

Supplementary Table 1. Mortality of individuals with lean MASLD compared to those with non-lean MASLD

Country (year)	BMI criteria	Study design (period)	Asian population (%)	LM, n (%M)	NLM, n (%M)	Age of LM vs. NLM (year) ^a	MASLD diagnosis method	Median follow-up (year)	Mortality (LM vs. NLM)			Risk modifiers for overall mortality	Ref. NOS		
									Overall	LR	CVD Cancer				
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	↔	NA	NA	NA	Advanced liver fibrosis was positively associated with mortality in both LM and NLM.	4	11
Australia (2022)	Lean: BMI <25 Non lean: BMI ≥25	R (2012–2017)	0.0	35 (2)	1,721 (98)	NA	FLI	5	↔	NA	NA	NA	Older age was positively associated with mortality in both LM and NLM.	5	7
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	↔	↑	↓	↑	NA	6	9
China (2022)	Lean: BMI <23 Non lean: BMI ≥23	P (2006–2019)	100.0	1,543 (75)	21,654 (78)	53.6±11.4 vs. 52.8±11.5	US	14.4	↑	↑	NA	NA	HTN was positively associated with mortality in LM.	7	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	↑	NA	NA	NA	Advanced liver fibrosis was positively associated with mortality in both LM and NLM.	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	↔	NA	NA	NA	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	↔	↓	NA	NA	Older age was positively associated with mortality in both LM and NLM.	10	9

Supplementary Table 1. Continued

Country (year)	BMI criteria	Study design (period)	Asian population (%)	LM, n (%M)	NLM, n (%M)	Age of LM vs. NLM (year) ^a	MASLD diagnosis method	Median follow-up (year)	Mortality (LM vs. NLM)			Risk modifiers for overall mortality	Ref. NOS			
									Overall	LR	CVD Cancer					
Japan (2020)	Lean: BMI <25 Non lean: BMI ≥25	R (1975–2012)	100.0	102 (68)	121 (65)	43.7±14.1 vs. 42.9±14.3	Histology	19.5	↔	NA	NA	NA	Older age and T2DM were positively associated with mortality in both LM and NLM.	11	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	↔	NA	NA	NA	Advanced liver fibrosis and history of liver cancer were positively associated with mortality in LM.	12	11	
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	↔	NA	NA	NA	Age at least 60 years was positively associated with mortality in LM.	13	8	
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	↓	↑	↓	NA	NA	NA	14	8
South Korea (2023)	Lean: BMI <23 Non lean: BMI ≥23	R (2009–2019)	100.0	119,892 (84)	2,121,805 (73)	52.2±12.5 vs. 49.8±12.2	FLI	10.3	↑	NA	NA	NA	T2DM was positively associated with mortality in both LM and NLM.	15	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	↔	↑	↔	NA	Older age, advanced liver fibrosis, and HTN was positively associated with mortality in LM.	16	9	
Thailand (2022)	Lean: BMI <23 Non lean: BMI ≥23	R (2008–2019)	100.0	1,276 (27)	5,807 (31)	53.2±15.2 vs. 48.8±12.7	LAP	8.5	↔	NA	NA	NA	Poor muscle strength was positively associated with mortality in both LM and NLM.	17	9	

Supplementary Table 1. Continued

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									Overall	LR	CVD Cancer				
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	↑	NA	NA	NA	CVD was positively associated with mortality in NLM.	18	8
USA (2014)	Lean: BMI <25 Non lean: BMI ≥25	P (NA)	NA	125 (NA)	965 (NA)	NA	Histology	11.1	↑	NA	NA	NA	NA	19	6
USA (2020)	Lean: BMI <25 Non lean: BMI ≥25	R (1988–1994)	8.8	797 (38.8)	2,344 (54.7)	41.0±4.5 vs. 48.1±3.9	US	22.4	↑	NA	↔	↑	Waist circumference was positively associated with mortality in LM.	20	8
USA (2020)	Lean: BMI <25 Non lean: BMI ≥25	R (1999–2016)	2.5	1,528 (61)	3,183 (49)	NA	FLI	NA	↑	NA	↑	↑	Advanced liver fibrosis and T2DM were positively associated with mortality in both LM and NLM.	21	11
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	↑	NA	NA	NA	NA	22	9
USA (2023)	Lean: BMI <25 Non lean: 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	NA	NA	23	9

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									Overall	LR	CVD Cancer				
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	↑	↔	↔	↔	NA	24	8

%M, percent of males; BMI, body mass index; CVD, cardiovascular-disease-related causes; FLI, fatty liver index; HTN, hypertension; LAP, liver accumulation product; LM, lean individuals with metabolic dysfunction-associated steatotic liver disease; LR, liver-related causes; 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.

^aAge of LM vs NLM (year) expressed by mean±standard deviation or median (interquartile range or range).