

Supplementary Table 1. Body composition data sources.

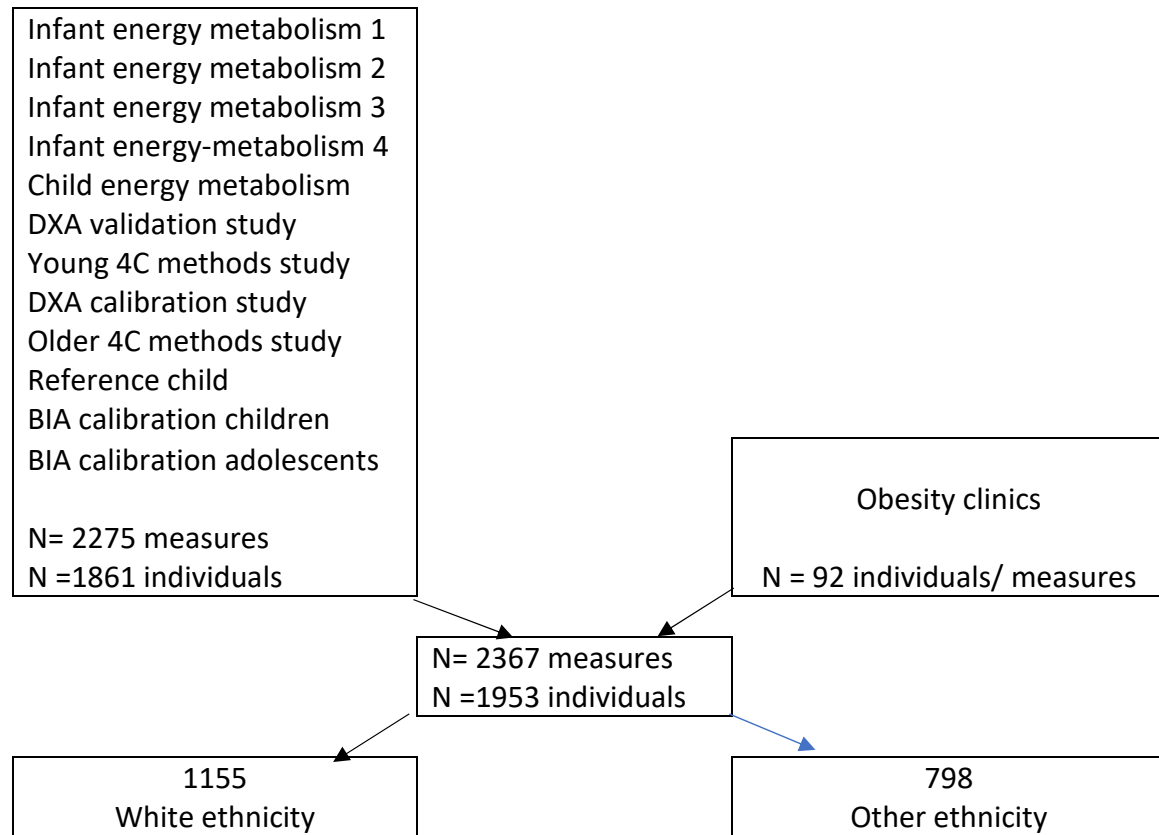
Study (citation)	Period	Age range	Location	% male	Method used	Number of subjects	Number of measures	Number of measures per subject
Infant energy metabolism 1 (16)	1987-1988	1.5m – 9m	Cambridge	37.5	D ₂ O	51	157	1-4 (median 3)
Infant energy metabolism 2 (17, 18)	1992-1995	3m – 3y	Cambridge	50.0	D ₂ O	42	58	1-2
Infant energy metabolism 3 (19, 20)	1995-1997	9m – 2y	Cambridge	49.0	D ₂ O	35	53	1-2
Infant energy-metabolism 4 (21)	2007-2008	4 – 6m	Glasgow	50.0	D ₂ O	28	56	2
Child energy metabolism (22)	1991-1992	1.5 – 4.5y	Cambridge	51.9	D ₂ O	77	77	1
DXA validation study (23)	1995-1996	5 – 11y	Cambridge	51.2	D ₂ O	41	41	1
Young 4C methods study (24)	2001-2002	4 – 7y	Cambridge	50.0	4C	20	20	1
DXA calibration study (15)	2000	8 – 9y	Bristol	50.0	D ₂ O	50	50	1
Older 4C methods study (14)	1996-1997	8 – 12y	Cambridge	53.3	4C	30	30	1
Reference child (12)	2001-2016	4 – 20 y	London	49.4	4C	509	755	1-5 (median 1)
BIA validation children (25)	1995-1996	5 – 11y	London	47.5	D ₂ O	598	598	1
BIA calibration adolescents (26)	2008-2009	11 – 15y	London	47.1	D ₂ O	380	380	1
Obesity clinics (27, 28)	2003-2008	6 – 19y	London	38.0	4C	92	92	1

Age: m – months, y – years; Method: D₂O – deuterium dilution, 4C – 4-component model

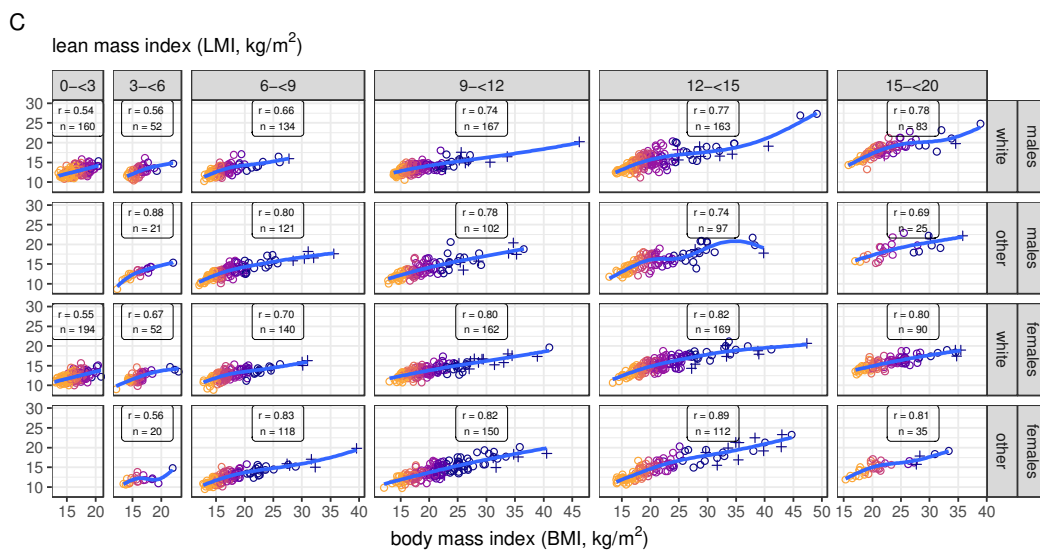
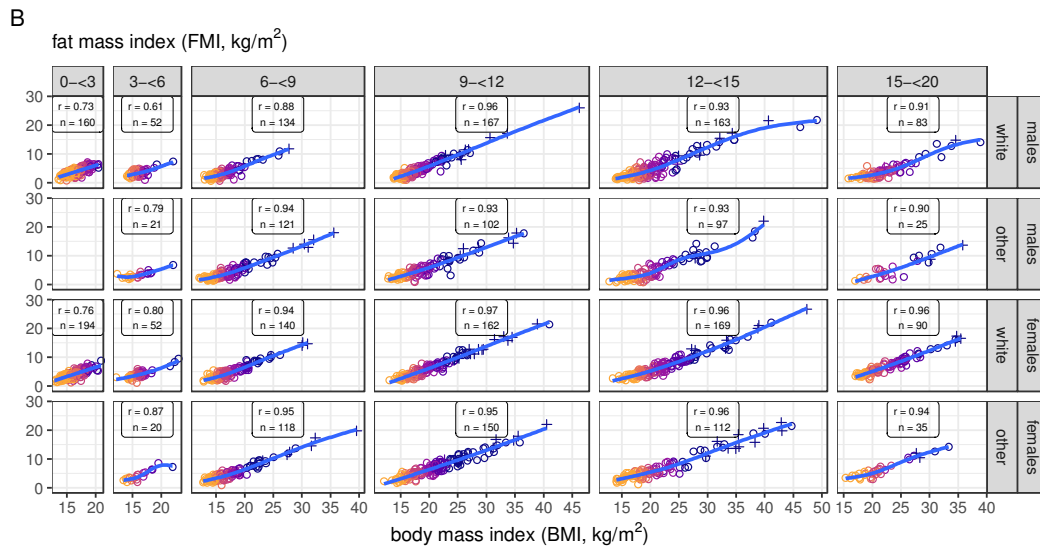
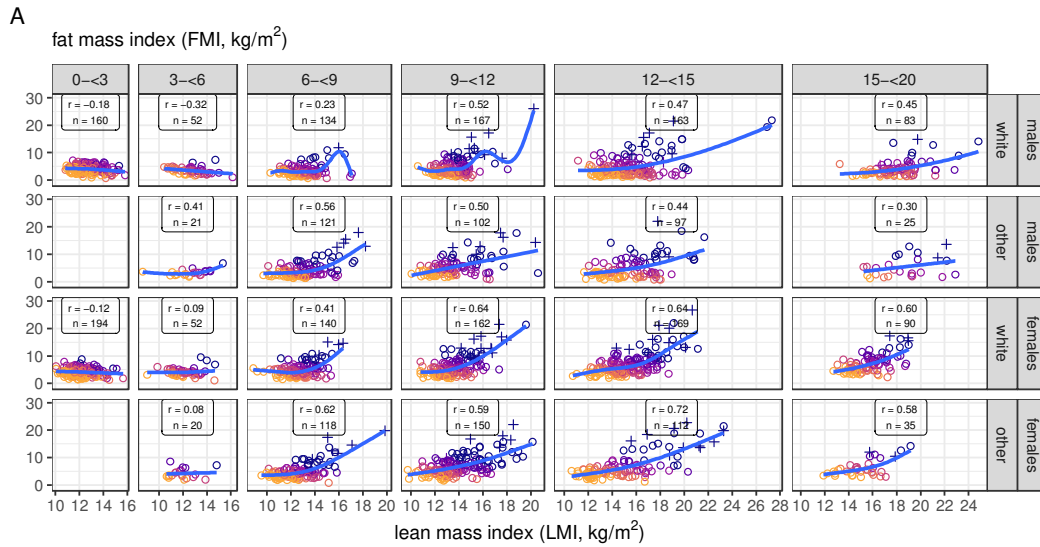
Supplementary Table 2. Linear regression results for Figure 2 by sex and age group.

Sex	Age group (years)	Correlation coefficient + 95% CI	Regression coefficient + 95% CI
FMI-LMI			
boys	0-<3	-0.18 (-0.33, -0.03)	-0.23 (-0.43, -0.03)
girls	0-<3	-0.12 (-0.26, 0.03)	-0.15 (-0.33, 0.03)
boys	3-<6	-0.09 (-0.32, 0.15)	-0.08 (-0.30, 0.14)
girls	3-<6	0.08 (-0.16, 0.31)	0.11 (-0.21, 0.43)
boys	6-<9	0.44 (0.34, 0.54)	0.77 (0.57, 0.97)
girls	6-<9	0.53 (0.44, 0.62)	1.03 (0.83, 1.23)
boys	9-<12	0.5 (0.40, 0.59)	1.03 (0.81, 1.25)
girls	9-<12	0.61 (0.53, 0.67)	1.24 (1.06, 1.42)
boys	12-<15	0.46 (0.36, 0.55)	0.79 (0.59, 0.99)
girls	12-<15	0.68 (0.60, 0.74)	1.21 (1.05, 1.37)
boys	15-<20	0.42 (0.24, 0.56)	0.64 (0.36, 0.92)
girls	15-<20	0.6 (0.48, 0.70)	1.23 (0.93, 1.53)
FMI-BMI			
boys	0-<3	0.73 (0.65, 0.80)	0.63 (0.53, 0.73)
girls	0-<3	0.76 (0.70, 0.82)	0.64 (0.56, 0.72)
boys	3-<6	0.65 (0.49, 0.77)	0.47 (0.35, 0.59)
girls	3-<6	0.82 (0.73, 0.89)	0.64 (0.54, 0.74)
boys	6-<9	0.92 (0.90, 0.94)	0.68 (0.64, 0.72)
girls	6-<9	0.95 (0.93, 0.96)	0.70 (0.68, 0.72)
boys	9-<12	0.95 (0.93, 0.96)	0.72 (0.70, 0.74)
girls	9-<12	0.96 (0.95, 0.97)	0.71 (0.69, 0.73)
boys	12-<15	0.93 (0.91, 0.94)	0.68 (0.64, 0.72)
girls	12-<15	0.96 (0.95, 0.97)	0.67 (0.65, 0.69)
boys	15-<20	0.91 (0.86, 0.94)	0.64 (0.58, 0.70)
girls	15-<20	0.96 (0.94, 0.97)	0.71 (0.67, 0.75)
LMI-BMI			
boys	0-<3	0.54 (0.41, 0.64)	0.37 (0.27, 0.47)
girls	0-<3	0.55 (0.44, 0.64)	0.36 (0.28, 0.44)
boys	3-<6	0.7 (0.55, 0.80)	0.53 (0.41, 0.65)
girls	3-<6	0.63 (0.47, 0.76)	0.36 (0.26, 0.46)
boys	6-<9	0.75 (0.69, 0.80)	0.32 (0.28, 0.36)
girls	6-<9	0.78 (0.72, 0.82)	0.30 (0.28, 0.32)
boys	9-<12	0.75 (0.69, 0.80)	0.28 (0.26, 0.30)
girls	9-<12	0.81 (0.77, 0.85)	0.29 (0.27, 0.31)
boys	12-<15	0.76 (0.70, 0.81)	0.32 (0.28, 0.36)
girls	12-<15	0.86 (0.82, 0.89)	0.33 (0.31, 0.35)
boys	15-<20	0.76 (0.67, 0.83)	0.36 (0.30, 0.42)
girls	15-<20	0.81 (0.74, 0.86)	0.29 (0.25, 0.33)

Supplementary Figure 1: Flow diagram



Supplementary Figure 2: Scatterplots of A) FMI against LMI, B) FMI against BMI and C) LMI against BMI by age group, ethnicity and sex, each with Pearson correlation coefficient r , sample size n , cubic P-spline regression curve and 95% confidence band. Points are color-coded by BMI centile group: yellow <25th, orange 25<50th, mauve 50<75th, purple 75<91st, dark purple 91<98th, navy blue >98th: obesity clinic patients shown as '+'.



BMI centile ● 0-<25 ● 25-<50 ● 50-<75 ● 75-<91 ● 91-<98 ● 98-<100 source ○ sample + clinic