Belgian Society for GERONTOLOGY and GERIATRICS

MUSCLE MASS
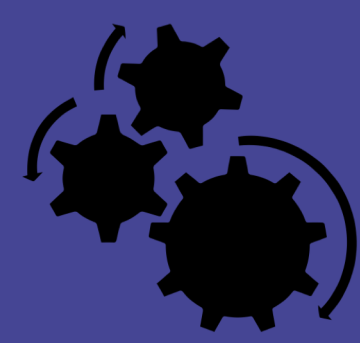## Sarcopenia Guidelines 2018 - Assessment
BVGG - SBGG

Fat Free Mass — (BIA) [kg] / kg.m^{-2}]
Appendicular Lean Mass — (DXA) [kg]
Appendicular Lean Mass — (DXA) [kg.m^{-2}]
Lean Body Mass — (DXA) [kg]

WHY?

Muscle mass is one of the subdimensions of sarcopenia according to EWGSOP.
Various components of body composition as well as different measurement techniques to estimate muscle mass are described in literature.

The proposed findings can be seen as a call for more research which uses relative muscle mass data.

HOW?

A systematic search on reference values for muscle mass was performed:

- *Population*: young/healthy men & women (20-39)
- *Exposure*: muscle mass assessed by DXA or BIA
- *Outcome*: reference values
- *Study design*: observational / RCT (baseline)
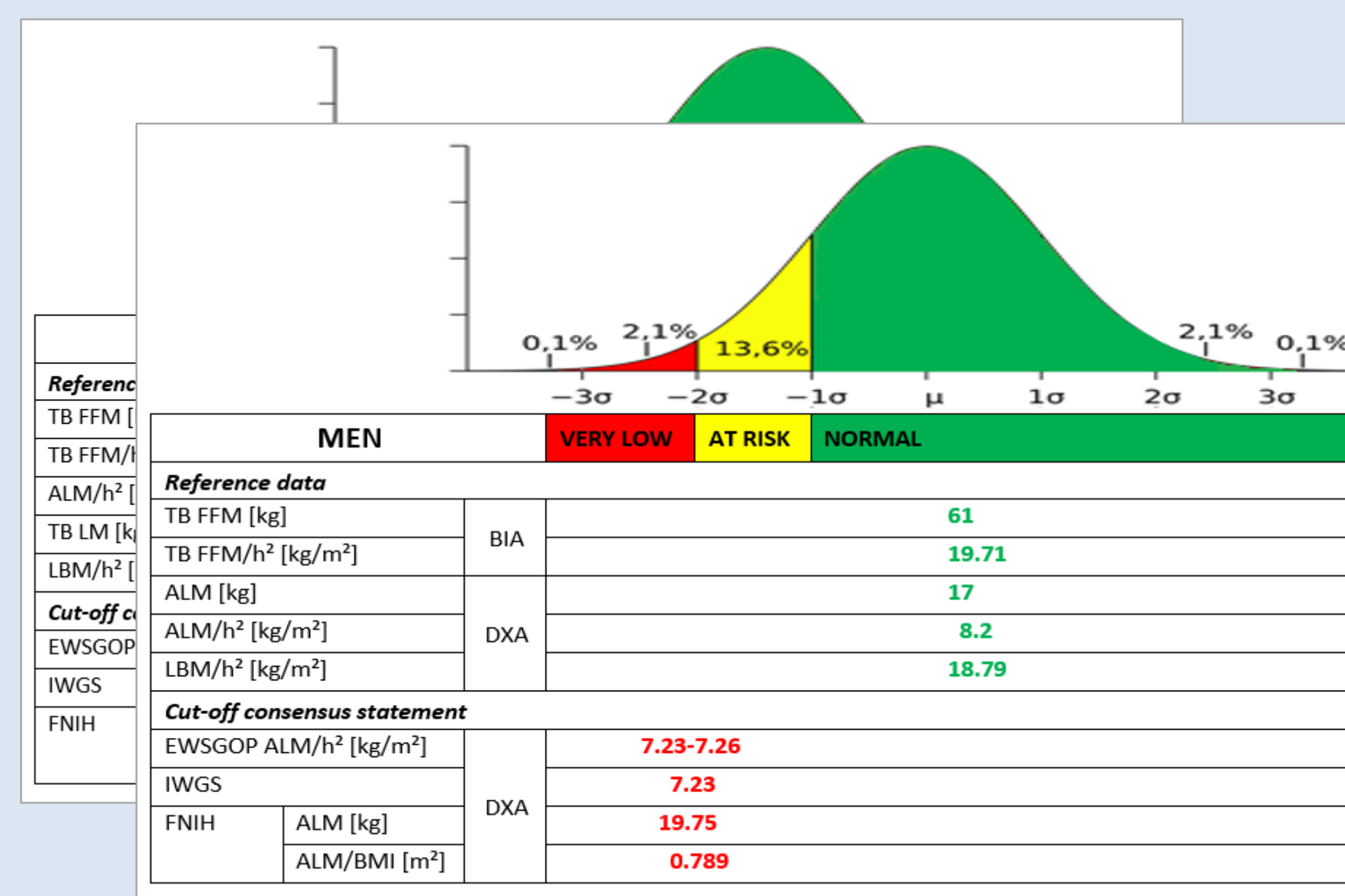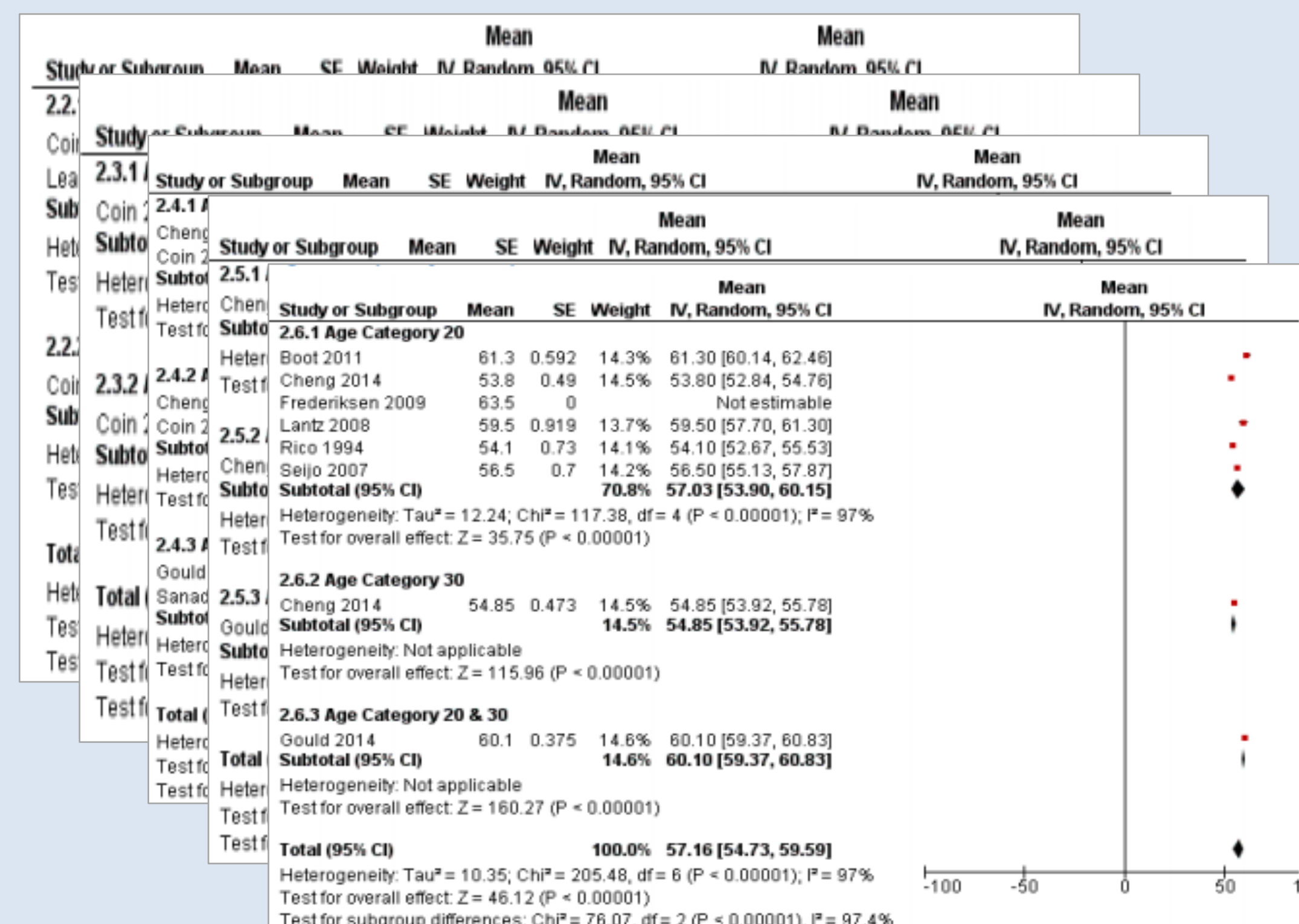- *Quality assessment*: COSMIN checklist

DATA HANDLING

Initial umbrella review revealed no relevant systematic reviews. Subsequently a systematic search was performed and revealed 2645 eligible reviews of which 22 were finally included.

Mean, standard deviation and number of participants was retrieved. Subsequently standard error, pooled degrees of freedom and pooled standard deviation was calculated. Due to high heterogeneity and low number of studies we were not able to calculate T-scores.

Mostly data regarding **absolute** muscle mass was found in the included papers. No proper **adjusted** data for height or body weight was reported.

STOP

❯ **Absolute muscle mass values**

❯ **High heterogeneity**

❯ **Low number of studies**

GO

CUT-OFF CONSENSUS STATEMENT

	DXA	MALE	FEMALE
EWGSOP	ALM/h^2 [kg/m^2]	$7.23 - 7.26$	$5.50 - 5.67$
IWGS	ALM/h^2 [kg/m^2]	7.23	5.67
FNIH	ALM [kg]	19.75	15.02
	ALM/BMI [m^2]	0.789	0.512

Legend: EWGSOP: European Working Group on Sarcopenia in Older People; IWGS: International Working Group on Sarcopenia; FNIH: Foundation for the National Institutes of Health Sarcopenia; DXA: Dual-energy X-ray absorptiometry, BIA: Bioelectrical impedance;

🌐 RECOMMENDATION

- We want to warn clinicians that **different components of body composition** are described in literature to estimate muscle mass in the context of sarcopenia. These depend on the techniques and devices that have been used, for example Dual-energy X-Ray absorptiometry (lean body mass, appendicular lean mass) or Bioelectrical impedance analysis (fat free mass (including bone), lean body mass (excluding bone)).
- For estimating the muscle mass in the context of sarcopenia, we recommend to use **relative indices** (height, body weight); e.g. appendicular lean mass (ALM, assessed by DXA or BIA) corrected by height^2 or BMI. For clinical routine, we do not recommend to use other types of medical imagery.
- We recommend the use of **cut-off values for relative muscle mass** that are proposed by the **international working groups on sarcopenia** (EWGSOP, FNIH, IWGS).

REFERENCES: Andreoli, A., et al. (2011). "Relationship between body composition, body mass index and bone mineral density in a large population of normal, osteopenic and osteoporotic women." La Radiologia medica 116(7): 1115-1123.; Boot, A. M., et al. (2011). "The relation between 25-hydroxyvitamin D with peak bone mineral density and body composition in healthy young adults." Journal of pediatric endocrinology & metabolism: JPEM 24(5): 355-360.; Cheng, Q., et al. (2014). "A cross-sectional study of loss of muscle mass corresponding to sarcopenia in healthy Chinese men and women: reference values, prevalence, and association with bone mass." Journal of bone and mineral metabolism 32(1): 78-88; and 19 others; icons from thenounproject.com.