

Chapter 4

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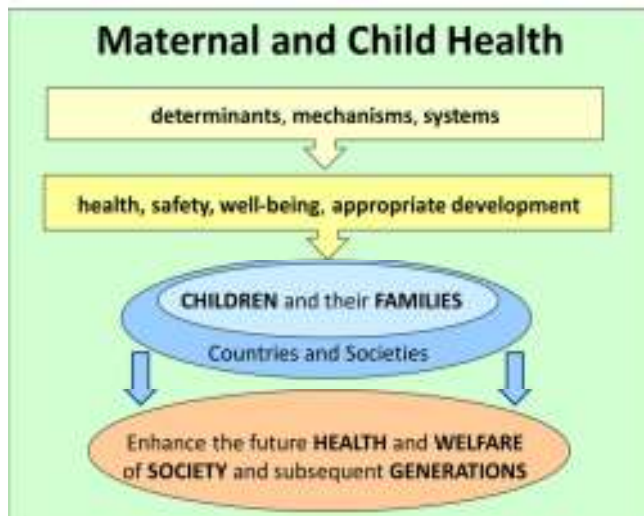
4.5.6.2. Youth health

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4.5.1. Introduction

Maternal and child health focuses on the determinants, mechanisms, and systems that operate



and maintain the health, safety, well-being, and appropriate development of children and their families in countries and societies in order to enhance the future health and welfare of society and subsequent generations (Alexander et al. 2004). Global health policies and programs are rooted in a social justice philosophy and the protection of vulnerable populations, maternal and child health embodies the concept of global advocacy for the largest vulnerable populations in both developed and less-developed countries, notably women, children, and adolescents.

Goals of maternal and child health:

- 1) Encourage *planned pregnancy*.
- 2) Promote *healthy relationships* within the family to nurture the growing child.
- 3) Optimize the *normal developmental* processes.
- 4) Prevent *child health problems* and reduce the risk of adult health problems.
- 5) Provide *early intervention* to minimize morbidity, mortality and disability (timely, cost effective treatment).

Main topics of maternal and child health:

- Reproductive health
- Prenatal care
- Screening in infancy, childhood and adolescence
- Encourage breastfeeding
- Immunization
- Prevention of childhood diseases

Participants:

- Obstetrics-gynecologist
- GP (general practitioner or family doctor)
- Neonatologist
- Pediatrician
- Mother and child health care nurses
- Staff of the family planning center

4.5.2. Reproductive health

The 1994 International Conference on Population and Development (ICPD) in Cairo was attended by delegates of over 180 countries as well as representatives of approximately 1,200 NGOs. Both family planning and safe motherhood, along with sexual health, were incorpo-



rated under the concept of reproductive health. The ICPD defined reproductive health as follows:

- 1) Reproductive health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity, in all matters relating to the reproductive system and to its functions and processes.
- 2) Reproductive health therefore implies that people are able to have a satisfying and safe sex life and that they have the capability to reproduce and the freedom to decide if, when and how often to do so.
- 3) Implicit in this last condition are the right of men and women to be informed and to have access
 - to safe, effective, affordable and acceptable methods of family planning of their choice,
 - as well as other methods of their choice for regulation of fertility which are not against the law,
 - and the right of access to appropriate health-care services that will enable women to go safely through pregnancy and childbirth and provide couples with the best chance of having a healthy infant.

Reproductive healthcare:

- Defined as the constellation of methods, techniques and services that contribute to reproductive health and well-being by preventing and solving reproductive health problems.
- It also includes sexual health, the purpose of which is the enhancement of life and personal relations, and not merely counseling and care related to reproduction and sexually transmitted diseases.

4.5.2.1. Sexual health

- 1) *Unsafe sex* is the leading risk factor for mortality in African women: 1 million African women are killed annually by HIV, human papillomavirus and other sexually transmitted infections.

- 2) Non-use and use of ineffective methods of contraception increase the risk of *unintended pregnancy* and its consequences, including unsafe abortions.
- 3) The proportion of women aged 15–44 years *who used modern contraception* (such as the pill, barrier methods, sterilization or intrauterine device)
 - 14% in the WHO African Region
 - 64% in high-income countries
- 4) The risk of abortion-related complications is proportional to the *risk of unsafe abortion* which is strongly related to the legality of abortion in the country concerned.
- 5) *Unplanned pregnancies* are estimated to be *responsible for*
 - 30% of the disease burden associated with maternal conditions
 - ~90% of unsafe abortions globally.

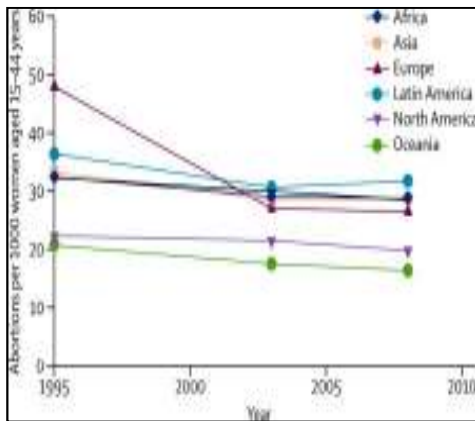
Globally, 68 countries prohibit abortion or permits it only to save a woman's life, 57 countries permit abortion to protect women's like and health, 14 countries permit abortion for socio-economic motives and 60 countries allow women to decide about her pregnancy (*Finer L. et al., 2013*).



Trends in abortion rate by geographic region from 1995 to 2008:

An estimated 43.8 million abortions occurred in 2008, compared with 41.6 million in 2003, and 45.6 in 1995. About 78% of all abortions took place in the developing world in 1995, and increased to 96% in 2008, whereas the proportion of all women of reproductive age who live in the developing world rose from 80% to 84% in the same interval. Since 2003, the number of abortions fell by 0.6 million in the developed world, but increased by 2.8 million in developing countries. The estimated annual number of abortions rose moderately in Africa and Asia, and slightly in the Latin America region; it fell slightly in Europe and North America

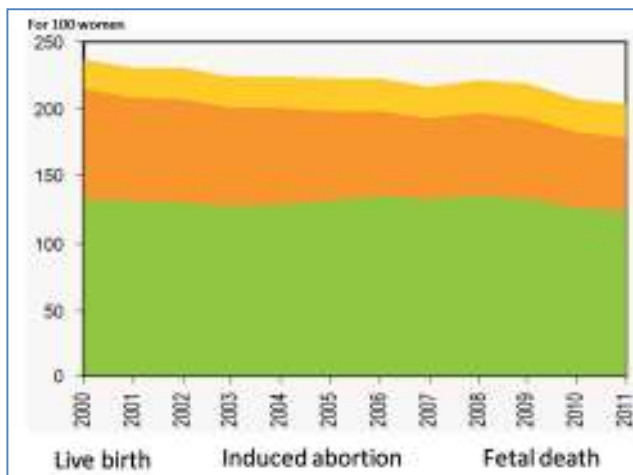
and Held steady in Oceania. Although absolute numbers of abortions might increase as a result of population growth, the abortion rate per 1000 women is not affected by this factor. In



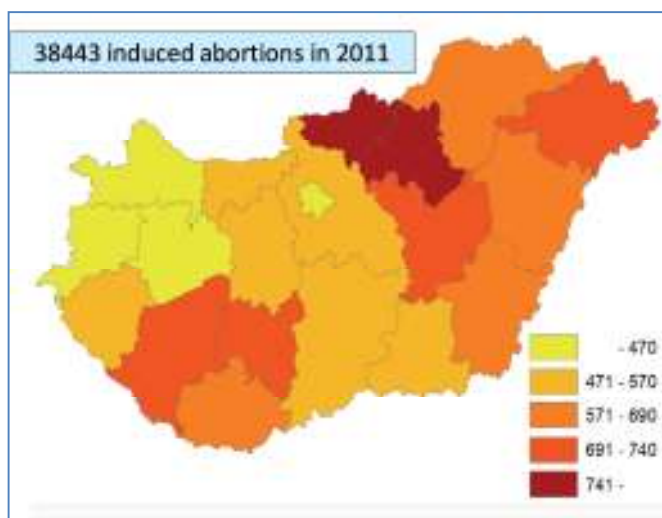
2008, the estimated rate was 24 in the developed world and 29 in the developing world. Abortion rates have been fairly stable at the regional level since 2003, following small declines in some regions, most notably Europe, between 1995 and 2003. (Sedgh G. et al., 2012). There is no evidence of a connection between restrictions on access to abortion and increased birth rate. Women who wish to terminate their pregnancies will seek this service whether it is legal or not. Public health impact of unsafe abortion is directly linked to its legal status. Procedural barriers (mandatory waiting periods, biased counseling requirements) can delay care and hinder access to safe service and increase health risks. (Finer L. et al., 2013)

Conceptions and induced abortions in Hungary

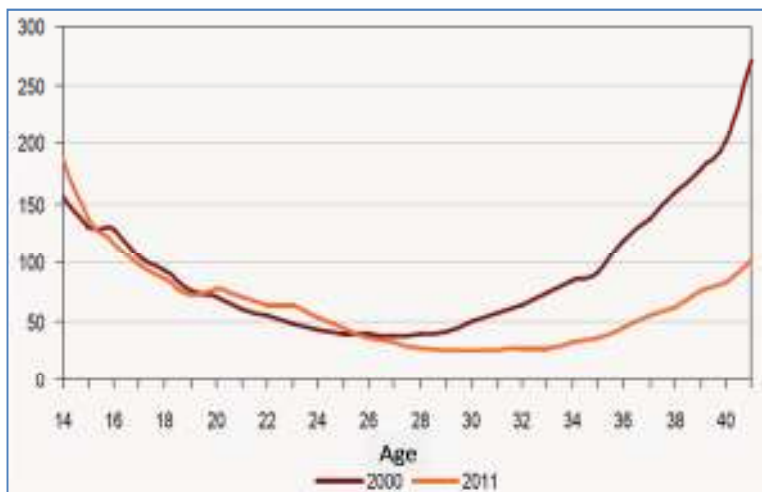
The number and outcomes of conceptions in Hungary, 2000-2011



Total number of induced abortions by counties in Hungary, 2011



Number of induced abortions for 100 live birth by the age of women in Hungary.



4.5.2.2. Family planning – preconception care

- 1) Health of women and men during their reproductive years.
- 2) Focuses on steps that women, men, and health professionals can take to reduce risks, promote healthy lifestyles, and *increase readiness for pregnancy*.
- 3) *Challenge for health professionals: reach women and men with interventions at the time they will be most effective in reducing risks.*
- 4) *Timing is a key issue*
 - The *fetus is vulnerable* to developing certain problems 17–56 days after conception.
 - Prenatal health care may be too late to prevent these problems (weeks 11 or 12 of pregnancy).
- 5) *Role of health professionals*
 - **Screening** for risks.
 - Recommending **interventions** to address identified risks.
- 6) Promoting health and providing *education*.

Interventions:

- 1) Managing medical conditions (e.g. diabetes, obesity, STDs, hypothyroidism).
- 2) Counseling women to avoid certain risks (e.g. alcohol consumption, smoking, teratogenic drug use, under-nutrition, exposure to toxic substances).
- 3) Counseling women to engage in healthy behaviors (e.g. proper nutrition).
- 4) Counseling women about the availability of vaccines to protect their infants from the consequences of infections that affect the mother (e.g. rubella, varicella, HBV).
- 5) Counseling men to avoid certain risks (e.g. tobacco use, exposure to toxic substances).
- 6) Counseling men to engage in healthy behaviors (e.g. proper nutrition, healthy weight management).

Family planning and preconception care for women

- 1) Health Promotion
 - Family Planning and Reproductive Life Plan
 - Screening women for their intentions to become or not become pregnant in the short and long-term.

- Encourage patients (women, men, and couples) to consider a reproductive life plan and educate patients about how their reproductive life plan impacts contraceptive and medical decision-making.
 - Every woman of reproductive age should receive information and counseling about all forms of contraception and the use of emergency contraception that is consistent with their reproductive life plan and risk of pregnancy.
- 2) Weight Status (BMI), healthy weight management, risk of overweight or underweight
 - 3) Physical Activity
 - 4) Nutrient Intake
 - Take a multivitamin supplement if any question of ability to meet the recommended daily allowance through food sources is uncovered.
 - Counsel against ingesting supplements in excess of the recommended daily allowance.
 - 5) Folate: ingest 0.4 mg (400 µg) of synthetic folic acid daily from fortified foods and/or supplements and to consume a balanced, healthy diet of folate-rich food
 - 6) Substance Use (NO tobacco, alcohol)
 - 7) STDs

Pregnancy Rates for Birth Control Methods

(For One Year of Use)

The following table provides estimates of the percent of women likely to become pregnant while using a particular contraceptive method for one year. These estimates are based on a variety of studies.

"Typical Use" rates mean that the method either was *not always used correctly* or was *not used with every act of sexual intercourse* (e.g., sometimes forgot to take a birth control pill as directed and became pregnant), or was *used correctly but failed anyway*.

"Lowest Expected" rates mean that the method was *always used correctly with every act of sexual intercourse but failed anyway* (e.g., always took a birth control pill as directed but still became pregnant).

Method	Typical Use Rate of Pregnancy	Lowest Expected Rate of Pregnancy
Sterilization:		
Male Sterilization	0.15%	0.1%
Female Sterilization	0.5%	0.5%
Hormonal Methods:		
Implant (<i>Norplant™ and Norplant™-2</i>)	0.05%	0.05%
Hormone Shot (<i>Depo-Provera™</i>) ⁴	0.3%	0.3%
Combined Pill (<i>Estrogen/Progestin</i>)	5%	0.1%
Minipill (<i>Progestin only</i>)	5%	0.5%
Intrauterine Devices (IUDs):		
Copper T	0.8%	0.6%
Progesterone T	2%	1.5%
Barrier Methods:		
Male Latex Condom ¹	14%	3%
Diaphragm ²	20%	6%
Vaginal Sponge (<i>no previous births</i>) ³	20%	9%
Vaginal Sponge (<i>previous births</i>) ³	40%	20%
Cervical Cap (<i>no previous births</i>) ²	20%	9%
Cervical Cap (<i>previous births</i>) ²	40%	26%
Female Condom	21%	5%
Spermicide: (gel, foam, suppository, film)	26%	6%
Natural Methods:		
Withdrawal	19%	4%
Natural Family Planning (calendar, temperature, cervical mucus)	25%	1-9%
No Method:	85%	85%

¹ Used Without Spermicide

² Used With Spermicide

³ Contains Spermicide

Data adapted from: Trussell J. Contraceptive efficacy. In Hatcher RA, Trussell J, Stewart F, et al. Contraceptive Technology: Seventeenth Revised Edition. New York, NY: Ardent Media, 1998.

Table prepared by FDA: 5/13/97, revised 9/17/98

The **Pearl Index**, the most common technique used in clinical trials for reporting the effectiveness of a birth control method. The Pearl Index is used as a statistical estimation of the number of unintended pregnancies in 100 woman-years of exposure (e.g. 100 women over one year of use, or 10 women over 10 years). It is also sometimes used to compare birth control methods, a lower Pearl index representing a lower chance of getting unintentionally pregnant.

Personal history: family history, known genetic conditions, prior cesarean delivery, prior miscarriage, prior preterm birth, prior stillbirth, uterine anomalies.

Nutrition

- Calcium – 1000 mg/day for pregnant and lactating women
- Essential Fatty Acids – omega-3 and omega-6 fatty acids
- Folic Acid – 400 µg to prevent neural tube defects
- Iodine – 150 µg during preconception, 200 µg during pregnancy and lactation
- Iron
- Vitamin A
- Vitamin D – no data for optimal dose
- Dietary Supplements

Immunizations: Hepatitis B, Influenza, Measles, Mumps, and Rubella, Tetanus, Diphtheria, Pertussis, Varicella, HPV.

Infectious diseases

- Impact on pregnancy-related outcomes and the reproductive health of women (Chlamydia, Cytomegalovirus, Gonorrhea, Hepatitis C, Herpes Simplex Virus, HIV, Listeriosis, Malaria, Sexually Transmitted Infections, Syphilis, Toxoplasmosis, Tuberculosis);
- the ability to conceive or the site of implantation, e.g. gonorrheal and chlamydial infections;
- Clinical consequences during pregnancy but are not preventable through preconception strategies, e.g. group B Streptococcus.

Medical conditions: Asthma, Cardiovascular Disease, Diabetes Mellitus, Eating Disorders, Hypertension, Lupus, PKU, Psychiatric Conditions, Renal Disease, Rheumatoid Arthritis, Seizure Disorders, Thrombophilia, Thyroid Disease.

Exposures

- 1) Alcohol, Tobacco, Illicit Substances
- 2) Environmental
 - Mercury - avoid consumption of shark, swordfish, King mackerel and some other fish
 - Lead
 - Soil and water hazards
 - Workplace exposures
 - Household exposures
- 3) Hobbies
- 4) Medications

Psychosocial risks

- 1) Access to Care
- 2) Inadequate Financial Resources

Special populations

- 1) Disability
- 2) Immigrant and Refugee Populations

- 3) Survivors of Cancer: fertility preservation options, reproductive effects of cancer treatments.

4.5.2.3. Prenatal care

Physical	Technical	Laboratory
Blood pressure	Fetal heart auscultation	Alpha-fetoprotein (triple)
Body mass index	Abdominal ultrasound	Red cell antibodies
Fetal position	Transvaginal ultrasound	Blood group
Formal risk scoring		Gestational diabetes
Fundal height		Hemoglobin
Maternal height		Hepatitis B
Maternal weight		HIV
Vaginal examination		Lues
		Rhesus factor
		Rubella titer
		Bacteria in urine
		Glucose in urine
		Protein in urine

Source: OECD (2006)

In OECD countries, general practitioner, physicians, specialist obstetricians, nurse midwives, or a team of caregivers including both physicians and midwives deliver prenatal care. Standard number of prenatal care visits a woman with a normal pregnancy should attend includes 12–16 prenatal care visits by the WHO guideline, which seems to have become the standard in a number of countries. See the most frequently mentioned tests (23 tests mentioned by at least 50% of countries) of prenatal care in the table.

Recommended prenatal screenings in the United Kingdom

Recommended	Not recommended
Gestational age (ultrasound)	Asymptomatic bacterial vaginosis
Anemia (first appointment and 28 weeks)	Cytomegalovirus
Proteinuria	Hepatitis C
Blood group and red cell alloantibodies	Streptococcus group B
Sickle cell and thalassemia	Toxoplasmosis
Structural abnormalities	Gestational diabetes mellitus
Down's syndrome	Cervical exam to predict preterm birth
Hepatitis B	Fetal fibronectin
HIV	Transabdominal scan at 36 weeks unless placenta extends over the os
Rubella	Fetal movement counting
Syphilis	Cardiotocography
Pre-eclampsia risk level	Routine ultrasound after 24 weeks
Fetal presentation at 36+ weeks	Umbilical artery Doppler ultrasound
Symphysis-fundal distance	Fetal heart auscultation unless requested by the patient

Source: National Collaborating Centre for Women's and Children's Health (2008)

Prenatal care in Hungary

- 1) Well-organized
- 2) Obstetrician, health visitor, GP
- 3) Free/no-cost service
- 4) Min. 4 examinations
- 5) *Aims*:
 - Healthy development of fetus
 - Early recognition of pregnancy at risk
 - Prevention and early detection of complication

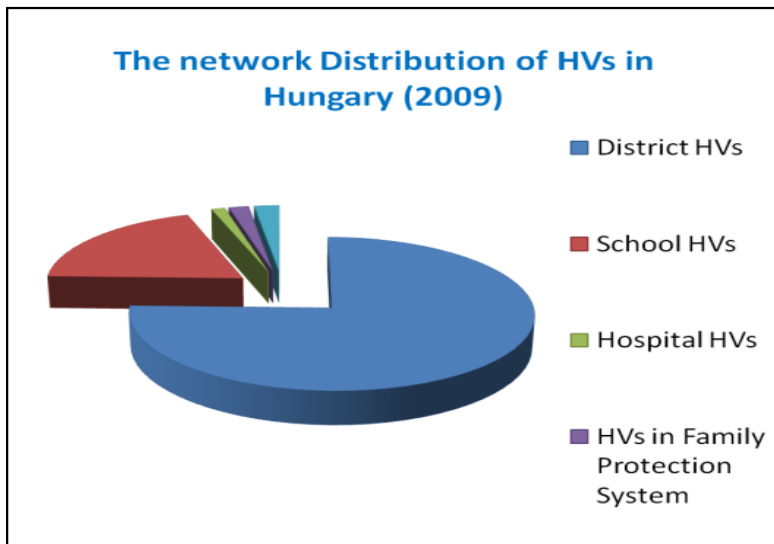
- Preparation for childbirth, breastfeeding and infant care

First medical examination: recognition of pregnancy, general medical check-up, dental examination, genetic counseling if patients are older than 35 years.

Regular medical check-up and screening:

- 1) Complex gynecological examination: vaginal examination, cytological screening, breast examination.
- 2) Measurement of body weight and height
- 3) Measurement of blood pressure and heart rate
- 4) Laboratory tests from maternal blood sample: blood counts, blood glucose, blood group determination, HBV and syphilis screening, AFP (alpha-fetoprotein).
- 5) Laboratory tests from urine sample: protein, bacteremia, glucose.
- 6) Screening of fetal development and fetal monitoring: ultrasound, cardiotocography – CTG, amnioscopy, abdominal circumference measurement.

Hungarian Health Visitor System (HVS)



The history of the HVS goes back to 1915. The Hungarian name is *védőnő* („women protector”). There are similar services in other countries: „public health nurses”, „health visitors”, but no other country has a program that is comparable to the Hungarian HVS.

Hungarian health visitors are highly educated (college degree), specialised in health promotion and prevention.

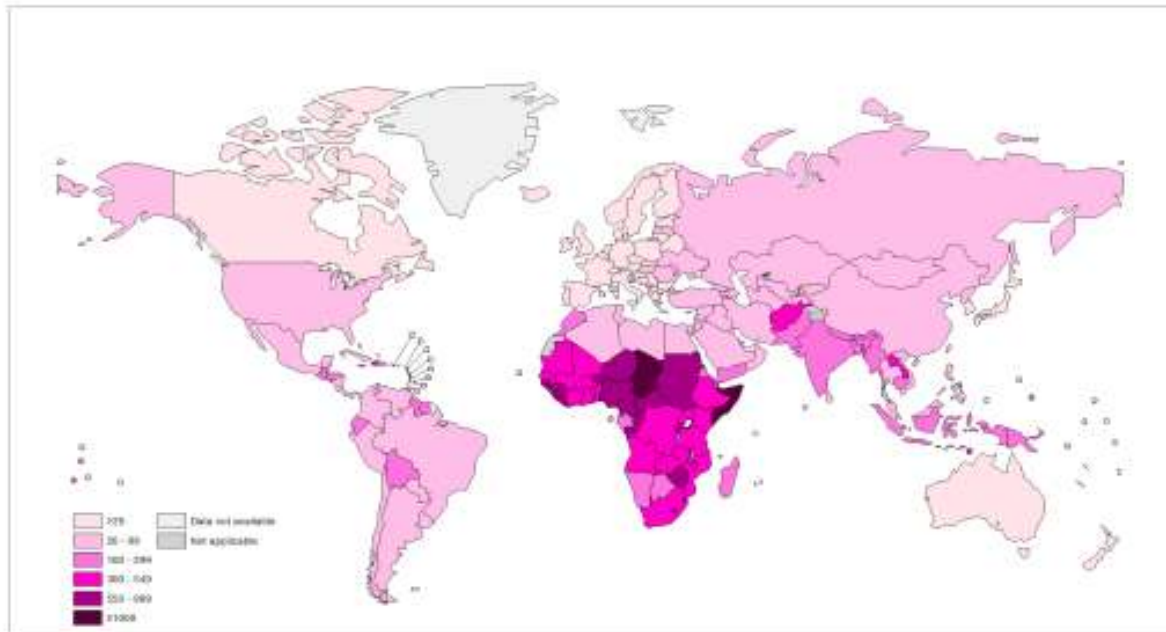
District Health Visitors

- 1) the largest part of the network ,
- 2) provide health support for families in the community
- 3) they operate based on a district system
- 4) the district of each Health Visitors includes on average 145 families, involving about 250-300 persons (pregnant women and children 0-6 yrs old)
- 5) they have the best accessibility to the under-served population

4.5.3. Maternal and child mortality

Based on the WHO data 2010, the world map shows the maternal mortality ratio per 100,000 live births.

Maternal mortality ratio (per 100 000 live births), 2010

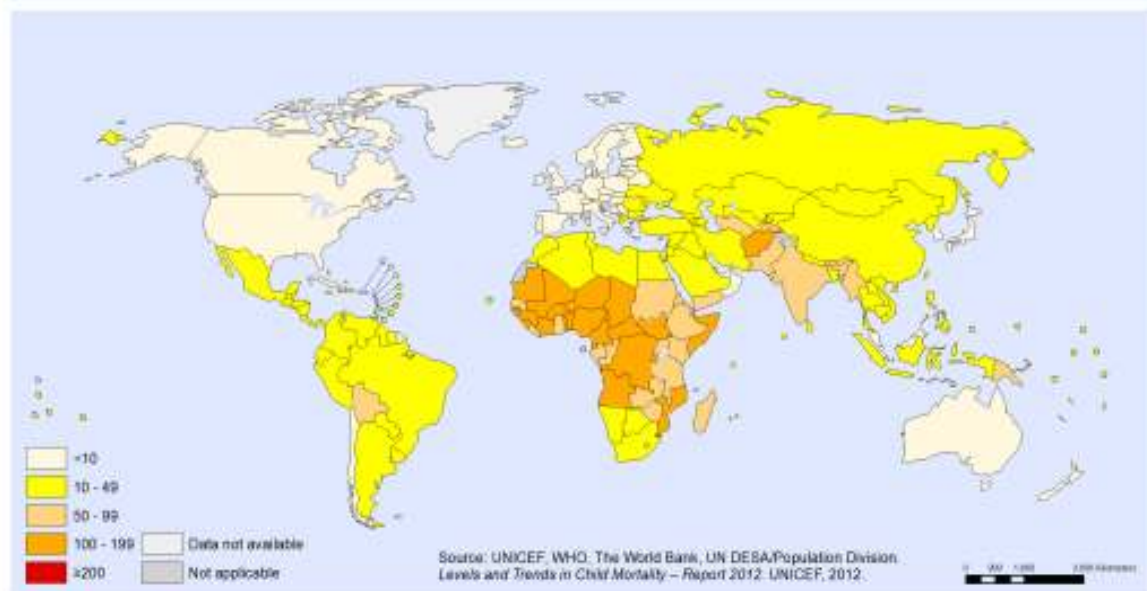


The boundaries and names shown and the designations used on this map do not imply the expression of any opinion whatsoever on the part of the World Health Organization concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries. Dotted and dashed 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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Under-five mortality rate (probability of dying by age 5 per 1000 live births), 2011



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 and dashed lines on maps represent approximate border lines for which there may not yet be full agreement.

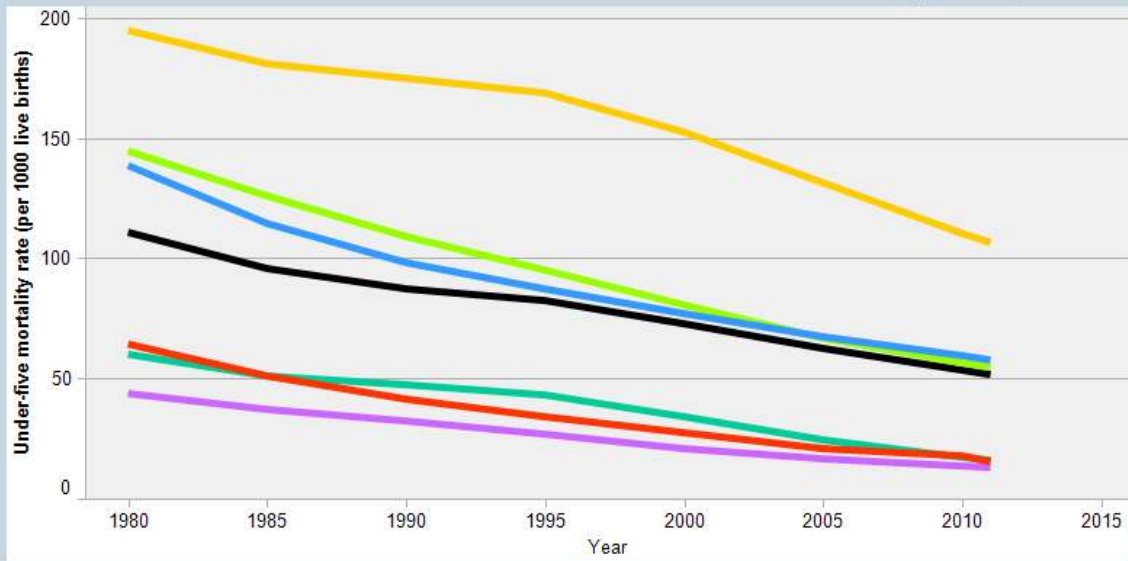
Data Source: World Health Organization
Map Production: Public Health Information and Geographic Information Systems (GIS)
World Health Organization

 **World Health Organization**
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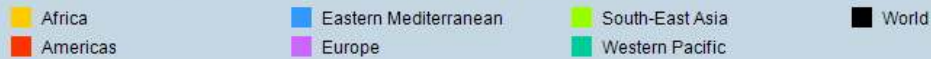
**Trend in under-five mortality rate (per 1000 live births)
Globally and by WHO region, 1980–2011**



Update: 13 September 2012

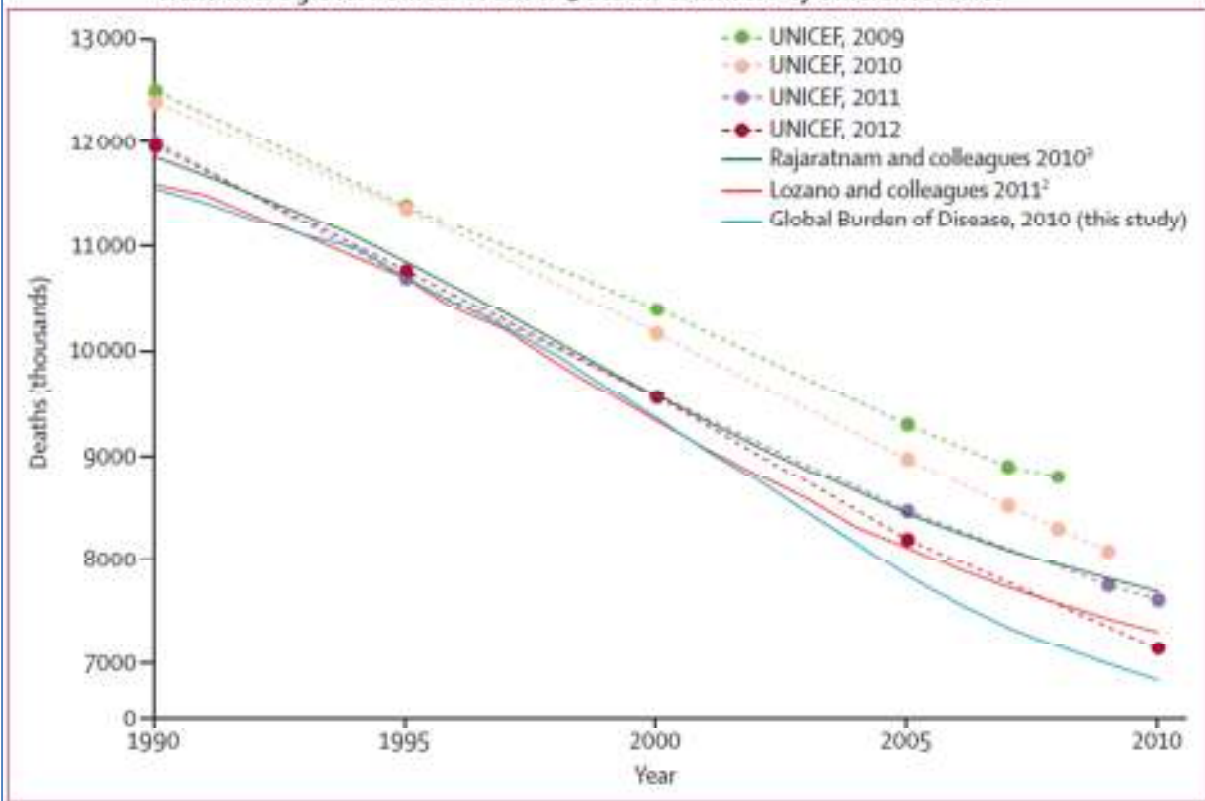


Source: UNICEF, WHO, The World Bank, UN DESA/Population Division.
Levels and Trends in Child Mortality – Report 2012. UNICEF, 2012.

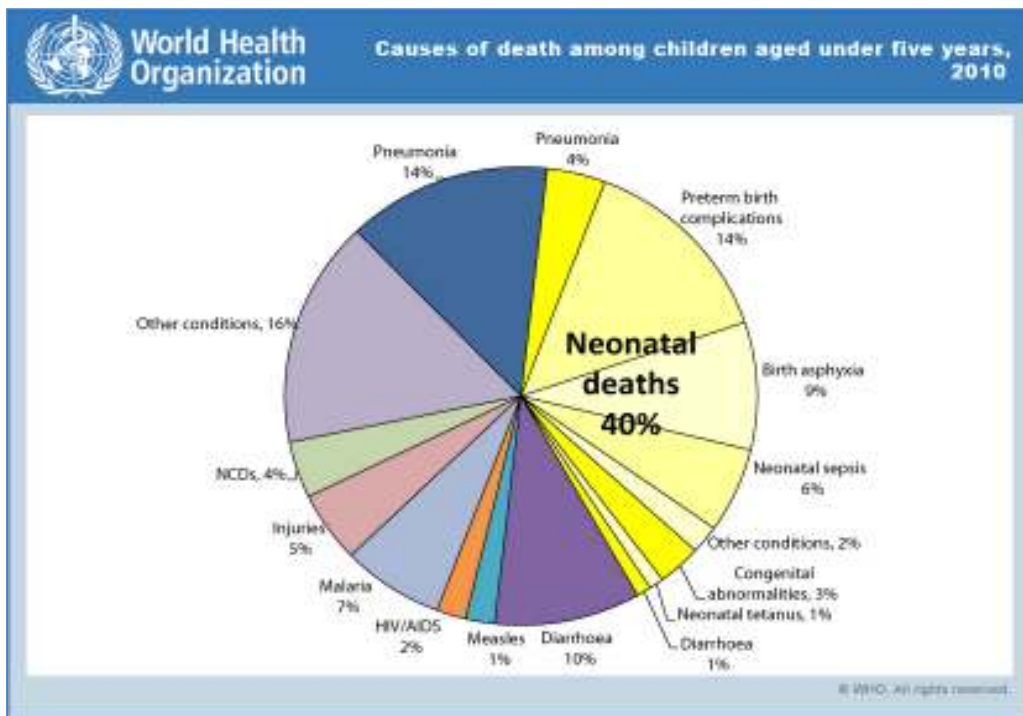


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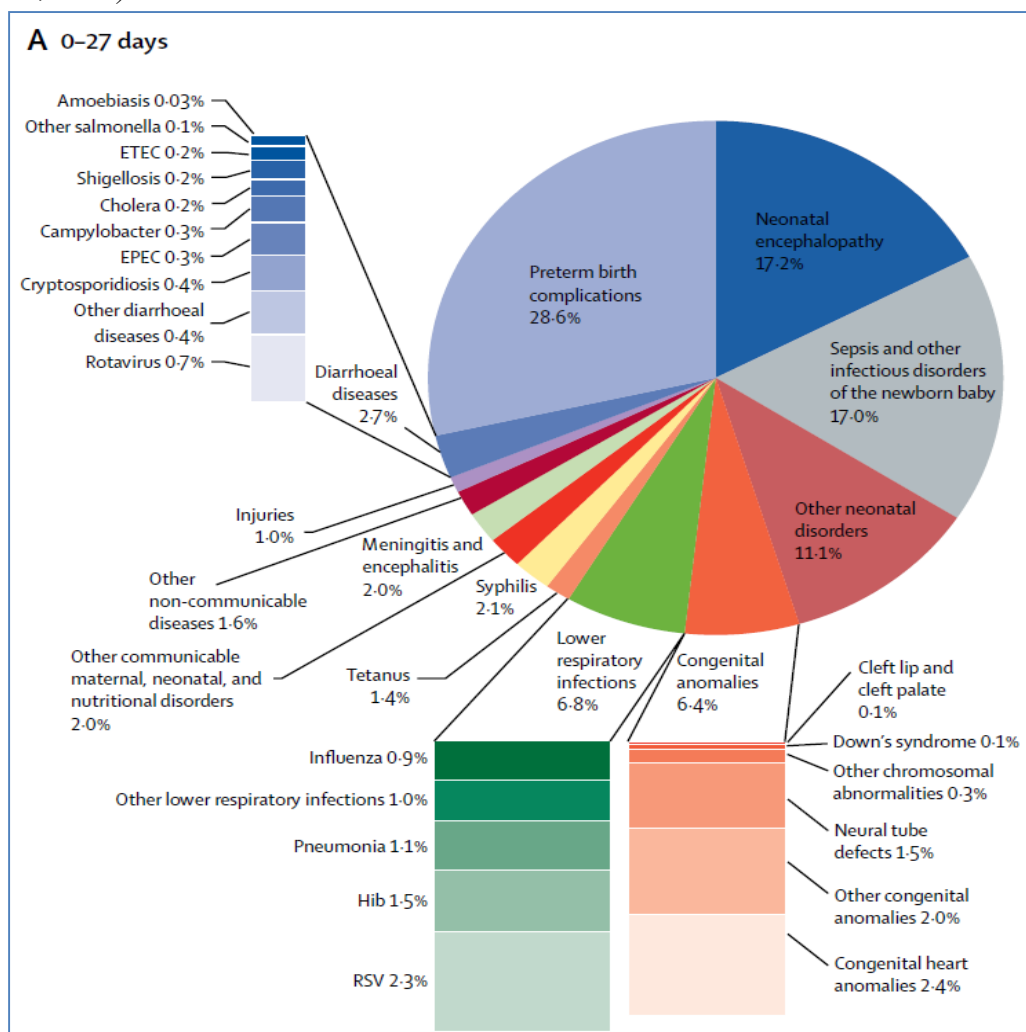
Trend in the global number of under-5 deaths estimated by different studies



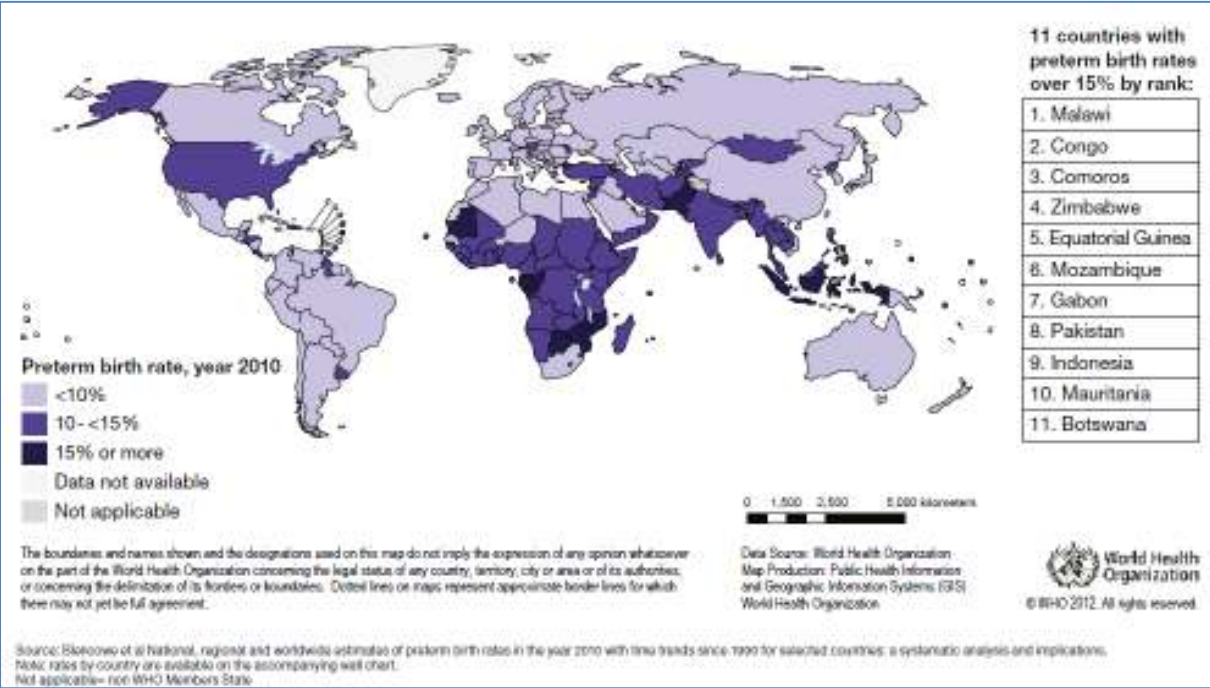
Wang H. et al., 2012



Global neonatal deaths in 2010 for children of both sexes combined by causes (Lozano R. et al., 2012)



Global burden of preterm birth in 2010



4.5.4. Burden of the disease attributable to sexual, maternal and child health conditions

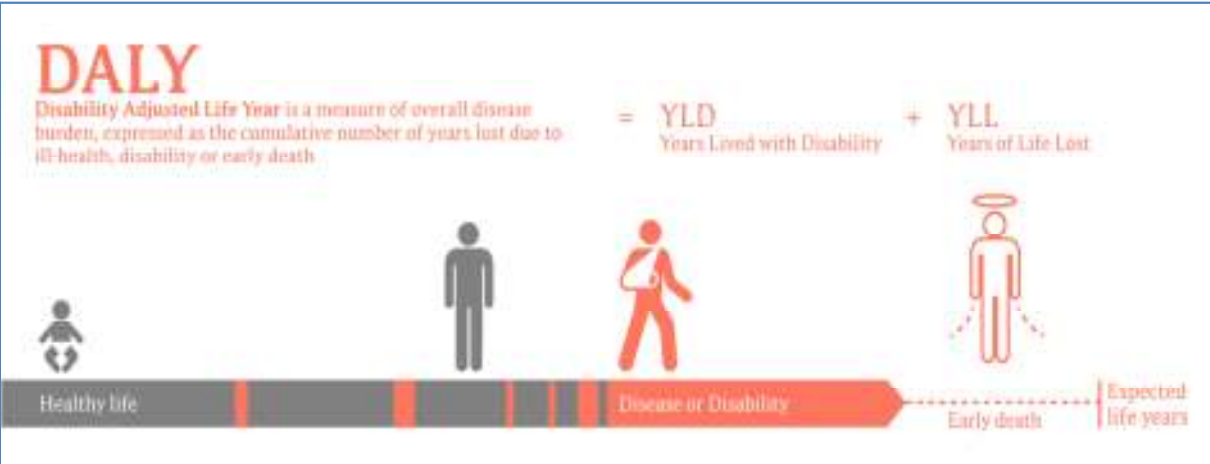
Definition of the Disability Adjusted Life Years (DALY):

The sum of years of potential life lost due to premature mortality and the years of productive life lost due to disability.

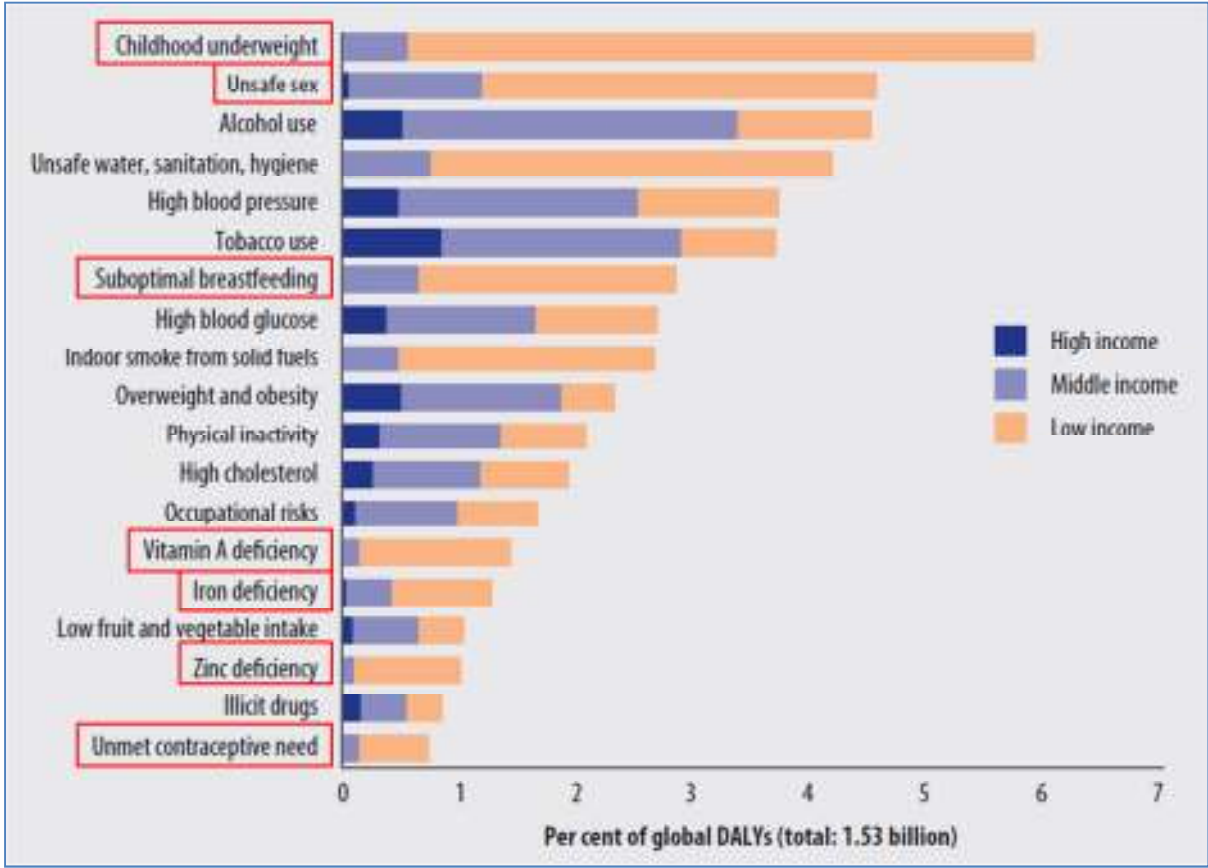
DALY measures: deaths at different ages and disability.

1 DALY = one lost year of “healthy” life.

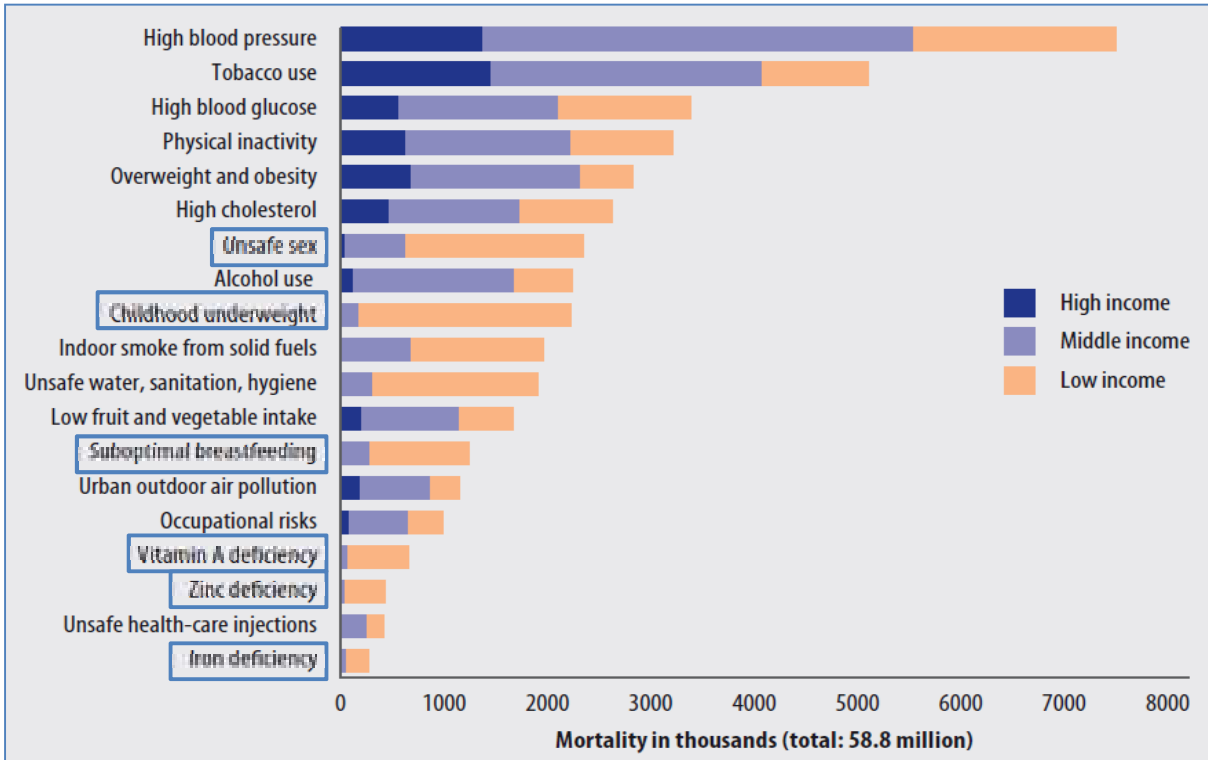
Burden of disease = measurement of the gap between current health status and an ideal situation where everyone lives into old age, free of disease and disability.



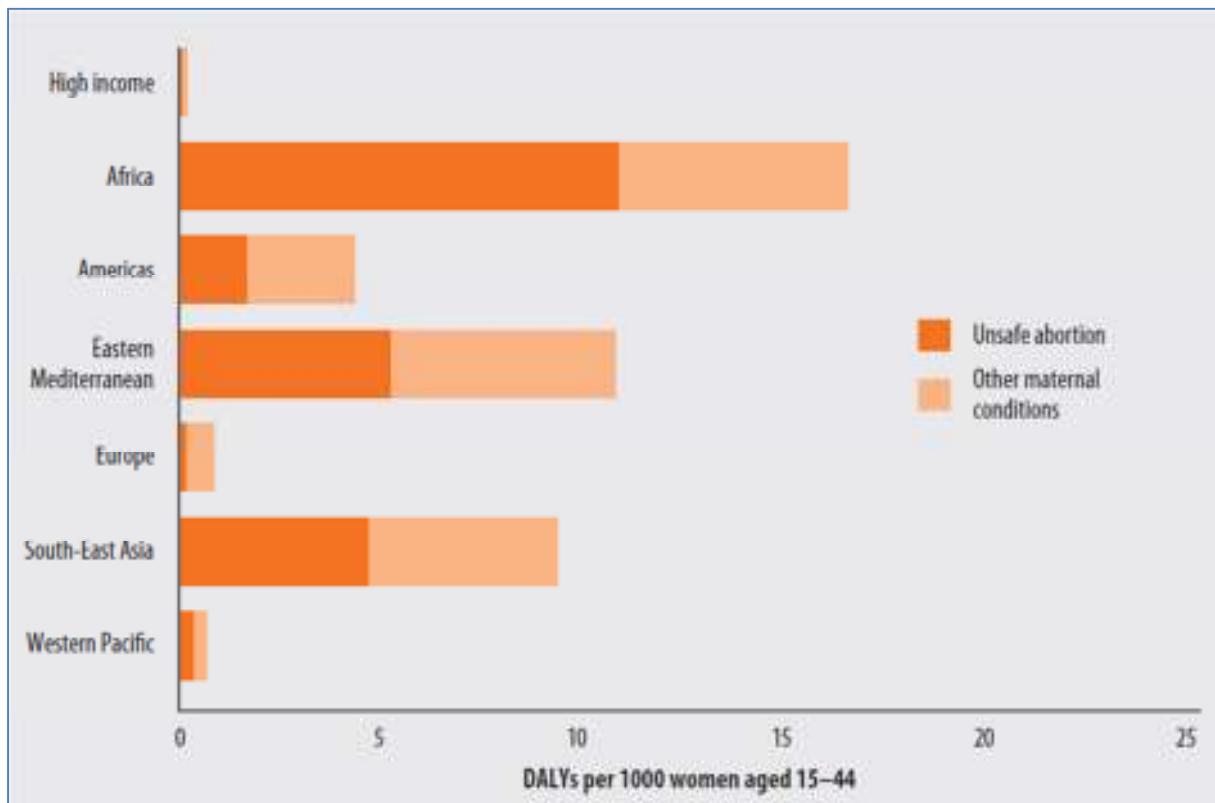
Percentage of *disability-adjusted life years* (DALYs) attributed to 19 leading risk factors, by country income level, 2004.



Deaths attributed to 19 leading risk factors, by country income level, 2004.



Burden of diseases attributable to lack of contraception by WHO regions 2004.



4.5.5 Demographics of births in Hungary

Characteristics of live births in Hungary

Year	Number of live births Proportion of live births/1000 people	Total fertility rate	Out of 100 liveborn infants		Average age of women at childbirth
			Within marriage	Born out of marriage	
1970	151 819/ 14,7	1,97	94,6	5,4	25,10
1990	125 679/ 12,1	1,84	86,9	13,1	25,67
2011	88049/ 8,8	1,24	54,0	46,0	30,53

Live birth by birth weight and week of pregnancy in Hungary

Years	Number of live births	Low birth weight infant		Average weight of liveborn infants (g)	Percentage of preterm births (before the 37th week)
		Number	Proportion		
1970	151 819	16 247	10,7%	3154	10,2%*
1990	125 679	11 654	9,3%	3185	8,7%
2011	88049	7742	8,6%	3255	8,4%

4.5.6 Child and youth health

Period	Time interval
Neonatal	0 – 4 weeks
Infant	1 month – 12 months
Toddler	1 – 3 years
Preschool	3 – 6 years
School age	6 – 12 years
Early adolescence	10 – 13 years
Middle adolescence	14 – 16 years
Late adolescence	16 – 20 years

Responsibilities of Child and Youth Health Care

- Immunization
- Age-related screenings
- School aptitude tests
- Prevention of chronic diseases
- Prevention of accidents
- Prevention of smoking, alcohol and drug consumption
- Sexual problems, contraception, STD prevention
- Participants: pediatrician, health care nurses, school health service, youth health care service, teachers (PE, health education).

4.5.6.1. Childhood screenings (mandatory in Hungary)

Age 0-4 days

- Complete physical examination (congenital malformations)
- Body weight and height, head circumference,

- Neurological examination
- Hip dislocation
- Senses (hearing, vision)
- Metabolic diseases (galactosaemia, biotinidase deficiency, hypothyroidism, phenylketonuria etc. – 25 in Hungary)

Age 1, 3 and 6 months

- somatic development
- hip dislocation up to 4th months
- congenital abnormalities
- neurological development
- psychomotoric and mental development
- sense organ development and function (hearing, vision, strabismus)
- retention of testes (cryptorchidism)

Age 1 to 6 years, annually

- Complete physical examination
- Neurological examination
- Cryptorchidism until age of 2 years, examination of testicles annually
- Screening of coeliac disease at 1 year-old (serology) in the case of positive family anamnesis
- Body weight, height, head circumference
- Psychomotoric, mental, social development, behavioural problems examination
- Senses and speech development examination
- Musculoskeletal examination (scoliosis, flatfoot etc.)
- Blood pressure measurements (3-6 years olds)
- Dental screening

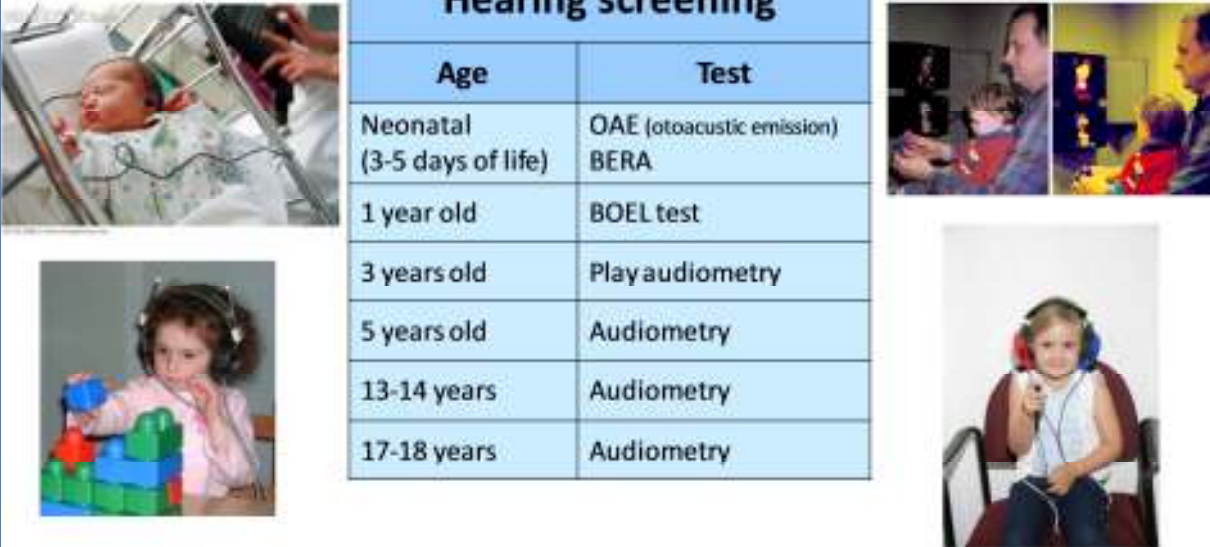
Age 6 to 18 years, biannually

- Complete physical examination
- Thyroid palpation from age 11
- Neurological examination
- Family anamnesis (especially hereditary malignant diseases or predisposing conditions e.g. familial colonic polyposis) and if necessary, medical examination
- Screening of children who have increased risk for cardiovascular diseases, metabolic syndrome and diabetes according to their family anamnesis, nutritional status and life-style habits
- Body weight, height, physical and sexual development, nutritional status,
- Psychomotoric, mental, social development, behavioural problems examination
- Senses, color vision
- Musculoskeletal examination (foot and vertebral disorders, Scheuerman)
- Blood pressure measurements
- Dental screening

Professional guidelines for hearing and vision screening in Hungary

Hearing screening: Complete, age-related among 0-18 year-old children

Hearing screening	
Age	Test
Neonatal (3-5 days of life)	OAE (otoacoustic emission) BERA
1 year old	BOEL test
3 years old	Play audiometry
5 years old	Audiometry
13-14 years	Audiometry
17-18 years	Audiometry

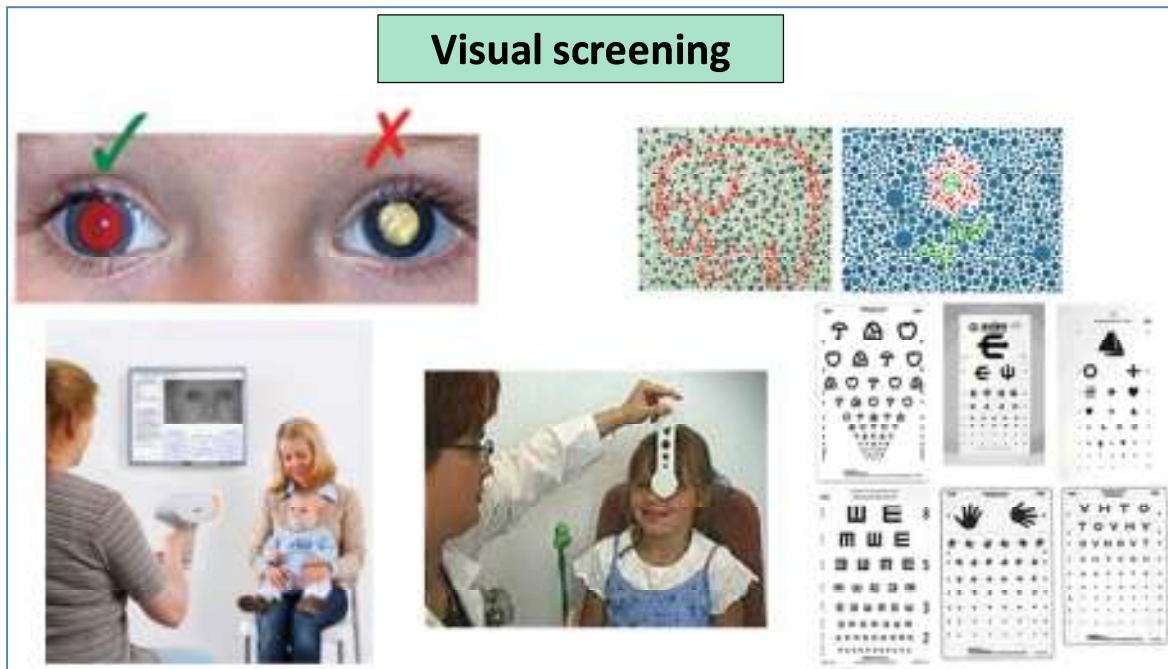


Pathogens that cause hearing loss:

- Congenital infections: Cytomegalovirus, Lymphocytic choriomeningitis virus, Rubella virus, Toxoplasma gondii, Treponema pallidum.
- Acquired infections: Borrelia burgdorferi, EBV, Haemophilus influenza, Lassa virus, Measles, Mumps, Neisseria meningitides, Non-polio enteroviruses, Plasmodium falciparum, Streptococcus pneumonia, VZV.)

Vision screening: Sight development and the recognition of strabismus and refractive errors among 0-18 years-old children

Vision screening						
Test	0-5 months	6th months	12-14 months	2,5-3 years	4-5 years	6-18 years (biannually)
Ocular history	✓	✓	✓	✓	✓	✓
Vision assessment	✓	✓	✓	✓	✓	✓
External inspection of the eyes and lids	✓	✓	✓	✓	✓	✓
Ocular motility assessment	✓	✓	✓	✓	✓	✓
Pupil examination	✓	✓	✓	✓	✓	✓
Red reflex examination	✓	✓	✓	✓	✓	✓
Cover-uncover test		✓	✓	✓	✓	✓
Photostreening			✓	✓	✓	✓
Color vision						✓



4.5.6.2. Youth health

Young people aged 10–24 years represent 27% of the world’s population in 2008 (1.8 billion), the largest cohort ever. This number is projected to peak in 2032 at about 2 billion, with 90% of youth living in low income and middle-income countries. The size of this population makes their health status of interest, not only as a determinant of future population, but also for social and economic development. (Gore F.M. et al., 2011)

Adolescents are those people between the ages of 10 and 19 according to the World Health Organization definition (1998).

The importance of adolescent health (Ehiri J., 2009):

- 1) *The size of the adolescent cohort:* the current generation of adolescents is the largest ever. They constitute one of every five persons. The current world population of adolescents aged 10–19 is 1.2 billion, the largest ever. This total is projected to peak in the year 2030 at about 1.3 billion, with about 90% living in developing countries. However, trends in the growth of this age group vary markedly by region.
- 2) *Adolescent health affects economic prosperity:* Encouraging young people to postpone marriage and childbearing can foster a reduction in family size and a slowing of population growth, which, when combined with investments in health and education, can contribute to higher economic growth and incomes.
- 3) *Adolescent health investments can reduce poverty:* Death and illness exacerbates poverty by disrupting and cutting short school opportunities, by weakening or killing young people in the prime of their working lives, or by placing heavy financial and social burdens on families and society.
- 4) *Prevention is cheaper than cure:* The disease burden in adolescence is largely preventable and acting to encourage healthy adolescent behaviors will avoid future loss from death and illness. Countries can save money by investing in preventive behaviors.

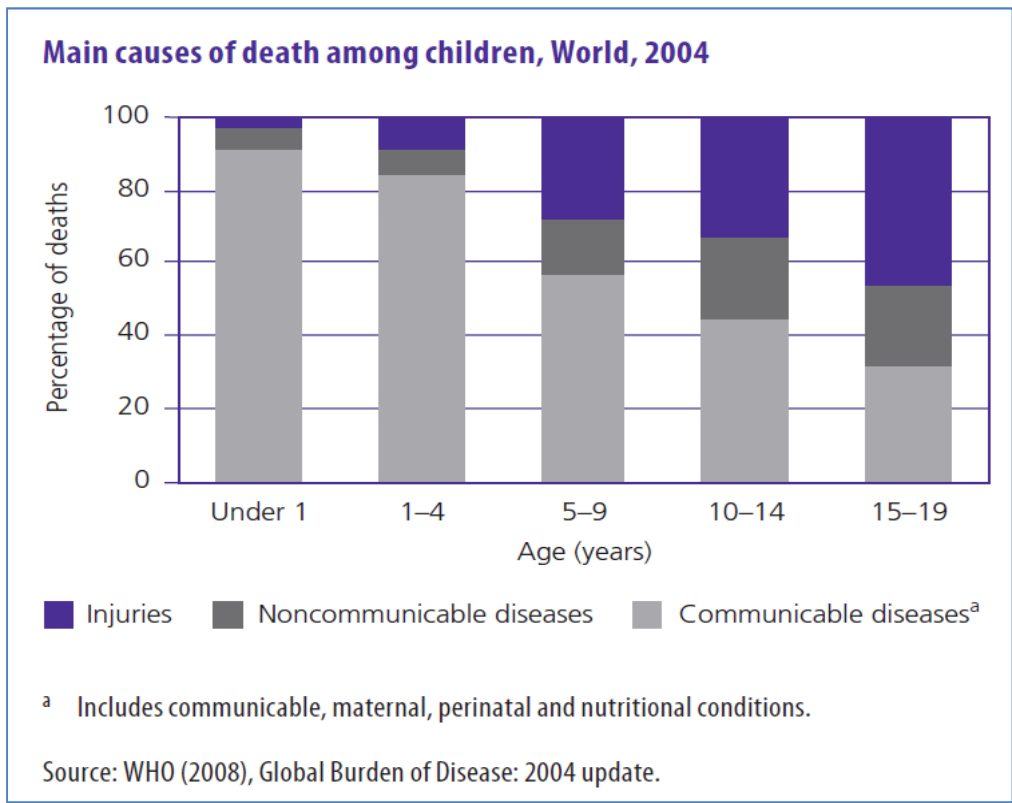
Important determinants of health risk emerging during adolescence

- eating patterns,
- physical activity,

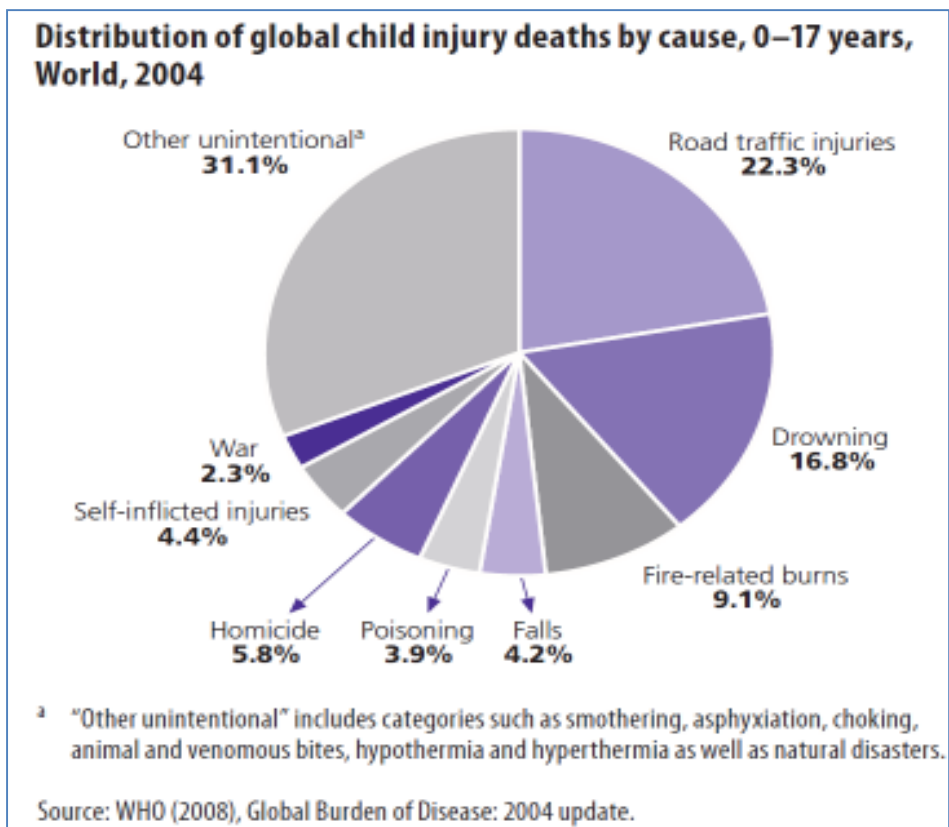
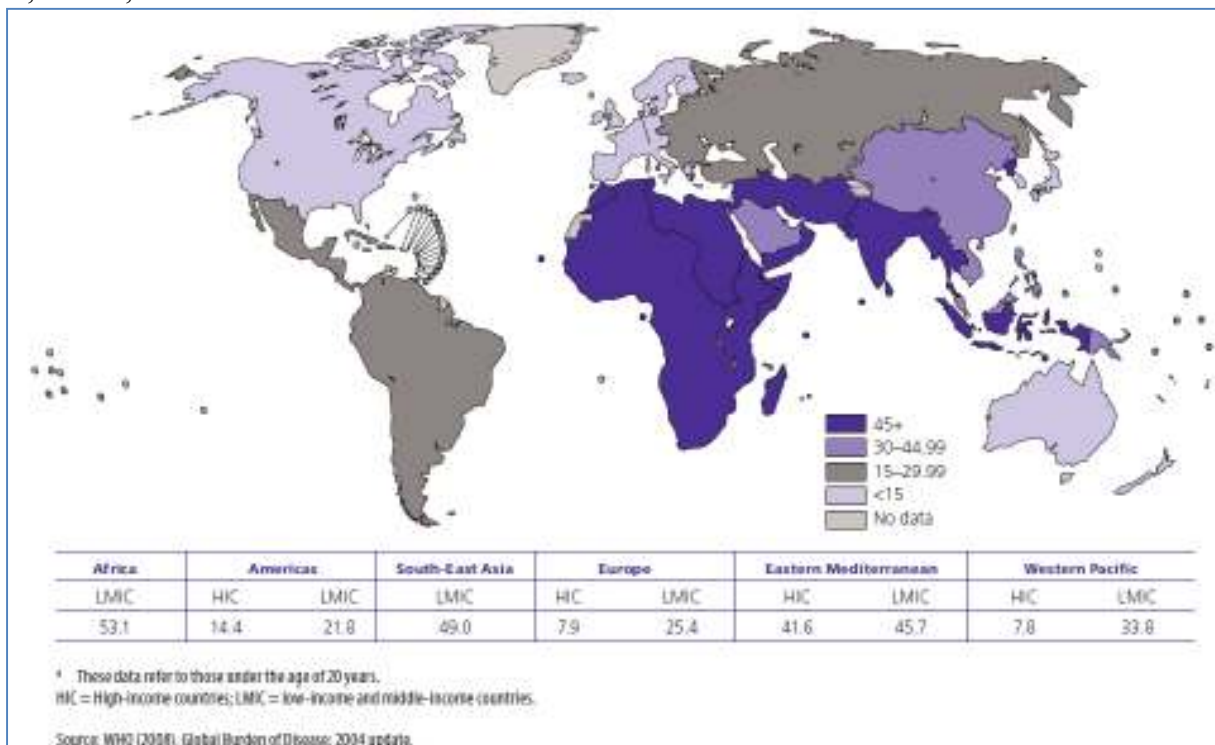
- weight,
- sexual behaviors,
- use of addictive substances (tobacco, alcohol and other drugs),
- use of motorized transportation.

Major adolescent health problems

- 1) *Mental disorders* (unipolar depressive disorder, bipolar disorder, schizophrenia, self-inflicted injuries, alcohol use disorder)
 - Children with mental disorders are estimated to range from 7.7 million to 12.8 million.
 - Serious emotional disturbances affect 1 in 10 young people.
 - The onset of major mental illness may occur as early as 7 to 11 years of age.
 - 21% of low-income children and youth ages 6 -17 have mental health problems.
 - Approximately 20% (1 in 5) of children/adolescents may have a diagnosable mental disorder.
 - Approximately 2/3 of all young people with mental health problems do not get the help they need.
- 2) *Intentional and unintentional injuries* (violence, homicide; road crashes)
 - ~830 000 children under the age of 18 years died as a result of an unintentional injury (2004)
 - Tens of millions more children are non-fatally injured and many of these require hospital treatment.
 - For survivors, the impairment that injuries can cause and the resulting need for care and rehabilitation have far-reaching impacts on a child’s prospects for health, education and social inclusion and on their parents’ livelihood.
 - Children in poorer countries and those from poorer families in better-off countries are the most vulnerable.



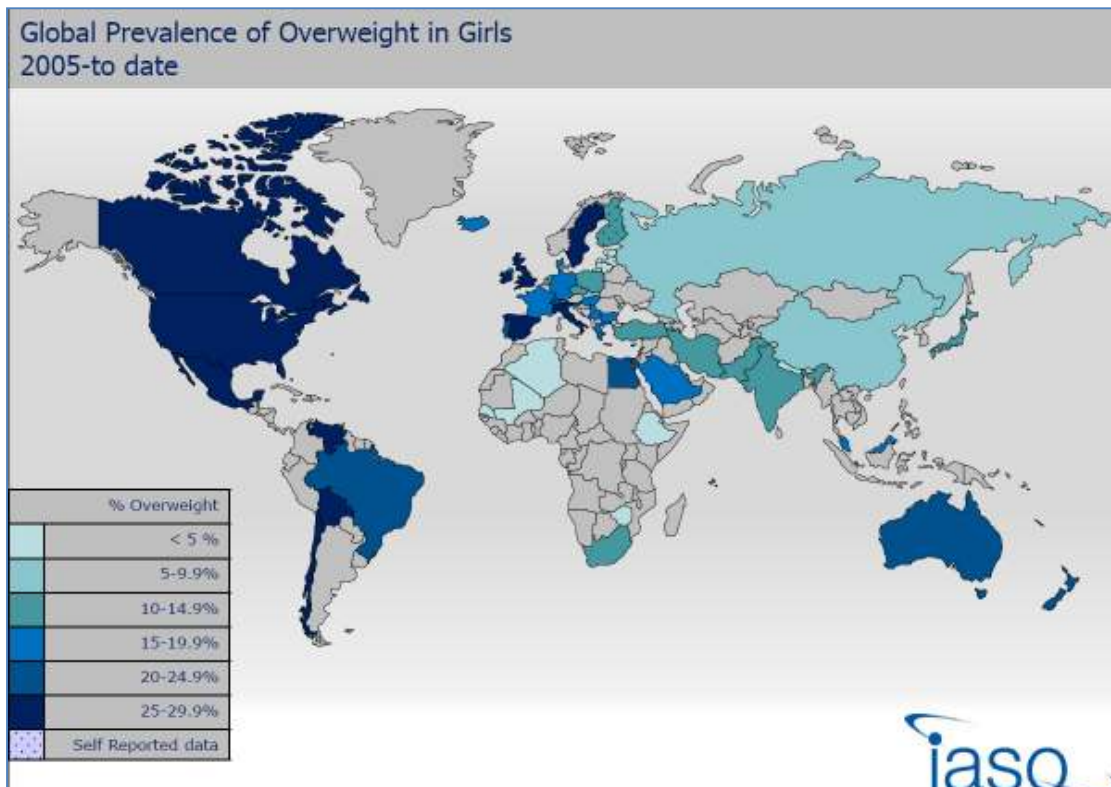
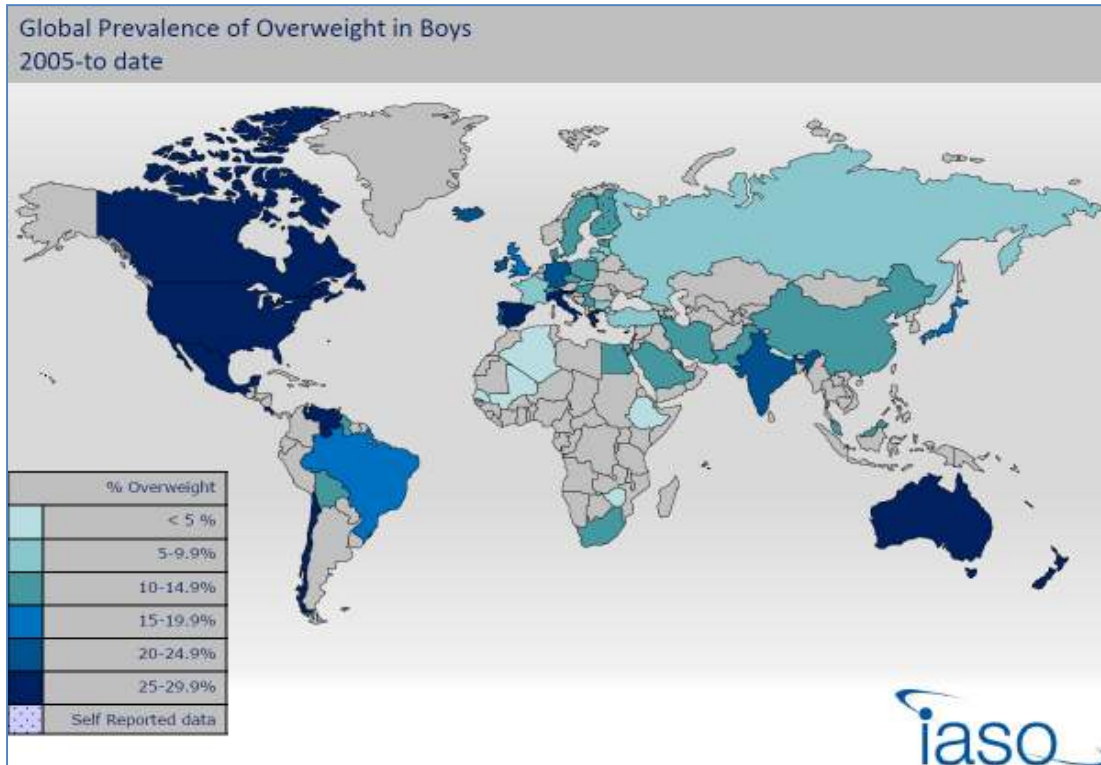
Rate of unintentional injuries per 100 000 children, by WHO region and country income level, World, 2004

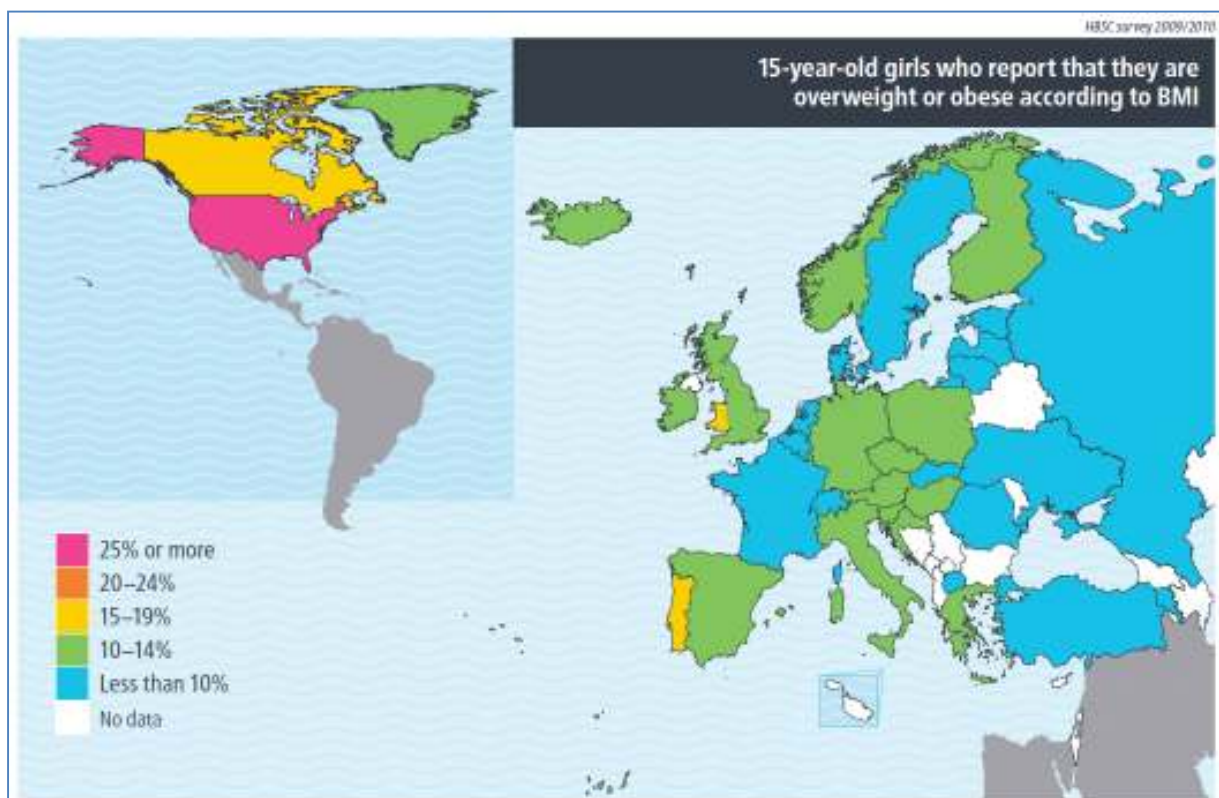
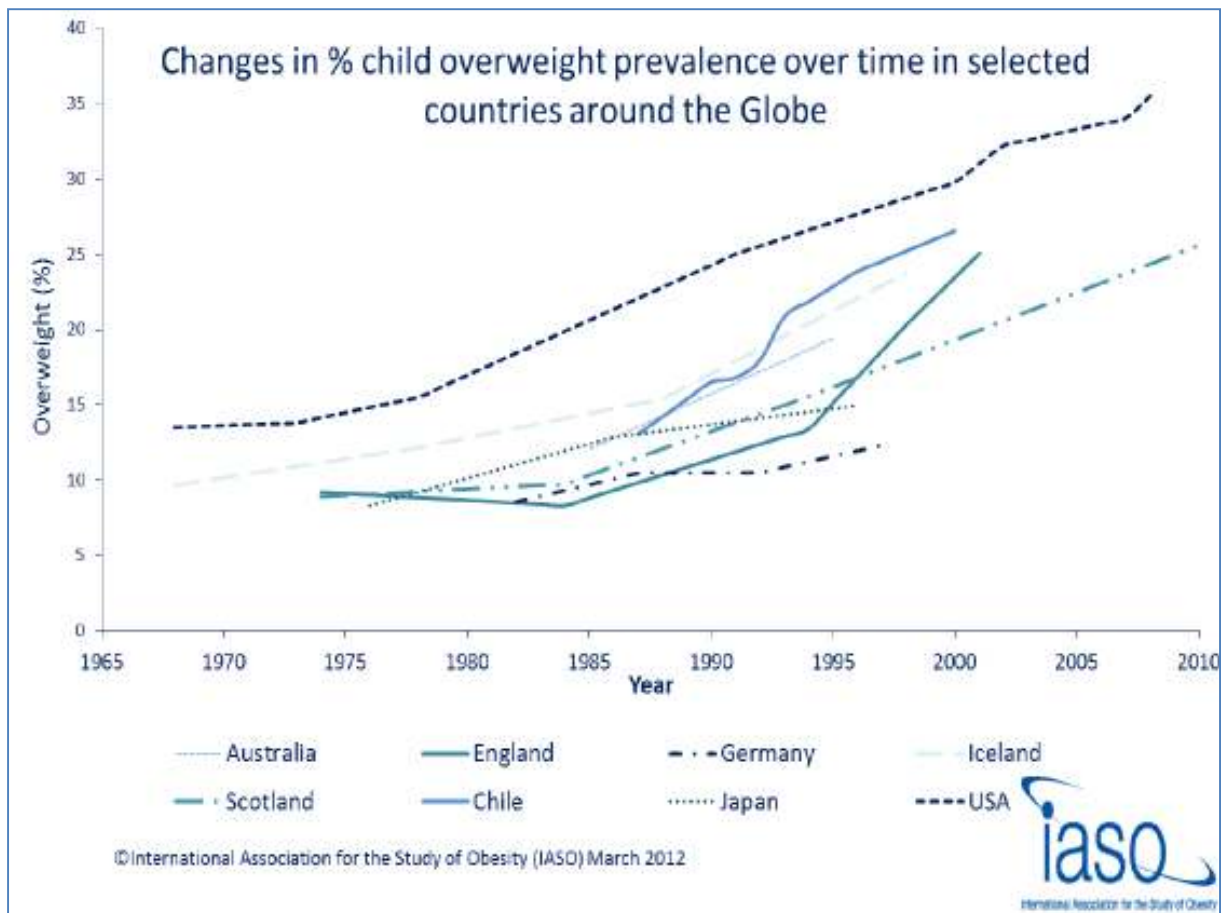


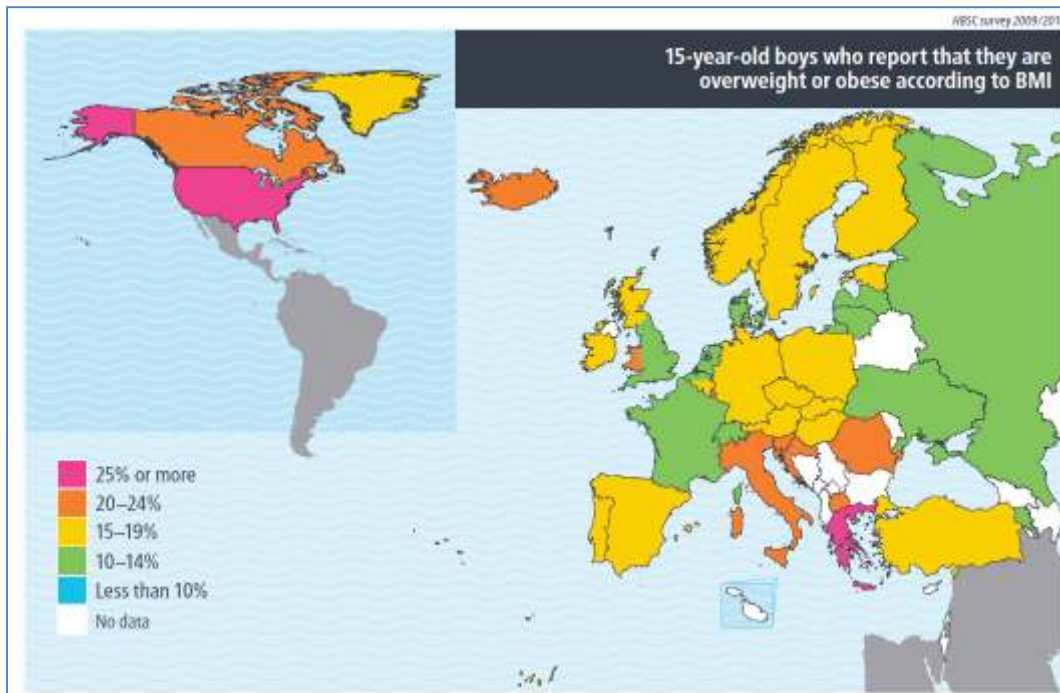
3) Overweight, diet, nutrition, exercise

- poor diet → problems in pregnancy, childbirth and motherhood.
- Overweight is the most serious public health challenges of the 21st century.

- The number of overweight children under the age of five, is estimated to be over 42 million. Close to 35 million of these are living in developing countries (2010)
- Overweight and obese children are likely to stay obese into adulthood and more likely to develop non-communicable diseases.
- Overweight is largely preventable.



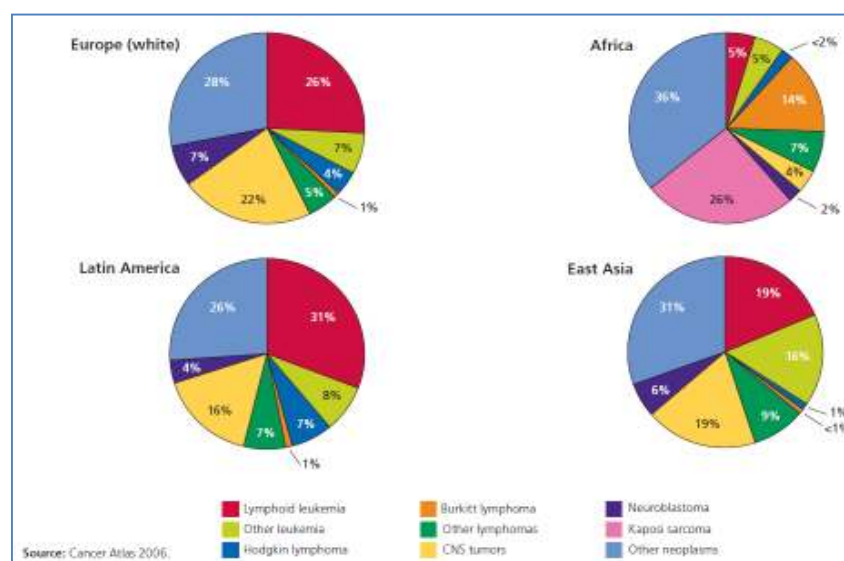




4) Childhood cancers

- Leading cause of childhood death in developed countries
- Not a public health priority in most developing countries
- Children who have cancer are never diagnosed, are diagnosed too late, or are diagnosed where treatment is limited or not available.
- 175,300 new cancer cases emerged among children aged 0-14 in 2008.
- Incidence rates are higher in developed than in developing countries.
- 80% of children with cancer, live in developing countries
- 96,400 children died from cancer in 2008.
- Mortality rates are lowest in developed countries, despite higher incidence rates
- Overall incidence rates of childhood cancer have been increasing since 1970.

Distributions of Cancer in Children Younger than 15 Years of Age, Selected Populations
Source



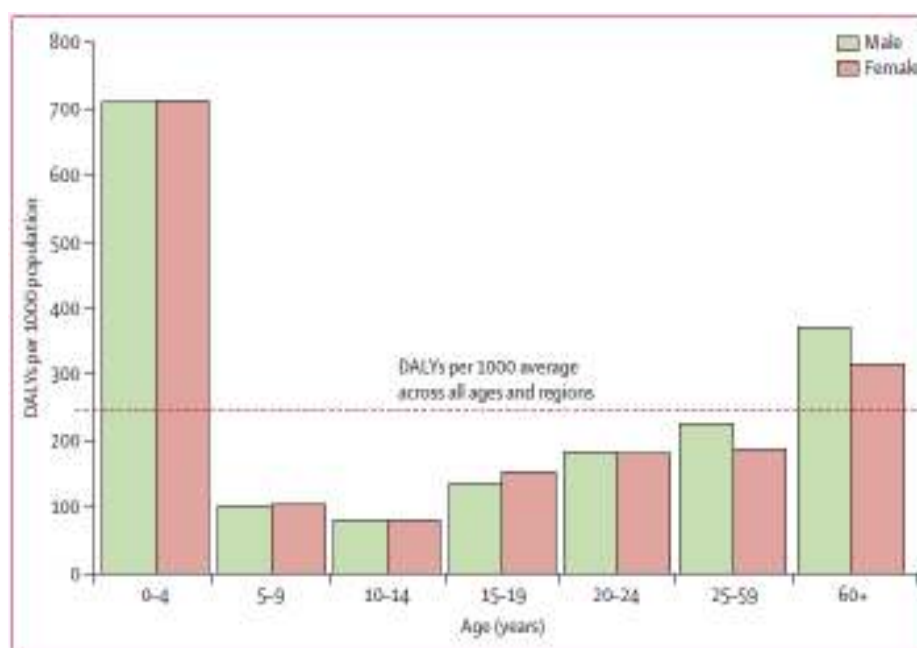
- 5) *Tobacco, alcohol and other drugs*
- 6) *Sexual and reproductive health*
 - Unsafe sex, HIV/AIDS, STDs
 - Adolescent pregnancy (negative health consequences for mother and child)
- 7) *Gender-based violence* (range of physical, sexual and psychosocial violence directed mainly girls).
- 8) *Musculoskeletal disorders*, e.g.flat foot, scoliosis, Scheuermann; physical inactivity, non-ergonomic computer use, unhealthy nutrition.
- 9) *Metabolic syndrome*: obesity, hypertension, diabetes type I, II
- 10) *Allergic disorders*: asthma bronchiale, rhinitis (seasonal, perennial)

Conditions causing greater than 1% of adolescent deaths		Conditions causing greater than 1% of adolescent DALYS	
Condition	Percent of total	Condition	Percent of total
Lower respiratory infections	11.2	Mental illness*	18.59
Road traffic accidents	10.0	Maternal conditions	6.69
Self-inflicted injuries	6.0	Road traffic accidents	6.07
Maternal conditions	4.8	Lower respiratory infections	5.43
Violence	4.8	Asthma	3.33
Tuberculosis	4.0	Violence	3.42
HIV/AIDS	3.9	Self-inflicted injuries	3.18
Falls	1.4	Alcohol use disorders	2.94
Protein-energy malnutrition	1.3	Falls	2.90
Nephritis and nephrosis	1.1	Tuberculosis	2.10
Ischemic heart disease	1.0	HIV/AIDS	1.87
Cerebrovascular disease	1.0		
Cirrhosis of the liver	1.0		

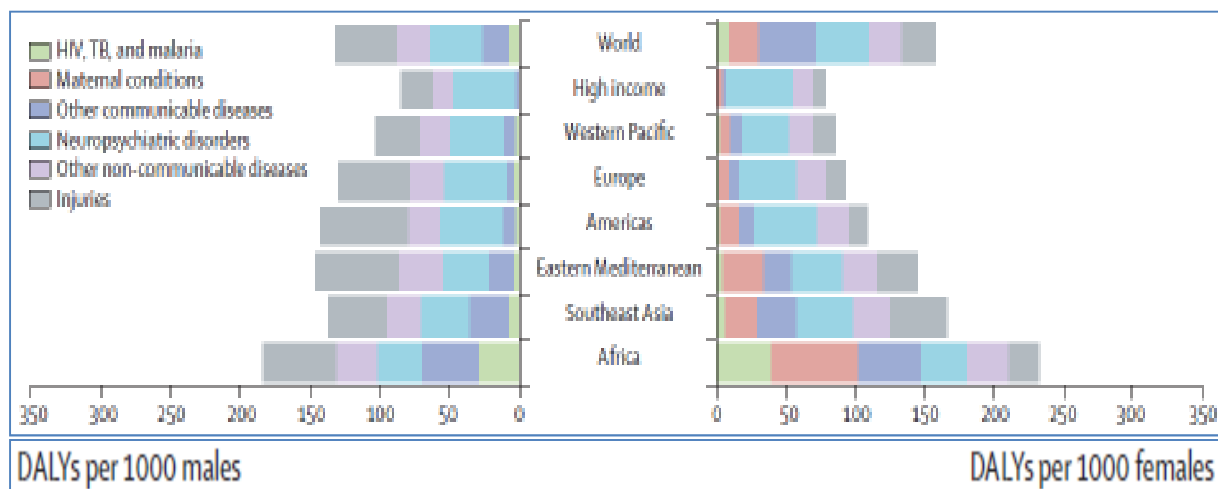
* Includes unipolar depressive disorders, schizophrenia, and bipolar disorder.

(Mathers C., 2009)

DALYs per 1000 population by age groups: Dotted line shows DALYs per 1000 average across all ages and regions. (Gore F.M. et al., 2011)



Major causes of disease burden in DALYs in adolescents (10–24-year-olds) per 1000 population. (Gore F.M. et al., 2011)



Global DALYs (%) attributable to leading risk factors for males and females within the age bands of 10–14 years, 15–24 years, 25–59 years, and 60 years and older. (Gore F.M. et al., 2011):

	10-14 years	15-24 years	25-59 years	60 years and over
Alcohol use	2%	8%	8%	3%
Unsafe sex	2%	5%	8%	1%
Lack of contraception	0	2%	1%	0
Iron deficiency	3%	2%	2%	0
Illicit drug use	0	2%	2%	0
Unsafe water, sanitation, and hygiene	2%	1%	1%	0
<hr/>				
High blood pressure, cholesterol, and glucose	0	0	11%	29%
Physical inactivity	0	0	3%	7%
Tobacco use	0	0	6%	10%
Overweight and obesity	0	0	4%	7%

Risk factors above the dashed line start contributing to the DALYs in late childhood or early adolescence (from ages 10–14 years or 15–24 years). Those below the dashed line generally start contributing only from ages 25 and older. For example, tobacco use is often started in youth, but the effects become apparent only in later life. DALY=disability-adjusted life-year.

Health promotion, disease prevention (among aged 10–24 years) should target conditions that affect burden of disease as well as risk behaviors of health in later life. Interventions should address the behaviors and social conditions that have both short-term and long-term health consequences.

Key Principles of Health Programming for Adolescents (Lule E. et al., 2006)

- 1) *Recognize the diversity of the youth age group.* A sexually inexperienced 11-year-old has vastly different needs than a married 20-year-old. Programs should apply different strategies to reach youth, who vary by age, sex, employment, schooling, and marital status.
- 2) *Involve young people.* Policies and programs are more effective when young people are involved in all aspects of their design, implementation, and evaluation. Involvement must go beyond tokenism and be genuine, meaningful, and sustained.

- 3) *Make health services appealing to youth.* A key to rapidly expanding young people's access to health services is to make them more youth friendly by using specially trained health workers and by bolstering the privacy, confidentiality, and accessibility of care.
- 4) *Address gender inequality.* Gender inequalities expose young girls to coerced sex, HIV infection, unwanted pregnancy, and poor nutrition. Efforts should focus on changing the factors that perpetuate gender inequalities.
- 5) *Address the needs of boys.* Adolescence presents a unique opportunity to help boys form positive notions of gender relations and to raise their awareness of health issues. At the same time, boys seem to be disproportionately exposed to a number of adolescent health risks, including accidents and injuries, suicide, tobacco use, substance abuse, and violence. Program design should take into account the specific needs of boys and young men as well as of girls and young women.
- 6) *Design comprehensive programs.* Comprehensive programs that provide information and services while addressing the social and political context are more effective than narrowly focused interventions.
- 7) *Consider all important benefits.* Many adolescent health interventions focus on only one benefit. For example, a school-based sex education program may focus exclusively on HIV prevention and may neglect other possible benefits from the intervention, such as increased education, averted teen pregnancy and abortions, and other averted STIs.
- 8) *Address the many non-health factors that influence adolescent health.* Linking school and livelihood opportunities to adolescent health programs, at either the policy or program level, is key to helping young people avoid risky behaviors.
- 9) *Address underlying risk and protective factors.* Factors such as feelings of self-efficacy, attitudes and behaviors of friends, connectedness with parents and other influential adults, and involvement in the community can either increase (risk factor) or decrease (protective factor) the chances that a young person will engage in unhealthy behaviors.

4.5.6.3. Environmental health and children (Ehiri J., 2009)

The concept of environmental health in children encompasses all the external conditions, influences, and interactions between children and their environment as well as the effects of these interactions on their health. This broad view of environmental health includes the chemical, physical, and biological risks that cause or influence diseases in women and children. While environmental risk factors vary across regions of the world, children have characteristics that make them particularly susceptible to environmental hazards in all regions. The environments of both mothers and children may be influenced more by income level, residential location, parental education, occupation, exposures to smoke, heavy metal toxins (arsenic, lead, and mercury), or industrial chemicals.

Environmental risks to children:

- 1) Chemicals
 - Poisoning
 - *Agricultural chemicals* (in low-income countries), e.g. pesticides, herbicides, contaminated clothes of parents.
 - *Household chemicals* (in high- and middle income countries) e.g. household cleaners, solvents, glues, fragrances, cosmetics, certain plastics, paints, auto products, and garden products.

- Effect on child development: Developmental, endocrin, reproductive, behavioural, neurologic
 - POPs in food chain, PCBs, BPA.
- 2) Air pollution
- 60% of Acute Respiratory Infections related to environmental conditions (less developed countries)
 - Indoor > Outdoor
 - Secondhand-smoke (e.g. otitis media, respiratory infection, worsened asthma, sudden infant death, fires, burns, childhood behavioral problems, and impaired physical and intellectual development)
 - *Large cities*: industry, transportation, household fuels; burning of trash.
- 3) Lack of clean water and sanitation
- 80-90 % of childhood diarrhea cases are related to environmental conditions
 - Contaminated water, food, inadequate sanitation
 - Lack of education regarding basic hygiene and sanitation (developing countries)
 - Schistosomiasis, malaria, West Nile Virus, dengue fever (ineffective water resource management, irrigation, or sanitation strategies, along with environmental degradation that increases runoff and produces standing water)
 - Climate change (deforestation, flooding, drought → water born diseases)

4.5.7. School health

Roles of the school health service:

- 1) Health care service and supervision of kindergartens
- 2) School aptitude tests (maturity for school education)
- 3) Screening tests at school
- 4) Medical examination before summer camping
- 5) First aid in case of accidents
- 6) Health education and promotion
- 7) Communicable disease control
- 8) Identifying, examining and supervising handicapped children
- 9) Control of the healthy school environment (e.g. lighting, furniture)
- 10) Control of the school canteen and nutritional adequacy
- 11) Control of students' personal hygiene
- 12) Immunization
- 13) Organization of school dental care programs

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Topics suggested for students' oral presentations:

- 1) Characteristics of reproductive health system in your home country.
- 2) Child and youth health care in your home country.