

# Trends in the diagnostic landscape of metabolic dysfunction-associated steatohepatitis in a large real-world population

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## Aim

- To identify the physician specialties most and least frequently involved in the diagnosis of metabolic dysfunction-associated steatohepatitis (MASH) and to examine trends in diagnosis by clinical specialties, using a large real-world cohort of patients with MASH.

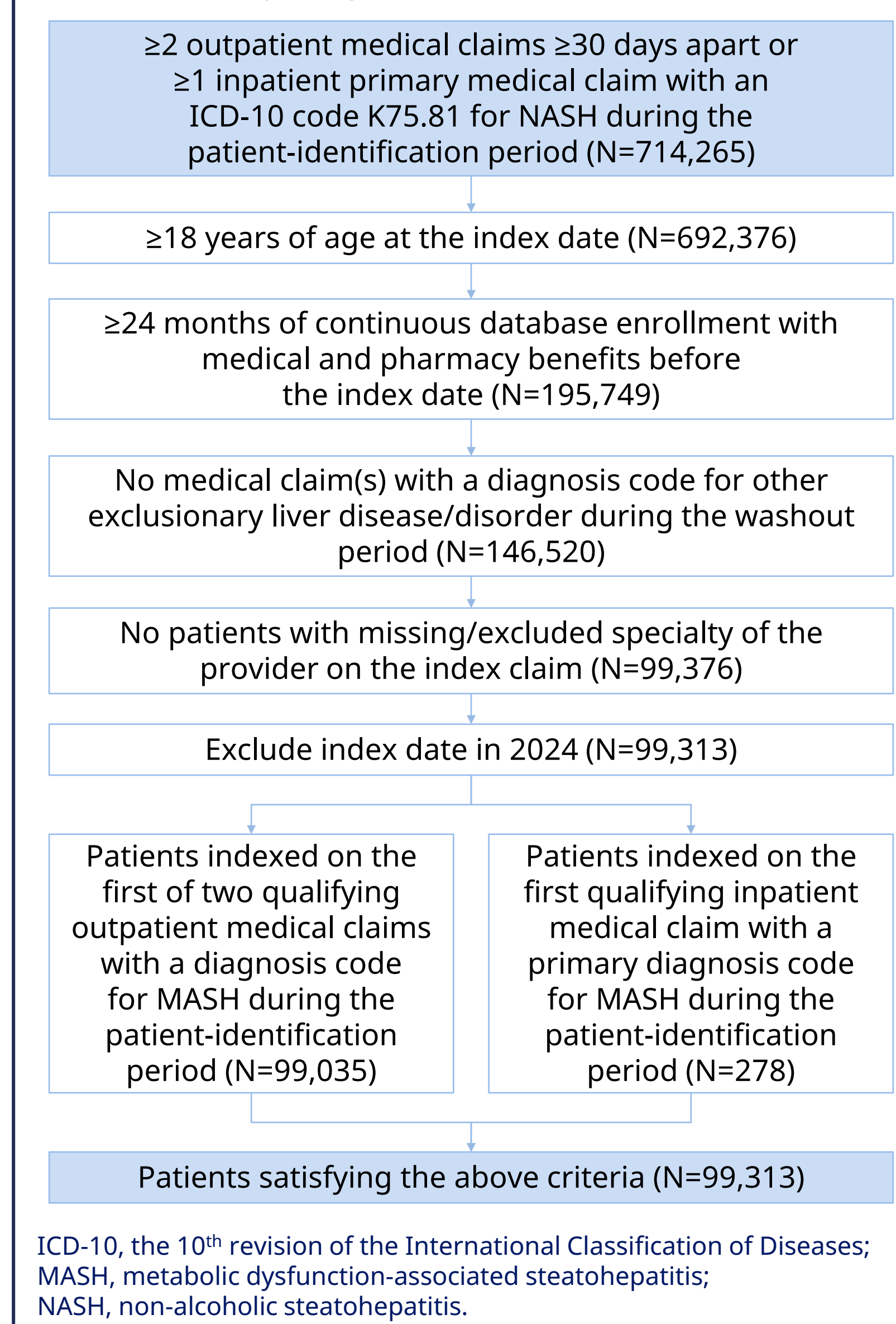
## Introduction

- Among the many barriers to early diagnosis, some key challenges include complex diagnostic pathways and between-specialty variation in clinical practice.<sup>1,2</sup> To address these barriers, both the American Association for the Study of Liver Diseases (AASLD) and the American Association of Clinical Endocrinology (AAACE) have issued clinical guidance for primary care physicians and specialists on the diagnosis and management of MASH.<sup>3,4</sup> To assist with the early diagnosis of MASH, this analysis sought insights into the diagnostic landscape by characterizing between-specialty variation in care for patients with MASH.

## Methods

- This study retrospectively analyzed administrative claims data between January 1, 2016 and December 31, 2023 from Komodo's Healthcare Map™ in the USA.
- Adult patients who were newly diagnosed with MASH between 2018 and 2023 were eligible based on the following criteria:
  - ICD-10 code K75.81 for non-alcoholic steatohepatitis;
  - Patients with data on the provider type with ≥2 outpatient claims in the primary position ≤30 days apart, or ≥1 inpatient medical claim in the primary position, with a MASH diagnosis.
- The first claim date was considered the date of MASH diagnosis by the physician and the index date was the first qualifying medical claim for MASH diagnosis.
- To reduce the likelihood of analyzing claims for clinically suspected MASH at the time of initial diagnosis, a sensitivity analysis was included that involved indexing on the second outpatient claim associated with a MASH diagnosis.
- To reduce the risk of misclassifying previously diagnosed patients as newly diagnosed cases, a 24-month pre-index period/washout period was used.
- Patients with any other liver disease ICD-10 diagnosis during the pre-index period were excluded.
- Data assessed from the index date included patient demographics, diagnosis date, and diagnosing physician specialty.
- Diagnosing physician specialties were grouped:
  - Primary care (internal and family medicine), liver specialists (hepatology/gastroenterology), and others (e.g., endocrinology, diagnostic radiology, oncology, and cardiology).
- Data were summarized with descriptive statistics, including the frequency of MASH diagnosis by specialties for each year.
- To assess between-specialty variation in the diagnosis of MASH, longitudinal trends were evaluated with the Cochran-Armitage test.

**Figure 1:** Sample attrition for patients with newly-diagnosed MASH

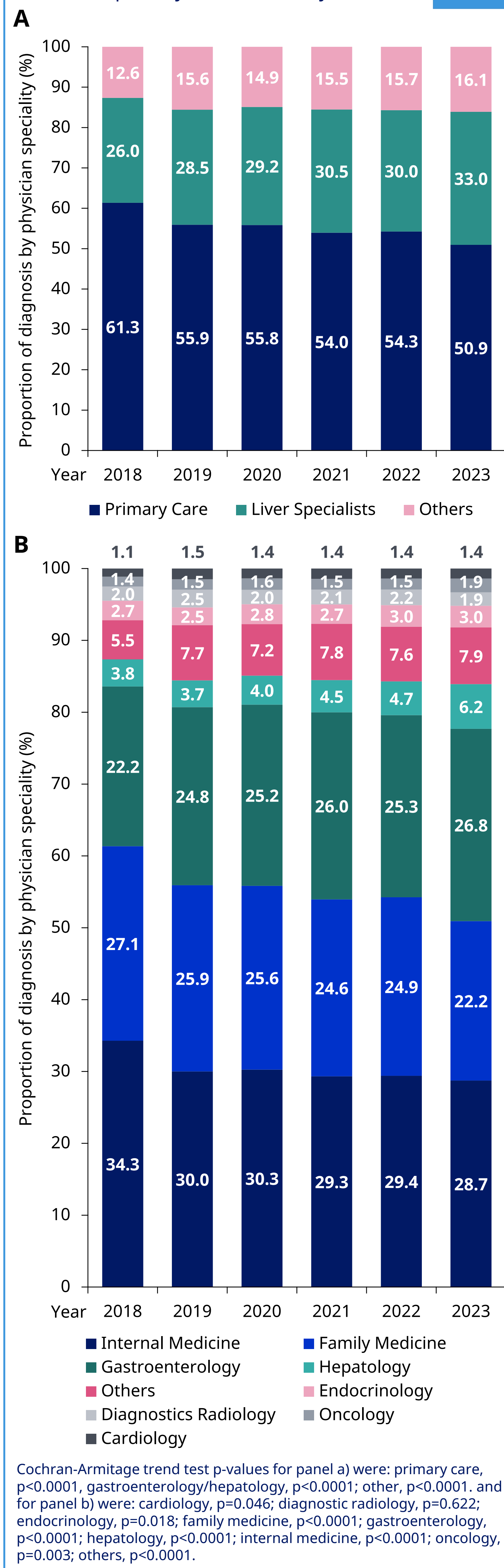


**Table 1:** Demographics and clinical characteristics among patients with newly-diagnosed MASH

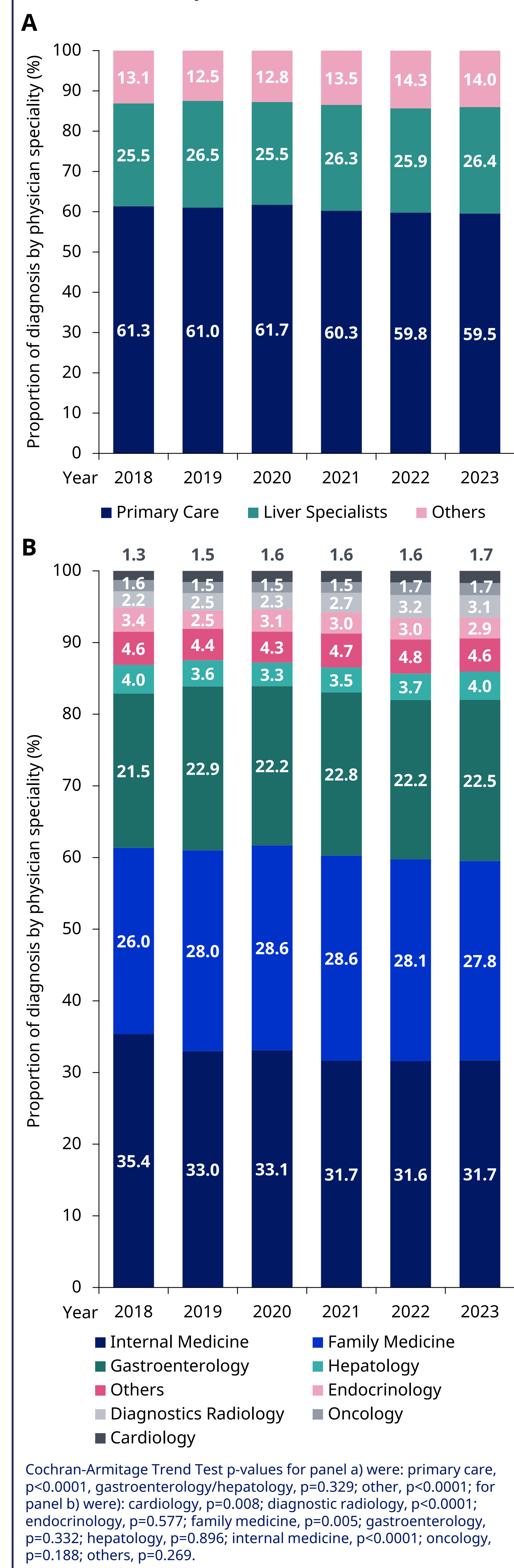
Variable	n	%
<b>Age, years (categorical)</b>		
18–24	2,279	2.3%
25–34	6,584	6.6%
35–44	14,161	14.3%
45–64	57,820	58.2%
65–74	13,604	13.7%
75–84	4,521	4.6%
≥85	344	0.3%
<b>Sex</b>		
Female	55,148	55.5%
Male	43,024	43.3%
Missing	1,141	1.1%
<b>Comorbid conditions</b>		
<b>BMI*</b>		
Lean-MASH: BMI <25.0 kg/m <sup>2</sup>	1,861	1.9%
Overweight: BMI 25.0–29.9 kg/m <sup>2</sup>	8,065	8.1%
Obesity: BMI ≥30.0 kg/m <sup>2</sup>	55,477	55.9%
Missing	33,910	34.1%
Lipid metabolism disorder	62,410	62.8%
HTN	60,844	61.2%
T2D	42,293	42.5%
Obesity and T2D	27,233	27.4%
Chronic pulmonary disease	16,853	16.9%
CHD	11,286	11.3%
Arrhythmia	7,889	7.9%
<b>Diagnostic testing</b>		
FIB-4	83,774	84.3%
Abdominal ultrasound	44,107	44.4%
FibroSure	24,929	25.1%
MRS	2	0.0%
<b>Bariatric surgery</b>	1,250	1.2%

\*There were no patients with BMI <18.5 kg/m<sup>2</sup>. BMI, body mass index; CHD, coronary heart disease; FIB-4, fibrosis-4 index; HTN, hypertension; MASH, metabolic dysfunction-associated steatohepatitis; MRS, magnetic resonance spectroscopy; T2D, type 2 diabetes.

**Figure 2:** Proportion of diagnosis by (a) grouped physician specialty and (b) individual physician specialty over calendar years



**Figure 3:** Sensitivity analysis in the proportion of diagnosis by (a) grouped physician specialty and (b) individual physician specialty over calendar years



## Results

- A total of 714,265 patients were diagnosed with MASH, and patients meeting the pre-specified inclusion criteria amounted to a sample size of 99,313 for the study (Figure 1), from which, 90,503 patients were included in the sensitivity analysis.
- Most patients were 45–64 years of age (58.2%) and prevalent comorbidities included lipid metabolism disorder (62.8%), hypertension (61.2%), obesity (55.9%), type 2 diabetes (T2D) (42.5%), or a combination of obesity/T2D (27.4%) (Table 1).
- Fibrosis-4 index (84.3%) was the most frequently ordered non-invasive diagnostic test (Table 1).
- The proportion of diagnosis by primary care physicians decreased from 61.3% in 2018 to 50.9% in 2023 (p<0.001) (Figure 2a). By contrast, the proportion of diagnoses made by liver specialists during this same period increased from 26.0% to 33.0% (p<0.001).
- Relative to other specialties, internal medicine accounted for the greatest proportion of diagnoses (34.3% in 2018, 28.7% in 2023, p<0.001) (Figure 2b).
- The sensitivity analyses for grouped specialties and individual specialties also showed some differences over time (Figure 3a and 3b, respectively).

## Discussion

- Among patients with MASH, at least 50% of diagnoses were made by primary care physicians. Although higher than expected, this was not surprising, given that most patients with MASH have fibrosis stages 0–2, which do not warrant referral to liver specialists as per specialty guidelines.
- This analysis demonstrates that over time, among patients with initial claims for MASH, the percentage of patients diagnosed by primary care physicians decreased while the percentage of patients diagnosed by liver specialists increased.
- One explanation for these observations could be a change in the epidemiology of disease severity. For example, the distribution of stages of fibrosis could possibly be changing towards more advanced fibrosis over time; in this case, patients with MASH may be more likely to be referred to liver specialists for diagnostic workups to monitor and assess disease progression.
- These findings warrant further analysis through additional studies since this study did not evaluate fibrosis staging.

## Conclusion

- The findings from this study aid the understanding of MASH diagnosis among physicians in the USA.
- They could inform specialty-specific awareness, education, and strategies for better early detection of MASH and downstream management.

<https://sciencehub.novonordisk.com/cmhc2024/Gbadamosi.html?cid=qr-taroy8610y>

