

**Supplementary Table 3.** Liver-related outcomes of lean MASLD compared to non-lean MASLD

Country (year)	BMI criteria	Study design (period)	Asian population (%)	LM, n (%M)	NLM, n (%M)	Age of LM vs. NLM (year) <sup>a</sup>	MASLD diagnosis method	Median follow-up (year)	Liver-related outcomes (LM vs. NLM)	HCC (LM vs. NLM)	Risk modifiers	Ref. NOS
Australia, Italy, Spain, and UK (2021)	Lean: BMI <25 Non lean: BMI ≥25	R (1990–2016)	0.0	195 (75)	1,144 (63)	45 (19) vs. 49 (20)	Histology	7.8	↔ Liver decompensation	↔	NA	4 11
Austria (2021)	Lean: BMI <25 Non lean: BMI ≥25	R (1997–2017)	0.0	39 (58)	257 (74)	47.6±13.7 vs. 49.8±13.3	Histology	8.4	↔ Liver decompensation	NA	NA	6 9
China (2021)	Lean: BMI <25 Non lean: BMI ≥25	P (2010–2015)	100.0	310 (30)	411 (34)	57.1±9.0 vs. 58.0±8.5	US	4.4	↔ Liver fibrosis	NA	High fat mass to fat-free mass ratio was related with development of liver fibrosis in both LM and NLM.	37 8
France (2023)	Lean: BMI <25 or <23 if Asian Non lean: BMI ≥25 or ≥23 if Asian	P (2012–2019)	36.3	3,664 (44)	22,089 (70)	45.1±0.4 vs. 54.9±0.1	FLI	3.6	1 Liver fibrosis 1 LRE	NA	NA	8 8
Hong Kong (2017)	Lean: BMI <25 Non lean: BMI ≥25	P (2006–2015)	100.0	72 (46)	235 (59)	54.0±11.0 vs. 51.0±12.0	Histology	4.1	↔ LRE	↔	NA	9 8
India (2023)	Lean: BMI <23 Non lean: BMI ≥23	R (2000–2022)	100.0	127 (76)	924 (66)	34.0 (20) vs. 40.4 (16)	TE and histology	4.3	↔ Liver fibrosis ↔ Liver decompensation	↔	Older age was positively associated with LRE in LM.	10 9
Japan (2020)	Lean: BMI <25 Non lean: BMI ≥25	R (1976–2019)	100.0	170 (61)	276 (59)	53.0 (18-85) vs. 52.0 (18-87)	US and histology	4.6	↔ LRE	1	NA	12 11
Japan (2023)	Lean: BMI <23 Non lean: BMI ≥23	R (2017–2022)	100.0	219 (38)	362 (62)	58.0±12.0 vs. 59.0±11.0	US	3	↔ LRE	NA	NA	30 9
Japan (2023)	Lean: BMI <23 Non lean: BMI ≥23	R (1996–2022)	100.0	86 (50)	695 (53)	57.5 (18-80) vs. 54.0 (14-82)	Histology	6.5	↔ LRE	NA	Age at least 60 years was positively associated with LRE in LM.	13 8

Supplementary Table 3. Continued

Country (year)	BMI criteria	Study design (period)	Asian population (%)	LM, n (%M)	NLM, n (%M)	Age of LM vs. NLM (year) <sup>a</sup>	MASLD diagnosis method	Median follow-up (year)	Liver-related outcomes (LM vs. NLM)	HCC (LM vs. NLM)	Risk modifiers	Ref. NOS
Japan (2024)	Lean: BMI <23 Non lean: BMI ≥23	R (2016–2021)	0.0	63,456 (10)	555,744 (90)	53.0 (14) vs. 51.0 (13)	FLI	4.2	↔ LRE	NA	Older age, T2DM, dyslipidemia, and smoking were associated with LRE in both LM and NLM.	14 8
South Korea (2021)	Lean: BMI <25 Obese: BMI ≥25	R (2008–2011)	100.0	525 (11)	1,274 (27)	60.5±10.8 vs. 58.2±10.6	LFS	2.0	↑ Liver decompensation	NA	NA	34 8
Sweden (2018)	Lean: BMI <25 Non lean: BMI ≥25	R (1971–2014)	0.0	123 (58)	523 (63)	51.4±13.4 vs. 47.4±13.6	Histology	19.9	↑ LRE	NA	NA	16 9
UK (2024)	Lean: BMI <25 Non lean: BMI ≥25	R (2006–2023)	NA	3,038 (85)	147,258 (62)	58.0±8.0 vs. 57.4±8.0	FLI	13.0	↑ Cirrhosis	↔	NA	18 8
USA (2022)	Lean: BMI <25 or <23 if Asian Non lean: BMI ≥25 or ≥23 if Asian	R (1996–2016)	4.2	414 (34)	4,420 (52)	51.5±18.0 vs. 51.8±14.6	Imaging	6.4	↔ Cirrhosis ↔ Liver decompensation	↔	NA	22 9
USA (2023)	Lean: BMI <25 Obese: BMI ≥25	R (2004–2018)	0.7	2,426 (7)	30,474 (93)	58.3±12.6 vs. 55.9±10.9	FLI	5.5	NA	↑	NA	23 9
USA (2023)	Lean: BMI <25 or <23 if Asian Non lean: BMI ≥25 or ≥23 if Asian	R (2012–2021)	4.9	2,137 (41)	16,457 (48)	51.0 (27) vs. 50.6 (21)	US, TE, histology	4.1	↓ Cirrhosis	NA	NA	24 8

%M, percent of males; BMI, body mass index; FLI, fatty liver index; HCC, hepatocellular carcinoma; LFS, liver fat score; LRE, liver-related events; LM, lean individuals with metabolic dysfunction-associated steatotic liver disease; MASLD, metabolic dysfunction-associated steatotic liver disease; NA, non-applicable; NLM, obese individuals with metabolic-dysfunction associated steatotic liver disease; NOS, Newcastle-Ottawa Scale; P, prospective study; R, retrospective study; T2DM, type 2 diabetes mellitus; TE, transient elastography; US, ultrasonography.

<sup>a</sup>Age of LM vs NLM (year) expressed by mean ± standard deviation or median (interquartile range or range).