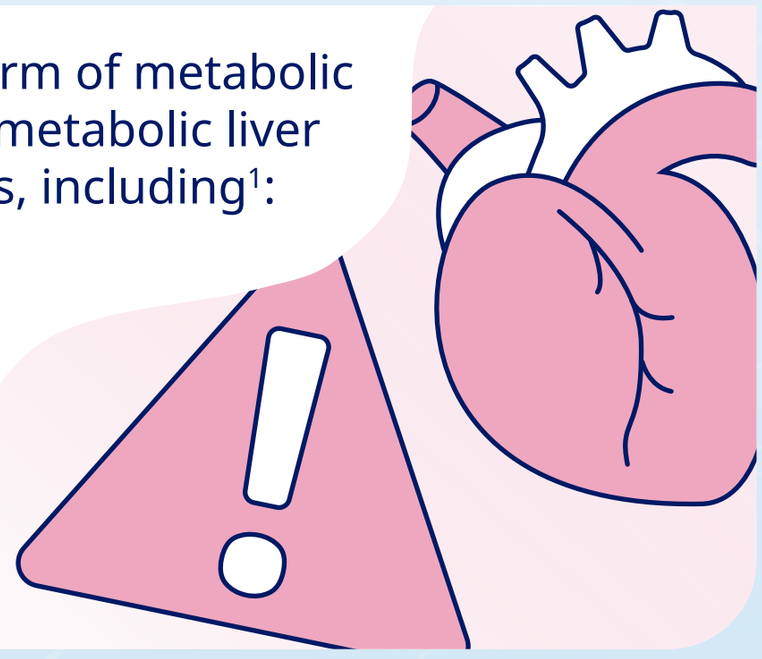
Understanding the socioeconomic and genetic risk factors for MASH

Metabolic dysfunction-associated steatohepatitis (MASH), a severe form of metabolic dysfunction-associated steatotic liver disease (MASLD) is a chronic, metabolic liver disease that is associated with certain cardiometabolic risk factors, including[1]:



- **Obesity**
- **Type 2 diabetes**
- **Hypertension**
- **Dyslipidemia**
  Hypertriglyceridemia and/or low HDL

MASLD and MASH disproportionately impacts populations based on sex and socioeconomic group

Sex differences in MASLD and MASH prevalence:

Men are **19%** more likely to have MASLD than women[2]

Both sexes have similar risk of MASH, the progressive form of MASLD, however women have a **37%** greater risk of advanced fibrosis[2]

Women aged >50 are at an increased risk of MASH and advanced fibrosis[2]

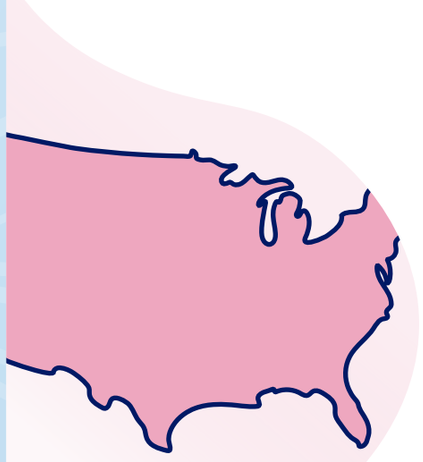
- Lower levels of estrogen in post-menopausal women may contribute to the development of advanced fibrosis[2]

Socioeconomic disparities contribute to MASLD disease burden:

- **Poverty**
- Poor access to **nutritionally adequate food**
- **Food insecurity**

MASLD and MASH burden is higher in certain racial and ethnic populations

Prevalence of MASLD among different racial and ethnic groups in the United States[3-5]



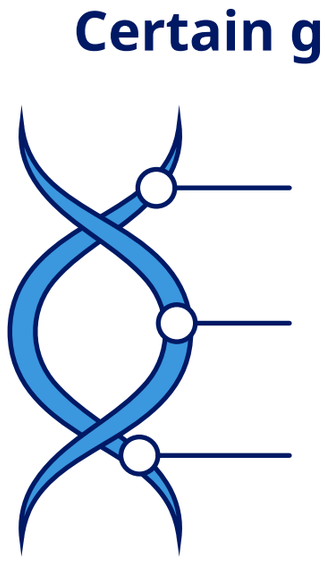
Hispanic Americans: **41.0%***

Asian Americans: **18.1%†**

Black Americans: **18.0%†**

White Americans: **14.4%‡**

Certain genetic determinants can increase risk of MASH, regardless of cardiometabolic health



PNPLA3 variant is strongly linked to an increased risk of MASH associated with more advanced liver disease in Hispanics and lean MASLD in Asian populations[6,7]

TM6SF2 increases liver triglycerides and ALT levels contributing to MASLD risk[8]

HSD17B13 loss of function variant may be associated with protection against MASH development[7]

There are many factors that can increase risk of MASLD and MASH, including sex, genetic factors, socioeconomic group and racial or ethnic subgroups, making it crucial to increase awareness about populations at risk for MASH

** Data for Hispanic American population is pooled prevalence data from a systematic review and meta-analysis quantifying MASLD disease burden to characterize health disparities experienced by adult Hispanic individuals in the United States. † Data for Asian and Black Americans from the National Health and Nutrition Examination Survey 2011-2016 (n=4538). †† Data for White American population is pooled prevalence data from a systematic review and meta-analysis of patients with MASLD, diagnosed using biochemical, radiologic, or histologic criteria per AASLD guidelines.[4]*

ALT, alanine aminotransferase; HDL, high-density lipoprotein; HSD17B13, hydroxysteroid 17-beta dehydrogenase 13; MASH, metabolic dysfunction-associated steatohepatitis; MASLD, metabolic dysfunction-associated steatosic liver disease; PNPLA3, patatin-like phospholipase domain-containing protein 3; TM6SF2, transmembrane 6 superfamily member 2.

1. Younossi ZM et al. Hepatology. 2023;77:1335–1347; 2. Kardashian A et al. Hepatology. 2023;77:1382–1403; 3. Tesfai K et al. Clin Gastroenterol Hepatol. 2025;23:236-249; 4. Le MH et al. J Int Med. 2020;287:711–22; 5. Rich NE et al. Clin Gastroenterol Hepatol. 2018;16:198–210; 6.Yip TCF et al. J Hepatol 2022;76(3):726-734; 20241;119:1089-1101; 7. Riazi K et al. Nutrients. 2022;14:4556; 8. Luo F et al. Hepatol Commun. 2022;6:448-460.