

NUR 312

INFECTION CONTROL

**UNIT I – Basic Infection Control Measures at
different level of prevention in health care
settings**

NUR 312 TEAM

Overview of IC (WHO , MOH KSA)

risk factor close contact person medication
chronic illness transmission chest pain carrier
cough up blood blood tests high-risk tests
common immunized screening biopsy
lungs tuberculosis
fever chronic cough
infection inflammatory diseases infected
antibiotics death rate spread infection
skin test public health immune system medicine
asymptomatic loss of appetite bacterium
weight loss survive mycobacteria
several factors tissue damage prevention
coughing

development students factors schools interventions people lack infectious
developed science research degrees programs diseases professionals policy care
improvements deaths issues considered preventing efforts established
vaccinations sanitation prevention population evolution epidemiology life first medicine
focus smallpox foundations evolutionary epidemiology tobacco problems organizations policy society important
system average resistance information effects nations technology impact promoting
tobacco occupational services organizations policy society important
children harmful doctor increase master leading campaign pandemic assessing structural measures effective promotion reports governments
global medical modern social world practice reports governments
physical strategies environmental behavior countries education water prevention
control policies basis nurses economic concern social environmental academic governments
training spread behavior countries education water prevention
control policies basis nurses economic concern social environmental academic governments

SAFE DISEASE SANITATION OCTOBER 15 NAILS PERSONAL PREVENTION HANDLING CHEMICAL WIPES GELS CLEANER FINGERS SOCKS RUB SOAP TOILET SNEEZE GERMS LIQUID SOAP WASH CLEAN WATER HYGIENE AGENTS
SOAP CONTROL HEALTH PETS TOUCHING FREQUENT PUBLIC STAY HEALTHY! ANTIOXIDANT FOAM PALM AIR DRY PREVENT PRESERVATION SANITIZERS VIRUSES SEPTIC DESTROY INGREDIENTS CARBAGE LATHER WASTE HYGIENE SAVE DRY
GELS CLEANING DIRTY BACTERIA TOWEL FAUCET INFECTION HANDWASHING CHEMICAL HYGIENE RINSE BASIN HEALTH TOILET SNEEZE GERMS LIQUID SOAP WASH CLEAN WATER HYGIENE AGENTS
PEOPLE MICROBES ANTISEPTIC CARE DISPENSER HANDSOAP METHODS RINSE BASIN HEALTH TOILET SNEEZE GERMS LIQUID SOAP WASH CLEAN WATER HYGIENE AGENTS
FOAM DANGER ALCOHOL AFTER TOILET SOAP TOILET SNEEZE GERMS LIQUID SOAP WASH CLEAN WATER HYGIENE AGENTS
FOAM DANGER LATHER WARNING HANDWASHING PROTECTION PROCEDURE RUNNING WATER PUBLIC HEALTH VIRUSES SEPTIC DESTROY INGREDIENTS CARBAGE LATHER WASTE HYGIENE SAVE DRY
ANTIBACTERIAL SODIUM HYDROXIDE DIRTY GERMS

Vision:

- The development of a cross-cutting coordinated WHO strategy for infection control in health care is of utmost importance to harmonize and strengthen infection prevention and control in health care for preparedness and response to outbreaks .
- Such a coordinated strategy would provide a powerful tool to help promote prevention and control of infections associated with healthcare across Member States.



Mission

- The mission of the WHO Infection Prevention and Control in Health Care initiative to assist Member States in reducing dissemination of infections associated with healthcare, by assisting with the assessment, planning, implementation and evaluation of **national infection control policies**.

Objectives:



- Develop a cross-sectional, multidisciplinary WHO initiative for Prevention and Control of infections associated with healthcare.
- Provide support to help prevent spread of infectious diseases through evidence-based infection control measures in health care settings.
- Provide support for infection control preparedness and response to public health emergencies of potential international concern.

Ministry of Health Saudi Arabia : Health Facilities Infection Control General Department

Vision:



To improve performance towards clean and safe health facilities **from** infection **for** ensuring the safety of patients, medical staff and visitors.





- Aims to develop mechanisms to monitor the implementation of the infection control and central sterilization in health facilities program, confront epidemic outbreaks in health facilities, and coordinate with the concerned departments to ensure implementation of the conditions and requirements of the infection control in health facilities.

MOH KSA...

Objectives:

1. To set up mechanisms that would monitor the implementation of the infection control and central sterilization in health facilities program.
2. To confront epidemic outbreaks of health facilities.
3. To coordinate with the concerned departments to ensure implementation of the conditions and requirements of the infection control in health facilities.

4. To update job description and duties of workers in the field of infection control and central sterilization in health facilities.
5. To effectively communicate with infection control divisions/departments in health directorates and to evaluate these divisions.
6. To provide technical consultancy and training programs in the field of infection control to the different agencies.
7. To constantly improve of the performance through statistical analysis of the data of the various activities data of the department.



BASIC CONCEPTS OF INFECTION

CONTROL

- **Definition of infection**
- Complex process of interaction between pathogen and human body
- Infection is composed of three factors: pathogen, host and environment.



INFECTION

- Invasion and multiplication of an infectious agent within the body.
- Multiplication of the bacteria that are part of the normal flora is not considered an infection.

Community Acquired Infections

- Community Acquired infections are those present and spread in the community. It also includes infections in present or incubating at the time of hospital admission.
- Respiratory tract infections, diarrhea, typhoid fever, skin infections etc are common examples.
- **Community-acquired**
Present or incubating at the time of admission to hospital until 48-72 h.

Hospital Acquired Infections (HAI)

- Hospital acquired infections are also called nosocomial infections (NCI). These are infections that are acquired during stay in the hospital.
- **Health Care - Associated (*nosocomial*)**
An infection that is acquired after *48 to 72* hours of admission or within a defined period (*of 10 days*) after hospital discharge.

Categories of Nosocomial Infection

- 1. Surgical Site Infection**
- 2. Pneumonia**
- 3. Urinary Tract Infection**
- 4. Bacteremia**
- 5. Device Related Infection**
- 6. Gastro – intestinal Tract Infection**

Risk groups for developing hospital– acquired infections:

- Immune-compromise patients,
- newborn babies,
- persons with chronic diseases like diabetes,
- elderly are more likely to develop an infection.

Infectious disease

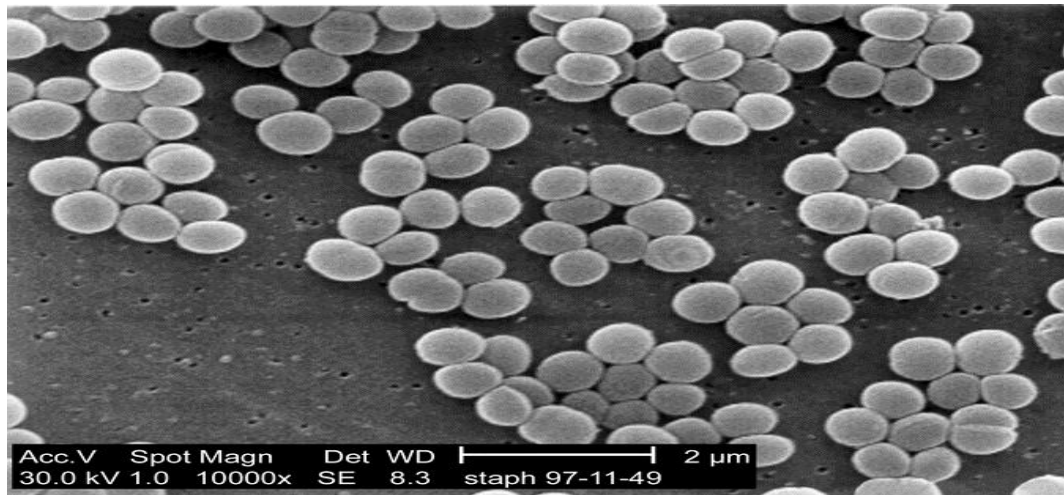
An infectious disease results from invasion of a host by disease-producing organisms, such as:

- bacteria,
- viruses,
- fungi,
- parasites.

(WHO; 2010)

- **Colonization**

Colonization, is the presence of pathogenic bacteria on a body surface (like on the skin, mouth, intestines or airway) without causing clinical evidence of infection in the person, but do not invade or cause an associated host response, is distinct from infection. No treatment is warranted.



- **Asepsis**

The complete absence of bacteria, fungi, viruses or other micro-organisms that could cause disease.



Standard precautions

- Infection control precautions that should be applied as standard principles by **all** healthcare staff to the care of **all** patients at **all** times.
- ▶ **Standard Precautions apply to all hospitalized patients regardless of their diagnosis .**



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Standard Precautions

STANDARD PRECAUTIONS

A simple, consistent and effective approach to infection control

Handwashing
Use of gloves
Personal protective equipment
Use of fluid resistant gown or apron
Safe handling of sharps
Safe handling of waste
Safe handling of soiled linen
Environmental cleaning

Minimise contact with blood and body substances by utilising safe work practices and protective barriers.

STANDARD PRECAUTIONS APPLY TO ALL PATIENTS

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Biohazard

- A risk of exposure to harmful bacteria, viruses, or other dangerous biological agents



Body Fluids

“Fluids that have been recognized by the CDC as directly linked to the transmission of HIV and/or HBV and/or to which Universal Precautions apply: blood, semen, blood products, vaginal secretions, cerebrospinal fluid, pericardial fluid, amniotic fluid, and concentrated HIV or HBV viruses.” (OSHA

- **Infectious Waste**

“Blood and blood products, pathological wastes, microbiological wastes, and contaminated sharps.”

- **Disease Transmission**

Direct: Communicable disease is transmitted from one person to another due to direct contact with infected blood, body fluids, or other infectious material.

- **Disinfection**

“A procedure which inactivates virtually all recognized pathogenic microorganisms, but not all microbial forms . **Occupational Safety and Health Administration ...**
(OSHA)

- **Sterilization**

“The use of a physical or chemical procedure to destroy all microbial life, including highly resistant bacterial endospores.” (OSHA)

Blood-borne disease	Disease such as HBV, HCV, or HIV infection that is caused by microorganisms such as viruses or bacteria that are carried in blood.
Blood-borne pathogens	Disease-causing organisms transferred through contact with blood or other body fluids.
Chain of infection	Conditions that all must be present for infection to occur.
Chronic infection	An infection of long duration.
Communicable disease	Condition caused by an infection that can be spread from person to person or through contact with body fluids.

Contaminated waste	Contaminated waste Items such as gloves and patient napkins that may contain potentially infectious body fluids of patients.
Direct contact	Touching or contact with a patient's blood or saliva.
Droplet infection	An infection that occurs through mucosal surfaces of the eyes, nose, or mouth.
Epidemiologic studies	Studies of the patterns and causes of diseases.
Hazardous waste	Waste that poses a danger to humans or to the environment.
Immunity	Ability of the body to resist disease.
Indirect contact	Touching or contact with a contaminated surface or instrument.
Infection prevention	Ultimate goal of all infection control procedures and policies Infection control Policies and practices designed to prevent the spread of infectious agents.

Pathogen	Disease-causing organism.
Percutaneous contact	Through the skin, such as with a needle stick, cut, or human bite.
Per mucosal contact	Contact with mucous membranes, such as the eyes or mouth.
Personal protective equipment	Items such as protective clothing, masks, gloves, and eyewear used to protect employees. Sharps Pointed or cutting instruments, including needles, scalpel blades, orthodontic wires, and endodontic instruments.
Universal Precautions Guidelines	Universal Precautions Guidelines based on treating all human blood and body fluids (including saliva) as potentially infectious.
Virulence	Strength of a pathogen's ability to cause disease; also known as pathogenicity.



Examples of Guidelines needed in every setting:

1. Develop and maintain infection prevention and occupational health programs
2. Assure sufficient and appropriate supplies necessary for adherence to Standard Precautions (e.g., hand hygiene products, personal protective equipment, injection equipment)
3. Assure at least one individual with training in infection prevention is employed by or regularly available to the facility
4. Develop written infection prevention policies and procedures appropriate for the services provided by the facility and based upon evidence-based guidelines, regulations, or standards



- **Group Discussion and Problem Solving Activity– Applying Infection**

Control Measures to Different Situations

- **Objectives:**

Group members will know when and how to apply infection control measures.

Scenario 1

While no human avian influenza H5N1 cases have yet been confirmed in the U.S., a highly pathogenic H5N1 avian influenza has been identified in poultry in your area. The avian virus causing this outbreak has been shown to cause lower respiratory disease in humans in other parts of the world.

You are asked to lead a team that is being sent to identify and interview people who may have been exposed to infected birds on a small farm. You do not expect that your team will have direct contact with birds, but you may be near areas where the poultry were housed.

Question 1

Based on what you know about infection control, what Personal Protective Equipment (PPE) would you bring on this initial visit as the public health responders?

Suggested Answer

- *The team should bring full PPE (gloves, gown, eye protection, surgical masks, boot covers, and N95 respirators). As always, hand hygiene is an important recommendation, and the team should bring an alcohol based sanitizer in case running water isn't readily available.*

Question 2

- If the PPE that you planned to bring is unavailable or cannot be accessed for some reason, how would you proceed?

Suggested Answer

- *There are several options available to the team. They could contact a local hospital and request to use some of their PPE.*
- *They could conduct screening interviews over the phone to determine if anyone is symptomatic. If so, they could refer the person to the hospital, and if not, the team may conduct the in-person interviews without wearing PPE, if they maintain 3 ft (1 meter = 3 feet) (**1 foot is equal to 30.48cm**) distance, avoid entry into contaminated environments, and practice good hand hygiene.*
- *A way to avoid the need for PPE is to conduct all possible interviews by phone.*

Scenario 2

- While you are conducting an interview of a person who may have been exposed to sick poultry, the interviewee reports that she has a fever and diarrhea. You are not wearing any PPE

Question 1

- Ideally, what PPE should be worn when interviewing a symptomatic exposed person?

Suggested Answer

- *CDC recommends that you take contact and droplet precautions, plus use an N95 or better respirator when interviewing symptomatic patients.*

Question 2

- How do you proceed in this situation?

Suggested Answer

- *Participants should be encouraged to identify the barriers to using PPE in this situation, and brainstorm about strategies to adequately protect themselves while understanding the needs of the interviewee*

D. Levels of Prevention

- Primary, Secondary, and Tertiary Prevention



Prevention; Definition and Concept

- Actions aimed at eradicating, eliminating or minimizing the impact of disease and disability.
- The concept of prevention is best defined in the context of levels, traditionally called
 - **primary,**
 - **secondary and**
 - **tertiary prevention.**

Determinants of Prevention

- Successful prevention depends upon:
 - a knowledge of causation,
 - dynamics of transmission,
 - identification of risk factors and risk groups,
 - availability of prophylactic or early detection and treatment measures,
 - an organization for applying these measures to appropriate persons or groups, and
 - continuous evaluation of and development of procedures applied

Primary Prevention

- measures include activities that help avoid a given health care problem.
- Primary prevention strategies emphasize general health promotion, risk factor reduction, and other health protective measures.
- These strategies include health education and health promotion programs designed to foster healthier lifestyles and environmental health programs designed to improve environmental quality.

Primary prevention

Achieved by

Health promotion

Specific protection

Health education

Environmental modifications

Nutritional interventions

Life style and behavioral changes

Immunization and seroprophylaxis

chemoprophylaxis

Use of specific nutrients or supplementations

Protection against occupational hazards

Safety of drugs and foods

Control of environmental hazards,
e.g. air pollution

Examples: PRIMARY PREVENTION

- Immunization against communicable diseases; public health education about good nutrition, exercise, stress management, and individual responsibility for health; chlorination and filtration of public water supplies; and legislation requiring child restraints in motor vehicles.
- Health protecting education and counseling promoting the use of automobile passenger restraints and bicycle helmets.
- Since successful primary prevention helps avoid the suffering, cost and burden associated with disease, it is typically considered the most cost-effective form of health care.

Secondary Prevention

- focuses on early detection and swift(early) treatment of disease.
- **Its purpose** is to cure disease, slow its progression, or reduce its impact on individuals or communities.
- A common approach to secondary prevention is screening for disease, such as the noninvasive computerized test for the early detection of heart disease. This test uses computerized tomography scans to look for calcium deposition in the arteries, which can signal previously undetected heart disease.

Examples: SECONDARY PREVENTION

- **Mammography for breast cancer detection**; eye tests for glaucoma; blood tests for lead exposure; occult blood tests for colorectal cancer; the Pap test for cervical ,concrete breath test for Helicobacter pylori, the bacterium implicated in duodenal and gastric ulcers; and the Prostate-Specific Antigen(PSA) test for prostate cancer. In each case, screening is performed to detect disease early so prompt treatment can be initiated.
- **Treatment** of hypertension to prevent complications and removal of skin cancer lesions as they occur.

Tertiary Prevention

- Involves both therapeutic and rehabilitative measures once **disease is firmly established**.
- Involves the care of established disease, with attempts made to restore to highest function, minimize the negative effects of disease, and prevent disease-related complications. Since the disease is now established, primary prevention activities may have been unsuccessful. Early detection through secondary prevention may have minimized the impact of the disease.

Examples : TERTIARY PREVENTION

- include treatment of diabetics to prevent complication of the disease and the ongoing management of chronic heart disease patients with medication, diet, exercise, and periodic examination.
- Other examples include improving functioning of stroke patients through rehabilitation by occupational and physical therapy, nursing care, speech therapy, counseling, and so forth, and treating those suffering from complications of diseases such as meningitis, multiple sclerosis, or Parkinson's disease.



Tertiary (FEW)

- Reduced complications, intensity, severity of current cases



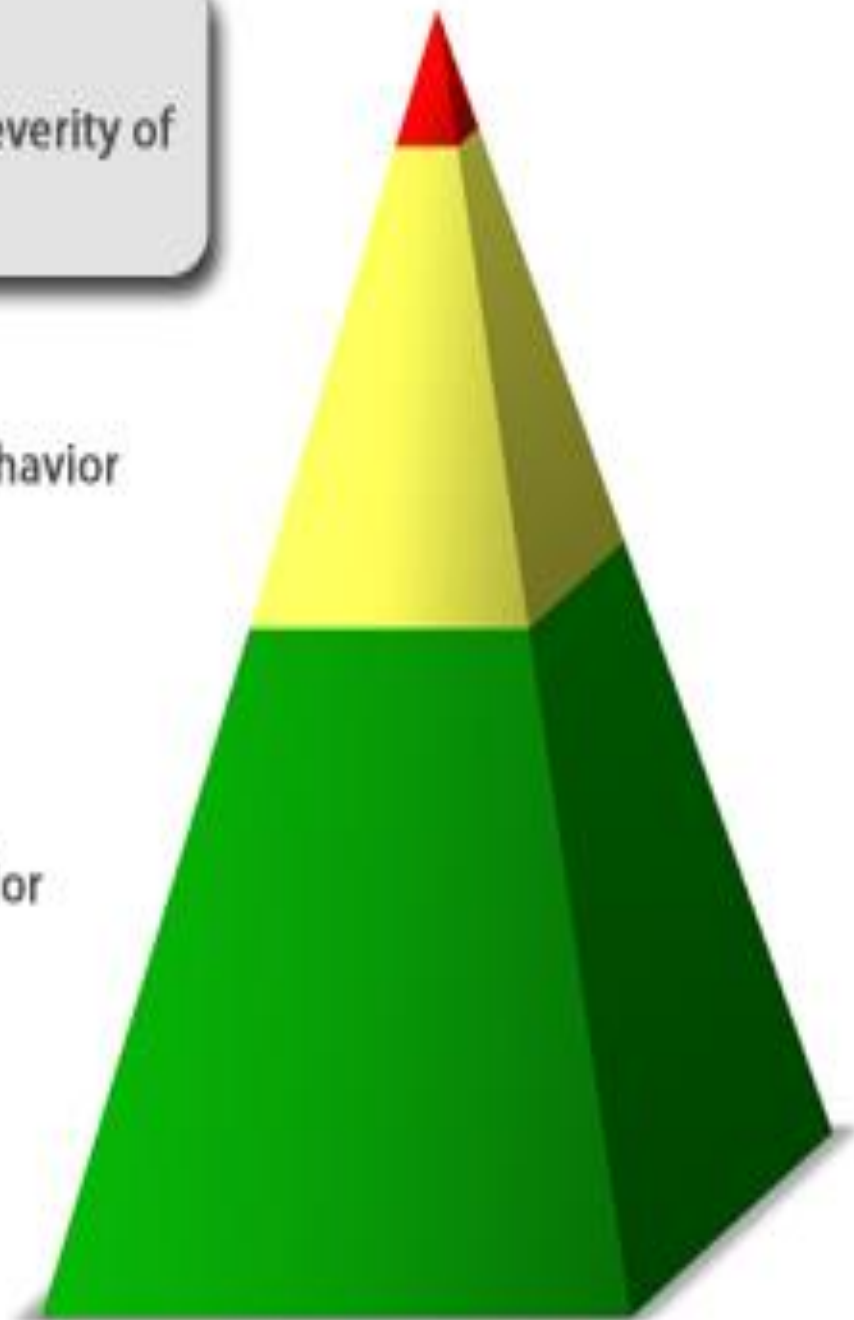
Secondary (SOME)

- Reduce current cases of problem behavior

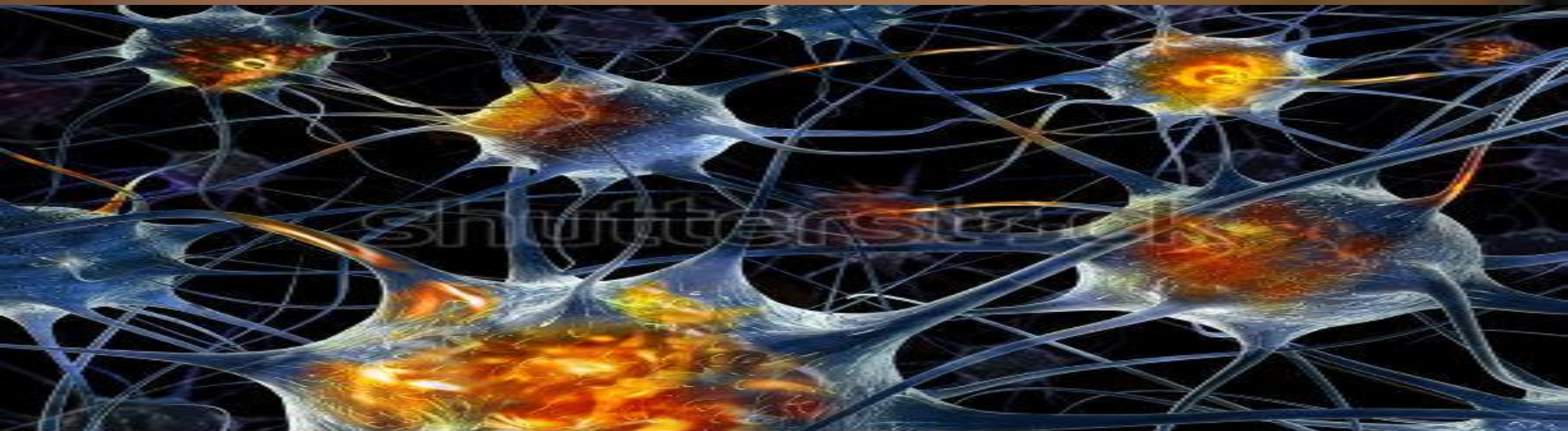


Primary (ALL)

- Reduce new cases of problem behavior



- **E. Communicable Diseases**



Communicable Diseases

- refer to diseases that can be transmitted and make people ill.
- are caused by infective agents (pathogens) e.g. bacteria and viruses, which invade the body and multiply or release toxins to cause damages to normal body cells and their functions.
- In severe cases, they may lead to death. These infective agents can spread from a source of infection (e.g. patients, sick animals) to a person through various routes of transmission.

Cont. CD

- Some communicable diseases are highly infectious and cause severe sequelae to such an extent that they threaten human lives and affect the economy. If there are proper precautionary or control measures in place, the disaster posed by these communicable diseases can be averted.
- The evolution of outbreaks of communicable diseases and their management vary to a certain extent with different countries or regions, where the types of communicable diseases occurred and the living environment are different.
- To safeguard public health and safety, every country or region has legislation stipulating certain communicable diseases as statutory notifiable diseases which warrant special precautions, and policies are developed to prevent outbreaks and to contain their spread.

Non-communicable diseases (NCDs)

- are currently responsible for over 60% of global deaths. This burden is one of the major public health challenges facing all countries, regardless of their economic status.
- threaten economic and social development and, without concerted efforts at country level, are predicted to increase in the coming decade.
- are diseases of long duration and generally slow progression.
- are by far the leading cause of death in the world, representing 63% of all annual deaths.
- kill more than 36 million people each year. Some 80% of all NCD deaths occur in low- and middle-income countries.

Top 10 Facts About Non communicable Diseases: (WHO)

1. **NCDs account for 63% of all deaths.**

- NCDs, primarily cardiovascular diseases, cancers, chronic respiratory diseases and diabetes, are responsible for 63% of all deaths worldwide (36 million out of 57 million global deaths).

2. **80% of NCDs deaths occur in low- and middle-income countries.**

3. **More than 9 million of all deaths attributed to NCDs occur before the age of 60.**

4. **Around the world, NCDs affect women and men almost equally.**

5. **NCDs are largely preventable.**

- NCDs are preventable through effective interventions that tackle shared risk factors, namely: tobacco use, unhealthy diet, physical inactivity and harmful use of alcohol.

6. CDs are not only a health problem but a development challenge as well.

- NCDs force many people into, or entrench them in poverty due to catastrophic expenditures for treatment. They also have a large impact on undercutting productivity.

7. 1.5 billion adults, 20 and older, were overweight in 2008.

8. Nearly 43 million children under 5 years old were overweight in 2010.

9. Tobacco use kills nearly 6 million people a year.

- By 2020, this number will increase to 7.5 million, accounting for 10% of all deaths.

10. Eliminating major risks could prevent most NCDs.

- If the major risk factors for NCDs were eliminated, at around three-quarters of heart disease, stroke and type 2 diabetes would be prevented; and 40% of cancer would be prevented.

WHO Statistical Data

[NCD BAR GRAPH\WHO data low income.pdf](#)

[NCD BAR GRAPH\WHO data lower middle.pdf](#)

[NCD BAR GRAPH\WHO data upper middle.pdf](#)

[NCD BAR GRAPH\WHO data high income.pdf](#)

