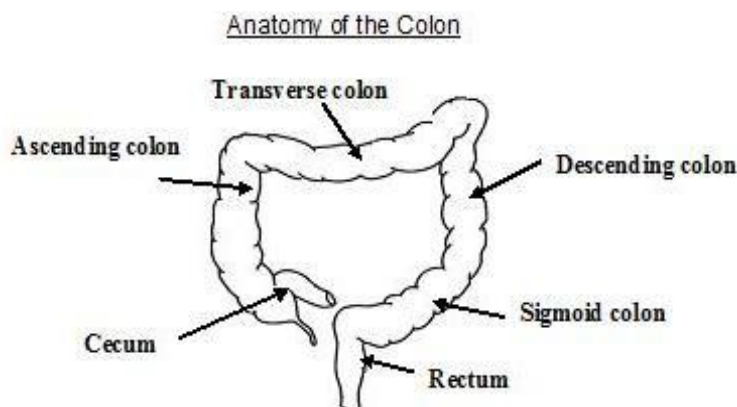


Trends of Colorectal Cancer in Singapore, 2007-2011

1. Introduction

The large intestine consists of the cecum, ascending colon, transverse colon, descending colon, sigmoid colon and the rectum. The picture shows the anatomy of the large intestine. Colorectal cancer can arise in any part of the large intestine.



2. Ranking of cancers

- ❖ Colorectal cancer was the most common cancer among men and the second most common cancer among women in the period 2007-2011. (Figs 1 & 2)

Figure 1: Ten most frequent cancers (%) in Males, 2007-2011

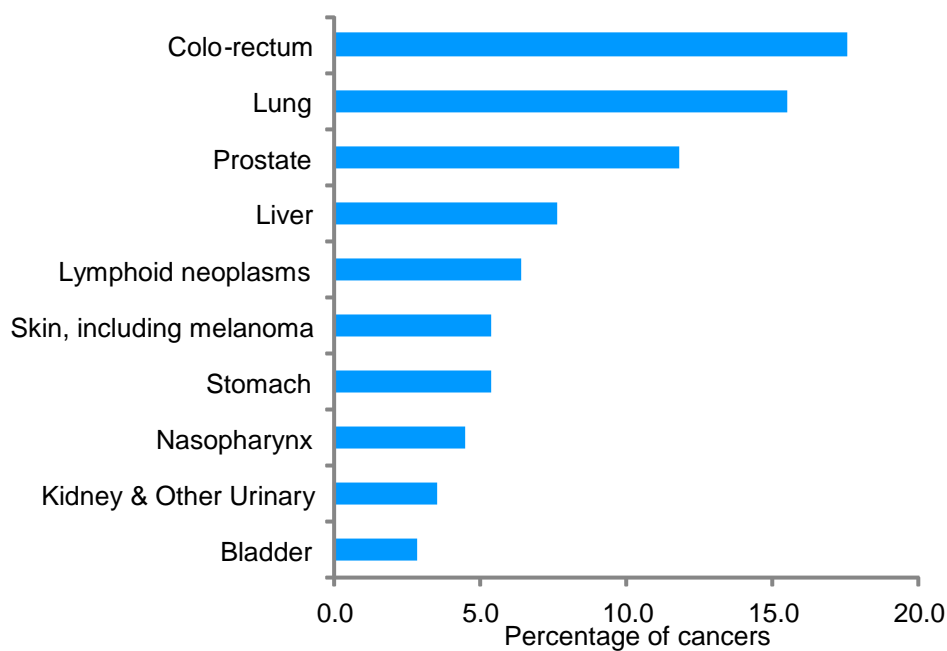
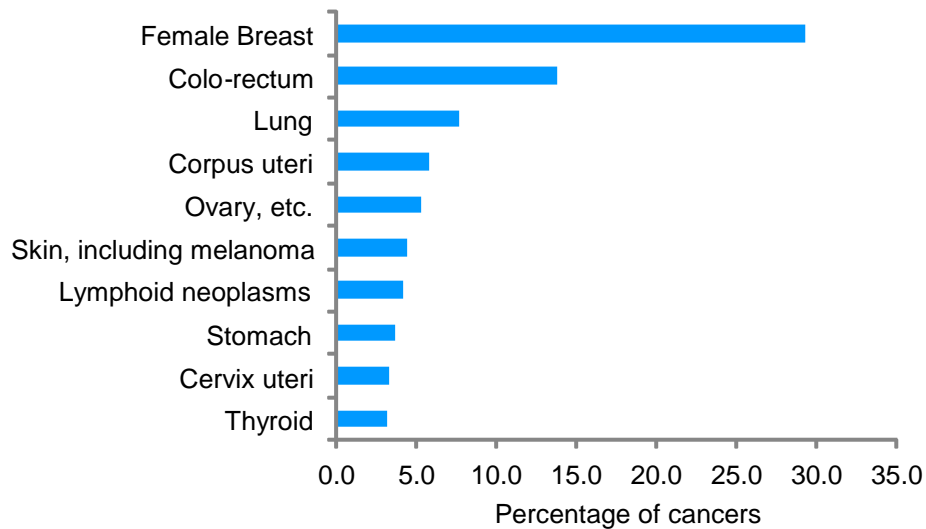


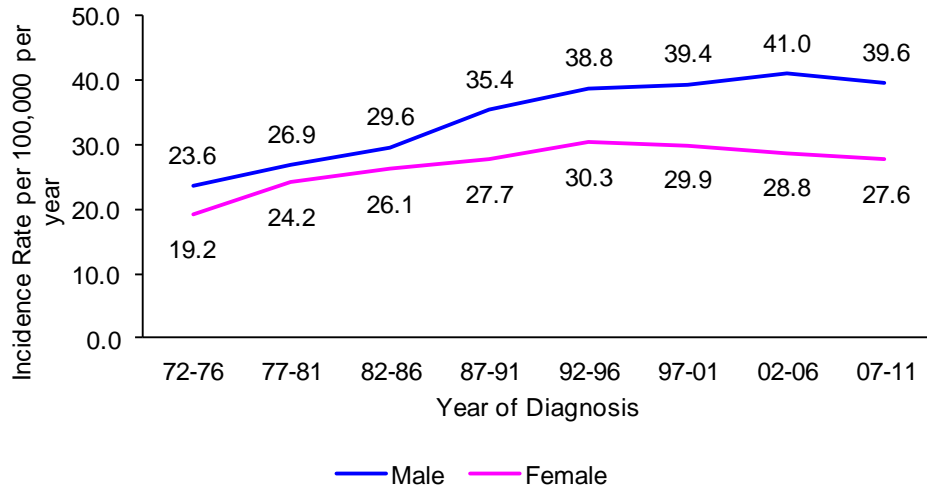
Figure 2: Ten most frequent cancers (%) in Females, 2007-2011



3. Incidence of colorectal cancers, 1972-2011

- ❖ The rates¹ for males have increased consistently over the past three decades and then stabilised from 2002- 2006.
- ❖ However, the rates for females have increased from 1972 to 1991, before reaching a plateau from the period 1992-1996 onwards.

Figure 3: Incidence Rates for Colorectal Cancer per 100,000 per year by Gender, 1972-2011



4. Incidence Rates among Ethnic groups

- ❖ Among a total of 8459 new cases diagnosed from 2007-2011, the incidence rates among the Chinese were the highest for both genders.

Table 1: Crude and Age-Standardised Incidence Rates of Colorectal Cancer by Gender and Ethnic Group, 2007-2011

Ethnic Group	Male			Female		
	No.	CR [^]	ASR [*]	No.	CR [^]	ASR [*]
Chinese	4035	59.6	42.9	3395	48.4	29.5
Malay	329	26.4	27.4	287	22.9	21.1
Indian	184	21.2	21.0	104	12.8	12.7
Others	71	26.3	37.7	54	18.3	26.0
All Races	4619	50.5	39.6	3840	41.0	27.6

[^]CR: Crude rate per 100,000 per year. The effect of age has not been accounted for, in the computation of crude rates.

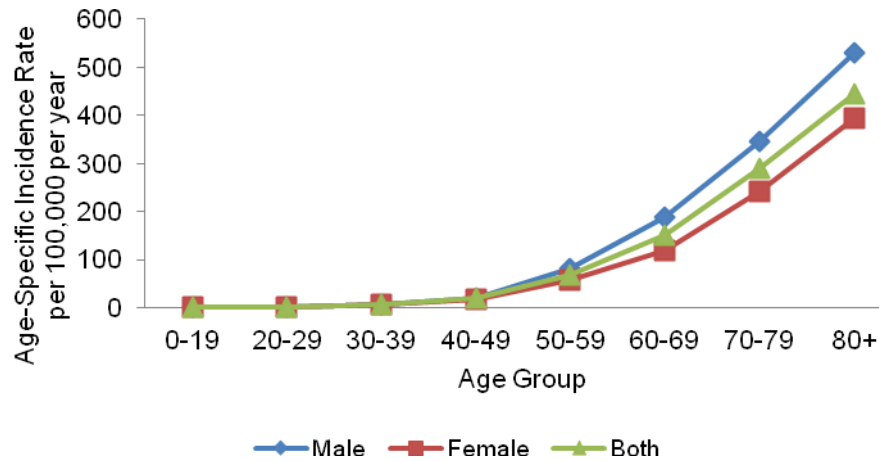
^{*}ASR: Age-Standardised Incidence Rate per 100,000 per year

¹ All rates in this paper have been age-standardised to eliminate the effect of age on the results. For example, if the population in Singapore now is older than the population 20 years ago, the colorectal cancer incidence now is expected to be higher than that of 20 years ago because the risk of colorectal cancer increases with age. In age-standardisation, we compute the rate based on a reference age population. The World population has been used as been used as the reference population in this paper.

5. Age at diagnosis

- ❖ Regardless of gender, the median age at diagnosis of colorectal cancer was 67 years. The median age at diagnosis for males and females were 66 years and 68 years respectively.
- ❖ The age-specific incidence rates start to increase from age 50 years.

Figure 4: Age-Specific Incidence Rates per 100,000 per year by Gender, 2007- 2011



6. Stage at diagnosis

- ❖ The incidence rates of colorectal cancer cases were highest in stages II and III for all age groups (Figs 5, 6 & 7).

Figure 5: Incidence Rates by Age Groups and Stage, 2007-2011

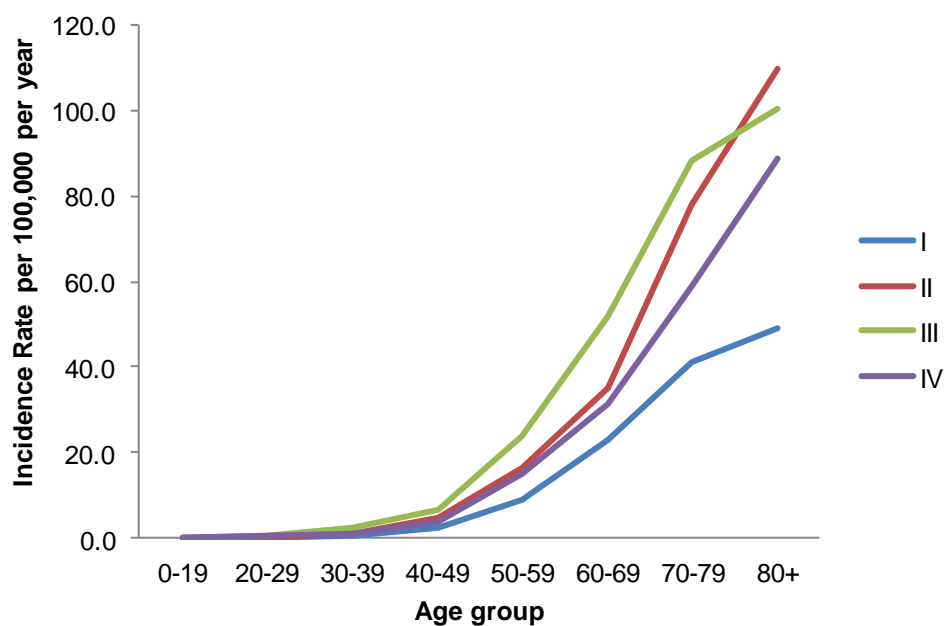


Figure 6: Percentage of Colorectal Cancer Cases by Stage for Males, 2007-2011

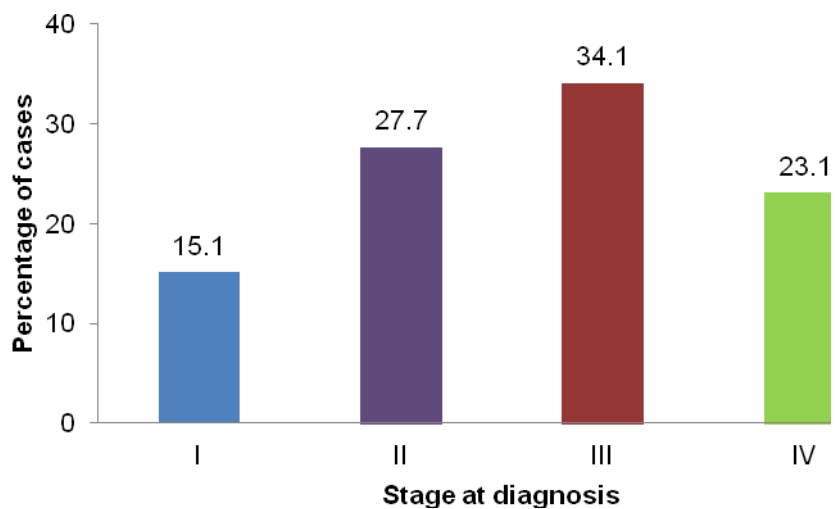
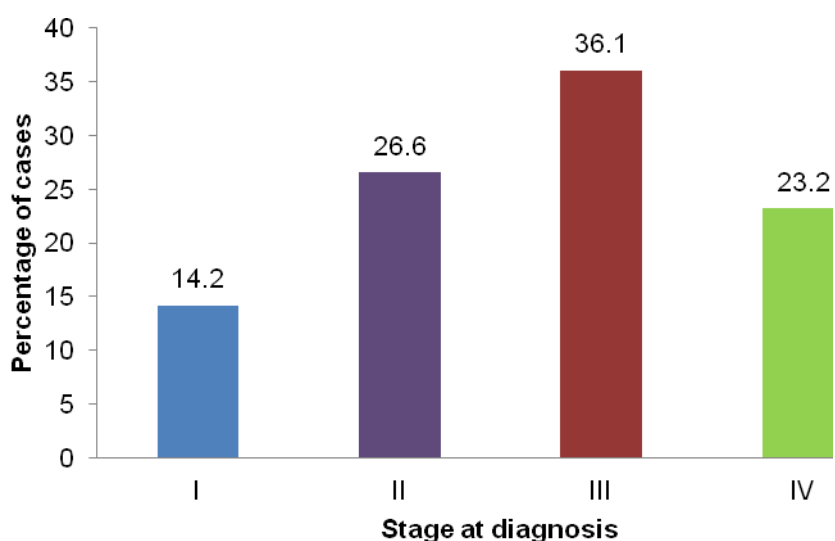


Figure 7: Percentage of Colorectal Cancer Cases by Stage for Females, 2007-2011



7. Mortality Rates

- ❖ While colorectal cancer was the second leading cause of death among male cancer patients, it was the third leading cause of death among female cancer patients in Singapore in the period 2007-2011 (Figs 8 & 9).

Figure 8: Ten Most Frequent Cancer Deaths among Male Cancer Patients,

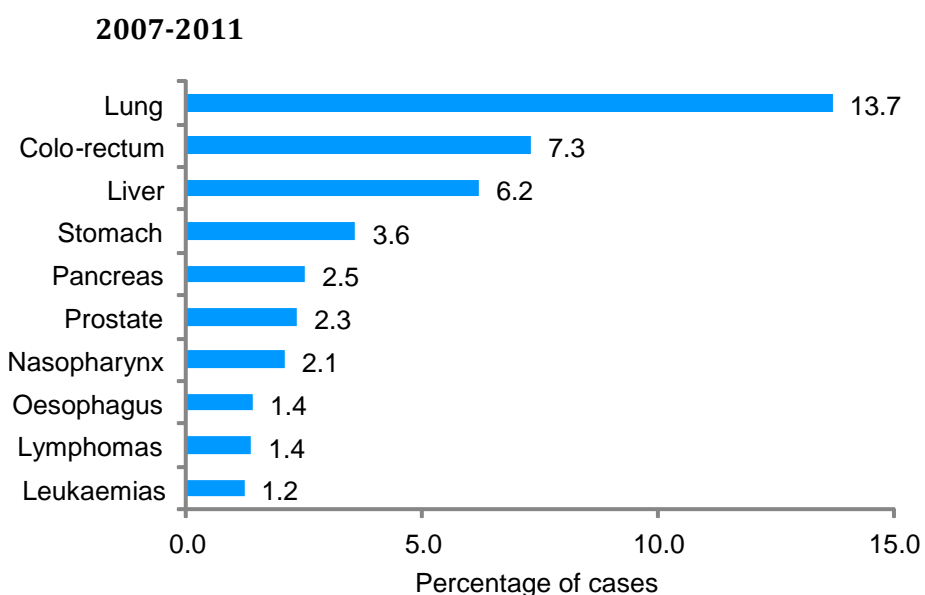
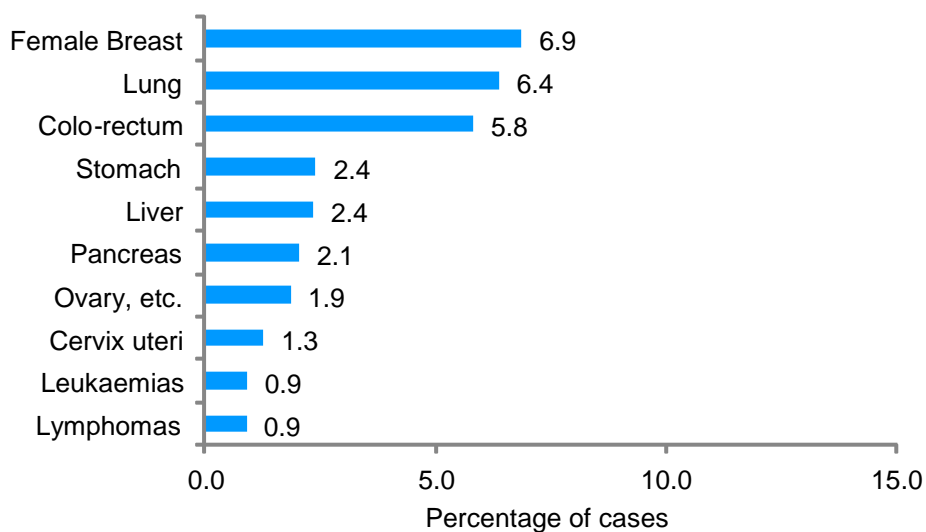


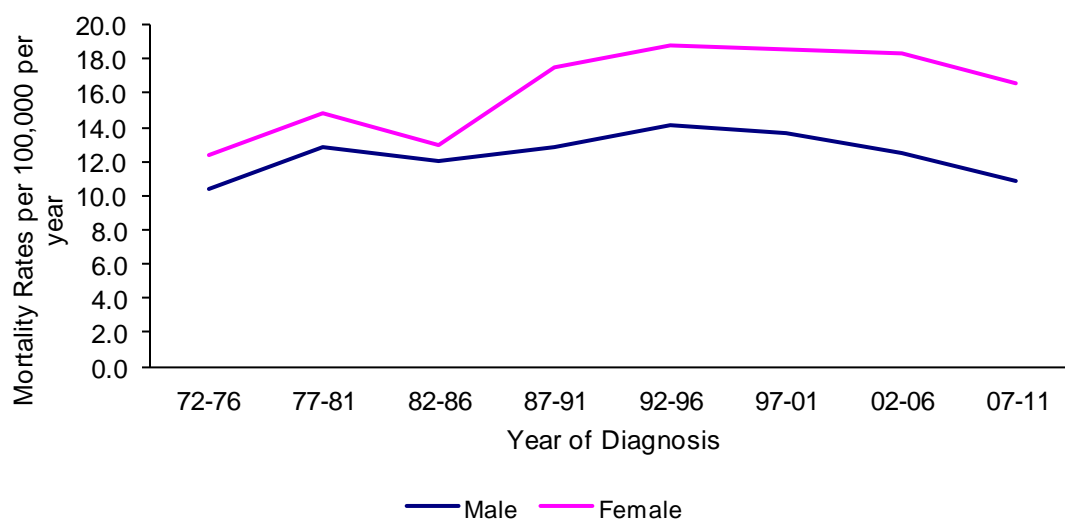
Figure 9: Ten Most Frequent Cancer Deaths among Female Cancer Patients,

2007-2011



- ❖ The mortality rates for males were higher than females (Fig 10).
- ❖ A declining trend of deaths from colorectal cancer was seen in both genders from the period 1992-1996. This is probably due to detection of the cancer at an earlier stage by screening and the advances in treatment.

Figure 10: Mortality Rates for Colorectal Cancer per 100,000 per year by Gender, 1972-2011



8. Survival Rates

- ❖ There was an increasing trend in the survival rates of colon and rectal cancers over the years².
- ❖ The earlier the diagnosis of colorectal cancer at a less advanced stage, the better the survival (Figs 11 & 12)

² Cancer Survival in Singapore, 1968-2007. Singapore Cancer Registry, HPB.

Figure 11: Observed Survival Rates by Stage of Colorectal Cancer Cases among Males Diagnosed in 2003-2007

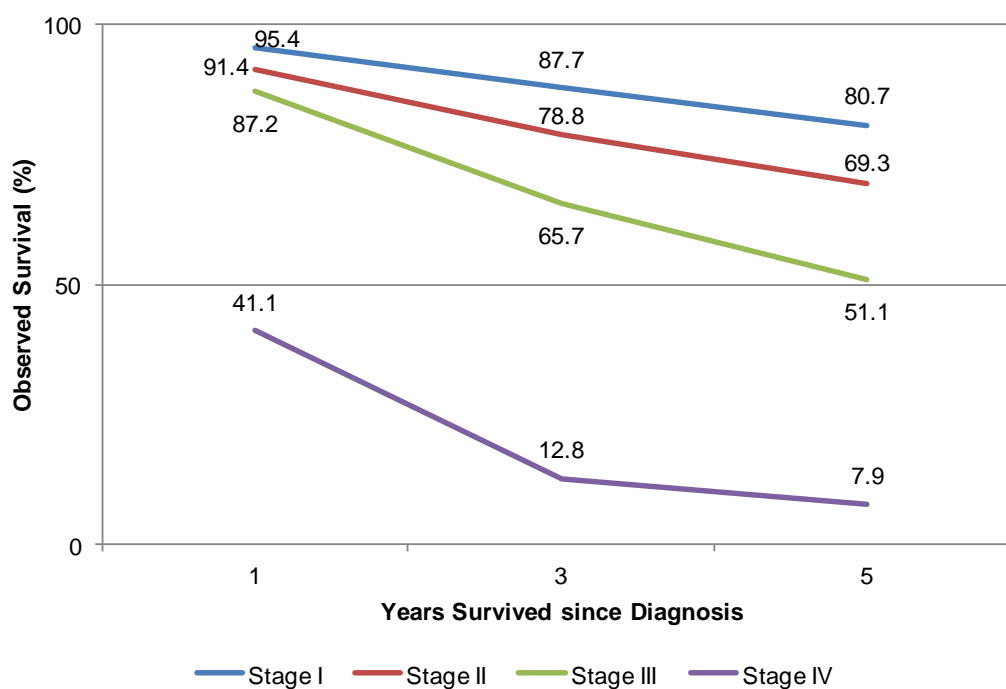
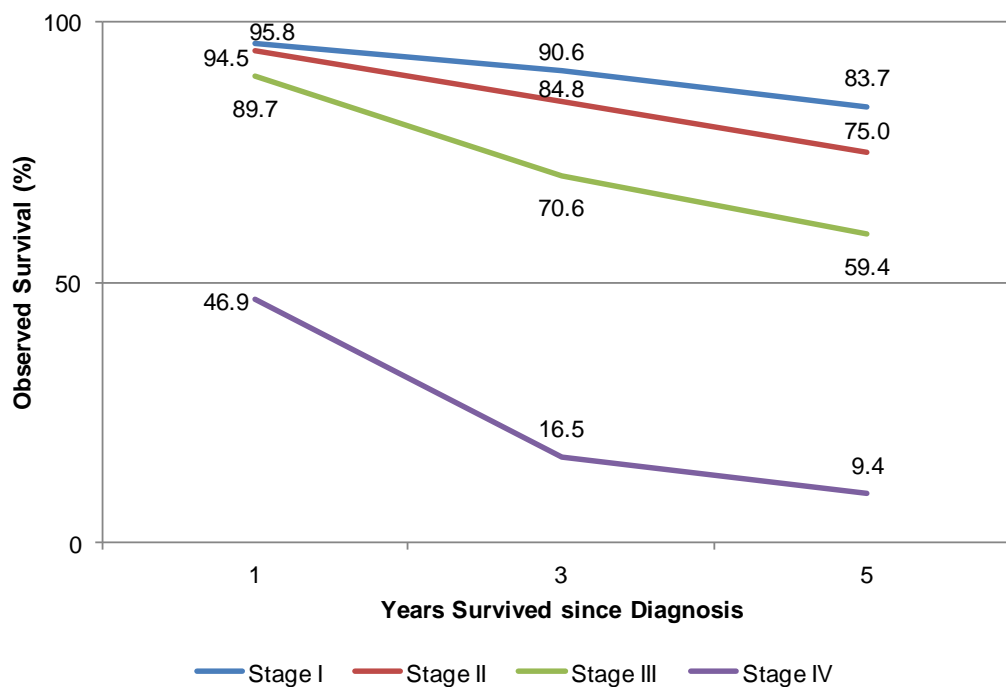


Figure 12: Observed Survival Rates by Stage of Colorectal Cancer Cases among Females Diagnosed in 2003-2007



9. Risk factors for colorectal cancers

- ❖ The risk factors linked to colorectal cancer include³:
 - (a) Family and hereditary factors
 - (b) Lifestyle-related factors
- Nutritional practices such as high red and /or processed meat consumption, and diet low in fruits and vegetables
- Physical inactivity
- Obesity
- Smoking
- Heavy intake of alcohol

10. Symptoms of colorectal cancer

- ❖ Common signs and symptoms are:
 - Change in bowel habits, including diarrhoea and constipation
 - Presence of blood in stool
 - Persistent abdominal discomfort such as cramps, gas or pain

11. Screening for colorectal cancer

- ❖ Regular screening for colorectal cancer can detect an early stage of disease, where there may not be symptoms.
- ❖ Screening is recommended from the age 50 for people with no symptoms.
- ❖ In Singapore, there are two recommended screening tests to detect colorectal cancer, namely, the 2-day Faecal Immunochemical Test (FIT) and the screening colonoscopy. Under the Health promotion Board's (HPB) Integrated Screening Programme, the 2-day Faecal Immunochemical Test (FIT) for colorectal cancer screening is

³ Colorectal Cancer Epidemiology: Incidence, Mortality, Survival, and Risk Factors: Clinics in Colon and Rectal Surgery. 2009. Vol 22, No. 4.

recommended, which is safe, quick and easy to do. Screening using FIT should be done once a year.^{4,5}

- ❖ Alternatively, screening using colonoscopy can also detect colorectal cancer and this test should be carried out once every 10 years. For individuals at increased or high risk, screening by colonoscopy is indicated as below.^{4,5} It is advised that you consult your family doctor who can advise you on the type of screening test to take.

Risk Group	Onset Age	Frequency of Colonoscopy Screening
Average risk		
Asymptomatic or family history limited to non-first degree relatives	50 yrs	Every 10 yrs
Increased risk		
1. Colorectal cancer in first degree relative (parent, sibling) age 60 years or younger or two or more first degree relatives	10 yrs prior to youngest case in the family or age 40 yrs, whichever is earlier	Every 5 yrs
2. Colorectal cancer in first degree relative over the age of 60 years	10 yrs prior to youngest case in the family or age 50 yrs, whichever is earlier	Every 10 yrs
3. Personal history of colorectal polyps	3 yrs after polypectomy in the presence of high risk features (>1cm, multiple, villous architecture); otherwise, 5 yrs after polypectomy for low risk polyps	-
4. Personal history of colorectal malignancy	One year after resection	Every 3 yrs
5. Personal history of ovarian or endometrial cancer	One year after resection	--
High Risk		
1. Family history of familial adenomatous polyposis	10 to 12 yrs (from puberty)	Annually*
2. Family history of hereditary nonpolyposis colorectal cancer	20-25 yrs	Every 1-2 yrs
3. Inflammatory bowel disease		
a. Left-sided colitis	From 15th year of diagnosis	Every 1-2 yrs
b. Pan-colitis	From 8th year of diagnosis	Every 1-2 yrs

*Flexible sigmoidoscopy from age 10-12 years (puberty) until adenomas are identified, upon which screening is switched to colonoscopy

⁴ Report of the Screening Test Review Committee. <http://www.ams.edu.sg/pdf/str2011.pdf>. Accessed on 18 Feb 2013

⁵ <http://www.hpb.gov.sg/HOPPortal/dandc-article/598>. Accessed on 18 Feb 2013

12. Prevention of colorectal cancer

- ❖ Risk of colorectal cancer can be reduced by:
 - Maintaining a diet with not more than 70 grams⁶ of red meat (equivalent to 2 beef burgers⁷) and at least 2 servings each of fruits and vegetables daily
 - Maintaining a healthy body mass index (BMI) of no more than 23 kg/m²
 - Adopting a physically-active lifestyle
 - Limiting alcohol intake to no more than 3 standard drinks a day for men and no more than 2 standard drinks a day for women⁸
 - Quitting smoking⁹

13. More Information

More information on prevention, screening, risk factors and, treatment of colorectal cancer is available at HPB's website at <http://www.hpb.gov.sg/HOPPortal/dandc-article/598>.

⁶ <http://www.nhs.uk/Livewell/Goodfood/Pages/red-meat.aspx>. Accessed on 18 Feb 2013

⁷ http://www.breakingnewsenglish.com/1102/110227-red_meat.html. Accessed 22 Feb 2013

⁸ One standard drink is equal to 220 ml of beer (about 2/3 of a can), 125 ml of wine (about 1 small glass) or 30 ml of liquor (about 1 shot glass).

⁹ <http://www.hpb.gov.sg/HOPPortal/dandc-article/598>. Accessed on 18 Feb 2013