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## Assessment of relationship between nutritional factor and rising cancer prevalence in India

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### Abstract

Cancer is becoming the most common life-threatening disease, and it is spreading as a result of our modern lifestyle. Cancer is caused by uncontrolled cell proliferation, which can be treated if detected early in life. Cancer treatment is based on the different internal and external elements that cause cancer. Different screening tests are used to detect cancer, and a variety of therapies are now available, including gene therapy, chemotherapy, surgery, radiation therapy, and immunotherapy. Up to 2030, around 22.2 million cancer cases are predicted to be diagnosed. According to WHO data 2020: nearly about 10 million died due to cancer in all over the world. According to National cancer registry programme, India cancer statistics, 2020 the number of patients with cancer in India is 1,392,179 for the year, 2020. In this research work we have collected 10 years data of five types of cancer i.e., TRC, Head and Neck Cancer, LHS cancer, gynecological cancer, and digestive system cancer. For finding out the most prevalent cancer. The most common cancers observed during the survey were: Breast, Lung, mouth, leukemia and gall bladder. After performing this particular work, recommendation are to start primary prevention and screening programs on national basis, government can come up with cancer detection and prevention clinics followed by palliative care and treatment facilities.

**Keywords:** Cancer, chemotherapy, tobacco, nutrition

### Introduction

The worldwide burden of most cancers maintains to growth in large part due to the ageing and boom of the sector populace and a growing adoption of most cancers-causing behaviors, specifically smoking, inside economically growing countries. Female breast, lung, and colon rectal cancers are happening in excessive frequencies in lots of economically growing countries, further to the disproportionately excessive burden of cancers associated with infections. (Jemal A, *et al*, 2011) <sup>[8]</sup>. This is the second one most not unusual place sickness after cardiovascular issues for optimum deaths within side the world (Jemal A *et al*, 2007). The world's populace is anticipated to be 7.5 billion through 2020 and approximations predict that approximately 15.0 million new most cancers instances could be diagnosed; with deaths of about 12.0 million most cancers patients (Brayand *et al*, 2006). However, the common age of presentation for breast cancers in the Indian populace is broadly suggested to be round 10 years more youthful in comparison to the evolved global and may have devastating impact in this predominantly young populace (Sabu *et al.*, 2010).

Over the ultimate 30 years, scientist have worked tough to become aware of carcinogenic substances within side the home, art work area and stylish environment that purpose maximum cancers. Evidence for maximum cancers causing substances and their danger comes from three reasserts especially human studies, animal studies and laboratory test with human cells. Evidences from each of these reassets are critical in assisting public health officials decide whether or not or now no longer exposure to positive carcinogenic substances wants to be reduced or eliminated. (Ingole S. P. *et al*, 2013)

During final one decade, approximately 70% cancer instances were identified and dealt with survival of some patients (Dins haw *et al*, 1999). It is assumed that during close to future the range of most cancers patients will growth within side the growing and developing advanced countries, which might also additionally rise as much as 70%; a severe difficulty for all of us. The significance of most cancers hassle in the Indian Sub-continent (sheer numbers) is growing because of negative to moderate residing standards (Wynder *et al*, 1974) and insufficient clinical facilities. Most regularly discovered cancers in Indian populace are of lungs, breast, colon, rectum, belly and liver (Nandakumar, 1990-96; Rao *et al*, 1998; Murthy *et al*, 2004). According to National cancer registry programmed, India cancer statistics, 2020 the

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number of patients with cancer in India is 1,392,179 for the year, 2020. The most common cancers observed during the survey were: Breast, Lung, mouth, Cervix uteri and tongue. In both the sexes male and female, the incidence rate has been increased. According to the data it is also observed that most of the patients suffering were diagnosed at later stages or the advanced stages for: breast (57.0%), cervix uteri (60.0%), head and neck (66.6%), stomach (50.8%), in case of lung cancer distant metastasis was predominant among males (44.0%), females (47.6%). (Mathur *et al.* 2020).

### Materials and Method

This research is carried out in department of food technology and nutrition, School of Agriculture, Lovely Professional University, Phagwara Punjab. The objective of the study is to study the prevalence of cancer through secondary data analysis, Following cancer data from 2010 – 2021 will be collected from certain websites like Cancer Index, NCDIR registry, ICMR etc and it will be interpreted through graphical form by secondary data analysis. After collecting data we performed overall relative severity of prevalence of 10 years of cancer.

### Result and Discussion

Prevalence of five different types of cancer is collected then overall relative severity of five types of cancer has been done followed by trend analysis

#### Relative severity of tobacco related cancer

As the researcher can see that year-on-year increase and decrease in the number of Lip cancer from the year 2010 to 2020 but in the same time there is slightly low cases in the year 2015-16, 2016-17, 2018-19 and 2019-20 as we can see in the graph. It has also observed that there is increase in the number of cases in cancer related to tongue, mouth, larynx and lung.

From the year 2013-14, 2016-17 & 2018-19, the number of tongue cancer cases has been increased but in the same time during the year 2014-15, 2015-16 & 2017-18 the number of tongue cancer cases has been decreased as we can easily see in the graph.

In the same manner, from the year 2011-13, 2013-14, 2016-17 & 2017-18, the number of mouth cancer cases has been increased but in the same time during the year 2011-11, 2012-13, 2014-15 & 2017-18 the number of mouth cancer cases has been decreased as we can easily see in the graph. After looking into the graph, we can easily see that year-on-year increase and decrease in the number of other oropharynx cancer, Hypopharynx cancer, Pharynx unspecified cancer, Bladder cancer and Oesophagus cancer from the year 2010 to 2020 but in the same time there is slightly low cases in the year 2014-15, 2015-16, 2016-17, 2018-19 and 2019-20 as we can see in the graph.

From the year 2011-12, 2013-14, 2016-17 & 2019-20, the number of larynx cancer cases has been increased but in the same time during the year 2010=11, 2012-13, 2014-15, 2015-16, 2017-18 & 2018-19 the number of larynx cancer cases has been decreased as we can easily see in the graph. In the same way we can observe, from the year 2011-12 & 2013-14 the number of lung cancer cases has been increased but in the same time during the year remaining years between 2010-2020 the number of lung cancer cases has been decreased but during the year 2019-20, the cases were extremely high. But

for bladder cancer, cases have gone extremely up during the year 2016-17 in comparison to remaining years.

#### Relative severity of digestive system cancer

As the researcher can see that year-on-year increase and decrease in the number of Oesophagus cancer, Stomach cancer, Rectum cancer, Anus and anal canal cancer & Pancreas cancer from the year 2010 to 2020 but in the same time there is slightly low cases in each year except 2014-15 for oesophagus cancer as we can see in the graph. It has also observed that there is increase in the number of cases in cancer related to Stomach, Rectum, Anus and anal canal & Pancreas.

From the year 2014-15 & 2015-16, the number of stomach cancer cases has been increased but in the same time during the year 2013-14, 2016-17 & 2017-18 the number of stomach cancer cases has been decreased as we can easily see in the graph.

In the same manner, from the year 2012-13 & 2014-15, the number of rectum cancer cases has been increased but in the same time during the year 2013-14, 2015-16 & 2017-18 the number of rectum cancer cases has been decreased as we can easily see in the graph. After looking into the graph, we can easily see that year-on-year increase and decrease in the number of Anus and anal canal & Pancreas cancer from the year 2010 to 2020 but in the same time there is slightly low cases in the year 2011-12, 2012-13, 2014-15, 2018-19 and 2019-20 as we can see in the graph.

From the year 2011-12, 2014-15 & 2015-16, the number of colon cancer cases has been increased but in the same time during the year 2010-11, 2012-13, 2014-15 & 2018-19 the number of colon cancer cases has been decreased as we can easily see in the graph. In the same way we can observe, from the year 2011-12 2010-11, 2013-14, 2018-19 & 2019-20, the number of liver cancer cases has been increased but in the same time during the year remaining years between 2010-2020 the number of lung cancer cases has been decreased but during the year 2019-20, the cases were extremely high. But for Gall bladder cancer, cases have gone extremely up during the year 2014-15 in comparison to remaining years.

#### Relative severity of lms cancer

As researcher can see fluctuation in year-on-year cancer cases as we can see in the graph. Researcher has seen rapid increase-decrease in the number of cases related to NHL starting from the year 2010. There is increase and decrease in the number of Hodgkins disease from the year 2010 to 2020 as the cases has been increasing from the year 2010-11, 2012-13, 2013-14 & 2014-15 but in the same time there is slightly low cases in the year 2011-12, 2015-16, 2016-17 and 2018-19 as we can see in the graph. It has also observed that there is increase in the number of cases in cancer related to Hodgkins disease, Multiple myeloma & Lukaemia.

From the year 2011-12, 2013-14 & 2015-16, the number of Hodgkins disease cases has been increased but in the same time during the year 2014-15 & 2017-18 the number of Hodgkins disease cases has been decreased as we can easily see in the graph.

In the same manner, from the year 2010-11, 2012-13, 2013-14, 2014-15 & 2016-17, the number of Multiple myeloma cases has been increased but in the same time during the year 2011-12, 2015-16, 2018-19 & 2019-20 the number of Multiple myelomas has been decreased as we can easily see in the

graph. After looking into the graph, we can easily see that year-on-year increase and decrease in the number of Leukemia, Lymphoid leukemia & Myeloid leukemia from the year 2010 to 2020 but in the same time there is slightly low cases in the year 2014-15, 2015-16, 2016-17, 2018-19 and 2019-20 as we can see in the graph.

From the year 2010-11, 2012-13, 2013-14& 2017-18, the number of Lymphoid leukemia cases has been increased but in the same time during the year 2011-12, 2015-16, 2016-17, 2018-19 & 2019-20 the number of Lymphoid leukemia cases has been decreased as we can easily see in the graph.

In the same way we can observe, from the year 2010-11, 2012-13, 2013-14, 2014-15 & 2017-18 the number of Myeloid leukemia cases has been increased but in the same time during the year remaining years between 2010-2020, the number of Myeloid leukemia cases has been decreased. But for Leukemia, cases have recorded extremely high during the year 2013-14 & extremely low during the year 2014-15 in comparison to remaining years.

**Relative severity of head and neck cancer**

As the researcher can see that year-on-year increase and decrease in the number of Vulva, vagina, cervix, corpus uteri, ovary, other female genital, placenta from the year 2010 to 2020 but in the same time there is slightly low cases in the year 2012-13, 2013-14 and 2014-15 as we can see in the graph. It has also observed that there is increase in the number of cases in gynecological cancer and breast cancer.

From the year 2015-16, 2016-17 & 2018-19, the number of gynecological cancer cases has been increased but in the same time during the year 2013-14, 2014-15& 2017-18 the number of gynecological cancer cases has been decreased as we can easily see in the graph.

In the same manner, from the year 2015-16, 2016-17, 2018-19& 2019-20, the number of breast cancer cases has been

drastically increased but in the same time during the year 2012-13, 2013-14 & 2014-15 the number breast cancer cases have been decreased as we can easily see in the graph.

**Relative severity of gynaecological cancer**

As the researcher can see that year-on-year increase in the number of Lip, Salivary gland, Tonsil, Other oropharynx, Nasopharynx, Pharynx Unsp., Nose & sinus cancer from the year 2010 to 2020 as we can see in the graph. It has also observed that there is increase in the number of cases in cancer related to tongue, mouth, hypopharynx, larynx & thyroid.

From the year 2012-13, 2013-14, 2014-15, 2017-18& 2018-19, the number of tongue cancer cases has been increased but in the same time during the year 2011-12, 2015-16, 2016-17& 2019-20 the number of tongue cancer cases has been decreased as we can easily see in the graph.

In the same manner, from the year 2011-13, 2013-14, 2016-17 & 2017-18, the number of mouth cancer cases has been increased but in the same time during the year 2011-11, 2012-13, 2014-15 & 2017-18 the number of mouth cancer cases has been decreased as we can easily see in the graph. After looking into the graph, we can easily see that year-on-year increase and decrease in the number of hypo pharynx cancer from the year 2010 to 2020 but in the same time there is slightly low cases in the year 2011-12,2016-17, 2018-19 and 2019-20 as we can see in the graph.

From the year 2011-12, 2013-14, 2016-17 & 2019-20, the number of larynx cancer cases has been increased but in the same time during the year 2010-11, 2015-16, 2016-17& 2019-20, the number of larynx cancer cases has been decreased as we can easily see in the graph. In the same way we can observe, from the year 2013-14 the number of thyroid cases has been increased but in the same time during the year 2015-16, the number of cases has been decreased.

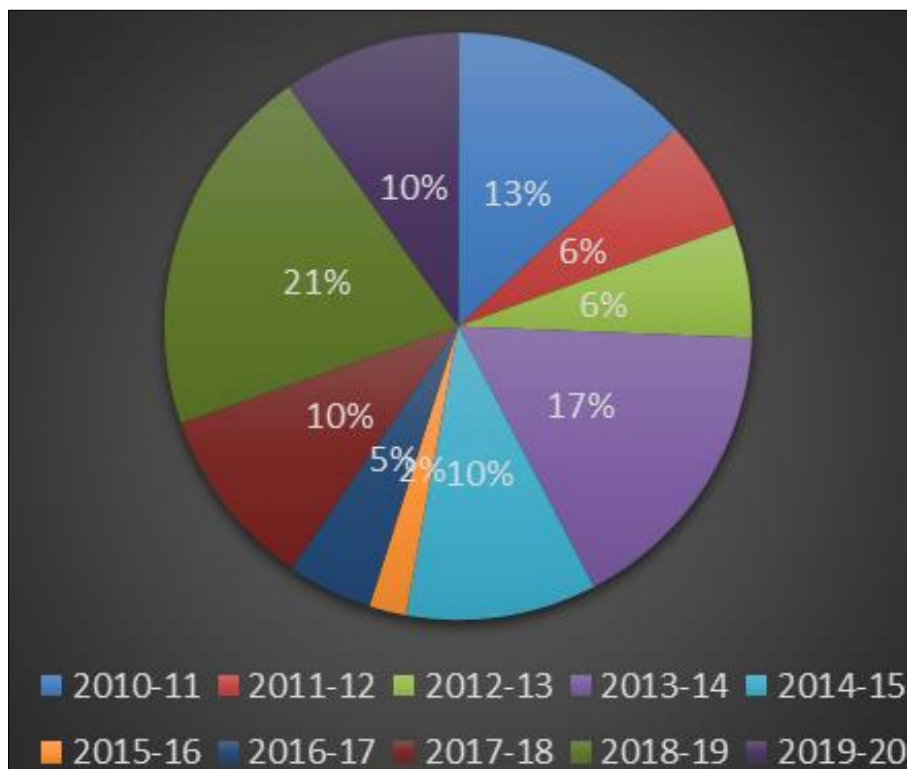


Fig 1: Relative severity of tobacco related cancer

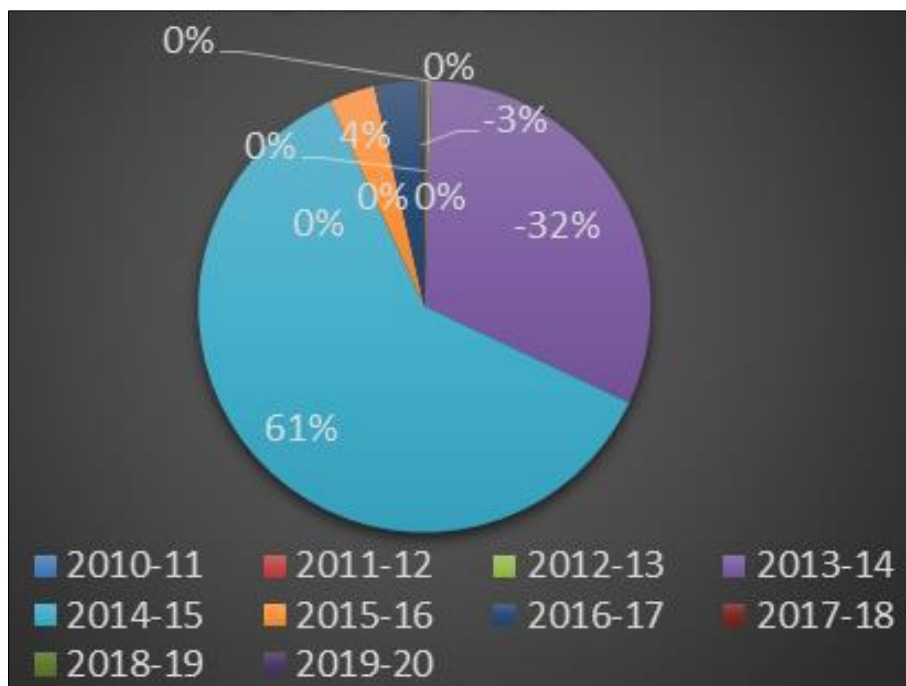


Fig 2: Digestive system cancer

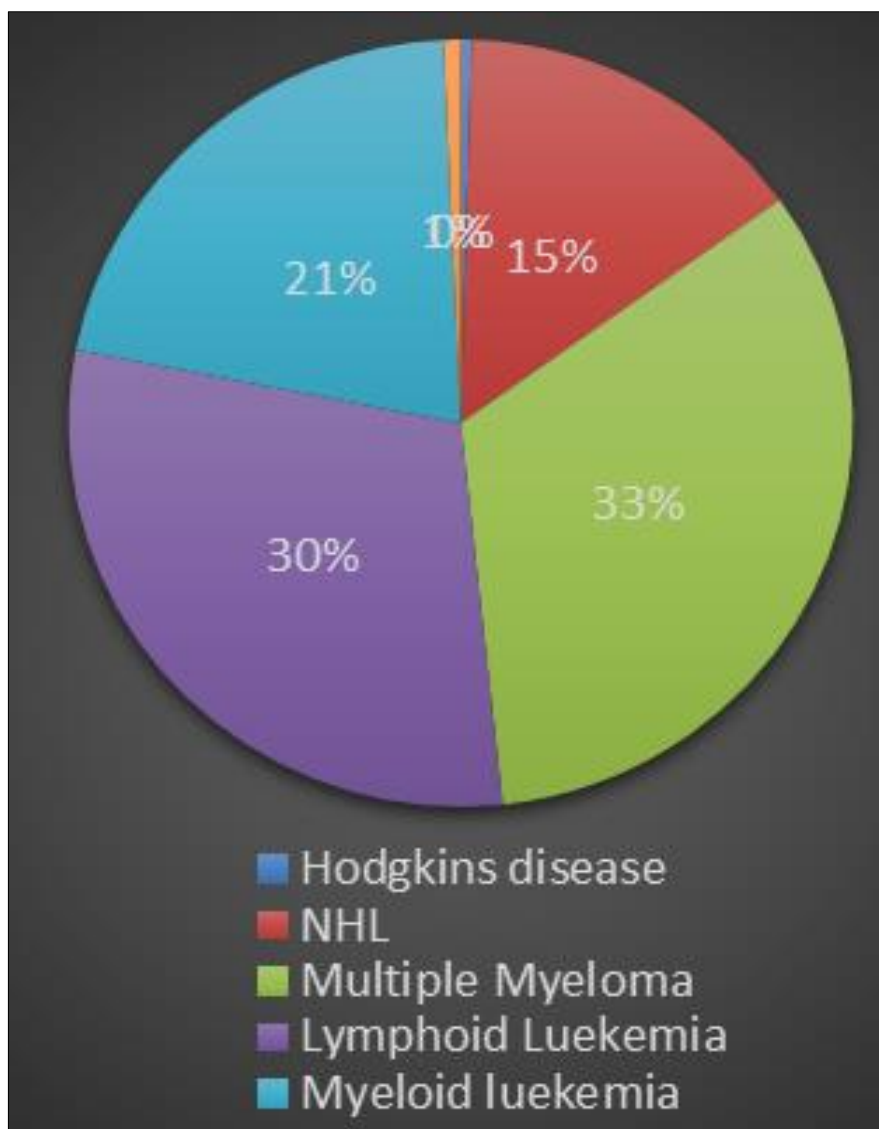


Fig 3: Relative severity of lhs cancer

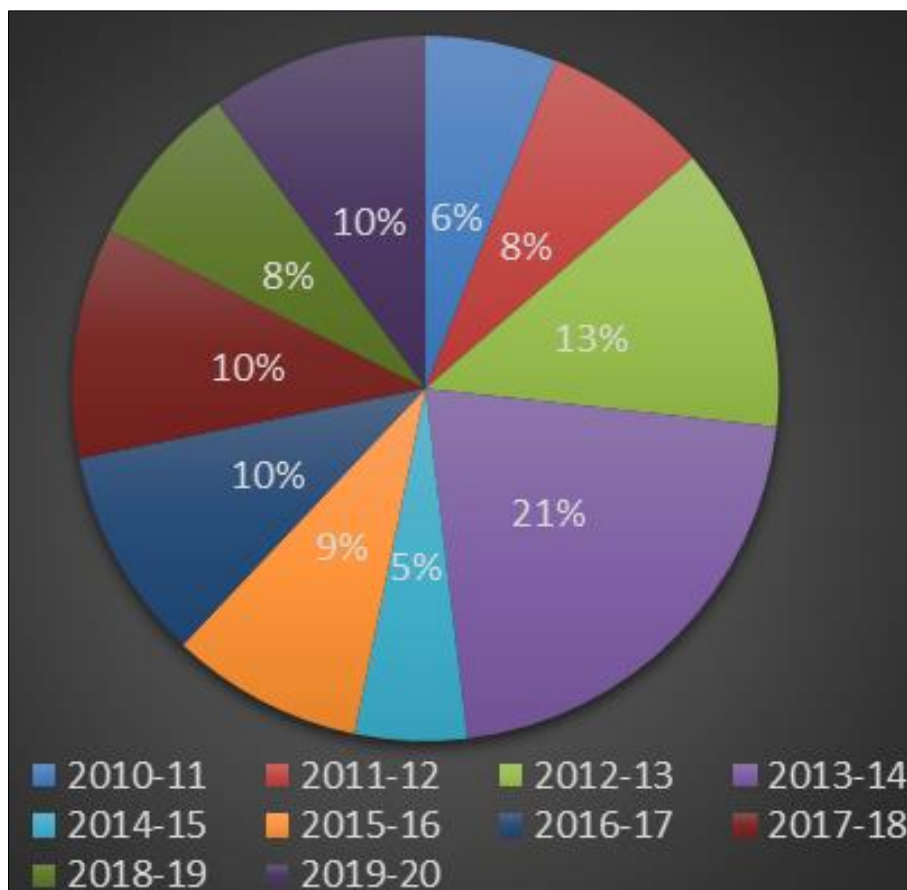


Fig 4: Relative severity of head and neck cancer

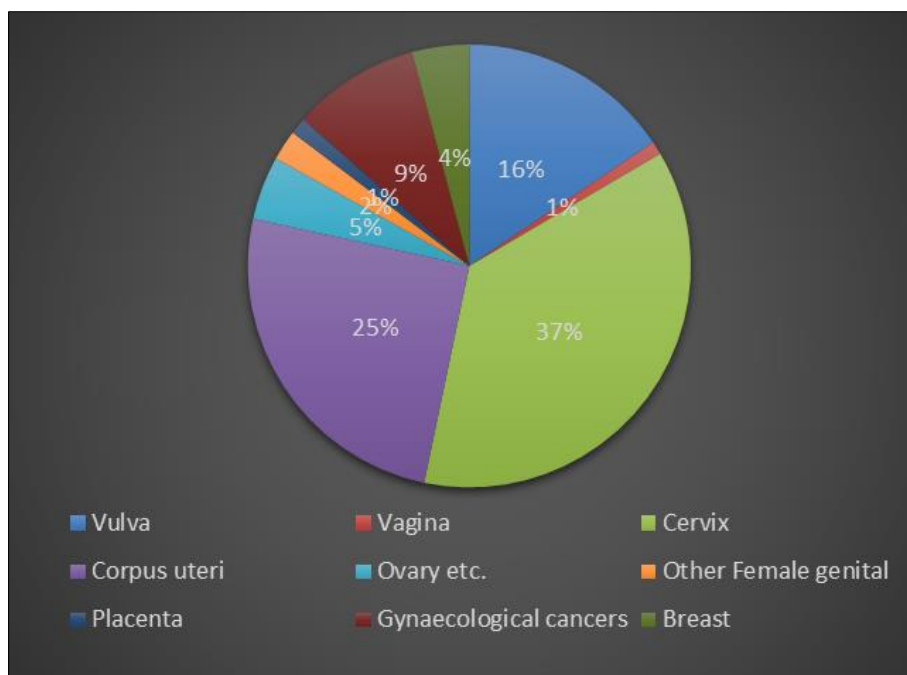


Fig 5: Relative severity of gynecological cancer

**Conclusion**

According to the survey, tobacco-related cancers are expected to account for 27.1 percent of the total cancer burden in 2020, with the highest rates in the country's north-eastern region. The gastrointestinal system and breast cancers are expected to be the next most common cancers. Lung, oral, stomach, and esophageal cancers were the most common among men.

Breast and cervix uteri malignancies were the most frequent among women. The number of new cases of cancer in men is expected to rise to 679,421 in 2020 and 763,575 in 2025. It is predicted that there will be 712,758 women in 2020 and 806,218 in 2025. Breast cancer accounts for 200,000 (14.8 percent) of all cancer cases in women, with cervical cancer accounting for 75,000 (5.4 percent), while malignancies of the

gastrointestinal tract account for 270,000 (19.7%) of all cancer cases in both men and women. The analysis indicates that lung tumors were discovered at a stage of dissemination to distant areas, whereas cancers of the head and neck, stomach, breast, and cervix were diagnosed at a stage of loco-regional spread in larger proportions. The mainstay of cancer treatment in the country remains to be a combination of surgery, chemotherapy, and radiation therapy. Breast and head and neck cancers are frequently treated with all three kinds, whereas cervical cancer is mostly treated with radiotherapy and chemotherapy. Systemic therapy was the treatment of choice for lung and stomach malignancies. (ICMR NCRP 2020).

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