

Methamphetamine-associated pulmonary arterial hypertension: Uncovering an urgent unmet medical need in the US via analytics and insights

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Introduction

- Methamphetamine use is continuing to increase nationally in the United States and worldwide^{1,2}
- Methamphetamine use can lead to pulmonary arterial hypertension (PAH), classified as methamphetamine-associated PAH (Meth-APAH)³
- Compared to idiopathic PAH, Meth-APAH is associated with more than double the risk of clinical worsening or death⁴
- The societal, psychological, and clinical aspects of treating patients with Meth-APAH are an under-recognized and understudied challenge for clinicians^{4,5}

Study objective

- To uncover the current landscape of Meth-APAH prevalence, patient characteristics, and treatment patterns across the United States against a background of rising use of methamphetamine nationwide

Methods

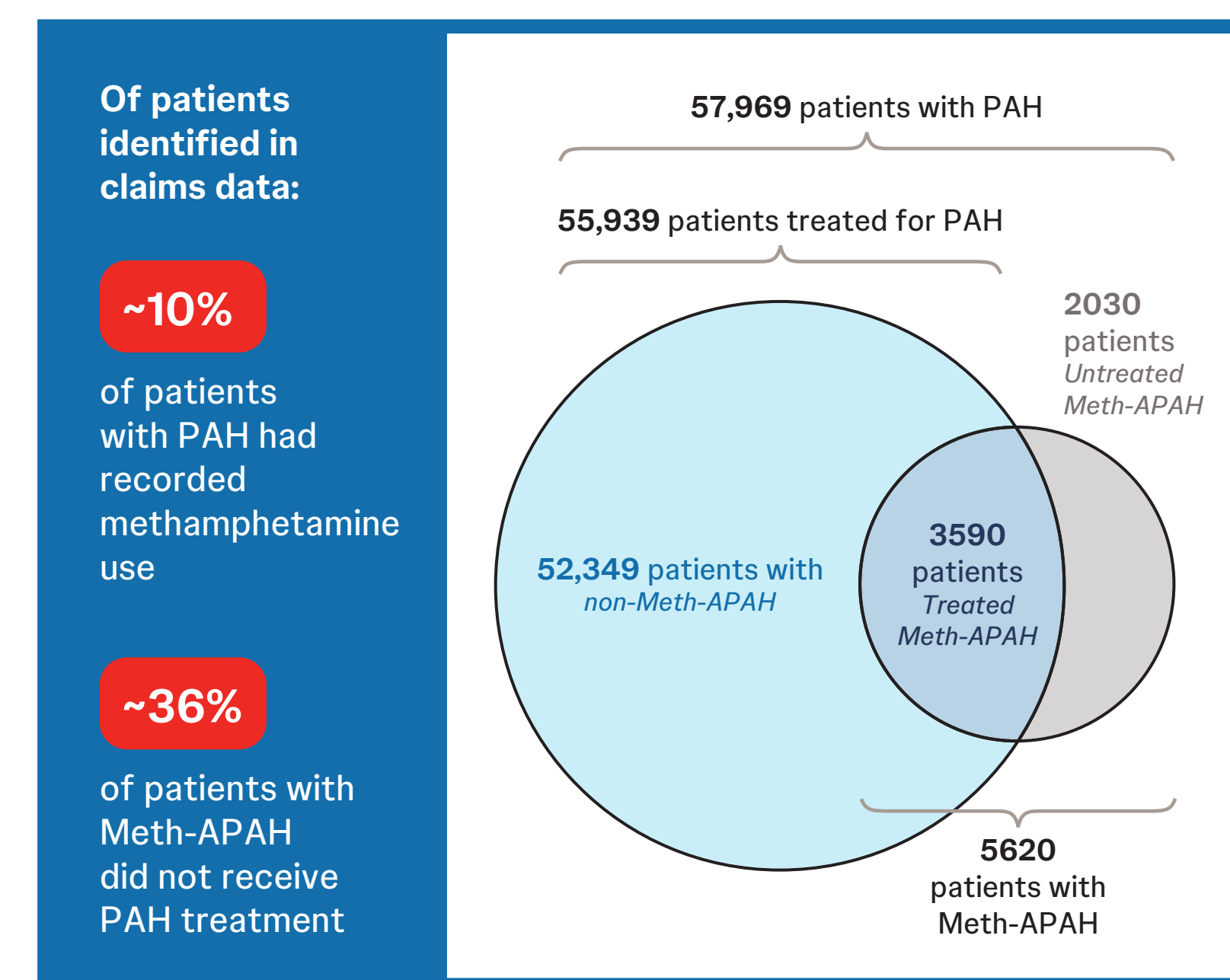
Dataset

- This study used an integrated dataset of Komodo and Symphony Health Solutions (SHS) claims data of patients with pulmonary hypertension
 - The dataset included full medical and pharmacy claims from January 1, 2016, to present day
- Approximately 88 million and 22 million patients, respectively, were represented in the Komodo and SHS databases

Patient identification and counts

- 55,939 patients were identified as being treated for PAH if they had at least one PAH treatment claim temporally related to a PAH diagnosis between September 1, 2021, and August 31, 2023, and had not been diagnosed with left heart disease or interstitial lung disease if prescribed a phosphodiesterase type 5 inhibitor (Figure 1)
- 3590 patients had methamphetamine use (Meth-APAH) reported in claims data across the available time range, and 52,349 patients had no methamphetamine use (non-Meth-APAH) reported
- 2030 untreated patients with Meth-APAH were also identified using the following criteria:
 - Methamphetamine use reported across the available time range
 - At least one PAH diagnosis between September 1, 2021, and August 31, 2023
 - At least two PAH diagnoses in all available claims data
 - At least one echocardiogram prior to PAH diagnosis
 - At least one PAH-related visit to a cardiologist, pulmonologist, or rheumatologist

FIGURE 1: Summary of patient counts

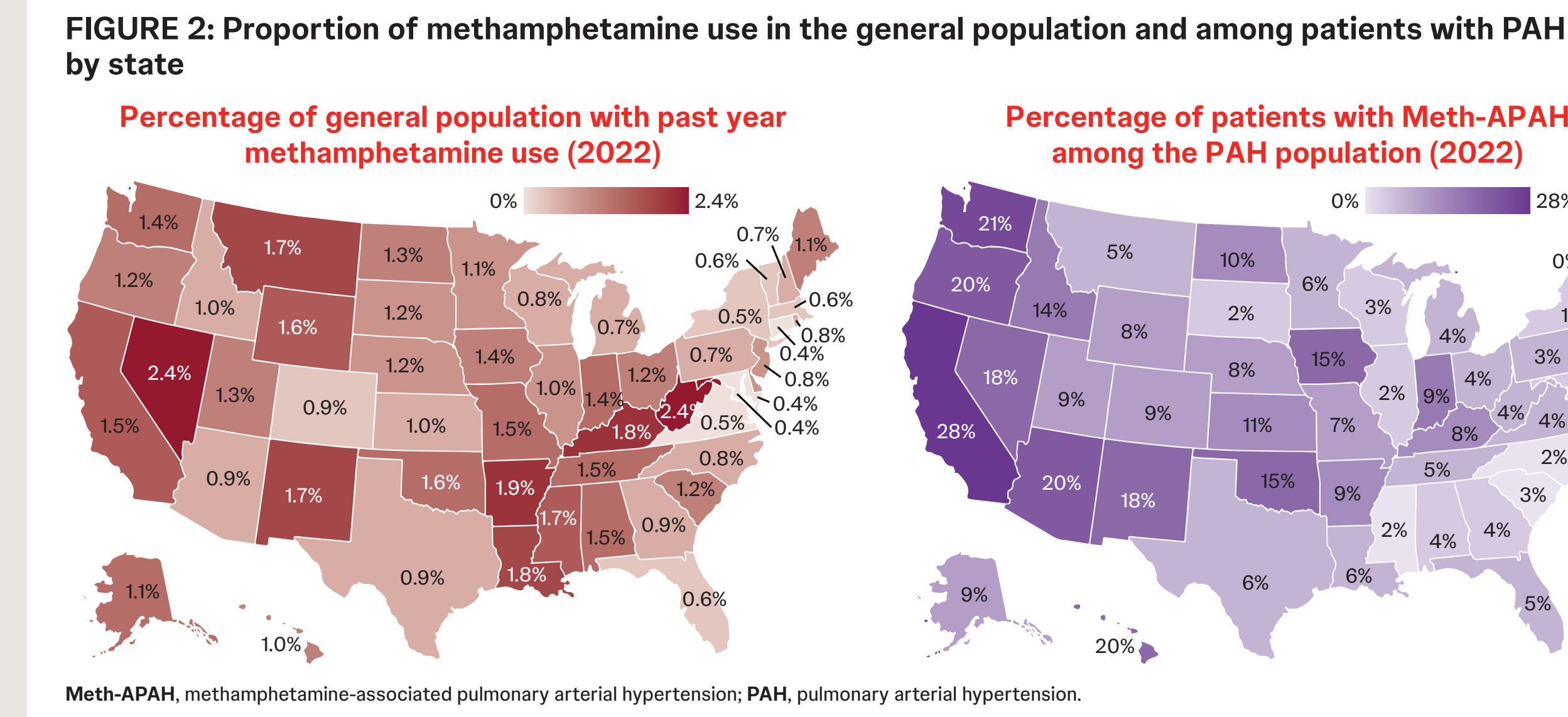


Medical and prescription claims data from an integrated dataset of Komodo and Symphony Health Solutions claims data of patients with pulmonary hypertension, with full medical and pharmacy claims. Meth-APAH, methamphetamine-associated pulmonary arterial hypertension; PAH, pulmonary arterial hypertension.

Results

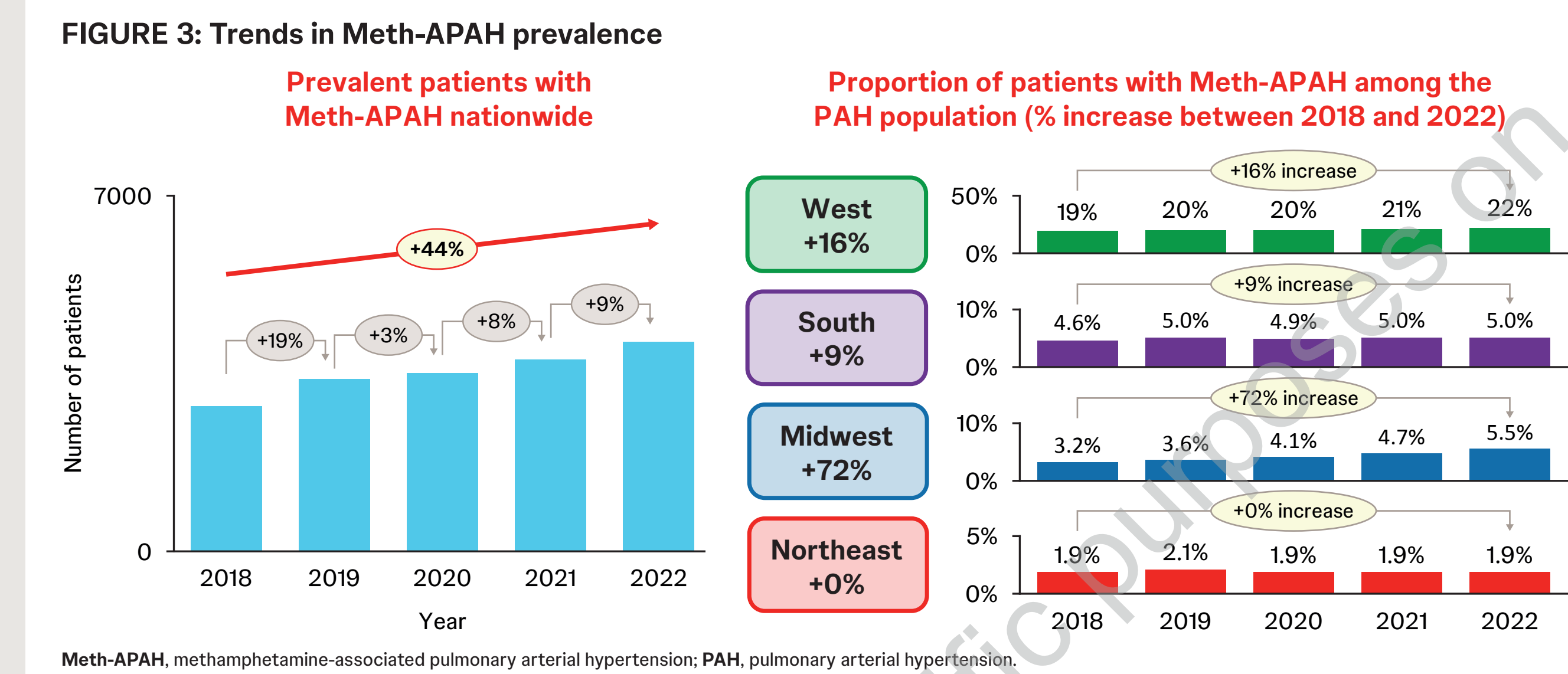
Proportion of patients with PAH with methamphetamine use by state

- On average, approximately 10% of patients with PAH had a history of methamphetamine use, compared with approximately 1% of the general population (Figure 2)



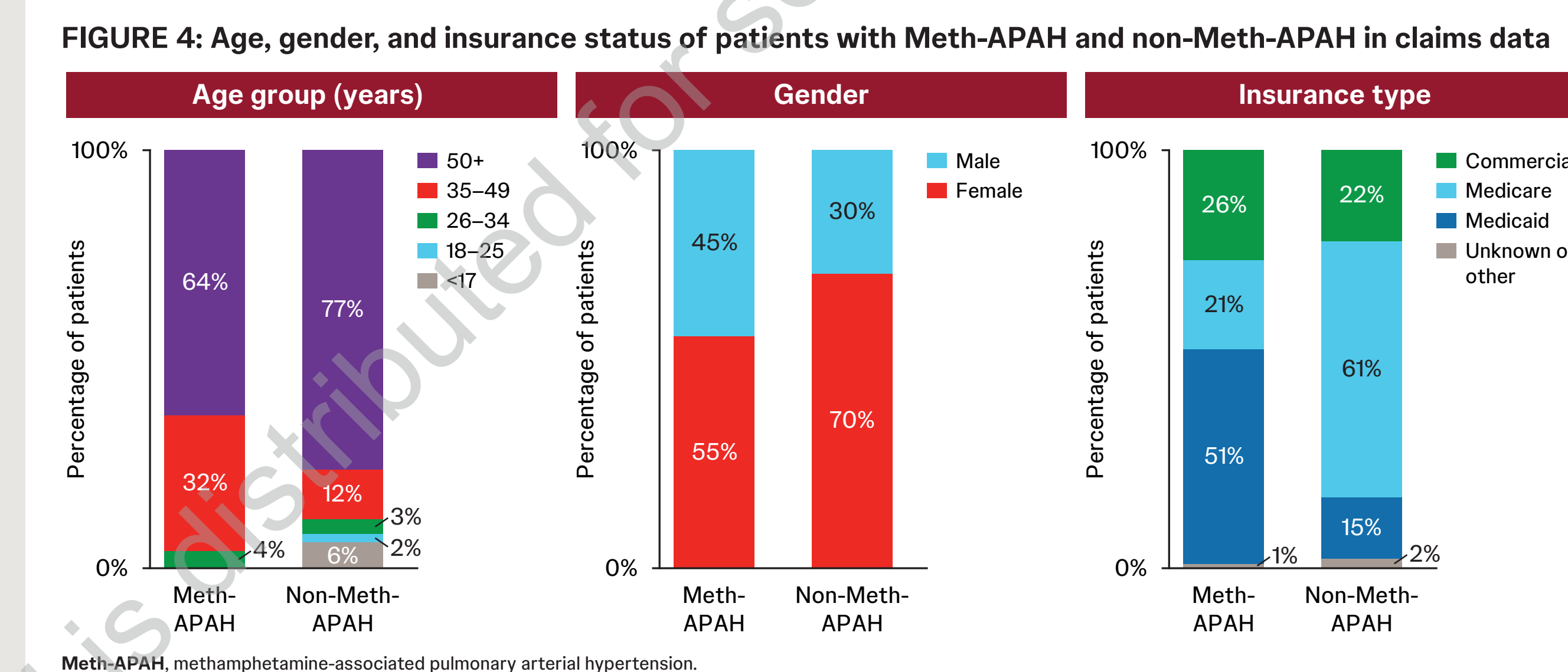
Trends in Meth-APAH prevalence

- Meth-APAH prevalence has been steadily rising, especially in the West and Midwest (Figure 3)



Demographics of patients with Meth-APAH

- Patients with Meth-APAH are more likely to be male, younger, and on Medicaid compared to those with non-Meth-APAH (Figure 4)



- Among patients with Meth-APAH, the proportion aged 35–49 years increased from 2018 to 2022, whilst the proportion aged ≥50 years declined (Figure 5)

Proportion of treated patients with Meth-APAH by state

- Approximately 30% of patients with Meth-APAH did not receive PAH treatment in 2022 (Figure 6)

FIGURE 5: Age and gender distribution of newly diagnosed patients with Meth-APAH

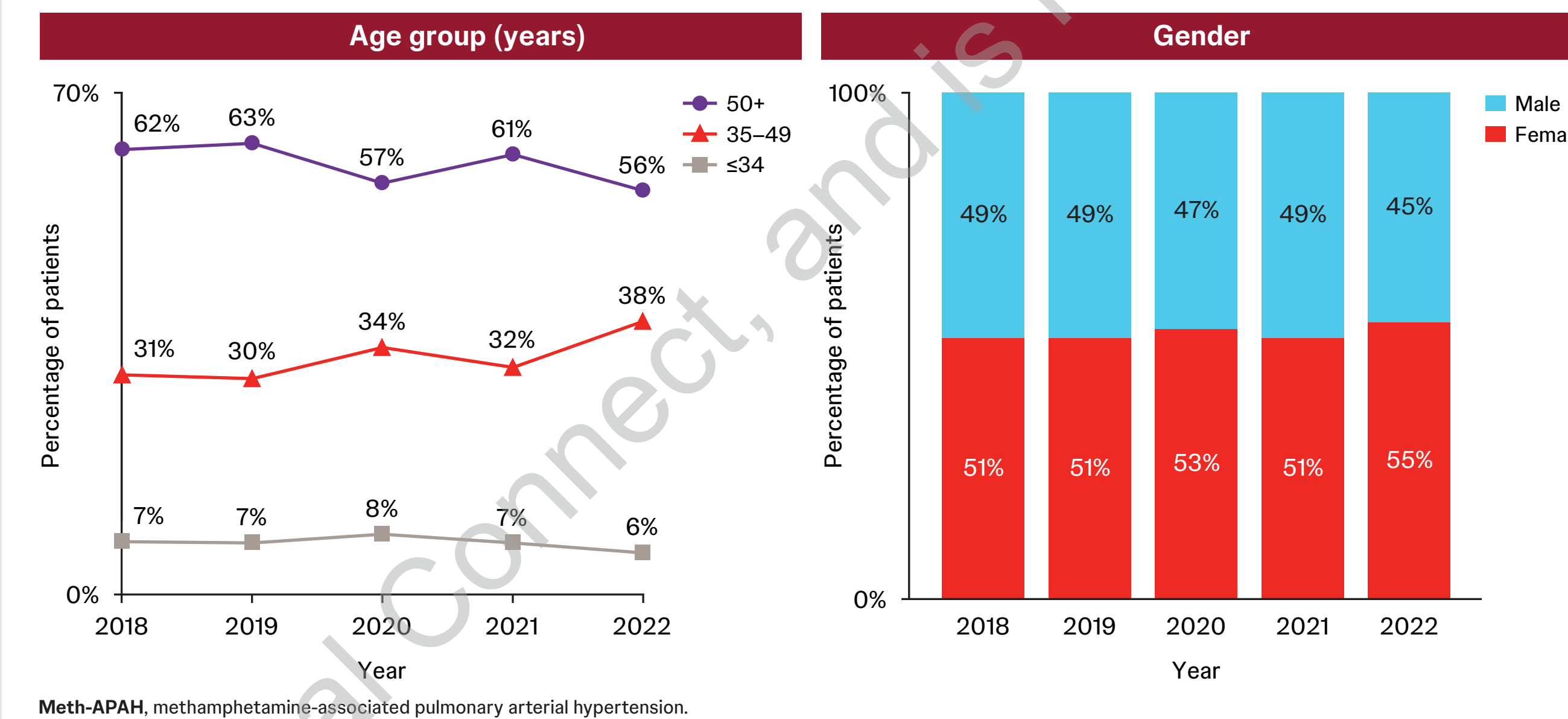
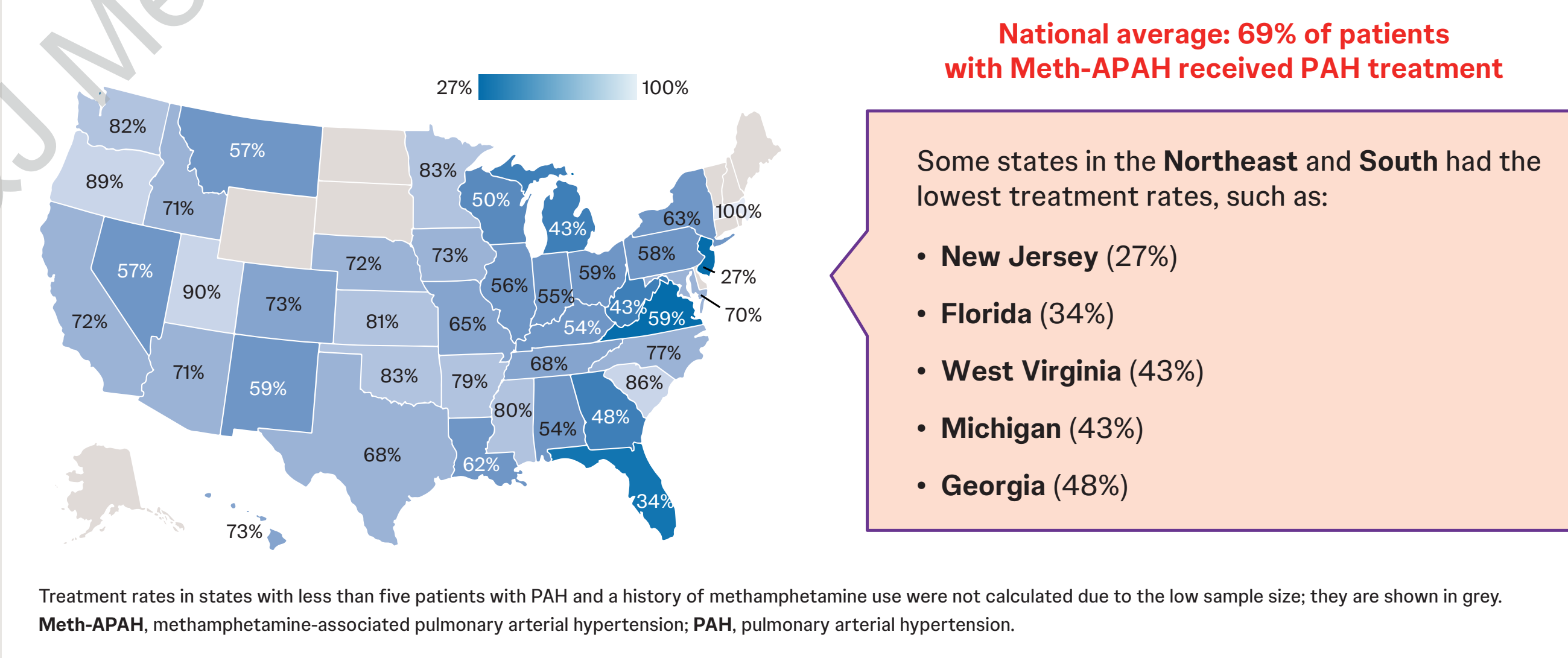


FIGURE 6: Percentage of patients with Meth-APAH receiving PAH treatment in 2022



Treatment patterns of patients with Meth-APAH

- Patients with Meth-APAH were more likely than patients with non-Meth-APAH to be prescribed an initial therapy of dual or triple therapy following diagnosis (Figure 7)
- Treatment adherence was approximately 3% lower in patients with Meth-APAH compared to those with non-Meth-APAH (Figure 8)

FIGURE 7: Distribution of initial therapy type

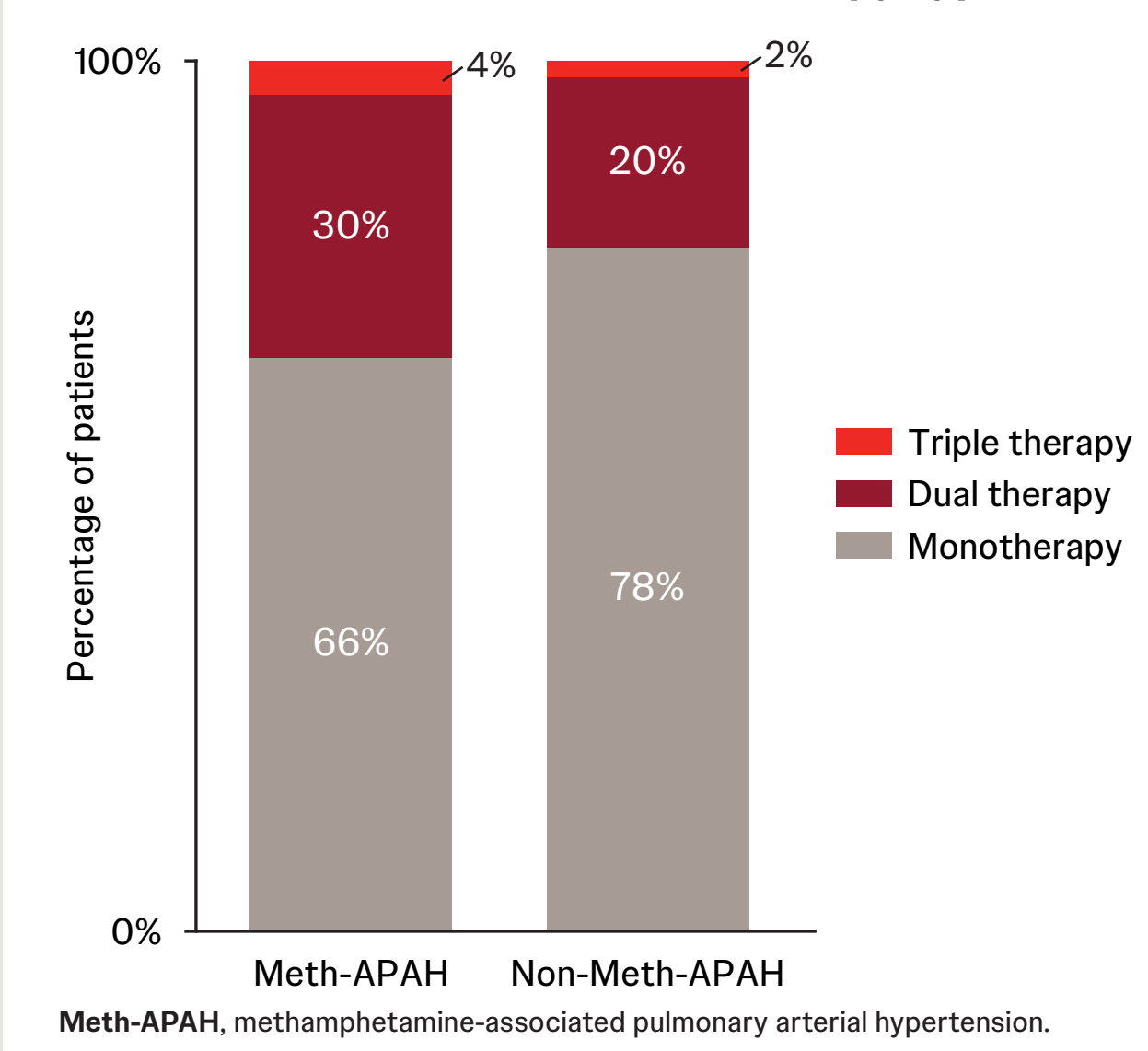
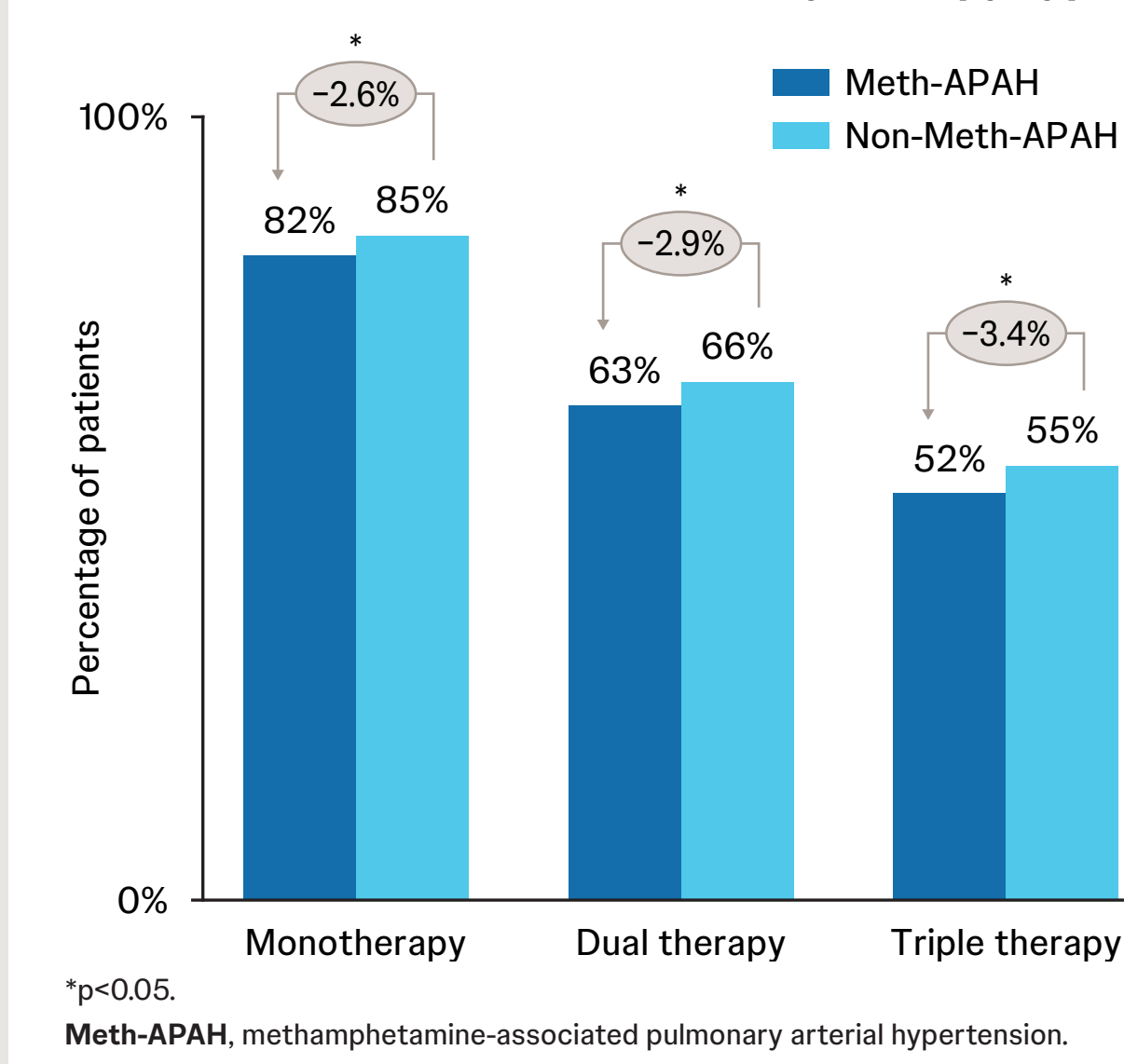


FIGURE 8: Treatment adherence by therapy type



Study limitations

- As claims data are collected for billing purposes, data capture may be incomplete
- Patients without insurance are not represented in claims data
- The time frame analyzed in this study overlaps with the COVID-19 pandemic

Key takeaways

- Prior to this study, there was little information on patients with Meth-APAH outside of registries tracked at PAH specialty centers
- Using claims data, this first-of-its-kind study demonstrates a methodology to identify, quantify, and characterize the nationwide distribution, prevalence, and demographics of patients with Meth-APAH

Conclusions

- Meth-APAH diagnoses have been steadily rising in the United States, with ~10% of patients with PAH recorded as having a history of methamphetamine use
- Patients with Meth-APAH are more likely to be male (compared to those with non-Meth-APAH), younger, and on Medicaid
- Approximately 30% of patients with Meth-APAH were not receiving PAH treatment in 2022; treatment rates vary greatly across the country

- There is an urgent need to understand and address the key challenges felt by patients and providers managing Meth-APAH

- This research calls for:
 - Increased provider education and awareness of the prevalence of Meth-APAH
 - Routine screening for past and/or ongoing methamphetamine use during PAH workup
 - Improved strategies to identify and provide treatment to patients with Meth-APAH

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Disclosures

VdJP declares no conflict of interest. AA, DL, MC, and MS are employees and shareholders of Johnson & Johnson. JJR is an employee of University of Utah and contracted as a consultant by Bayer, Johnson & Johnson, Kiniksa Pharmaceuticals, Merck, and United Therapeutics.

Pulmonary Hypertension



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