Singapore Cancer Registry
Interim Annual Report
Trends in Cancer Incidence in Singapore
2010-2014

National Registry of Diseases Office
(NRDO)

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Acknowledgement

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CANCER REGISTRY REPORT FOR THE YEARS 2010 – 2014

1 GLOSSARY

Crude Rate (CR): Crude incidence or mortality rate is the number of cancer cases or deaths divided by the mid-year general population respectively.

Age-Standardised Rate (ASR): Age-standardised incidence or mortality rate is the rate that would be observed if the general population has the age structure of an external world standard population. Age-standardisation facilitates the comparison of rates across time, and also across countries. In this report, Segi's world population was used in direct age-standardisation.

The CR and ASR figures in this report are stated as per 100,000 population.

Observed Survival (OS): Observed survival refers to the percentage of patients that survive after a specific time period. This estimate includes death from cancer and also from other causes.

2 EXECUTIVE SUMMARY

A total number of 61,519 incident cancer cases were diagnosed among the resident population during the period 2010-2014 **(Table 5.1)**. Of these, 29,750 (48.4%) were reported in males and 31,769 (51.6%) in females **(Table 5.2.1)**.

The crude incidence rates for total male and female cancer patients for the period 2010-2014 were 316.4 and 327.8 per 100,000 Singapore resident population per year respectively **(Table 5.2.1)**. The corresponding age-standardised incidence rates were 229 and 217.6 per 100,000 person-years.

In both males and females, the crude and age-standardised rates were highest in Chinese followed by Malays and Indians **(Table 5.2.2)**.

Colorectal, lung and prostate cancers were the top ranked cancers among the male resident population **(Table 5.3.1)**. Among female residents, breast, colorectal and lung cancers were the most common **(Table 5.3.2)**.

The incidence (number and crude rates) of cancer for the period 2010-2014 have increased (by 4.7% and 4.0%, respectively) compared to the incidence reported for the period 2009-2013 though the type and order of top ranked cancers have remained the same.

Lung cancer and breast cancer had the highest mortality rates in males and females respectively **(Tables 5.5.1 and 5.5.2)**.

3 INTRODUCTION

The Singapore Cancer Registry provides information on cancer patterns and trends in Singapore. The comprehensive population-based cancer registration in Singapore began in January 1968. In April 2001, the Singapore Cancer Registry came under the auspices of the National Registry of Diseases Office (NRDO).

MOH enacted the National Registry of Diseases Act in 2007 to enable the disease registries to access medical information while safeguarding data confidentiality. Cancer was the first disease to be covered by the Act.

4 SOURCE OF DATA AND DATA PROCESSING

Comprehensive cancer registration was achieved through data obtained from a combination of sources, viz., (a) notifications by the medical profession, (b) pathology records, (c) hospital records, and (d) mortality data from the Registry of Births and Deaths (RBD), Ministry of Home Affairs (MHA). Notifications were mandatory since 2009.

For cancer cases obtained from sources other than physician's notifications, the data were checked against known registered cases in the registry. For missed notifications, the doctors-in-charge would be informed and reminded to notify. About 10% of cases were not notified by physicians, and would need to be registered by the Registry staff.

Data Processing

Data were captured through electronic transfer of data from relevant institutions and manually (from case notes). All relevant information of new cases would be entered into a computerised system and checked for possible duplication against a master index. The clinical data would then be verified by NRDO staff and a visiting consultant pathologist.

NRDO staffs do not have personal contact with the patients and are not involved in the clinical management of the patients.

The Singapore Cancer Registry adopted the International Classification of Diseases for Oncology, 2nd Edition (ICD-O-2) for the classification of primary sites and morphology during the period 1993 to 2002. From 2003 onwards, cases of cancer diagnosed were classified using the International Classification of Diseases for Oncology, 3rd Edition (ICD-O-3).

Cases of carcinoma-in-situ were registered but not included in the computation of incidence rates. Those which progressed to be invasive at a later stage would be re-registered in the year they were diagnosed as invasive carcinomas.

This report is based primarily on cancers registered in Singapore with the date of diagnosis falling within the period 1/1/2010 - 31/12/2014. The data reported are accurate as of 15th April 2015.

All the results refer only to the resident population (citizens and permanent residents) only.

Population Denominators

In this report, the population denominators used were obtained from Department of Statistics (DOS) to compute the rates. DOS releases mid-year population estimates annually and these population denominators are widely used in official publications in Singapore, including those published by the Ministry of Health. Segi's World Population was used for direct standardisation to calculate age-standardised rates.

Survival

Calculation of survival follows the methodology in 'Cancer Survival in Singapore, 1968-2007'[1] except that the life table used to generate expected survival for 2003 - 2014 were obtained from DOS.

In addition, the Brenner method is now used for age-standardisation[2]. This was done so that age-standardised survival could still be obtained even if none of the patients within one or more age strata was followed up over the entire period of interest. Furthermore, this method also assures that age-adjustment using the study's population own age-distribution yields exactly the same result as obtained in the crude analysis.

The site-specific age groups in the distribution tables were based on the age categories for weights used to obtain age-standardised survival.

[1] Cancer Survival in Singapore 1968-2007. Singapore Cancer Registry.

[2] H. Brenner et al. An alternative approach to age adjustment of cancer survival rates. *European Journal of Cancer* 40 (2004), 2317–2322.

5 OVERALL FINDINGS

5.1 Notifications by Year of Diagnosis

For the period 2010 to 2014, the number of notifications per year had increased year on year (Table 5.1).

Table 5.1: Number of Incident Cancer Cases by Year of Diagnosis, 2010-2014

Year of diagnosis	2010	2011	2012	2013	2014	2010-2014
No. of notifications	11,431	11,726	12,295	12,651	13,416	61,519

5.2 Incidence of Cancer for the Period, 2010-2014

A total number of 61,519 incident cases were diagnosed among the resident population during the period 2010-2014. Of these, 29,750 (48.4%) and 31,769 (51.6%) were reported in males and females respectively (Table 5.2.1).

The crude incidence rates for total male and female cancer patients for the period 2010-2014 were 316.4 and 327.8 per 100,000 Singapore resident population per year respectively. The corresponding age-standardised incidence rates were 229 and 217.6 per 100,000 person-years.

Table 5.2.1: Incidence of Cancer by Gender, 2010-2014

Gender	Number	%	CR (95% CI)	ASR (95% CI)
Male	29,750	48.4	316.4 (312.8-320.0)	229.0 (226.3-231.6)
Female	31,769	51.6	327.8 (324.2-331.4)	217.6 (215.1-220.1)

Among the males, the crude and age-standardised rates were highest in Chinese followed by Malays and Indians. This was also seen in the females (Table 5.2.2).

Table 5.2.2: Age-Standardised Incidence Rates for All Cancers by Ethnic Groups and Gender, 2010-2014

Gender	Race	Number	CR (95% CI)	ASR (95% CI)
Male	Chinese	24,990	360.6 (356.1-365.1)	238.7 (235.7-241.8)
	Malay	2,580	203.4 (195.5-211.2)	190.9 (183.3-198.5)
	Indian	1,316	145.6 (137.7-153.5)	140.9 (132.8-148.9)
	All	29,750	316.4 (312.8-320.0)	229.0 (226.3-231.6)
Female	Chinese	26,152	361.6 (357.2-366.0)	222.1 (219.3-225.0)
	Malay	3,259	254.5 (245.8-263.2)	207.8 (200.4-215.1)
	Indian	1,609	189.6 (180.4-198.9)	169.5 (161.0-178.0)
	All	31,769	327.8 (324.2-331.4)	217.6 (215.1-220.1)

5.3 Ten Most Frequent Cancers, 2010-2014

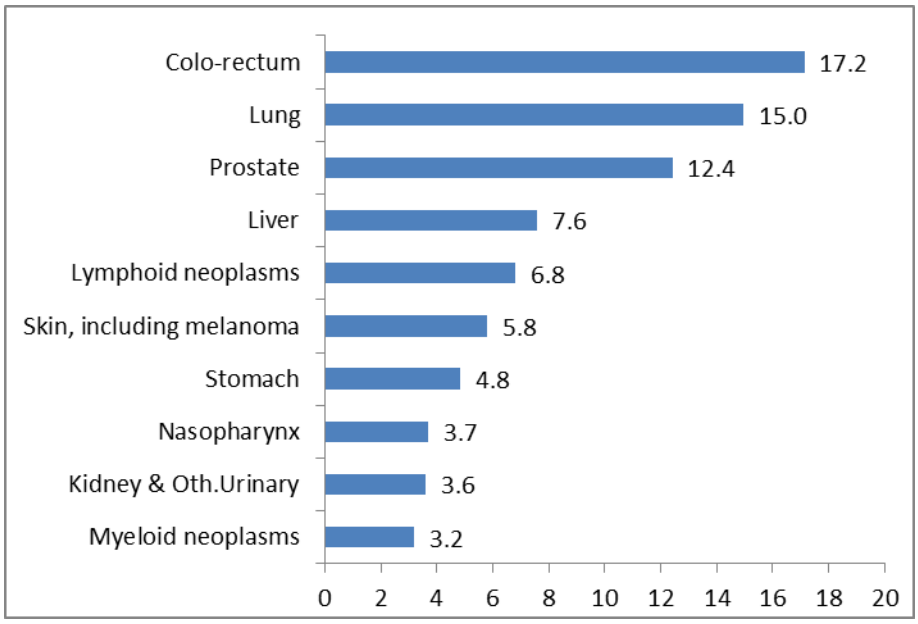
Colorectal, lung and prostate cancers were the most common cancers among the male resident population in 2010-2014 (Table 5.3.1, Figure 5.3.1).

Table 5.3.1: Ten Most Frequent Cancers in Males, 2010-2014

Rank	Site	Number	%	CR (95% CI)	ASR (95% CI)
1	Colo-rectum	5,103	17.2	54.3 (52.8-55.8)	38.2 (37.2-39.3)
2	Lung	4,454	15.0	47.4 (46.0-48.8)	33.5 (32.5-34.5)
3	Prostate	3,694	12.4	39.3 (38.0-40.6)	28.5 (27.6-29.4)
4	Liver	2,254	7.6	24.0 (23.0-25.0)	16.9 (16.2-17.6)
5	Lymphoid neoplasms	2,023	6.8	21.5 (20.6-22.5)	17.4 (16.6-18.3)
6	Skin, including melanoma	1,719	5.8	18.3 (17.4-19.1)	12.9 (12.2-13.5)
7	Stomach	1,432	4.8	15.2 (14.4-16.0)	10.7 (10.2-11.3)
8	Nasopharynx	1,103	3.7	11.7 (11.0-12.4)	8.1 (7.6-8.6)
9	Kidney & Other Urinary	1,077	3.6	11.5 (10.8-12.1)	8.1 (7.6-8.6)
10	Myeloid neoplasms	942	3.2	10.0 (9.4-10.7)	7.5 (7.0-8.0)
	Others	5,949	20.0		
	All	29,750	100.0	316.4 (312.8-320.0)	229.0 (226.3-231.6)

*Other urinary refers to renal pelvis, ureter, urethra, etc.

Figure 5.3.1: Ten Most Frequent Cancers (%) in Males, 2010-2014

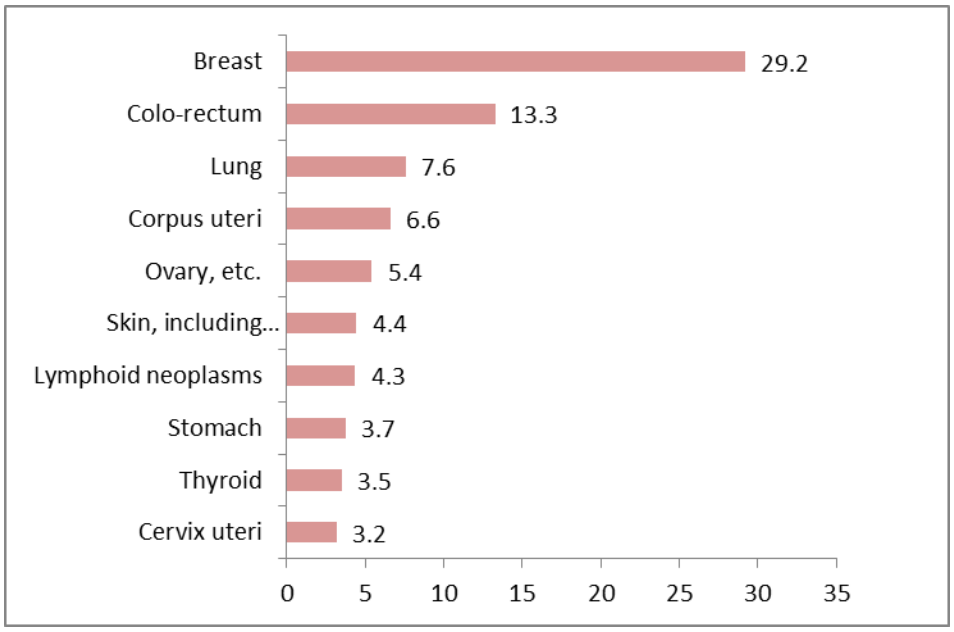


Among female residents in 2010-2014, breast, colorectal and lung cancers were the top ranked cancers (Table 5.3.2, Figure 5.3.2). The trend findings of 2010-2014 in both genders were similar to that of the period 2009-2013.

Table 5.3.2: Ten Most Frequent Cancers in Females, 2010-2014

Rank	Site	Number	%	CR (95% CI)	ASR (95% CI)
1	Breast	9,284	29.2	95.8 (93.8-97.7)	64.7 (63.4-66.0)
2	Colo-rectum	4,221	13.3	43.6 (42.2-44.9)	26.7 (25.9-27.6)
3	Lung	2,399	7.6	24.8 (23.8-25.7)	15.0 (14.4-15.7)
4	Corpus uteri	2,089	6.6	21.6 (20.6-22.5)	14.6 (14.0-15.2)
5	Ovary, etc.	1,719	5.4	17.7 (16.9-18.6)	12.7 (12.1-13.3)
6	Lymphoid neoplasms	1,410	4.4	14.5 (13.8-15.3)	11.2 (10.5-11.8)
7	Skin, including melanoma	1,381	4.3	14.2 (13.5-15.0)	8.4 (7.9-8.9)
8	Thyroid	1,184	3.7	12.2 (11.5-12.9)	9.0 (8.5-9.5)
9	Stomach	1,115	3.5	11.5 (10.8-12.2)	6.8 (6.4-7.2)
10	Cervix uteri	1,005	3.2	10.4 (9.7-11.0)	7.1 (6.6-7.5)
	Others	5,962	18.8		
	All	31,769	100.0	327.8 (324.2-331.4)	217.6 (215.1-220.1)

Figure 5.3.2: Ten Most Frequent Cancers (%) in Females, 2010 – 2014



5.4 Highest Ranking Cancers in Different Ethnic Groups, 2010-2014

During the period 2010-2014, colorectal, lung and prostate cancers were the three most common cancers among the Chinese and Indian male residents. Among the Malay male residents, lung and colorectal cancers were the two most common cancers, followed by lymphoid neoplasm and then prostate cancer (Tables 5.4.1, 5.4.2 and 5.4.3).

Breast cancer was the most common cancer among females in the three main ethnic groups. Colorectal cancer was the second most common cancer among the Chinese and Malay females and was ranked as the third most common cancer among Indian females. Cancer of corpus uteri was the second and third most common cancer in Indian and Malay females respectively. Lung cancer was the third most common cancer in Chinese females.

Due to the relatively smaller numbers of Indian residents compared to the other two ethnicities, the confidence intervals of the incidence rates were wider.

Table 5.4.1: Highest Ranking Cancers among Chinese Residents, 2010-2014

Male	Site	Number	%	CR (95% CI)	ASR (95% CI)
1	Colo-rectum	4,436	17.8	64.0 (62.1-65.9)	41.2 (40.0-42.5)
2	Lung	3,762	15.1	54.3 (52.5-56.0)	34.8 (33.7-35.9)
3	Prostate	3,175	12.7	45.8 (44.2-47.4)	29.8 (28.8-30.9)
4	Liver	1,946	7.8	28.1 (26.8-29.3)	18.0 (17.2-18.8)
5	Lymphoid neoplasms	1,493	6.0	21.5 (20.5-22.6)	16.4 (15.4-17.3)
6	Skin, including melanoma	1,375	5.5	19.8 (18.8-20.9)	12.8 (12.1-13.5)
7	Stomach	1,279	5.1	18.5 (17.4-19.5)	11.9 (11.2-12.5)
8	Nasopharynx	984	3.9	14.2 (13.3-15.1)	9.4 (8.8-10.0)
9	Kidney & Other Urinary	924	3.7	13.3 (12.5-14.2)	8.7 (8.1-9.3)
10	Pancreas	740	3.0	10.7 (9.9-11.4)	6.8 (6.3-7.3)
	Others	4,876	19.5		
	All	24,990	100.0	360.6 (356.1-365.1)	238.7 (235.7-241.8)
Female	**Site**	**Number**	**%**	**CR (95% CI)**	**ASR (95% CI)**
1	Breast	7,476	28.6	103.4 (101.0-105.7)	66.0 (64.5-67.5)
2	Colo-rectum	3,634	13.9	50.2 (48.6-51.9)	27.9 (27.0-28.8)
3	Lung	2,118	8.1	29.3 (28.0-30.5)	16.1 (15.3-16.8)
4	Corpus uteri	1,625	6.2	22.5 (21.4-23.6)	14.4 (13.7-15.1)
5	Ovary, etc.	1,345	5.1	18.6 (17.6-19.6)	12.6 (11.9-13.4)
6	Skin, including melanoma	1,213	4.6	16.8 (15.8-17.7)	8.9 (8.4-9.4)
7	Lymphoid neoplasms	1,049	4.0	14.5 (13.6-15.4)	10.4 (9.7-11.1)
8	Stomach	992	3.8	13.7 (12.9-14.6)	7.3 (6.8-7.8)
9	Thyroid	940	3.6	13.0 (12.2-13.8)	9.2 (8.6-9.8)
10	Cervix uteri	820	3.1	11.3 (10.6-12.1)	7.3 (6.8-7.8)
	Others	4,940	18.9		
	All	26,152	100.0	361.6 (357.2-366.0)	222.1 (219.3-225.0)

Table 5.4.2: Highest Ranking Cancers among Malay Residents, 2010-2014

Male	Site	Number	%	CR (95% CI)	ASR (95% CI)
1	Lung	467	18.1	36.8 (33.5-40.2)	34.9 (31.6-38.2)
2	Colo-rectum	392	15.2	30.9 (27.8-34.0)	28.0 (25.1-30.9)
3	Lymphoid neoplasms	321	12.4	25.3 (22.5-28.1)	24.1 (21.4-26.8)
4	Prostate	239	9.3	18.8 (16.5-21.2)	19.1 (16.6-21.6)
5	Liver	191	7.4	15.1 (12.9-17.2)	13.8 (11.8-15.9)
6	Myeloid neoplasms	129	5.0	10.2 (8.4-11.9)	9.6 (7.9-11.3)
7	Nasopharynx	93	3.6	7.3 (5.8-8.8)	6.1 (4.8-7.3)
8	Bladder	89	3.4	7.0 (5.6-8.5)	6.9 (5.4-8.3)
9	Kidney & Other Urinary	81	3.1	6.4 (5.0-7.8)	5.9 (4.5-7.2)
10	Stomach	69	2.7	5.4 (4.2-6.7)	4.9 (3.7-6.1)
	Others	509	19.7		
	All	2,580	100.0	203.4 (195.5-211.2)	190.9 (183.3-198.5)

Female	Site	Number	%	CR (95% CI)	ASR (95% CI)
1	Breast	985	30.2	76.9 (72.1-81.7)	60.4 (56.5-64.2)
2	Colo-rectum	384	11.8	30.0 (27.0-33.0)	24.3 (21.8-26.8)
3	Corpus uteri	259	7.9	20.2 (17.8-22.7)	15.8 (13.8-17.8)
4	Lymphoid neoplasms	252	7.7	19.7 (17.2-22.1)	17.5 (15.2-19.7)
5	Ovary, etc.	248	7.6	19.4 (17.0-21.8)	15.6 (13.6-17.6)
6	Lung	187	5.7	14.6 (12.5-16.7)	11.4 (9.8-13.1)
7	Thyroid	121	3.7	9.4 (7.8-11.1)	8.0 (6.5-9.4)
8	Cervix uteri	120	3.7	9.4 (7.7-11.0)	7.8 (6.3-9.2)
9	Myeloid neoplasms	89	2.7	7.0 (5.5-8.4)	6.0 (4.7-7.4)
10	Stomach	68	2.1	5.3 (4.0-6.6)	4.3 (3.2-5.3)
	Others	546	16.8		
	All	3,259	100.0	254.5 (245.8-263.2)	207.8 (200.4-215.1)

Table 5.4.3: Highest Ranking Cancers among Indian Residents, 2010-2014

Male	Site	Number	%	CR (95% CI)	ASR (95% CI)
1	Colo-rectum	182	13.8	20.1 (17.2-23.1)	19.0 (16.1-21.9)
2	Prostate	165	12.5	18.3 (15.5-21.0)	19.6 (16.5-22.7)
3	Lung	154	11.7	17.0 (14.3-19.7)	16.7 (14.0-19.5)
4	Lymphoid neoplasms	149	11.3	16.5 (13.8-19.1)	16.7 (13.8-19.6)
5	Liver	88	6.7	9.7 (7.7-11.8)	9.6 (7.5-11.7)
6	Stomach	66	5.0	7.3 (5.5-9.1)	6.6 (5.0-8.3)
7	Myeloid neoplasms	54	4.1	6.0 (4.4-7.6)	5.3 (3.8-6.8)
8	Kidney & Other Urinary	50	3.8	5.5 (4.0-7.1)	5.1 (3.6-6.6)
9	Bladder	41	3.1	4.5 (3.1-5.9)	4.6 (3.1-6.0)
10	Pancreas	38	2.9	4.2 (2.9-5.5)	3.9 (2.6-5.2)
	Others	329	25.0		
	All	1,316	100.0	145.6 (137.7-153.5)	140.9 (132.8-148.9)
Female	**Site**	**Number**	**%**	**CR (95% CI)**	**ASR (95% CI)**
1	Breast	580	36.0	68.4 (62.8-73.9)	58.8 (53.9-63.6)
2	Corpus uteri	165	10.3	19.4 (16.5-22.4)	17.3 (14.6-20.0)
3	Colo-rectum	125	7.8	14.7 (12.1-17.3)	13.3 (10.9-15.7)
4	Ovary, etc.	95	5.9	11.2 (8.9-13.4)	9.9 (7.9-12.0)
5	Lymphoid neoplasms	78	4.8	9.2 (7.2-11.2)	9.3 (7.2-11.5)
6	Thyroid	75	4.7	8.8 (6.8-10.8)	7.2 (5.6-8.9)
7	Lung	59	3.7	7.0 (5.2-8.7)	6.6 (4.9-8.4)
8	Stomach	39	2.4	4.6 (3.2-6.0)	4.2 (2.8-5.5)
9	Myeloid neoplasms	37	2.3	4.4 (3.0-5.8)	3.9 (2.5-5.2)
10	Pancreas	36	2.2	4.2 (2.9-5.6)	4.0 (2.6-5.3)
		320	19.9		
	All	1,609	100.0	189.6 (180.4-198.9)	169.5 (161.0-178.0)

5.5 Mortality Rates by Gender, 2010-2014

Lung cancer and breast cancer had the highest mortality rates in males and females respectively, based on the mortality data from the Registry of Births and Deaths (RBD), Ministry of Home Affairs (MHA) (Tables 5.5.1 and 5.5.2).

Table 5.5.1: Ten Most Frequent Cancer Deaths in Males, 2010-2014 (Source: RBD, MHA)

Rank	Site	Number	%	CR (95% CI)	ASR (95% CI)
1	Lung	3,809	27.1	40.5 (39.2-41.8)	28.6 (27.7-29.5)
2	Colo-rectum	1,944	13.8	20.7 (19.8-21.6)	14.7 (14.0-15.3)
3	Liver	1,768	12.6	18.8 (17.9-19.7)	13.2 (12.6-13.8)
4	Stomach	887	6.3	9.4 (8.8-10.1)	6.6 (6.1-7.0)
5	Pancreas	741	5.3	7.9 (7.3-8.4)	5.5 (5.1-5.9)
6	Prostate	739	5.3	7.9 (7.3-8.4)	5.6 (5.2-6.0)
7	Nasopharynx	578	4.1	6.1 (5.6-6.6)	4.2 (3.9-4.6)
8	Lymphomas	445	3.2	4.7 (4.3-5.2)	3.4 (3.1-3.7)
9	Kidney & Other Urinary	406	2.9	4.3 (3.9-4.7)	3.0 (2.7-3.3)
10	Leukaemias	379	2.7	4.0 (3.6-4.4)	3.0 (2.7-3.4)
	All	14,039	100.0	149.3 (146.8-151.8)	105.8 (104.0-107.5)

Table 5.5.2: Ten Most Frequent Cancer Deaths in Females, 2010-2014 (Source: RBD, MHA)

Rank	Site	Number	%	CR (95% CI)	ASR (95% CI)
1	Breast	2,051	17.6	21.2 (20.2-22.1)	13.7 (13.1-14.3)
2	Lung	1,912	16.4	19.7 (18.8-20.6)	11.4 (10.9-11.9)
3	Colo-rectum	1,782	15.3	18.4 (17.5-19.2)	10.4 (9.9-10.9)
4	Liver	748	6.4	7.7 (7.2-8.3)	4.3 (4.0-4.6)
5	Stomach	693	5.9	7.2 (6.6-7.7)	4.0 (3.7-4.3)
6	Pancreas	667	5.7	6.9 (6.4-7.4)	4.0 (3.7-4.4)
7	Ovary, etc.	609	5.2	6.3 (5.8-6.8)	4.0 (3.6-4.3)
8	Cervix uteri	357	3.1	3.7 (3.3-4.1)	2.3 (2.1-2.6)
9	Lymphomas	295	2.5	3.0 (2.7-3.4)	1.9 (1.7-2.1)
10	Leukaemias	292	2.5	3.0 (2.7-3.4)	2.0 (1.8-2.3)
	All	11,663	100.0	120.3 (118.2-122.5)	72.2 (70.9-73.6)

6. Commentary on Selected Cancer Sites

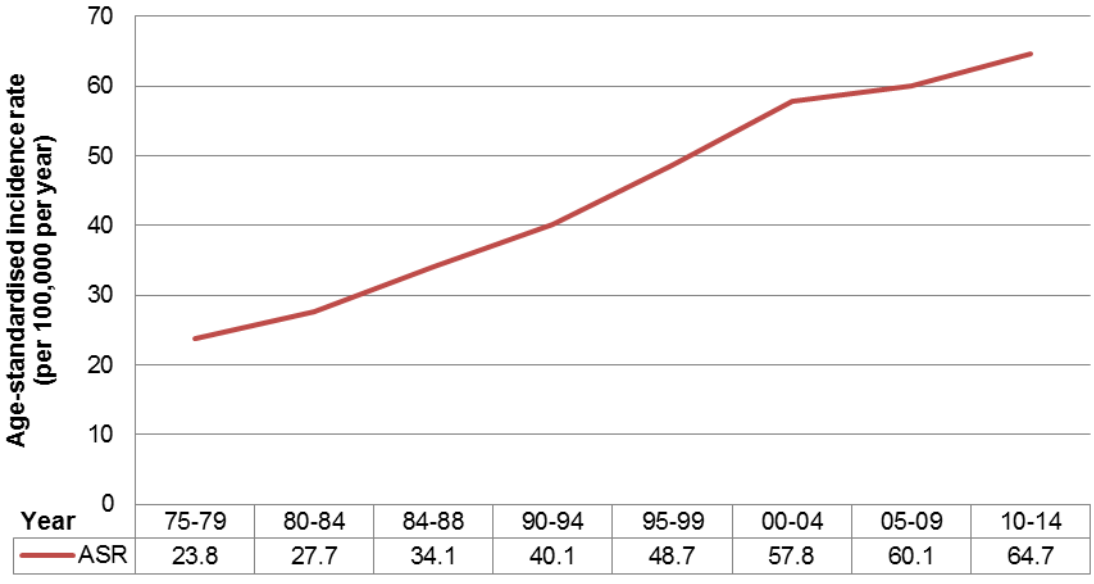
6.1 Female Breast Cancer

Incidence

The age-standardised incidence rate (ASIR) of newly diagnosed breast cancer in females had increased significantly over the years. It had increased almost three-fold from 23.8 per 100,000 in 1975-79 to 64.7 per 100,000 in 2010-2014 (Figure 6.1.1). The age-standardised incidence rate of non-invasive (in situ) breast cancer was 11.1 per 100,000 in 2005-2009 and 11.5 per 100,000 in 2010-2014 respectively (not shown in Figure 6.1.1). The incidence of breast cancer in Chinese females was higher compared to the Malays and Indians (Table 6.1.1).

The ethnic and age distribution of the incident cases was fairly similar for 2005-2009 and 2010-2014 (Table 6.1.2 and Table 6.1.3 respectively).

Figure 6.1.1: Age-Standardised Incidence Rates for Female Breast Cancer, 1975-2014



Year	75-79	80-84	84-88	90-94	95-99	00-04	05-09	10-14
ASR	23.8	27.7	34.1	40.1	48.7	57.8	60.1	64.7

Table 6.1.1: Crude and Age-Standardised Incidence Rates for Female Breast Cancer by Ethnic Group, 2010-2014

Ethnic Group	No.	CIR (95% CI)	ASIR (95% CI)
Chinese	7,476	103.4 (101.0-105.7)	66.0 (64.5-67.5)
Malay	985	76.9 (72.1-81.7)	60.4 (56.5-64.2)
Indian	580	68.4 (62.8-73.9)	58.8 (53.9-63.6)
Others	243	73.6 (64.4-82.9)	71.4 (61.0-81.8)
All	9,284	95.8 (93.8-97.7)	64.7 (63.4-66.0)

Table 6.1.2: Ethnic Distribution of Female Breast Cancer Patients, 2005-2014

Period	2005-2009		2010-2014	
Ethnicity	No. of cases	Percent (%)	No. of cases	Percent (%)
Chinese	6,047	80.8	7,476	80.5
Malay	845	11.3	985	10.6
Indian	441	5.9	580	6.3
Others	148	2.0	243	2.6
Total	7,481	100.0	9,284	100.0

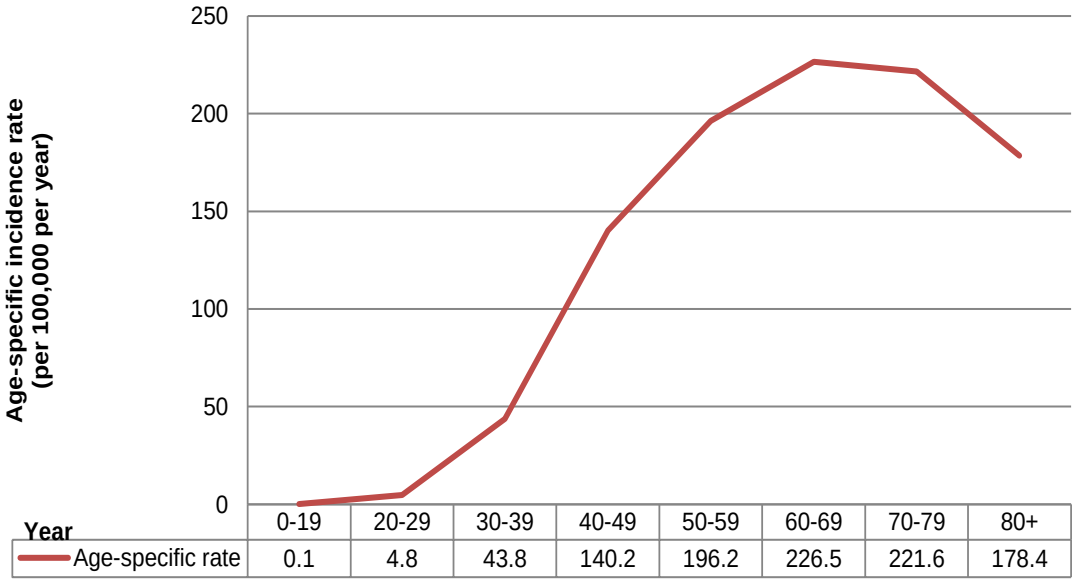
Table 6.1.3: Age Distribution of Female Breast Cancer Patients, 2005-2014

Period	2005-2009		2010-2014	
Age Group (years)	No. of cases	Percent (%)	No. of cases	Percent (%)
0-14	1	0.01	1	0.01
15-44	1,624	21.7	1,655	17.8
45-54	2,562	34.3	2,691	29.0
55-64	1,786	23.9	2,701	29.1
65-74	900	12.0	1,375	14.8
75+	608	8.1	861	9.3
Total	7,481	100.0	9,284	100.0

Age at Diagnosis

In the period of 2010-2014, the age-specific incidence rate of female breast cancer increased sharply from the 30-39 age group onwards, and peaked in the 60-69 age group. The rate then gradually declined in the 70 and above age groups (Figure 6.1.2).

Figure 6.1.2: Age-Specific Incidence Rates for Female Breast Cancer, 2010-2014

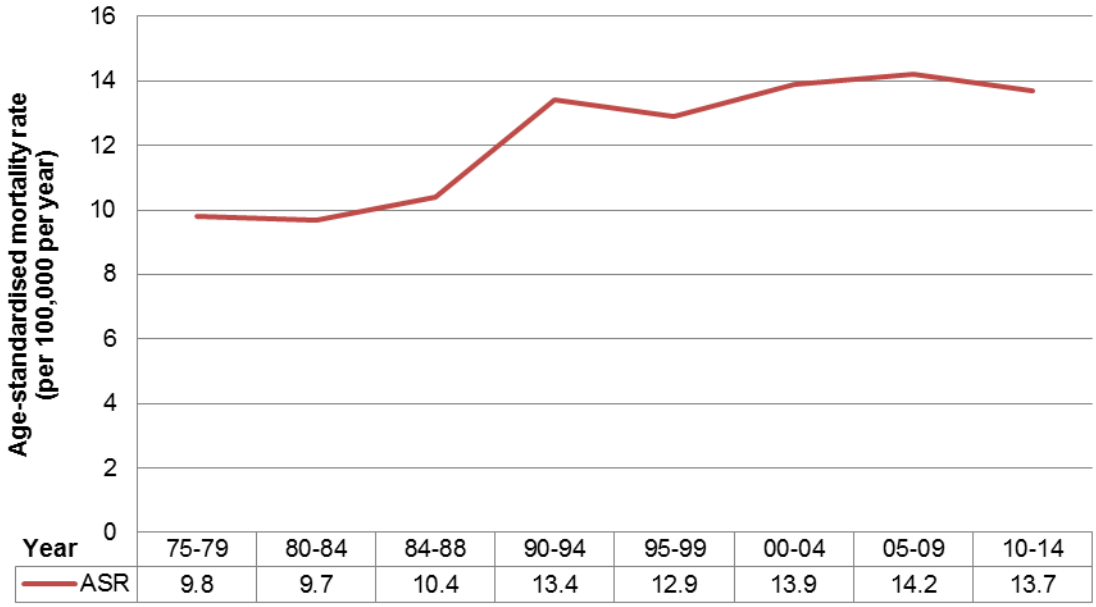


Year	0-19	20-29	30-39	40-49	50-59	60-69	70-79	80+
Age-specific rate	0.1	4.8	43.8	140.2	196.2	226.5	221.6	178.4

Mortality Rates

The age-standardised mortality rates of female breast cancer have remained relatively stable since 1990-1994 to 2010-2014 (Figure 6.1.3).

Figure 6.1.3: Age-Standardised Mortality Rates for Female Breast Cancer, 1975-2014



Year	75-79	80-84	84-88	90-94	95-99	00-04	05-09	10-14
ASR	9.8	9.7	10.4	13.4	12.9	13.9	14.2	13.7

Survival

Compared to the period 2005-2009, there was an increase in the survival of breast cancer patients among all ethnicities and for each age group except for those aged 65-74 in 2010-2014 (Table 6.1.4).

Table 6.1.4: 5-Year Age-Standardised Observed Survival of Female Breast Cancer by Ethnicity and Age Group, 2005-2014

	2005-2009	2010-2014
Ethnicity	**5yr ASOS (95% CI)**	**5yr ASOS (95% CI)**
All	67.52 (66.45, 68.56)	70.51 (69.58, 71.42)
Chinese	69.30 (68.14, 70.42)	72.73 (71.72, 73.72)
Malay	52.87 (49.30, 56.30)	53.69 (50.58, 56.70)
Indian	61.93 (56.83, 66.61)	66.17 (62.14, 69.89)

Age Group (years)	**5yr OS (95% CI)**	**5yr OS (95% CI)**
15-44	87.27 (85.48, 88.85)	88.97 (87.32,90.42)
45-54	84.44 (82.90, 85.86)	86.44 (85.07, 87.70)
55-64	78.57 (76.39, 80.58)	81.74 (80.04, 83.31)
65-74	73.78 (70.56, 76.71)	72.75 (70.00, 75.30)
75+	47.35 (42.85, 51.72)	54.74 (50.87, 58.43)

6.2 Cervical Cancer

Incidence

A total of 1,005 new cases of cervical cancer were diagnosed from 2010-2014. The incidence rate for cancer of the cervix has significantly declined since 1995-1999. The age-standardised incidence rates (ASIR) dropped from 16.6 per 100,000 in 1975-1979 to 7.1 per 100,000 in 2010-2014 (Figure 6.2.1). The incidence of cervical cancer in Indian women was lower compared to the Chinese and Malay women (Table 6.2.1).

The ethnic and age distribution of the incident cases was fairly similar for 2005-2009 and 2010-2014 (Table 6.2.2 and Table 6.2.3 respectively).

Figure 6.2.1: Age-Standardised Incidence Rates for Cervical Cancer, 1975-2014

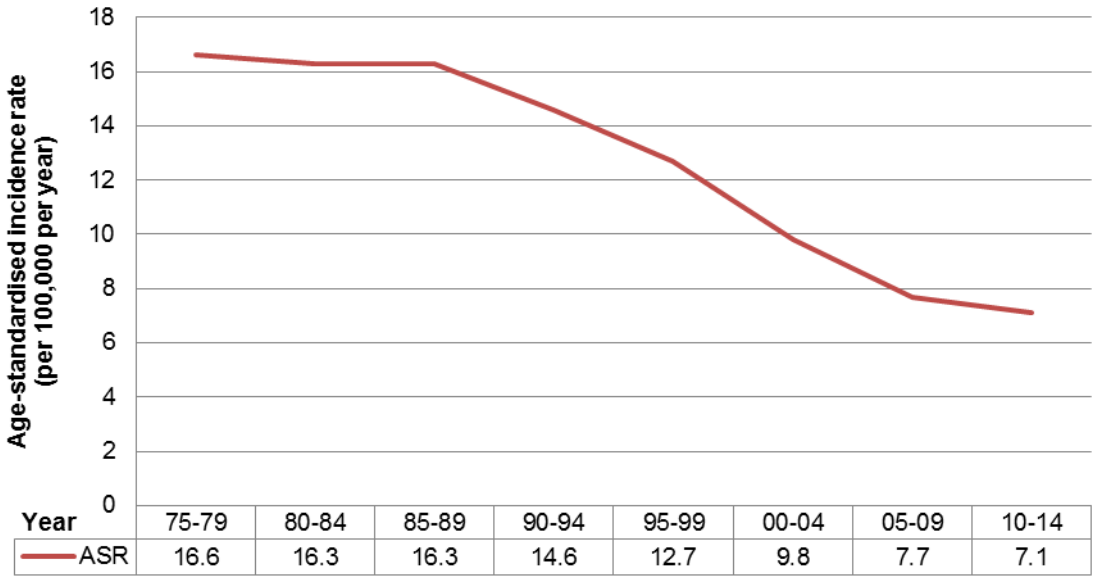


Table 6.2.1: Crude and Age-Standardised Incidence Rates for Cervical Cancer by Ethnic Group, 2010-2014

Ethnic Group	No.	CIR (95% CI)	ASIR (95% CI)
Chinese	820	11.3 (10.6-12.1)	7.3 (6.8-7.8)
Malay	120	9.4 (7.7-11.0)	7.8 (6.3-9.2)
Indian	33	3.9 (2.6-5.2)	3.6 (2.3-4.8)
Others	32	9.7 (6.3-13.1)	7.4 (4.6-10.3)
All	1,005	10.4 (9.7-11.0)	7.1 (6.6-7.5)

Table 6.2.2: Ethnic Distribution of Cervical Cancer Patients, 2005-2014

Period	2005-2009		2010-2014	
Ethnicity	No. of cases	Percent (%)	No. of cases	Percent (%)
Chinese	802	83.8	820	81.6
Malay	102	10.7	120	11.9
Indian	24	2.5	33	3.3
Others	29	3.0	32	3.2
Total	957	100.0	1,005	100.0

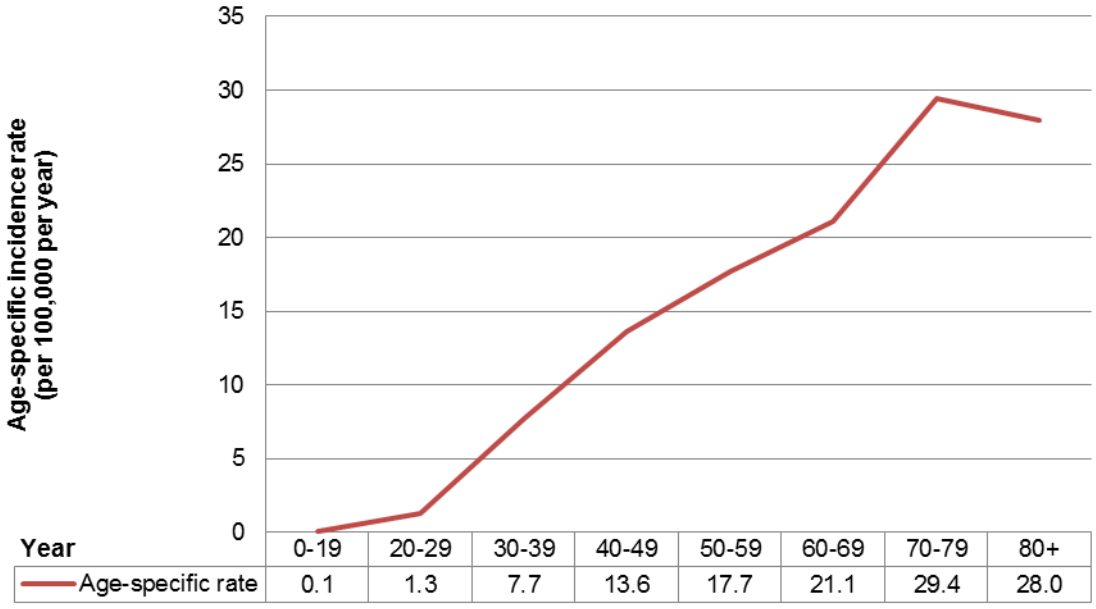
Table 6.2.3: Age Distribution of Cervical Cancer Patients, 2005-2014

Period	2005-2009		2010-2014	
Age Group (years)	No. of cases	Percent (%)	No. of cases	Percent (%)
0-14	0	0.0	1	0.1
15-44	206	21.5	238	23.7
45-54	241	25.2	240	23.9
55-64	182	19.0	229	22.8
65-74	182	19.0	176	17.5
75+	146	15.3	121	12.0
Total	957	100.0	1,005	100.0

Age at Diagnosis

In 2010-2014, the age-specific incidence rate of cervical cancer was lowest in those aged 0-19, at 0.1 per 100,000 compared to 29.4 per 100,000 in those aged 70-79 (Figure 6.2.2).

Figure 6.2.2: Age-Specific Incidence Rates for Cervical Cancer, 2010-2014

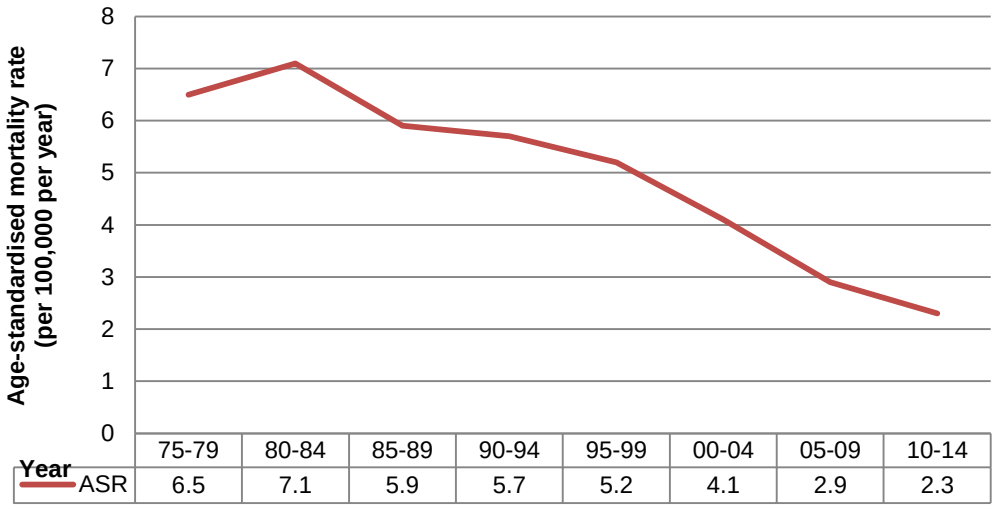


Year	0-19	20-29	30-39	40-49	50-59	60-69	70-79	80+
Age-specific rate	0.1	1.3	7.7	13.6	17.7	21.1	29.4	28.0

Mortality Rates

In 2010-2014, cervical cancer had the 8th highest cancer mortality rate in Singapore with 357 deaths. The age-standardised mortality rate for cervical cancer was 6.5 per 100,000 per year for the period 1975-1979, and this decreased progressively to 2.3 per 100,000 for the period 2010-2014 (Figure 6.2.3).

Figure 6.2.3: Age-Standardised Mortality Rates for Cervical Cancer, 1975-2014



Year	75-79	80-84	85-89	90-94	95-99	00-04	05-09	10-14
ASR	6.5	7.1	5.9	5.7	5.2	4.1	2.9	2.3

Survival

Compared to the period 2005-2009, there was an overall decrease in the survival of cervical cancer patients in 2010-2014. The decrease was observed in all ethnicities, particularly for the Indians. This decrease was observed for all age groups except for those aged 45-54 (Table 6.2.4).

Table 6.2.4: 5-Year Age-Standardised Observed Survival of Cervical Cancer by Ethnicity and Age Group, 2005-2014

	2005-2009	2010-2014
Ethnicity	**5yr ASOS (95% CI)**	**5yr ASOS (95% CI)**
All	58.57 (55.68, 61.34)	53.60 (50.65, 56.46)
Chinese	59.83 (56.71, 62.80)	55.68 (52.45, 58.79)
Malay	43.52 (34.48, 52.21)	41.64 (32.63, 50.38)
Indian	67.17 (46.96, 81.10)	37.62 (21.82, 53.38)

Age Group (years)	**5yr OS (95% CI)**	**5yr OS (95% CI)**
15-44	81.79 (76.03, 86.29)	76.09 (69.84,81.23)
45-54	69.68 (63.85, 74.76)	71.62 (65.30, 77.00)
55-64	66.50 (59.23, 72.78)	63.24 (56.14, 69.51)
65-74	54.96 (47.58, 61.73)	52.47 (44.56, 59.77)
75+	36.86 (28.21, 45.52)	27.16 (20.01, 34.77)

6.3 Colorectal Cancer

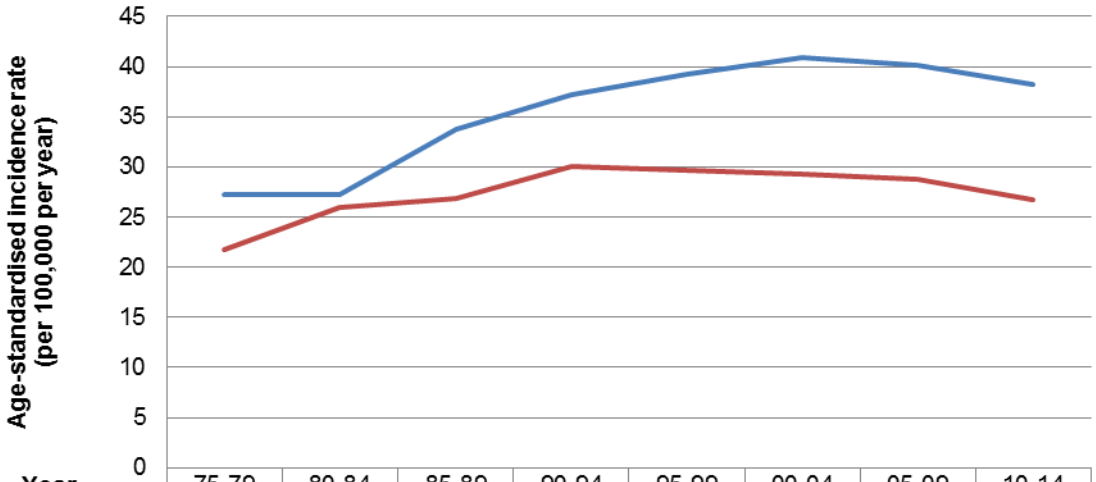
Incidence

A total of 9,324 new cases of colorectal cancer were diagnosed from 2010-2014. The age-standardised incidence rates for colorectal cancer for both males and females have climbed consistently since 1975. However, the rates appeared to have plateaued since 2000-2004 (Figure 6.3.1).

Amongst the 3 ethnic groups, the age-standardised incidence rate was highest among the Chinese (Table 6.3.1).

The ethnic and age distribution of the incident cases was fairly similar for 2005-2009 and 2010-2014 in both genders (Table 6.3.2 and Table 6.3.3 respectively).

Figure 6.3.1: Age-Standardised Incidence Rates for Colorectal Cancer by Gender, 1975-2014



Year	75-79	80-84	85-89	90-94	95-99	00-04	05-09	10-14
Male	27.2	27.3	33.7	37.2	39.2	40.9	40.2	38.2
Female	21.7	26	26.9	30.1	29.7	29.3	28.8	26.7

Table 6.3.1: Crude and Age-Standardised Incidence Rates for Colorectal Cancer by Ethnic Group, 2010-2014

Ethnic Group	No.	CIR (95% CI)	ASIR (95% CI)
Chinese	8,070	57.0 (55.7-58.2)	34.1 (33.3-34.8)
Malay	776	30.4 (28.3-32.6)	26.1 (24.2-28.0)
Indian	307	17.5 (15.6-19.5)	16.1 (14.2-18.0)
Others	171	27.1 (23.1-31.2)	32.9 (27.5-38.3)
All	9,324	48.8 (47.8-49.8)	32.1 (31.5-32.8)

Table 6.3.2: Ethnic Distribution of Colorectal Cancer Patients, 2005-2014

a) Males

Period	2005-2009		2010-2014	
Ethnicity	No. of cases	Percent (%)	No. of cases	Percent (%)
Chinese	3,763	88.2	4,436	86.9
Malay	294	6.9	392	7.7
Indian	156	3.6	182	3.6
Others	55	1.3	93	1.8
Total	4,268	100.0	5,103	100.0

b) Females

Period	2005-2009		2010-2014	
Ethnicity	No. of cases	Percent (%)	No. of cases	Percent (%)
Chinese	3,298	89.9	3,634	86.1
Malay	235	6.4	384	9.1
Indian	94	2.6	125	3.0
Others	42	1.1	78	1.8
Total	3,669	100.0	4,221	100.0

Table 6.3.3: Age Distribution of Colorectal Cancer Patients, 2005-2014

a) Males

Period	2005-2009		2010-2014	
Age Group (years)	No. of cases	Percent (%)	No. of cases	Percent (%)
0-14	0	0.0	1	0.02
15-44	221	5.2	228	4.5
45-54	679	15.9	688	13.5
55-64	1,095	25.7	1,495	29.3
65-74	1,222	28.6	1,436	28.1
75+	1,051	24.6	1,255	24.6
Total	4,268	100.0	5,103	100.0

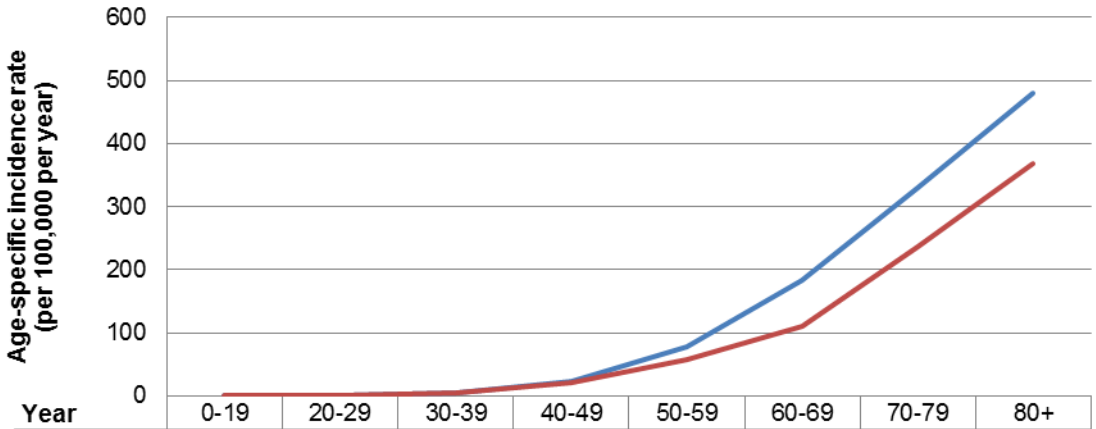
b) Females

Period	2005-2009		2010-2014	
Age Group (years)	No. of cases	Percent (%)	No. of cases	Percent (%)
0-14	0	0.0	1	0.02
15-44	201	5.5	214	5.1
45-54	509	13.9	552	13.1
55-64	790	21.5	1,021	24.2
65-74	903	24.6	984	23.3
75+	1,266	34.5	1,449	34.3
Total	3,669	100.0	4,221	100.0

Age at Diagnosis

In 2010-2014, the age-specific incidence rate of colorectal cancer in males was lowest in those aged 0-19, at 0.2 per 100,000 compared to 479.4 per 100,000 in those aged 80 and above. The trend was similar for the females (Figure 6.3.2).

Figure 6.3.2: Age-Specific Incidence Rates for Colorectal Cancer, 2010-2014

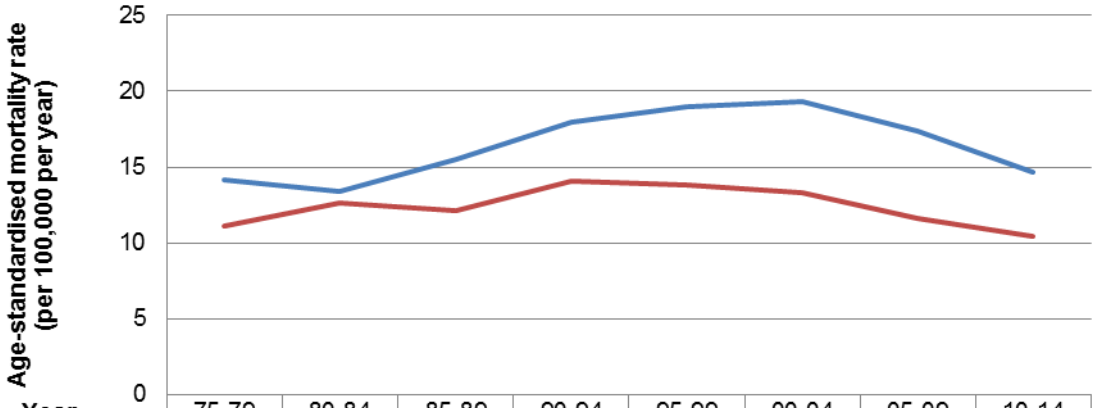


Year	0-19	20-29	30-39	40-49	50-59	60-69	70-79	80+
Male	0.2	1.5	5.5	22.5	77.5	183.3	330	479.4
Female	0.4	1.3	4.8	20	56.8	110.4	235.4	368.2

Mortality Rates

In 2010-2014, colorectal cancer had the 2nd highest cancer mortality rate among males and 3rd highest cancer mortality rate among females in Singapore. There were a total of 3,726 deaths (1,944 in males and 1,782 in females) during this period. The age-standardised mortality rate for colorectal cancer appeared to have declined in both genders over the recent years (Figure 6.3.3), probably attributed to advances in treatment such as adjuvant therapy combining chemo and radiotherapy, and total mesorectal excision.

Figure 6.3.3: Age-Standardised Mortality Rates for Colorectal Cancer, 1975-2014



Year	75-79	80-84	85-89	90-94	95-99	00-04	05-09	10-14
Male	14.2	13.4	15.5	18	19	19.3	17.4	14.7
Female	11.1	12.6	12.1	14.1	13.8	13.3	11.6	10.4

Survival

Compared to the period 2005-2009, there was a general increase in the overall survival of both male and female colorectal cancer patients in 2010-2014. This was particularly so for the Chinese males, Malay and Indian females. However, there was a slight decrease in the survival of Malay males. All age groups experienced an increase in survival in both genders (Table 6.3.4).

Table 6.3.4: 5-Year Age-Standardised Observed Survival of Colorectal Cancer by Ethnicity and Age Group, 2005-2014

a) Males

	2005-2009	2010-2014
Ethnicity	**5yr ASOS (95% CI)**	**5yr ASOS (95% CI)**
All	45.96 (44.38, 47.51)	50.77 (49.34, 52.19)
Chinese	45.91 (44.24, 47.56)	51.23 (49.70, 52.74)
Malay	41.43 (35.38, 47.36)	41.15 (35.80, 46.40)
Indian	54.15 (45.32, 62.16)	56.44 (48.96, 63.25)

Age Group (years)	**5yr OS (95% CI)**	**5yr OS (95% CI)**
15-44	58.63 (51.76, 64.86)	65.16 (58.05, 71.37)
45-54	61.72 (57.64, 65.53)	66.35 (62.69, 69.73)
55-64	56.36 (53.12, 59.46)	63.30 (60.60, 65.87)
65-74	48.03 (45.03, 50.96)	53.60 (50.82, 56.30)
75+	32.20 (29.15, 35.28)	35.39 (32.56, 38.22)

b) Females

	2005-2009	2010-2014
Ethnicity	**5yr ASOS (95% CI)**	**5yr ASOS (95% CI)**
All	50.89 (49.16, 52.58)	53.21 (51.62, 54.76)
Chinese	51.82 (50.00, 53.61)	53.57 (51.88, 55.23)
Malay	36.22 (30.12, 42.35)	43.43 (37.90, 48.82)
Indian	43.70 (33.33, 53.60)	61.39 (51.32, 69.99)

Age Group (years)	**5yr OS (95% CI)**	**5yr OS (95% CI)**
15-44	59.32 (51.50, 66.31)	65.50 (58.41, 71.67)
45-54	63.84 (59.42, 67.92)	64.68 (60.35, 68.66)
55-64	62.87 (59.07, 66.41)	64.61 (61.39, 67.63)
65-74	55.86 (52.42, 59.15)	59.56 (56.30, 62.67)
75+	35.45 (32.57, 38.33)	37.51 (34.88, 40.14)

6.4 Ovarian Cancer

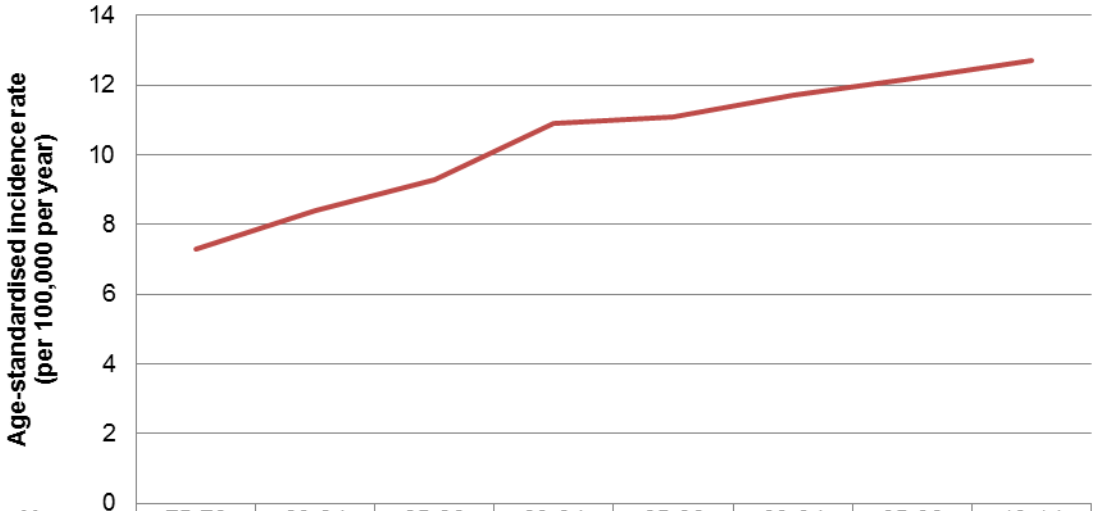
Incidence

A total of 1,719 new cases of ovarian cancer were diagnosed from 2010-2014. The age-standardised incidence rate for ovarian cancer had climbed consistently over the last forty years from 7.3 per 100,000 in 1975-1979 to 12.7 per 100,000 in 2010-2014 (Figure 6.4.1).

Amongst the ethnic groups, the age-standardised incidence rate was the highest among the Chinese and Malays (Table 6.4.1).

The ethnic and age distribution of the incident cases was fairly similar for 2005-2009 and 2010-2014 (Table 6.4.2 and Table 6.4.3 respectively).

Figure 6.4.1: Age-Standardised Incidence Rates for Ovarian Cancer, 1975-2014



Year	75-79	80-84	85-89	90-94	95-99	00-04	05-09	10-14
ASR	7.3	8.4	9.3	10.9	11.1	11.7	12.2	12.7

Table 6.4.1: Crude and Age-Standardised Incidence Rates for Ovarian Cancer by Ethnic Group, 2010-2014

Ethnic Group	No.	CIR (95% CI)	ASIR (95% CI)
Chinese	1,345	18.6 (17.6-19.6)	12.6 (11.9-13.4)
Malay	248	19.4 (17.0-21.8)	15.6 (13.6-17.6)
Indian	95	11.2 (8.9-13.4)	9.9 (7.9-12.0)
Others	31	9.4 (6.1-12.7)	7.7 (4.7-10.7)
All	1,719	17.7 (16.9-18.6)	12.7 (12.1-13.3)

Table 6.4.2: Ethnic Distribution of Ovarian Cancer Patients, 2005-2014

Period	2005-2009		2010-2014	
Ethnicity	No. of cases	Percent (%)	No. of cases	Percent (%)
Chinese	1,144	79.7	1,345	78.3
Malay	182	12.7	248	14.4
Indian	81	5.6	95	5.5
Others	29	2.0	31	1.8
Total	1,436	100.0	1,719	100.0

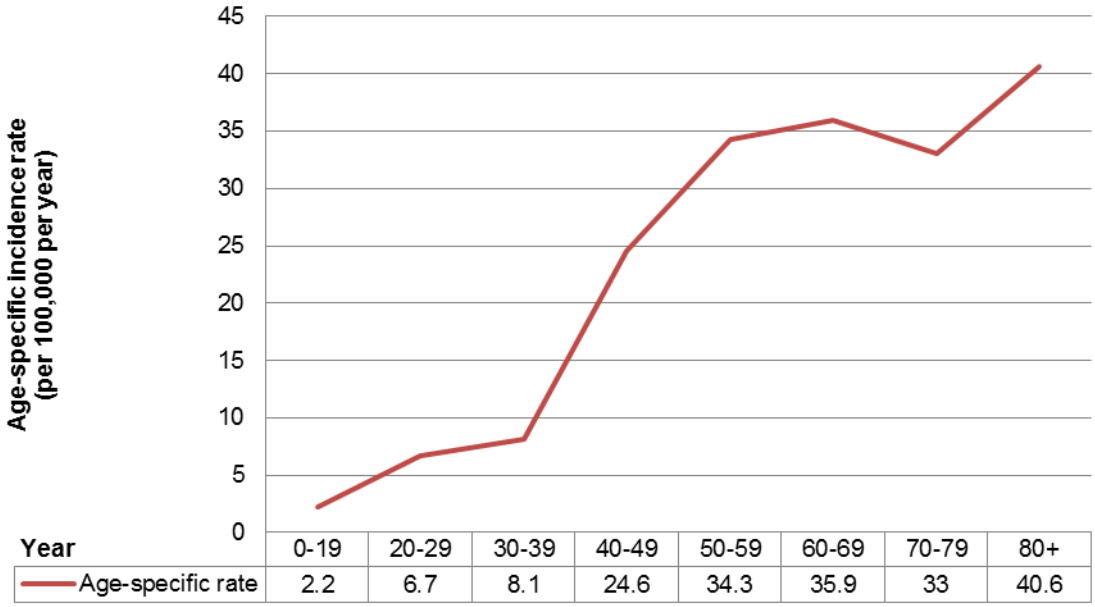
Table 6.4.3: Age Distribution of Ovarian Cancer Patients, 2005-2014

Period	2005-2009		2010-2014	
Age Group (years)	No. of cases	Percent (%)	No. of cases	Percent (%)
0-14	12	0.8	20	1.2
15-44	380	26.5	402	23.4
45-54	430	29.9	485	28.2
55-64	310	21.6	433	25.2
65-74	165	11.5	214	12.4
75+	139	9.7	165	9.6
Total	1,436	100.0	1,719	100.0

Age at Diagnosis

In 2010-2014, the age-specific incidence rate of ovarian cancer was lowest in those aged 0-19, at 2.2 per 100,000 compared to 40.6 per 100,000 in those aged 80 and above. Of note, the age-specific incidence rate rose steeply from 8.1 per 100,000 in those aged 30-39 to 24.6 per 100,000 in those aged 40-49 (Figure 6.4.2).

Figure 6.4.2: Age-Specific Incidence Rates for Ovarian Cancer, 2010-2014

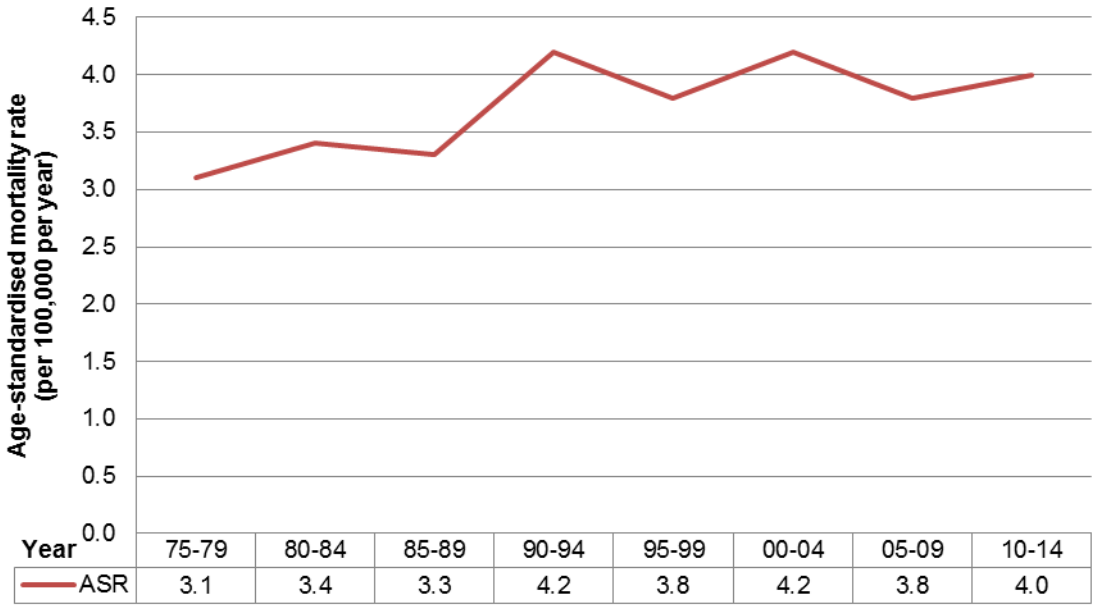


Year	0-19	20-29	30-39	40-49	50-59	60-69	70-79	80+
Age-specific rate	2.2	6.7	8.1	24.6	34.3	35.9	33	40.6

Mortality Rates

In 2010-2014, ovarian cancer had the 7th highest cancer mortality rate in females in Singapore with 609 deaths. The age-standardised mortality rate for ovarian cancer had remained fairly stable from 1995-1999 to 2010-2014 (Figure 6.4.3).

Figure 6.4.3: Age-Standardised Mortality Rates for Ovarian Cancer, 1975-2014



Year	75-79	80-84	85-89	90-94	95-99	00-04	05-09	10-14
ASR	3.1	3.4	3.3	4.2	3.8	4.2	3.8	4.0

Survival

Compared to the period 2005-2009, there was an overall decrease in the survival of ovarian cancer in 2010-2014. The survival varied between different age groups and ethnicities. There was a decrease in survival in the Chinese but an increase in the Indians. For the age groups, there was a decrease in survival in those aged 55-64 and 75+ but an increase in those aged 15-44, 45-54 and 65-74 (Table 6.4.4).

Table 6.4.4: 5-Year Age-Standardised Observed Survival of Ovarian Cancer by Ethnicity and Age Group, 2005-2014

	2005-2009	2010-2014
Ethnicity	**5yr ASOS (95% CI)**	**5yr ASOS (95% CI)**
All	40.66 (38.08, 43.22)	34.56 (32.34, 36.79)
Chinese	43.91 (40.98, 46.81)	35.48 (32.95, 38.02)
Malay	27.36 (20.85, 34.26)	24.60 (19.26, 30.31)
Indian	28.09 (19.28, 37.55)	34.51 (26.24, 42.91)

Age Group (years)	**5yr OS (95% CI)**	**5yr OS (95% CI)**
15-44	75.90 (70.21, 80.66)	81.47 (75.69, 86.01)
45-54	64.48 (58.76, 69.61)	71.68 (66.55, 76.17)
55-64	57.86 (50.94, 64.16)	51.47 (45.84, 56.80)
65-74	38.62 (30.22, 46.93)	43.03 (35.16, 50.65)
75+	24.21 (16.47, 32.77)	9.30 (5.56, 14.21)

6.5 Uterine Cancer

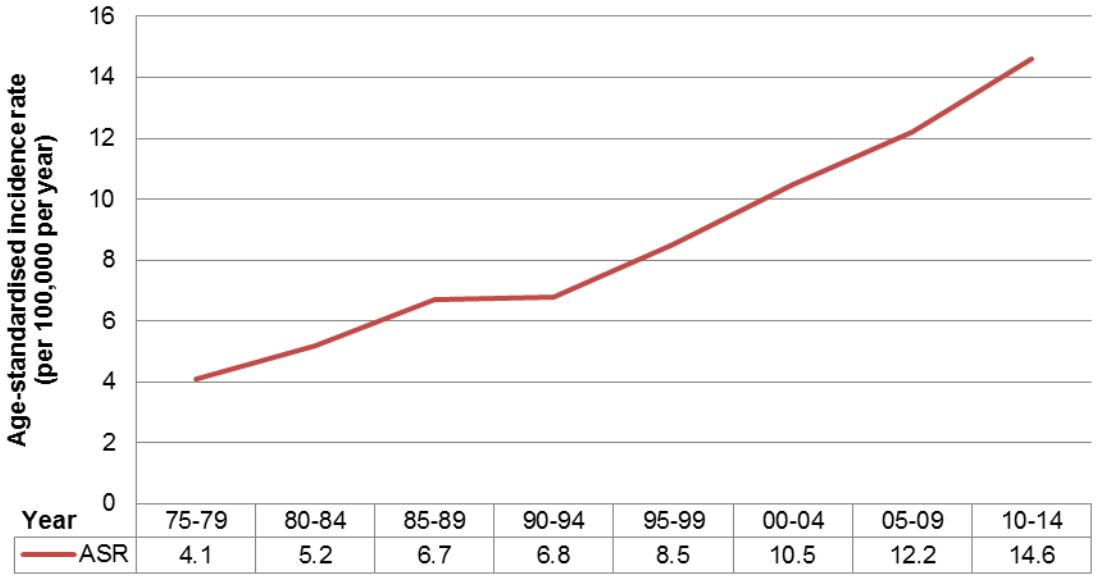
Incidence

A total of 2,089 new cases of uterine cancer were diagnosed in 2010-2014. The age-standardised incidence rate for uterine cancer has increased significantly over the last forty years from 4.1 per 100,000 in 1975-1979 to 14.6 per 100,000 in 2010-2014 (Figure 6.5.1).

Amongst the ethnic groups, the age-standardised incidence rate was highest among the Indians (Table 6.5.1).

The ethnic and age distribution of the incident cases was fairly similar for 2005-2009 and 2010-2014 (Table 6.5.2 and Table 6.5.3 respectively).

Figure 6.5.1: Age-Standardised Incidence Rates for Uterine Cancer, 1975-2014



Year	75-79	80-84	85-89	90-94	95-99	00-04	05-09	10-14
ASR	4.1	5.2	6.7	6.8	8.5	10.5	12.2	14.6

Table 6.5.1: Crude and Age-Standardised Incidence Rates for Uterine Cancer by Ethnic Group, 2010-2014

Ethnic Group	No.	CIR (95% CI)	ASIR (95% CI)
Chinese	1,625	22.5 (21.4-23.6)	14.4 (13.7-15.1)
Malay	259	20.2 (17.8-22.7)	15.8 (13.8-17.8)
Indian	165	19.4 (16.5-22.4)	17.3 (14.6-20.0)
Others	40	12.1 (8.4-15.9)	11.3 (7.4-15.2)
All	2,089	21.6 (20.6-22.5)	14.6 (14.0-15.2)

Table 6.5.2: Ethnic Distribution of Uterine Cancer Patients, 2005-2014

Period	2005-2009		2010-2014	
Ethnicity	No. of cases	Percent (%)	No. of cases	Percent (%)
Chinese	1,220	81.6	1,625	77.8
Malay	156	10.4	259	12.4
Indian	100	6.7	165	7.9
Others	20	1.3	40	1.9
Total	1,496	100.0	2,089	100.0

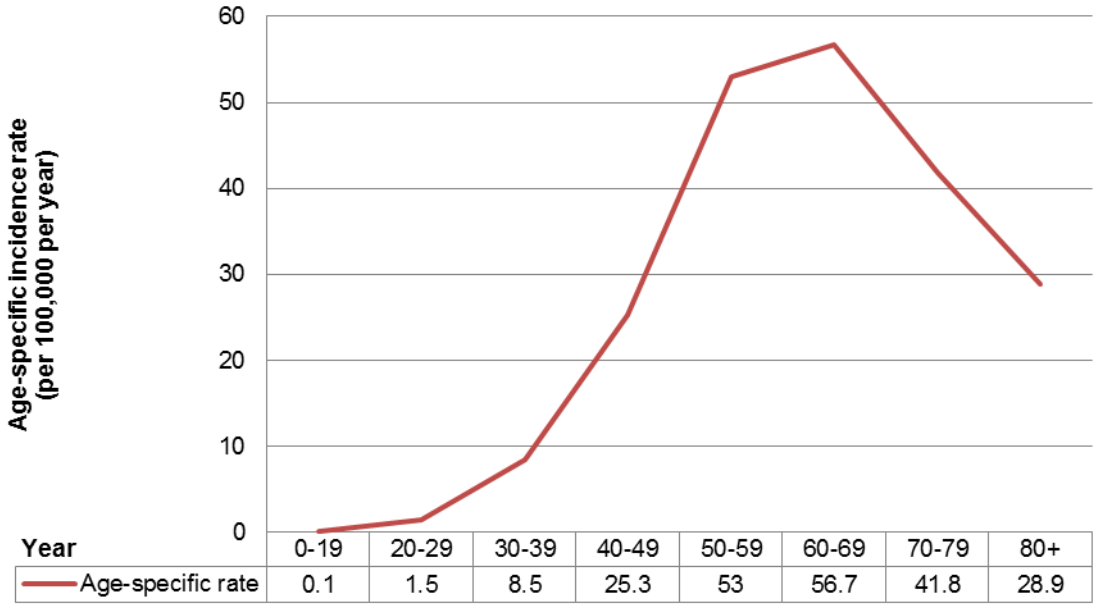
Table 6.5.3: Age Distribution of Uterine Cancer Patients, 2005-2014

Period	2005-2009		2010-2014	
Age Group (years)	No. of cases	Percent (%)	No. of cases	Percent (%)
0-14	0	0.0	0	0.0
15-44	230	15.4	327	15.7
45-54	498	33.3	628	30.1
55-64	434	29.0	681	32.6
65-74	229	15.3	310	14.8
75+	105	7.0	143	6.8
Total	1,496	100.0	2,089	100.0

Age at Diagnosis

In 2010-2014, the age-specific incidence rate of uterine cancer was lowest in those aged 0-19, at 0.1 per 100,000 and the highest in those aged 60-69 at 56.7 per 100,000 resident population (Figure 6.5.2).

Figure 6.5.2: Age-Specific Incidence Rates for Uterine Cancer, 2010-2014

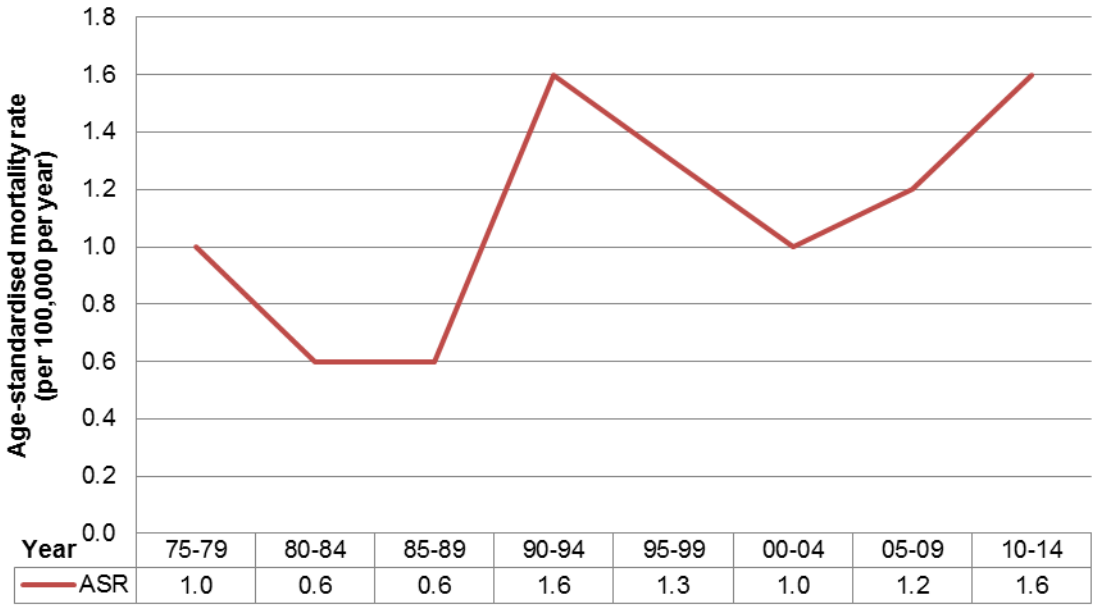


Year	0-19	20-29	30-39	40-49	50-59	60-69	70-79	80+
Age-specific rate	0.1	1.5	8.5	25.3	53	56.7	41.8	28.9

Mortality Rates

In 2010-2014, uterine cancer had the 11th highest cancer mortality rate in Singapore with 215 deaths. The rates had been fluctuating over the years from 1975-1979 to 2010-2014 (Figure 6.5.3).

Figure 6.5.3: Age-Standardised Mortality Rates for Uterine Cancer, 1975-2014



Year	75-79	80-84	85-89	90-94	95-99	00-04	05-09	10-14
ASR	1.0	0.6	0.6	1.6	1.3	1.0	1.2	1.6

Survival

Compared to the period 2005-2009, there was an overall increase in the survival of uterine cancer in 2010-2014. The survival of uterine cancer patients varied between different age groups and ethnicities. There was a decrease in survival in the Malays but survival for Chinese and Indians increased. For the age groups, there was an increase in those aged 45-54, 65-74 and 75+ but a decrease in those aged 15-44 and 55-64 (Table 6.5.4).

Table 6.5.4: 5-Year Age-Standardised Observed Survival of Uterine Cancer by Ethnicity and Age Group, 2005-2014

	2005-2009	2010-2014
Ethnicity	**5yr ASOS (95% CI)**	**5yr ASOS (95% CI)**
All	62.94 (60.44, 65.32)	64.45 (62.34, 66.47)
Chinese	64.29 (61.54, 66.89)	67.35 (65.02, 69.56)
Malay	55.79 (47.92, 62.95)	47.17 (40.41, 53.62)
Indian	57.69 (45.97, 67.74)	69.71 (61.82, 76.28)

Age Group (years)	**5yr OS (95% CI)**	**5yr OS (95% CI)**
15-44	93.25 (88.86, 95.95)	92.23 (88.17, 94.93)
45-54	86.86 (83.39, 89.66)	88.16 (85.09, 90.64)
55-64	81.75 (77.28, 85.42)	76.84 (73.17, 80.09)
65-74	65.82 (58.63, 72.06)	68.18 (61.97, 73.60)
75+	39.36 (28.98, 49.57)	45.16 (36.18, 53.70)

6.6 Prostate Cancer

Incidence

A total of 3,694 new cases of prostate cancer were diagnosed in 2010-2014. The age-standardised incidence rate for prostate cancer has increased significantly over the last forty years from 5.7 per 100,000 in 1975-1979 to 28.5 per 100,000 in 2010-2014 (Figure 6.6.1). The rapid rise in prostate cancer incidence in the 1990s can be partly attributed to the advent of the prostate specific antigen (PSA) test. The rates of prostate cancer overdiagnosis due to PSA testing for cases diagnosed in the US between 1988 and 1998 were estimated by a simulation model[3]. Overdiagnosis in the study was defined as the detection of prostate cancer through PSA testing that otherwise would not have been diagnosed within the patient's lifetime. Overdiagnosis rates were found to be approximately 29% for white men and 44% for black men.

Amongst the ethnic groups, the age-standardised incidence rate was highest among the Chinese (Table 6.6.1). The ethnic and age distribution of the incident cases was fairly similar for 2005-2009 and 2010-2014 (Table 6.6.2 and Table 6.6.3 respectively).

[3] Etzioni R, Penson DF, Legler JM et al. (2002) Overdiagnosis due to prostate-specific antigen screening: Lessons from US Prostate Cancer Incidence Trends. JNCI 94(13): 981-990.

Figure 6.6.1: Age-Standardised Incidence Rates for Prostate Cancer, 1975-2014

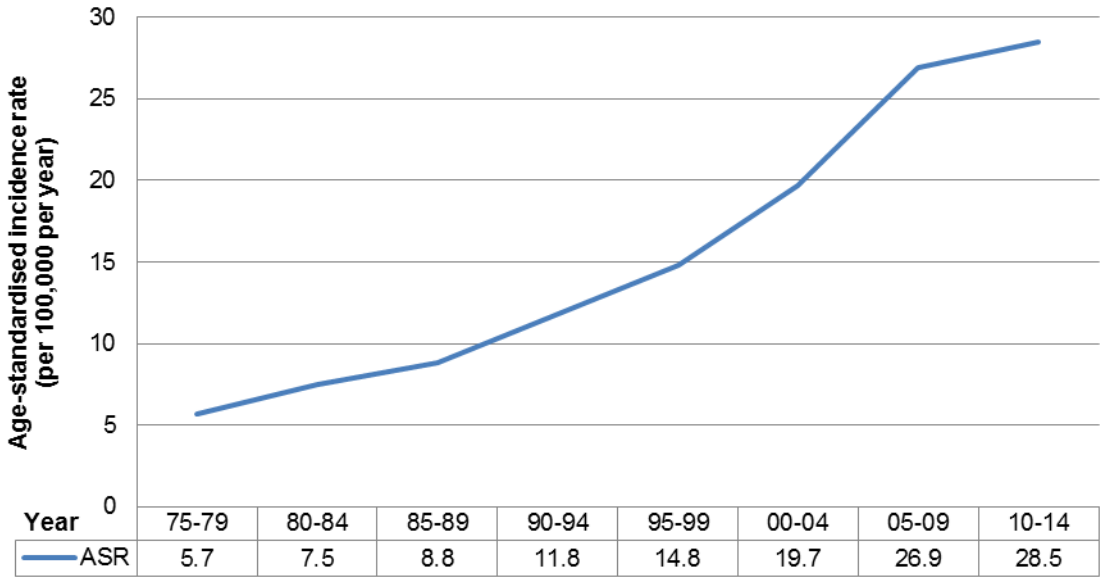


Table 6.6.1: Crude and Age-Standardised Incidence Rates for Prostate Cancer by Ethnic Group, 2010-2014

Ethnic Group	No.	CIR (95% CI)	ASIR (95% CI)
Chinese	3,175	45.8 (44.2-47.4)	29.8 (28.8-30.9)
Malay	239	18.8 (16.5-21.2)	19.1 (16.6-21.6)
Indian	165	18.3 (15.5-21.0)	19.6 (16.5-22.7)
Others	115	38.3 (31.3-45.3)	50.7 (41.1-60.4)
All	3,694	39.3 (38.0-40.6)	28.5 (27.6-29.4)

Table 6.6.2: Ethnic Distribution of Prostate Cancer Patients, 2005-2014

Period	2005-2009		2010-2014	
Ethnicity	No. of cases	Percent (%)	No. of cases	Percent (%)
Chinese	2,287	84.9	3,175	85.9
Malay	201	7.5	239	6.5
Indian	133	4.9	165	4.5
Others	73	2.7	115	3.1
Total	2,694	100.0	3,694	100.0

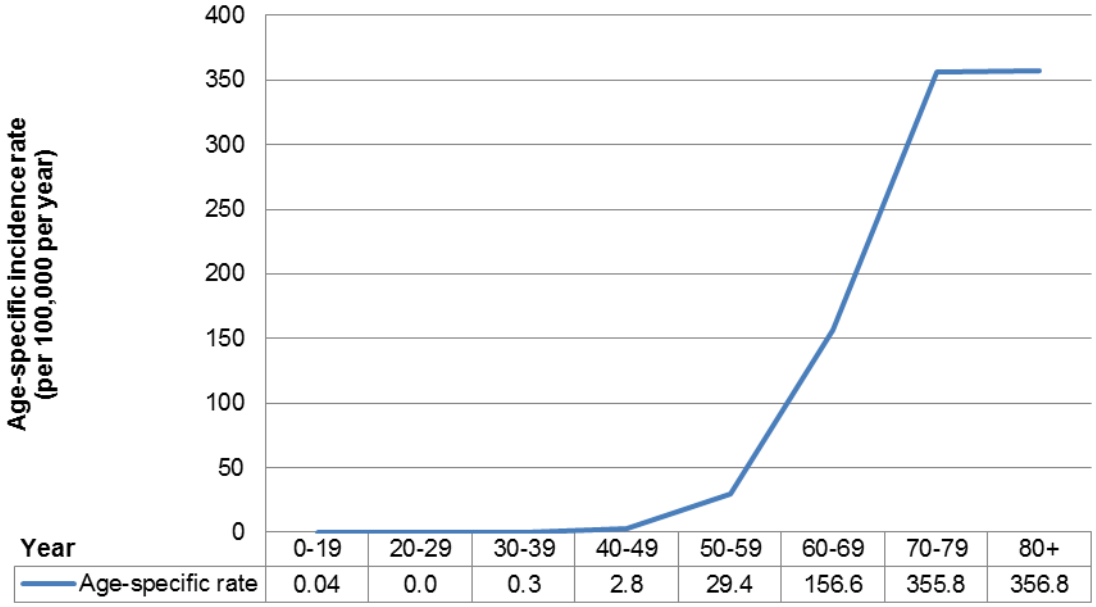
Table 6.6.3: Age Distribution of Prostate Cancer Patients, 2005-2014

Period	2005-2009		2010-2014	
Age Group (years)	No. of cases	Percent (%)	No. of cases	Percent (%)
0-14	0	0.0	0	0.0
15-44	8	0.3	13	0.4
45-54	108	4.0	144	3.9
55-64	688	25.5	909	24.6
65-74	1,088	40.4	1,526	41.3
75+	802	29.8	1,102	29.8
Total	2,694	100.0	3,694	100.0

Age at Diagnosis

In 2010-2014, the age-specific incidence rate of prostate cancer rose steeply from 2.8 per 100,000 in those aged 40-49 to 355.8 per 100,000 in those aged 70-79 (Figure 6.6.2).

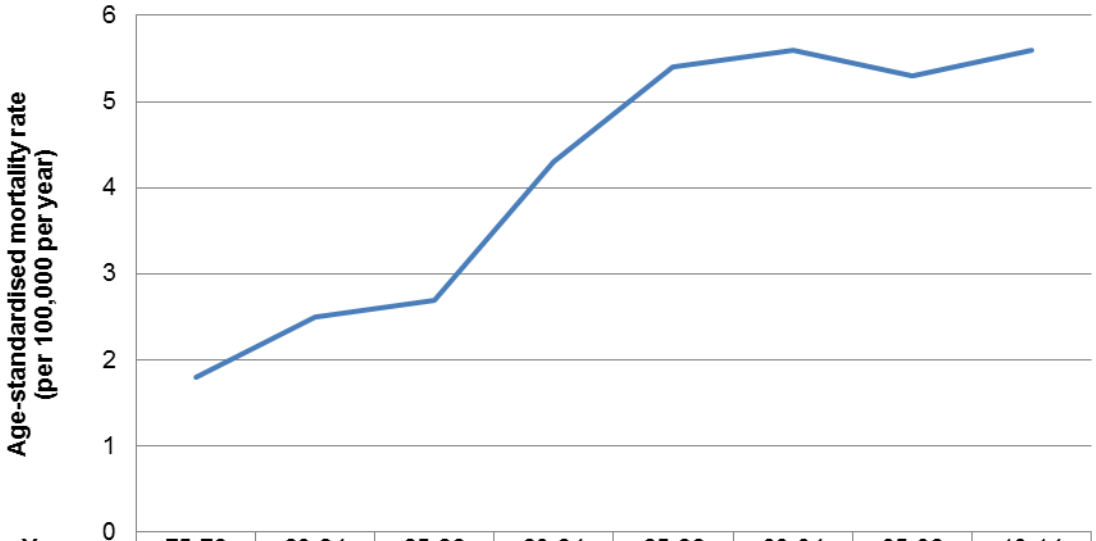
Figure 6.6.2: Age-Specific Incidence Rates for Prostate Cancer, 2010-2014



Mortality Rates

In 2010-2014, prostate cancer had the 6th highest cancer mortality rate in males in Singapore with 739 deaths. There was an increase in the age-standardised mortality rate for prostate cancer since 1985-1989 which then stablised in 1995-1999 onwards. This is probably due to the increased incidence of prostate cancer (Figure 6.6.3).

Figure 6.6.3: Age-Standardised Mortality Rates for Prostate Cancer, 1975-2014



Year	75-79	80-84	85-89	90-94	95-99	00-04	05-09	10-14
ASR	1.8	2.5	2.7	4.3	5.4	5.6	5.3	5.6

Survival

Compared to the period 2005-2009, there was an overall increase in the survival of prostate cancer patients in 2010-2014. The survival varied between different ethnicities. The Chinese and Malays experienced an increase while the Indians experienced a decrease (Table 6.6.4).

Table 6.6.4: 5-Year Age-Standardised Observed Survival of Prostate Cancer by Ethnicity and Age Group, 2005 - 2014

	2005-2009	2010-2014
Ethnicity	**5yr ASOS (95% CI)**	**5yr ASOS (95% CI)**
All	72.01 (70.00, 73.92)	74.96 (73.42, 76.43)
Chinese	73.44 (71.24, 75.49)	76.36 (74.73, 77.91)
Malay	52.34 (44.88, 59.25)	59.46 (52.30, 65.90)
Indian	75.28 (65.99, 82.37)	63.93 (55.69, 71.04)

Age Group (years)	**5yr OS (95% CI)**	**5yr OS (95% CI)**
15-54	88.55 (80.20, 93.52)	90.92 (84.85, 94.64)
55-64	85.71 (82.24, 88.54)	86.48 (83.91, 88.66)
65-74	76.65 (73.60, 79.40)	80.59 (78.30, 82.68)
75+	47.76 (43.70, 51.70)	53.55 (50.28, 56.69)

6.7 Lung Cancer

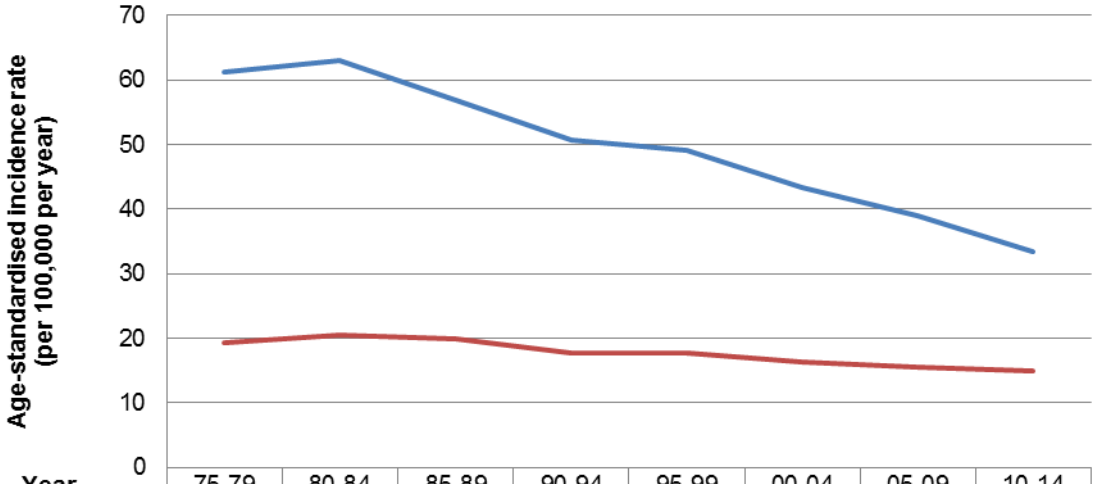
Incidence

A total of 6,853 new cases of lung cancer were diagnosed from 2010-2014. The decrease in age-standardised incidence rate was much greater in males than females from 1980-1984 to 2010-2014 (Figure 6.7.1).

Amongst the ethnic groups, the age-standardised incidence rate was highest among the Chinese in 2010-2014 (Table 6.7.1).

The ethnic and age distribution of the incident cases was fairly similar for 2005-2009 and 2010-2014 in both genders (Table 6.7.2 and Table 6.7.3 respectively).

Figure 6.7.1: Age-Standardised Incidence Rates for Lung Cancer by Gender, 1975-2014



Year	75-79	80-84	85-89	90-94	95-99	00-04	05-09	10-14
Male	61.2	63.1	56.9	50.7	49.1	43.4	38.9	33.5
Female	19.3	20.6	19.9	17.7	17.8	16.4	15.6	15.0

Table 6.7.1: Crude and Age-Standardised Incidence Rates for Lung Cancer by Ethnic Group, 2010-2014

Ethnic Group	No.	CIR (95% CI)	ASIR (95% CI)
Chinese	5,880	41.5 (40.5-42.6)	24.5 (23.8-25.1)
Malay	654	25.7 (23.7-27.6)	22.2 (20.5-24.0)
Indian	213	12.2 (10.5-13.8)	11.6 (10.0-13.2)
Others	106	16.8 (13.6-20.0)	21.0 (16.7-25.3)
All	6,853	35.9 (35.0-36.7)	23.4 (22.9-24.0)

Table 6.7.2: Ethnic Distribution of Lung Cancer Patients, 2005-2014

a) Males

Period	2005-2009		2010-2014	
Ethnicity	No. of cases	Percent	No. of cases	Percent
Chinese	3,480	86.3	3,762	84.5
Malay	386	9.6	467	10.5
Indian	130	3.2	154	3.4
Others	36	0.9	71	1.6
Total	4,032	100.0	4,454	100.0

b) Females

Period	2005-2009		2010-2014	
Ethnicity	No. of cases	Percent	No. of cases	Percent
Chinese	1,792	89.3	2,118	88.3
Malay	169	8.4	187	7.8
Indian	31	1.5	59	2.5
Others	16	0.8	35	1.4
Total	2,008	100.0	2,399	100.0

Table 6.7.3: Age Distribution of Lung Cancer Patients, 2005-2014

a) Males

Period	2005-2009		2010-2014	
Age Group (years)	No. of cases	Percent (%)	No. of cases	Percent (%)
0-14	2	0.05	2	0.04
15-44	112	2.8	110	2.5
45-54	384	9.5	428	9.6
55-64	819	20.3	1,039	23.3
65-74	1,402	34.8	1,383	31.1
75+	1,313	32.6	1,492	33.5
Total	4,032	100.0	4,454	100.0

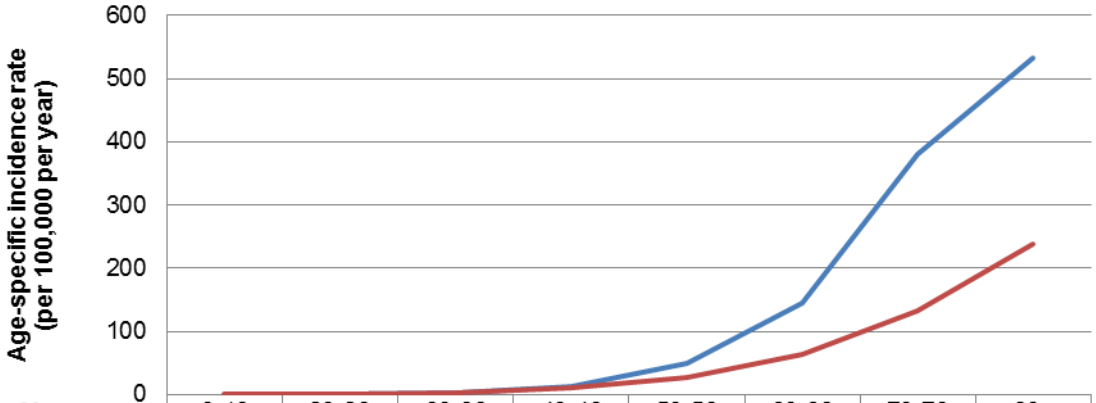
b) Females

Period	2005-2009		2010-2014	
Age Group (years)	No. of cases	Percent (%)	No. of cases	Percent (%)
0-14	1	0.05	1	0.04
15-44	88	4.4	101	4.2
45-54	239	11.9	295	12.3
55-64	395	19.7	510	21.3
65-74	527	26.2	588	24.5
75+	758	37.8	904	37.7
Total	2,008	100.0	2,399	100.0

Age at Diagnosis

In 2010-2014, the age-specific incidence rate in males was lowest in those aged 0-19, at 0.2 per 100,000 compared to 533.8 per 100,000 in those aged 80 and above. The trend was similar for the females (Figure 6.7.2).

Figure 6.7.2: Age-Specific Incidence Rates for Lung Cancer, 2010-2014

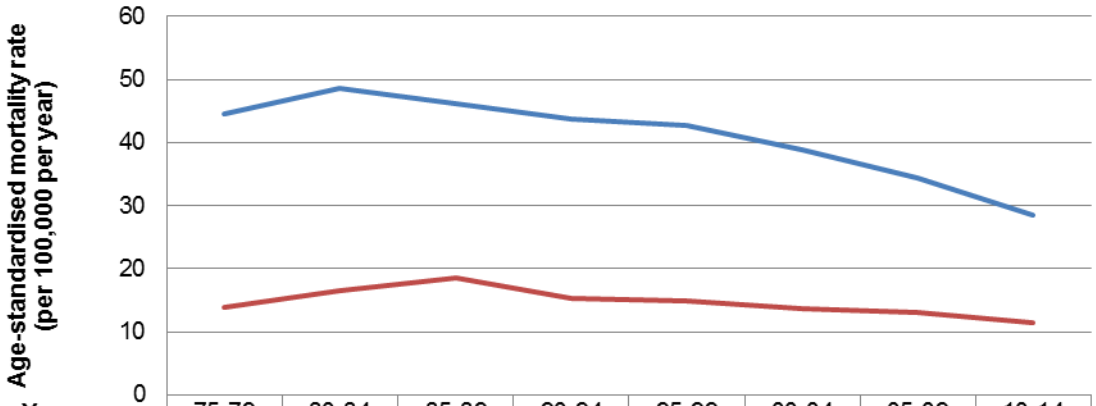


Year	0-19	20-29	30-39	40-49	50-59	60-69	70-79	80+
Male	0.2	0.5	2.8	13.7	49.9	144.2	380.6	533.8
Female	0.0	0.3	3.1	10.9	27.6	63.6	133.6	238.5

Mortality Rates

In 2010-2014, lung cancer had the highest cancer mortality rate among males and 2nd highest cancer mortality rate among females in Singapore. There were a total of 5,721 deaths (3,809 in males and 1,912 in females) during this period. The age-standardised mortality rate for lung cancer appeared to have declined in both genders since 1985-1989 to 2010-2014 (Figure 6.7.3).

Figure 6.7.3: Age-Standardised Mortality Rates for Lung Cancer, 2010-2014



Year	75-79	80-84	85-89	90-94	95-99	00-04	05-09	10-14
Male	44.5	48.6	46.2	43.8	42.8	38.8	34.3	28.6
Female	13.9	16.6	18.5	15.2	14.9	13.6	13.1	11.4

Survival

Compared to the period 2005-2009, there was an overall increase in the survival of lung cancer patients in both genders, particularly for the females in 2010-2014. For the males, the increase was observed in the Chinese, Malays and in all age groups. For the females, the increase was observed in all ethnic and age groups, but the one experienced by the Indians is particularly striking (Table 6.7.4).

Table 6.7.4: 5-Year Age-Standardised Observed Survival of Lung Cancer by Ethnicity and Age Group, 2005-2014

a) Males

	2005-2009	2010-2014
Ethnicity	**5yr ASOS (95% CI)**	**5yr ASOS (95% CI)**
All	8.82 (7.95, 9.75)	10.39 (9.48, 11.35)
Chinese	8.82 (7.90, 9.81)	10.41 (9.41, 11.46)
Malay	6.71 (4.41, 9.66)	9.22 (6.72, 12.20)
Indian	13.50 (7.89, 20.62)	14.19 (9.26, 20.14)

Age Group (years)	**5yr OS (95% CI)**	**5yr OS (95% CI)**
15-44	24.75 (17.18, 33.05)	27.74 (19.47, 36.60)
45-54	12.81 (9.69, 16.37)	16.13 (12.67, 19.96)
55-64	12.75 (10.48, 15.25)	15.35 (13.14, 17.73)
65-74	8.26 (6.85, 9.84)	9.60 (8.10, 11.25)
75+	3.33 (2.47, 4.38)	3.67 (2.74, 4.79)

b) Females

	2005-2009	2010-2014
Ethnicity	**5yr ASOS (95% CI)**	**5yr ASOS (95% CI)**
All	12.36 (10.86, 13.97)	17.09 (15.46, 18.78)
Chinese	12.50 (10.91, 14.20)	17.61 (15.85, 19.45)
Malay	8.35 (4.57, 13.55)	9.71 (6.10, 14.31)
Indian	8.84 (1.07, 27.32)	20.94 (10.10, 34.43)

Age Group (years)	**5yr OS (95% CI)**	**5yr OS (95% CI)**
15-44	22.06 (13.50, 31.95)	35.99 (26.09, 45.96)
45-54	17.87 (12.85, 23.57)	26.94 (21.77, 32.36)
55-64	19.38 (15.04, 24.14)	25.36 (21.20, 29.72)
65-74	13.49 (10.75, 16.54)	19.56 (16.10, 23.28)
75+	3.65 (2.45, 5.21)	4.17 (2.95, 5.69)