

Chapter 13

Trends in Cancer Incidence

Introduction

Trend analysis aims to identify a pattern of change in a series of observations over a defined period of time. Trends in cancer incidence rate is important for measuring how things are progressing (increasing or decreasing) by specific types of cancer, gender and place over the years.

The cancer burden assessment for future is useful for a country to prioritize health care services, plan resource intensive efforts like formulation of government policies or/and budget allocation.

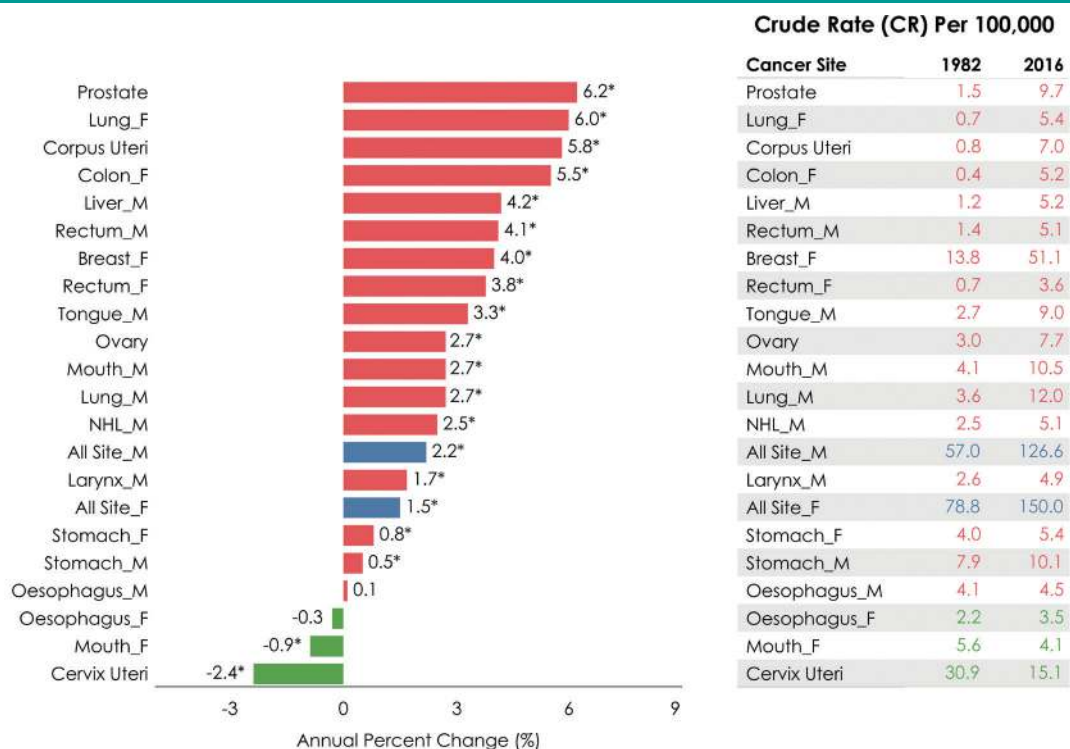
The objective of this chapter is to provide trends in cancer incidence rates over time (Annual Percent Change: 1982-2016) by different registries and project number of incidence of cancer cases in India by anatomical sites and gender for the years 2016 to 2020 and 2025. The crude incidence rates for selected cancers are also listed. This includes 16 PBCRs where number of years of regular data availability was at least 10 years. However, any abrupt or fluctuating trend in cancer incidence rate by registry or site of cancer was not considered for trend analysis. Also, sites with fewer than 10 cases for any given year have been excluded.

Annual Percent Change

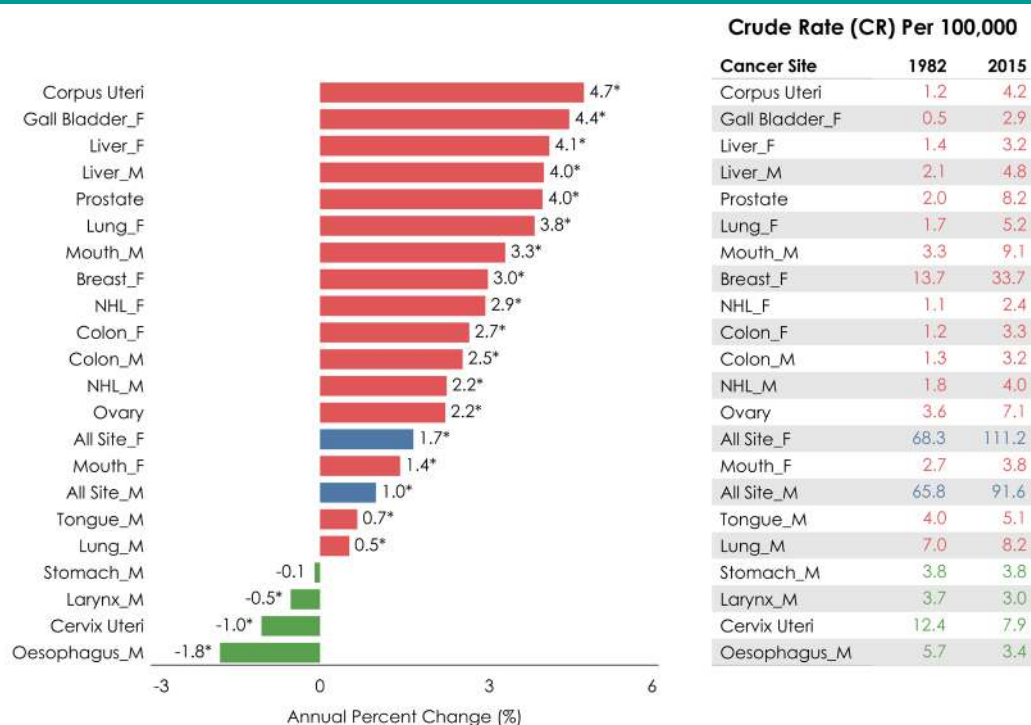
Joinpoint regression analysis of cancer incidence rate was used to estimate the annual percent change (APC). The APC is the average rate of change in a cancer rate per year in a given time frame (how quickly or slowly a cancer rate has increased or decreased each year over a period of years). The APC was calculated using crude incidence by different sites of cancer using joinpoint regression software. A negative APC describes a decreasing trend, and a positive APC describes an increasing trend.

The actual crude rate for all sites of cancer and for few selected ones have been provided against each graph to illustrate the change in crude rate between the first year of registry and the last year.

In few sites of cancer, there may be contradiction in the direction of trend (APC) value in graph and the Crude Rate (CR) (start and end of the year) table. This is because the APC was calculated based on regression based estimated CR, whereas the table values of CR are actual, rather than estimated.

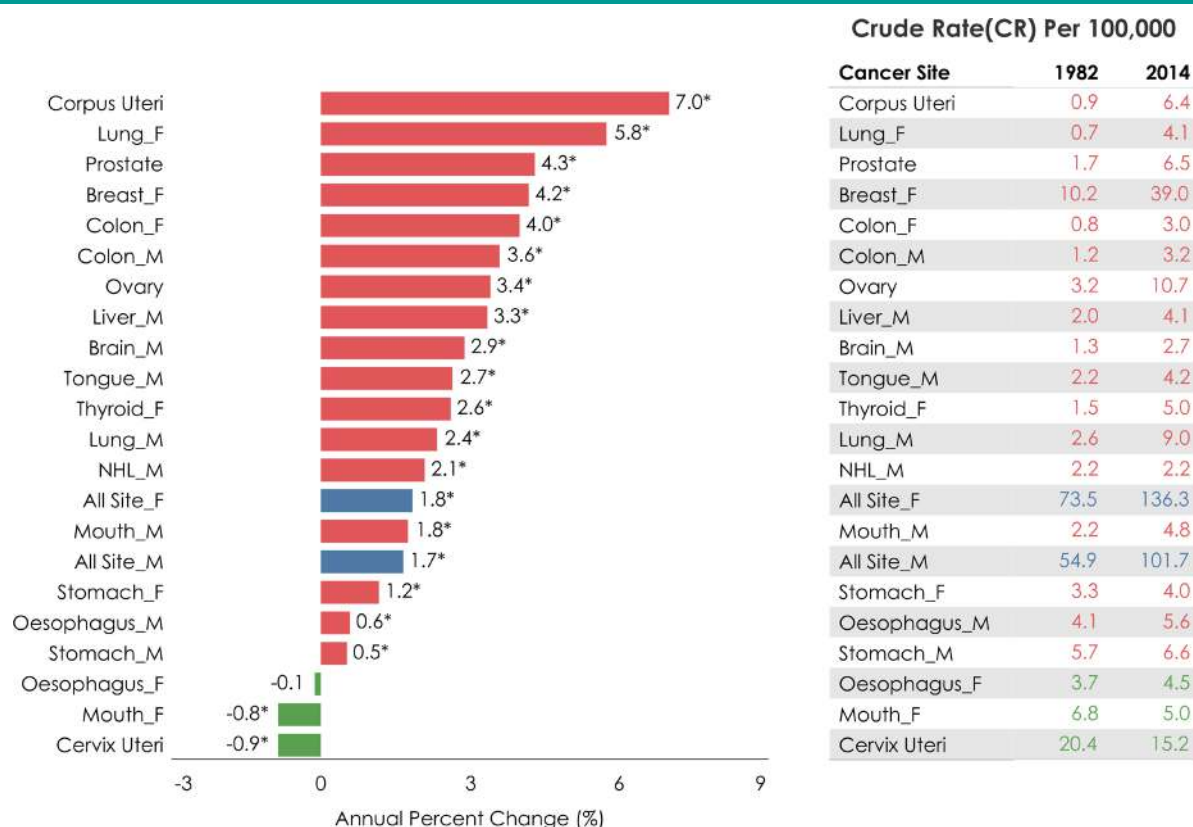
Fig 13.1 Annual Percent Change for selected Sites of Cancer – Chennai

The incidence rate of prostate cancer, corpus uteri and lung in females increased significantly by 6% annually between 1982 to 2016. Among females, there was significant decrease in cancers of the mouth and cervix uteri.

Fig 13.2 Annual Percent Change for selected Sites of Cancer – Mumbai

In Mumbai PBCR, the APC for cancer of corpus uteri was 4.7%. The APC for cancer of the liver in males was 4.0% between 1982 and 2015. Liver cancer showed significant increase in annual incidence rate in both genders by 4% between 1982 to 2015. There was a significant decrease in cancer incidence rate for oesophagus (-1.8%), larynx (-0.5%) among males and cervical cancer (-1.0%).

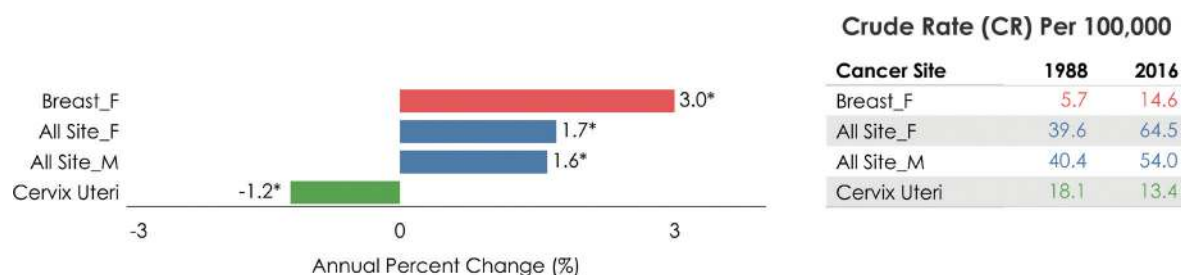
Fig 13.3 Annual Percent Change for selected Sites of Cancer – Bangalore



Increase in APC, Decrease in APC, Increase or Decrease in APC for All Sites; * Significant Increase or Decrease at 95% Confidence Level
M - Males; F - Females

In Bangalore PBCR the APC for cancer corpus uteri in females was 7.0% between 1982 and 2014. The crude rate for the same in 2014 was 6.4 in females compared to 0.9 in 1982. The significant decrease in APC for cancers of oesophagus, mouth and cervix uteri were seen in females (by <1% annually). APC for prostate cancer was 4.3% and the crude rate increased from 1.7 in 1982 to 6.5 in 2014.

Fig 13.4 Annual Percent Change for selected Sites of Cancer – Barshi rural

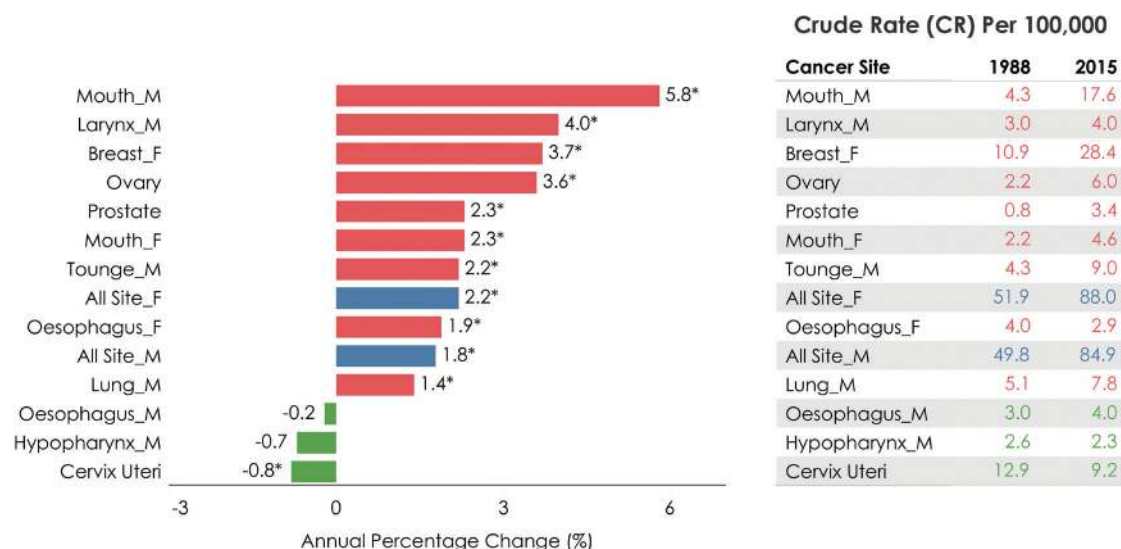


Increase in APC, Decrease in APC, Increase or Decrease in APC for All Sites; * Significant Increase or Decrease at 95% Confidence Level

M - Males; F - Females

The incidence rate of breast cancer increased significantly by 3% annually while there was a significant decrease in cervical cancer by -1.2% annually over the time period (1988-2016).

Fig 13.5 Annual Percent Change for selected Sites of Cancer – Bhopal

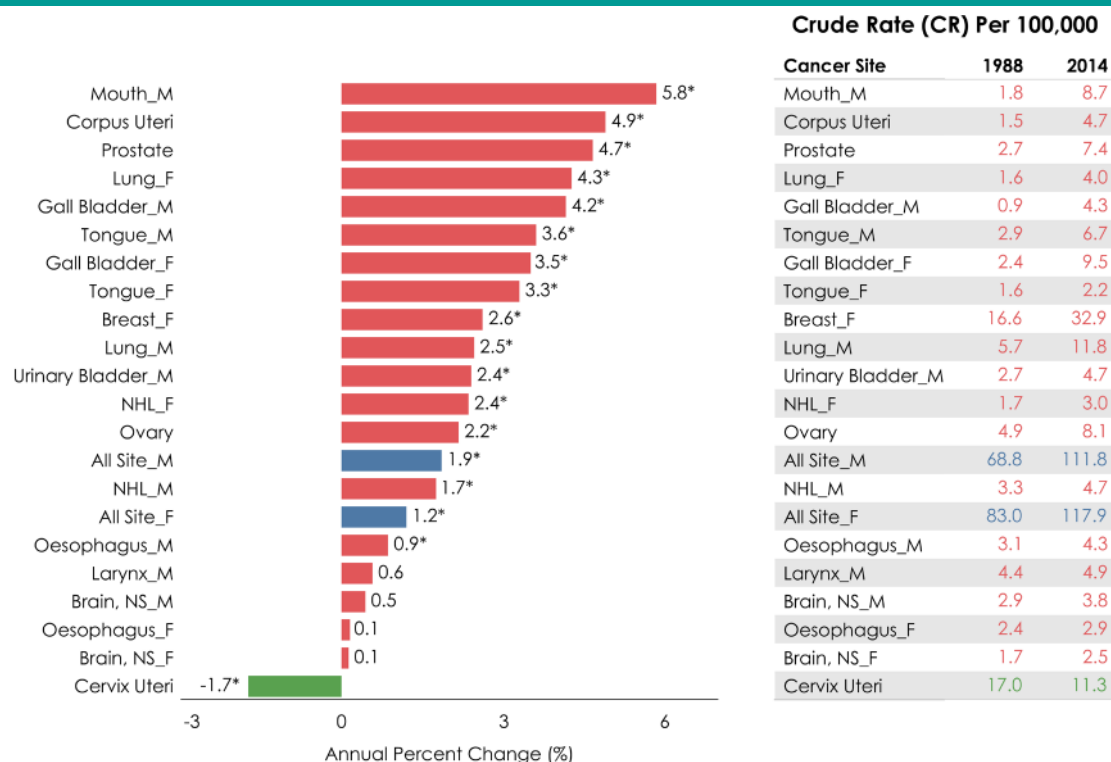


Increase in APC, Decrease in APC, Increase or Decrease in APC for All Sites; * Significant Increase or Decrease at 95% Confidence Level

M - Males; F - Females

In Bhopal PBCR the APC for cancer mouth in males was 5.8% between 1988 and 2015. The crude rate for cancer mouth in males was 17.6 in 2015 compared to 4.3 in 1988. The APC decreased for cancer oesophagus and cancer hypopharynx in males and cancer cervix in females. For females the APC for cancer breast was 3.7% and the crude rate increased from 10.9 in 1988 to 28.4 in 2015.

Fig 13.6 Annual Percent Change for selected Sites of Cancer – Delhi

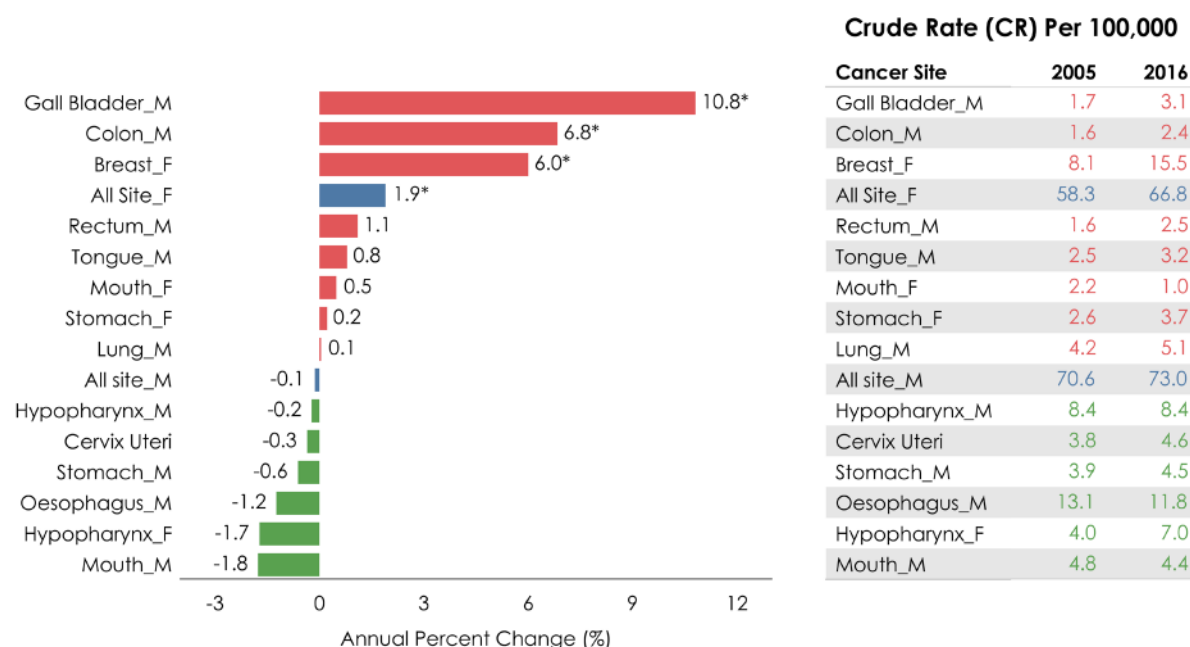


Increase in APC, Decrease in APC, Increase or Decrease in APC for All Sites; * Significant Increase or Decrease at 95% Confidence Level

M - Males; F - Females

Among males, significant increase in cancer incidence rate was seen for mouth (5.8%), prostate (4.7%) and gall bladder (4.2%) annually, while there was significant decrease in rates of cervical cancer. All sites of cancer showed significant increase in males (1.9%) and females (1.2%).

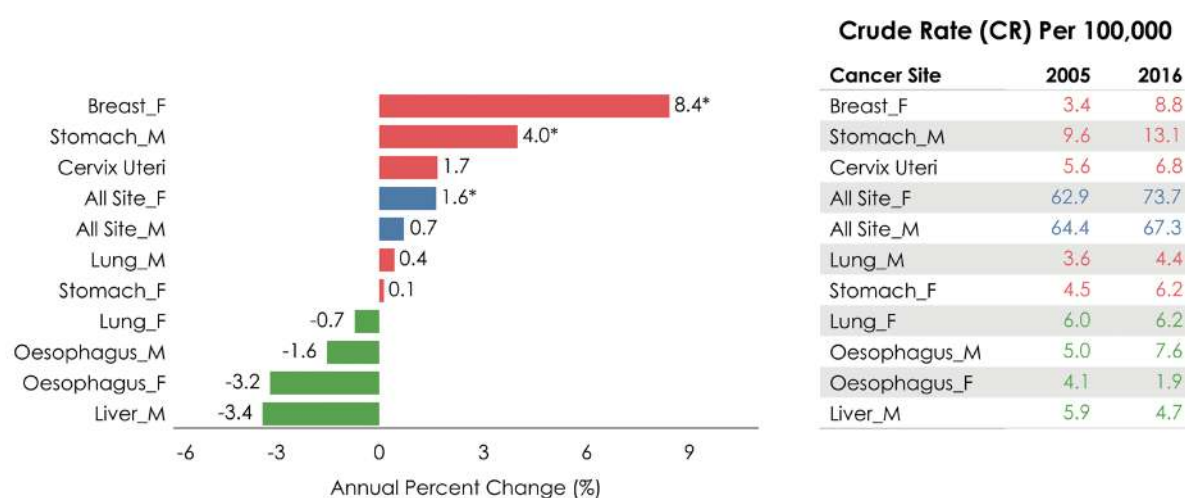
Fig 13.7 Annual Percent Change for selected Sites of Cancer – Dibrugarh district



Increase in APC, Decrease in APC, Increase or Decrease in APC for All Sites; * Significant Increase or Decrease at 95% Confidence Level
M - Males; F - Females

Among males, significant increase in cancer incidence rate was seen for gall bladder (10.8%) and colon (6.8%). Among males, the APC for cancer of all sites, cancer hypopharynx, cancer stomach, cancer oesophagus and cancer mouth decreased and among females, the decrease in APC was observed for cancer hypopharynx and cancer cervix uteri.

Fig 13.8 Annual Percent Change for selected Sites of Cancer – Sikkim state



Increase in APC, Decrease in APC, Increase or Decrease in APC for All Sites; * Significant Increase or Decrease at 95% Confidence Level
M - Males; F - Females

The incidence rate of breast cancer increased significantly by 8.4% annually from 2005 to 2016. Stomach cancer incidence rate in males showed significant increase of 4.0% annually.

Fig 13.9 Annual Percent Change for selected Sites of Cancer – Imphal West district

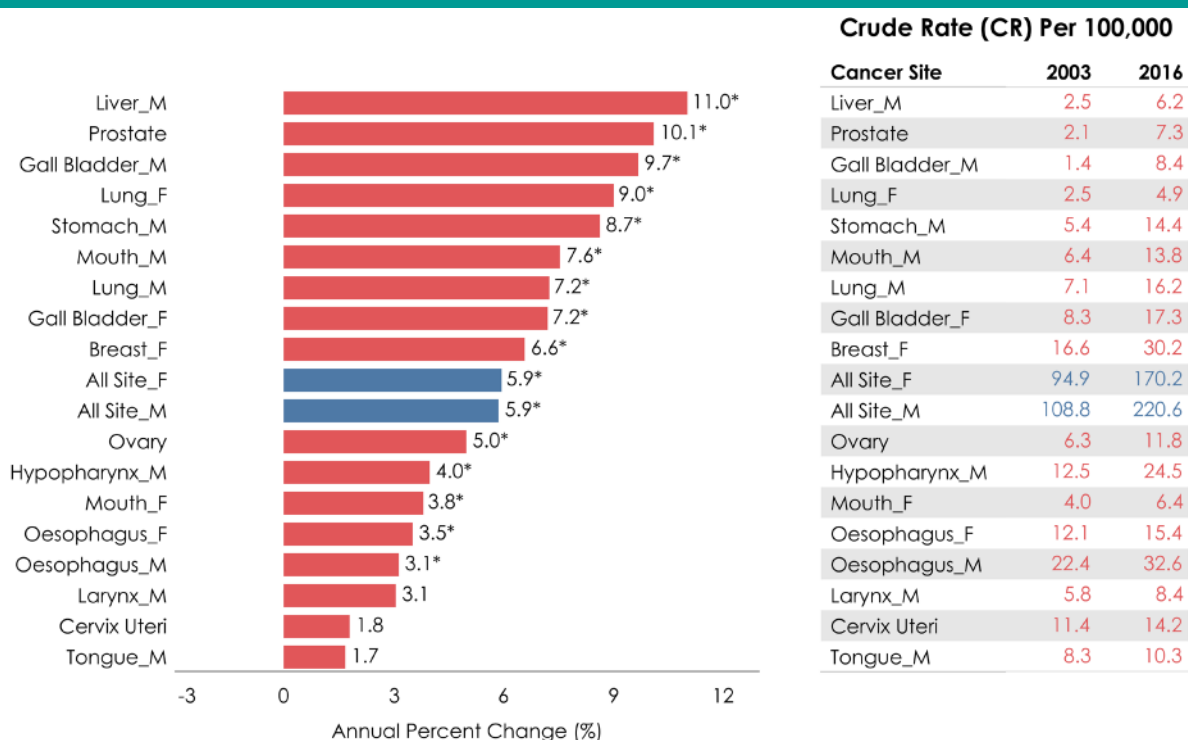


Increase in APC, Decrease in APC, Increase or Decrease in APC for All Sites; * Significant Increase or Decrease at 95% Confidence Level

M - Males; F - Females

There was no significant change in the annual incidence rate of thyroid cancer in males, but the rate in females increased by 4.9%. There was significant increase in the incidence rate of breast cancer (3.7%) among females.

Fig 13.10 Annual Percent Change for selected Sites of Cancer – Kamrup urban

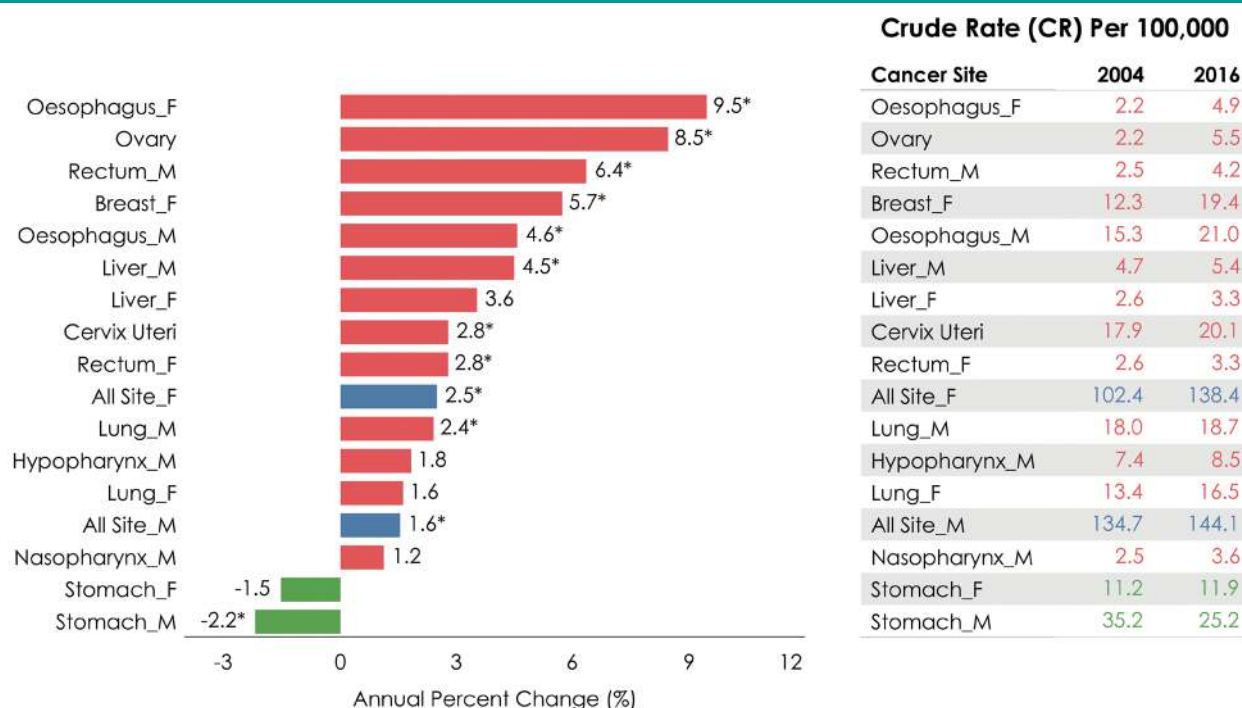


Increase in APC, Decrease in APC, Increase or Decrease in APC for All Sites; * Significant Increase or Decrease at 95% Confidence Level

M - Males; F - Females

All sites of cancer showed significant increase in annual incidence rates in males as well as females by 5.9% for the period between 2003 and 2016. Lung cancer showed significant increase in males and females by 7.2% and 9.0%, respectively.

Fig 13.11 Annual Percent Change for selected Sites of Cancer – Mizoram state

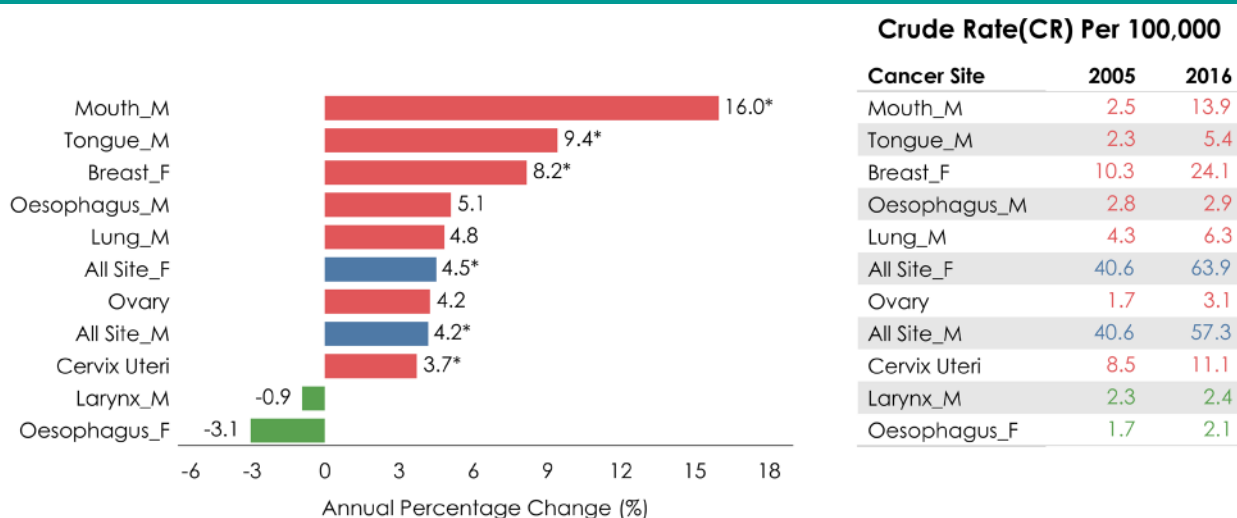


Increase in APC, Decrease in APC, Increase or Decrease in APC for All Sites; * Significant Increase or Decrease at 95% Confidence Level

M - Males; F - Females

In Mizoram state PBCR, the APC for cancer oesophagus in males and females was 4.6% and 9.5%, respectively between 2004 and 2016. The APC for cancer stomach decreased for both males and females.

Fig 13.12 Annual Percent Change for selected Sites of Cancer - Aurangabad

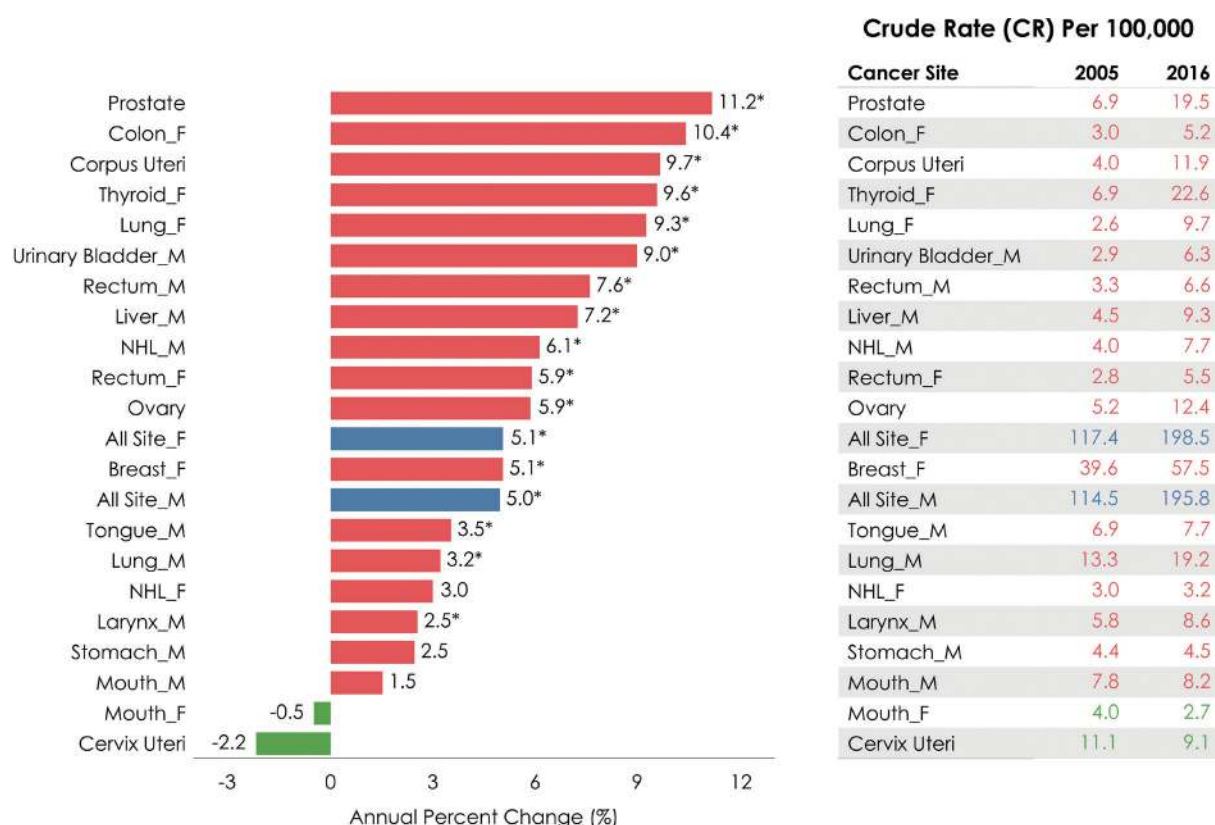


Increase in APC, Decrease in APC, Increase or Decrease in APC for All Sites; * Significant Increase or Decrease at 95% Confidence Level

M - Males; F - Females

The incidence rate of mouth cancer in males increased significantly by 16% annually between 2005 to 2016. The crude rate for cancer mouth in males was 13.9 in 2016 compared to 2.5 in 2005. The APC decreased for cancer larynx in males and cancer oesophagus in females. For females the APC for cancer breast was 8.2% and the crude rate increased from 10.3 in 2005 to 24.1 in 2016. All sites of cancer showed significant increase in cancer incidence rate over the period of time in both genders.

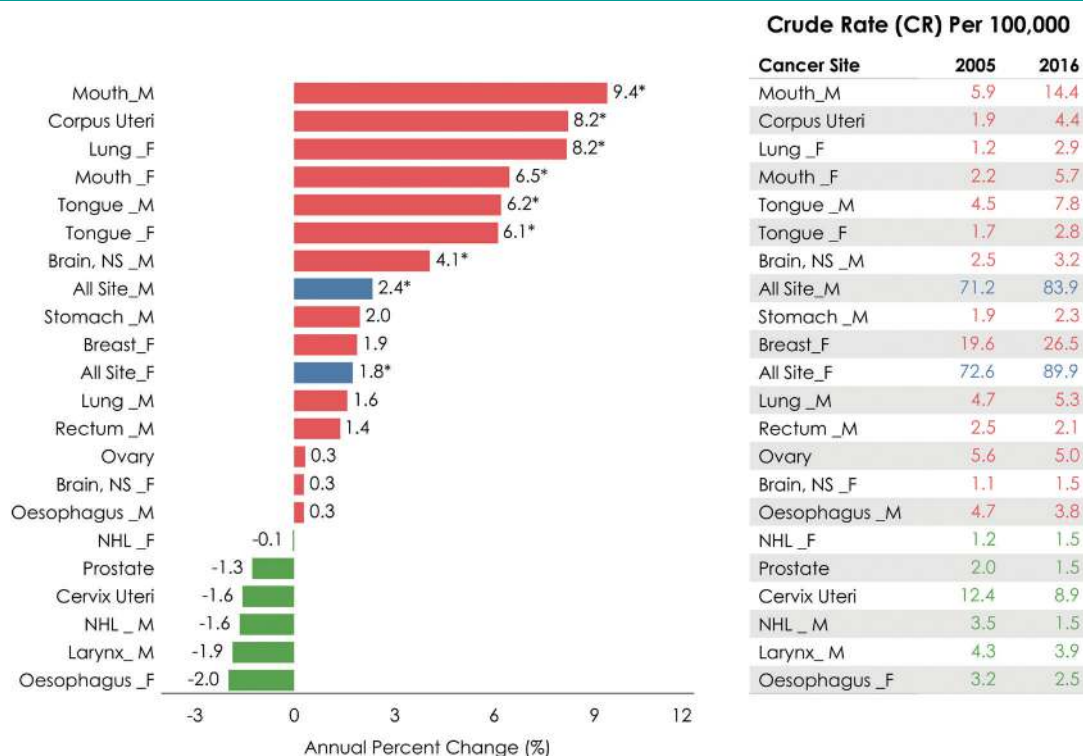
Fig 13.13 Annual Percent Change for selected Sites of Cancer – Thiruvananthapuram taluk



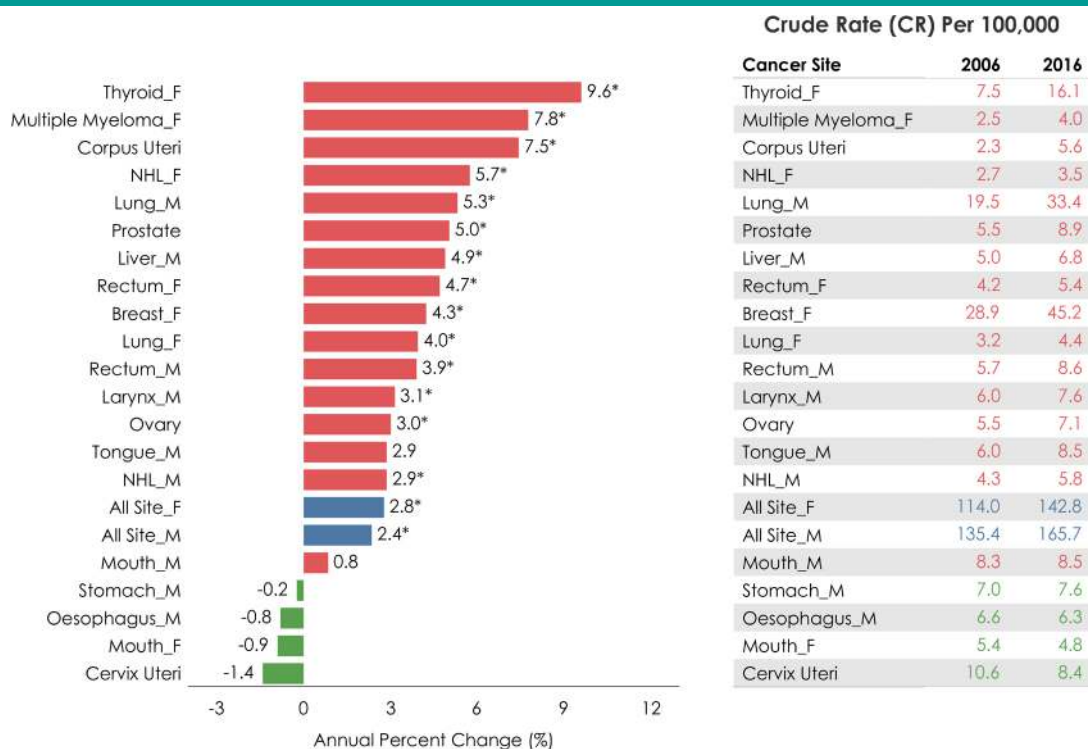
Increase in APC, Decrease in APC, Increase or Decrease in APC for All Sites; * Significant Increase or Decrease at 95% Confidence Level

M - Males; F - Females

All sites of cancer showed significant increase in males and females by 5% annually in the period between 2005 and 2016. Prostate cancer showed a significant increase of 11.2%. Among females, significant increase in incidence rates were observed in cancers of the colon (10.4%), corpus uteri (9.7%) and thyroid (9.6%) during the period.

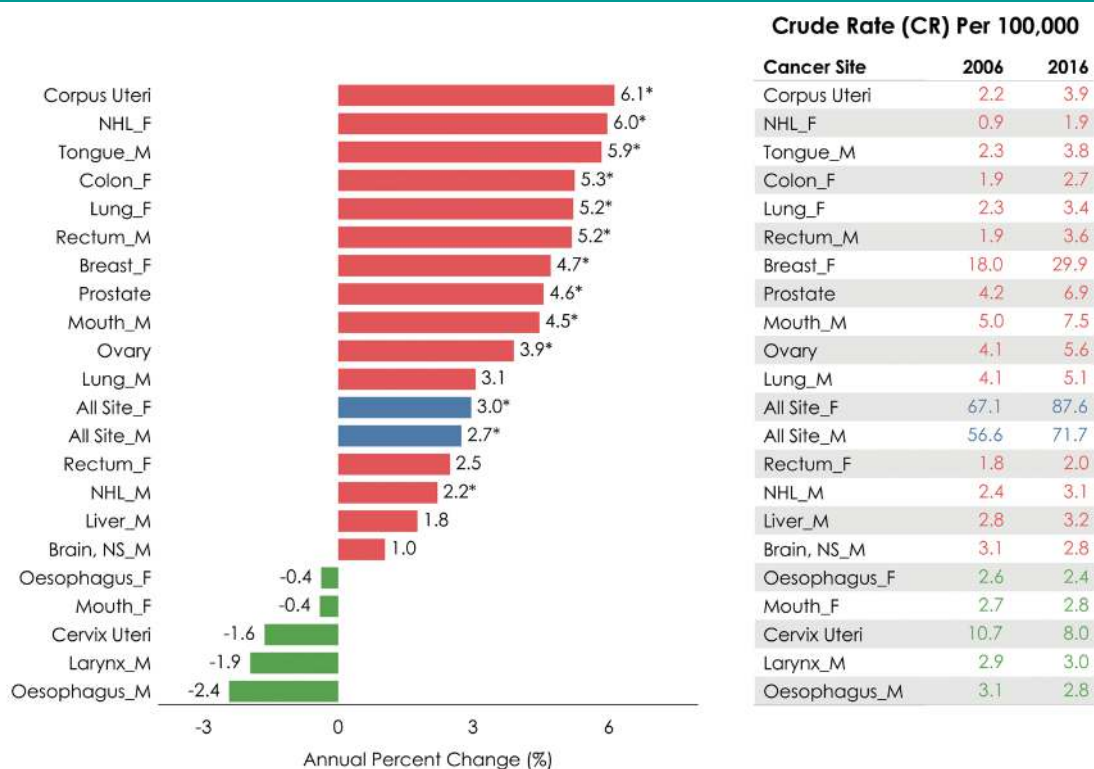
Fig 13.14 Annual Percent Change for selected Sites of Cancer – Nagpur

Mouth cancer showed significant increase of 9.4% and 6.5% annually in males and females, respectively. Tongue cancer also showed significant increase at 6% annually for the period 2005 to 2016.

Fig 13.15 Annual Percent Change for selected Sites of Cancer – Kollam district

The incidence rate of thyroid cancer has increased by 9.6% annually for females from 2006 to 2016. All sites of cancer showed significant increase in males and females by 2 to 3% annually in the period between 2006 and 2016. There was decrease in cancer incidence rate for cancer oesophagus in males, cancer cervix uteri and cancer mouth in females.

Fig 13.16 Annual Percent Change for selected Sites of Cancer – Pune



Increase in APC, Decrease in APC, Increase or Decrease in APC for All Sites; * Significant Increase or Decrease at 95% Confidence Level

M - Males; F - Females

All sites of cancer showed significant increase in males and females by 2.7% and 3.0% annually for the period between 2006 and 2016. Breast cancer among females showed a significant increase in incidence rate (4.7%) over the years.