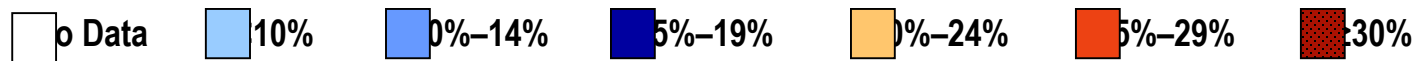
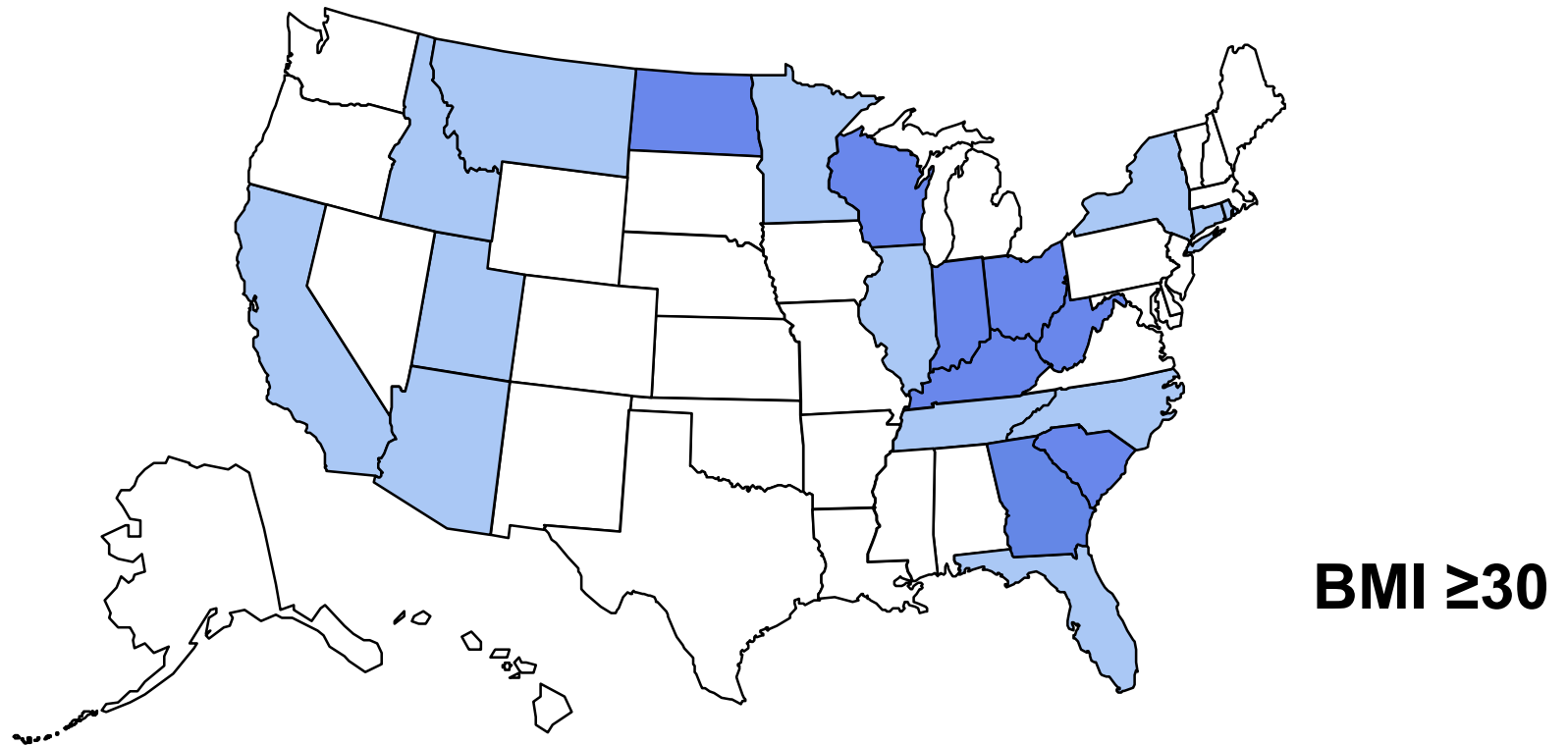
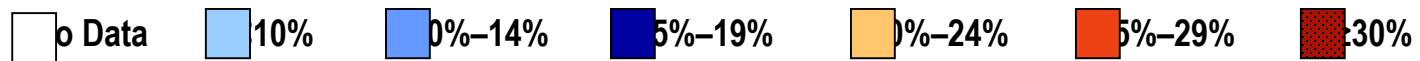
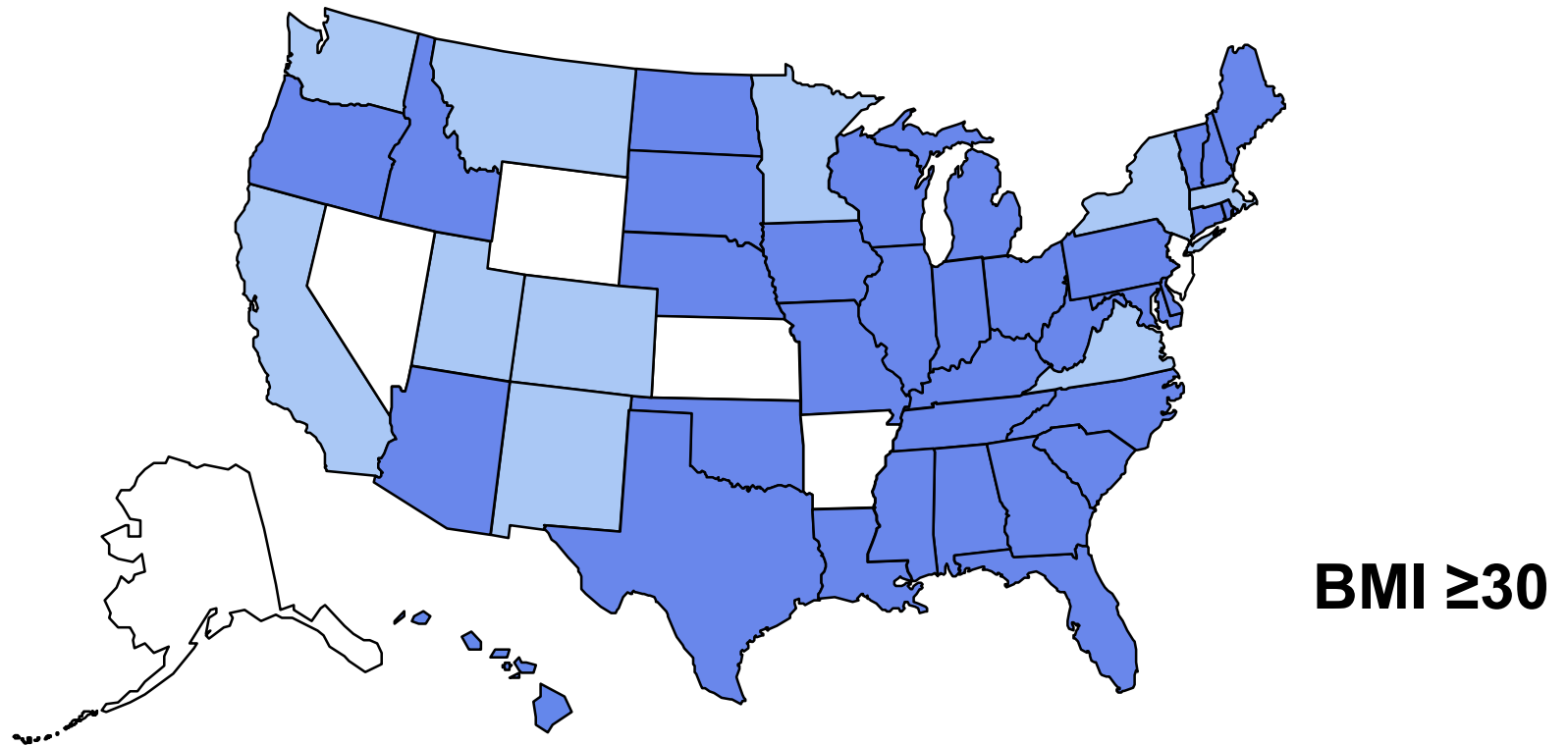


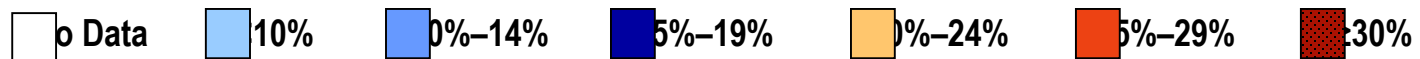
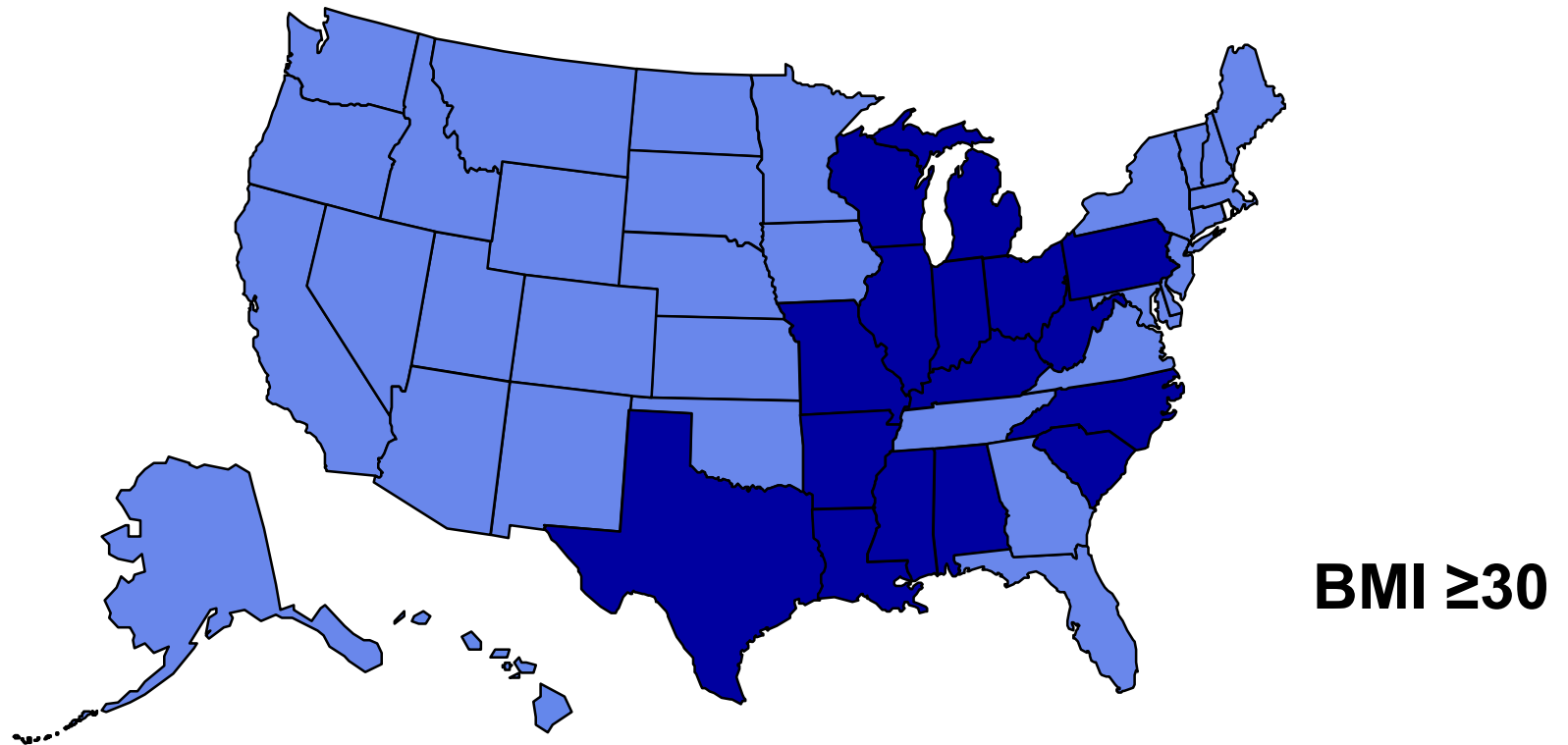
Obesity in the USA - 1985



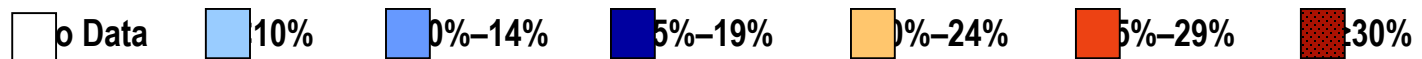
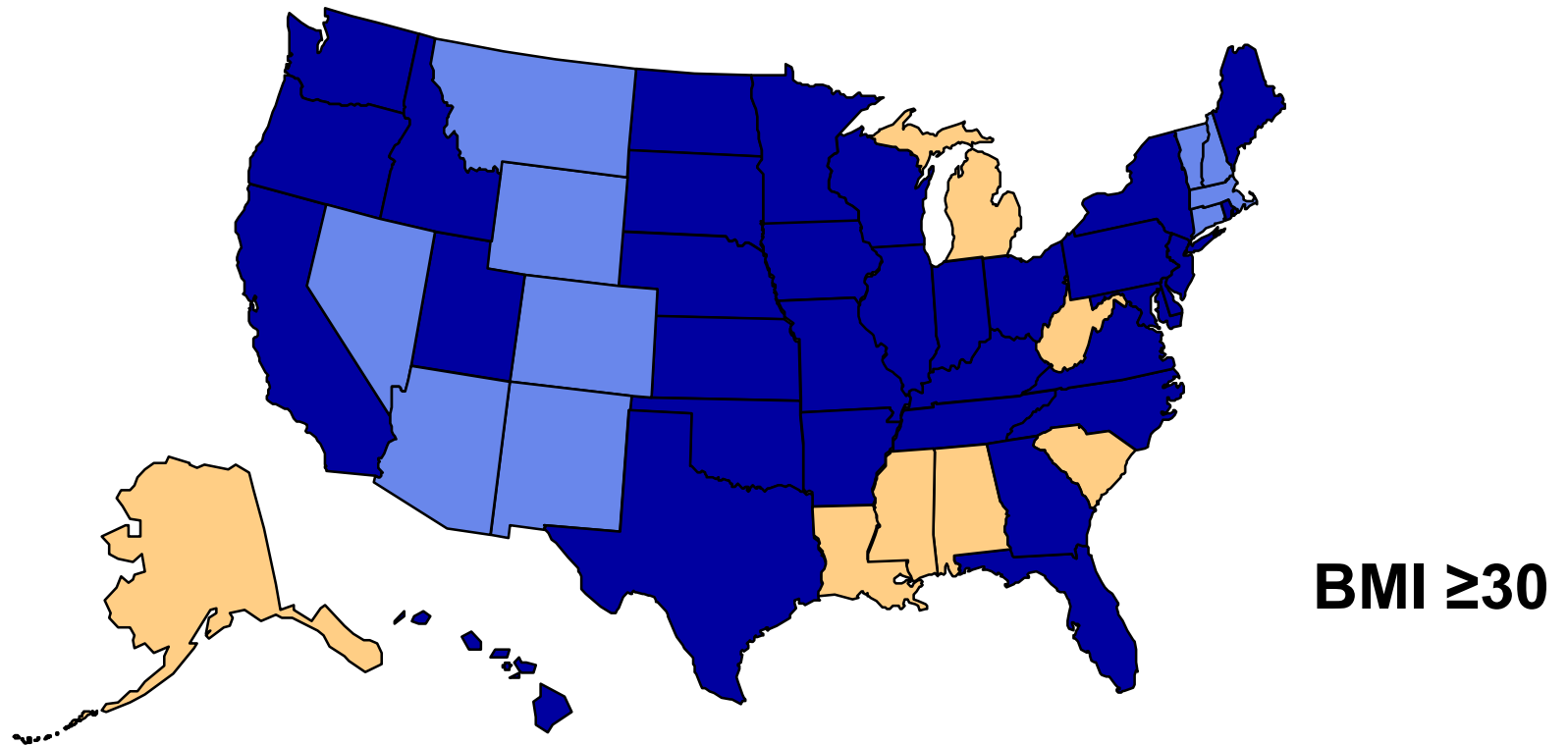
Obesity in the USA - 1990



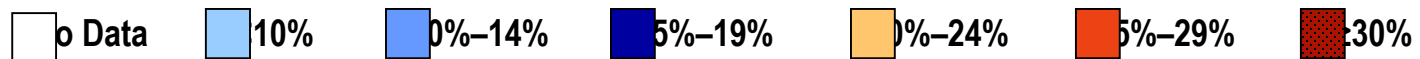
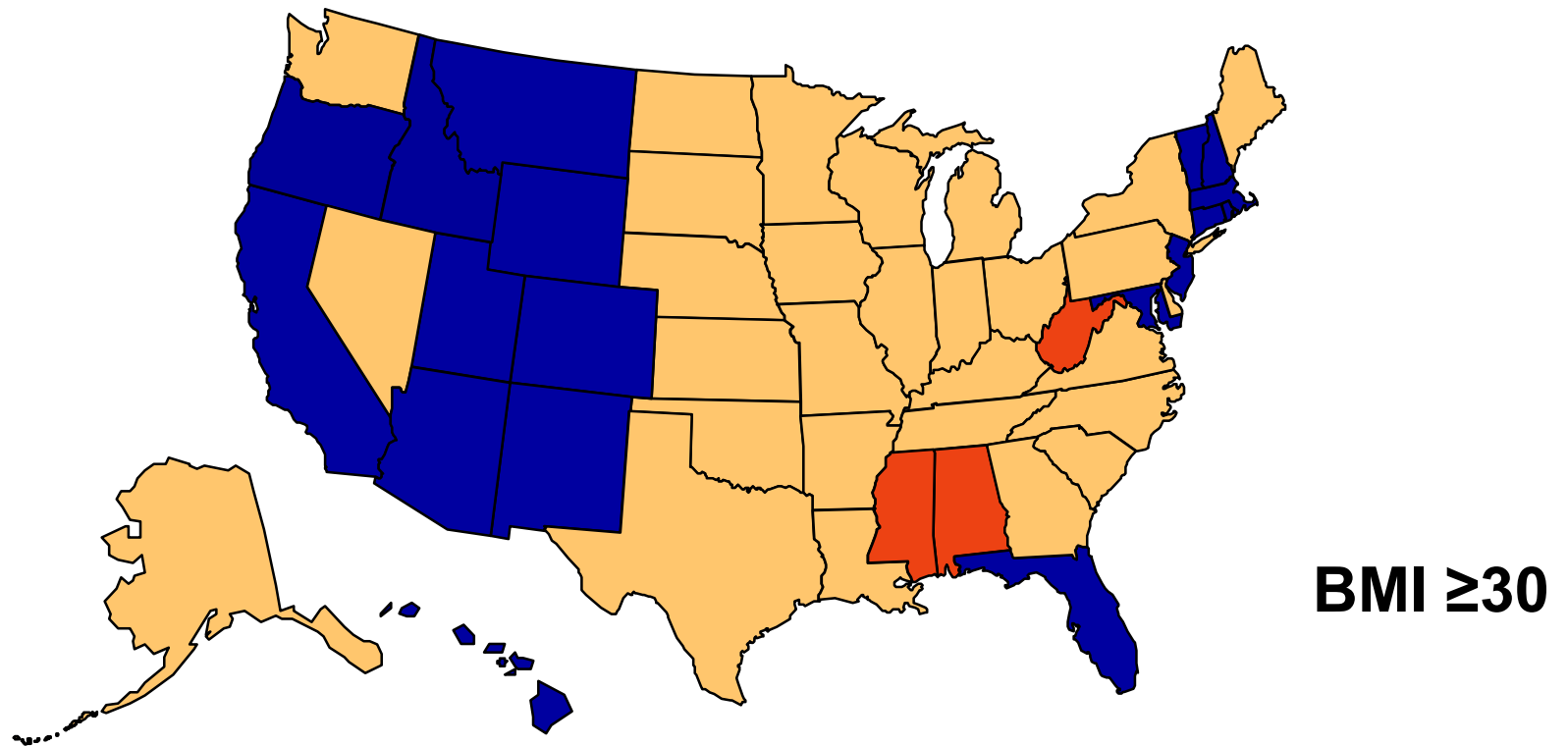
Obesity in the USA - 1994



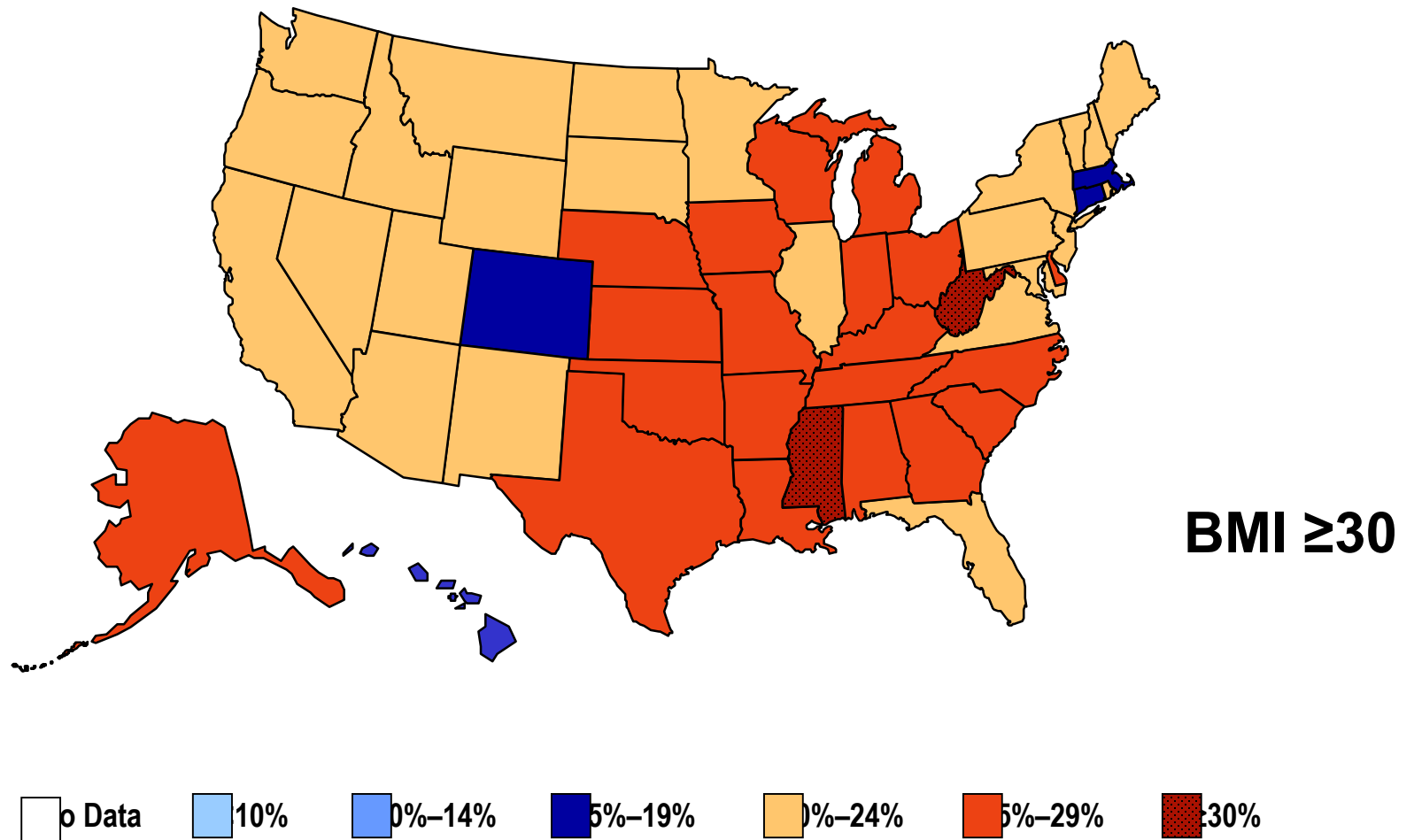
Obesity in the USA - 1998



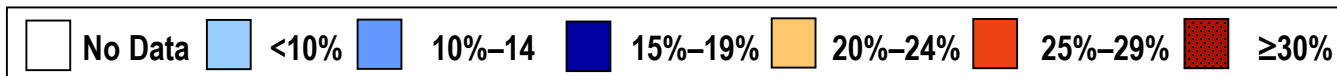
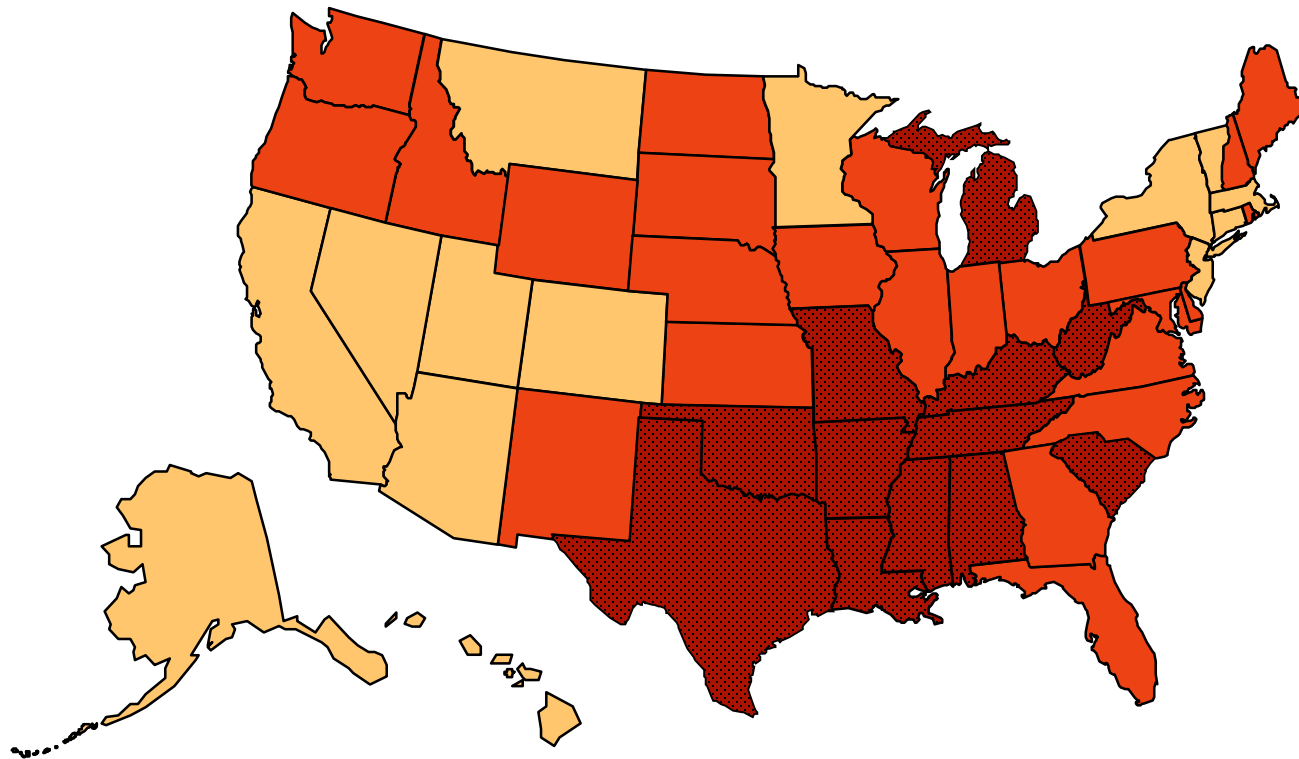
Obesity in the USA - 2002



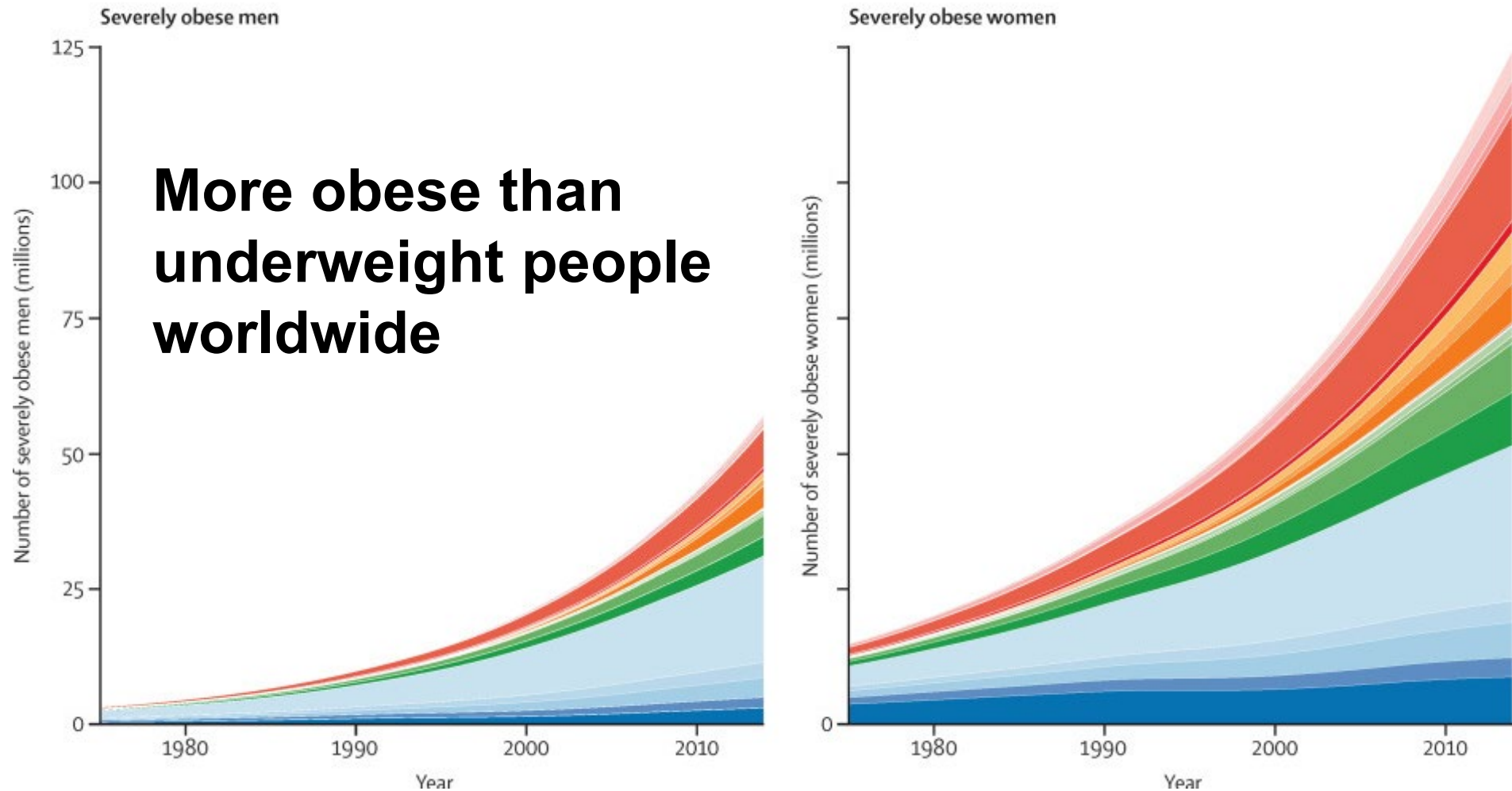
Obesity in the USA - 2006



Obesity in the USA 2010



Rising Obesity Levels Worldwide

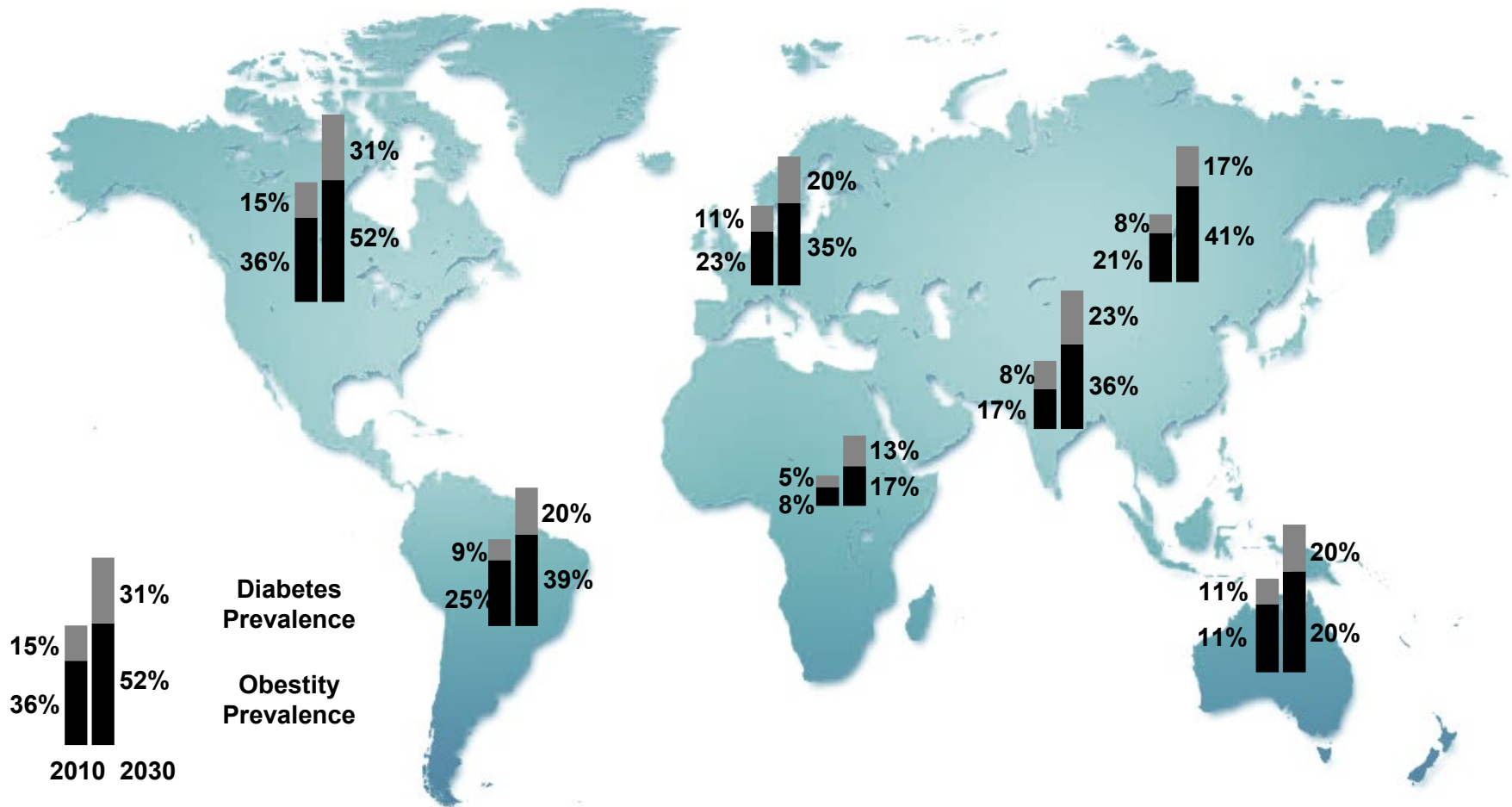


Obesity co-morbidities

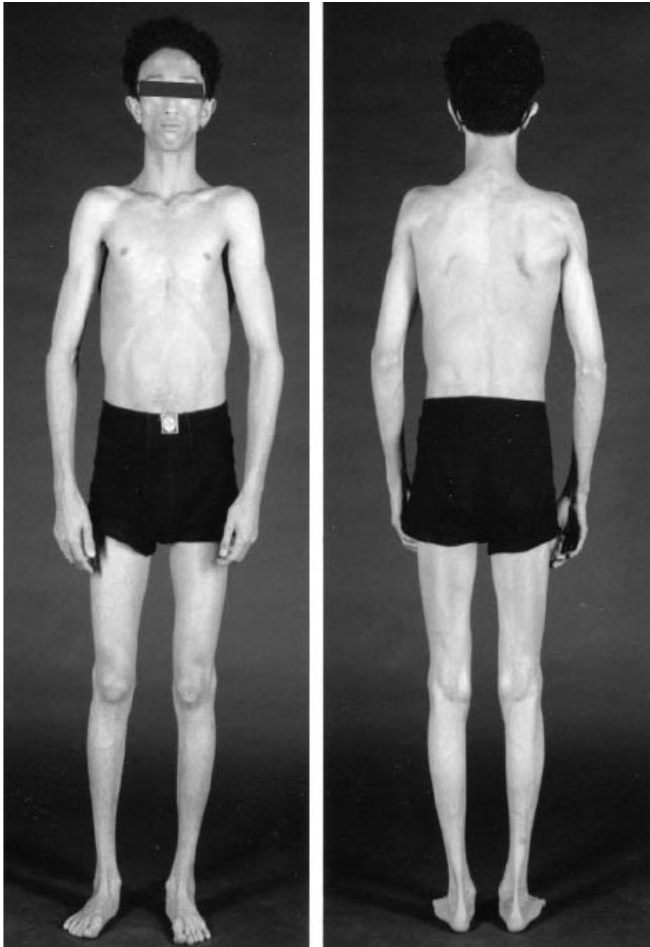


- **Dyslipidemia**
- **Hepatic steatosis**
- **Cardio-vascular diseases**
- **Insulin resistance/Typ 2 Diabetes**
- **Depression**
- **Cancer**

Typ 2 Diabetes und Adipositas

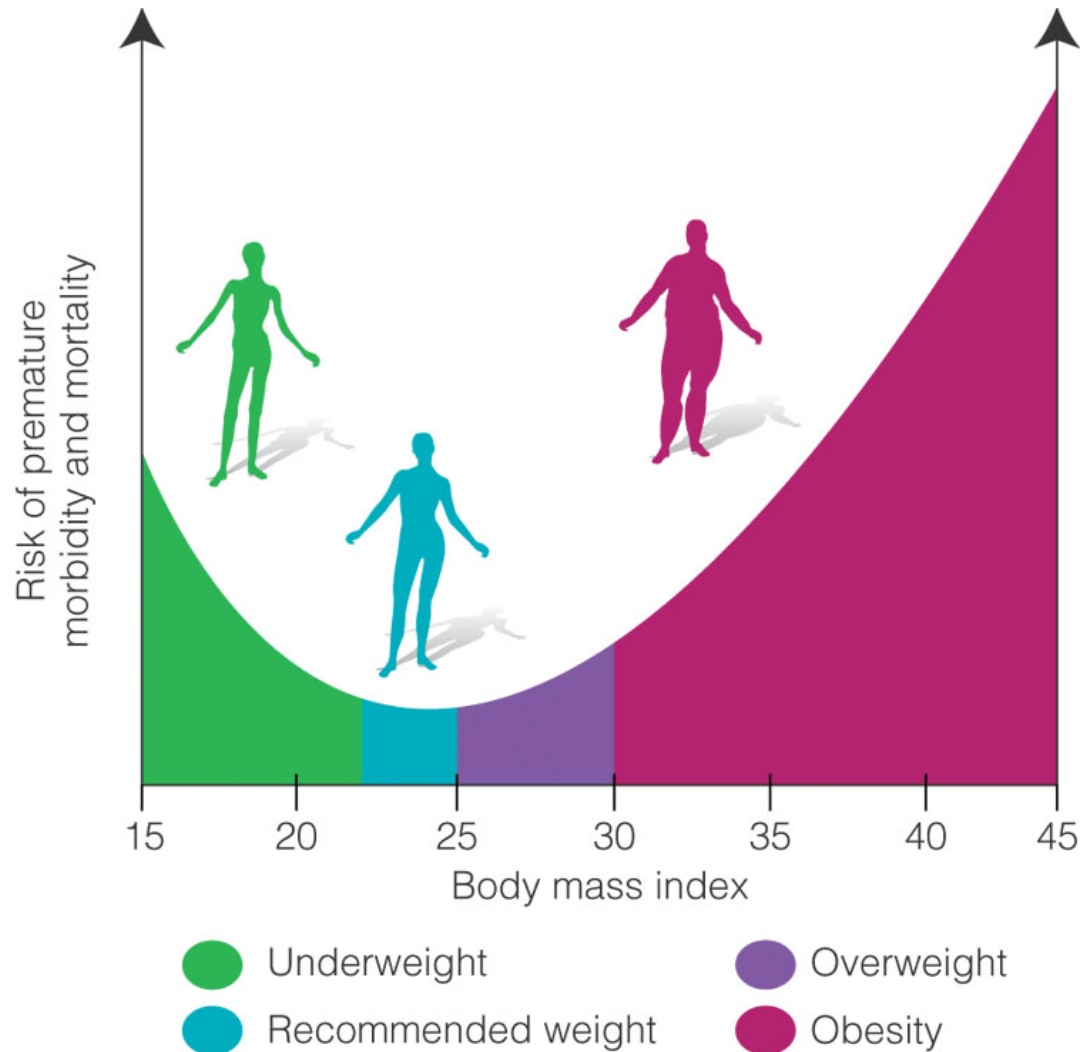


Lipodystrophic co-morbidities



- **Dyslipidemia**
- **Hepatic steatosis**
- **Cardio-vascular diseases**
- **Insulin resistance/Typ 2 Diabetes**
- **Depression**
- **Cancer**

BMI dependent risk of death



Lecture: Molecular Disease Mechanisms

Obesity and Energy Metabolism (2h)

Central Control of Food Intake (2h)

Obesity and Insulin Resistance (2h)

Insulin Resistance and Type 2 Diabetes (2h)

Hepatic Lipid Metabolism/Steatosis (2h)

Endothelial Function and Hypertension (2h)

Lipid Metabolism and Cardiovascular

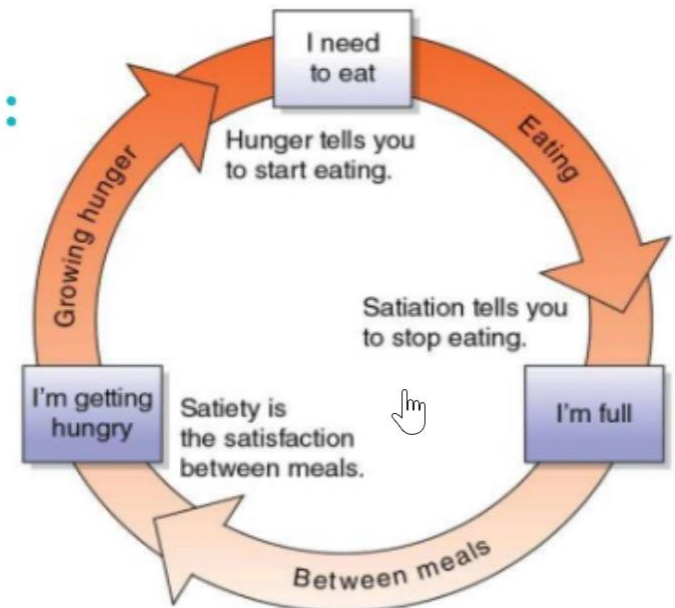
Complications (4h)

Paper discussion (2h)

- **Hunger**- sensation associated with the drive to eat
- **Appetite**- psychological desire to eat
- **Satiation**- termination of eating after hunger has been satisfied

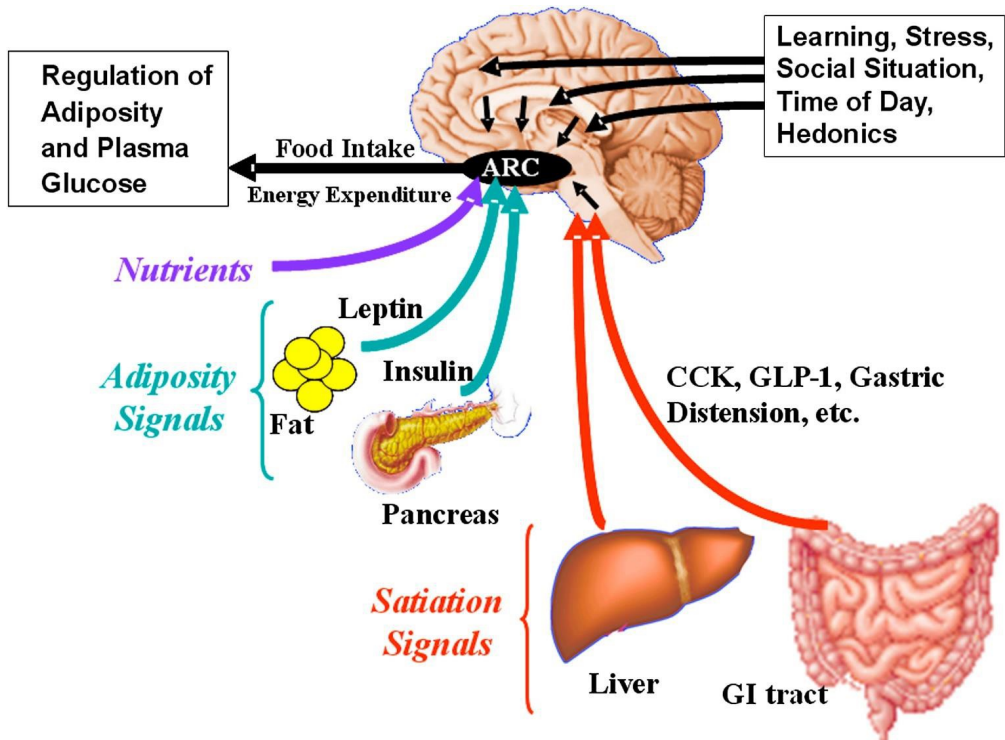
Feeding cycle :

- **Appetite**
 - **Hunger**
- Eat
- **Satiation**
 - **Satiety**
- Stop eating



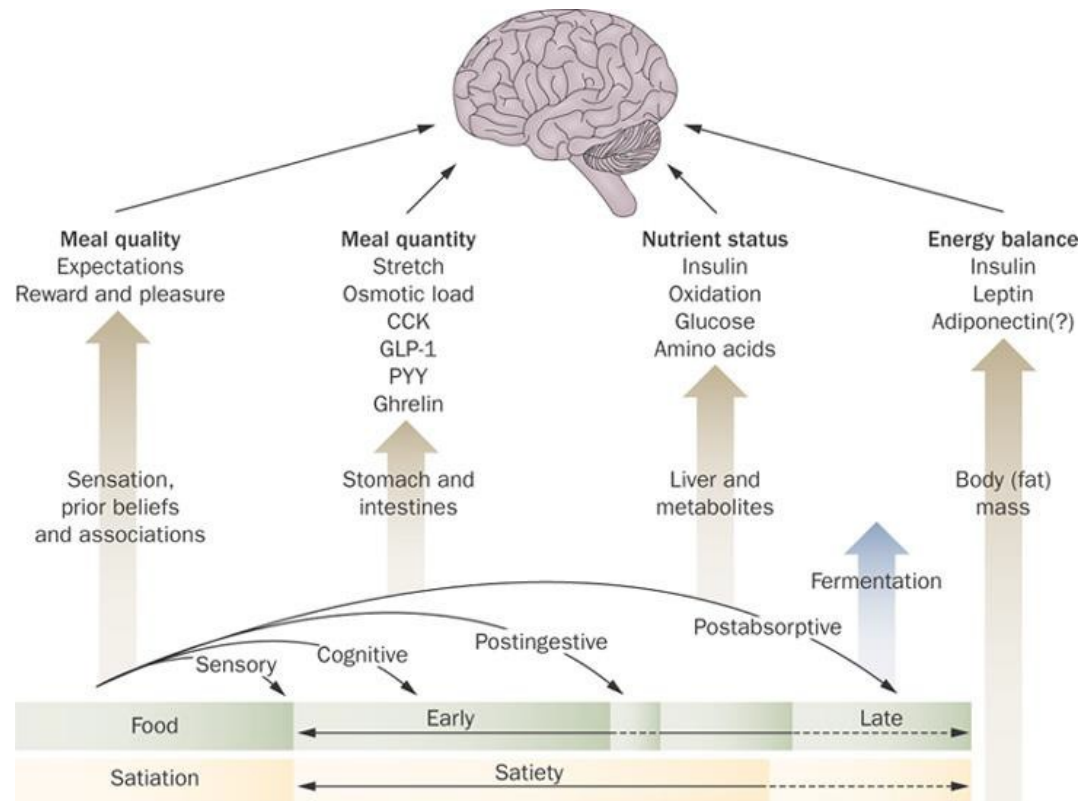
Energy homeostasis

- The brain is a key player in the control of energy homeostasis
- The brain integrates incoming information in the form of hormonal and neural signals with data on energetic needs or anticipated needs
- Environmental factors

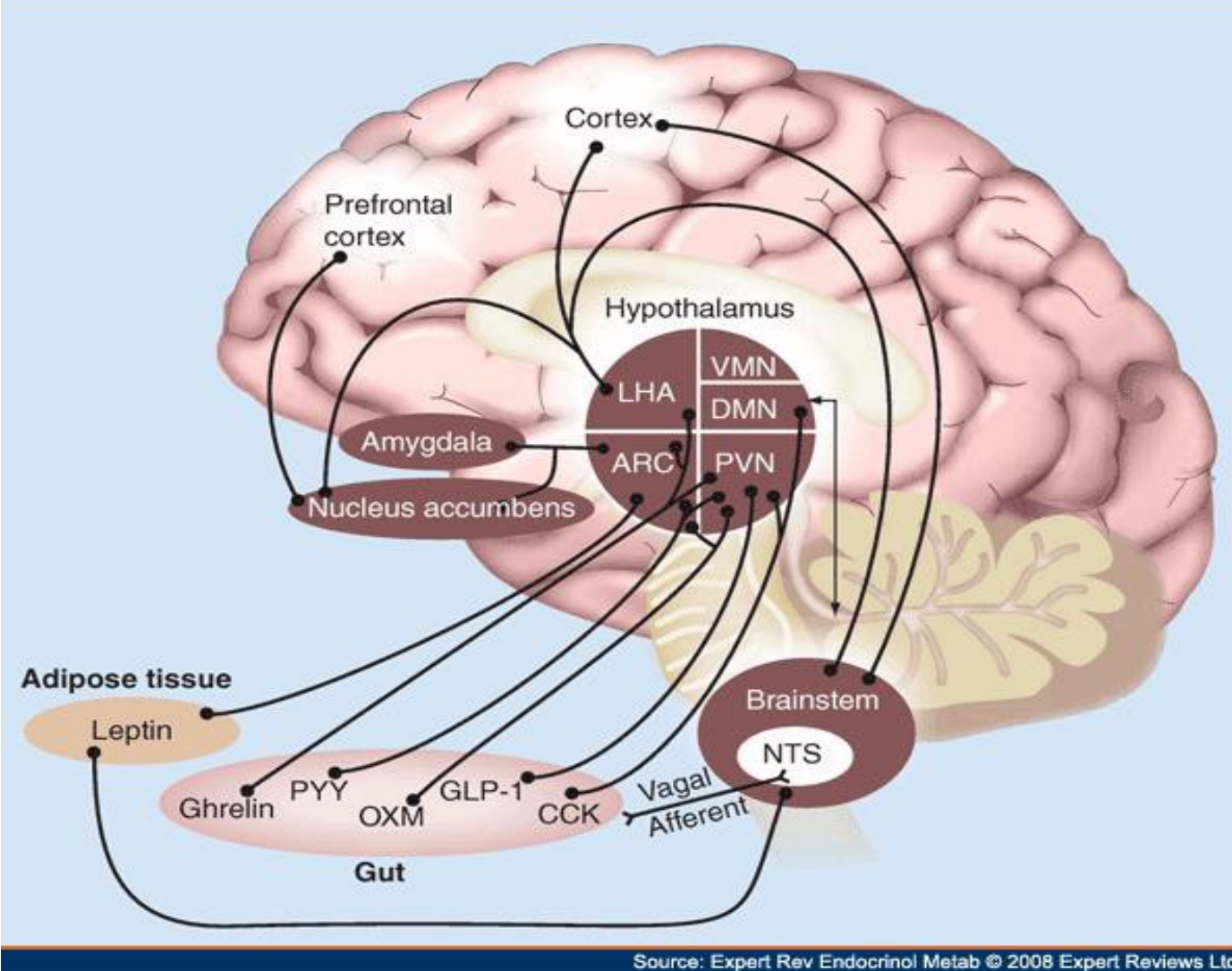


Woods., 2009

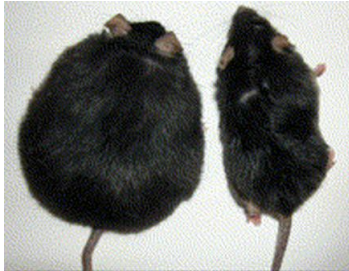
The physiological regulation of food intake is a complex homeostatic process that is regulated by many endocrine and metabolic factors in a combination with visual, olfactory, taste sensation, emotions, memory and the life conditions



Adapted from J. Blundell



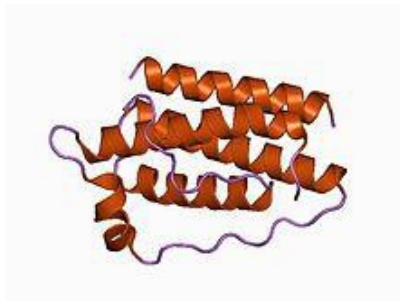
Historical overview



ob/ob mice
(1950)

1994- Jeffrey Friedman cloned the ob gene in mice and its homolog in humans.

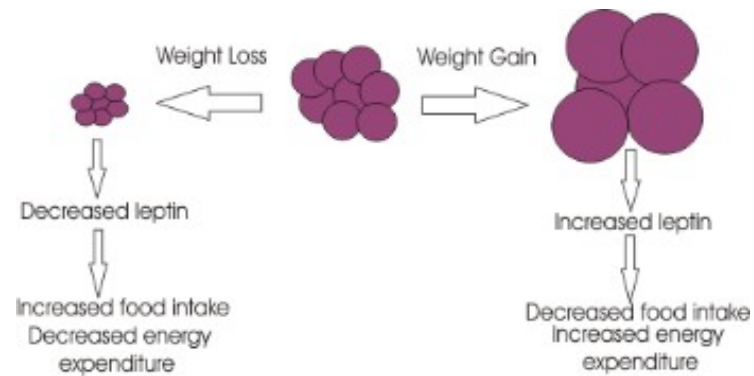
1995- purification of the gene product, hormone called leptin.



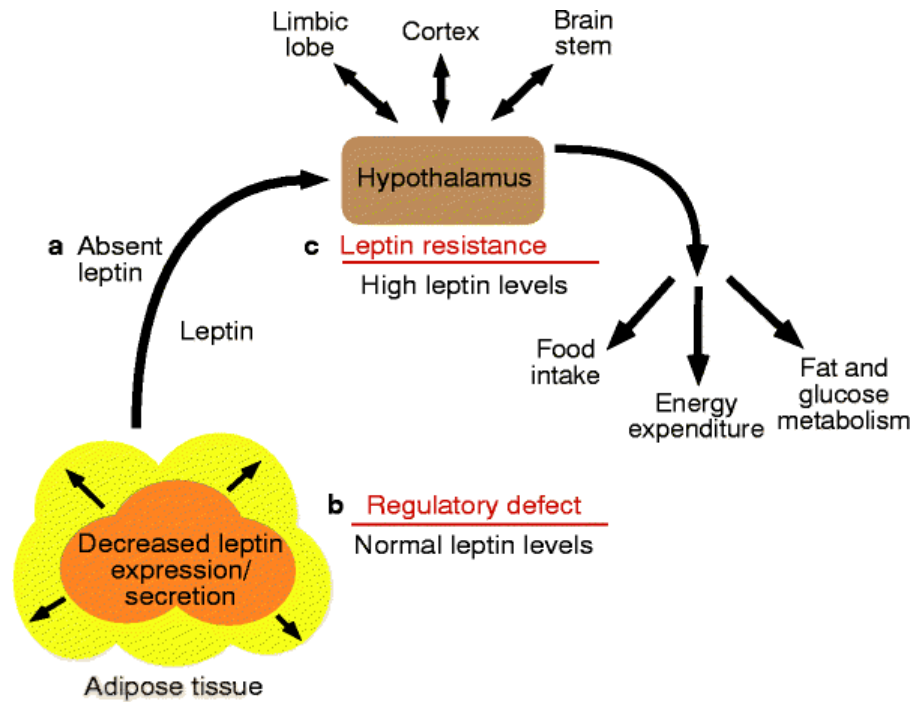
Leptin, is a 16-kilodalton adipocyte derived hormone that circulates in the serum

The role of leptin

- Increases metabolic rate/energy expenditure
- Decreases food intake



Defects in leptin leading to obesity



How does it work?

1. Inhibiting appetite through appetite-stimulating neuropeptide Y (NPY) neurons and the appetite-inhibiting proopiomelanocortin (POMC) neurons in the hypothalamic arcuate nucleus.

Leptin inhibits NPY/AGRP neurons that increase NPY and results in inhibition of food intake.

