MEDIA FACTSHEET

CANCER EXPLAINED

What is cancer?
Cancer is a disease which occurs when changes in a group of normal cells within the body lead to uncontrolled growth causing a lump called a tumour; this is true of all cancers except leukaemia (cancer of the blood). If left untreated, tumours can grow and spread into the surrounding normal tissue, or to other parts of the body via the bloodstream and lymphatic systems, and can affect the digestive, nervous and circulatory systems.[1]

Tumours (lumps) can be benign or malignant.

- **Benign tumours** are not cancerous and rarely threaten life.[2] They tend to grow quite slowly, do not spread to other parts of the body and are usually made up of cells quite similar to normal / healthy cells.[3] They will only cause a problem if they grow very large, becoming uncomfortable or press on other organs - for example a brain tumour inside the skull

- **Malignant tumours** are faster growing than benign tumours and have the ability to spread and destroy neighbouring tissue. Cells of malignant tumours can break off from the main (primary) tumour and spread to other parts of the body through a process known as metastasis. Upon invading healthy tissue at the new site they continue to divide and grow. These secondary sites are known as metastases and the condition is referred to as metastatic cancer[2]

Cancer can be classified according to the following categories:[4]

- **Carcinoma** – A cancer that arises from the epithelial cells (the lining of cells that helps protect or enclose organs). Carcinomas may invade the surrounding tissues and organs and metastasise to the lymph nodes and other areas of the body. The most common forms of cancer in this group are breast, prostate, lung and colon cancer
- **Sarcoma** – A type of malignant tumour of the bone or soft tissue (fat, muscle, blood vessels, nerves and other connective tissues that support and surround organs). The most common forms of sarcoma are leiomyosarcoma, liposarcoma and osteosarcoma
- **Lymphoma** – Lymphoma is a cancer of the lymphatic system, which runs all through the body, and can therefore occur anywhere. The two main forms are non-Hodgkin's which begins with uncontrolled growth of the - white blood cells -lymphocytes - of the immune system) and Hodgkin's lymphoma in which cells of the lymph nodes become cancerous
- **Leukaemia** - Leukaemia is a cancer of the white blood cells and bone marrow, the tissue that forms blood cells. There are several subtypes; common are lymphocytic leukaemia and chronic lymphocytic leukaemia

Causes
There are about 200 known types of cancer.[3] As with most illnesses cancer is multifactorial, meaning there is no single cause for any one type of cancer.

- **Cancer-causing substances (carcinogens)** - Genes are coded messages inside a cell that tell it how to behave (i.e. which proteins to make). Mutation or changes to the gene, such as damage or loss, can alter how that cell behaves. For example, a mutation may mean that too much protein is made, or that protein is not made at all. Significantly, there needs to be a number of genetic mutations[3] within a cell before it becomes cancerous. Something that damages a cell, changing its behaviour and makes it more likely to be cancerous is called a 'carcinogen'
- **Age** – Many types of cancer become more prevalent with age. The longer people live, the more exposure there is to carcinogens and the more time there is for genetic changes or mutations to occur within their cells[3]
- **Genetics** – Some people are unfortunately born with a genetically inherited high risk for a specific cancer ('genetic predisposition). This does not mean developing cancer is guaranteed, but a genetic predisposition makes the disease more likely.
    - For example, women that carry the BRCA 1 and BRCA 2 breast cancer genes have a higher predisposition to developing this form of cancer than women with a normal breast cancer risk.[2] However, less than 5% of all breast cancer is known to be due to genes. So although women with one of these genes are individually more likely to develop breast cancer, most cases are not caused by a high risk inherited gene fault. This is true of other common cancers where some people have a genetic predisposition - for example, colon (large bowel) cancer
- **The immune system -** People who have weakened immune systems are more at risk of developing some types of cancer. This includes people who have had organ transplants and take drugs to suppress their immune systems to stop organ rejection, plus people who have HIV or AIDS, or other medical conditions which reduce their immunity to disease

Certain lifestyles and environmental factors are also known to cause mutations that can cause cancer. Lifestyle and environmental causes are to a large extent controllable or avoidable. Examples include:

- **Bodyweight, diet and physical activity -** Cancer experts estimate that maintaining a healthy bodyweight, making changes to our diet and taking regular physical activity could prevent about one in three deaths from cancer. Many people eat too much red and processed meat and not enough fresh fruit and vegetables. This type of diet is known to increase the risk of cancer
- **Overweight or obesity -** 'Obese' means being more than about 25% overweight. Overweight or obese people have an increased risk of bowel and pancreatic cancer, probably due to a tendency towards higher insulin levels. Obesity can also increase the risk of cancer of the foodpipe (oesophageal cancer), kidney and gallbladder cancer, as well as breast or womb (uterine) cancer in women

- **Alcohol -** The evidence that all types of alcoholic drinks are a cause of a number of cancers is now stronger than ever before.[5] Alcohol can increase the risk of a number of cancers, including mouth, throat (which includes pharyngeal cancer), laryngeal and cancer of the foodpipe, plus liver, breast and bowel cancer (in men). Even moderate alcohol intake increases the risk of cancer
- **Tobacco** – Tobacco smoke contains at least 80 different cancer-causing substances (carcinogenic agents). When smoke is inhaled the chemicals enter the lungs, pass into the blood stream and are transported throughout the body.[6] This is why smoking or chewing tobacco not only causes lung cancer and mouth cancers, but is also related to many other cancers. The more a person smokes, the younger they start, and the longer they keep smoking, all further increase the risk of cancer
- **Ionising radiation** – Manmade sources of radiation can cause cancer and are a risk for workers. The main risk is however, prolonged and unprotected exposure to ultraviolet radiations from the sun which can lead to melanoma and skin malignancies.[7] Fair skinned people, those with lot of moles or who have a relative who has had melanoma or non-melanoma skin cancer, are at highest risk
- **Work place hazards** - Some people risk being exposed to a cancer causing substance because of the work that they do. For example, workers in the chemical dye industry have been found to have a higher incidence than normal of bladder cancer. Asbestos is a well-known work place cause of cancer - particularly a cancer called mesothelioma,[3] which most commonly affects the covering of the lungs (pleura)
- **Infection** – A proportion of cancers can be caused by infection with a virus. However, this does not mean that these cancers can be caught like an infection; rather the virus can cause changes[3] in cells that make them more likely to become cancerous
    - Examples include cervical cancer, linked to the Human Papilloma Virus, primary liver cancer which can be caused by the Hepatitis B and C virus and lymphomas linked to the Epstein-Barr virus[8]
    - Bacterial infections have not been thought of as cancer causing agents in the past. But studies have shown that people who have helicobacter pylori infection of their stomach develop inflammation of the stomach lining, which increases the risk of stomach cancer

Signs and symptoms

As there are so many different types of cancer the symptoms are varied and depend on where the disease is located. However, there are some key signs and symptoms[9], including:

- **Lumps** – some cancers can be felt through the skin. Cancerous lumps are often painless and may increase in size as the cancer progresses
- **Coughing, breathlessness** – persistent coughing episodes and breathlessness can be associated with lung cancer
- **Changes in bowel habit** – symptoms of bowel cancer may include blood in the stools and a change in bowel habits such as constipation and diarrhoea

- **Bleeding** – any unexpected bleeding can be a sign of cancer:
    - Bleeding from the anal passage may be a sign of bowel cancer
    - Bleeding from the cervix may be a sign of cervical cancer
    - Blood present in the urine may be a sign of kidney or bladder cancer
- **Unexplained weight loss** – a large amount of unexplained weight loss over a short period of time (a couple of months) can be a sign of cancer
- **Fatigue** - fatigue is extreme tiredness and a severe lack of energy. If fatigue is due to cancer, sufferers normally also have other symptoms

The global cancer epidemic
The incidence and burden of cancer is huge and is set to rise. Cancer kills more people on a global scale than AIDS, malaria and TB combined. Many of the 600,000 deaths each month attributed to cancer can be prevented with increased governmental support and funding for prevention, detection and treatment programmes.

The incidence of cancer is highest in developed countries, particularly in Northern America, Australia and New Zealand and in Northern and Western Europe. However, the impact in the developing world is growing at an alarming rate. More than 70% of all cancer deaths already occur in low- and middle-income countries and these regions are projected to account for two-thirds of all cases of cancer worldwide by 2050 (an increase of 15% since 1975).[10]

There are significant regional differences in cancer prevalence, but the biggest cancer killers worldwide are lung cancer (1.4 million deaths in 2008), stomach cancer (740,000 deaths in 2008), liver cancer (700,000 deaths in 2008), colorectal cancer (610,000 deaths in 2008), and breast cancer (460,000 deaths in 2008).[11]

In addition to the impact on loss of life, the economic impact of cancer is huge. Currently it is estimated that the disease costs economies across the world an estimated $290 billion in 2010 - $154 billion of which were medical costs.[12]

The future cancer burden
The global cancer epidemic is set to continue rising, placing further strains on both individuals and the families, and the societies in which they live. The number of cancer cases and related deaths worldwide is estimated to double over the next 20-40 years. With the greatest increase in low- and middle-income countries; those least equipped to cope with both the social and economic impact of the disease.

Worryingly, it is expected that by 2030:
- There will be 12 million cancer deaths per year[13]
- The global costs of cancer are estimated to rise to 458 billion[12]

The rising burden of cancer across the world can be linked to a number of factors including:[13]
- Expanding and ageing populations
- Increases in modifiable risk factors (smoking, western diet and physical inactivity)
- Higher incidences of cancers related to preventable or treatable infections (particularly in developing countries)

62 route de Frontenex • 1207 Geneva • Switzerland • Tel. +41 (0)22 809 1811 • Fax +41 (0)22 809 1810 • info@uicc.org • uicc.org

Prevention and early detection of cancer
More than a third of all cancers are preventable by reducing exposure to risk factors including tobacco, obesity, physical inactivity and sexually transmitted infections.[11] Preventative measures such as vaccination programmes against HBV and HPV and public education campaigns are vital now, and in the future, to mitigate the expected increase of people affected by cancer in the coming decades.

Early detection can also play its part in reducing the global cancer epidemic. Implementation of screening programmes to identify pre-cancer or early stage cancer are crucial in the fight against the disease in both developed and developing countries. In order for early detection programmes to be effective, strong healthcare systems must be in place to provide equity of access to diagnosis and treatment for all cancer patients. In addition, public education campaigns are needed across the world to tackle the cancer epidemic by helping people recognise the early signs of disease and encourage the seeking of prompt medical attention.

Call to action
Unless urgent action is taken to raise awareness about cancer and encourage governments to develop practical, multisectoral strategies to address the disease, millions of people around the world will continue to die prematurely or suffer every year because of this devastating disease.

For more information, please contact:
UICC Press Relations
Laura Korgaonkar
Email: Laura.K@toniclc.com
Tel: 0044 7985 540 319

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