



Forecasting the burden of cancer in Singapore in 2020

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SingHealth Centre for Health Services Research

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Introduction



- Cancer is the leading cause of death world wide, and up to 40% of cancer cases can be prevented¹.
- Cancer incidences are rising worldwide, hence it is important that we anticipate the additional burdens of an increase in future cancer cases so as to prepare our health care system for the additional cases.
- In this study, the incidences of the 5 most common cancers (liver, lung, colorectal, female breast and prostate cancers) in Singapore² as well as world-wide¹ were projected.

¹WHO, <http://www.who.int/mediacentre/factsheets/fs297/en/>

²Trends in Cancer Incidence in Singapore, 1968-2002; Singapore Cancer Registry,

Methodology

Step 1: From the Singapore cancer registry, the most common cancers – those of the liver, lung, colon, female breast and prostate were chosen.

Step 2: Estimate future cancer burden using Globocan 2002 by IARC from WHO. Globocan 2002 makes estimations based on:
1) population changes as projected by UN (2002) and
2) annual percentage change (APC) of incidence rates.

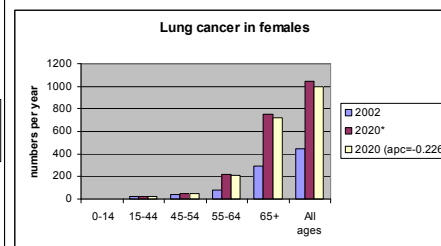
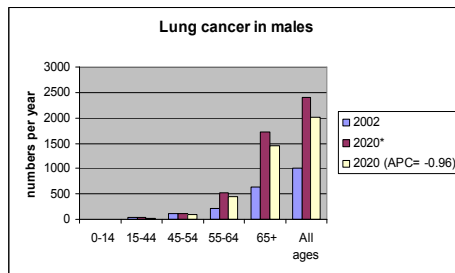
Step 3: APCs were taken as the average¹ annual percentage change in age-standardised incidence rates published by the Singapore cancer registry

Step 4: Plot charts to compare current burden (2002 incidences) with future burden (2020). Future burden assuming zero growth rates was also included to show the impact of ageing demography alone.



¹Annual percentage change (APC) were averaged over 1968 to 2002.

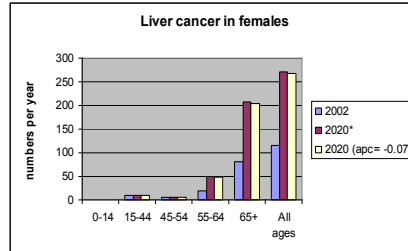
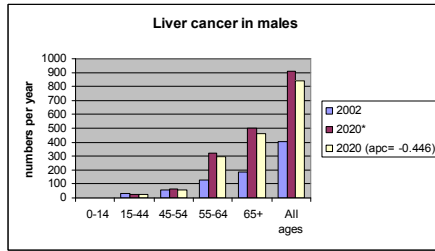
Lung cancer in Singapore, 2020



- Incidence of lung cancer set to double for both males and females from 2002 to 2020.
 - Current incidence (males): 1000 cases/yr
 - Future incidence (males): 2000 cases/yr
- In 2020, the incidence of lung cancer for males looks to be almost twice of females.

*Projected number of new cases of cancer in 2020 due to aging of the population alone

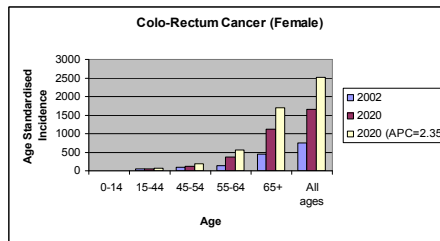
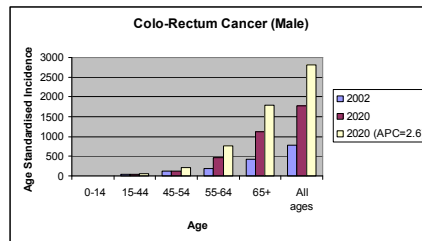
Liver cancer in Singapore, 2020



- Projected doubling of incidence for liver cancer
 - Largely fueled by demographic changes.
- The effects of a Hepatitis B vaccination, introduced in 1984, on incidences of liver cancer in Singapore remain to be seen.
 - A Taiwanese study¹ compared the liver cancer incidence in children aged 6–9 years born before and after vaccination against Hep B virus was introduced. A 4-fold difference in incidence was observed in the unvaccinated group. These encouraging results suggest that vaccination will help to reduce liver cancer incidences.⁴

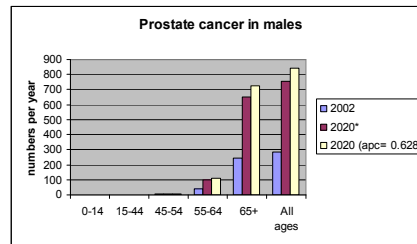
1. M.H. Chang, C.J. Chen, M.S. Lai *et al.*, Universal hepatitis B vaccination in Taiwan and the incidence of hepatocellular carcinoma in children. Taiwan Childhood Hepatoma Study Group. *N. Engl. J. Med.* **336** (1997), pp. 1855–1859.

Colorectal cancer in Singapore, 2020



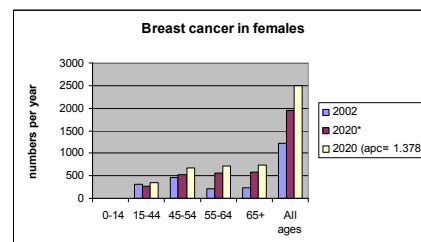
- Incidence of colorectal cancers is projected to triple in both males and females from 2002 to 2020.
- Global rise in colorectal cancer incidence is also reported across Eastern Europe and Asia.

Prostate cancer in Singapore, 2020



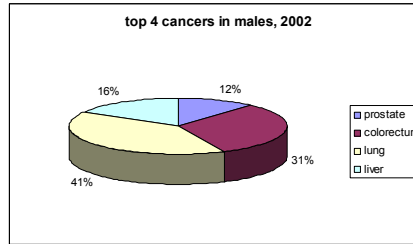
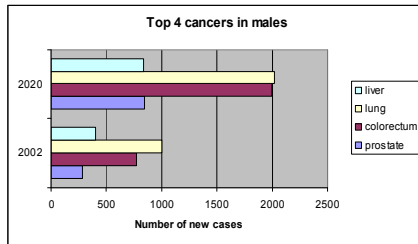
- An estimated 3 fold increase in incidence of prostate cancer from 2002 to 2020.
- Note that prostate cancer incidence started from a relatively low base (which may be due to earlier under-diagnosis of clinically silent prostatic cancer) and hence, the projected 3-fold increase.

Breast cancer in Singapore, 2020

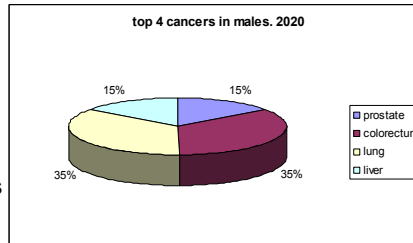


- Incidence of breast cancer is projected to increase two-fold from 2002 to 2020.
- It is and will remain the top cancer in females and will contribute a significant portion of the increase in total cancer cases in Singaporean females.

4 most common cancers in Singapore males

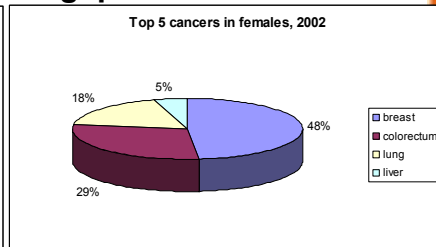
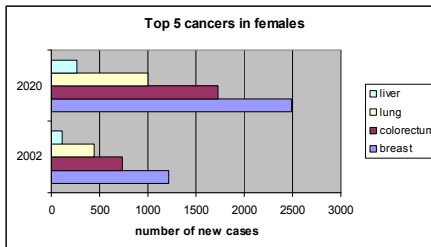


- Of the 4 most common cancers, colorectal cancer will have the greatest absolute increase.
- Lung cancer will decrease in proportion while colorectal cancer set to take up a larger proportion among the top 4 cancers in Singapore males.

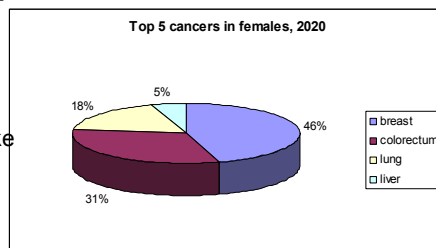


Increasing burden of colorectal cancer

4 most common cancers in Singapore females



- Breast cancer will experience the greatest increase in the number of new cases, followed by colorectal cancer.
- Colorectal cancer will increasingly take up a larger portion of the commonest cancers in the Singapore female
 - Similar to trends projected for Singapore males.



Limitations



- The forecasted results only considers past trends. Globocan 2002 methodology does not predict future trends which may be influenced by
 - lifestyle changes,
 - future technological improvements (e.g. newer diagnostic methods)
 - better prevention efforts
- APCs were taken as the annual percent change in age-standardised incidences averaged over 1968 to 2002 as published by the Singapore cancer registry.
 - Less weight given to recent changes such as aggressive anti-smoking efforts since the late 70s.
- Population projections does not take into account active immigration and emigration.
- Forecasting is based on a simple, general model developed by IARC for global estimates. Projections for Singapore may be better served by a more specific, local model.