



A SYSTEMATIC REVIEW ON THE EMERGING CANCER CONDITION IN WORLDWIDE**Shopnil Akash**² & Ifat Jahan²**Department of Pharmacy, Daffodil International University, Dhaka, Bangladesh
Email:shopnil29-059@diu.edu.bd**ABSTRACT**

This review paper provides an update on the burden of global cancer by estimating the mortality rates and incidences. Cancer is one of the main causes of morbidity and mortality globally. It is considered that by 2020, the rate of the new cases of cancer will raise to more than 15 million, including death raising to 12 million. The burden of cancer incidence and mortality will increase worldwide. When in the United States and many other western countries, the most cancer incidences and mortality rates for most cancers (with colorectum cancer, breast cancer, lung cancer and prostate cancer) are declining, and then in the several less developed and economically transitioning countries, those are developing. The reasons for increasing in the less developed and economically transitioning countries are the acceptance of unhygienic westerly lifestyles such as smoking, taking tobacco, taking alcohol, deficiency of exercise, industrial exposures, physical inactivity etc. Already in some of these countries, the rates for colon and lung cancers have surpassed. The most developing countries are getting affected by cancer related to infectious agents, such as liver, stomach, and cervix cancers. In this review, we discuss the incidence and mortality of this changing world for selected common cancers and the potential for cancer prevention in developing countries.

Key Words: Cancer, burden of cancer, infectious agents, developing countries, mortality, incidence, prevention

INTRODUCTION

Cancer is one of the most monumental causes of death. At the same time in every country cancer is identified as an important barrier to life expectancy. According to 2019 estimates, cancer is the first or second leading cause of death before the age of 60 in 112 out of 173 countries, and in 23 more countries it is the third or fourth leading cause of death. The growing specialty of cancer as a primary cause of death is partially reflected in the lower mortality rate of stroke and coronary heart disease compared to cancer in many countries. The incidence of cancer and the burden of death are increasing very fast all over the world. It mainly reflects the age and growth of the population including changes in the spread and distribution of the prime risk factors for cancer, most of which are connected with the socio-economic improvement. [1]

All communities around the world are affected by cancer. But there are different signs of the spread and type of cancer among the communities. The burden of total cancer is most noticeable in Afghan society, with less developed economies closing the gap very quickly. When developing countries succeed in living like developed economies, they are also more likely to develop cancer, especially breast, uterine and prostate cancers. In this way, the incidence of cancer in developing countries increases, which later becomes global, which is not affordable for us. One of the main causes of cancer worldwide is rapid aging of people,

such as tobacco, food, use of many harmful substances and infectious agents. Certain cancers, such as breast, prostate and colon tumors, are associated with Western lifestyle. Developed countries have taken some steps to prevent some cancers. For example, the tumors that are being created for smoking are increasing the risk of getting this cancer. Another difference between developed and less developed economies is the incidence of infectious cancer prevention. Developed countries also have rapid disease detection and advanced diagnostic methods that have reduced the incidence and mortality of cancer in these countries, which is not seen in less developed countries. [2]

Apart from the growing trend, the future burden of cancer in the developing world will be worrying as a result of the increase in life expectancy and growth and the expected increase in population growth. The proportion of cases scheduled in the under developed countries is expected to increase from about 56% in 2008 to more than 60% in 2030. [3]

The goal of this review is the discussion of the incidence and mortality of this changing world pattern for selective common cancers using incidences and mortalities.

BACKGROUND

Cancer is the sum of uncontrolled cell division diseases. The death rate from this disease is still very high. This is because cancer is not easily identified in the early stages, so it is not possible to give any good treatment in the early stages. In fact, no cure for cancer has yet been discovered. Different treatments are applied to cure cancer. However, if identify cancer in early stages, the chances of curing the disease increase a lot. There are more than 200 types of cancer. Every cancer is different and their treatment is also different. There is a lot of research being done on cancer and a lot of new information is being found about it.[4]

Many people think that when they hear the word tumor, they think it is cancer, and when they hear the word cancer, they think it is tumor. As people say- have a brain tumor, or have brain cancer! But the two are the same! Not at all. Like breast tumors or breast cancer, the two are not the same. Tumor is the accumulation of some abnormal tissue, where the cells increase in number in an abnormal process. Tissue means some cells of the same type, while somewhere becoming one and doing the same type of work.[5]

There are trillions upon trillions of cells in our body, not billions. It is estimated that an adult has an average of thirty trillion cells. At birth this number is one percent to four percent. Inside the cell, the old cell dies according to some rules, new cells are born, some cells grow in size, some cells grow in number. But which cell will die and which cell will be able to produce to how many new cells, what will be the size of a cell, there are some instructions or rules inside the cell to control all such features of the cell. And those rules are in DNA. If for some reason this instruction in the DNA changes, the cells begin to give birth to new cells abnormally, the old cells continue to rot without dying, or the newly born cells move around in vain. Because the cells do not have instructions on where to stop, the direction of what will work changes. Then, under the direction of altered DNA, new cells are born one after the other like robots, the number of new abnormal cells increases, disrupts the function of normal cells, the process of picking up old cells stops and accumulates in the body. [6]

When these extra and abnormal cells of the body accumulate somewhere and appear, then it is called a tumor.

There are two types of tumors. One type of tumor grows in one place and stays in one place.

These are called benign tumors. They are not so harmful. Abnormal cells inside another type of tumor accumulate in other parts of the body through certain chemicals called blood or lymph and disrupt the normal functioning of that part, creating a new tumor there, then called malignant tumor. This malignant tumor is differently called cancerous tumor.

There are about 200 types of cancer in our body. Cancer is basically a combination of different problems in many parts of the body. It starts in any part of the body. Then when it spreads to different parts of the body, only then is it called cancer.

Abnormal cells in a tumor can travel to different parts of the body and sometimes become new tumors, sometimes simply disrupting the function of other cells there. While benign tumors that do not spread in this way spread to other parts of the body and cause problems, those malignant tumors are mainly responsible for most cancers, while the problems they create are simply called cancers. In this case, the organ or part from which the change of cells begins, then it is called cancer of that part.[7]

Again, there are some exceptions. Such as- blood cancer, leukemia. In this case, there are more abnormal cells in the blood than normal blood cells do not allow the blood to do its normal work, no separate tumor occurs in the blood. So not all tumors are not cancers, some tumors are just cancers, when the cells in those tumors move to other parts of the body to create more new tumors or work problems. Again, not all cancers are tumors, where abnormal cells clot somewhere in the form of tissue. Such tumors do not occur in blood cancer.

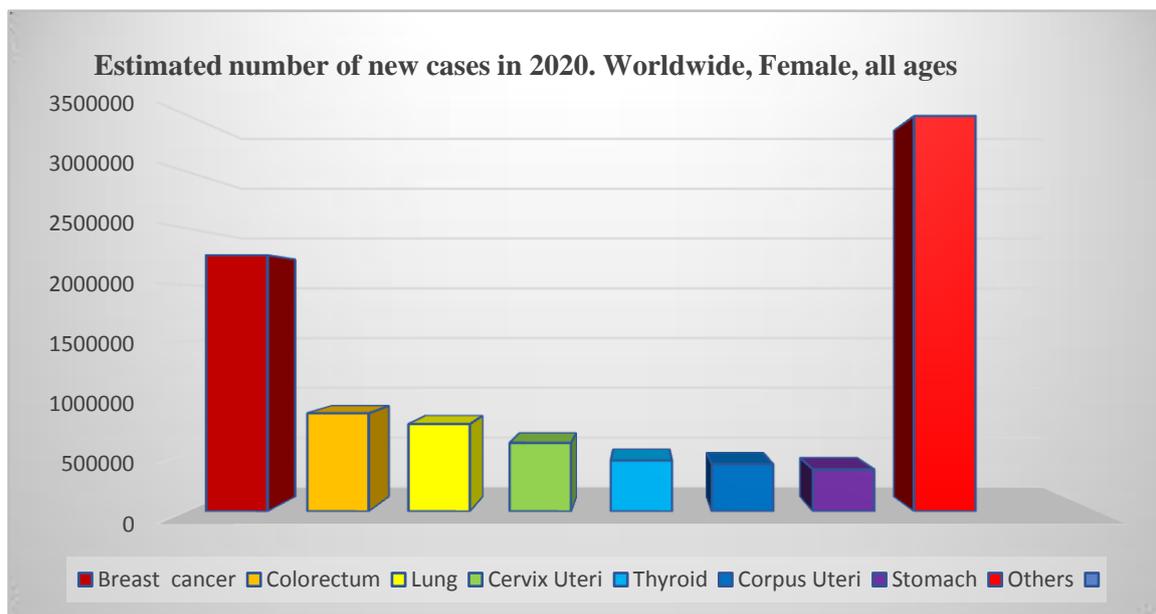


Figure: 1 Estimated Number of New cases in 2020. Worldwide, Female, all ages (Ref-8)

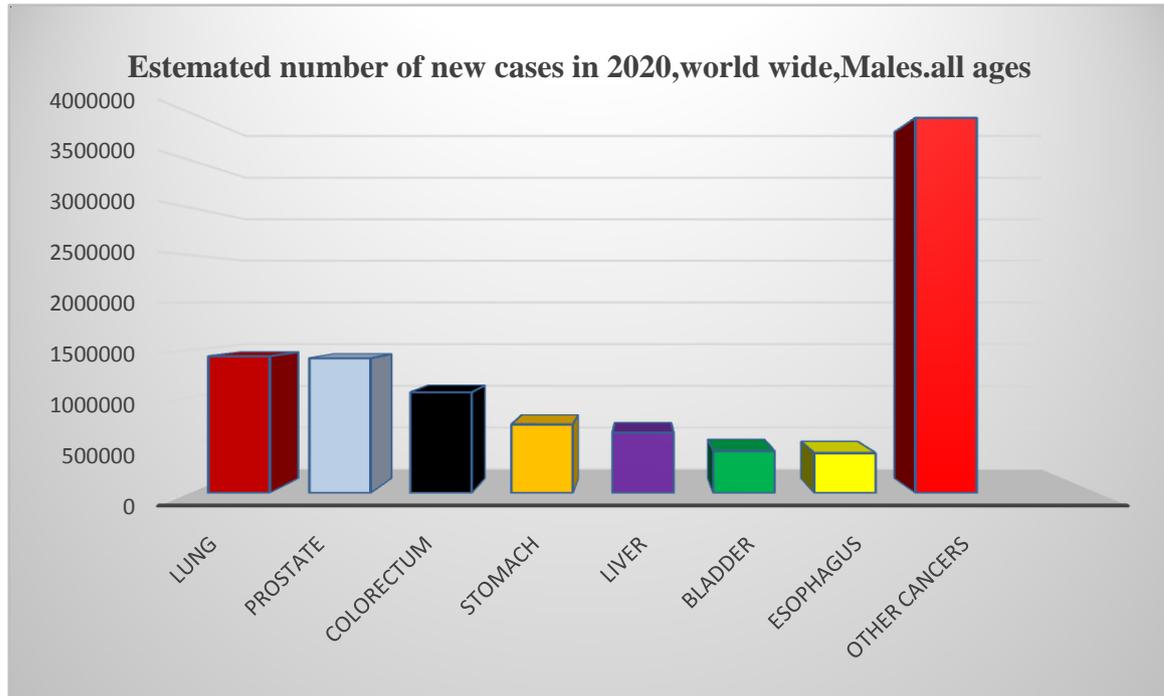


Figure: 2 Estimated Number of New cases in 2020.Worldwide, male, all ages (Ref:9)

METHOD

First, we have selected several update researches papers related to Breast cancer and also some keyword. Then we searched through the Google Scholar, PubMed, ResearchGate and some other online Journal using relevant keywords with Breast cancer, tumor, different factor responsible for breast cancer etc. We found some updated journal and information from several survey conducted by different organization like WHO report and we summarize them.

CANCER SITE	NO. OF NEW CASES	NO. OF NEW DEATHS
Female breast	2,261,419	684,996
Lung	2,206,771	1,796,144
Prostate	1,414,259	375,304
Nonmelanoma of skin	1,198,073	63,731
Colon	1,148,515	576,858
Stomach	1,089,103	768,793
Liver	905,677	830,180
Rectum	732,210	339,022
Cervix uteri	604,127	341,831
Esophagus	604,100	544,076
Thyroid	586,202	43,646
Bladder	573,278	212,536
Non- Hodgkin lymphoma	544,352	259,793
Pancreas	495,773	466,003
Leukemia	474,519	311,594
Kidney	431,288	179,368
Corpus uteri	417,367	97,370
Lip, oral cavity	377,713	177,757
Melanoma of skin	324,635	57,043
Ovary	313,959	207,252
Brain, nervous system	308,102	251,329
Larynx	184,615	99,840
Multiple myeloma	176,404	117,077
Nasopharynx	133,354	80,008
Gallbladder	115,949	84,695
Oropharynx	98,412	48,143
Hypopharynx	84,254	38,599
Hodgkin lymphoma	83,087	23,376
Testis	74,458	9334
Salivary glands	53,583	22,778
Anus	50,865	19,293
Vulva	45,240	17,427
Penis	36,068	13,211
Kaposi sarcoma	34,270	15,086
Mesothelioma	30,870	26,278
Vagina	17,908	7995
All sites excluding	18,094,716	9,894,402
All sites	19,292,789	9,958,133

Table:1 New Cases and Deaths for 36 Cancers and All Cancers Combined in 2020 (Ref:10)

DISCUSSION AND UNDERSTANDING

Lung [11]

Lung cancer is a major cause of death for men worldwide and the second most important cause for women.[6] The highest incidence of lung cancer among men is found in the United

States (black) and east European countries and the lowest rates are available in Africa, Central and South America and South-Central Asia. Among women, the highest lung cancer rates were found in parts of North America and Europe, including the UK and Denmark, and the lowest rates were found in Africa, South Central Asia and Latin America. The US has a higher rate of Hispanic men and women than most registries or countries in Latin America. On the contrary, several Asian countries or registry have higher rates of lung cancer than both men and women compared to Asians in the United States. Notably, lung cancer rates among Chinese men and women, Filipino men and Thai women are higher than the rate among women in many European countries, including Germany and Finland. International changes in lung cancer rates and trends largely reflect the difference between the stage and degree of the death after breast cancer. The rate of cases tobacco's anime as smoking causes around 80% of global lung cancer deaths in men and 50% of deaths in women. In the US a tobacco epic was established in the middle of the last century, including in the UNITED STATES, UK, Canada and Australia, and peaks have spread, with lung cancer rates declining among men and carrying plateaus among women. On the contrary, in countries where the disease has been established very recently and smoking has just peaked or is set to rise, including several countries in China, Korea and Africa, lung cancer rates are rising, and will likely continue to rise at least further, excluding interventions to speed up smoking for the next few decades.

With an estimated 2.2 million new cancer cases and 1.8 million deaths, lung cancer is the most commonly prescribed cancer and cancer-related death cause by 2020, it's scheduled 10 (11.4%) About one and 5 deaths (18.0%) of cancer determines. Lung cancer is the main cause of cancer and death in men, where in women it is third after breast and colorectal cancer and second in and deaths is about 2 times higher than that of men compared to women, although there is a very high difference between 1.2 in North America and 2.2 in North Africa compared to men. 6. As the tobacco outbreak increases, 201-1. In2, smokers aged 15-10 were living in low- income and middle-income countries, compared to countries with 4 times higher infection rates than lung cancer outbreaks and mortality rates.

Colon and Rectum

Colorectal cancer is the third common cancer in men and the second common among women. Variable factors that increase risk include obesity, physical inaction, long-term smoking, and eating high amounts of red or processed meat, low calcium intake, moderate to heavy alcohol intake and moderate to very low fruit and vegetables and whole granule fiber. Increases the risk that hereditary and treatment factors include a personal or family history of colorectal cancer and/or polyps (adenomatous), some inherited genetic conditions (e.g., launch syndrome and family adenomatous polyps) chronic inflammatory stomach personal disease (ulcerative colitis) or disease of the croon) and type 2 diabetes. Nonsteroidal anti-inflammatory drugs such as aspirin reduce the risk of regular long-term use, but these drugs can have severe adverse health effects, such as abdominal bleeding. Decisions about aspirin use should be discussed with the healthcare provider. [6] More than 1.9 million new colorectal cancers (including rectum) and 9353 people were likely to die in 2020 representing about one in 10 cancer cases and deaths. Overall, the third is in the case of the colorectal events, but second in terms of death. The incident rate in the transiting countries is estimated to be 4 times higher than in the transiting countries, but there is a lower difference in the rate of death due to higher rates in the transitioned countries. European regions, Australia/New Zealand and North America have a near 9% humming among the rates of colon cancer cases in the world region with the first place among men and women in Hungary and Norway respectively. Rectal cancer outbreak rates have the same regional distribution, although East

Asia rates are among the highest. The rate of infection of both colon and rectum cancer sits low in most parts of Africa and South-Central Asia.

Prostate cancer [12]

Prostate cancer is the second most often occurring cancer and the sixth primary cause of cancer deaths among men globally. [3] The only well-established risk factors for prostate cancer are age, African descendants, family history of the disease and some inherited genetic conditions. The United States and Caribbean blacks have the highest documented prostate cancer infection rates in the world because they are poorly understood, but may partially reflect genetic sensitivity. The inherited conditions associated with the 5% - 10% increased risk of all prostate cancers include lynch syndrome. Smoking Deadly prostate for aggressive prostate cancer increases risk of cancer and obesity.[6] After an estimated 1.4 million new case and 355,000 died around the world, Prostate cancer is the fifth highest cause of cancer deaths and cancer deaths among men in 2020. It is the most frequently diagnosed among men in one-half of the world's countries (112 out of 185). The highest rates are found in North and Western Europe, Caribbean, Australia/New Zealand, North America, and South Africa and Asia and North Africa with the lowest rates in 100,000 men across the region. Regional patterns of mortality do not follow events in the Caribbean, sub-Saharan Africa and Micronesia/Polynesia with the highest mortality rates. Prostate cancer is the highest cause of cancer deaths in men, including co-Africa, the Caribbean and Central and South America (e.g., Ecuador, Chile and Venezuela), as well as Sweden.

Stomach Cancer [13]

Stomach cancer is the fourth most cancer and the second-most common cause of cancer deaths around the world. [3] The chronic infection with H. pylori is the most powerful known risk factor for stomach cancer, with 89% of new non-cardiac (lower abdomen) gastric cancers attributed worldwide. The most likely route for H. pylori infection is from person to person through anus, gastro-oral or oral-oral routes. Possible environmental sources include water contaminated with human waste. Outbreaks of wholesale infections in Africa, South America and West Asia (about 70%) Armenia (24%), Western Europe (34%), and North America (37%) More than that. Although less than 5% of people who are chronically infected will be diagnosed with stomach cancer, H in Africa. Rates are surprisingly low compared to high levels of pylori infection. Sometimes this phenomenon identified as "African disguised, "is not un explained, but may be related to evolutionary or environmental factors such as other bacteria and/or an adhesion with parasites that neutralize the harmful effects of H. pylori.

Stomach cancer remains a significant cancer worldwide and accounts for more than a million new cases in 2020 and is ranked fifth and fourth for deaths worldwide. It is most commonly diagnosed among men and is the highest cause of cancer deaths in several Southeast Asian countries, including Iran, Afghanistan, Turkmenistan and Kyrgyzstan. The rate of incidents is the highest in East Asia (Japan and Mongolia, the largest number of men and women respectively) and in Eastern Europe, where rates in North America and Northern Europe are generally the same as those seen across African regions and are equivalent to that. Breast Cancer, Breast is one of the most feared and common cancers in women both developing and developing countries. According to the report of American cancer society, before the age of 40 years old. Around 7% women diagnosed breast cancer and by comparison with other cancer, Breast cancer account for 40% of all cancer.[14].

Another research shows that the women whose age under 20-39 are high risk to death by

breast cancer in the last decade. Researcher find due to some physiological cause like concern about fertility, sexual dysfunction is also responsible for breast cancer.[15]

Breast is one of the most feared and common cancers in women. Breast cancer occurs when a woman's breast cells grow abnormally in the milk production glands of body. Normally, breast cancer starts as a malignant tumor in the part of the tissue of breast and it may occur both male and female.

Common treatment of cancer [16]

- Surgery
- Drug therapy (chemotherapy, hormonal therapy, targeted therapy).
- Radiotherapy

The doctor suggests to the patient's various treatments based on the nature of the cancer. Surgery and then chemotherapy and radiotherapy or chemotherapy / radiotherapy may be given before or after the operation.

Surgery

The early stages of breast cancer treatment are surgery. Based on the shape of the tumor, the doctor surgically removes the tumor and some healthy tissue around it.

The doctor usually follows in two methods:

1. Removal of part of the breast cancer (lumpectomy).
2. Complete breast removal (mastectomy).

If there is cancer in a lymph node during the operation, the surgeon will usually remove it as well.

Radiotherapy

In this therapy, uses a high-powered X-rays to destroy cancer cells. In most cases radiotherapy is given after the wound has get well after the operation. This reduces the risk of the cancer coming back.

Chemotherapy

Chemotherapy uses anti-cancer (cytotoxic) drugs to destroy cancer cells. Although this therapy has very dangerous side effects, still, it is a very effective and popular cancer treatment.

Targeted therapy

A study reported that in addition to chemotherapy and hormonal therapy, the new and more effective treatment is targeted therapy, which can destroy specific cells without damaging normal cells. Besides, it can prevent the growth or rapid spread of cancer. Scientists prove that sometimes targeted therapy works in areas where chemotherapy has failed to work. The side effects of targeted therapy are limited compared to chemotherapy. In breast cancer, 1 in 5 women have a special protein called HER2 and this type of cancer is more aggressive than other cancers.

RESULT

After analysis of data from various research papers and online sources we found that the highest number of deaths occurs due to Lung cancer and second most death occurs due to colorectal cancer.

Scientists are blaming human unconsciousness is responsible for dying people due to breast cancer.

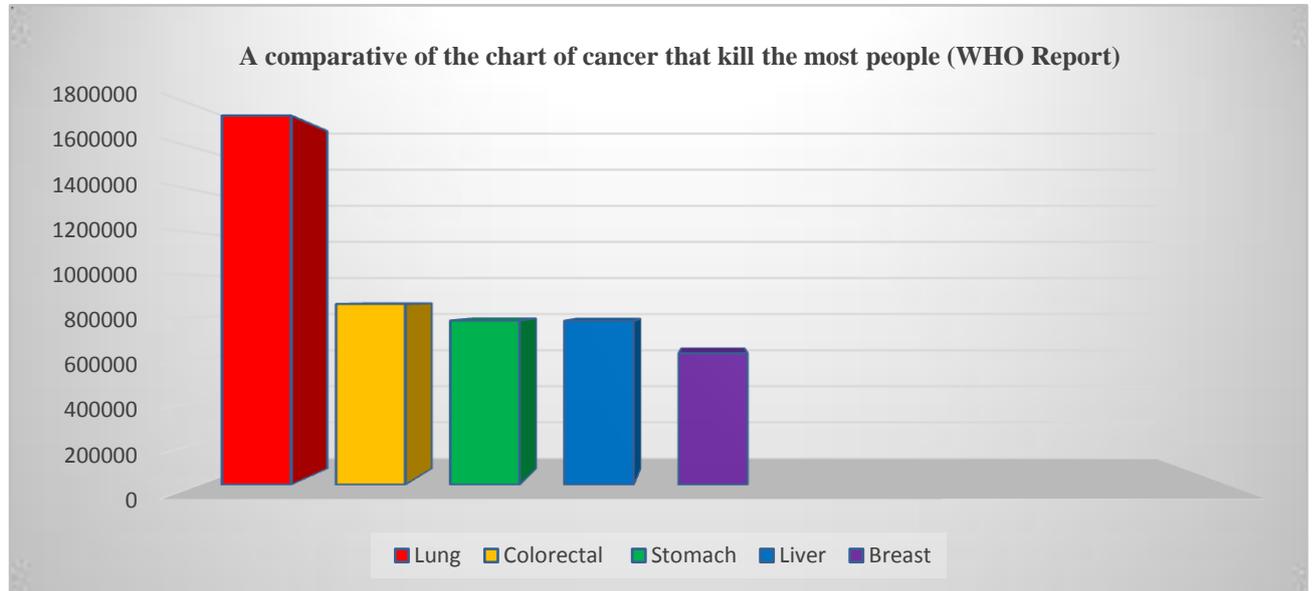


Figure: Chart overall cancer death 2018 WHO report

CONCLUSION

Although cancer rates are declining in general in the United States and many Western countries, they are increasing in less developed and economically transformed countries, including Eastern European countries, such as smoking and physical inactivity and adopting unhealthy Western lifestyles such as eating calorie- dense foods. Cancers that were once known as diseases of industrialized countries, such as lung, colon, and breast cancers, are now commonly occurring in economically transformed and less developed countries. Most of these countries are disproportionately affected by infectious agents, such as cancers related to the uterus, liver, and stomach, which are potentially preventable.

Observing the incidence of cancer in young adults, often under the age of 50, is informative because it often reflects relatively recent changes in exposure to carcinogenic components. In addition, this cancer propensity often serves as a sentinel for future adults to understand future disease, in which most cancer cases occur. Exposure to carcinogens in early life can affect a person's risk of cancer by acting at critical developmental times and increasing collective mutagenic damage. Due to the obesity epidemic of the last 40 years, the young generation around the world is facing more adiposity in their lifetime than the previous generation. Numerous cancers are associated with excess body weight, and evidence from experimental studies from the urine model suggests that obesity and obesity accelerate the multistage transition from food to those invasive malignancies and metastatic diseases from normal tissue. The incidence of colorectal cancer has increased in several high-income countries, including the United States, over the past decade, and obesity may partly reflect the epidemic. We have expanded our previous study on early colorectal cancer by examining the prevalence of invasive cancer among young adults in the United States, including 12 well-

established obesity-related cancers for 30 common cancers.

WHO has formulated a set of guidelines and policies to establish an effective national cancer control program to accelerate the translation of cancer control knowledge. In economically developing countries, this includes raising awareness on growing cancer, reducing the risk of major risk factors (obesity, tobacco, and infectious agents), applying less technology and costly methods for early / early detection of cervical cancer, and several in Vietnam and Tanzania. Developing countries have developed national cancer control programs, although these programs are inadequately funded due to limited resources and other competitive public health programs. International public health organizations and private and public donors can play an important role in strengthening existing cancer control programs and / or capturing the growing burden of cancer in economically developing countries. Development of cancer control programs should include the establishment of a cancer registry to identify and prioritize the burden of cancer and to evaluate the effectiveness of the program.

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