). 2. Wu J et al. *Front Pharmacol*. 2022;13:88837. 3. Gross JH et al. *Front Neurol*. 2017;8:505. 4. Scheller IE, et al. *Nat Rev Dis Primers*. 2024;10(1):61. 5. European Medicines Agency. Ontozoy (cenobamate): summary of product characteristics. 2026. Available from: https://www.ema.europa.eu/en/documents/product-information/ontozoy-epar-product-information_en.pdf (Accessed 19 August 2026). 6. European Medicines Agency. Fenfluramine (fenfluramine): summary of product characteristics. 2023. Available from: https://www.ema.europa.eu/en/documents/product-information/fenfluramine-epar-product-information_en.pdf (Accessed 19 August 2026). **Support and Acknowledgements:** This study was sponsored by Jazz Pharmaceuticals, Inc. The authors would like to thank all of the study staff for their participation in this research. Writing and editorial assistance were provided to the authors by David Griffiths, PhD, on behalf of Synos Health, UK, and funded by Jazz Pharmaceuticals, Inc., in accordance with Good Publication Practice (GPP) 2022 guidelines. **Disclosures:** All authors met the ICMJE authorship criteria and had full access to relevant data and information. Neither honoraria nor payments were made for authorship. **AS** has consulted for, conducted studies funded by, or received honoraria for services provided to Jazz Pharmaceuticals, Inc. **PMF** and **AP** are employees of Jazz Pharmaceuticals Germany GmbH, Munich, Germany, and hold stock and/or stock options in the company. **AA** is an independent researcher on behalf of Jazz Pharmaceuticals Germany GmbH, Munich, Germany. **LB** is an employee of Jazz Pharmaceuticals, Inc., and holds stock and/or stock options in the company. **Epidyolex®** is approved in the EU for the adjunctive treatment of seizures associated with Lennox-Gastaut syndrome or Dravet syndrome, in conjunction with clobazam, in patients ≥2 years of age; it is additionally approved in the EU for the adjunctive treatment of seizures associated with tuberous sclerosis complex in patients ≥2 years of age.



Presented at the 16th European Epilepsy Congress; 5–9 September 2026; Athens, Greece
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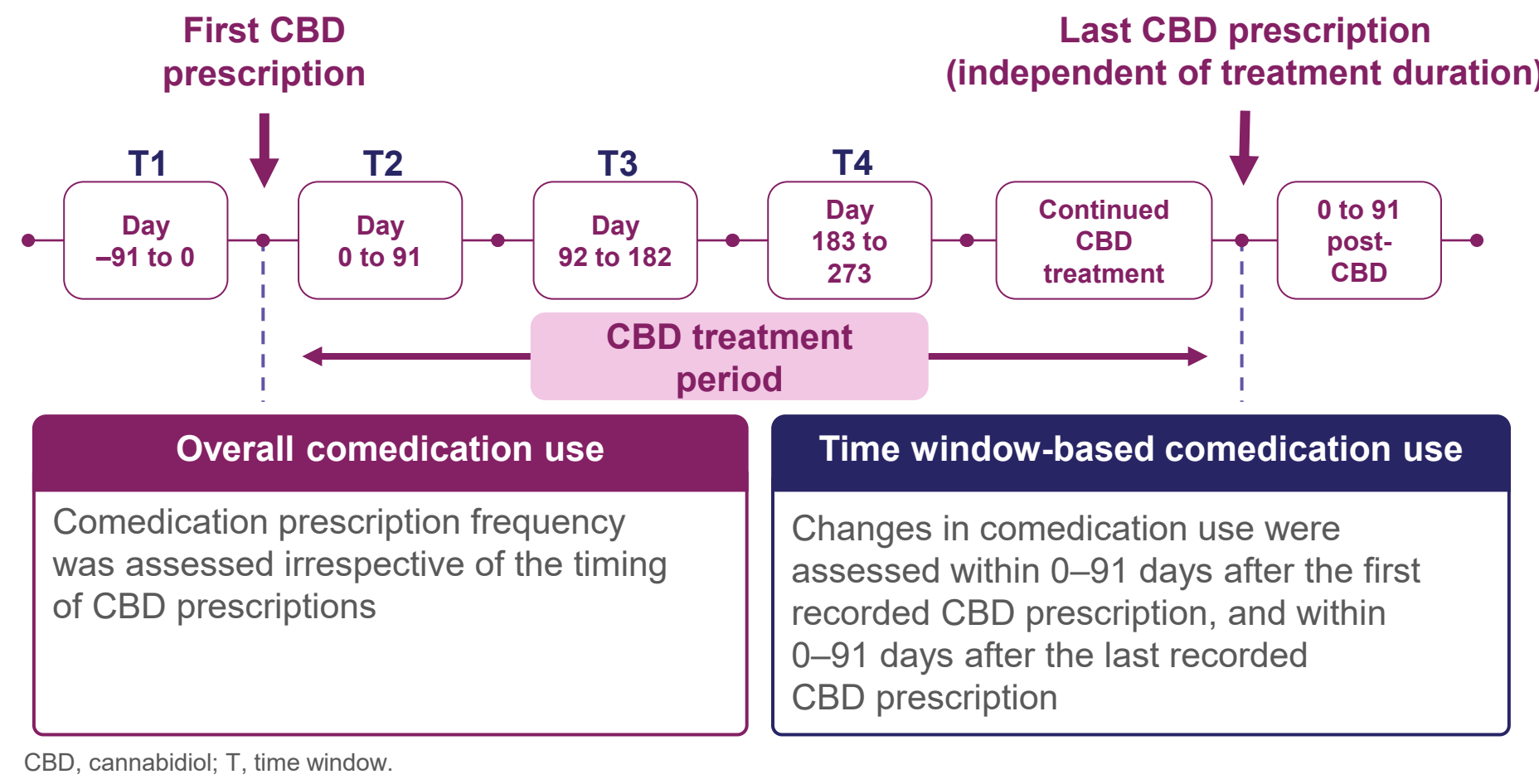
Introduction

- Cannabidiol (CBD; Epidyolex®, 100 mg/mL oral solution) is approved for the treatment of seizures associated with the developmental and epileptic encephalopathies (DEEs), Lennox-Gastaut syndrome (LGS), Dravet syndrome (DS), and tuberous sclerosis complex (TSC)¹
- These DEEs, in particular LGS and DS, are associated with a high treatment burden, including the use of multiple antiseizure medications (ASMs)^{2,3}
- The manifestations and co-occurring conditions of DEEs change with age, requiring lifelong, comprehensive management of both seizures and multimorbidity, and contributing to a complex polypharmacy burden in patients, particularly in adults⁴
- This retrospective, observational study aimed to evaluate patterns of concomitant medication (comedication) prescriptions in adults, before and after CBD was prescribed, to assess whether CBD alleviates the polypharmacy burden faced by these patients

Methods

- Aggregated CBD prescription data from January 2021–October 2025 were collected for adult patients from the German Insight Health prescription database
 - This database contains prescription drug claims from pharmacies in Germany, covering 64 million patients with public and private prescription insurance
 - Patients were included if they had private or public prescription insurance 91 days before first CBD prescription
- Analyses included overall prescriptions and comedication prescription changes from first-to-last CBD prescription (**Figure 1**), including neurological treatments (ATC-N) and ASMs
 - ATC-N included anaesthetics, analgesics, ASMs, anti-Parkinson drugs, psycholeptics, psychoanaleptics, and other nervous system drugs
 - Descriptive analyses were performed and Cohen’s *h* used to assess magnitude of the changes in proportion of comedication prescriptions. Conventional benchmarks were $|h|=0.2$ (small), 0.5 (medium) and 0.8 (large); $|h|<0.2$ was considered negligible
 - Changes were analysed in a 91-day window before first and after last CBD prescription
- Data collected pertain to comedication prescriptions before and after prescription of Epidyolex®, and do not apply to any other CBD-containing products

Figure 1. Study timings and outcomes



Results

Baseline demographics and characteristics

Table 1. Baseline demographics and characteristics

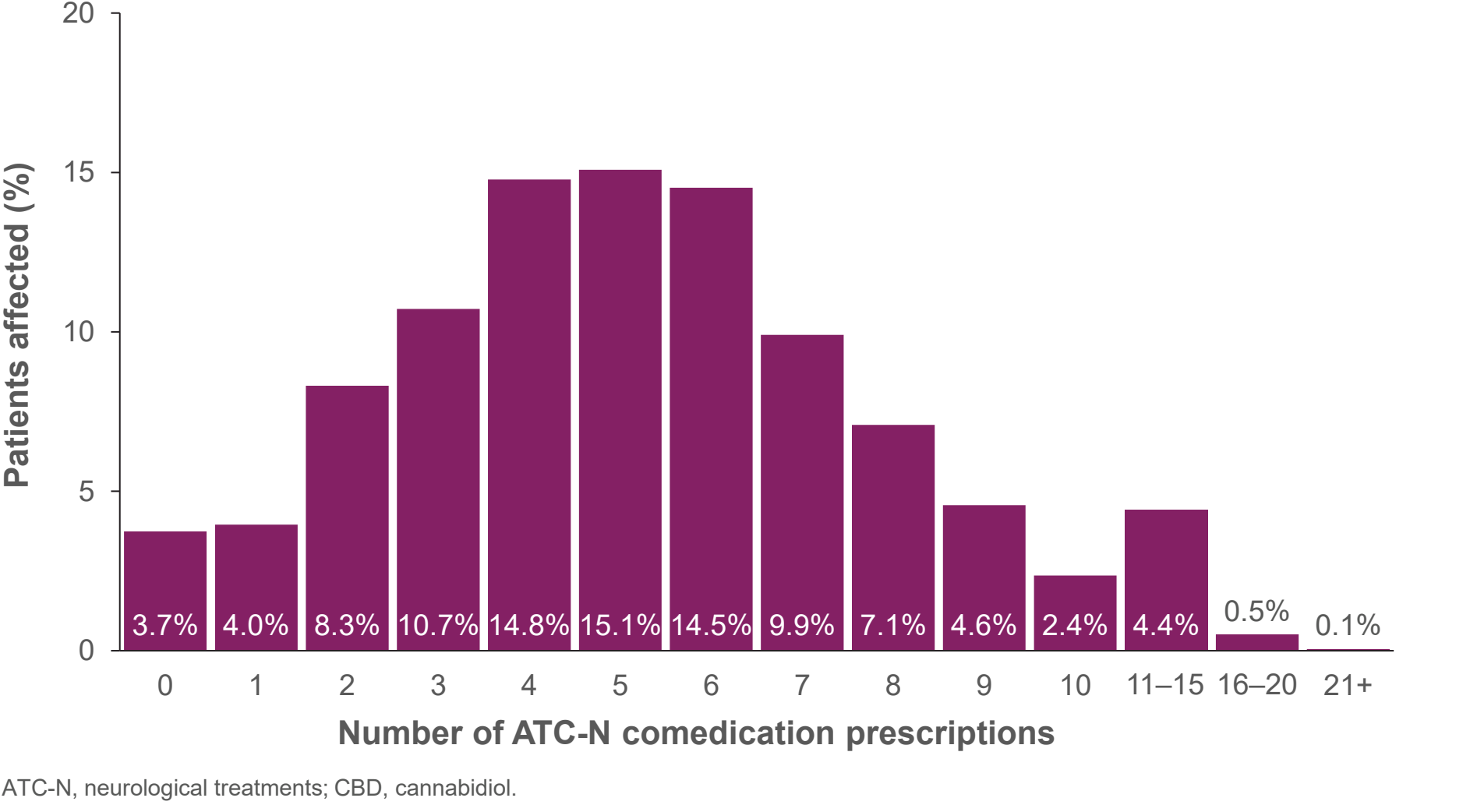
	Patients (N=1945)	Prescriptions (n=72,423)	Prescriptions per patient ^a
Age, years, n (%)			
18–19	222 (11.4)	7928 (10.9)	35.6
20–29	712 (36.6)	27,335 (37.7)	38.4
30–39	469 (24.1)	20,220 (27.9)	43.1
40–49	238 (12.2)	8261 (11.4)	34.7
50–59	166 (8.5)	5911 (8.2)	35.6
60–69	92 (4.7)	2226 (3.1)	24.2
≥70	46 (2.4)	543 (0.7)	11.8
Sex, n (%)			
Male	850 (43.7)	32,916 (45.5)	38.7
Female	725 (37.3)	26,127 (36.1)	36.0
Unknown ^b	370 (19.0)	13,379 (18.5)	36.1

^aRatio of total prescriptions divided by patients. ^bSex was inferred from first name; names for which sex could not be assigned, including ambiguous names, were categorised as unknown. ^cPercentages were calculated using N=1945 and do not total 100% because patients may have received prescriptions from more than one specialty. ^dIncludes specialists in internal medicine who act as primary care physicians within the healthcare system. ^eCounts may not sum to the overall total because of rounding. CBD, cannabidiol; GPs, general practitioners.

- Data were evaluated for 1945 patients, who collectively were prescribed 72,423 prescriptions (**Table 1**)
 - Most patients were aged 18–39 years; 43.7% were male
- Most patients (82.5%) had ≥3 CBD prescriptions

ATC-N comedication prescriptions

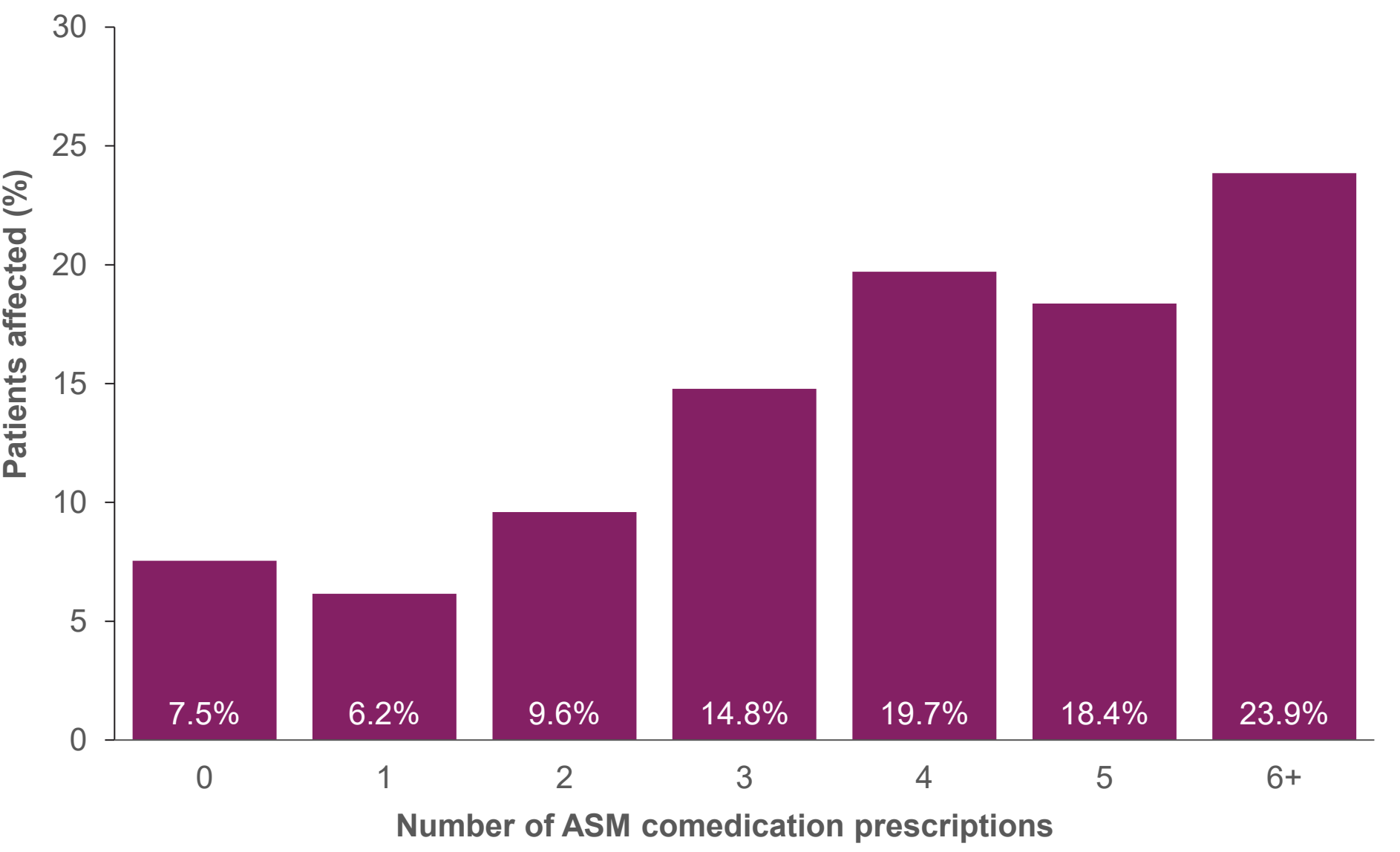
Figure 2. ATC-N comedication prescriptions within 0–91 days of any CBD prescription



- Patients had up to 21 ATC-N comedication prescriptions in the 91-day interval surrounding any CBD prescription (**Figure 2**)
- A total of 44.4% (95% confidence interval [CI]: 42.2, 46.6) of patients had 4–6 ATC-N comedication prescriptions
 - 28.9% (26.9, 30.9) of patients had ≥7 ATC-N comedication prescriptions and 26.7% (24.8, 28.7) had <4

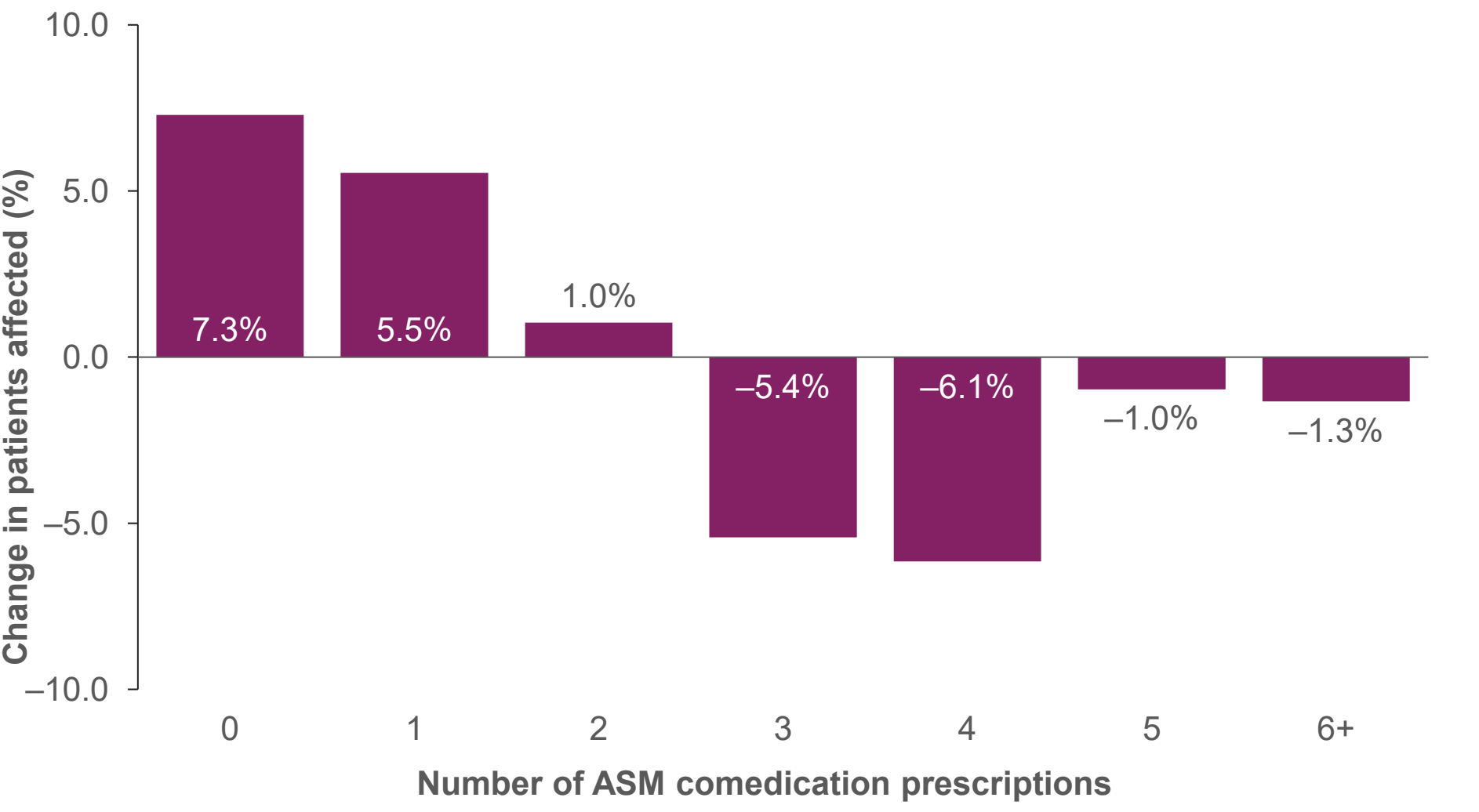
ASM comedication prescriptions

Figure 4. ASM comedication prescriptions within 0–91 days of any CBD prescription



- A total of 62.4% (95% CI: 60.3, 64.6) of patients had 2–5 comedication prescriptions in the 91-day interval surrounding any CBD prescription (**Figure 4**)
 - 23.9% (95% CI: 22.0, 25.8) of patients had ≥6 ASM comedication prescriptions and 13.7% (95% CI: 12.2, 15.2) had <2
- The maximum number of comedication prescriptions was 15

Figure 5. Changes in ASM comedication from first-to-last CBD prescription^a



^aThe first and last assessments included comedication prescriptions recorded within 0–91 days after the first and last recorded CBD prescriptions, respectively. ASM, antiseizure medication; CBD, cannabidiol.

- The proportion (95% CI) of patients with ≥3 ASM prescriptions from first-to-last CBD prescription decreased from 58.9% (56.7, 61.1) to 44.9% (42.7, 47.1; Cohen’s *h*=0.28; **Figure 5**)
 - The absolute difference was –14.0 percentage points. The difference in proportions was small to moderate in magnitude and may suggest a modest change in prescribing patterns between the first and last recorded CBD prescriptions

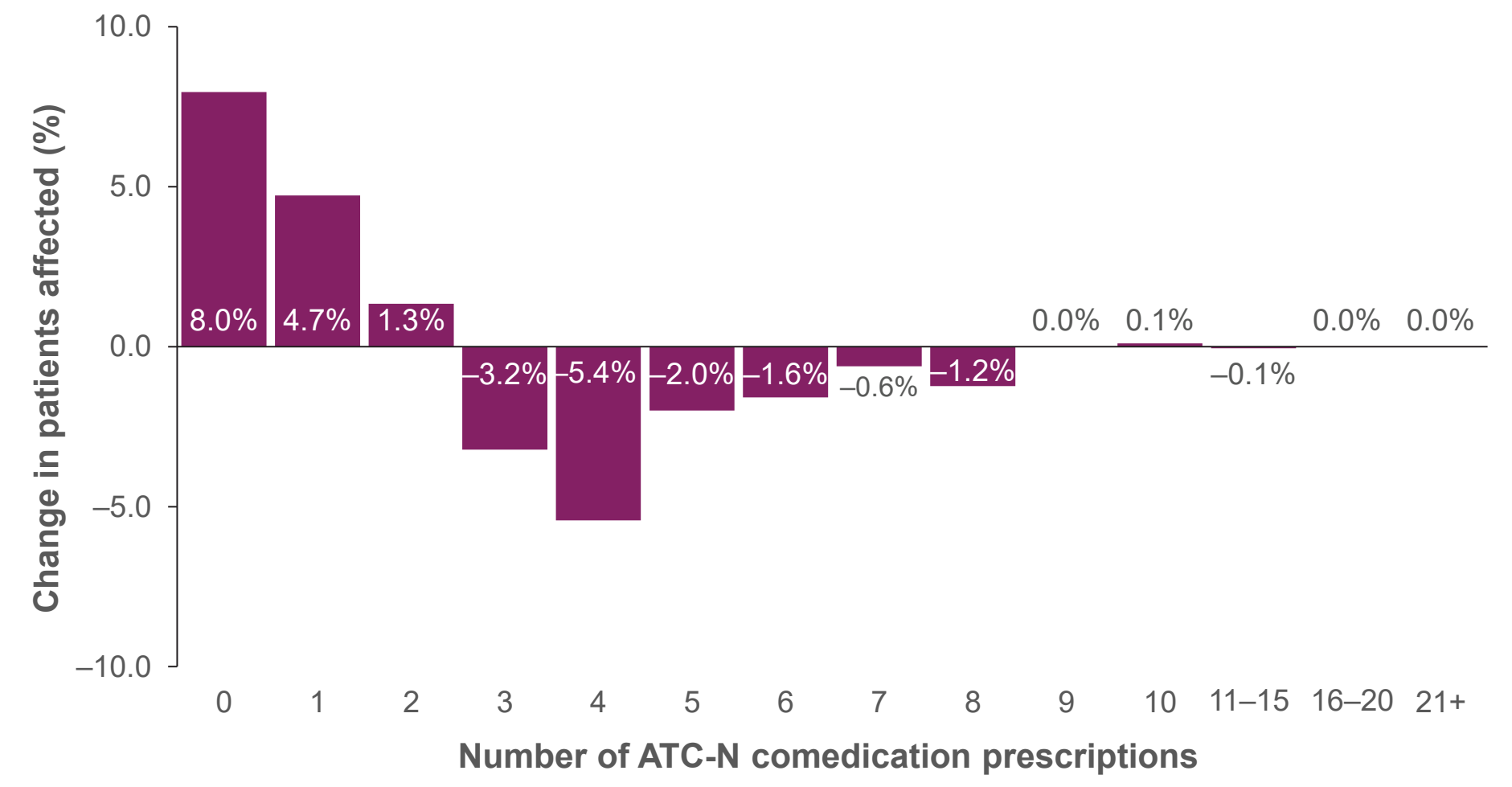
Other comedication prescriptions

- Data for other comedication prescriptions, including neuroleptics, antidepressants, attention deficit hyperactivity disorder (ADHD) medications, and sleep-promoting medications, are available in the **supplementary material** by scanning the poster QR code (**Figures S1–8**)
 - Small absolute decreases were observed in the proportions of patients with ≥1 neuroleptic prescription (–2.4 percentage points; Cohen’s *h*<0.2) and ≥1 antidepressant prescription (–1.9 percentage points; Cohen’s *h*<0.2) from the first to the last CBD prescription (**Figures S1–S4**)
 - ADHD medications demonstrated no changes in comedication prescriptions (**Figures S5 and S6**)
 - The proportion of patients with ≥1 sleep-promoting prescription decreased by 2.1 percentage points from first to last CBD prescription (5.6% to 3.4%; Cohen’s *h*=0.1), representing a negligible-magnitude difference (**Figures S7 and S8**)

	Patients (N=1945)	Prescriptions (n=72,423) ^a	Prescriptions per patient ^a
Number of CBD prescriptions, n (%)			
1–2	341 (17.5)	—	—
≥3	1604 (82.5)	—	—
Prescriber specialty^c, n (%)			
GPs ^d	446 (22.9)	5635 (7.8)	12.6
Paediatricians	427 (22.0)	11,740 (16.2)	27.5
Outpatient clinics	837 (43.0)	16,861 (23.3)	20.1
Neurologists	1212 (62.3)	37,423 (51.7)	30.9
Other	107 (5.5)	766 (1.1)	7.2
Prescriptions from >1 source, n (%)	1083 (55.7)	—	—

- Most CBD prescriptions (91.2%) were issued by paediatricians, neurologists, or outpatient clinics
- More than half of patients (55.7%) received prescriptions from >1 source

Figure 3. Changes in ATC-N comedication from first-to-last CBD prescription^a

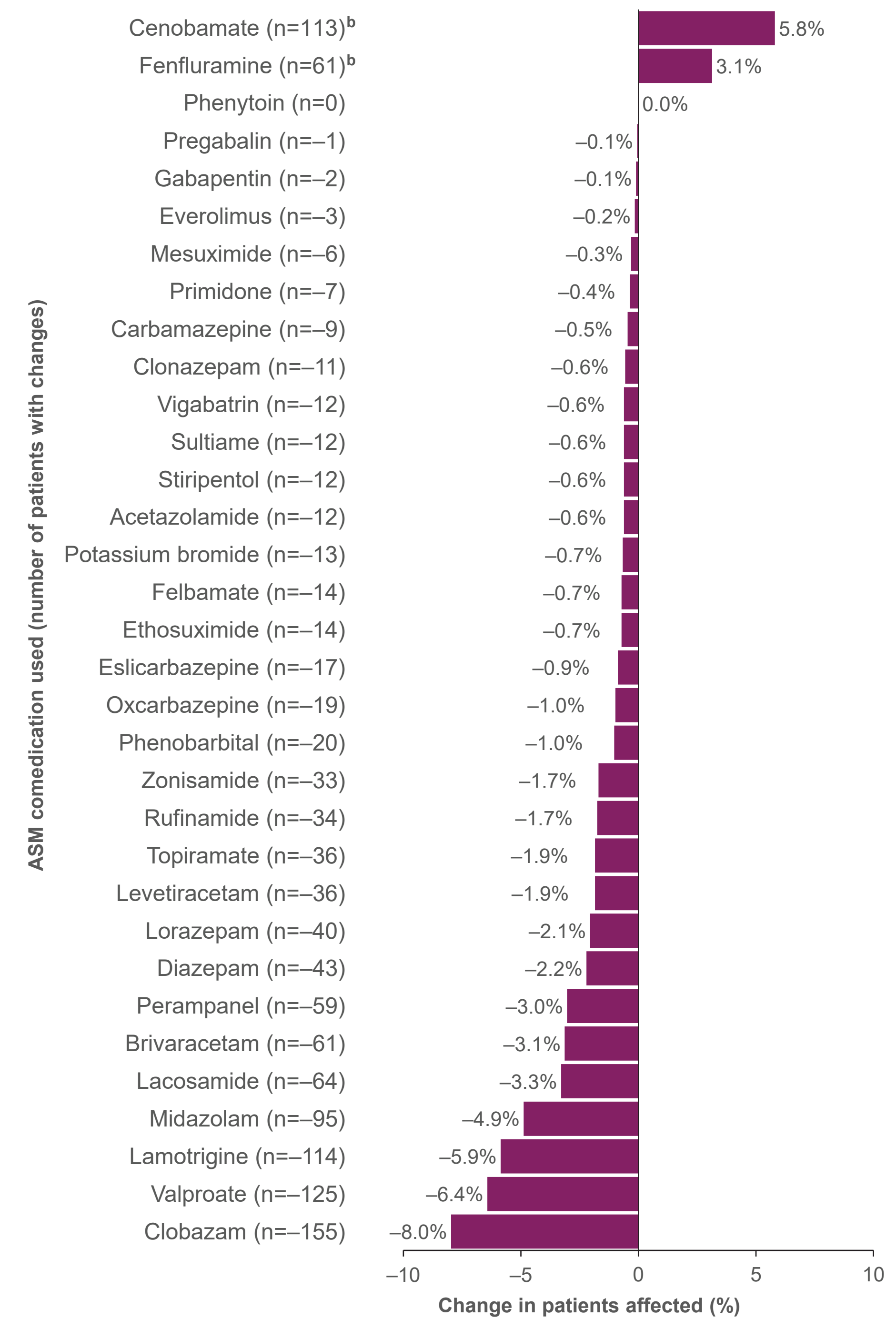


^aThe first and last assessments included comedication prescriptions recorded within 0–91 days after the first and last recorded CBD prescriptions, respectively. ATC-N, neurological treatments; CBD, cannabidiol.

- The proportion (95% CI) of patients with ≥3 ATC-N prescriptions from first-to-last CBD prescription decreased from 67.9% (65.8, 70.0) to 53.8% (51.6, 56.0; Cohen’s *h*=0.29; **Figure 3**)
 - The absolute difference was –14.1 percentage points. The difference in proportions was small to moderate in magnitude and may suggest a modest change in prescribing patterns between the first and last recorded CBD prescriptions

Specific ASM comedication drug changes

Figure 6. Changes in ASM comedication from first-to-last CBD prescription by drug^a



^aThe first and last assessments included comedication prescriptions recorded within 0–91 days after the first and last recorded CBD prescriptions, respectively. ^bFenfluramine and cenobamate are recently approved medications, approved in Europe in 2020 and 2021, respectively. ^cASM, antiseizure medication; CBD, cannabidiol.

- Prescriptions for nearly all ASMs demonstrated numerical reductions between the first and last CBD prescription (**Figure 6**)
 - The most prominent reductions in the proportion of patients with ASM comedication prescriptions were observed in clobazam (–8.0%), valproate (–6.4%), and lamotrigine (–5.9%)
 - Only cenobamate and fenfluramine demonstrated increases in the proportion of patients with prescriptions, with increases of 5.8% and 3.1%, respectively

Strengths and Limitations

- This was a real-world study providing insights into clinical practice beyond trials, using a large national prescription database with broad population coverage, and evaluation of multiple concomitant medication classes
- These are aggregated data and patient-level clinical information was unavailable, including indication/diagnosis, comorbidities, CBD dose and days’ supply/treatment coverage. Additionally, sex was inferred from patients’ first names and some data (eg, prescription counts) were not always whole numbers and required rounding
- Temporal changes in clinical prescribing practice, including adoption of newly approved therapies such as fenfluramine and cenobamate, may have contributed to the observed drug-specific changes
- This descriptive analysis did not have a comparator group or adjustment for confounding factors; data should be interpreted accordingly, accounting for other factors that may have played a role in the observed prescribing changes

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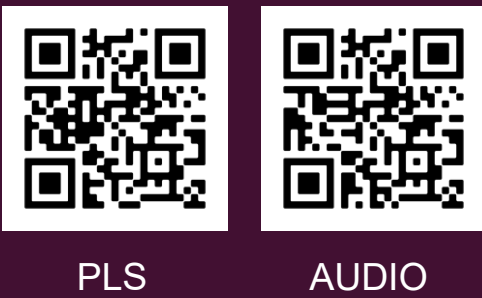
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Support and Acknowledgements: This study was sponsored by Jazz Pharmaceuticals, Inc. The authors would like to thank all of the study staff for their participation in this research. Writing and editorial assistance were provided to the authors by David Griffiths, PhD, on behalf of Syneos Health, UK, and funded by Jazz Pharmaceuticals, Inc., in accordance with Good Publication Practice (GPP) 2022 guidelines.

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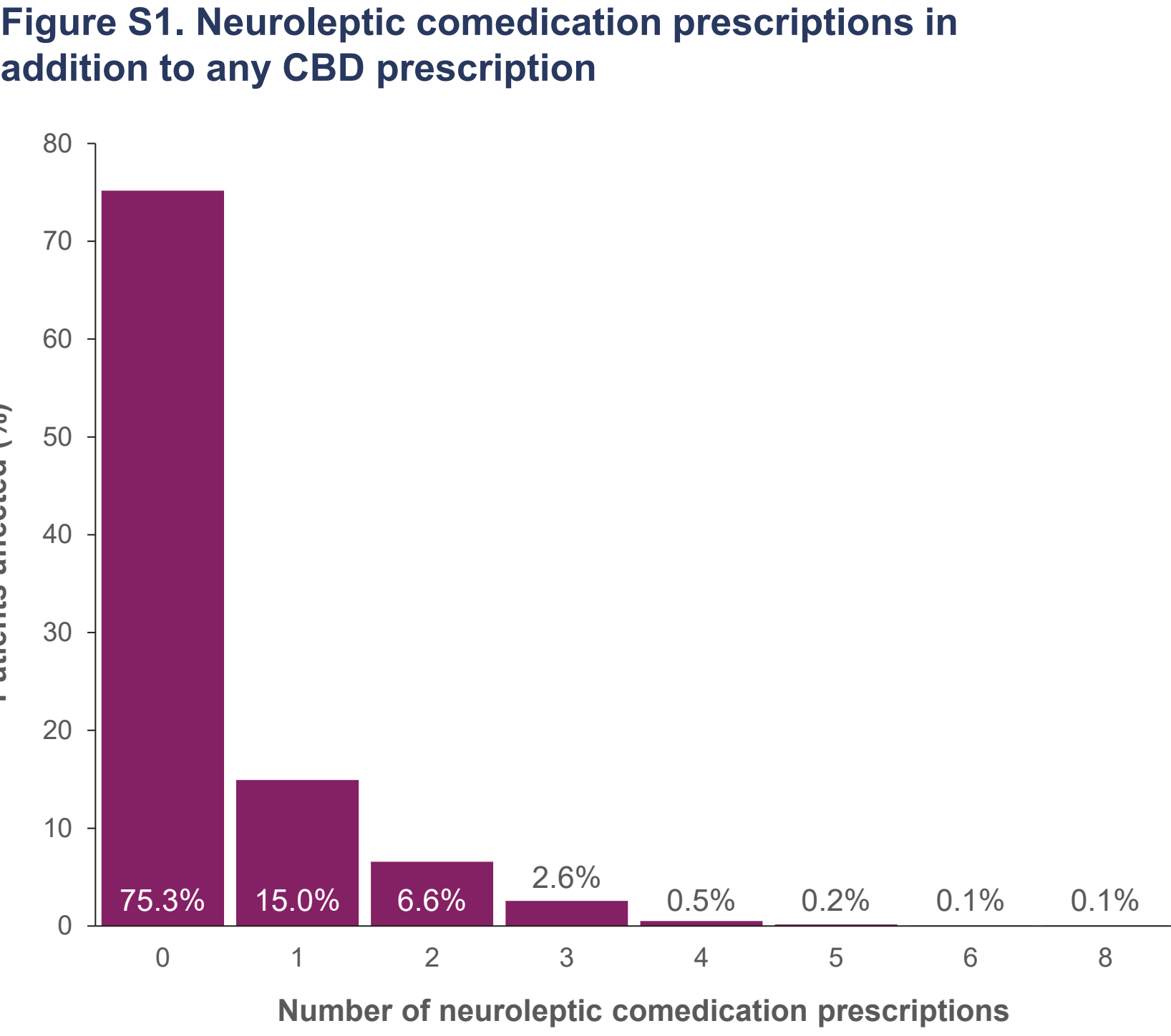


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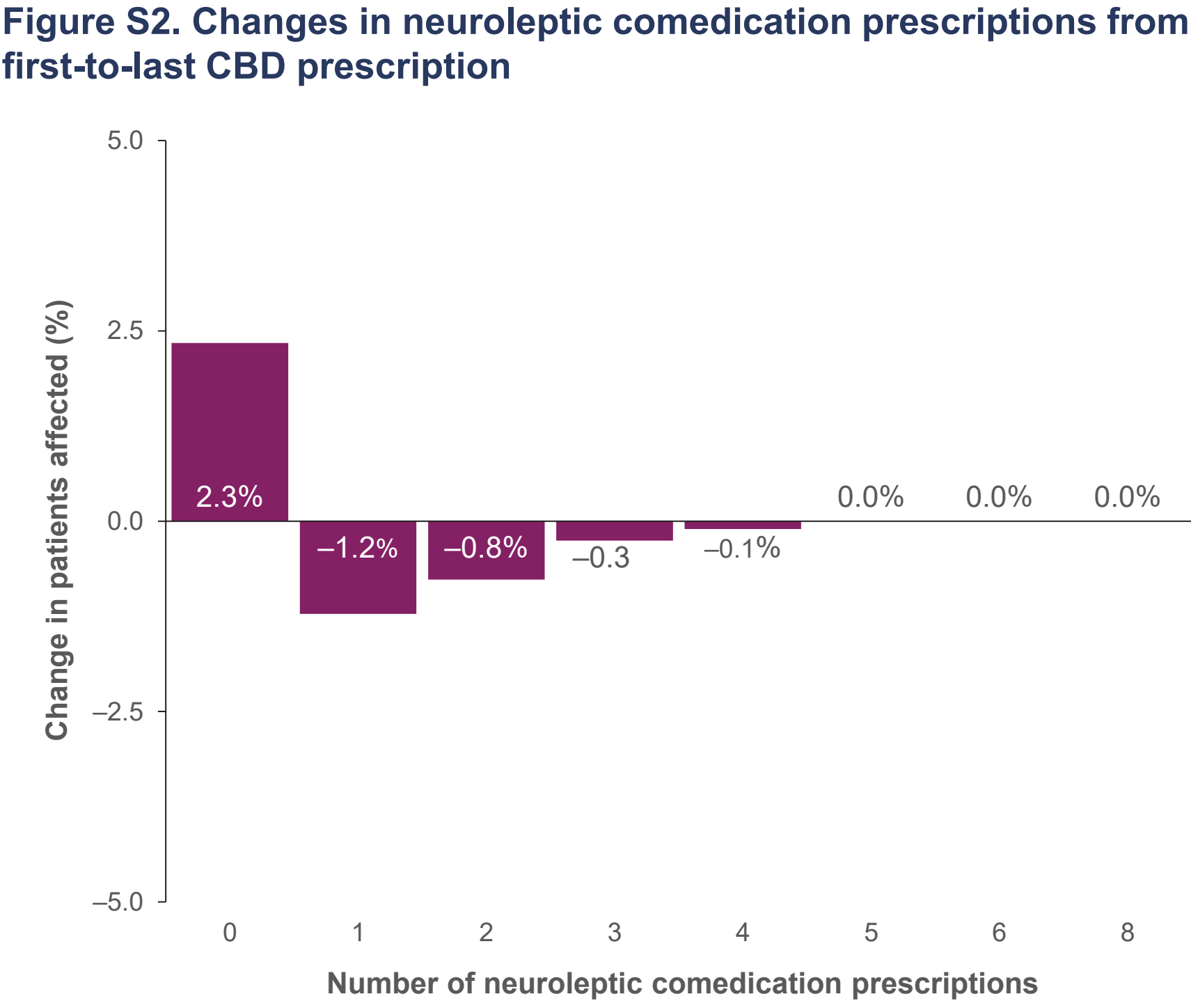
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Supplementary Material

Neuroleptic comedication prescriptions

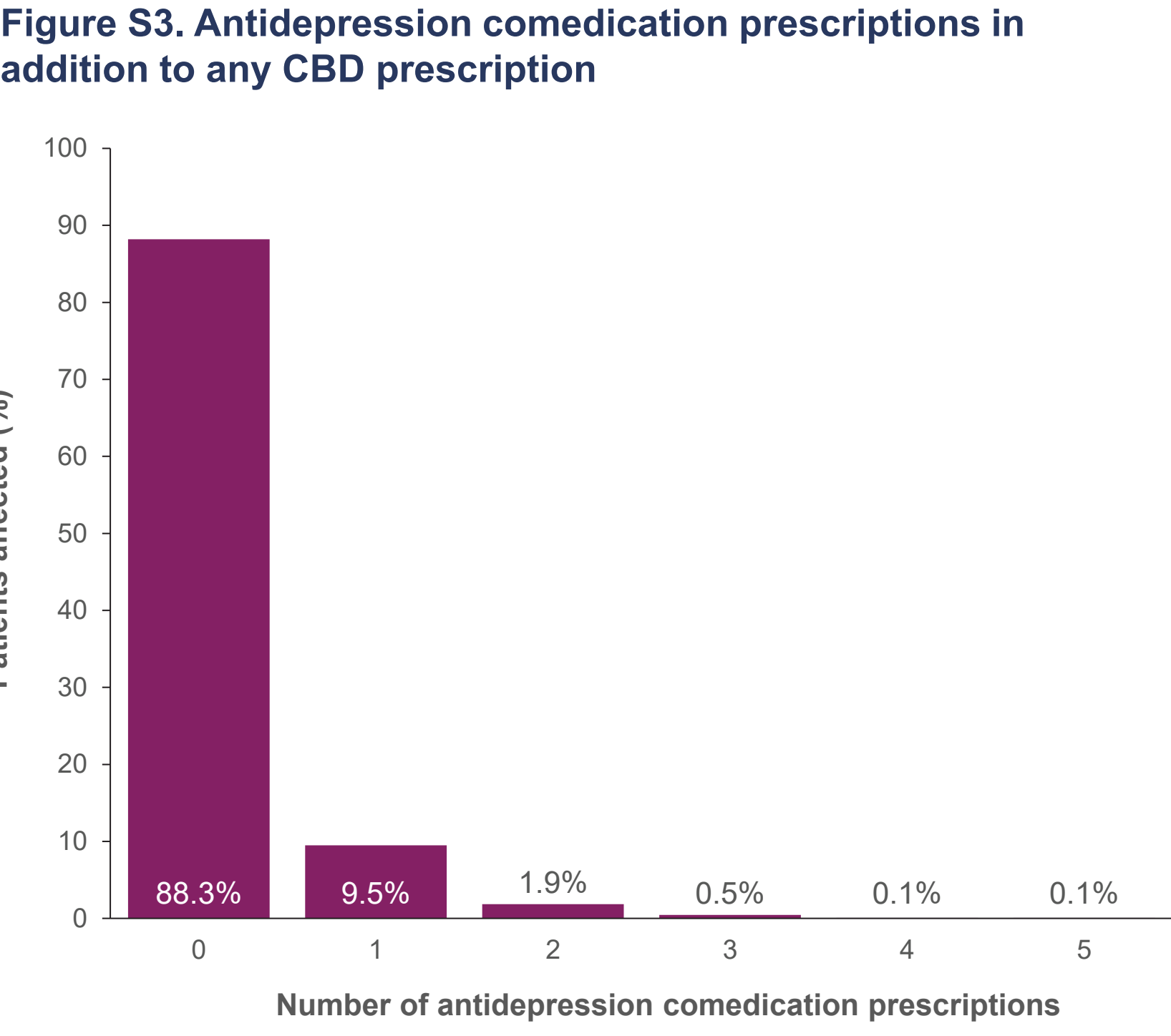


- Patients had up to eight neuroleptic comedication prescriptions in the 91-day interval surrounding any cannabidiol (CBD) prescription (**Figure S1**)
- Most (75.3% [95% CI: 73.4, 77.2]) had none or were prescribed with a single neuroleptic agent (15.0% [95% CI: 13.4, 16.5])

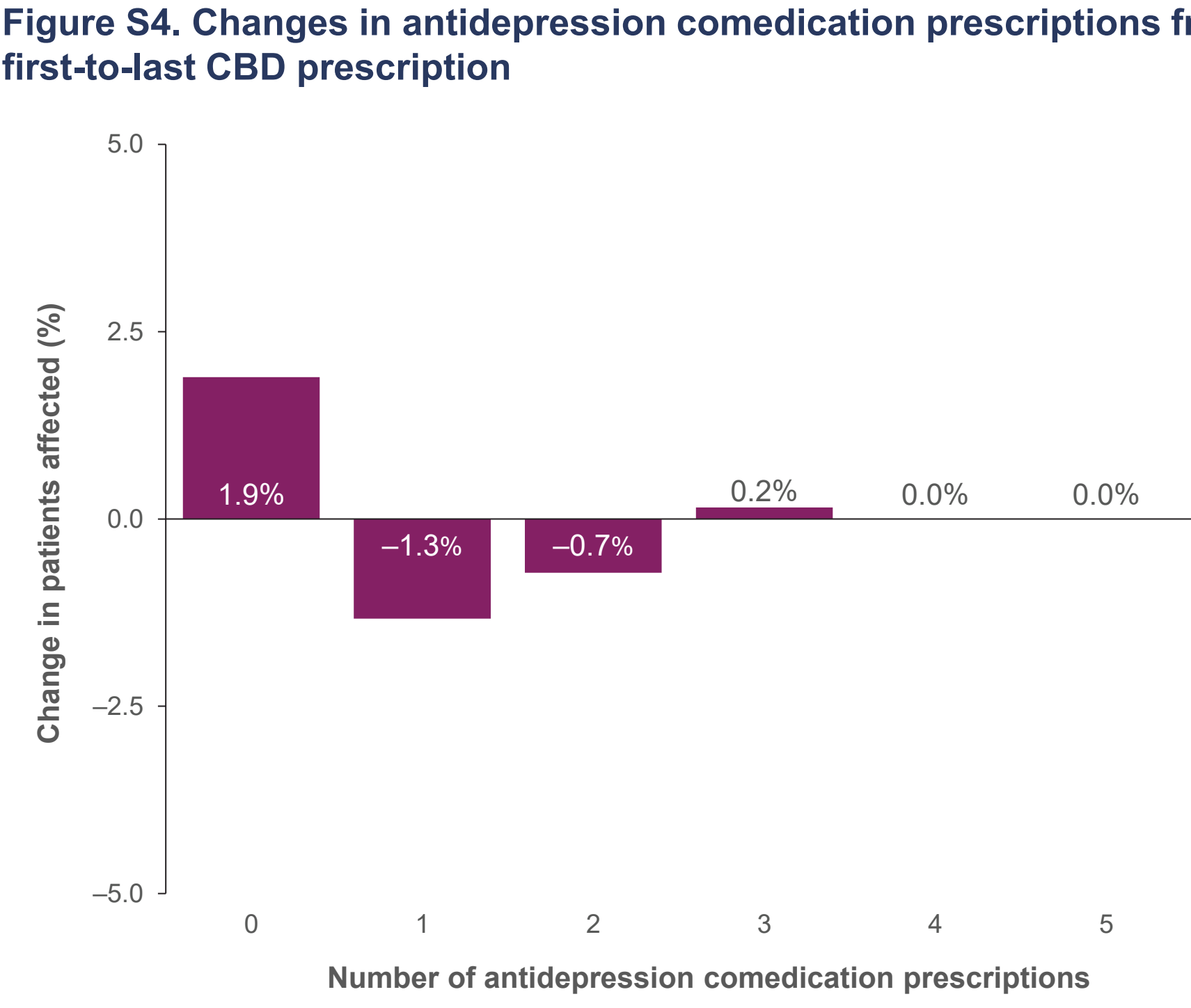


- Figure S2** shows changes according to the number of neuroleptic prescriptions. Across patients with ≥1 prescription, the proportion (95% CI) decreased from 17.7% (16.0, 19.4) after the first CBD prescription to 15.4% (13.8, 17.0) after the last CBD prescription (Cohen's *h*<0.2)
 - The absolute decrease was 2.3 percentage points, and the difference in proportions was negligible in magnitude

Antidepressant comedication prescriptions

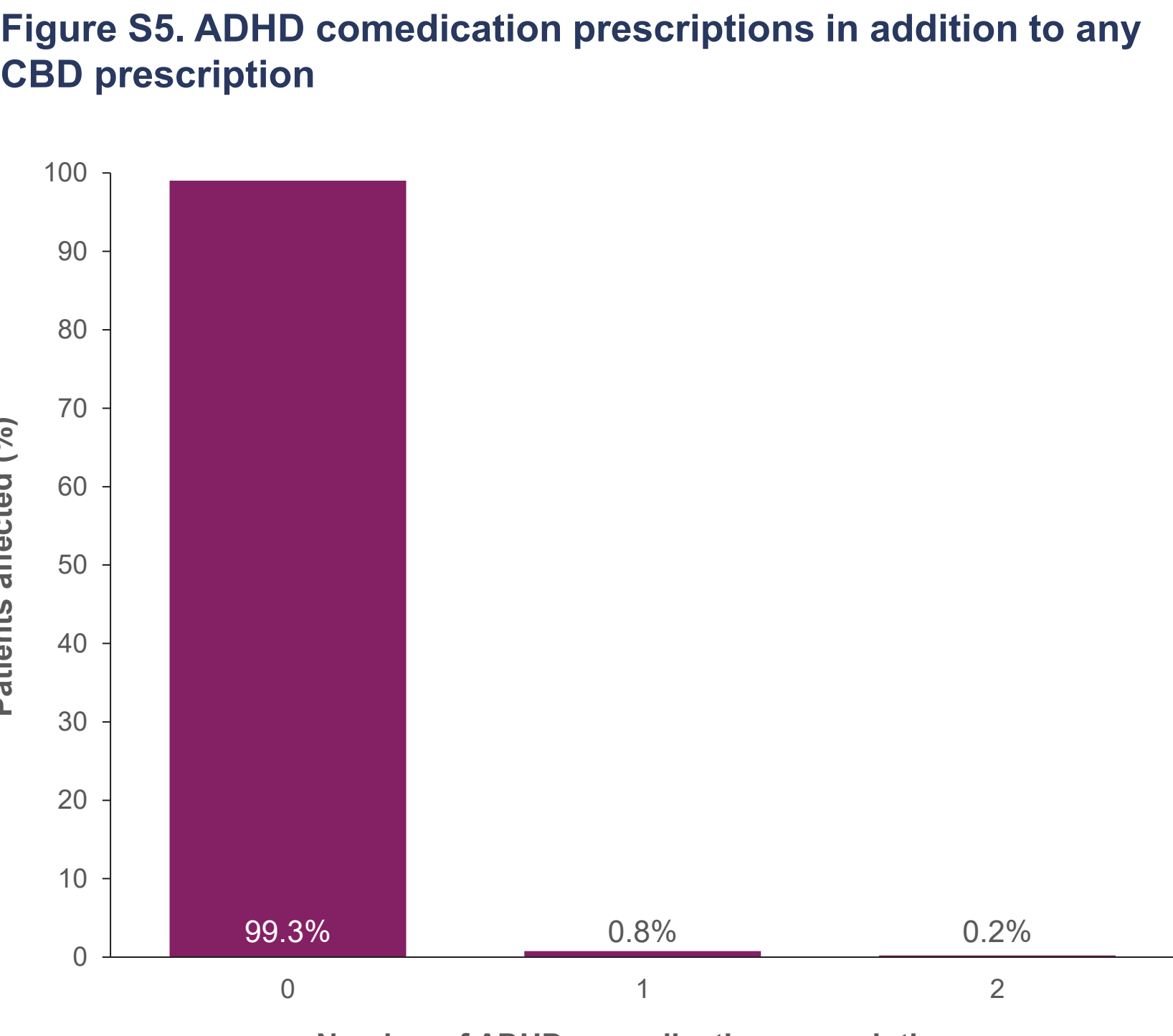


- Patients had up to five antidepressant comedication prescriptions in the 91-day interval surrounding any CBD prescription (**Figure S3**)
- Most (88.3% [95% CI: 86.8, 89.7]) had none or were prescribed with a single antidepressant agent (9.5% [95% CI: 8.2, 10.8])

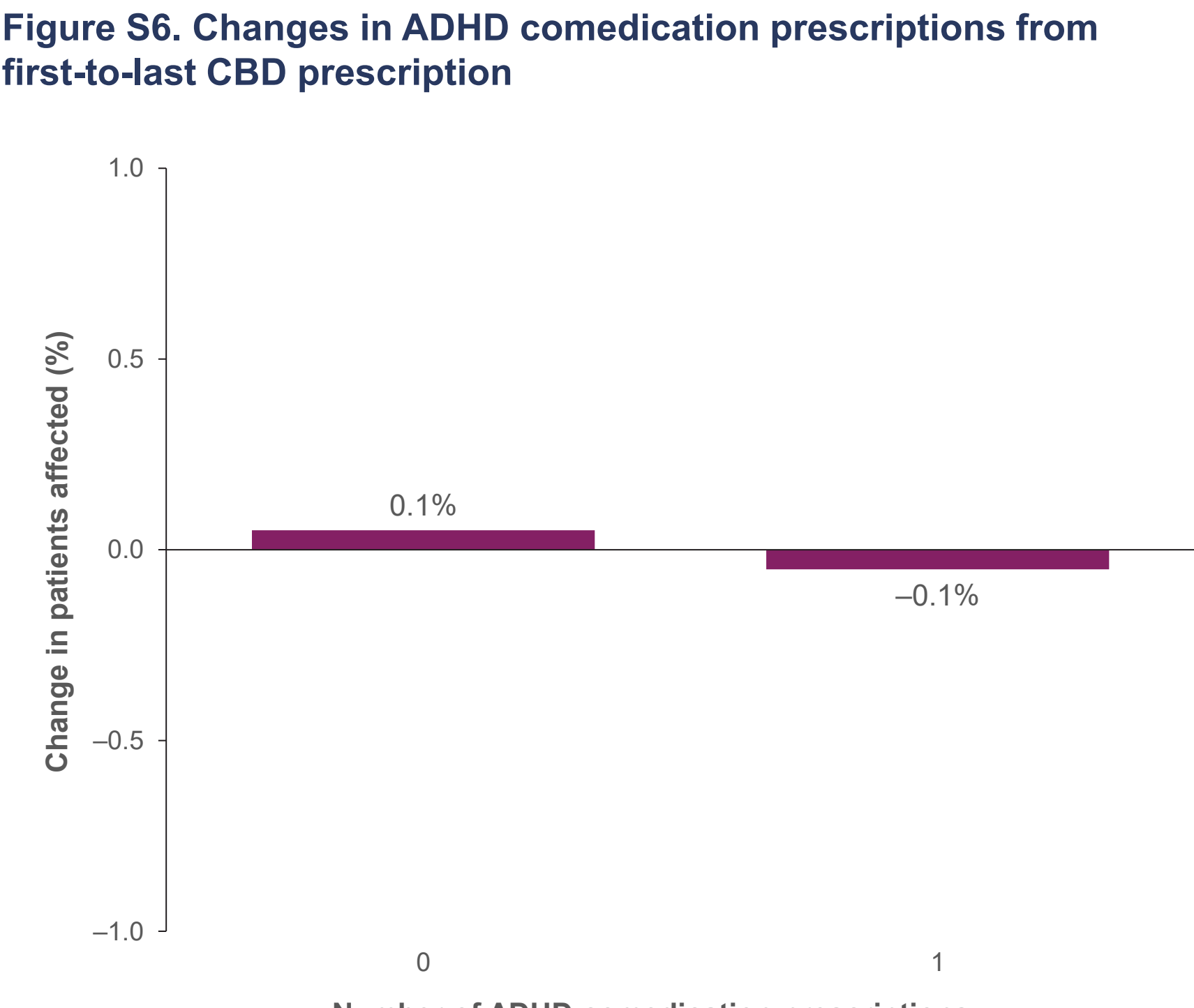


- Figure S4** shows changes according to the number of antidepressant prescriptions. Across patients with ≥1 prescription, the proportion (95% CI) decreased from 7.9% (6.7, 9.1) after the first CBD prescription to 6.0% (4.9, 7.0) after the last CBD prescription (Cohen's *h*<0.2)
 - The absolute decrease was 1.9 percentage points, and the difference in proportions was negligible in magnitude.

ADHD comedication prescriptions

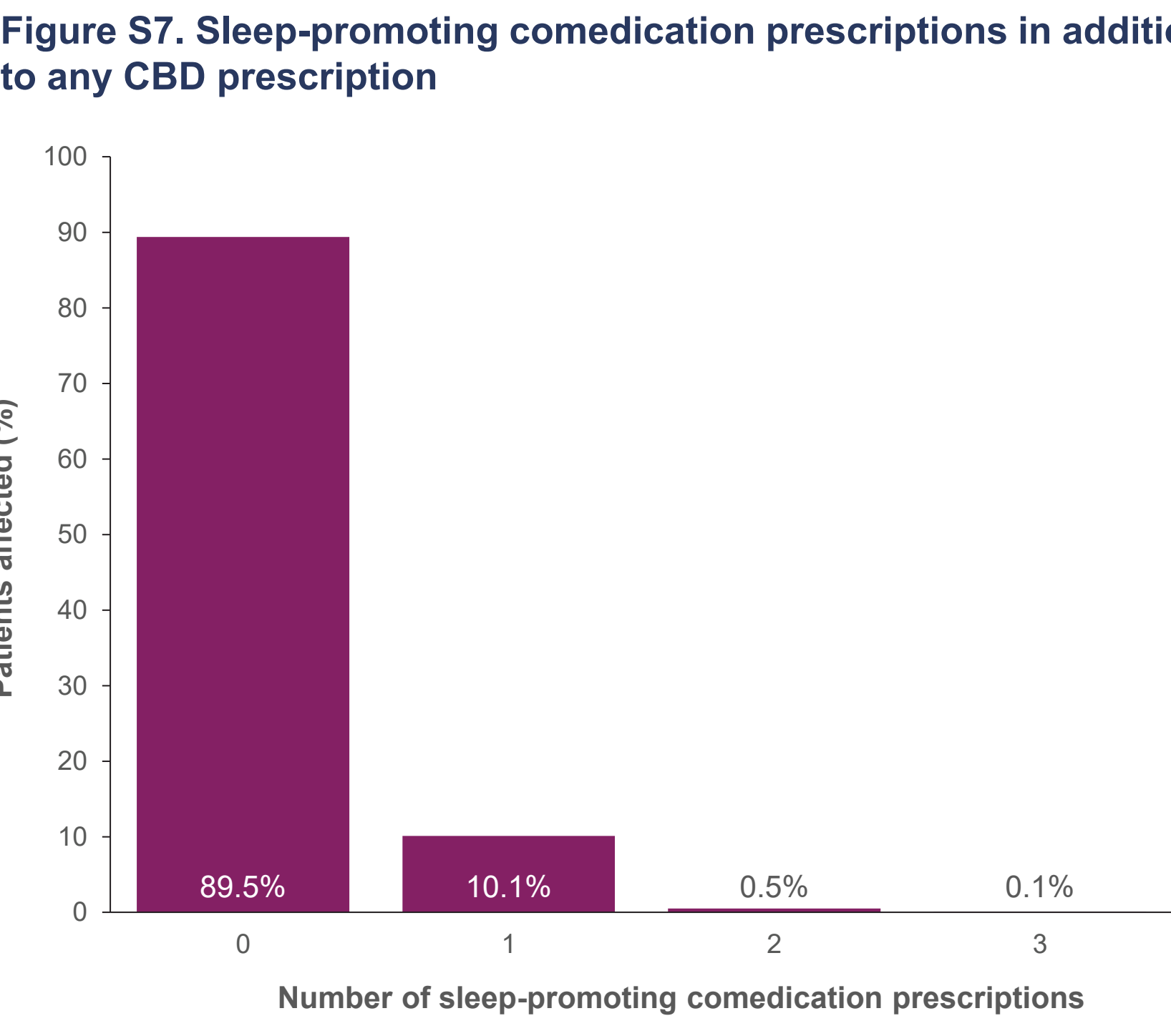


- Almost all (99.3% [95% CI: 98.9, 99.7]) had no ADHD comedication prescriptions (**Figure S5**)
- Patients had up to two ADHD comedication prescriptions in the 91-day interval surrounding any CBD prescription

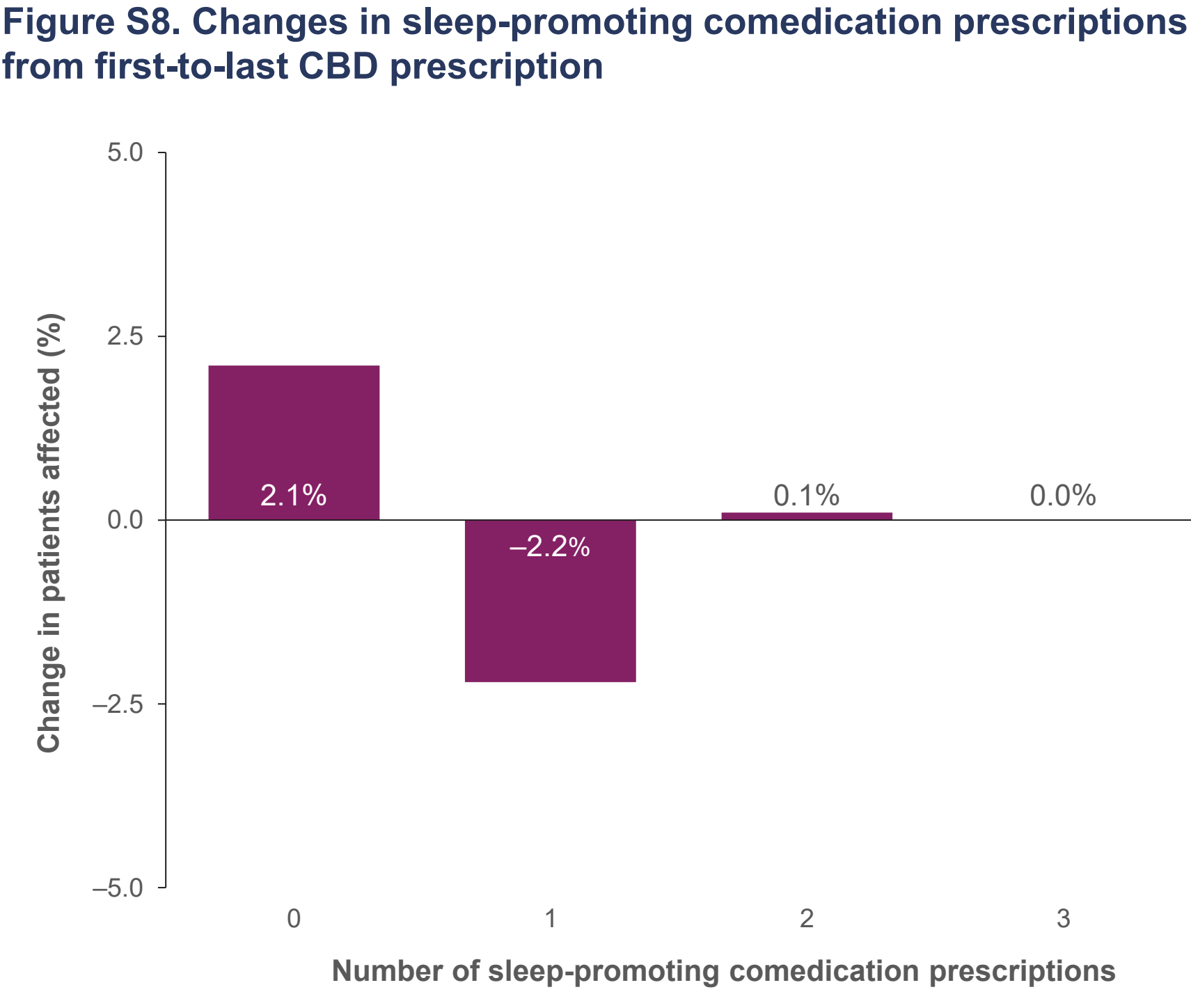


- The proportion of patients with ≥1 ADHD prescription was 0.8% (95% CI: 0.4, 1.2) after both the first and last CBD prescriptions (Cohen's *h*<0.2; **Figure S6**)
 - The difference in proportions was negligible in magnitude

Sleep-promoting comedication prescriptions



- Patients had up to three sleep-promoting comedication prescriptions in the 91-day interval surrounding any CBD prescription (**Figure S7**)
- Only 10.7% (95% CI: 9.3, 12.1) of patients had ≥1 sleep-promoting comedication prescription at any point during CBD treatment



- Figure S8** shows changes according to the number of sleep-promoting prescriptions. Across patients with ≥1 prescription, the proportion (95% CI) decreased from 5.6% (5.0, 6.6) after the first CBD prescription to 3.4% (3.0, 4.3) after the last CBD prescription (Cohen's *h*<0.2)
 - The absolute decrease was 2.2 percentage points, and the difference in proportions was negligible in magnitude

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What are Lennox-Gastaut syndrome (LGS), Dravet syndrome (DS), and tuberous sclerosis complex (TSC)?

- LGS is a serious brain disorder that **causes seizures** and problems with how a child grows and learns^{1,2}
 - Despite people with LGS taking medicine, **many still experience frequent seizures**^{1,3}
- DS is a rare disease caused by genetic mutations that results in **seizures and seizure-associated** problems with how a child grows and learns^{4,5}
 - Seizures are lifelong, tend to worsen over time, and are **often treatment resistant**, resulting in a reduced quality of life^{4,5}
- TSC is a rare disease that occurs when a specific gene mutation causes noncancerous tumours to grow in multiple organs throughout the body^{6,7}
 - Growths can occur in the brain, with **about 85%** of people with TSC **experiencing epilepsy**⁷

What is cannabidiol (CBD)?

- A plant-derived, highly purified pharmaceutical formulation of **CBD (Epidyolex® [EU]/Epidiolex® [US])**⁸ approved for the treatment of **seizures associated with LGS, DS, and TSC**^{8,9}
- Seizures associated with LGS, DS, and TSC are difficult to treat, and many patients require treatment with multiple medicines, including the use of multiple antiseizure medications (ASMs) such as CBD^{1,3,10}

Why was this study done?

- Adults with LGS, DS, and TSC may need lifelong treatment for seizures and other conditions, and often take several medicines
- This study used a medical database to examine how the use of other medicines changed over time in adults prescribed CBD
- Because diagnoses were not recorded, CBD may have been prescribed for LGS, DS, TSC, other types of epilepsy or seizures, or other conditions

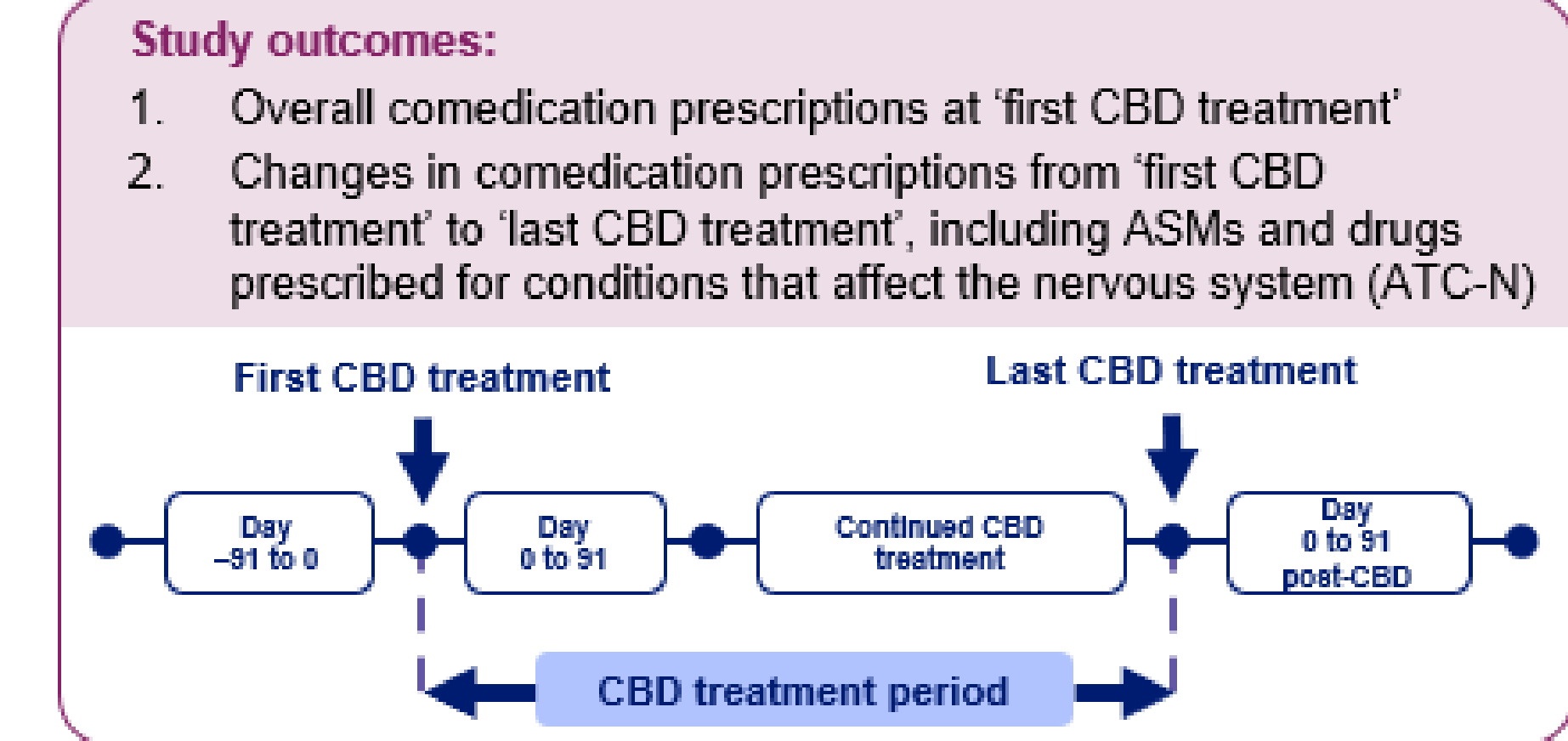
How was the study done?



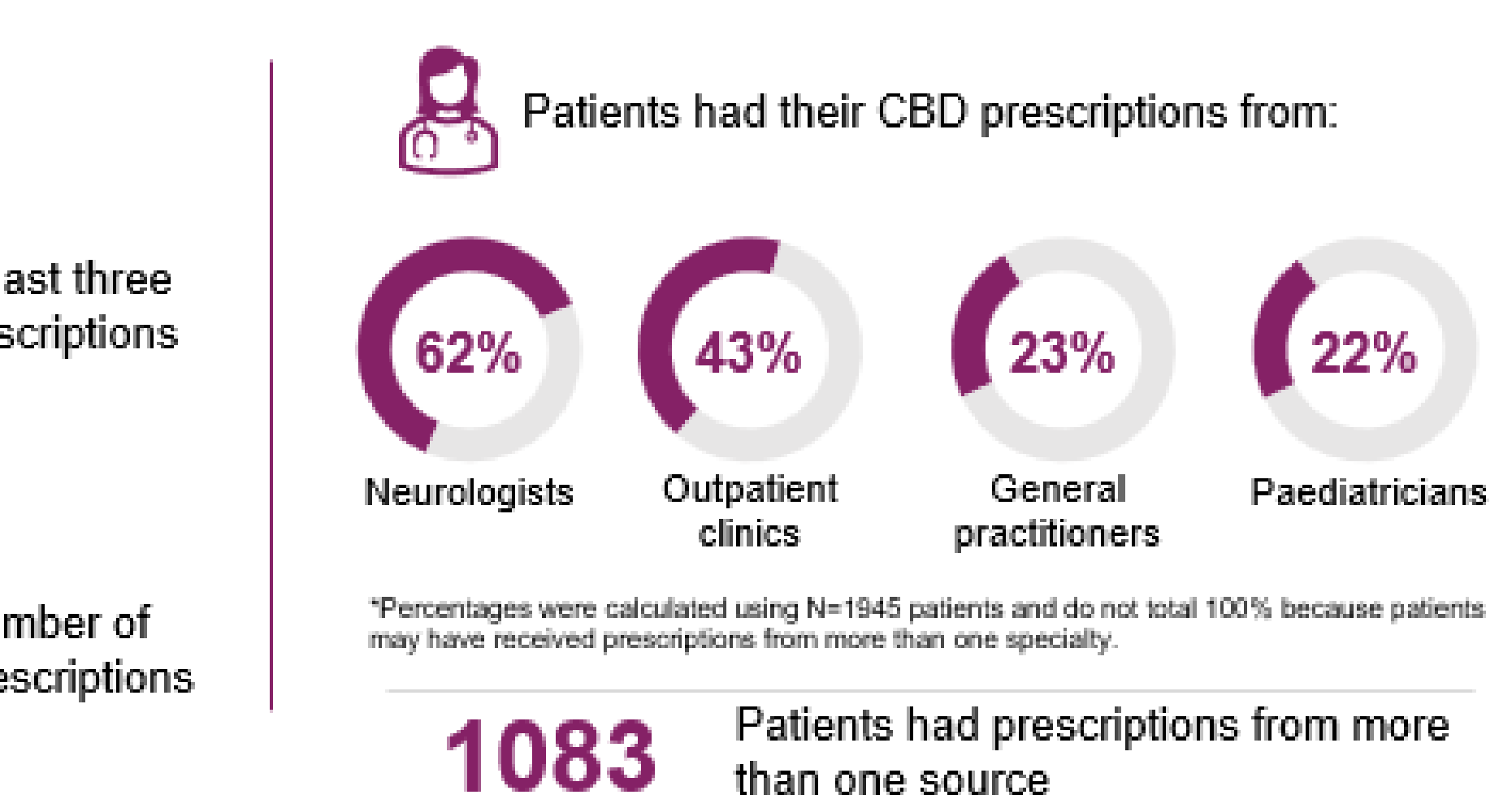
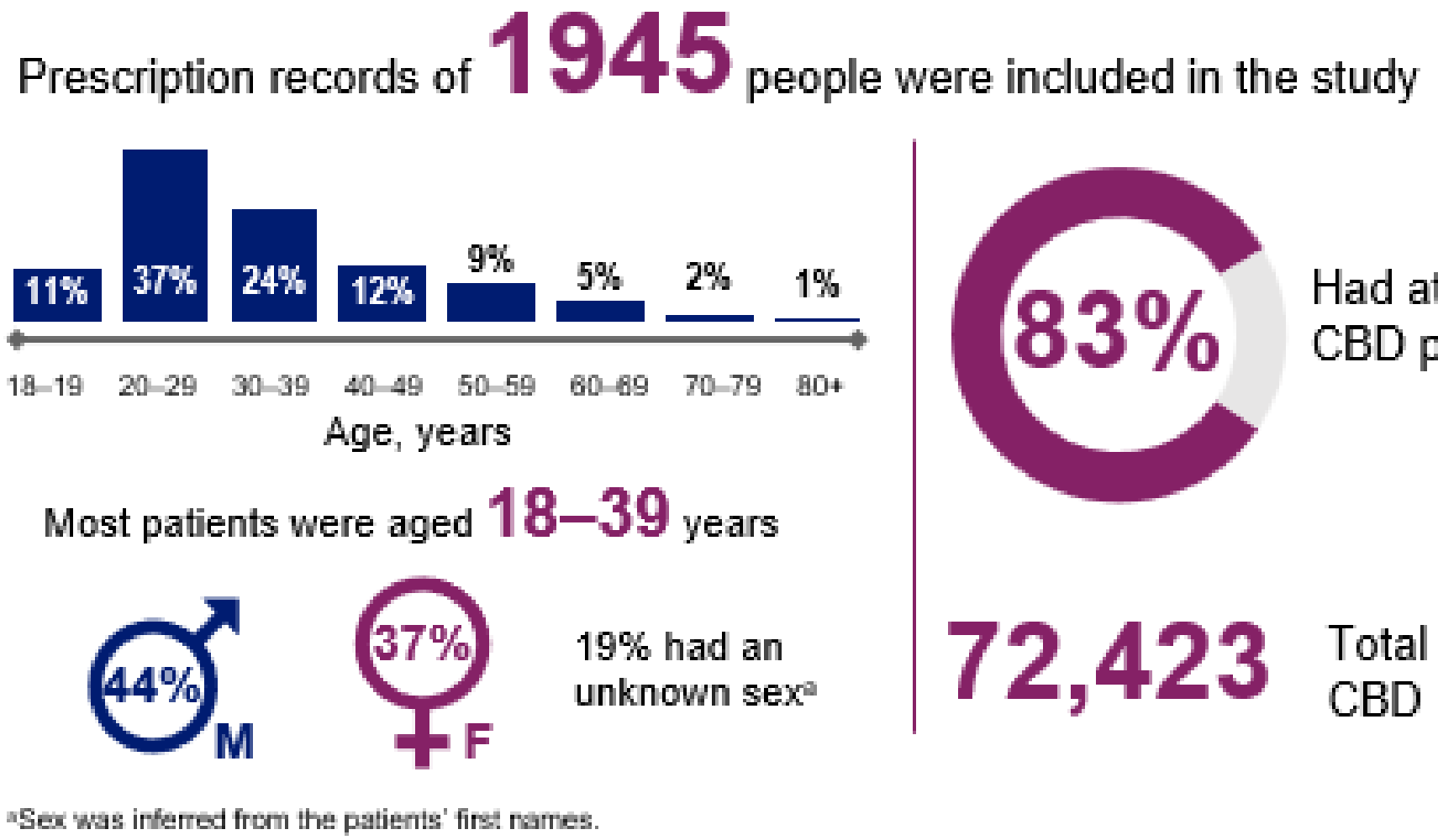
The study included people from the **German Insight Health prescription database**

The **German Insight Health prescription database** contains prescription drug claims data for approximately 64 million people with public and private prescription drug insurance, sourced from pharmacies in Germany

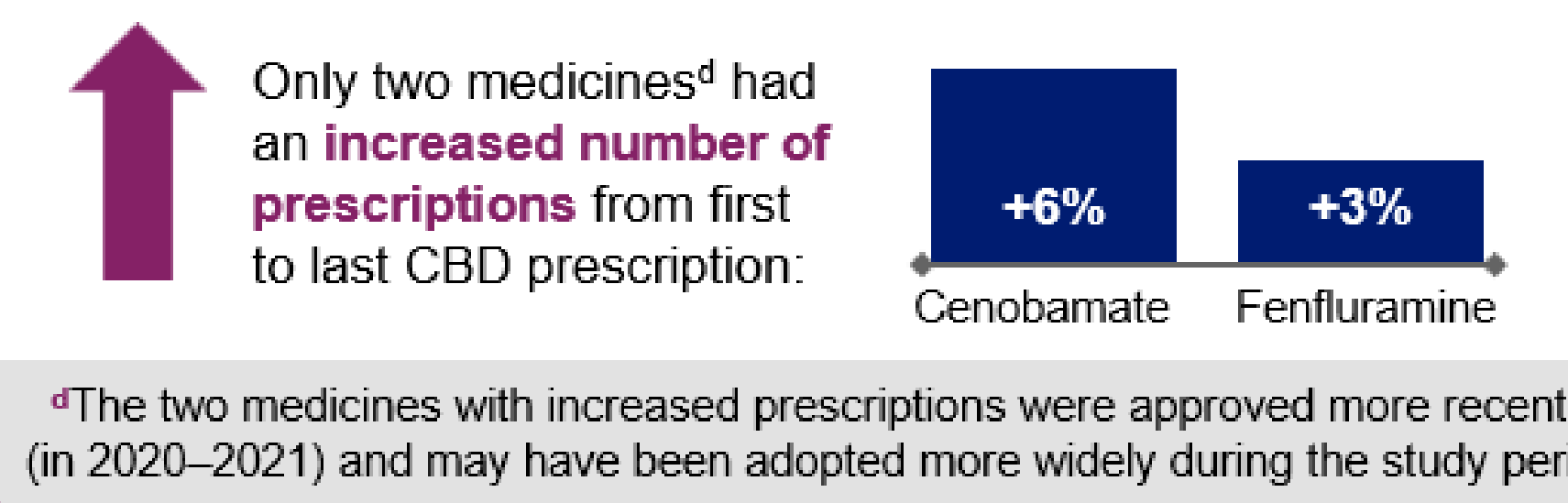
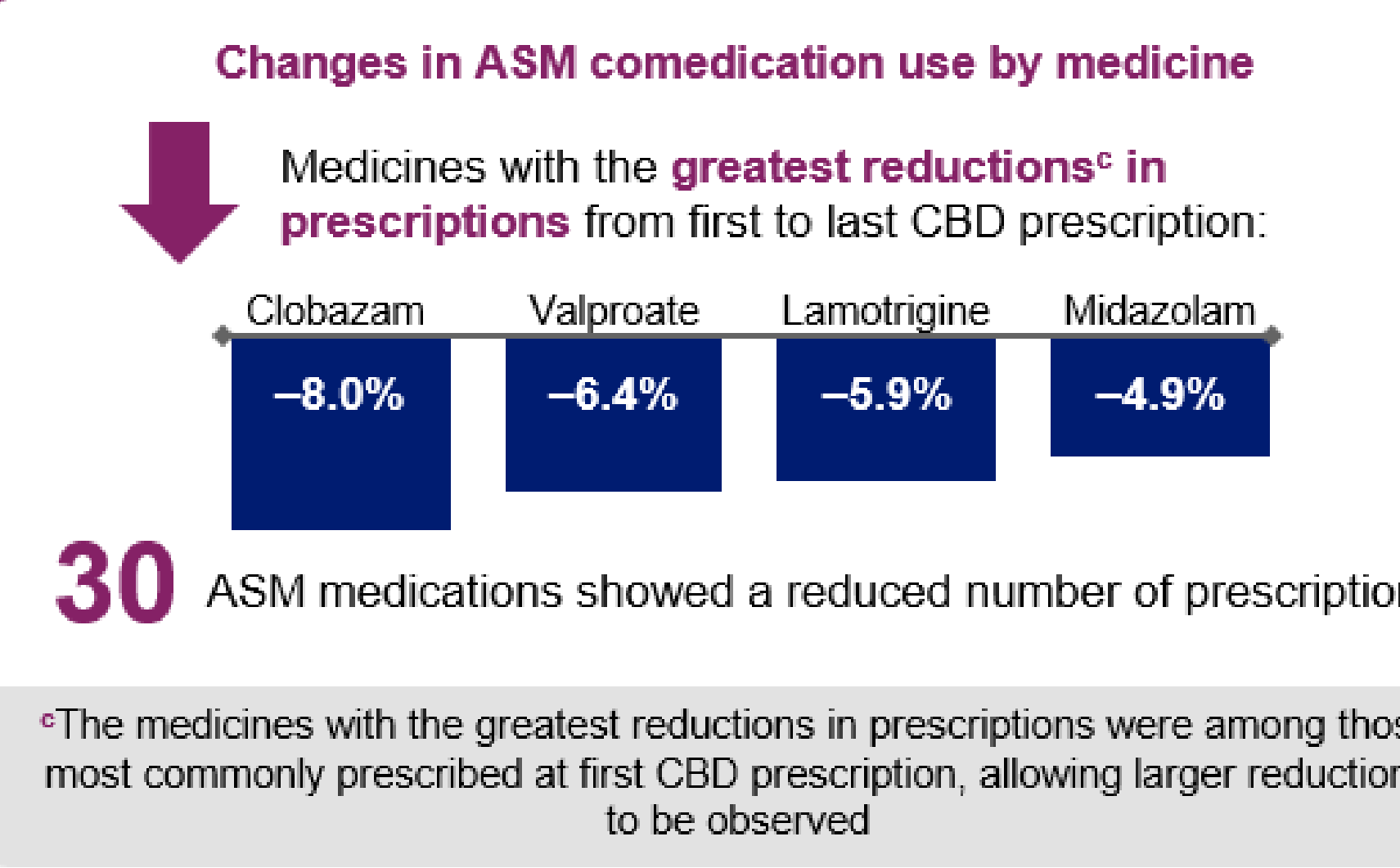
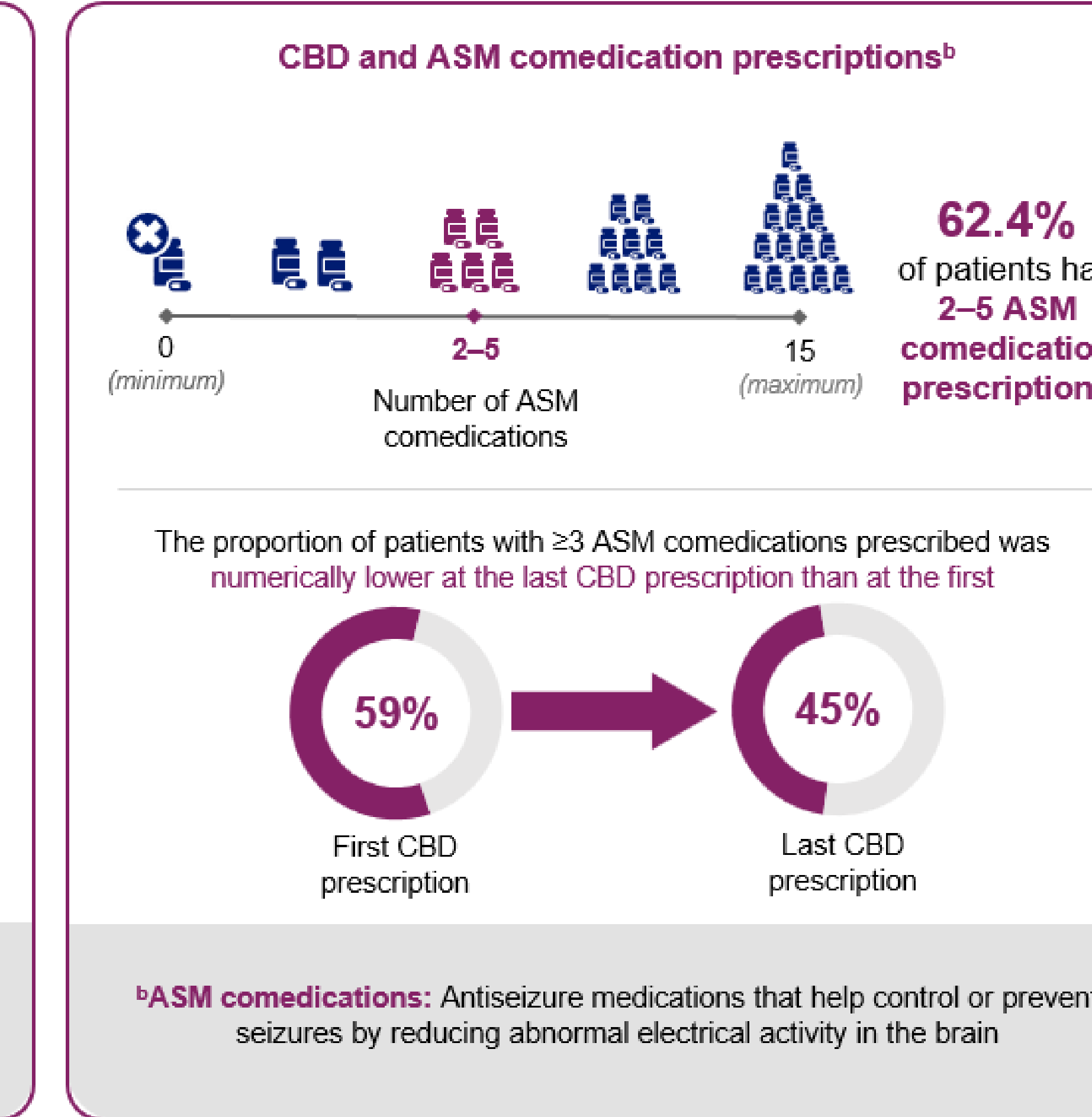
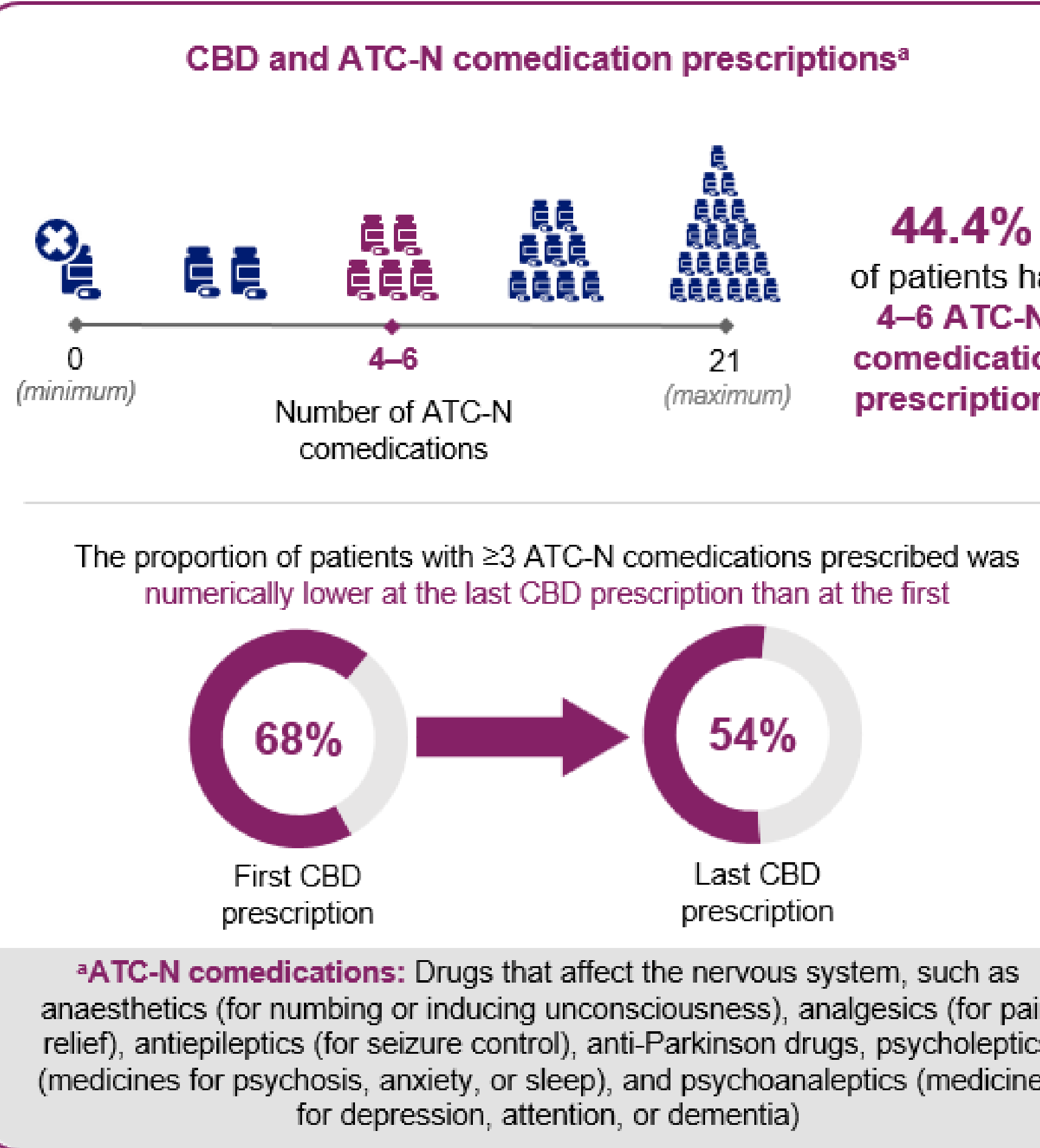
- Only people who met certain criteria were included:
- Had a prescription for CBD from **January 2021 to October 2025**
 - Aged **≥18 years**
 - Had **prescription drug insurance** at least 91 days before their first CBD prescription



What were the key features of people who were included in the study?



What are the key findings from the study?



- Other comedication prescriptions**
- From first to last CBD prescription:
- Small reductions were observed in prescriptions for neuroleptics (medicines for psychosis or severe behavioural problems), antidepressants, and sleep-promoting medications
 - No changes were observed in prescriptions for attention deficit hyperactivity disorder (ADHD) medications

- What were the strengths and limitations of the study?**
- The real-world data provided insights into clinical practice outside of clinical trials and included a large number of patients over a 5-year time period
 - The analysis was based on real-world data and did not adjust the data to account for unknown variables
 - The study inferred sex from a patient's first name and had no data on CBD dosing or treatment coverage

What do these results mean?

- These results may suggest that adults who were prescribed CBD were prescribed fewer neurological and antiseizure medications over time than when they started CBD treatment
- Therefore, CBD may have the potential to help reduce the burden associated with taking multiple medicines, which is common in people with severe epilepsies such as LGS
- Because this was an observational study using prescription data, the results show changes in prescribing patterns but do not prove that CBD directly caused these changes

⁸Epidyolex® is approved in the EU for the adjunctive treatment of seizures associated with Lennox-Gastaut syndrome or Dravet syndrome, in conjunction with clobazam, in patients ≥2 years of age; it is additionally approved in the EU for the adjunctive treatment of seizures associated with tuberous sclerosis complex in patients ≥2 years of age.
⁹Epidiolex® is approved in the US for the treatment of seizures associated with Lennox-Gastaut syndrome, Dravet syndrome, or tuberous sclerosis complex in patients ≥1 year of age.

Support : This study was funded by Jazz Pharmaceuticals, Inc.

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