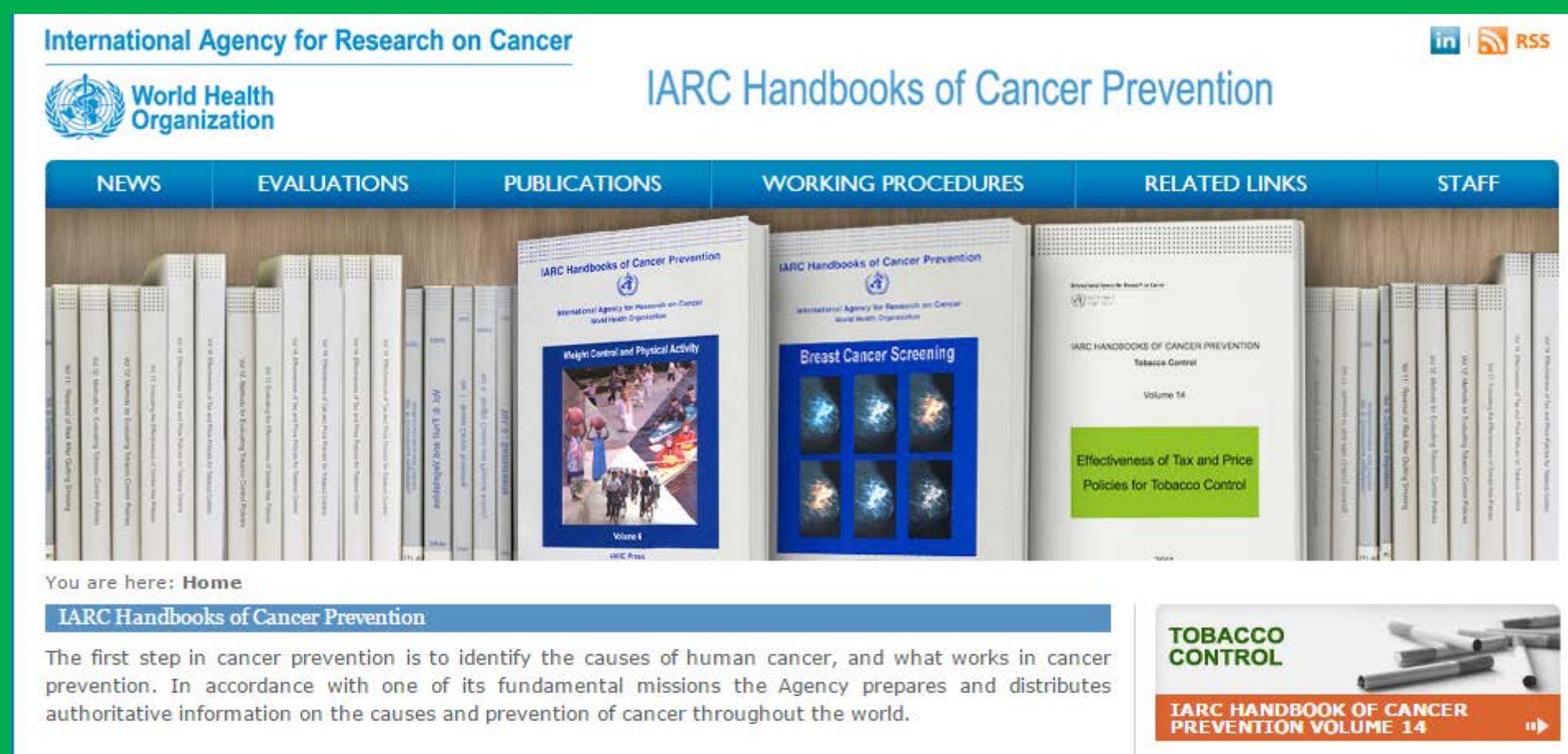


# IARC Handbooks of Cancer Prevention Vol. 16 - Body fatness

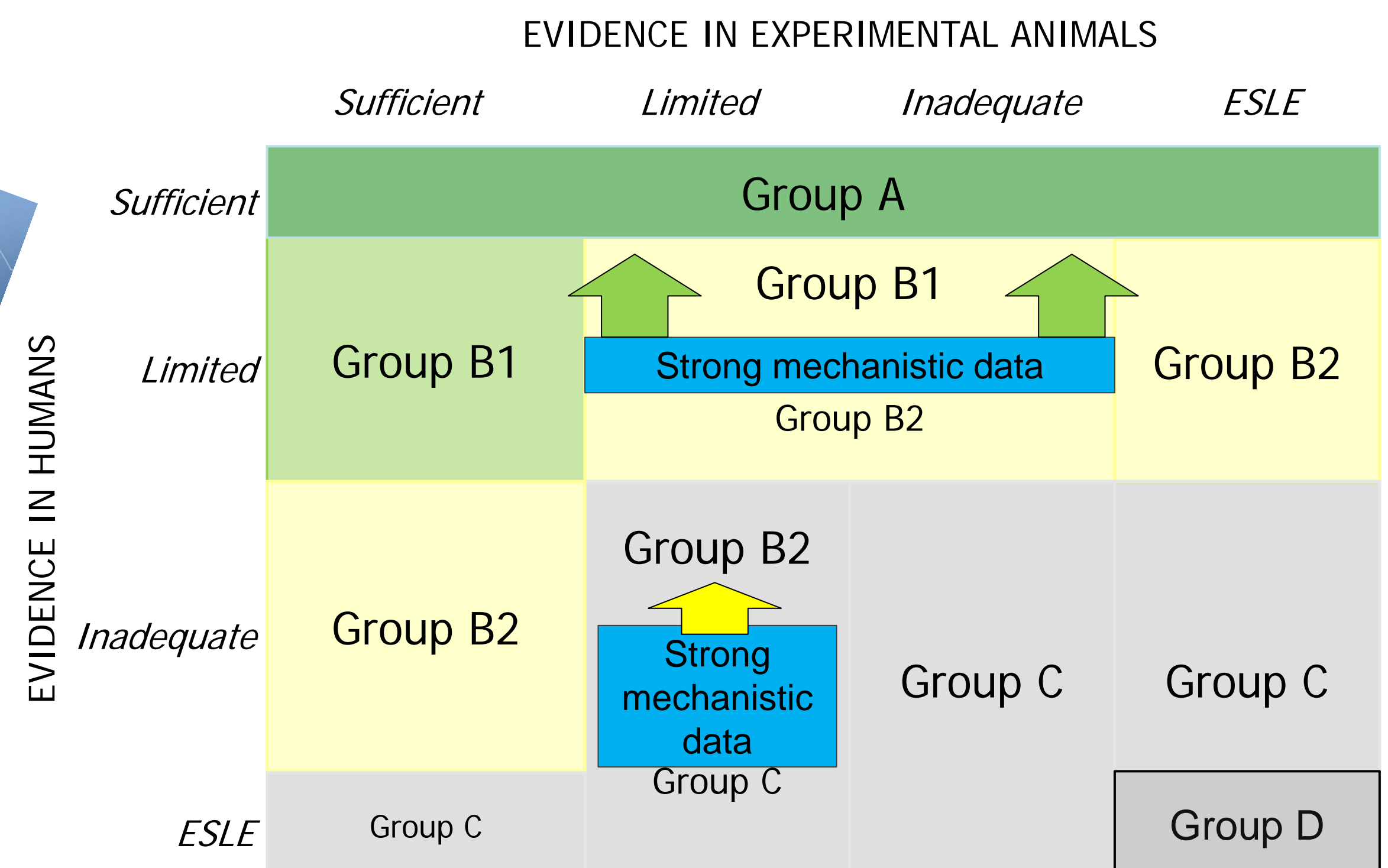
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## The IARC Handbooks of Cancer Prevention Series



- ✓ Dedicated website @ <http://handbooks.iarc.fr>
- ✓ Handbooks Vol. 1-14 available free of charge on the website
- ✓ Detailed tables of evaluations for Vol. 1 through 15
- ✓ Updated Working Procedures

## Evaluation scheme

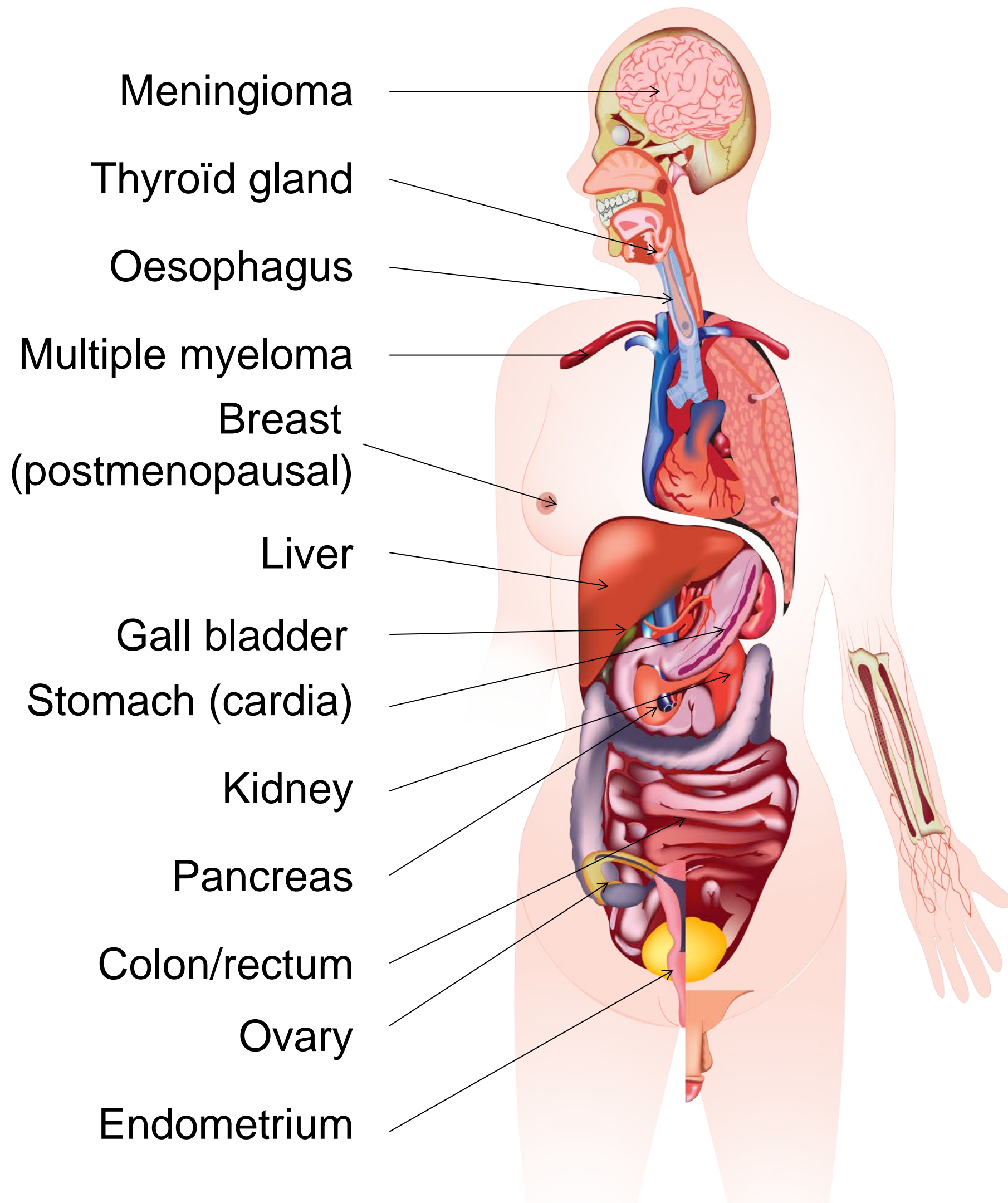


## Evaluation of excess body fatness / weight

- Fat facts (2013/14):** 640 million adults obese (six-fold increase since 1975); 110 million children obese (two-fold increase since 1980)  
 Estimated prevalence of obesity of 10.8% in men, 14.9% in women, 5.0% in children  
 4.5 million deaths worldwide caused by overweight and obesity, i.e. 8-9% of total global mortality (Arnold et al., 2016)
- Excess body fatness:** Linked to energy imbalance, with more energy absorbed than spent  
 Most commonly measured with BMI (in kg/m<sup>2</sup>)

### Data of cancer in humans

Excess body fatness in adults : cancer sites with *sufficient* evidence



Excess body fatness in children, adolescents and young adults: same sites as those observed with excess body fatness in adulthood, except for post-menopausal breast

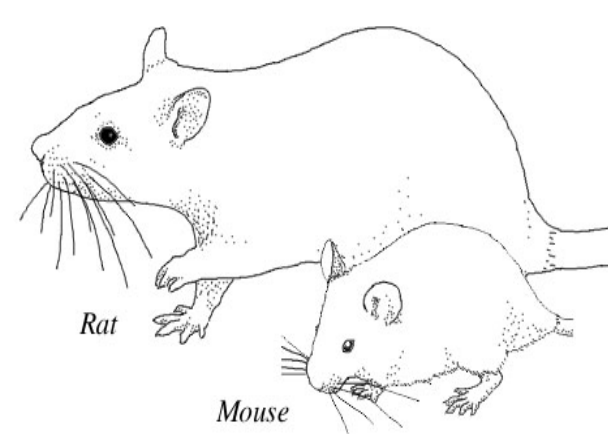
Excess body fatness in cancer survivors: evidence supporting an association between increased BMI and cancer-related mortality in breast cancer survivors

Sustained body-weight loss and cancer risk: intervention trials & studies of bariatric surgery suggest that intentional weight loss may reduce cancer risk, notably of the breast and endometrium.

### Data in experimental animals

Effect of obesity (genetic or diet-induced) on tumour incidence:

Studies on obesity were not formally evaluated. Available data showed that obesity in rodents promotes tumorigenesis and increases the age-specific incidence of several cancers.



Effect of dietary/caloric restriction on tumour incidence:

There is *sufficient* evidence in experimental animals for a cancer-preventive effect of limitation of body-weight gain by dietary restriction. Limitation of body-weight gain by dietary restriction prevents cancer of the mammary gland, colon, liver, pancreas, skin, and pituitary gland. In addition, an association has been observed for cancer of the prostate, and for lymphoma and leukaemia.

### Mechanistic data

Mechanisms of cancer prevention in the context of obesity

MECHANISM	EVIDENCE
KEY MECHANISM	
Sex hormones metabolism	strong
Inflammation	strong
Insulin and IGF1-signalling	moderate
Cell proliferation, apoptosis and angiogenesis	(convincing)*
Oxidative stress	weak
DNA repair	weak
Epigenetics	weak
Immortalization/Telomere length	weak
OTHER MECHANISMS	
Vitamin D status	weak
Microbiome	weak
Immune function	weak
Gut hormones	weak
Non-alcoholic fatty liver disease and non-alcoholic steatohepatitis	weak

\* This key characteristic was not evaluated formally.

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