

BURDEN OF MASLD IN INDIA: A SYSTEMATIC REVIEW OF EPIDEMIOLOGIC AND ECONOMIC EVIDENCE TO INFORM HTA

Manupati R, M.Pharm¹; Kumar A, BSc¹; Vishnubhotla M, MS²; Rai MK, PhD³

¹Trinity Life Sciences, Gurgaon, India ²Trinity Life Sciences, Mumbai, India ³Trinity Life Sciences, Singapore



BACKGROUND

Metabolic dysfunction-associated steatotic liver disease (MASLD), formerly NAFLD, is an increasingly important contributor to chronic liver disease worldwide. Rising obesity, type 2 diabetes mellitus (T2DM), metabolic syndrome, and urbanisation are driving disease burden in India. India may carry among the largest absolute numbers of MASLD patients globally given its population size and rising metabolic risk factors.

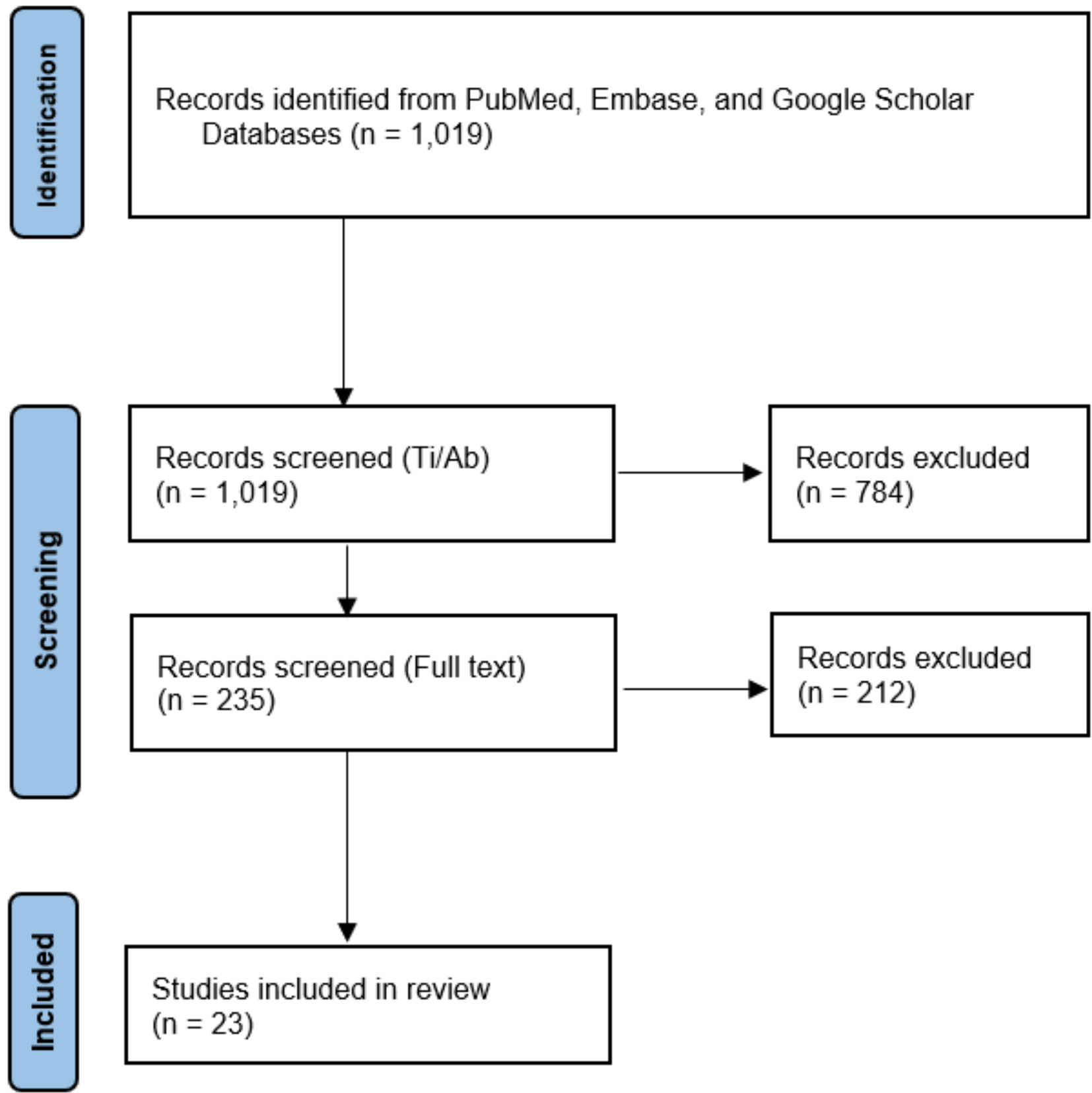
OBJECTIVES

To systematically review epidemiologic, clinical, and economic evidence on MASLD burden in India and identify evidence gaps relevant to health technology assessment (HTA).

METHODS

Databases: PubMed, Embase, Google Scholar
Publication period: January 2010 - May 2026
Reporting standard: PRISMA 2020
Screening: Two independent reviewers
Quality assessment: Standard risk-of-bias frameworks
Synthesis: Descriptive (due to study heterogeneity)
Outcomes: Prevalence, clinical burden, disease progression, economic burden, HTA evidence gaps

PRISMA FLOW DIAGRAM

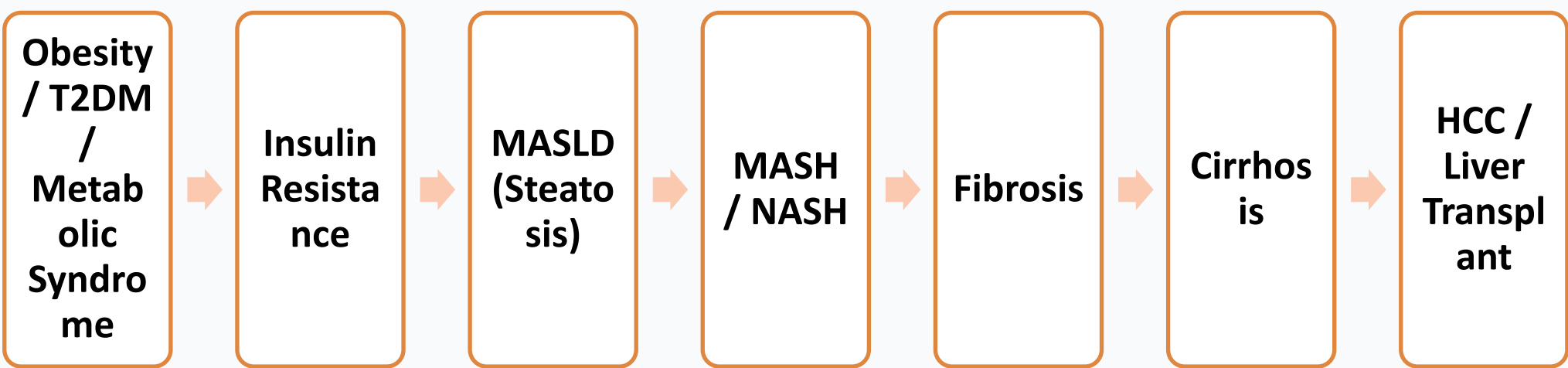


KEY RISK FACTORS

Studies consistently identified the following as major drivers of MASLD in India:

- Obesity
- Type 2 diabetes mellitus
- Metabolic syndrome
- Insulin resistance
- Urban lifestyle

DISEASE PROGRESSION PATHWAY



- Multiple studies have identified metabolic dysfunction as the primary determinant of MASLD in the Indian population.
- Obesity, type 2 diabetes mellitus, metabolic syndrome, and insulin resistance are consistently associated with a higher risk of disease development.
- Increasing adoption of urban lifestyles has compounded these risk factors, contributing to the rising prevalence of MASLD across the country.
- MASLD typically develops in the setting of obesity, type 2 diabetes mellitus (T2DM), and metabolic syndrome, with insulin resistance serving as a key pathogenic driver.
- While simple steatosis (MASLD) may remain stable in some individuals, a subset progresses to MASH/NASH, characterised by hepatic inflammation and injury.
- Continued disease progression can lead to fibrosis, cirrhosis, and ultimately hepatocellular carcinoma (HCC) or the need for liver transplantation.

LIMITATIONS

- Substantial heterogeneity across study populations, diagnostic criteria, and settings precluded meta-analytic pooling for several outcomes.
- Economic evidence was extremely limited; only one micro-costing study was identified.
- Nationally representative, longitudinal, and pediatric data remain sparse.
- Indirect/productivity costs and HTA-ready cost-effectiveness data were not reported.

EPIDEMIOLOGY RESULTS

Of 1,019 identified records, 23 studies were included. MASLD prevalence in India was high and heterogeneous, ranging from 28.1% in average-risk populations to 52.8% in high-risk groups, with higher estimates in hospital-based settings than in community settings (40.8% vs 28.2%). Urban populations exhibited particularly high prevalence rates (53.7%- 61.5%). (Figure 1)

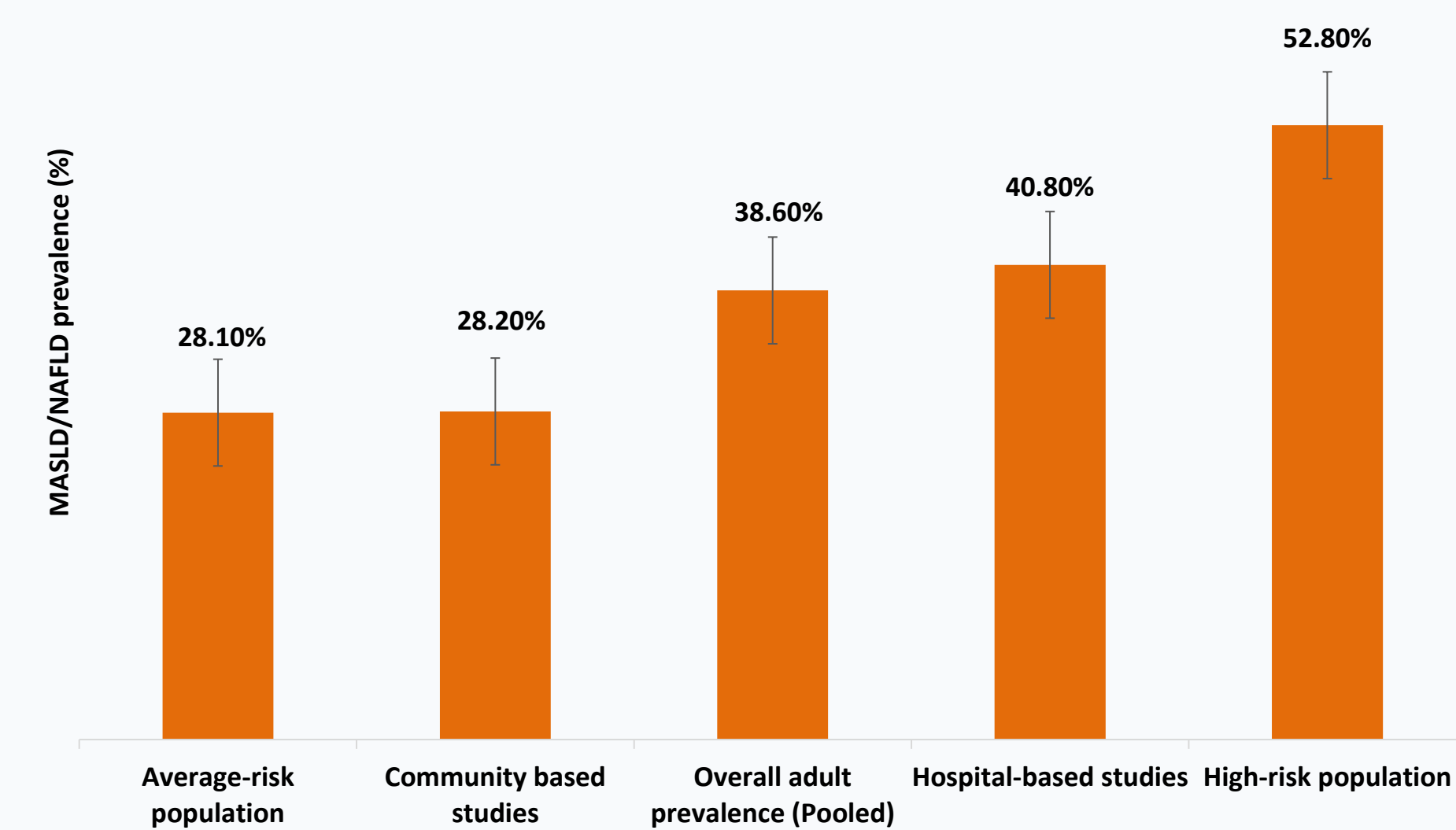


Figure 1. MASLD/NAFLD prevalence across Indian population subgroups.

The Phenome India study, the largest recent multicity community-based cohort in India, offers contemporary insights into the burden of metabolic dysfunction-associated steatotic liver disease (MASLD) and associated liver fibrosis.

The study reported a crude MASLD prevalence of 47.8%, indicating that nearly one in two adults had evidence of the disease. After adjusting for age, the prevalence remained substantial at 38.9%, underscoring the significant population-level burden of MASLD in India. Importantly, 6.3% of individuals with MASLD had significant liver fibrosis, highlighting a meaningful risk of disease progression among affected patients.

In the overall study population, the prevalence of significant fibrosis was 2.4%, demonstrating that fibrosis is considerably more common among individuals with MASLD than among those without the condition. (Table 1)

Endpoint	Estimate
MASLD prevalence	47.8%
Age-adjusted prevalence	38.9%
Significant fibrosis among MASLD patients	6.3%
Overall significant fibrosis prevalence	2.4%

Table 1. PHENOME INDIA COHORT STUDY (n = 7,764; 27 CITIES)

CLINICAL BURDEN

MASLD progresses along a spectrum of steatosis, steatohepatitis (MASH/NASH), fibrosis, cirrhosis, hepatocellular carcinoma (HCC), and liver failure. A contemporary national survey of Indian liver transplant centers reported 3,920 liver transplants in India during 2022, with NASH-related cirrhosis representing approximately 20% of transplant indications. (Figure 2)

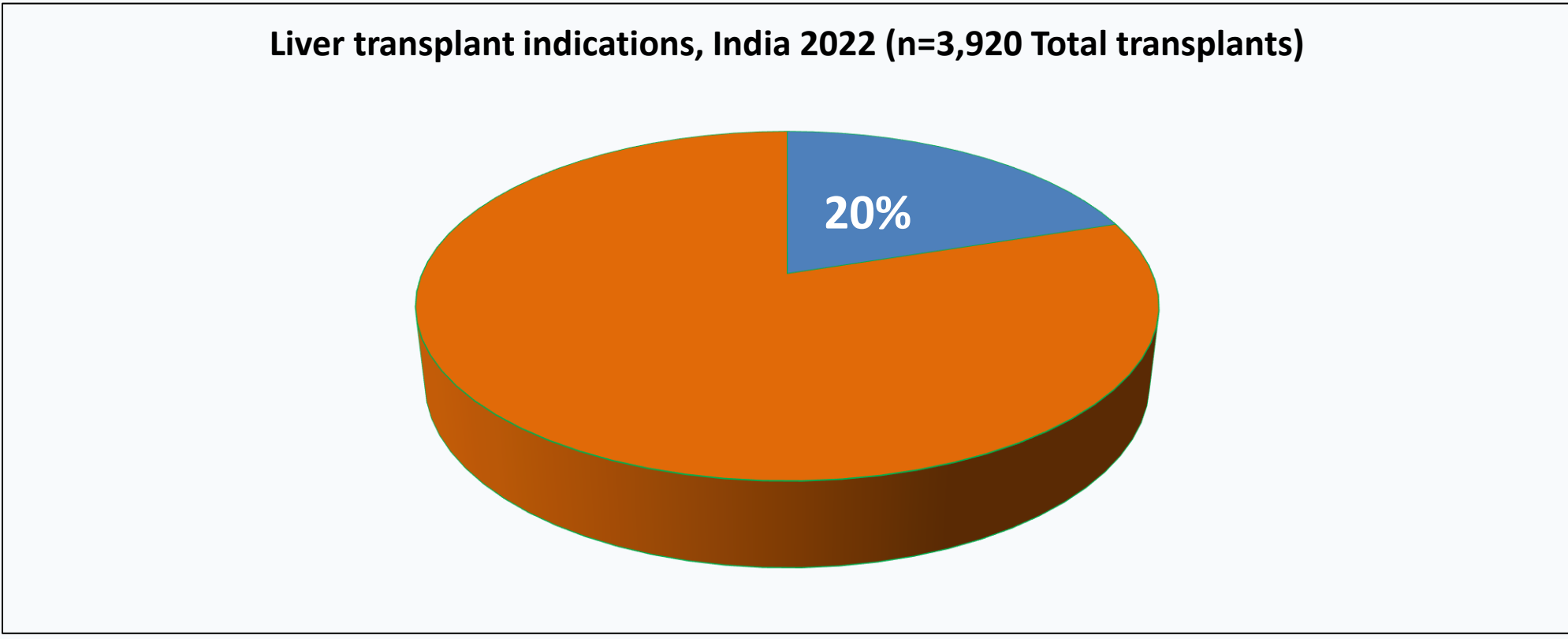


Figure 2. NASH-cirrhosis as a proportion of Indian liver transplant indications, 2022.

ECONOMIC BURDEN

Published Indian economic evidence remains extremely limited. The principal micro-costing study identified in this review reported a substantial per-patient financial burden.

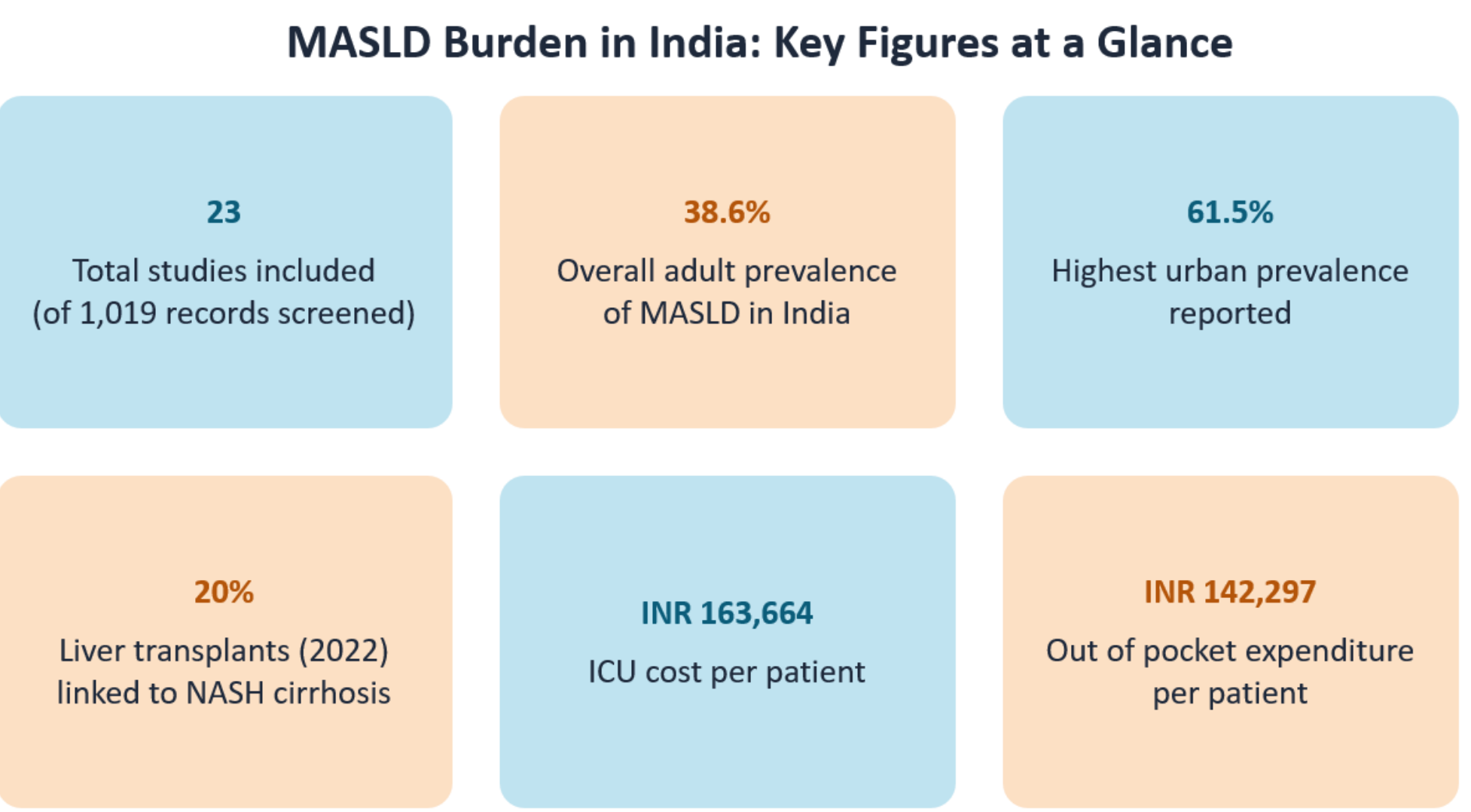
Cost Component	Cost (INR)
ICU cost	163,664
Out-of-pocket expenditure	142,297

Global evidence (outside the India-specific systematic review) indicates NAFLD/MASLD healthcare costs are approximately twice those of matched controls, with costs rising substantially with fibrosis stage and end-stage liver disease; hospitalisation is a principal cost driver. India-specific indirect/productivity costs, as well as long-term cost trajectories, were not reported.

HTA IMPLICATIONS

- MASLD imposes a substantial and growing clinical and economic burden in India, but HTA decision-making is constrained by limited nationally representative epidemiologic data and sparse cost evidence.
- Strengthening real-world evidence on disease progression, direct and indirect costs, and long-term outcomes is critical to inform cost-effective screening, risk stratification, and treatment strategies in Indian healthcare settings.
- Current evidence is insufficient to support robust cost-effectiveness or budget impact modelling for MASLD interventions in India without further primary data generation.

INDIA BURDEN AT A GLANCE



EVIDENCE-GAP HEATMAP

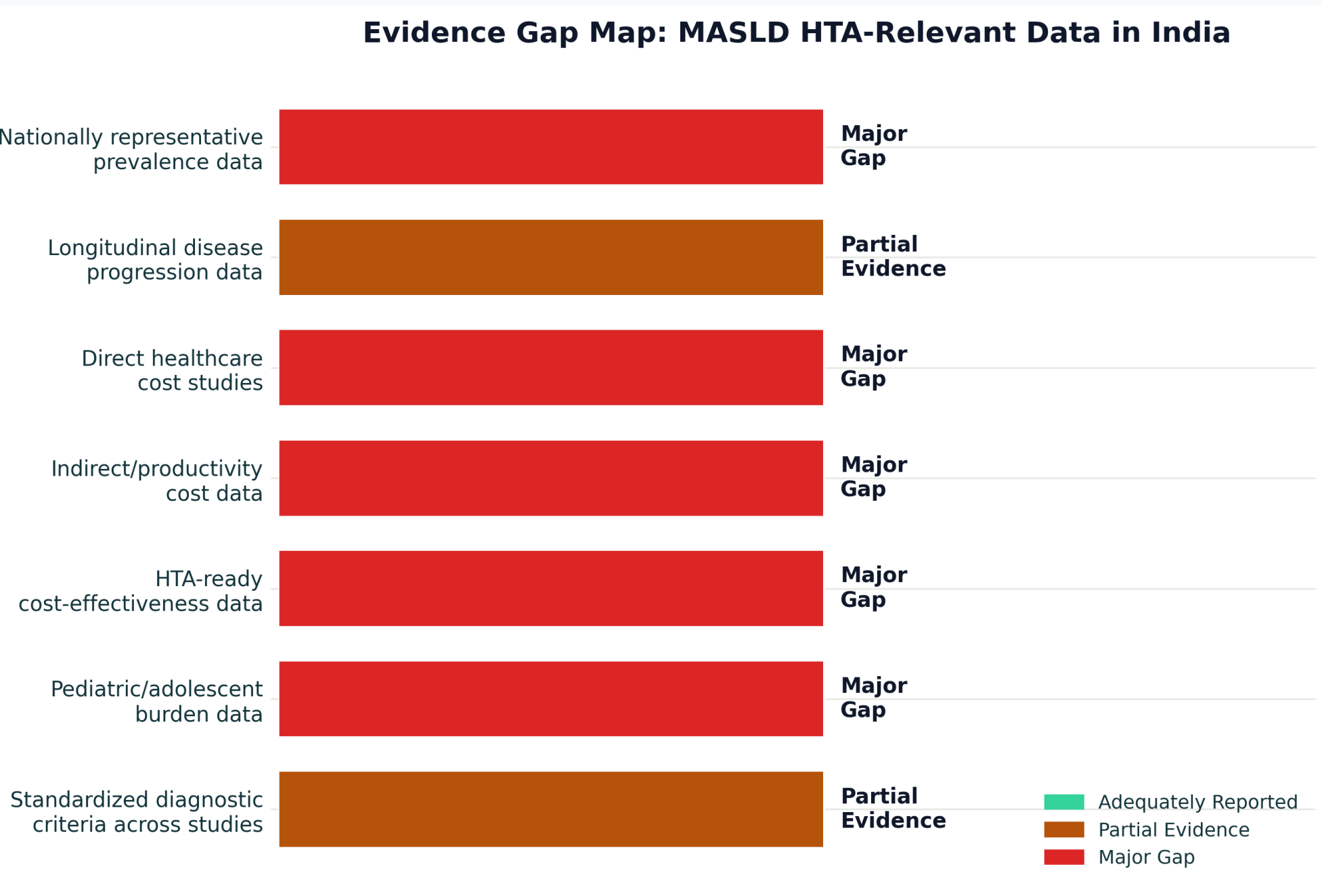


Figure 3. Categorical assessment of MASLD evidence gaps relevant to HTA in India, based on findings of this review

CONCLUSIONS

- MASLD affects an estimated 28%–62% of Indian adults depending on population risk and setting, with the highest rates in urban and hospital-based cohorts.
- NASH-related cirrhosis accounts for approximately 20% of Indian liver transplants.
- Economic burden is substantial per patient but nationally under-characterized.
- HTA readiness for MASLD interventions in India requires stronger real-world cost and outcomes data.

REFERENCES

- Anton MC, Shanthi B, Sridevi C. Prevalence of Non-Alcoholic Fatty Liver Disease in Urban Adult Population in Chennai. Indian J Community Med. 2023.
- Shalimar, Elhence A, Bansal B, et al. Prevalence of Non-alcoholic Fatty Liver Disease in India: A Systematic Review and Meta-analysis. J Clin Exp Hepatol. 2022;12(3):818-829.
- Arvind M, Verma A, Raj KS, et al. Burden of MASLD and Liver Fibrosis: Evidence from Phenome India Cohort. Lancet Regional Health Southeast Asia. 2026.
- Tiwari P, Nundy S. The Status of Liver Transplantation in India. Natl Med J India. 2025.
- Allen AM, Lazarus JV, Younossi ZM. Healthcare and Socioeconomic Costs of NAFLD: A Global Framework. J Hepatol. 2023.
- Riazì K, Azhari H, Charette JH, et al. The Prevalence and Incidence of NAFLD Worldwide: A Systematic Review and Meta-analysis. Lancet Gastroenterol Hepatol. 2022.
- Allen AM, Lazarus JV, Younossi ZM. Healthcare and Socioeconomic Costs of NAFLD: A Global Framework to Navigate the Uncertainties. J Hepatol. 2023;79(1):209-217.

CONFLICT OF INTEREST

Manupati R, Kumar A, Vishnubhotla M, and Rai MK are employees of Trinity Life Sciences, India
Financial disclosures: None
AI-assisted content disclosure: AI was used for editing purposes only in the creation of the accepted abstract.

CONTACT & POSTER INFO

Contact: mvishubhotla@trinitylifesciences.com

Poster presented at ISPOR Asia Pacific Summit 2026, 6-8 September 2026, Bangkok, Thailand