

# Cancer Epidemiology

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## **objectives**

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1. Define cancer and understand its pathophysiology.
2. Describe the most common causes of cancer
3. Formulate the proper preventive strategies for control of cancer.

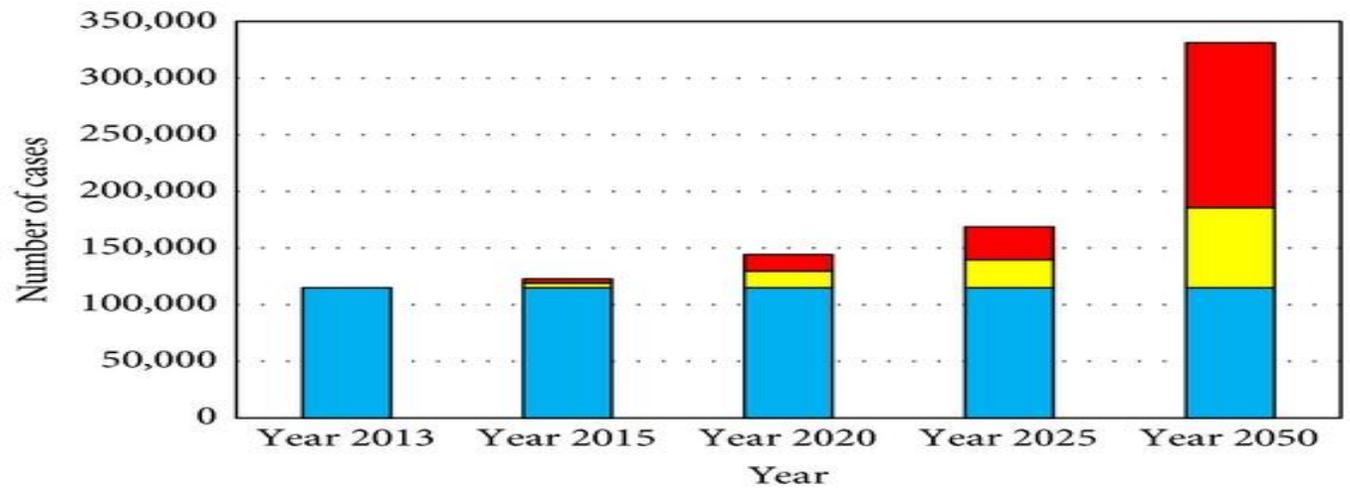
# Definition of cancer

Cancer is a disease characterized by rapid growth of cells often in the form of a tumor.

Cancer is invasive that is, it can spread to surrounding tissues.

It usually develops when the body's normal control mechanism stops working.

Old cells do not die and instead grow out of control, forming new, abnormal cells. These extra cells may form a mass of tissue, called a tumor.



- Increased cases due to change in population structure
- Increased cases due to population growth
- Baseline cases (number of cases in 2013)

## The most frequent cancers in Jordan are:

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In males: **colorectal**, **Lung**, bladder, prostate, Non-Hodgkin lymphoma and Brain

In Females: **Breast**, Liver, Brain, Ovary, Non-Hodgkin lymphoma and Thyroid.

For Both Sexes, Liver, Breast, Bladder, Brain, Non-Hodgkin lymphoma and Lung

## 1- Chemicals

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Worldwide, **tobacco** use is the single greatest avoidable risk factor for cancer mortality

Tobacco smoke has more than 7000 chemicals, at least 250 are known to be harmful and more than 50 are known to cause cancer.

Tobacco smoke causes lung cancer. cancer in the larynx, head, neck, stomach, bladder, kidney, esophagus and pancreas.

## 2- Diet and obesity

Diet, physical inactivity and obesity are related to up to 30–35% of cancer deaths.

High body mass index related to at least 10 types of cancer.

Physical inactivity is contributed to cancer risk, through negative effects on the immune system and endocrine system.

## Specific foods linked to specific cancers.

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- *→ in nuts  
دقيق القمح  
منه القمح له* (Aflatoxin B1) causes liver cancer.
- High-salt diet is linked to gastric cancer.
- Gastric cancer is more common in Japan due to its high-salt diet  
*⊕ spicy*
- Colon cancer is high in obese people.

# 3- Infection

(\*very important)

↳ explain the relationship between communicable and non-communicable.

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Worldwide approximately **18%** of cancer deaths are related to infectious diseases.

Viruses are the usual infectious agents that cause cancer but cancer **bacteria** and parasites may also play a role.

**Oncoviruses:** (viruses that can cause cancer):

صير الزوائد الخلوية  
تتغير فتقوم  
انا طلعت في  
high high.

1. **Human papillomavirus ..... cervical cancer**

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2. **Epstein-Barr virus ..... lymphoma**
3. **HIV ..... Kaposi's sarcoma**
4. **hepatitis B and hepatitis C viruses ..... hepatocellular carcinoma**

AIDS with symptoms

**Bacterial infection increase the risk of cancer, as seen in**

- **Helicobacter pylori ..... gastric carcinoma.**

**Parasitic infections as:**

- **Schistosoma haematobium ..... carcinoma of the bladder**

## 4- Radiation

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Up to 10% of invasive cancers are related to radiation exposure, including both ionizing radiation and non-ionizing ultraviolet radiation.

X-ray

leukemia

melanoma  
skin cancer

from sun

Children and adolescents are **twice** as likely to develop radiation-induced leukemia as adults

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Prolonged exposure to [ultraviolet radiation](#) from the [sun](#) can lead to [melanoma](#) and other skin malignancies.

Ultraviolet radiation, cause [skin cancers](#), which are the most common forms of cancer in the world.

Non-ionizing [radio frequency](#) radiation from [mobile phones](#), [electric power transmission](#) and other similar sources have been described as a [possible carcinogen](#)

## 5- Hereditary

Hereditary cancers are primarily caused by an inherited genetic defect.

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Less than 0.3% of the population is carriers of a genetic mutation that has a large effect on cancer risk and this cause less than 3–10% of cancer.

Some of these syndromes include:

- ❑ certain inherited mutations in the genes BRCA1 and BRCA2 with a more than 75% risk of breast cancer and ovarian cancer
- ❑ Hereditary nonpolyposis colorectal cancer (HNPCC or Lynch syndrome), which is present in about 3% of people with colorectal cancer, among others.

*run in family.  
special in mother*

## 6- Occubation

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Prolonged exposure to asbestos, naturally occurring mineral fibers that are a major cause of mesothelioma (cancer of the serous membrane) usually the serous membrane surrounding the lungs. *of pleura.*

Non-fibrous particulate materials that cause cancer include powdered metallic cobalt and nickel and crystalline silica (quartz, cristobalite and tridymite).

# 7- Hormones

cancer of the breast, [endometrium](#), prostate, ovary and [testis](#) and also of [thyroid cancer](#) and [bone cancer](#).

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For example, the daughters of women who have breast cancer have significantly higher levels of [estrogen](#) and [progesterone](#) than the daughters of women without breast cancer.

These higher hormone levels may explain their higher risk of breast cancer, even in the absence of a breast-cancer gene.

Similarly, men of African have significantly higher levels of [testosterone](#) than men of European and have a correspondingly higher level of prostate cancer.

## 8-Associated diseases

*immune disease*

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There is an association between [celiac disease](#) and an increased risk of all cancers. People with untreated celiac disease have a higher risk

Rates of gastrointestinal cancers are increased in people with [Crohn's disease](#) and [ulcerative colitis](#), due to chronic inflammation.

Also, [immuno-modulators](#) and [biologic agents](#) used to treat these diseases may promote developing extra-intestinal malignancies.

# 9- Pollution

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Pollution of air, water and soil with carcinogenic chemicals contributes to the cancer burden to differing degrees depending on the geographical settings.

Outdoor air pollution is classified as carcinogenic, or cancer-causing, for humans.

It has been estimated that outdoor air pollution contributed to 3.2 million premature deaths worldwide, 6% of these deaths are from lung cancer.

Indoor air pollution from coal fires doubles the risk of lung cancer, particularly among non-smoking women.

# Cancer Signs and symptoms

\*مشاور\*

## Common sites and symptoms of Cancer metastasis

### Brain

- Headaches
- Seizures
- Vertigo → عدم آزران

### Respiratory

- Cough
- Hemoptysis
- Dyspnea

### Lymph nodes

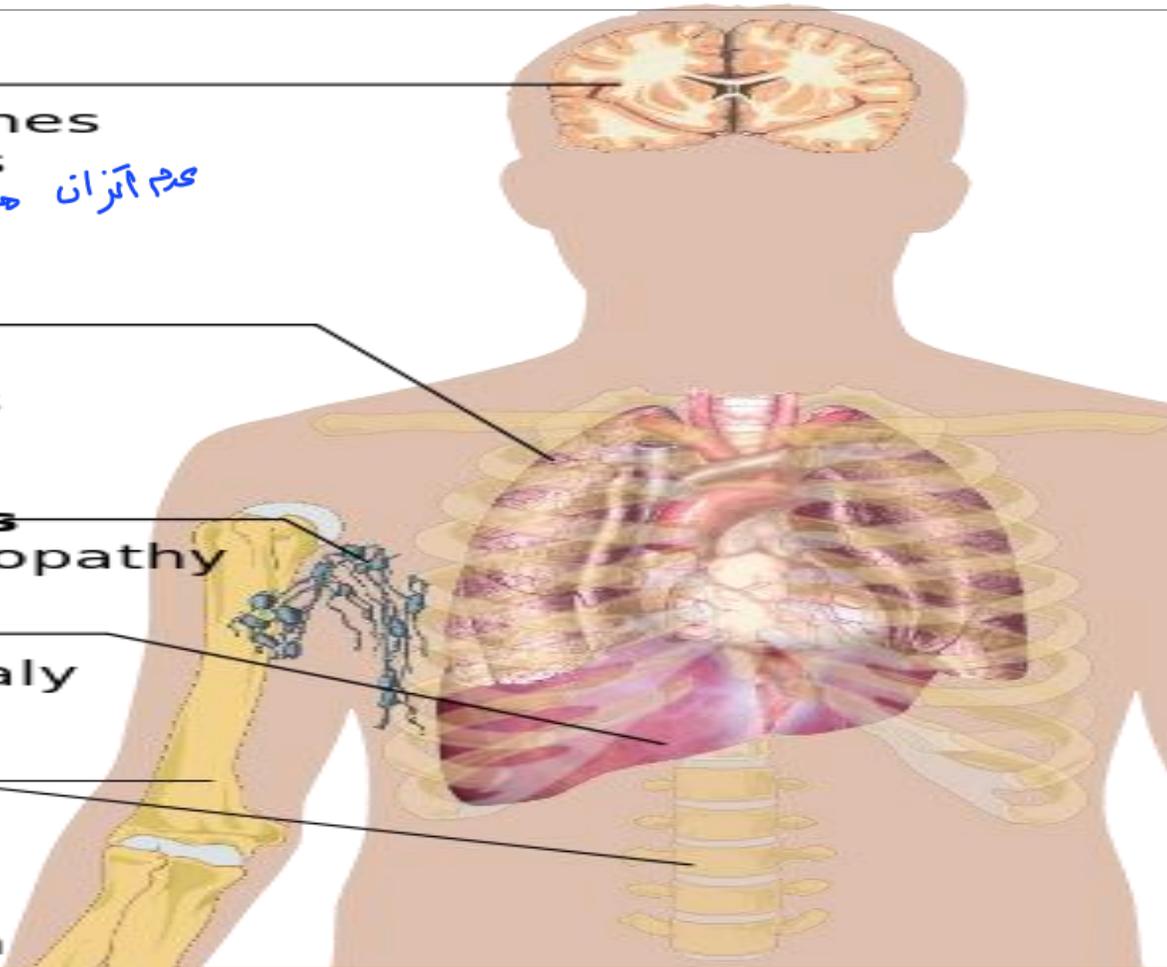
- Lymphadenopathy

### Liver

- Hepatomegaly
- Jaundice

### Skeletal

- Pain
- Fractures
- Spinal cord compression



# Cancer prevention: → Risk factor guide

## 7 tips to reduce the risk

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Between **30-50%** of all cancer cases are preventable. Prevention offers the most cost-effective long-term strategy for the control of cancer.

National policies and programs should be implemented to raise awareness, to reduce exposure to cancer risk factors and to ensure that people are provided with the information and support they need to adopt healthy lifestyles.

So if you're concerned about cancer prevention, take comfort in the fact that some simple lifestyle changes can make a big difference. Consider these seven cancer prevention tips.

# 1. Don't use tobacco

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Using any type of tobacco puts you on a collision course with cancer

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chewing tobacco has been linked to cancer of the oral cavity and pancreas.

Even if you don't use tobacco, exposure to secondhand smoke might increase your risk of lung cancer.

Avoiding tobacco — or deciding to stop using it — is one of **the most important health decisions you can make**. It's also an important part of cancer prevention.

## 2. Eat a healthy diet

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**Eat plenty of fruits and vegetables.** Base your diet on fruits, vegetables and other foods from plant sources — such as whole grains and beans.

**Avoid obesity.** Eat lighter and leaner by choosing fewer high-calorie foods, including refined sugars and fat from animal sources.

### 3. Maintain a healthy weight and be physically active

Maintaining a healthy weight might lower the risk of various types of cancer, including cancer of the breast, prostate, lung, colon and kidney. Physical activity counts, too.

Adults who participate in any amount of physical activity gain some health benefits. But for substantial health benefits, strive to get at least **150 minutes a week of moderate aerobic activity or 75 minutes a week of vigorous aerobic physical activity.**

You can also do a combination of moderate and vigorous activity. As a general goal, include at least 30 minutes of physical activity in your daily routine and if you can do more, even better.

## 4- Protect yourself from the sun

**Avoid midday sun.** Stay out of the sun between 10 a.m. and 4 p.m., when the sun's rays are strongest.

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**Stay in the shade.** When you're outdoors, stay in the shade as much as possible. Sunglasses and a broad-brimmed hat help, too.

**Cover exposed areas.** Wear tightly woven, loose fitting clothing that covers as much of your skin as possible.

**Don't skimp on sunscreen.** Use generous amounts of sunscreen when you're outdoors, and reapply often.

**Avoid tanning beds and sunlamps.** These are just as damaging as natural sunlight.

# 5. Get immunized

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**Hepatitis B.** Hepatitis B can increase the risk of developing liver cancer. The hepatitis B vaccine is recommended for **certain high-risk adults** — such as adults who are sexually active but not in a mutually monogamous relationship, people with sexually transmitted infections, intravenous drug users, men who have sex with men, and health care or public safety workers who might be exposed to infected blood or body fluids.

**Human papillomavirus (HPV).** HPV is a sexually transmitted virus that can lead to cervical and other genital cancers as well as squamous cell cancers of the head and neck. The HPV vaccine is recommended for girls and boys ages 11 and 12. It is also available to both men and women age 26 or younger who didn't have the vaccine as adolescents.

# 6. Avoid risky behaviors

**Practice safe sexual life (marriage).** Limit your number of sexual partners, and use a condom when you have sex. The more sexual partners you have in your lifetime, the more likely you are to contract a sexually transmitted infection — such as HIV or HPV.

**Don't share needles.** Sharing needles with an infected drug user can lead to HIV, as well as hepatitis B and hepatitis C which can increase the risk of liver cancer. If you're concerned about drug abuse or addiction, seek professional help.

## 7. Get regular medical care

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**Regular self-exams and screenings for various types of cancers such as cancer of the skin, colon, cervix and breast can increase your chances of discovering cancer early, when treatment is most likely to be successful. Ask your doctor about the best cancer screening schedule for you.**

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Thank you