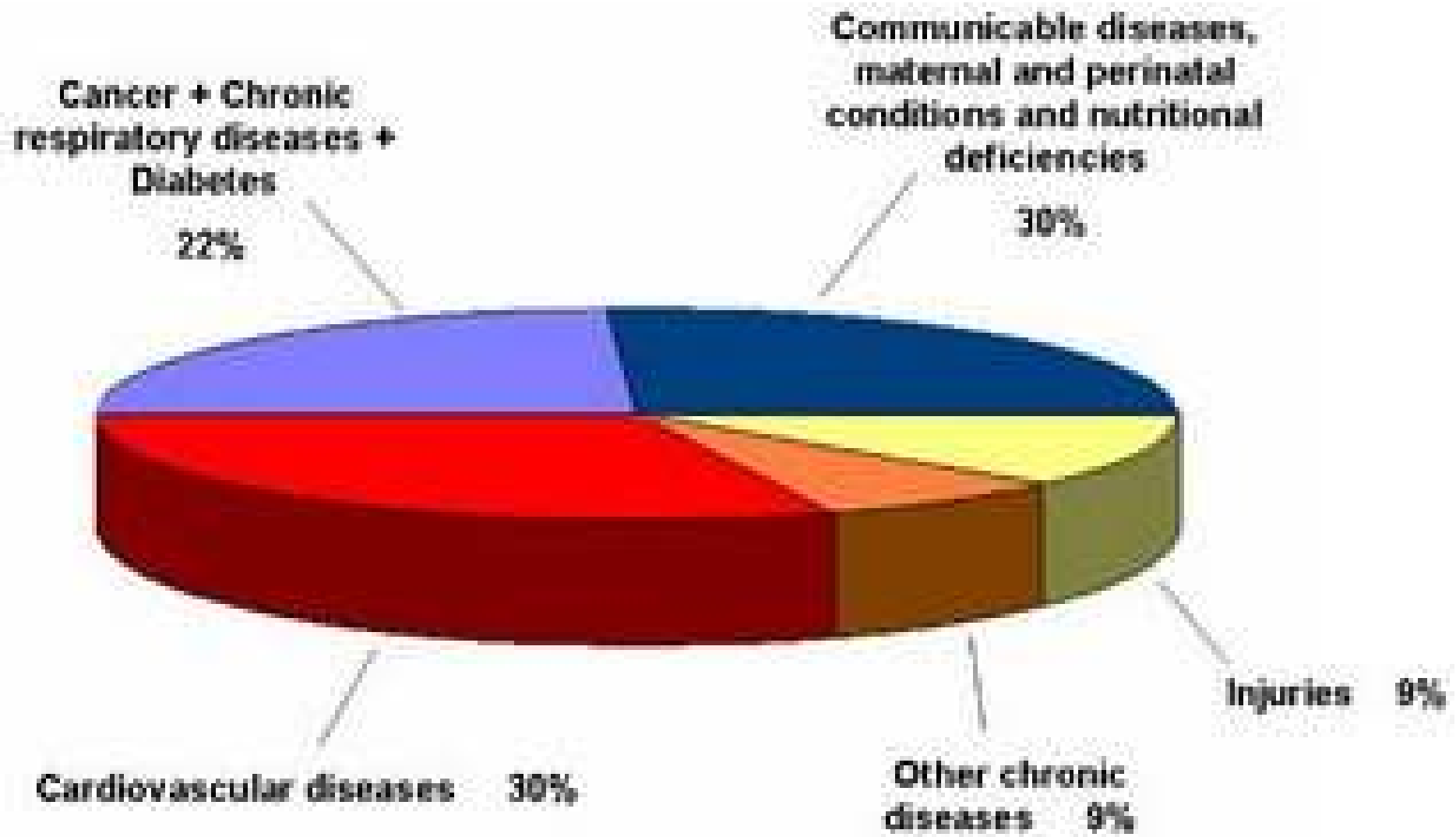


Prevention and management of hypertension and cardiovascular disease



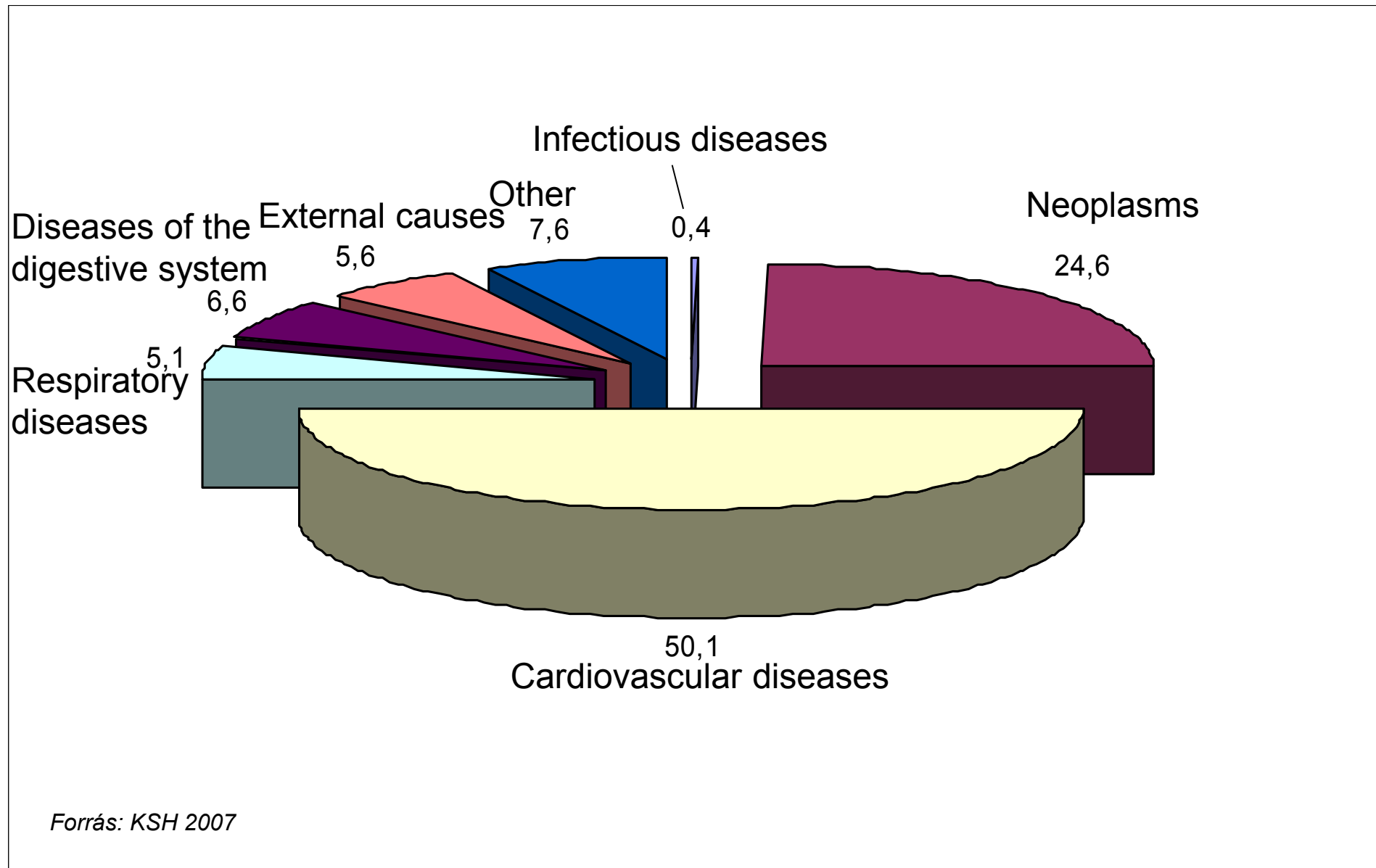
SU Department of Public Health

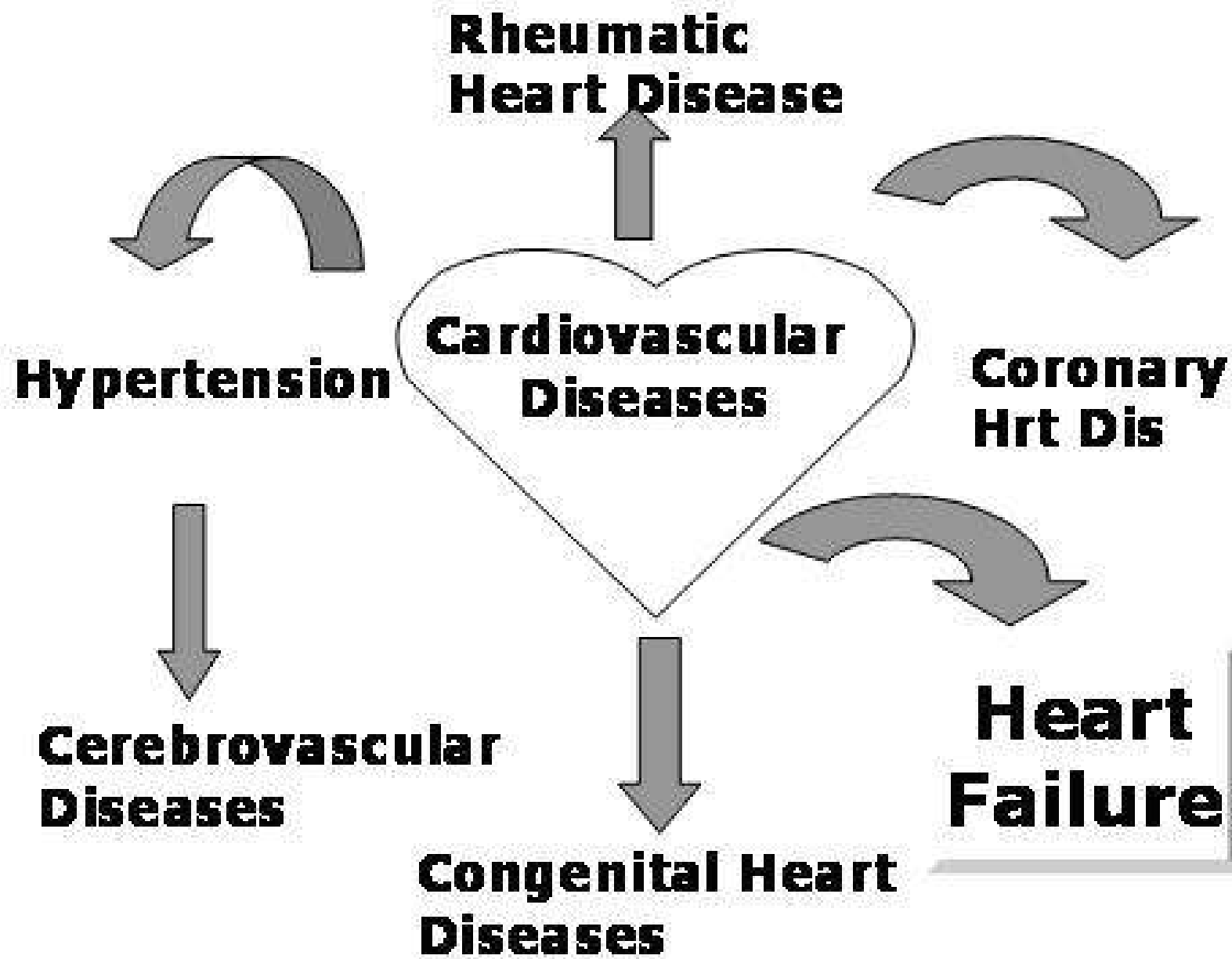


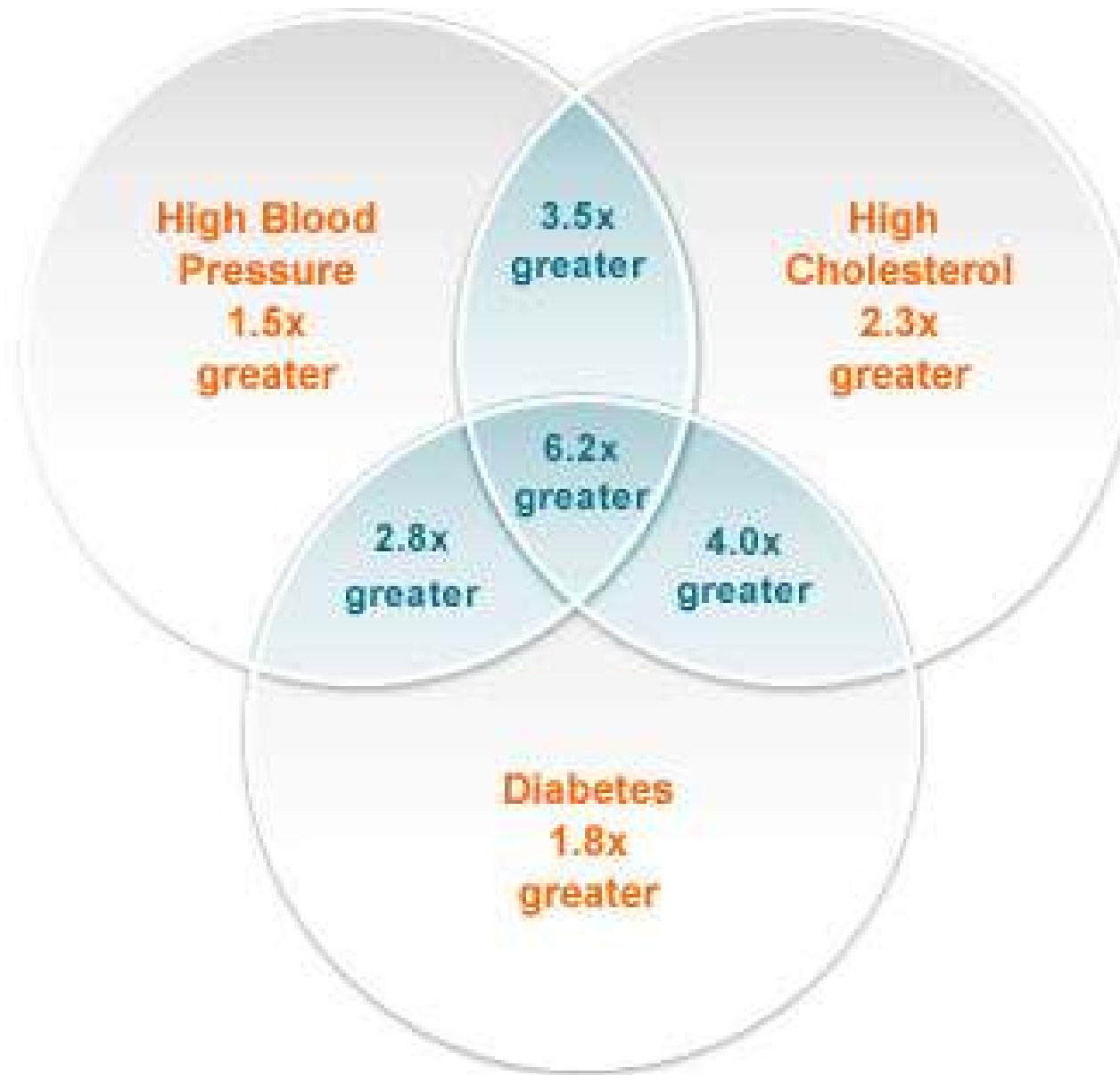


Cardiovascular disease is the number one cause of death globally.
An estimated 17.5 million people died from cardiovascular disease in 2005, representing **30 % of all global deaths.**

The main cause of death in Hungary (2007)







Risk Factors for Heart Disease

Cardiovascular Disease

Death toll in 2002 (World): 16 655 000 (29.2% of all deaths)

Three most common forms:

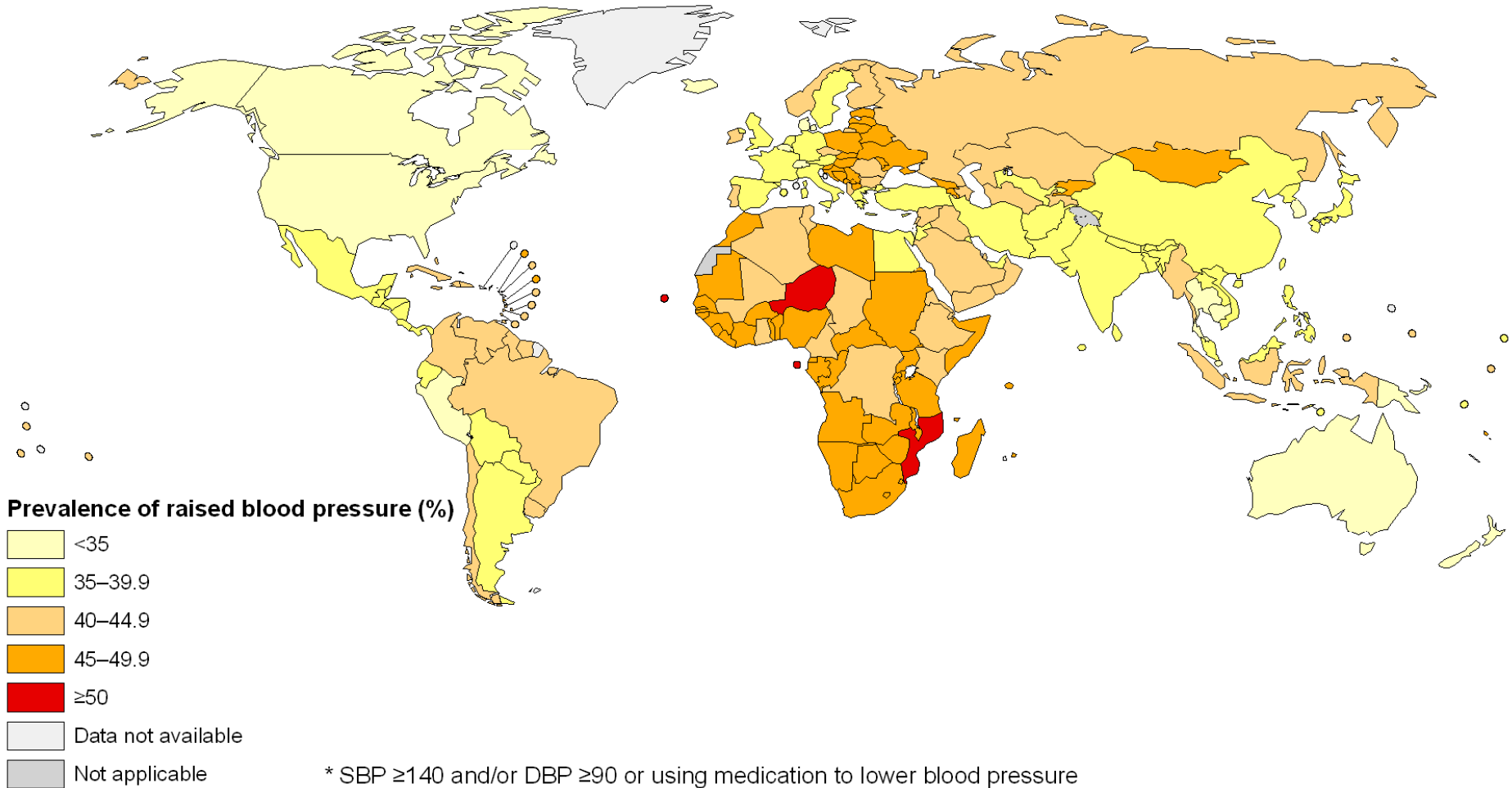
- a. Ischemic heart disease - 7 168 000 (12.6%)
- b. Cerebrovascular disease - 5 494 000 (9.6%)
- c. Hypertensive heart disease - 907 000 (1.6%)

**Disability-adjusted life years (DALYs) lost in 2002 (World):
147 541 000 (9.9% of all DALYs)**

Three most common forms:

- a. Ischemic heart disease - 58 334 000 (3.9%)
- b. Cerebrovascular disease - 49 118 000 (3.3%)
- c. Hypertensive heart disease - 7 622 000 (0.5%)

Prevalence of raised blood pressure*, ages 25+, age standardized Both sexes, 2008



The boundaries and names shown and the designations used on this map do not imply the expression of any opinion whatsoever on the part of the World Health Organization concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries. Dotted lines on maps represent approximate border lines for which there may not yet be full agreement.

Data Source: World Health Organization
Map Production: Public Health Information
and Geographic Information Systems (GIS)
World Health Organization

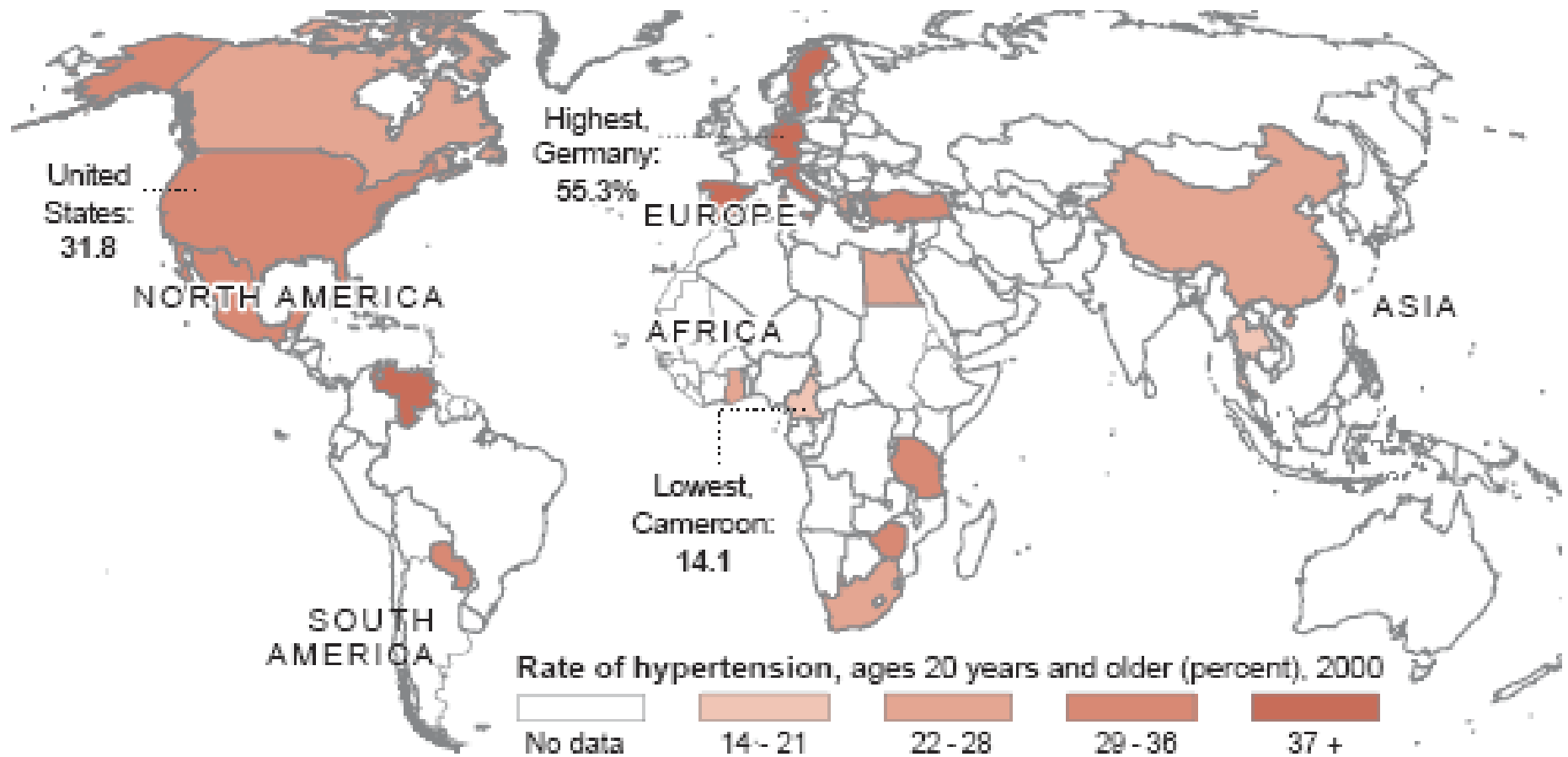


World Health Organization

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High blood pressure, a major risk factor globally

Almost 1 billion people worldwide have high blood pressure, a recent report found.



SOURCE: High Blood Pressure and Health Policy, 2005

Risk Factors for Heart Disease

Risk factors you can't control

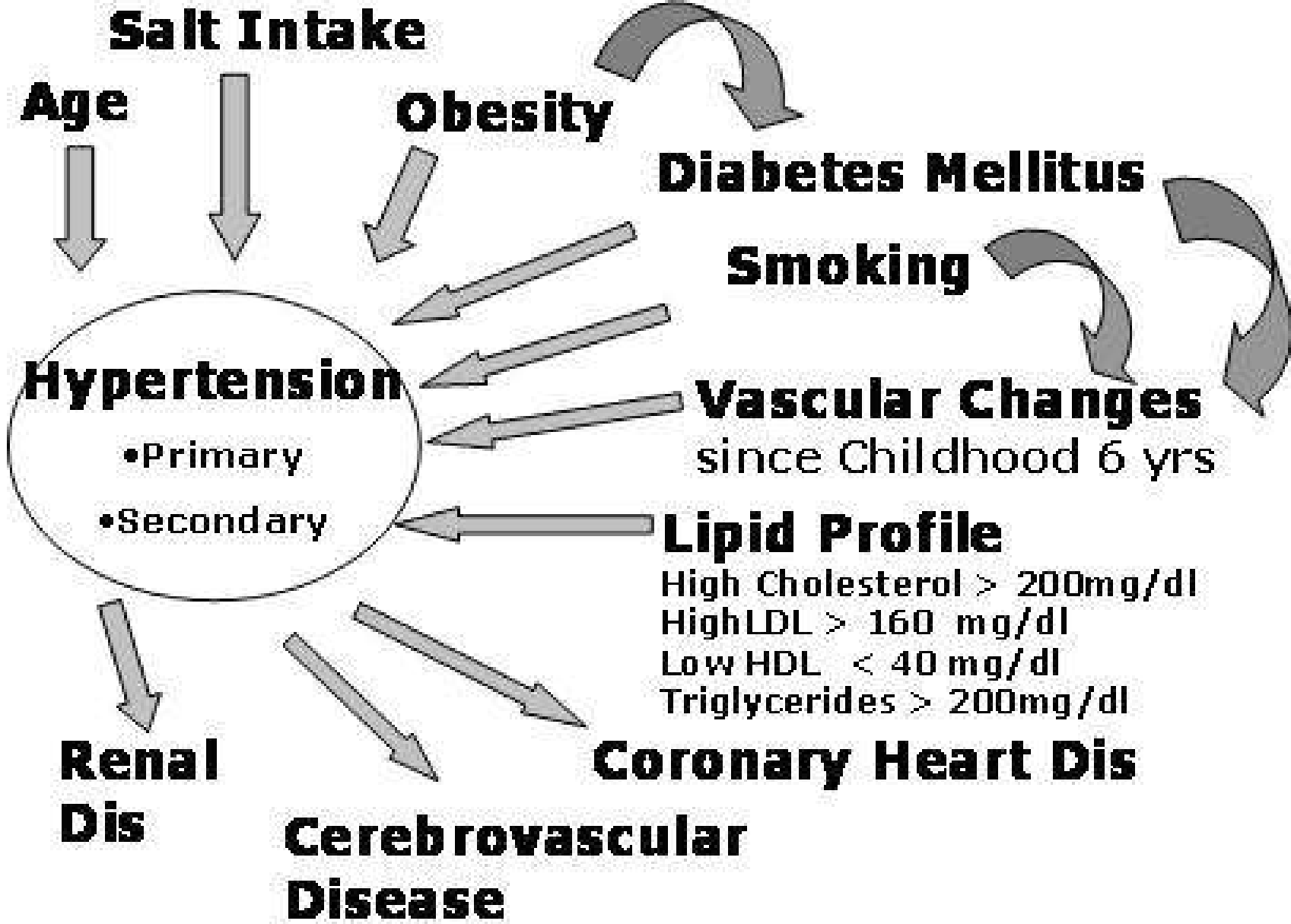
- **Age**
- **Family history (genetics)**
- **Race**
- **Gender**

Risk factors you can manage

- **Obesity**
- **Diabetes**
- **Smoking**
- **High blood pressure**
- **High LDL** (low-density lipoprotein, or "bad" cholesterol)
- **Low HDL** (high-density lipoprotein, or "good" cholesterol)

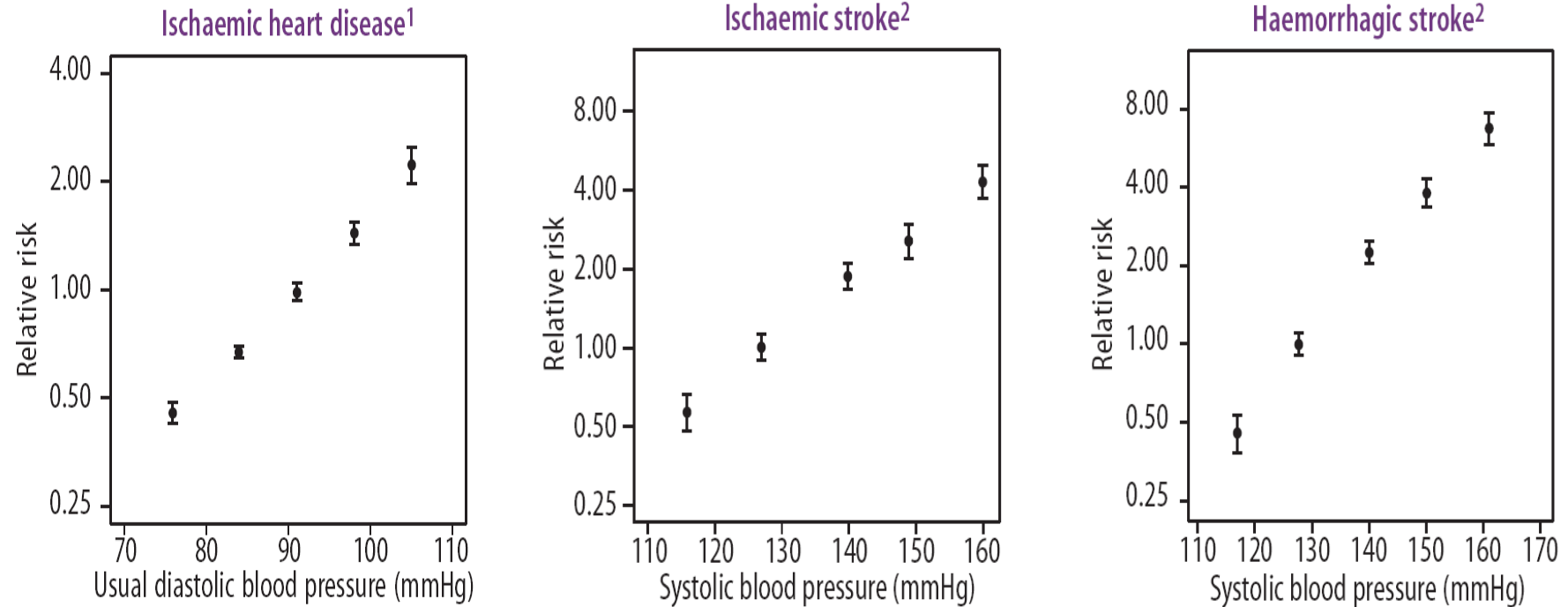
High blood pressure has been called the "silent killer" because it usually produces NO symptoms







Significance of HBP as a health risk factor



- Attributable disease burden in 2000: 4,4% of global total DALYs
- Estimated avoidable disease burden: 1,7-1,9% of global total DALYs

Source: World Health Report 2002. Available at URL: <http://www.who.int>

Classification of blood pressure

Category	Systolic	Diastolic
Optimal	< 120	< 80
Normal	120–129	80–84
High normal	130–139	85–89
Grade 1 hypertension (mild)	140–159	90–99
Grade 2 hypertension (moderate)	160–179	100–109
Grade 3 hypertension (severe)	≥ 180	≥ 110
Isolated systolic hypertension	≥ 140	< 90

Source: 2003 ESH/ESC Hypertension Guidelines. Journal of Hypertension 2003, Vol 21 No 10.

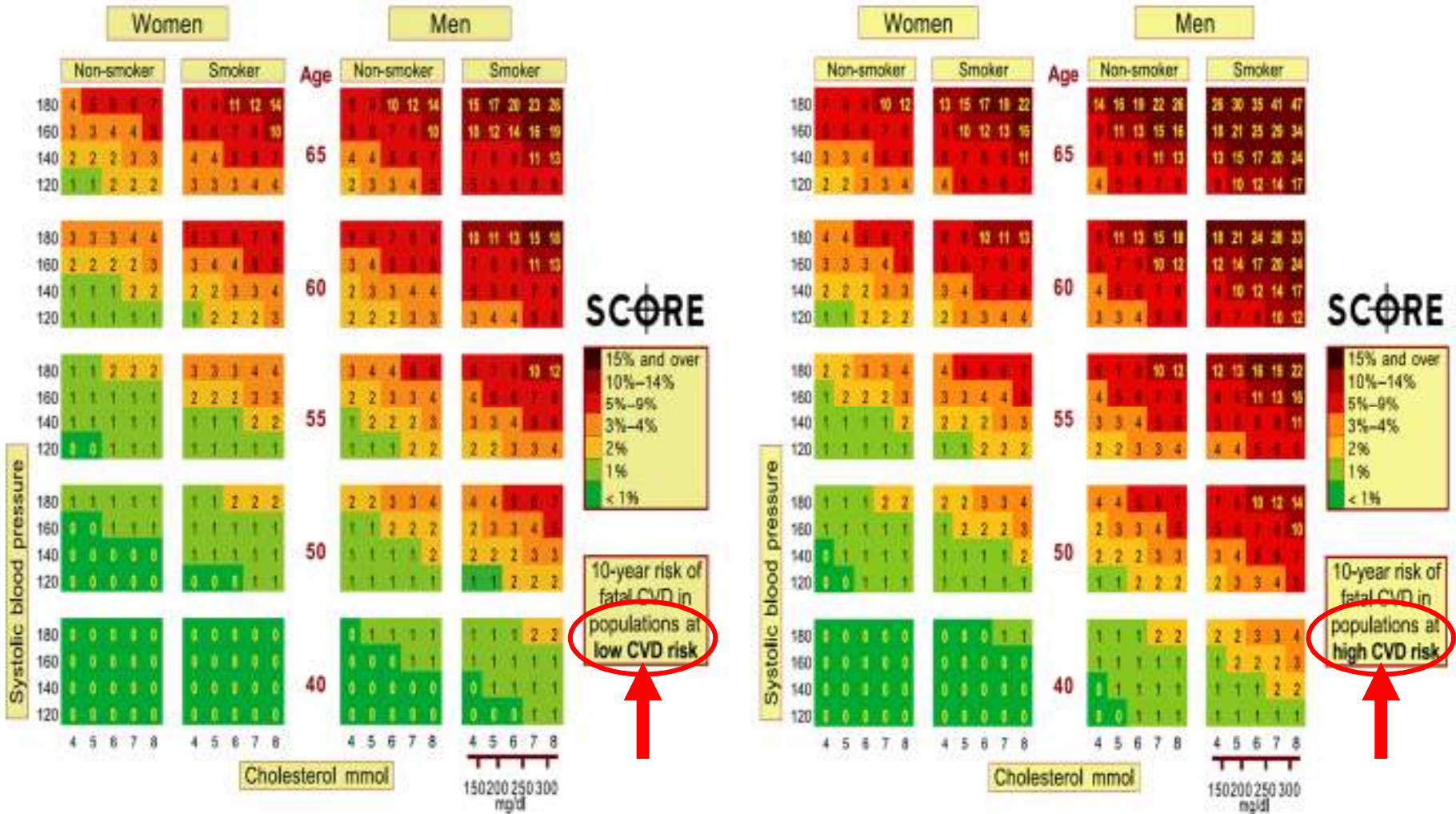
Stratification of total cardiovascular risk - overview

Other risk factors and disease history	Blood pressure (mmHg)				
	Normal SBP 120-129 or DBP 80-84	High normal SBP 130-139 or DBP 85-89	Grade 1 SBP 140-159 or DBP 90-99	Grade 2 SBP 160-179 or DBP 100-109	Grade 3 SBP ≥ 180 or DBP ≥ 110
No other risk factors	Average risk	Average risk	Low added risk	Moderate added risk	High added risk
1-2 risk factors	Low added risk	Low added risk	Moderate added risk	Moderate added risk	Very high added risk
3 or more risk factors or TOD or diabetes	Moderate added risk	High added risk	High added risk	High added risk	Very high added risk
ACC	High added risk	Very high added risk	Very high added risk	Very high added risk	Very high added risk

ACC, associated clinical conditions; TOD, target organ damage; SBP, systolic blood pressure; DBP, diastolic blood pressure.

Source: 2003 ESH/ESC Hypertension Guidelines. Journal of Hypertension 2003, Vol 21 No 10.

Ten-year risk of fatal cardiovascular disease – the SCORE system



Source: Estimation of ten-year risk of fatal cardiovascular disease in Europe: the SCORE project. European Heart Journal (2003) 24, 987–1003.



FRAMINGHAM RISK SCORE to predict 10 year ABSOLUTE RISK of CHD EVENT

ST ALBANS & HEMEL HEMPSTEAD NHS TRUST : CARDIOLOGY DEPARTMENT



This risk assessment only applies to assessment for PRIMARY PREVENTION of CHD, in people who do not have evidence of established vascular disease. Patients who already have evidence of vascular disease usually have a >20% risk of further events of over 10 years, and require vigorous SECONDARY PREVENTION. People with a Family History of premature vascular disease are at higher risk than predicted; Southern Europeans and some Asians may have a lower risk in relation to standard risk factors.

STEP 1: Add scores by sex for Age, Total Cholesterol, HDL-Cholesterol, BP, Diabetes and Smoking. (If HDL unknown, assume 1.1 in Males, 1.4 in Females)

Age			Total Cholesterol			HDL Cholesterol			Systolic BP		Diastolic BP					Diabetes			Smoking		
	M	F		M	F		M	F	Male	<80	80-84	85-89	90-99	≥100	No	M	F	No	M	F	
30-34	-1	-9	< 4.1	-3	-2	< 0.9	2	5	<120	0	0	1	2	3	No	0	0	No	0	0	
35-39	0	-4	4.1 - 5.1	0	0	0.9 - 1.16	1	2	120-129	0	0	1	2	3	Yes	2	4	Yes	2	2	
40-44	1	0	5.2 - 6.2	1	1	1.17 - 1.29	0	1	130-139	1	1	1	2	3							
45-49	2	3	6.3 - 7.1	2	1	1.30 - 1.55	0	0	140-159	2	2	2	2	3							
50-54	3	6	7.2	3	3	≥1.56	-2	-3	≥160	3	3	3	3	3							
55-59	4	7							Female	<80	80-84	85-89	90-99	≥100							
60-64	5	8							<120	-3	0	0	2	3							
65-69	6	8							120-129	0	0	0	2	3							
70-74	7	8							130-139	0	0	0	2	3							
									140-159	2	2	2	2	3							
									≥160	3	3	3	3	3							

If Systolic and Diastolic BP fall into different categories, use score from higher category

Categorisation of 10 year Risk of CHD Event	
Very Low risk	< 10%
Low risk	< 15%
Moderate risk	15-20%
High risk	> 20%

STEP 2: Use total score to determine Predicted 10 year Absolute Risk of CHD Event (Coronary Death, Myocardial Infarction, Angina) by sex

Total Score	≤-2	-1	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	≥17
10 year Risk: Male		<2%	3%	3%	4%	5%	7%	8%	10%	13%	16%	20%	25%	31%	37%	45%	53%	53%	53%	53%
10 year Risk: Female	<1%	2%	2%	2%	3%	3%	4%	4%	5%	6%	7%	8%	10%	11%	13%	15%	18%	20%	24%	27%

STEP 3: Compare Predicted 10 year Absolute Risk with "Average" and "Ideal" 10 year Risks, to give Relative Risks

Age	30 - 34	35 - 39	40 - 44	45 - 49	50 - 54	55 - 59	60 - 64	65 - 69	70 - 74
"Average" Male	3%	5%	7%	11%	14%	16%	21%	25%	30%
"Ideal" Male	2%	3%	4%	4%	6%	7%	9%	11%	14%
"Average" Female	< 1%	< 1%	2%	5%	8%	12%	12%	13%	14%
"Ideal" Female	< 1%	1%	2%	3%	5%	7%	8%	8%	8%

"Ideal" risk represents
Total Cholesterol = 4.1 - 5.1
HDL = 1.2 (Male), 1.4 (Female)
BP < 120/80
No Diabetes, Non Smoker

People with an absolute risk of >20% should be considered for treatment: with a Statin to achieve a Total Cholesterol <5 and/or LDL cholesterol <3.2 with anti-hypertensives to achieve a BP ≤160/90 (ideally ≤140/80)

High blood pressure

Definition: Systolic BP >139 OR Diastolic BP > 89 mmHg (or the use of antihypertensive medication).

- ***Over 90% of hypertension is primary.***
- *The “50% rule”: ~50% of people with HBP know of their disease; ~50% of those who know are treated; ~50% of those treated live with normal BP.*
- *Generally the lower BP is, the higher life expectancy one has.*
- ***Main risk factors: overweight; high sodium/salt & low potassium intake; relatively high, chronic alcohol consumption; physical inactivity, poor coping skills (high stress); male gender; family history***
- Avoidable (theoretically) cause of death – importance of routine secondary prevention (opportunistic screening)

HBP management I.

	Blood pressure (mmHg)				
	Normal: SBP 120–129 or DBP 80–84	High normal: SBP 130–139 or DBP 85–89	Grade 1: SBP 140–159 or DBP 90–99	Grade 2: SBP 160–179 or DBP 100–109	Grade 3: SBP ≥ 180 or DBP ≥ 110
Other risk factors and disease history					
No other risk factors	No BP intervention	No BP intervention	Lifestyle changes for several months, then drug treatment if preferred by the patient and resources available	Lifestyle changes for several months, then drug treatment	Immediate drug treatment and lifestyle changes
1-2 risk factors	Lifestyle changes	Lifestyle changes	Lifestyle changes for several months, then drug treatment	Lifestyle changes for several months, then drug treatment	Immediate drug treatment and lifestyle changes
3 or more risk factors or TOD or diabetes	Lifestyle changes	Drug treatment and lifestyle changes	Drug treatment and lifestyle changes	Drug treatment and lifestyle changes	Immediate drug treatment and lifestyle changes
ACC	Drug treatment and lifestyle changes	Immediate drug treatment and lifestyle changes	Immediate drug treatment and lifestyle changes	Immediate drug treatment and lifestyle changes	Immediate drug treatment and lifestyle changes

ACC, associated clinical conditions; DBP, diastolic blood pressure; SBP, systolic blood pressure; TOD, target organ damage.

Source: 2003 ESH/ESC Hypertension Guidelines. Journal of Hypertension 2003, Vol 21 No 10.

HBP management II.

Lifestyle intervention:

- weight-control (BMI < 25)
- lower Na⁺ intake < 2-3g
- higher proportional consumption of fruits and vegetables
- moderate alcohol consumption
- regular physical exercise
- stress-management

Medical intervention: depends on BP level & overall CV risk status

- *Elevated normal*: only lifestyle intervention
- *Borderline HT*: lifestyle for 6-12 months, if no change: medication
- *Mild HT*: lifestyle for 3-6 months...
- *All others*: lifestyle + medication
- *Drugs*: diuretics, β -blockers, ACE inhibitors...

Specific dietary guidelines for prevention of hypertension

- ***Sodium intake:*** ideally < 2-3g/day (<6g NaCl/day)
 - ✓ Don't buy foods or drinks which list sodium content among their first few constituents (usually indicates high content).
 - ✓ Try to buy fresh or frozen food instead of preserved or canned goods.
 - ✓ Decrease or omit salt when cooking.
 - ✓ Don't salt foods. [STOP SÓ](#)
- ***Decrease alcohol intake***
- ***Decrease total energy intake*** (overweight & obesity)
- For **detailed dietary recommendations** see the (Dietary Approaches to Stop Hypertension) ***DASH diet*** @:
<http://www.nhlbi.nih.gov/health/public/heart/hbp/dash/>

Secondary prevention of HBP

Basic principles:

- diagnosing hypertension relies on simple BP measurement
- it is a cheap, reliable and easy way for detecting hypertension
- hypertension is most frequently diagnosed in the late phase of specific organ damage („the silent killer”)

**BLOOD PRESSURE SHOULD BE MEASURED
ROUTINELY AT EVERY PATIENT-PHYSICIAN
ENCOUNTER!**

Where?

- at the GP's office
- at school and occupational physician's practices
- as a part of community health programs (at pharmacy's)
- at home using automatic devices
- etc... wherever possible, whenever possible..

Diagnostic considerations

Measuring & diagnosing HBP:

- at least 2 measurements on each occasion;
- if HBP suspected, repeated measurement on another occasion;
- nothing to eat drink or smoke (patient) immediately before measurement;
- use of properly calibrated equipment with appropriate cuff-size;
- short rest before measurement;
- at least a minute between separate measurements.

Selected quality indicators of secondary HBP prevention in primary care

patients with at least one BP measurement in a given year

all patients in the same year

Desirable: at least 90%

patients whose CV lifestyle risk factors were assessed

patients treated for HBP

Desirable: at least 70%

patients classified according to total CV risk status

patients diagnosed with HBP

Desirable: at least 70%

Source: Az Egészségügyi Minisztérium szakmai protokollja Felnőttkori hipertónia betegség háziorvosi ellátása (The Hungarian Ministry of Health's protocol for HBP management by the GP). Available (in Hungarian): http://www.euagazat.hu/portal/server.pt/gateway/PTARGS_0_270_3457_0_0_18/HAZI_Hypertonia_P.pdf

Useful Internet Resources:

American Heart Association www.americanheart.org

World Health Organization www.euro.who.int

The Healthy Heart Kit www.healthyheartkit.com

Hypertension Online www.hypertensiononline.org

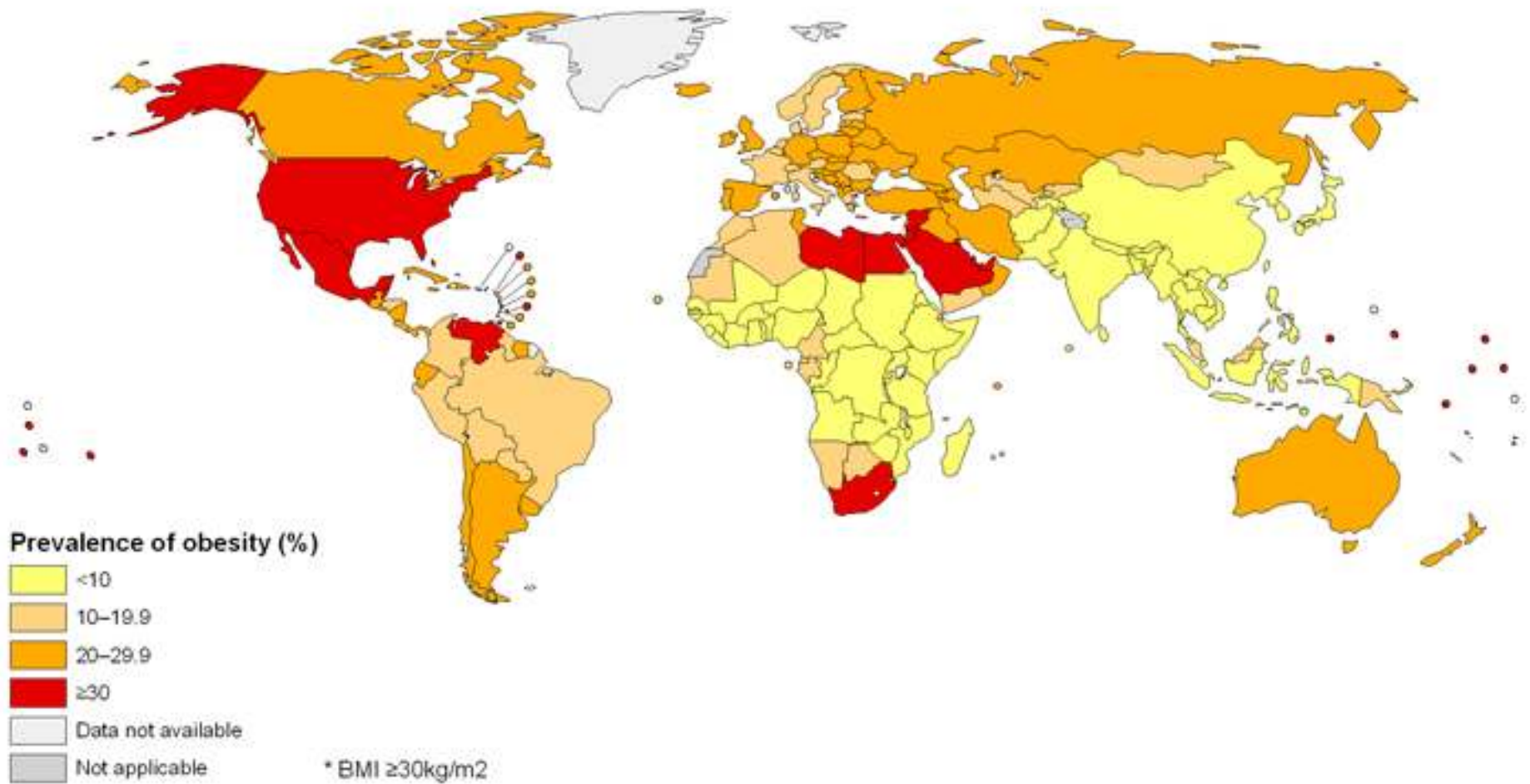
European Society for Cardiology www.escardio.org

U.S. National Heart Lung and Blood Institute
www.nhlbi.nih.gov/

Obesity

Facts about obesity

- Worldwide obesity has nearly doubled since 1980.
- In 2008, more than 1.4 billion adults, 20 and older, were overweight. Of these over 200 million men and nearly 300 million women were obese.
- 35% of adults aged 20 and over were overweight in 2008, and 11% were obese.
- 65% of the world's population live in countries where overweight and obesity kills more people than underweight.
- More than 40 million children under the age of five were overweight in 2011.
- Obesity is preventable.



BMI

- Overweight and obesity are defined as abnormal or excessive fat accumulation that may impair health.
- Body mass index (BMI) is a simple index of weight-for-height that is commonly used to classify overweight and obesity in adults. It is defined as a person's weight in kilograms divided by the square of his height in meters (kg/m^2).
- The WHO definition is:
 - a BMI greater than or equal to 25 is overweight
 - a BMI greater than or equal to 30 is obesity.

BMI

- May be inaccurate, waist circumference is better

BMI Chart

BMI less than 18.50	Underweight
BMI 18.50 - 24.99	Healthy weight
BMI 25.00 - 29.99	Overweight
BMI 30 or more	Obese

Waist circumference

- Measuring waist circumference helps screen for possible health risks that come with overweight and obesity. If most of your fat is around your waist rather than at your hips, you're at a higher risk for heart disease and type 2 diabetes. This risk goes up with a waist size that is greater than 35 inches for women or greater than 40 inches for men. To correctly measure your waist, stand and place a tape measure around your middle, just above your hipbones. Measure your waist just after you breathe out.

Combination of the two

	BMI (kg/m ²)	Obesity Class	Disease Risk* Relative to Normal Weight and Waist Circumference	
			Men 102 cm (40 in) or less Women 88 cm (35 in) or less	Men > 102 cm (40 in) Women > 88 cm (35 in)
Underweight	< 18.5		-	-
Normal	18.5-24.9		-	-
Overweight	25.0-29.9		Increased	High
Obesity	30.0-34.9	I	High	Very High
	35.0-39.9	II	Very High	Very High
Extreme Obesity	40.0 +	III	Extremely High	Extremely High

Significance of obesity

- Overweight and obesity are the fifth leading risk for global deaths.
- At least 2.8 million adults die each year as a result of being overweight or obese.
- In addition, 44% of the diabetes burden, 23% of the ischaemic heart disease burden and between 7% and 41% of certain cancer burdens are attributable to overweight and obesity.

What causes obesity and overweight?

- The fundamental cause of obesity and overweight is an energy imbalance between calories consumed and calories expended. Globally, there has been:
 - an increased intake of energy-dense foods that are high in fat; and
 - an increase in physical inactivity due to the increasingly sedentary nature of many forms of work, changing modes of transportation, and increasing urbanization.

What are common health consequences of overweight and obesity?

- Raised BMI is a major risk factor for noncommunicable diseases such as:
 - cardiovascular diseases (mainly heart disease and stroke);
 - diabetes;
 - musculoskeletal disorders (especially osteoarthritis - a highly disabling degenerative disease of the joints);
 - some cancers (endometrial, breast, and colon).

Consequences of childhood obesity

- Childhood obesity is associated with a higher chance of obesity, premature death and disability in adulthood. But in addition to increased future risks, obese children experience breathing difficulties, increased risk of fractures, hypertension, early markers of cardiovascular disease, insulin resistance and psychological effects.

Facing a double burden of disease

- Many low- and middle-income countries are now facing a "double burden" of disease.
 - While they continue to deal with the problems of infectious disease and under-nutrition, they are experiencing a rapid upsurge in noncommunicable disease risk factors such as obesity and overweight, particularly in urban settings.
 - It is not uncommon to find under-nutrition and obesity existing side-by-side within the same country, the same community and the same household.

How can overweight and obesity be reduced?

- Individual level
- Access to healthy lifestyle
- Food industry



Individual level

- At the individual level, people can:
 - limit energy intake from total fats and sugars;
 - increase consumption of fruit and vegetables, as well as legumes, whole grains and nuts;
 - engage in regular physical activity (60 minutes a day for children and 150 minutes per week for adults).

Access

- Individual responsibility can only have its full effect where people have access to a healthy lifestyle. Therefore, at the societal level it is important to:
 - support individuals in following the recommendations above, through sustained political commitment and the collaboration of many public and private stakeholders;
 - make regular physical activity and healthier dietary choices available, affordable and easily accessible to all - especially the poorest individuals.

Food industry

- The food industry can play a significant role in promoting healthy diets by:
 - reducing the fat, sugar and salt content of processed foods;
 - ensuring that healthy and nutritious choices are available and affordable to all consumers;
 - practicing responsible marketing especially those aimed at children and teenagers;
 - ensuring the availability of healthy food choices and supporting regular physical activity practice in the workplace.

Diabetes

Key facts

- 347 million people worldwide have diabetes.
- In 2004, an estimated 3.4 million people died from consequences of high fasting blood sugar.
- More than 80% of diabetes deaths occur in low- and middle-income countries.
- WHO projects that diabetes will be the 7th leading cause of death in 2030.
- Healthy diet, regular physical activity, maintaining a normal body weight and avoiding tobacco use can prevent or delay the onset of type 2 diabetes

Types

- **Type 1 diabetes** (previously known as insulin-dependent, juvenile or childhood-onset) is characterized by deficient insulin production and requires daily administration of insulin. The cause of type 1 diabetes is not known and it is not preventable with current knowledge.
- **Type 2 diabetes** (formerly called non-insulin-dependent or adult-onset) results from the body's ineffective use of insulin. Type 2 diabetes comprises 90% of people with diabetes around the world (5), and is largely the result of excess body weight and physical inactivity.

Other

- **Gestational diabetes:** Gestational diabetes is hyperglycaemia with onset or first recognition during pregnancy.
- **Impaired glucose tolerance (IGT) and impaired fasting glycaemia (IFG):** Impaired glucose tolerance (IGT) and impaired fasting glycaemia (IFG) are intermediate conditions in the transition between normality and diabetes. People with IGT or IFG are at high risk of progressing to type 2 diabetes, although this is not inevitable.

What are common consequences of diabetes?

- Diabetes increases the risk of heart disease and stroke. 50% of people with diabetes die of cardiovascular disease (primarily heart disease and stroke).
- Combined with reduced blood flow, neuropathy (nerve damage) in the feet increases the chance of foot ulcers, infection and eventual need for limb amputation.
- Diabetic retinopathy is an important cause of blindness, and occurs as a result of long-term accumulated damage to the small blood vessels in the retina. One percent of global blindness can be attributed to diabetes.
- Diabetes is among the leading causes of kidney failure.
- The overall risk of dying among people with diabetes is at least double the risk of their peers without diabetes.

How can the burden of diabetes be reduced?

- Prevention
- Early diagnosis and treatment
- Other



Prevention

- achieve and maintain healthy body weight;
- be physically active – at least 30 minutes of regular, moderate-intensity activity on most days. More activity is required for weight control;
- eat a healthy diet of between three and five servings of fruit and vegetables a day and reduce sugar and saturated fats intake;
- avoid tobacco use – smoking increases the risk of cardiovascular diseases.

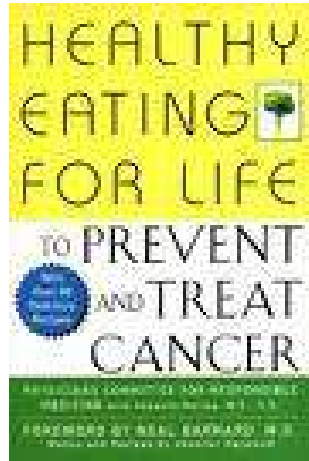
Early diagnosis and treatment

- Early diagnosis can be accomplished through relatively inexpensive blood testing.
- Treatment of diabetes involves lowering blood glucose and the levels of other known risk factors that damage blood vessels. Tobacco use cessation is also important to avoid complications.
- Interventions that are both cost saving and feasible in developing countries include:
 - moderate blood glucose control. People with type 1 diabetes require insulin; people with type 2 diabetes can be treated with oral medication, but may also require insulin;
 - blood pressure control;
 - foot care.

Other

- screening and treatment for retinopathy (which causes blindness);
- blood lipid control (to regulate cholesterol levels);
- screening for early signs of diabetes-related kidney disease.
- These measures should be supported by a healthy diet, regular physical activity, maintaining a normal body weight and avoiding tobacco use.

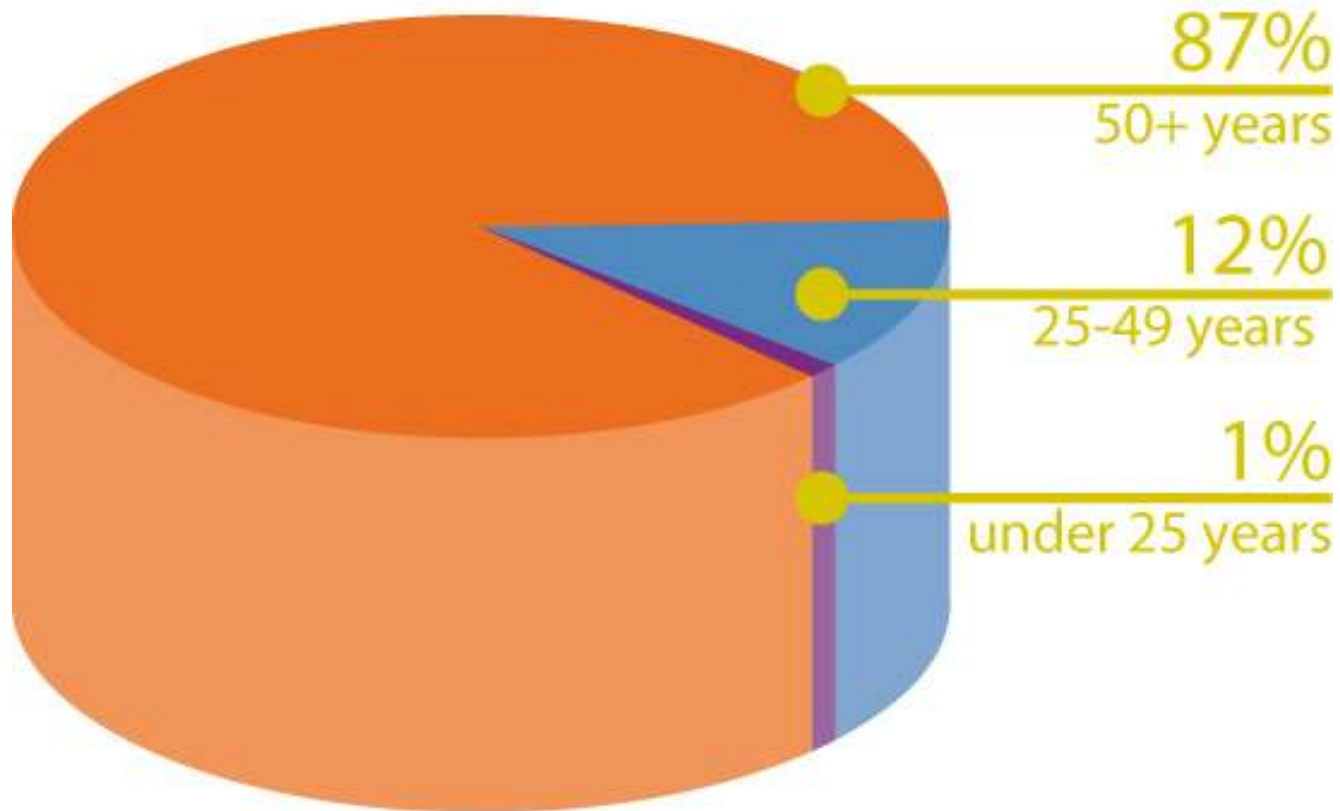
Cancer



Is cancer a significant public health issue?

- Most cancers develop as a result of exposure to *modifiable risk factors!*
- Most cancers have a *long detectable preclinical phase* which allows for early detection and effective treatment!

Who is affected by cancer?



Source: Cancer Care Ontario, Ontario Cancer Registry

Who is affected by cancer? Of all new cancer cases in 2007, 87% were in people over the age of 50, 12% in people between the age of 25 to 49 and 1% in people under the age of 25.

Is cancer a significant public health issue?

Global data (2002)

Total number of new cases: ~ 11 000 000

Total number of deaths: ~ 7 000 000

Total number of DALYs lost: ~ 75 500 000

Proportion of all deaths due to cancer: ~ 12,5%

Proportion of total DALY loss due to cancer: ~ 5,1%

Sources: World Health Report 2004. WHO, 2004. Available: <http://www.who.int>
IARC GLOBOCAN 2002 database. Available: <http://www-dep.iarc.fr/>

What is the burden of neoplastic diseases in Hungary?

- *Every fourth death* is caused by cancer (it is the second most frequent cause of death)
- Cancer *mortality in the under 65 year old population* is *twice that of the European Union's* corresponding figure (2000)
- Age-standardized cancer mortality is the third highest in the World and the highest in Europe (2002)
- Lung cancer (trachea, bronchus and lung) mortality and colon and rectum cancer mortality figures are highest in the World (2002)
- *Lung-, colon and mouth and oropharynx cancer mortality are highest in Europe* (2002)
- Nearly 80000 new cases of cancer develop every year

Sources: Internet-based Hungarian Health Datawarehouse (IMEA). Available: <http://www.eski.hu/index.html>;
Népegészségügyi Jelentés (Hungarian Public Health Report) 2004. OEK 2004. Available: <http://www.oek.hu>;
World Health Statistics 2006. Available: <http://www.who.int/whosis/whostat2006>

„What kinds?” – Cancer incidence in Hungary

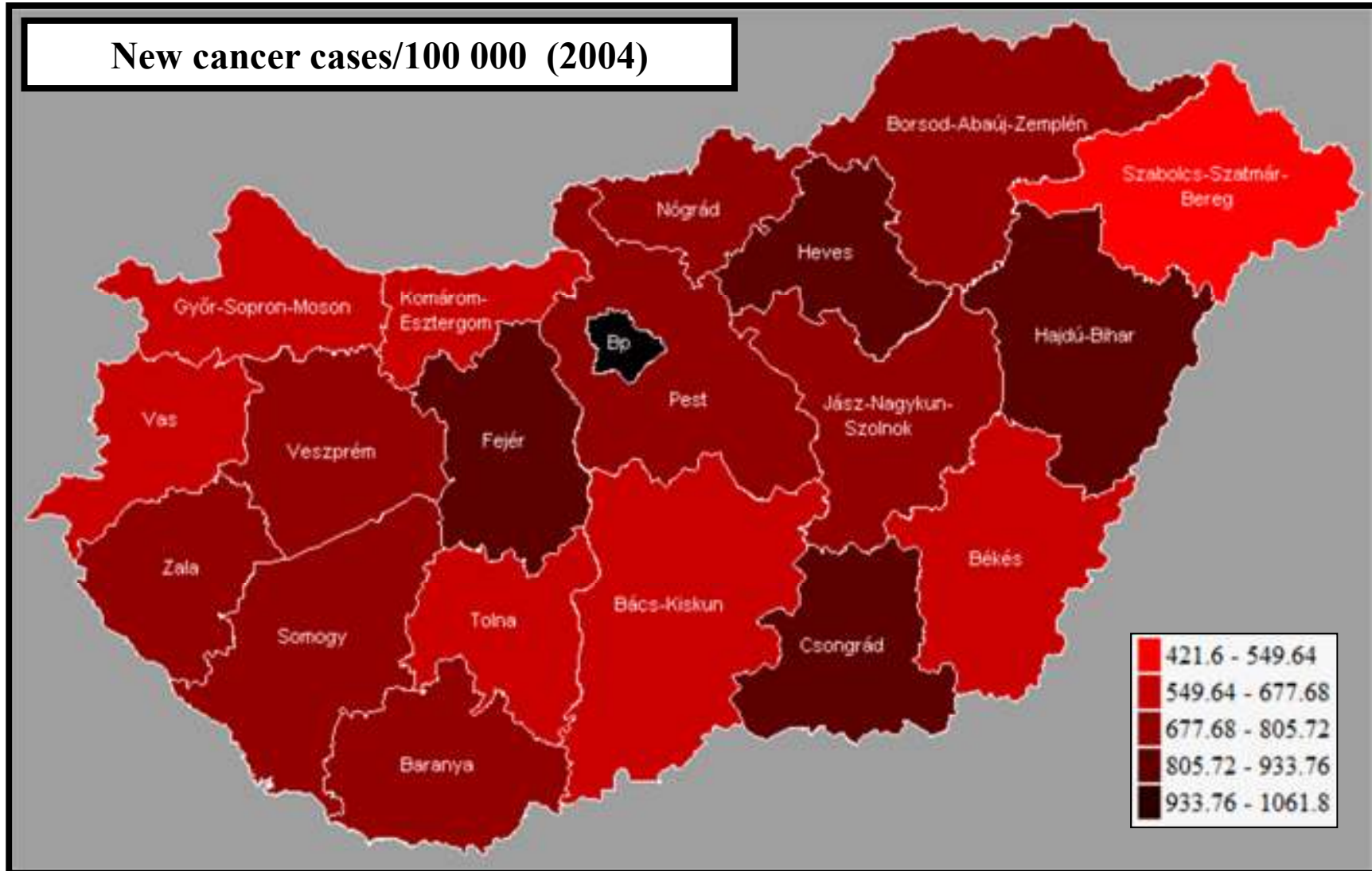
Males

1. Trachea, bronchus and lung
2. Skin
3. Prostate
4. Stomach and intestines
5. Bladder and other urological
6. Mouth and oropharynx
7. Rectum and anus
8. Lympho-hematological
9. Liver, gall bladder and bile ducts
10. Eye, brain and CNS

Females

1. Breast
2. Skin
3. Stomach and intestines
4. Trachea, bronchus and lung
5. Bladder and other urological
6. Rectum and anus
7. Lympho-hematological
8. Uterine cervix
9. Liver, gall bladder and bile ducts
10. Eye, brain and CNS

„Where?”



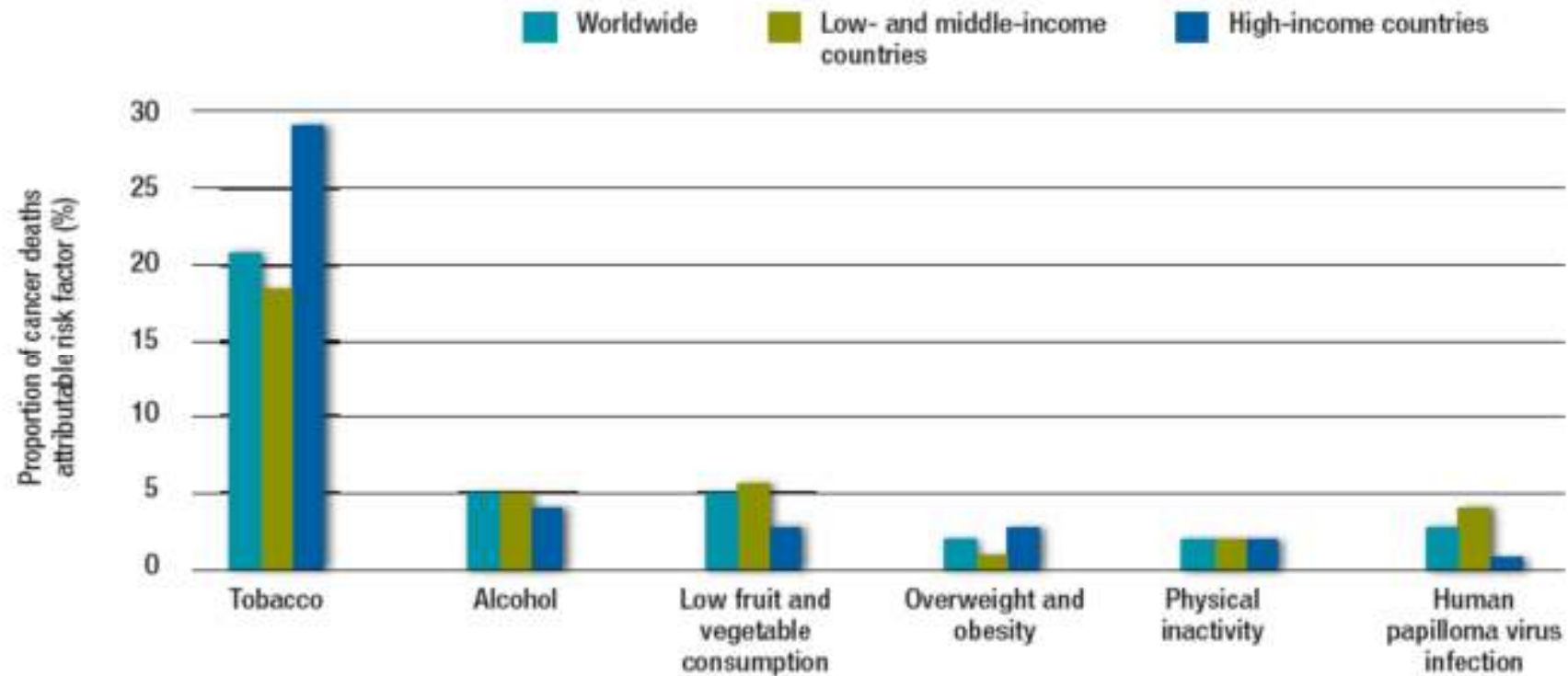
Source: Internet-based Hungarian Health Datawarehouse (IMEA). Available: <http://www.eski.hu/index.html>;

How about your home country?

The IARC GLOBOCAN 2002 database

<http://www-dep.iarc.fr/>

Contribution of selected risk factors for all cancer deaths, worldwide, in high-income countries, and in low- and middle-income countries



Source: based on data from Danaei et al., 2005.

WHO estimates that 40% of all cancer deaths is preventable. Tobacco use and harmful alcohol use are among the most important risk factors for the disease.

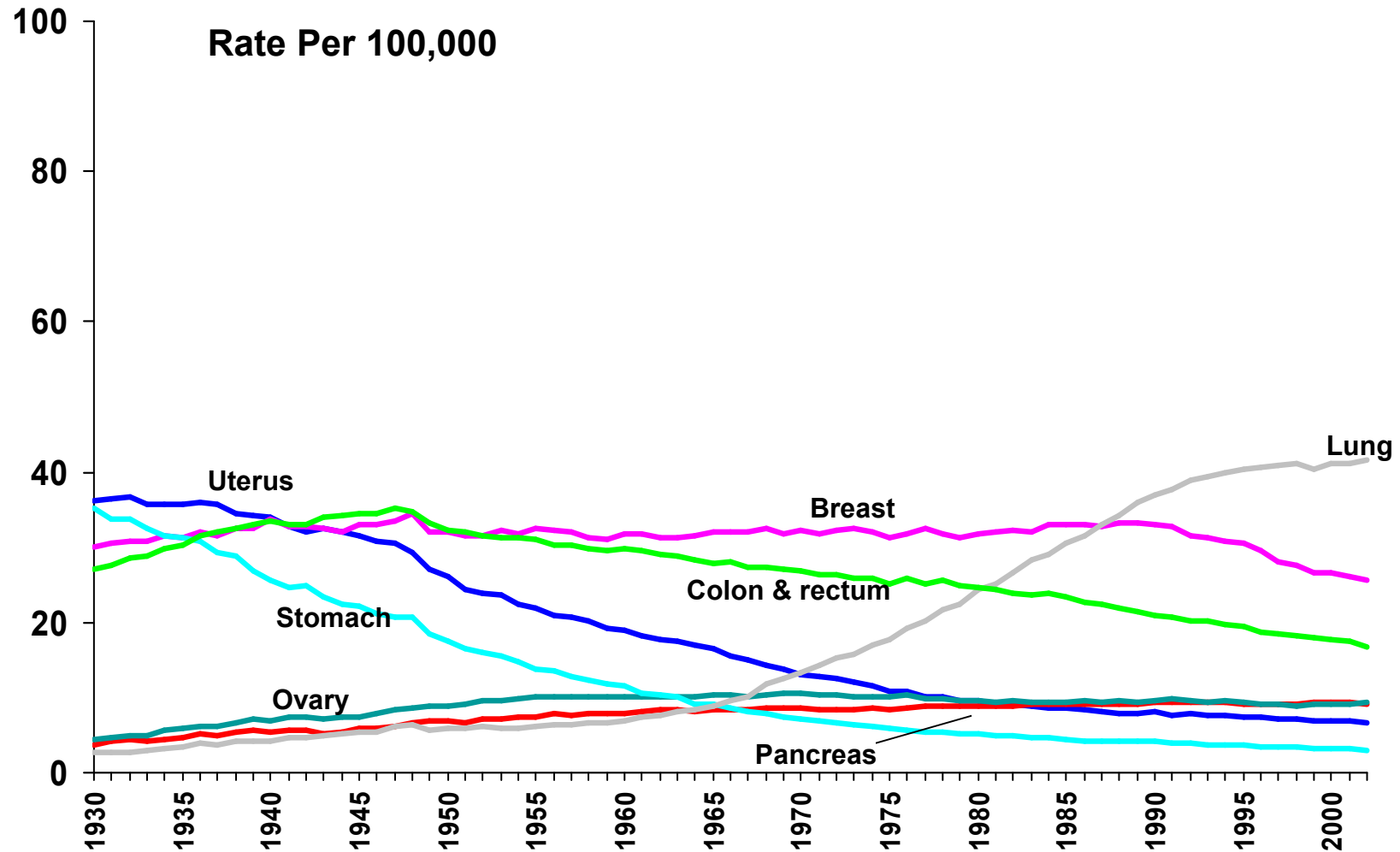
Cancer deaths:
every year at least 7 million people die from cancer

Tobacco use and exposure	1,5 million cancer deaths
Chronic hepatitis B infection	340 000 liver cancer and cirrhosis deaths
HPV	250 000 cervical cancer deaths
Occupational carcinogens	152 000 cancer deaths
Overweight, obesity, physical inactivity	274 000 cancer deaths
Harmful alcohol use	351 000 cancer deaths
Indoor and outdoor air pollution	71 000 cancer deaths

Source: WHO

Cancer Death Rates*, for Women, US, 1930-2002.

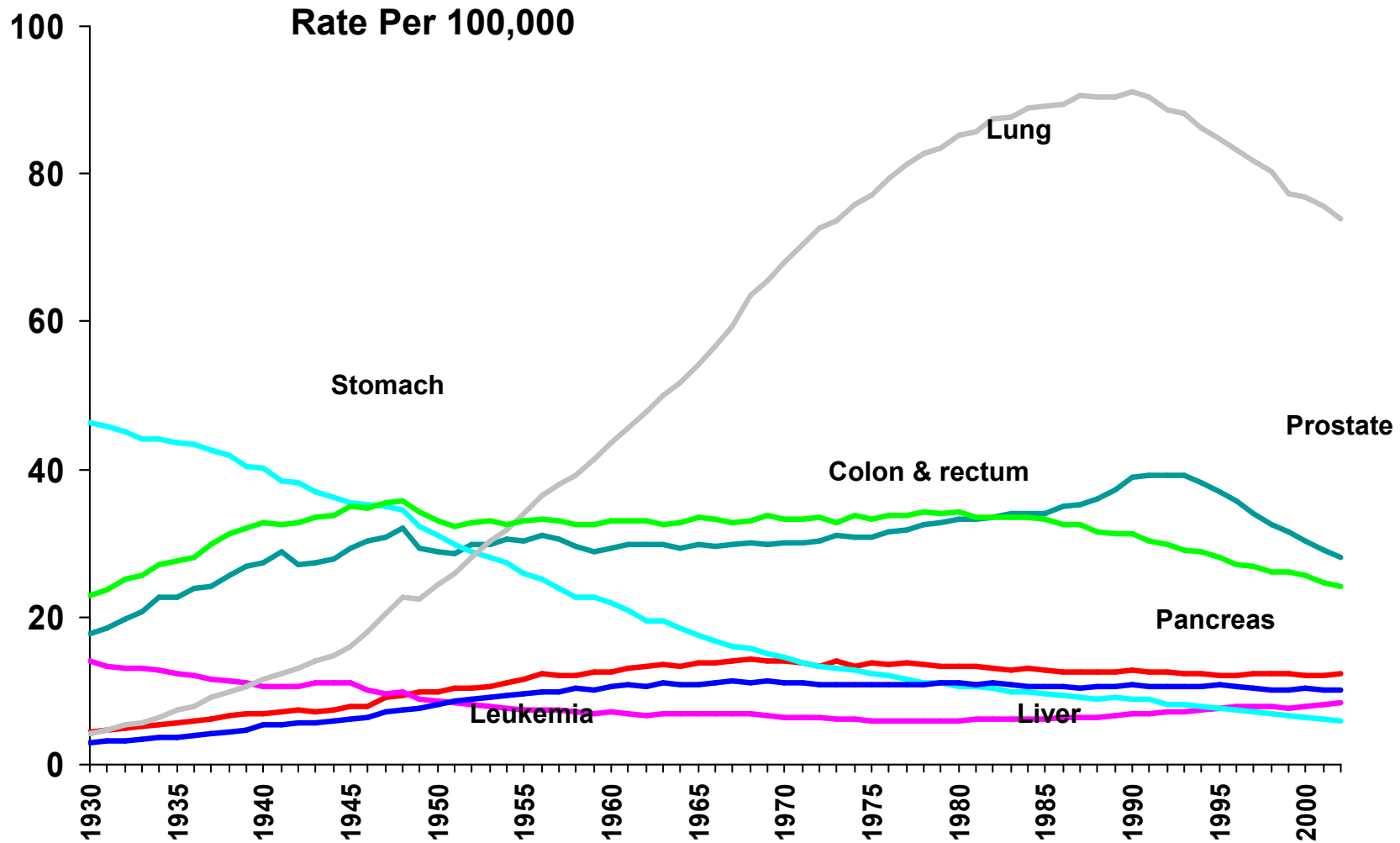
Note rise in lung cancer, decrease in uterus, stomach and colorectum. Breast cancer was very stable until 1990s.



*Age-adjusted to the 2000 US standard population.

Source: US Mortality Public Use Data Tapes 1960-2002, US Mortality Volumes 1930-1959, National Center for Health Statistics, Centers for Disease Control and Prevention, 2005.

Cancer Death Rates*, for Men, US, 1930-2002,
Note rise of lung cancer, decrease in stomach cancer.



*Age-adjusted to the 2000 US standard population.

Source: US Mortality Public Use Data Tapes 1960-2002, US Mortality Volumes 1930-1959, National Center for Health Statistics, Centers for Disease Control and Prevention, 2005.

Causes and risk factors of cancer

Tobacco smoking

Of the 7 million annual cancer deaths, 40% are preventable. Of these avoidable cancer deaths, tobacco accounts for 60%. Lung cancer is the leading form of tobacco-caused cancer, followed by tumours of the larynx, pancreas, kidney and bladder.

Dietary factors

The vegetable and fruit intake play protective role.

Obesity and physical exercise

Overweight and obesity alone account for 40% of endometrial cancer. Collectively, overweight and obesity, and physical inactivity account for 159 000 colorectal cancer deaths each year, and 88 000 breast cancer deaths each year.

Alcohol

Harmful alcohol use causes 351 000 cancer deaths annually and is a risk factor for many cancers, including oral, pharynx, larynx, oesophagus, liver, colorectal and breast.



Causes and risk factors of cancer

Infectious agents

Hepatitis B, C, HPV, H. pylori

Occupational and environmental agents

Asbestos, arsenic ...

Ionizing and non-ionizing radiation

Ionizing radiation is a well established carcinogen for certain cancers, like lung, breast and thyroid cancer and most types of leukaemia. Radon is the second most important risk factor for lung cancer after tobacco.

Non-ionizing radiation (UV, sunbed) is risk factor for skin cancers.

Medical procedures and drugs

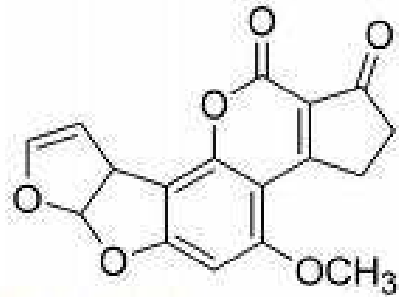
Chemotherapy (leukaemia), immunosuppressive therapy (Non-Hodgkin lymphoma), radiotherapy (cancer in the irradiated organs), replacement oestrogen therapy (endometrial cc), Phenacetin-containing analgesics (cancer of the renal pelvis)

Genetic factors

Population-level strategies

- Minimizing exposure to known environmental carcinogens
 - Decreasing levels of environmental pollutants
 - Development and implementation of workplace safety regulations
 - Development and implementation of food safety standards
- Providing protection
 - **Vaccination** (HBV, HPV)
- Early detection
 - Organized population screening
- Increasing knowledge and information on cancers
 - Organized health-education and risk-communication
 - Basic-, clinical and epidemiological research
 - Establishment and maintenance of cancer-registries

Aflatoxin



Brazil-nut



peanut



pistachio



fig

It is toxic, and cancer-causing, and is produced as secondary metabolites by the fungi, *Aspergillus flavus* and *Aspergillus parasiticus*. At least 13 different types of aflatoxin are produced in nature, but aflatoxin B1 is considered the most toxic.

Policy strategies for cancer prevention

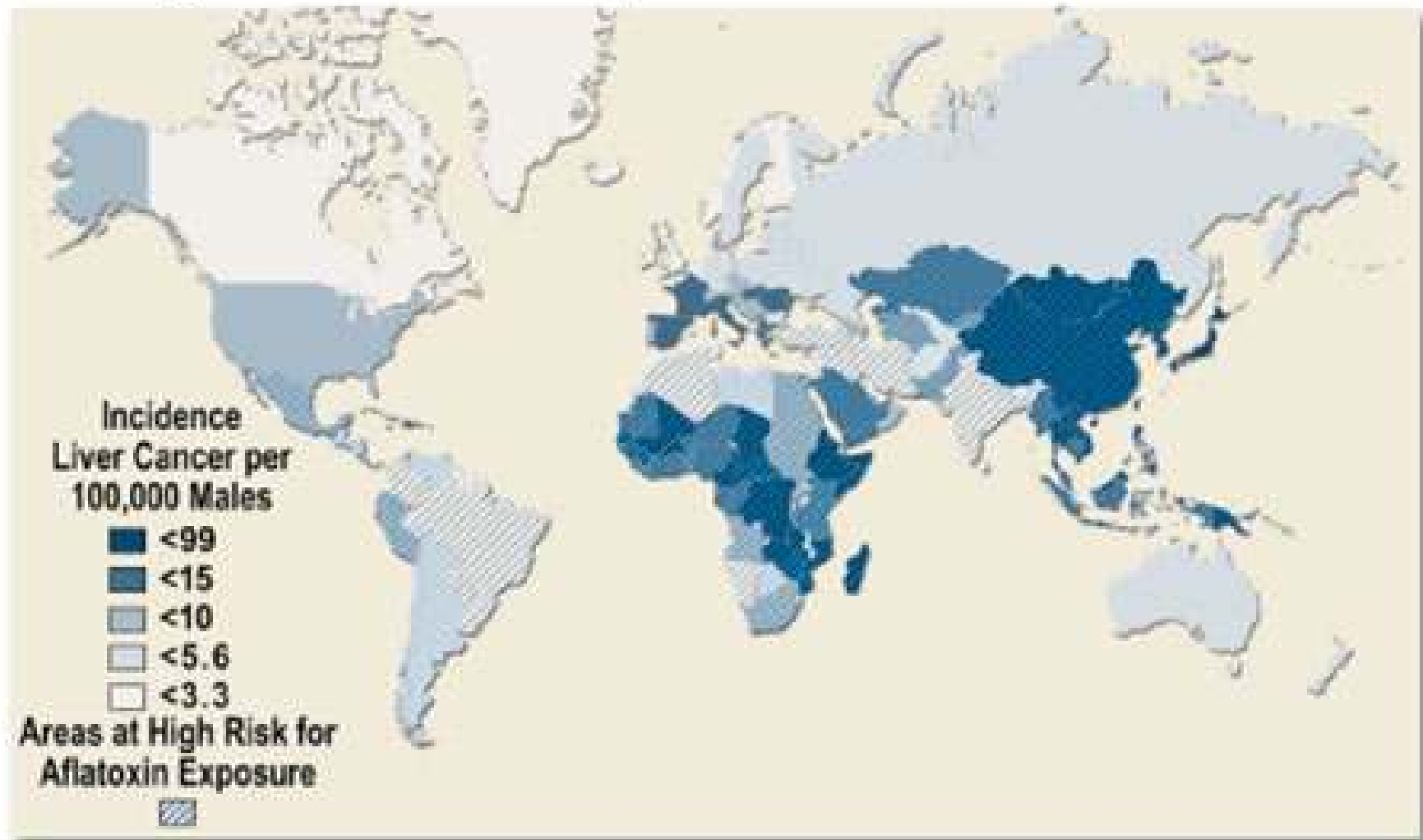
- *Tobacco*

- **Ban smoking in public places—arenas, malls, restaurants, work places**
- **Higher taxes on tobacco products**

- *Dietary Obesity*

- **Ban advertising of sugary drinks and unhealthy foods directed at children**
- **Remove vending machines that dispense high fat, sugary sweets or drinks out of schools and workplace cafeterias**
- **Reformulate processed meals, snacks and food reformulated to contain less sugar, refined starches, fat and salt.**
- **Ban trans-fat**

Correlation Between Populations with High Liver Cancer Rates and High Risk of Chronic Exposure to Aflatoxin Contamination



Individual level strategies for cancer prevention

- Primary prevention

- **Avoiding / minimizing contact with known carcinogens:**
 - Non-smoking
 - Moderate alcohol consumption
 - Safe sex
 - Moderate sun-bathing / tanning
- Healthy diet
- Regular physical exercise
- Adaptive coping strategies and stress management

- Secondary prevention

- Regular self-examination (breast cc, testicular cc, skin cc...)
- Regular health checkups including recommended cancer-screening based on age and personal risk factors
- Attending organized screening programs



1. Processed meats like hotdogs and bacon

Sodium Nitrate when placed in processed meats and consumed produces **nitrosamines**



2. Doughnuts



3. French Fries

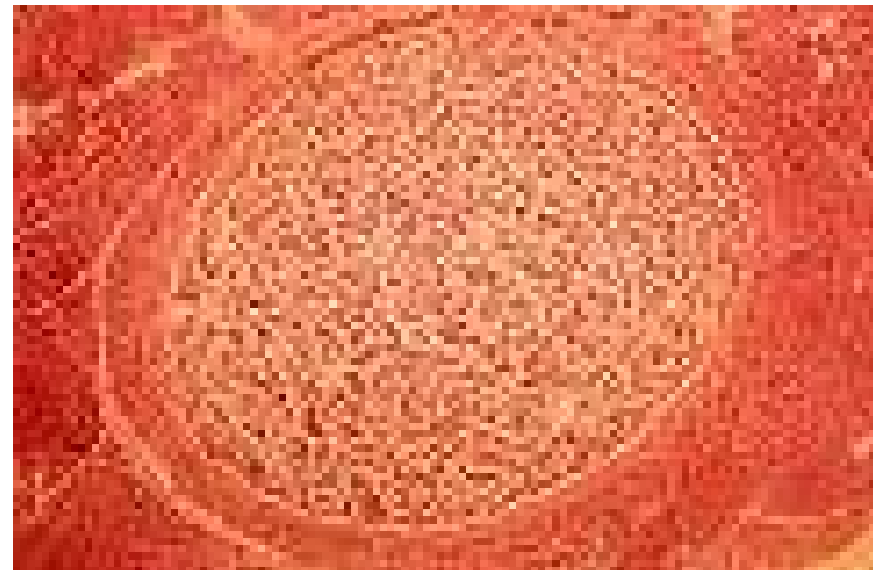
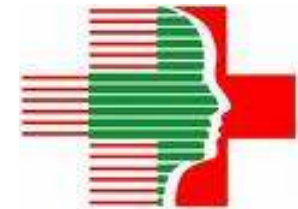
Trans-fats are usually contained in hydrogenated oils and these substances increase the bad cholesterol in the body.

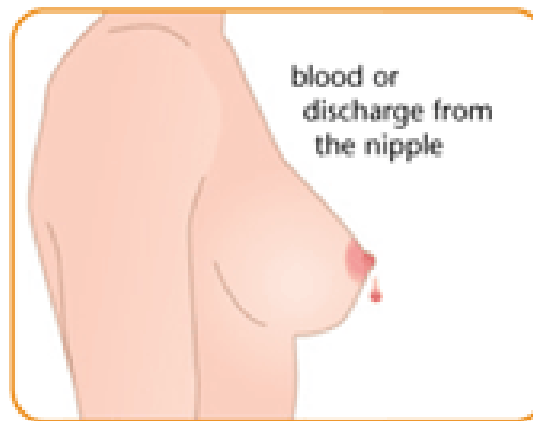
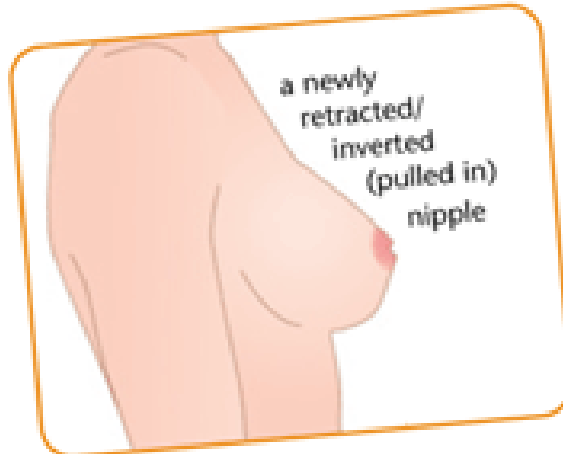
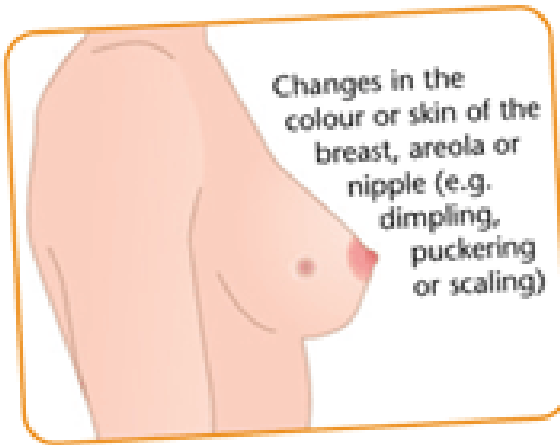
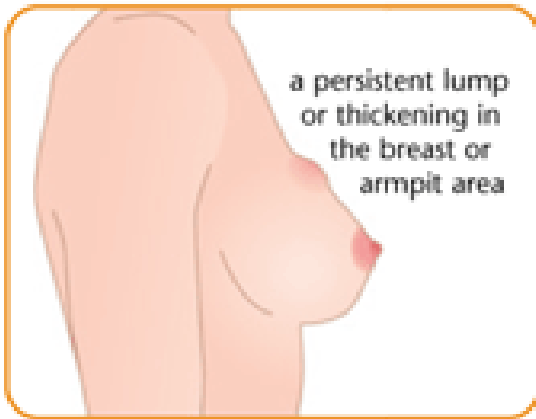


4. Chips, crackers and cookies

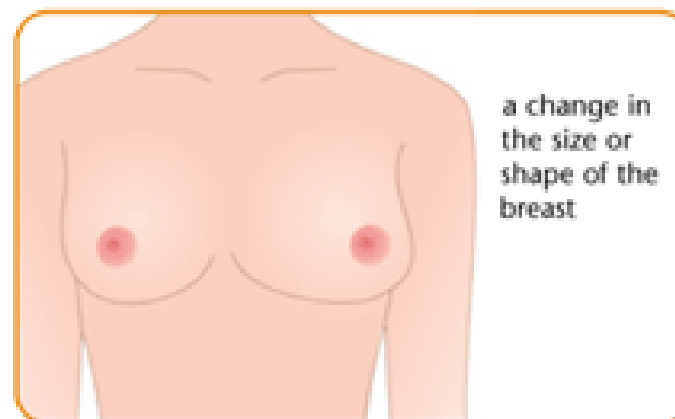
Breast cancer, population screening - in HUNGARY

- women between **45 – 65 years**
- every 2 years
- in Hungary: in a year about 7500 new breast cancer case and 2500 deaths



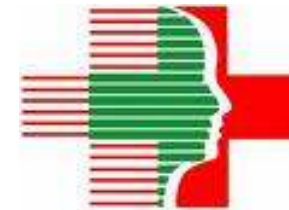
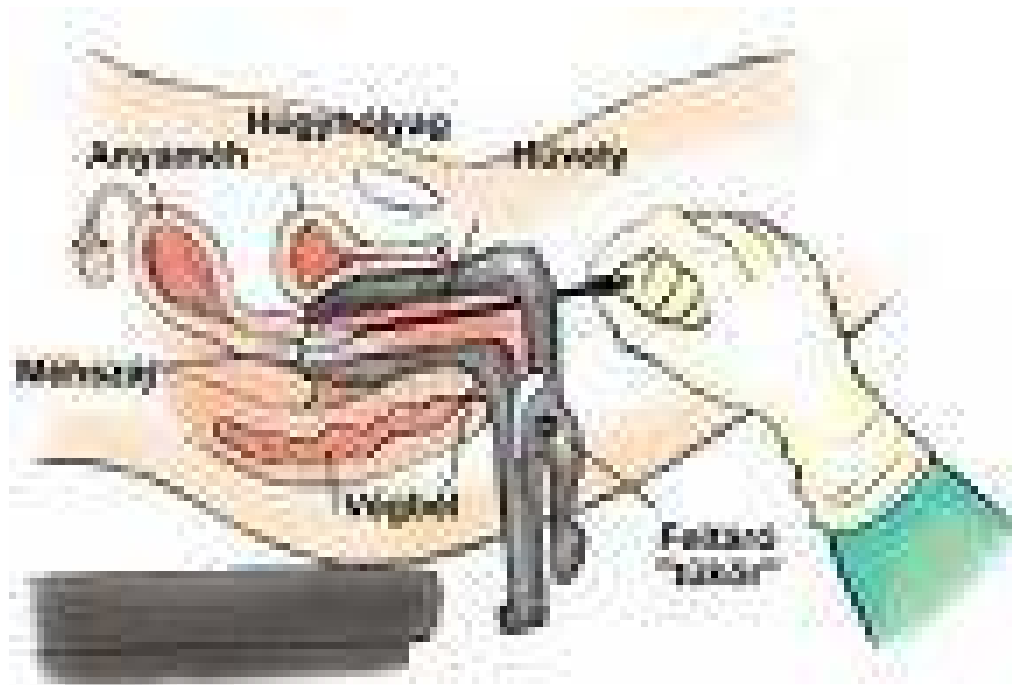


Consult a doctor as soon as possible if you notice any of these changes.



Cervix cancer, population screening - in HUNGARY

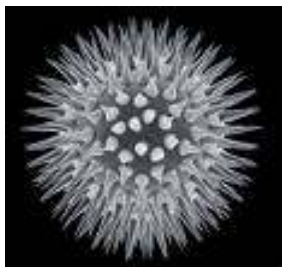
- women between 25 – 65 years
- in 3 years
- in Hungary: about 1500 new cases yearly and 500 deaths



HPV is the leading cause of cervical cancer in women and the **CDC recommends that (three doses of) the vaccine be given to girls when they are 11 – 12 years old** (but can be given between 9 and 26 years old).

There are approximately 40 types of genital HPV. Some types can cause cervical cancer in women and can also cause other kinds of cancer in both men and women. Other types can cause genital warts in both males and females. The HPV vaccine works by preventing the most common types of HPV that cause cervical cancer and genital warts.

USA: National surveys have found that about 7% of children have had sexual intercourse before age 13, and about 25% have done so by age 15.



Colorectal cancer, population screening - in HUNGARY

- between 50 – 70 years
- every 2 years
- in Hungary about 7500 new cases yearly and 5000 deaths



Stool testing for blood in the stool is getting more sophisticated. A new study has shown that use of a simple immunochemical fecal occult blood test (FOBT), in combination with the traditional guaiac FOBT is capable of accurately detecting colorectal cancer and may reduce the need for more complex and less pleasing procedure of invasive colonoscopy.

Organized population screening (in Hungary)

- *Breast cancer screening*
 - Has been operating since 2001 more or less successfully
 - Women between ages 45 and 65 years are invited every 2 years
 - Operates through a network of mammography screening stations
- *Cervical cancer screening*
 - Organized screening since 2003
 - Women between ages 25 and 65 years are invited every 3 years
 - Constrained to institutes with accredited cytopathology laboratories
- *Colon cancer screening*
 - First introduced in 2004, gradual implementation currently in progress
 - Men and women between ages 45 and 65 years are invited every 2 years for a **stool sample test for blood** (Weber's test)
 - Will probably operate through the GP network, but sample processing will take place at accredited laboratories only

The European Code Against Cancer I.

(<http://www.cancercode.org>)

- **Do not smoke**; if you smoke, stop doing so. If you fail to stop, do not smoke in the presence of non-smokers
- **Avoid obesity**
- Undertake some brisk **physical activity** every day
- Increase your daily intake and variety of **vegetables and fruits**: eat at least five servings daily. Limit your intake of foods containing fats from animal sources
- If you drink **alcohol**, whether beer, wine or spirits, **moderate your consumption** to two drinks per day if you are a man and one drink per day if you are a woman
- Care must be taken to **avoid excessive sun exposure**. It is specifically important to protect children and adolescents. For individuals who have a tendency to burn in the sun active protective measures must be taken throughout life
- Apply strictly regulations aimed at **preventing any exposure to known cancer causing substances**. Follow all health and safety instructions on substances which may cause cancer. Follow advice of national radiation protection offices

The European Code Against Cancer II.

<http://www.cancercode.org>

- **Women from 25 years of age** should **participate in cervical screening**. This should be within programmes with quality control procedures in compliance with European Guidelines for Quality Assurance in Cervical Screening
- **Women from 50 years of age** should **participate in breast screening**. This should be within programmes with quality control procedures in compliance with European Union Guidelines for Quality Assurance in Mammography Screening
- **Men and women from 50 years of age** should **participate in colorectal screening**. This should be within programmes with built-in quality assurance procedures
- **Participate in vaccination programmes against Hepatitis B** virus infection

Dietary prescriptions (Hungary)

- **Maintain a normal BMI** through calorie intake proportional to your activity level and engage in regular physical exercise
- **Increase your intake of fruits and vegetables**
- **Choose predominantly whole-grain cereals, lower consumption of sweets and sugar**
- **Lower your intake of red meats**, avoid grilled, smoked or marinated meat
- Choose low-fat milk and dairy products
- **Lower consumption of animal fat**
- **Eat less salt**
- **Avoid excess alcohol consumption** (females < 10g/day, males < 20g/day)
- **Do not drink very hot drinks** or have very hot soup often
- **Drink less coffee**
- **Avoid foods potentially contaminated with toxic molds** (A. flavus – aflatoxin etc.)



Back off on the red meat. Eat less than 500 grams (18 ounces) a week, and banish processed meats from your diet altogether.

The role of the primary care physician

- Accurate assessment and communication of patient's personal cancer risk
- *Opportunistic cancer-screening* (routinely or for high-risk patients)
 - ✓ Breast examination
 - ✓ Testes examination
 - ✓ Rectal digital examination (rectum and prostate cancer)
 - ✓ Examination of the oral cavity
 - ✓ Inspection of any suspicious skin phenomena (ABCD rule!)
- High risk cases should be referred to specialist care and follow-up
- Patient education on risk factors, symptoms and the importance of regular self examination and participation in organized screening

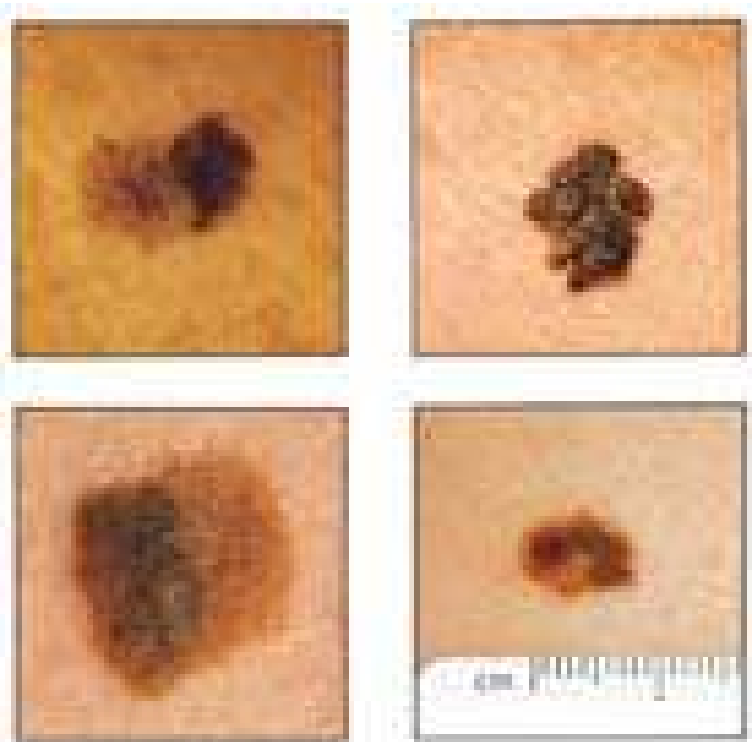
The ABCD Rule for Early Detection of Melanoma

A is for **ASYMMETRY**: One-half of a mole or birthmark does not match the other.

B is for **BORDER**: The edges are irregular, ragged, notched, or blurred.

C is for **COLOR** The color is not the same all over, but may have differing shades of brown or black, sometimes with patches of red, white, or blue.

D is for **DIAMETER**: The area is larger than 6 millimeters (about 1/4 inch -- the size of a pencil eraser) or is growing larger.



Tasks for primary care physicians in the prevention of specific types of cancer: three examples

Primary sources: Döbrössy L. Megelőzés az alapellátásban. Mi a teendő? Medicina, 2004.

Gonzales R, Kutner JS. Current practice guidelines in primary care. Lange, 2006.

Lung cancer

Main tasks:

- **Avoid smoking**, especially in public, especially at workplace
- **Strongly advise young non-smokers not to start smoking**
- Attempt brief intervention and **support smoking cessation**
- Advise smokers to avoid beta-carotene supplementation
- **Educate** patient on signs and symptoms of lung cancer
- Although routine screening with chest x-ray, sputum smear or low-dose, high-definition spiral CT is not recommended, **screening and/or close monitoring should be considered for persons at high risk** (over 40 years of age, heavy smoker, mostly males)

Colon and rectum cancer

Main tasks:

- Possibility for primary prevention is limited, but there is some evidence, that NSAIDs and postmenopausal hormone-replacement (HRT) may decrease risk
- Smoking should be discouraged
- Patient education on characteristic symptoms
- Patients presenting with enteric symptoms should receive digital rectal examination
- Fecal occult blood test (FOBT) every 1-2 years over age 50
- Positive FOBT should be followed up with colonoscopy
- Positive family history or the presence of certain syndromes (polyposis, long-standing Crohn's disease or ulcerative colitis) may warrant closer monitoring and investigation of genetic risk factors, possibly the screening of blood-relatives
- For persons at increased risk, screening should include colonoscopy every five years

Oral and oropharyngeal cancer

Main tasks:

- Brief / minimal intervention **against smoking and alcohol abuse**
- **Patient education** concerning characteristic symptoms and precancerous lesions
- **Routine examination of the oral cavity** (as a part of routine physical checkup) and enquiry about any oral complaints
- **For high risk patients** (over 40, smoker, high alcohol consumption, low oral hygiene, no regular dental visits, mostly males) **refer to specialist screening**
- If high risk patient has low probable compliance or referral is not possible examine oral cavity thoroughly for leukoplakia, erythroplakia, ulceration... etc.
- If there is any suspicion of cancer, refer to specialist care