Malnutrition

- Undernutrition
- Overnutrition
- ‘double burden of malnutrition’: undernutrition of children & overnutrition among adults, often within the same family – poverty driven

Obesity (hrv. debljina, gojaznost)

• Increased amount of fat tissue resulting from increased intake or decreased expenditure of energy

• Causes:
  – Dietary habits and physical activity
    • Processed food, rich in sugar and fat (saturated and trans fat) – lesser amount of nutrients, reduced vitamin and mineral intake
    • Genetic predisposition
• “thrifty genome” hypothesis

• ‘fetal origins hypothesis’ or ‘thrifty phenotype’: “fetal undernutrition in middle to late gestation, leads to disproportionate fetal growth, and programmes later coronary heart disease”

Food industry

– Foods rich in toxins, chemicals, preservatives, pesticides, antibiotics and steroids
– Adding sugar, salt and fat in almost all products, to be palatable and/or to cover up a bad taste
– Marketing "attack", specifically aimed at children
– Production of "food" in the factories, with no natural ingredients and nutrients

Dr Erik Hemmingsson

http://holisticobesity.com/2014/10/30/we-have-been-divided-and-conquered-by-big-food/
Sugary breakfast cereals
Packaged cookies
Packaged snacks like chips
Frozen meals
“Fed up” movie

https://www.youtube.com/watch?v=aCUbvOwwfWM
A new WHO guideline recommends adults and children reduce their daily intake of free sugars to **less than 10%** of their total energy intake

A further reduction to **below 5%** or roughly **25 grams/day (6 teaspoons)** would provide additional health benefits

Trends...

http://www.hivehealthmedia.com/television-obesity/
The competition is fierce!

U.S. OBESITY RATE

U.S. DEBT
Indicators of nutritional status

BMI = weight (kg)/height (m²)

• Body mass index
  ≥30 obesity
  25 - 30 overweight
  Normal weight = 18.5-24.9

• Other methods of measuring:
  – skin folds
  – waist-to-hip ratio
  – electrical impedance
  – CT, MR
Distribution of adipose tissue

- **central obesity**: abdominal area (subcutaneous or intraabdominal accumulation) – greater morbidity and mortality risk:
  - Men >102 cm, women >88 cm (older guidelines)
  - Men >94 cm, women >80 cm (new guidelines)

- **peripheral obesity type**: subcutaneous adipose tissue on the buttocks and lower extremities
World Health Organization

- Worldwide, obesity has almost doubled from 1980 to 2008
- **2008**: >1.4 billion adults were overweight, >200 million men & 300 million women were obese
- 65% of the world population lives in countries where overweight and obesity kills more people than underweight
- **2013**: 42 million children younger than 5 years were overweight or obese (170 million underweight children globally, 3 million of whom will die each year as a result of being underweight)

WHO Global Infobase

Estimated Obesity (BMI ≥ 30 kg/m²) Prevalence, Males, Aged 15+, 2010

https://apps.who.int/infobase/Comparisons.aspx?l=&NodeVal=WGIE_BMI_5_cd.0704&DO=1&DDLReg=ALL&DDLSex=1&DDLAgeGrp=15-100&DDLYear=2010&DDLMethod=INTMDCTM&DDLcateNum=6&TxtBxCtmNum=20%2c35%2c50%2c65%2c80&CBLC1=ON&CBLC3=ON&CBLC4=ON&CBLC6=ON&CBLC8=ON&CBLC10=ON&DDLMapsize=800x480&DDLMapLabels=none&DDLTmpRangBK=0&DDLTmpColor=-3342388
WHO Global Infobase

Estimated Obesity (BMI ≥ 30 kg/m²) Prevalence, Females, Aged 15+, 2010

https://apps.who.int/infobase/Comparisons.aspx?l=&NodeVal=WGIE_BMI_5_cd.0704&DO=1&DMLReg=ALL&DMLSex=1&DMLAgeGrp=15-100&DMLYear=2010&DMLMethod=INTMDCTM&DMLCateNum=6&TxtBxCtmNum=20%2c35%2c50%2c65%2c80&CBLC1=ON&CBLC3=ON&CBLC4=ON&CBLC6=ON&CBLC8=ON&CBLC10=ON&DMLMapsize=800x480&DMLMapLabels=none&DMLtmpRangBK=0&DMLtmpColor=-3342388
Rapid Increases in Adult Obesity in the U.S.

Trends in the obesity rates - USA (adults)

http://www.cdc.gov/obesity/data/prevalence-maps.html
Croatia

Croatian Health Survey, 2003

Obesity
Overweight
Normal weight

Men: 36.5% normal weight, 43.3% overweight, 20.2% obesity
Women: 45.7% normal weight, 33.6% overweight, 20.7% obesity
The consequences of obesity

• The effects of obesity on mortality and morbidity have been recognized for more than 2000 years

• Hippocrates: "Sudden death is more common in those who are ‘naturally’ obese, compared to lean people“
Medical Complications of Obesity

- Pulmonary disease
  - abnormal function
  - obstructive sleep apnea
  - hypoventilation syndrome

- Idiopathic intracranial hypertension

- Stroke

- Cataracts

- Nonalcoholic fatty liver disease
  - steatosis
  - steatohepatitis
  - cirrhosis

- Gall bladder disease

- Gynecologic abnormalities
  - abnormal menses
  - infertility
  - polycystic ovarian syndrome

- Coronary heart disease
  - Diabetes
  - Dyslipidemia
  - Hypertension

- Severe pancreatitis

- Cancer
  - breast, uterus, cervix
  - colon, esophagus, pancreas
  - kidney, prostate

- Osteoarthritis

- Skin

- Gout

- Phlebitis
  - venous stasis

http://mhadegree.org/obesity-and-your-healthcare-career/
COMPPLICATIONS OF CHILDHOOD OBESITY

Psychosocial
- Poor self-esteem
- Depression
- Eating disorders

Neurological
- Pseudotumor cerebri

Pulmonary
- Sleep apnoea
- Asthma
- Exercise intolerance

Cardiovascular
- Dyslipidaemia
- Hypertension
- Coagulopathy
- Chronic inflammation
- Endothelial dysfunction

Gastrointestinal
- Gallstones
- Steatohepatitis

Renal
- Glomerulosclerosis

Musculoskeletal
- Slipped capital femoral epiphysis
- Blount’s disease
- Forearm fracture
- Flat feet

Endocrine
- Type 2 diabetes
- Precocious puberty
- Polycystic ovary syndrome (girls)
- Hypogonadism (boys)

Obesity as a risk factor

- RR $\geq 3$:
  - type 2 diabetes, gallbladder disease, dyslipidemia, metabolic syndrome, sleep apnea, dyspnoea

- RR 2-3:
  - CHD (coronary heart disease), hypertension, osteoarthritis, hyperuricemia and gout

- RR 1-2:
  - cancer (breast, endometrial, colon), infertility, polycystic ovary syndrome, lower back pain, fetal malformations
Hypertension prevalence and BMI

http://www.obesityinamerica.org/trends.html
1.5 BILLION ADULTS ARE OVERWEIGHT

BY THE NUMBERS:

- 200 MILLION MEN
- 300 MILLION WOMEN

ARE OBSESE.

THAT'S MORE THAN

10% OF THE ADULT POPULATION

AND THE PROBLEM IS GROWING

OBESEITY IN 1980

- 7.9% OF WOMEN
- 4.8% OF MEN

OBESEITY IN 2008

- 13.8% OF WOMEN
- 9.8% OF MEN

BMI = KG/M²

Body mass index (BMI) is a simple index of weight-for-height that is commonly used to classify overweight and obesity in adults. To determine your BMI, divide your weight in kilograms by the square of your height in meters.

(For those that don’t do metric, that's your weight in pounds ÷ 200, divided by your height in inches squared, or 703 ÷ height²)

WHAT'S YOUR BMI?

- >25: Overweight
- >30: Class I Obese
- >35: Class II Obese
- >40: Class III Obese

65% OF THE WORLD'S POPULATION LIVE IN COUNTRIES WHERE THEY ARE MORE LIKELY TO DIE FROM OBESITY THAN MALNUTRITION

YOU NEED TO BURN 3500 CALORIES TO DROP A SINGLE POUND OF BODY FAT

That's about 9 hours on the elliptical

WORLD'S FATTEST COUNTRIES

- NAURU 94.5% overweight
- FSM 90.1% overweight
- COOK ISLANDS 90.9% overweight
- TONGA 90.8% overweight
- NIUE 81.7% overweight
- SAMOA 80.4% overweight
- PALAU 79.4% overweight
- KUWAIT 74.8% overweight
- USA 74.1% overweight

In Japan, about one-in-five 20-adult women is obese, compared to one-in-10 in the Netherlands, one-in-four in Jordan, one-in-three in the United States and Mexico, and up to one-in-two in some African countries.

Facts....

Obesity cost within the USA healthcare

• The estimated annual medical costs of obesity in the US = $147 billion, 2008.

• medical expenses for people who are obese are $1,429 higher compared to people with normal weight

http://umanitoba.ca/outreach/evidencenetwork/archives/4994

Prevention and treatment

• medical examination (identification of comorbidities, eg. impaired glucose tolerance, hypertension and dyslipidemia)

• > 40 yrs or a history of heart disease - a cardiologist examination before determining required level of physical activity

• exclude Cushing's syndrome, hypogonadism, hypothyroidism and certain genetic conditions
THE WORLD IS GETTING FATTER

250* MILLION PEOPLE
1980

* number of people who are either overweight or obese

904 MILION PEOPLE
2008

HOW DO I KNOW WHETHER I AM OVERWEIGHT?

Calculate your body mass index (BMI) using this formula

\[ \text{BMI} = \frac{\text{weight (kg)}}{\text{height (m)}^2} \]

Underweight < 18.5
Normal 18.5 - 24.9
Overweight 25 - 29.9
Obesity > 30
Severe Obesity > 35

OBESITY IS KILLING THE WORLD

PREVENTABLE

ABC TO OBESITY PREVENTION

SIMPLE RULES TO STAY IN SHAPE

Adopt New Healthy Habits

GOOD HABIT
Bike to Work
Balanced Diet
Swim

BAD HABIT
Drive to Work
Fast Food
Watch TV

Balance Your Calorie Intake

Food Beverages
Physical Activities
CALORIES IN
CALORIES OUT

Control Your Weight Gain

7 common diseases due to obesity:

- Arthritis
- Cancer
- Infertility
- Heart Diseases
- Back Pain
- Diabetes
- Stroke

source: World Health Organization
©2014 Healthbuzz
www.healthbuzz.asia

http://visual.ly/abc-obesity-prevention
The eatwell plate

Use the eatwell plate to help you get the balance right. It shows how much of what you eat should come from each food group.

- Fruit and vegetables
- Meat, fish, eggs, beans and other non-dairy sources of protein
- Foods and drinks high in fat and/or sugar
- Milk and dairy foods
- Bread, rice, potatoes, pasta and other starchy foods

http://clahrc-sy.nihr.ac.uk/theme-obesity-introduction.html
“diets”......

http://holisticobesity.com/2014/12/02/the-obesity-and-poverty-paradox/
Prevention and treatment

• Behavior modification:
  – healthy diet
  – physical activity
• Idealy - loss of up to 6 kg through 3-6 months (pharmacotherapy)
• BMI> 40: surgery (gastroplastic surgery, gastric bypass, liposuction)
Prevention and treatment

- According to the estimates in the United States, weight control could reduce the number of patients with hypertension by 48% in Caucasians and 28% in African Americans.
Bon appetit!