

Patterns of nitrous oxide use among samples of people who regularly use illicit stimulants in Australia

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The Difference is Research

Introduction

- ❖ Recreational nitrous oxide use is of increasing concern in Australia, with rising reports of neurologic, psychiatric and acute harms (1);
- ❖ In response to these harms, the Therapeutic Goods Administration (TGA) classified non-therapeutic nitrous oxide as a Schedule 6 poison, mandating warnings on product labels about permanent nerve damage (2);
- ❖ Many jurisdictions have introduced a range of supplementary regulatory measures including bans on sales to minors, out-of-sight storage requirements and restricted sales hours (1).

Aim

This research aims to examine:

- ❖ The per cent of EDRS participants who reported using nitrous oxide in the six months preceding interview, since the commencement of monitoring (2003-2026);
- ❖ Forms of nitrous oxide used in the six months preceding interview (small bulbs and/or bottle/cylinder/tanks $\leq 1000\text{g}$ and/or $>1000\text{g}$);
- ❖ Location and time of purchase, and reported difficulties accessing products; and
- ❖ Associated harms experienced in relation to use of nitrous oxide and treatment.

Methods

- ❖ The EDRS comprises annual surveys of people who regularly use ecstasy and other illicit stimulants, recruited from all capital cities of Australia.
- ❖ Each year approximately 100 participants are recruited from each Australian capital city. In 2026, 698 participants were recruited during March-July, primarily through social media (e.g., Facebook and Instagram) and via word-of-mouth.
- ❖ To be eligible, participants were required to be ≥ 18 years of age, have lived in an Australian capital city for at least 10 of the 12 months preceding interview, and have used illicit stimulants on at least six days in the previous six months.

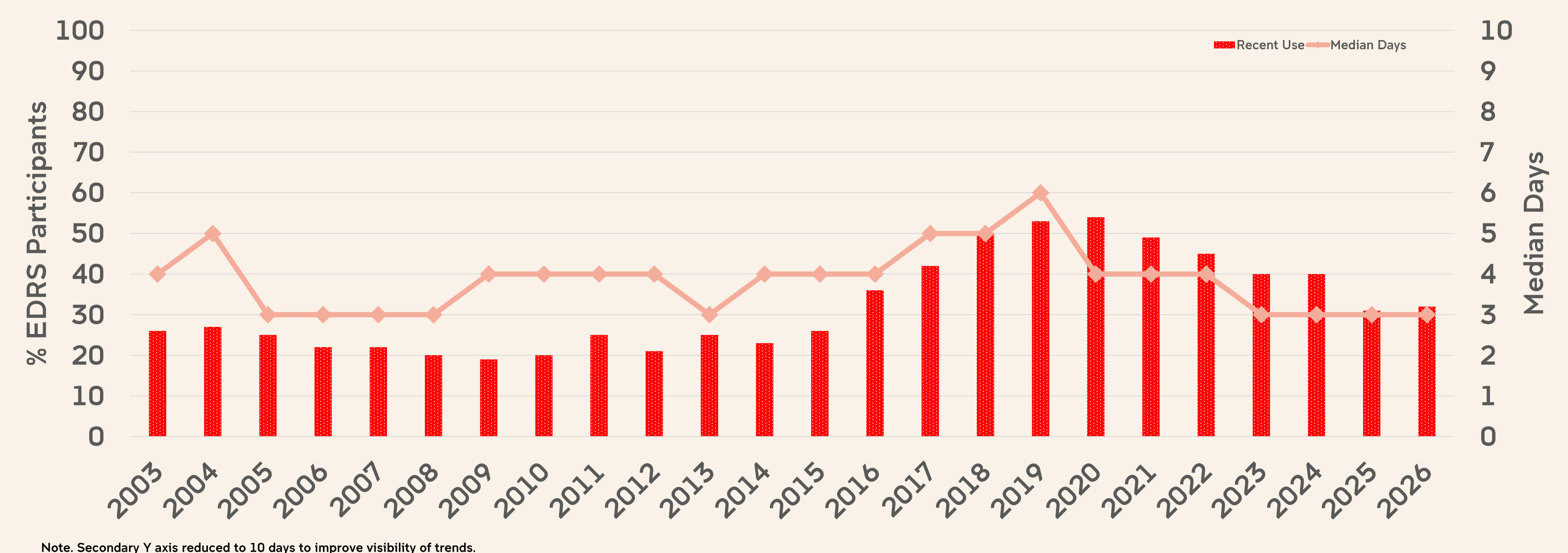
Implications

- ❖ Although nitrous oxide use has declined from its peak in 2020, the shift from small 8g bulbs to large cylinders raises concerns about higher levels of exposure and an increased neurotoxicity risk. Understanding whether this shift has led to greater harms is therefore essential.
- ❖ Targeted education and awareness campaigns are needed to communicate the risks associated with nitrous oxide use, particularly the potential for serious neurological harms to occur.
- ❖ Improved education may also support clinicians and people who use nitrous oxide to recognise early symptoms of toxicity and seek prompt medical attention.
- ❖ Convenience stores remained the most common source of both small bulbs and larger cylinders, with many participants reporting purchases between 10pm and 5am. This likely reflects variation in regulatory approaches across jurisdictions. Despite restrictions in some jurisdictions, few participants reported difficulty accessing products, underscoring the need for ongoing monitoring as further regulations are introduced.

Results

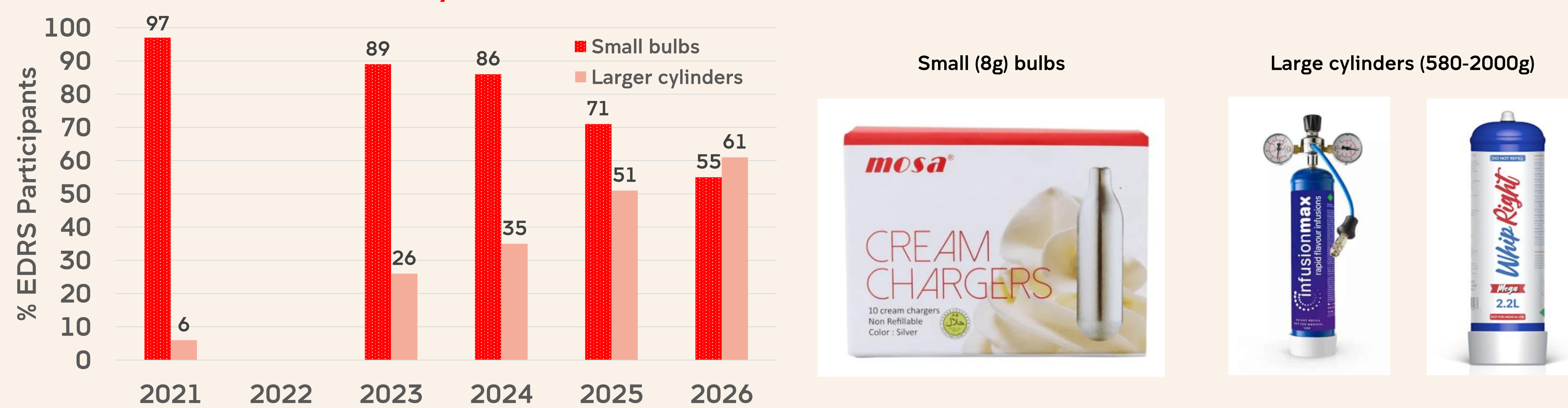
- ❖ Past six month (recent) use of nitrous oxide remained relatively stable between 2003 and 2015. From 2016, a steady rise commenced, peaking in 2020 at 54% of participants reporting recent use, and thereafter declining to 32% in 2026 (Figure 1). Median days of use was infrequent across the monitoring period, ranging from three days to six days in the six months preceding Interview (i.e., between once a month to once every two months).

Figure 1: Past six month use and median days of use of nitrous oxide, EDRS, nationally, 2003-2026



Note: Secondary Y axis reduced to 10 days to improve visibility of trends.

Figure 2: Forms of nitrous oxide used in the six months preceding interview, among those who had recently used nitrous oxide, EDRS, nationally, 2021-2026



- ❖ Among participants who had recently purchased small bulbs (~8g) of nitrous oxide and commented (n=93), two thirds (66%) reported purchasing these from a corner/convenience store, and one fifth (22%) from a friend/acquaintance.
- ❖ Among participants who had recently purchased bottles/cylinders/tanks of nitrous oxide and commented (n=115), two fifths (40%) reported purchasing these from a corner/convenience store, and 28% from a friend/acquaintance. Notably, almost one quarter (24%) reporting purchasing them from a 24/7 delivery service.
- ❖ Half (52%) of those who had purchased nitrous oxide from a physical retail outlet (e.g., a corner store/convenience store) and commented (n=93) reported purchasing nitrous oxide between 10pm and 5am.
- ❖ Four per cent of the entire sample reported being denied sale and/or difficulty accessing nitrous oxide.

Figure 3: Persistent neurological symptoms experienced following past six month use of nitrous oxide, among those who had recently used nitrous oxide, EDRS, nationally, 2021-2026

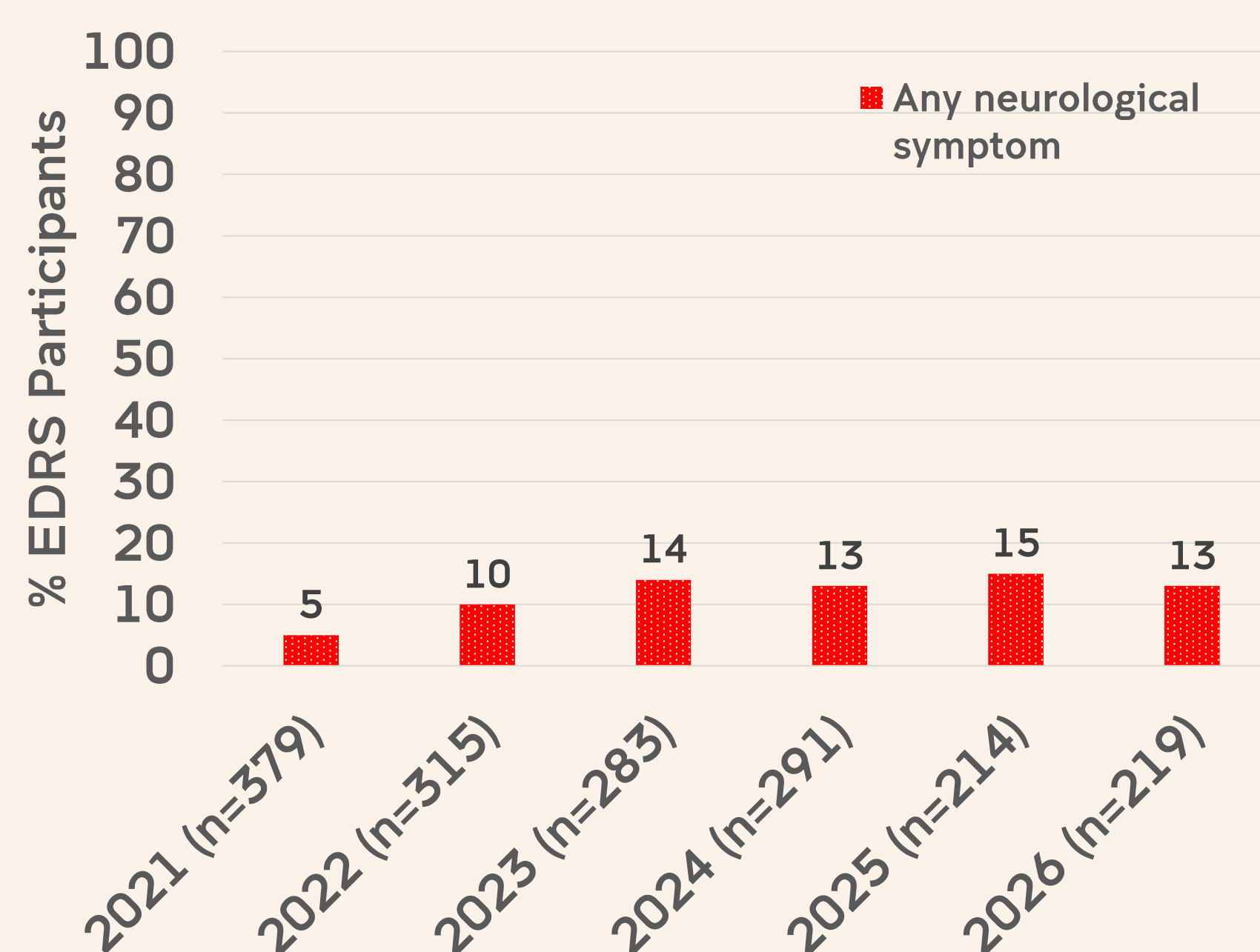
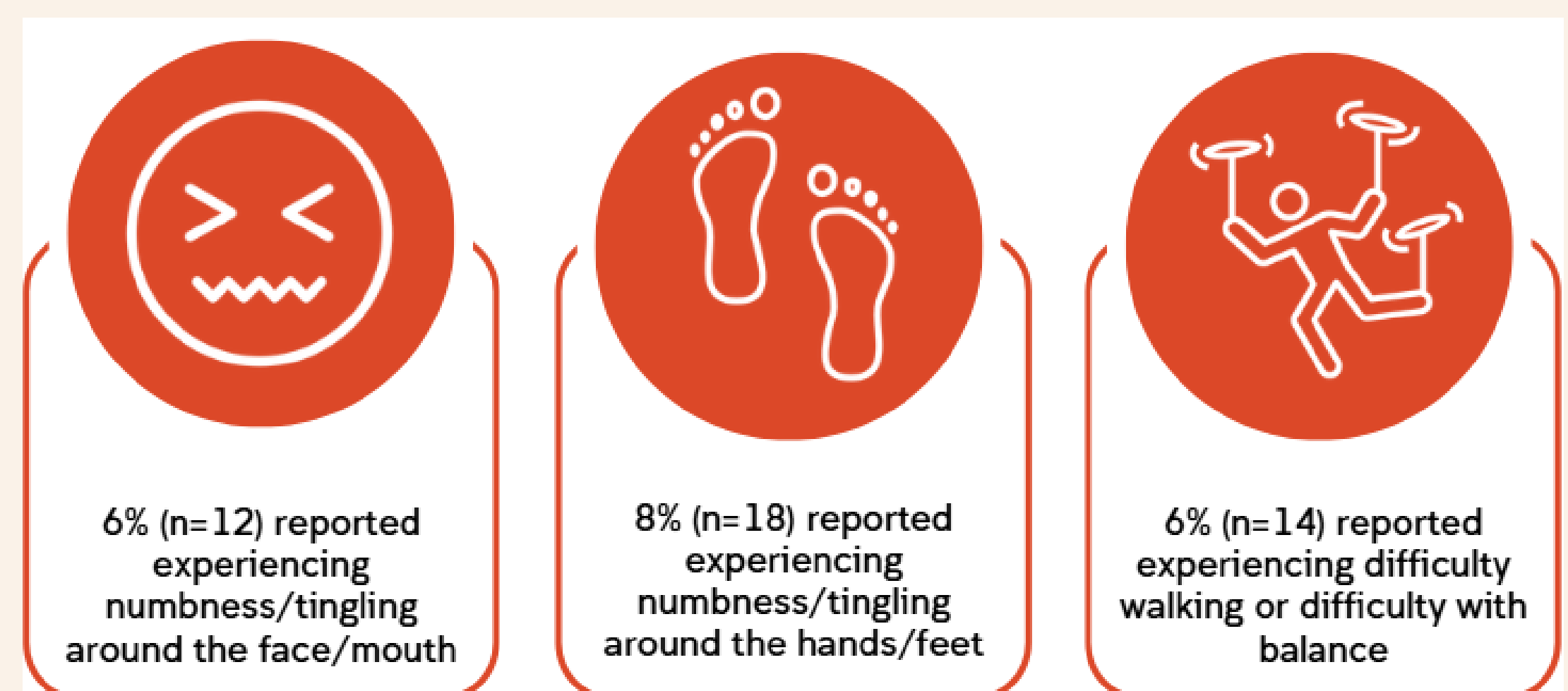


Figure 4: Symptoms experienced following past six month use of nitrous oxide, among those who had recently used nitrous oxide, EDRS, nationally, 2026



Acknowledgements and more information

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