

# Micro-Costing Analysis of the Economic Burden of Metabolic Dysfunction-Associated Steatohepatitis and Its Comorbidities in Saudi Arabia

Saleh A. Alqahtani<sup>1,2</sup>, Sultan Mohammed Mubarki<sup>3</sup>, Yasser Albarakah<sup>3</sup>, Mohamed Ahmed<sup>1</sup>, Laila Abu Esba<sup>4</sup>,, Faisal Abaalkhail<sup>5,6</sup>, Mai F. Alsaqa'aby<sup>7</sup>, Aditi Aggarwal<sup>8</sup>, Ashwini Abishek Bongale<sup>9</sup>, Jomol Jose<sup>10</sup>, Prashee Peer<sup>11</sup> Hana Al-Abdulkarim<sup>4</sup>

(1) Liver, Digestive, and Lifestyle Health Research Section and Organ Transplant Center of Excellence, King Faisal Specialist Hospital and Research Center, Riyadh, Saudi Arabia; (2) Division of Gastroenterology and Hepatology, Weill Cornell Medicine, New York, NY, USA; (3) King Fahad Armed Forces Hospital, Jizan, Saudi Arabia (4) Ministry of National Guards Affairs, Riyadh, Saudi Arabia; (5) Department of Medicine, Section of Gastroenterology, King Faisal Specialist Hospital and Research Center, Riyadh, Saudi Arabia; (6) College of Medicine, Alfaisal University, Riyadh, Saudi Arabia; (7) IQVIA Solutions, Riyadh, Saudi Arabia; (8) IQVIA, Gurgaon, India; (9) IQVIA, Haliyal, India; (10) IQVIA, Kottayam, India; (11) IQVIA, Gurugram, India

## INTRODUCTION

- Metabolic dysfunction-associated steatohepatitis (MASH) represents a growing public health and economic burden globally and in Saudi Arabia.
- This is exacerbated by the limited availability of approved treatments and inadequate public health policies to curb its incidence.

## OBJECTIVE

To estimate the direct healthcare costs associated with MASH and its common comorbidities in the Saudi Arabia from a payer perspective using a micro-costing approach

## METHODS

- Study Design:
  - Targeted literature review followed by cross-sectional survey
- Literature Review:
  - Targeted review conducted to identify healthcare resource utilization (HCRU) and cost inputs to inform the micro-costing approach
- Survey Method:
  - In-depth virtual interviews (60–75 minutes) with clinical experts
  - Explored patient volume, diagnosis, treatment patterns, and associated costs
- Survey Focus Areas:
  - Epidemiology of metabolic dysfunction-associated steatohepatitis (MASH)
  - HCRU and costs associated with:
    - Cardiovascular complications
    - Obesity
    - Diabetes
    - Postmenopausal breast cancer
    - Colon cancer
    - Postmenopausal endometrial cancer
- Survey Period:
  - October to December 2024
- Participants:
  - 16 clinical experts across Saudi Arabia with 10–15 years of experience
  - Specialties:
    - Endocrinology (n = 2)
    - Diabetology (n = 2)
    - Oncology (n = 4)
    - Hepatology (n = 4)
    - Cardiology (n = 4)

## RESULTS

- The average annual direct cost per patient increased with disease severity, ranging from USD 4,708.26 at fibrosis stage F0 to USD 104,627.97 for hepatocellular carcinoma.
- Liver transplant costs were USD 75,288.69 in the first year and USD 6,301.26 annually thereafter.
- Among comorbidities, distant colon cancer 31,786.29, obesity (USD 19,066.05), and myocardial infarction (USD 15,930) were among the highest cost drivers.
- Additional economic burden of comorbidities were frequently observed in patients with MASH, including diabetes, stroke, and malignancies.
- Table 1. and 2 provides the overall cost per fibrosis stage and MASH complications based on the micro -costing approach and survey data provided by the KOLs.

Table 1. Overall cost by fibrosis stage

Fibrosis stage	Annual cost (\$)
Fibrosis stage 0	4,650
Fibrosis stage 1	4,835
Fibrosis stage 2	5,952
Fibrosis stage 3	8,479
Compensated cirrhosis	9,835
Decompensated cirrhosis	12,355
Hepatocellular carcinoma	103,336
Liver transplant (year 1)	74,359
Liver transplant (year 2+)	6,223

Table 2. Cost of Complications

Complication	Cost (\$)
Cardiovascular disease	Myocardial infarction (MI) = 15,733, Post MI = 3,597, Stroke= 11,730 , Post-stroke =1,902, Coronary heart disease = 3,834 , Transient ischemic attack (year 1) = 3,997 , Peripheral arterial disease = 3,333, CV death = 1,369
Obesity	Total cost = 18,831
Diabetes (Type 2 diabetes microvascular complications)	Total cost = 5,726
Colon cancer	Colon cancer (year 1) = 9,428 , Localized colon cancer = 9,018 , Regional colon cancer = 5,914 , Distant colon cancer = 31,394
Postmenopausal breast cancer (year 1)	Diagnosis, outpatient visits, and monitoring tests = 8,951 , Chemotherapy = 14,993, Total cost = 23,944
Postmenopausal endometrial cancer	Postmenopausal endometrial cancer (year 1) = 8,428

## CONCLUSIONS

- This study shows that MASH places a heavy economic burden in Saudi Arabia, which increases with disease severity and related health conditions.
- These results stress the need for effective treatments and preventive measures to improve patient outcomes and reduce overall costs.