Health
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Singapore Cancer Registry Annual Report 2019

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THE SINGAPORE CANCER REGISTRY

The Singapore Cancer Registry (SCR) was first established in 1967 to collect information on all cancers diagnosed in Singapore from 1 January 1968 onwards. The key objective of setting up this registry was to obtain information on population-based cancer trends and patterns in Singapore.

LEGISLATION

The National Registry of Diseases (including the Singapore Cancer Registry) is governed by the National Registry of Diseases Act which was enacted in 2007. The Act ensures comprehensive coverage of reportable diseases through the mandatory reporting and collection of information from healthcare providers and ensures appropriate use of the information while maintaining patient confidentiality. The National Registry of Diseases (Cancer Notification) Regulations 2009 has been operational since 1 August 2009.

DATA SOURCES

Comprehensive cancer registration is achieved through data obtained via notifications received from (a) medical practitioners, (b) pathology laboratories, (c) haematology laboratories and departments, and (d) healthcare institutions.

IDENTIFICATION KEY

The primary identification key for Singapore residents (consisting Singapore citizens and permanent residents) is the National Registration Identity Card (NRIC) number. These unique numbers are used for updating existing records in the database and filtering duplicate records notified by multiple data sources.

VERIFICATION OF INFORMATION

All notifications were corroborated with clinical medical records. Registry coordinators (RCs) would review medical records to verify discrepancies in information and collect data to complete the registration of case records. A visiting consultant pathologist would be consulted for complex cases. Regular internal audits to assess the quality of the data were conducted and results from the audits showed that the registry achieved high inter-rater reliability (above 95%) for all data items.

CODING OF PRIMARY SITE AND HISTOLOGY

In this report, data on primary site was presented using the International Statistical Classification of Diseases and Related Health Problems, 10th Edition, Australian Modification (ICD-10-AM) [1]. The referenced sites and respective ICD-10-AM codes can be found in **Appendix 1**.

The Manual of Tumour Nomenclature and Coding (MOTNAC) [2] was used for histology coding up till 1992. Between 1993 and 2002, the SCR employed the International Classification of Diseases for Oncology, 2nd Edition (ICD-O-2) [3]. From 2003 onwards, the International Classification of Diseases for Oncology, 3rd Edition (ICD-O-3) was adopted [4]. In addition to ICD-O-3, the World Health Organisation (WHO) Classification of Tumours, 4th Edition volumes (also known as the Blue Books) were also used [5].

CANCER STAGING

The registry adopted stage grouping guidelines from the American Joint Committee on Cancer (AJCC) Cancer Staging Manual, 6th edition for cases diagnosed between 2003 and 2009, 7th edition for cases diagnosed from 2010 to 2017, and 8th edition for cases diagnosed from 2018 onwards [6] [7] [8].

STATISTICAL METHODS

This report is based on the anonymised data on all cases of malignant and certain borderline tumours diagnosed among Singapore residents from 1 January 1968 through 31 December 2019 in Singapore, as they stood as of 18 May 2021. Mortality data were as they stood as of 30 November 2020.

CANCER INCIDENCE AND MORTALITY

Computation of cancer incidence excludes benign and in-situ tumours (behaviour codes '0' and '2' respectively) [4].

Cancer incidence and mortality rates were calculated for all cancer sites combined, and for the most common cancer sites by gender, ethnicity, and age group. Incidence and mortality rates were age-standardised to adjust for differences in age structure in the Singapore resident population over time. Age-standardised incidence or mortality rates were calculated as the sum of the weighted age-specific incidence or mortality rates using the direct method based on the Segi-Doll World Standards. The age-specific incidence or mortality rates are defined as the number of new cancer cases or deaths, in the specified time period by the population at risk for that age stratum.

The population estimates were used as the denominators to calculate incidence and mortality rates. Population denominators from 1968 to 2019 were obtained from the Department of Statistics (DOS) [9].

RELATIVE SURVIVAL

Single and multiple primary malignant tumours diagnosed in individuals aged 15 years and above were included for survival analysis in this report. Childhood cancer cases were not included in survival analysis because of their differences in biological characteristics, treatment protocols and survival outcomes. Multiple primary cases were included in accordance with the (European Cancer Registry) Eurocare-6 and CONCORD-3 study protocols [10] [11].

Cases based on Death Certificates Only (DCO i.e. cases which were registered based on mortality data) were excluded from the survival analysis since their survival time was unknown.

Relative survival is defined as the ratio of observed survival of the patients with the expected survival of a comparable group in the general population, matched according to factors believed to be associated with survival at baseline (gender, age and calendar year of diagnosis). In other words, it reflects the chances of survival assuming that cancer is the only possible cause of death.

The expected survival was estimated from the Singapore general population which included deaths from all causes. Population life tables for the period of 1968-2002 were constructed using the Mortpak software with deaths and population counts obtained from the DOS [12] [9] . Complete life tables for the period of 2003-2019 were available from the DOS [13].

The Brenner method is used for age-standardisation [14]. 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. Analysis of five-year relative survival for the earliest five-year period, 1968-1972 was omitted, as there were insufficient cases available for analysis in one or more age groups.

Age-standardisation was performed using the International Cancer Survival Standards (ICSS) age categories for weights [15].

(1) TRENDS IN CANCER INCIDENCE AND MORTALITY, 1968-2019

1.1 Gender trends

Incidence and mortality of cancer by gender, 1968-2019

Since 1968, the age-standardised incidence rate (ASIR) of cancer has risen for both males and females. It increased from 228.2 to 238.6 per 100,000 population among males and from 155.0 to 235.4 per 100,000 population for females over the period spanning 1968-1972 to 2015-2019, thereby narrowing the gender gap (Figure 1.1.1, Table 1.1.1).

Over the same period, a similar pattern of a narrowing gender gap was also observed for cancer mortality. While there was an overall decrease in the age-standardised mortality rate (ASMR) of cancer among males from 121.8 per 100,000 population in 1968-1972 to 93.3 per 100,000 population in 2015-2019 (Figure 1.1.1, Table 1.1.2), ASMR among females remained relatively stable from 67.6 to 65.1 per 100,000 population during the same period. Despite the narrowing gender gap, the ASIR and ASMR of cancer had remained consistently higher among males than females throughout the years.

Ten most frequent incident cancers and cancer deaths by gender, 2015-2019

For the latest five-year period of 2015-2019, a total of 38,077 males and 40,127 females were diagnosed with cancer while 15,605 males and 12,940 females had died from the disease (Figure 1.1.2, Table 1.1.3). Colorectal, prostate, and lung cancer were the three most frequent incident cancers among males, while breast, colorectal and lung cancer were the top three most frequent incident cancers among females (Figure 1.1.2, Table 1.1.3). Colorectal cancer, the most common cancer in males, comprised about 17% of cancer diagnoses among males with 6,436 cases; while breast cancer, the most common cancer among females with 11,805 diagnoses over five years, alone accounted for about three in ten cancer diagnoses in females. The three leading incident cancers in males and females accounted for 46% and 50% of total diagnoses respectively during this period. Lung cancer was the leading cause of cancer death in males, accounting for 3,997 or more than a quarter of cancer deaths among males in 2015-2019, while breast cancer was the leading cause of cancer mortality in females, contributing to 2,208 or about 17% of cancer deaths among females.

Figure 1.1.1 Age-standardised incidence and mortality rate (per 100,000 population) of cancer by gender, 1968-2019
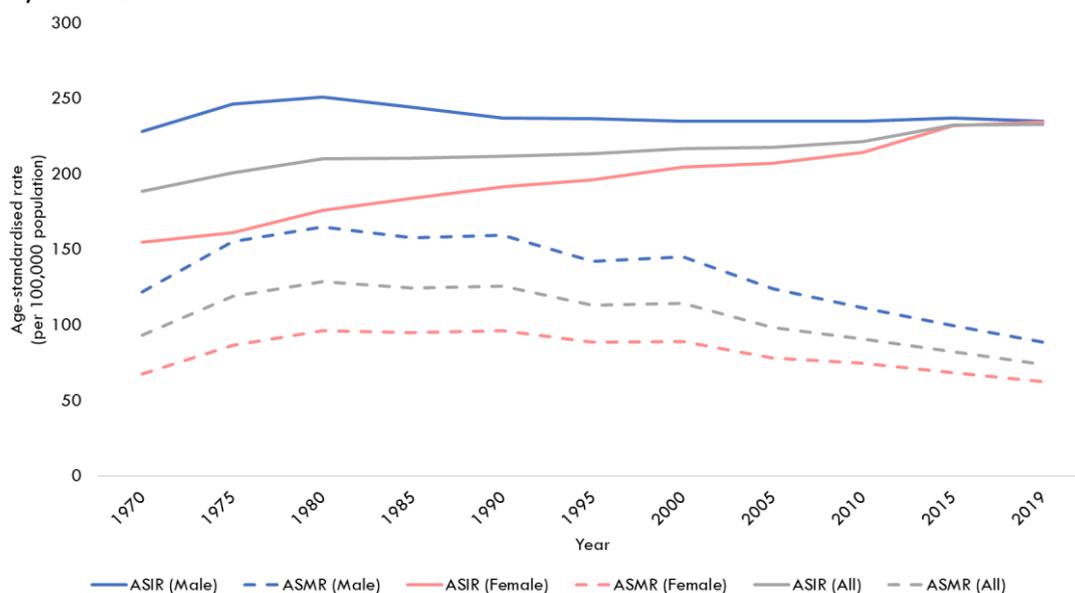
Table 1.1.1 Incidence number and age-standardised incidence rate (per 100,000 population) of cancer by gender, 1968-2019

		1968-1972	1973-1977	1978-1982	1983-1987	1988-1992	1993-1997
Male	No.	6986	8559	10126	11685	13641	16255
	ASIR	228.2	246.4	250.8	244.1	237.2	236.7
	(95% CI)	(222.4-234.0)	(240.9-251.9)	(245.8-255.8)	(239.6-248.6)	(233.2-241.2)	(233.0-240.4)
Female	No.	5087	6192	7992	10074	12764	15761
	ASIR	155.0	161.3	175.8	183.8	191.7	196.2
	(95% CI)	(150.6-159.3)	(157.3-165.4)	(171.9-179.7)	(180.2-187.5)	(188.3-195.1)	(193.0-199.3)
All	No.	12073	14751	18118	21759	26405	32016
	ASIR	188.7	200.8	210.2	210.6	211.7	213.4
	(95% CI)	(185.2-192.2)	(197.5-204.1)	(207.1-213.3)	(207.8-213.5)	(209.1-214.3)	(211.0-215.8)
		1998-2002	2003-2007	2008-2012	2013-2017	2018-2019	2015-2019
Male	No.	19069	22397	27951	34929	15962	**38077**
	ASIR	235.0	235.1	234.9	237.0	234.9	**238.6**
	(95% CI)	(231.6-238.4)	(232.0-238.2)	(232.1-237.8)	(234.5-239.6)	(231.1-238.7)	**(236.1-241.1)**
Female	No.	19885	23626	29351	37232	16727	**40127**
	ASIR	204.6	207.2	214.2	232.0	234.5	**235.4**
	(95% CI)	(201.6-207.5)	(204.5-209.9)	(211.6-216.7)	(229.6-234.5)	(230.8-238.3)	**(232.9-237.8)**
All	No.	38954	46023	57302	72161	32689	**78204**
	ASIR	216.8	217.6	221.6	232.3	233.0	**235.0**
	(95% CI)	(214.6-219.0)	(215.6-219.6)	(219.7-223.4)	(230.5-234.0)	(230.4-235.7)	**(233.3-236.7)**

Table 1.1.2 Mortality number and age-standardised mortality rate (per 100,000 population) of cancer by gender, 1968-2019

		1968-1972	1973-1977	1978-1982	1983-1987	1988-1992	1993-1997
Male	No.	3672	5332	6543	7449	9031	9599
	ASMR	121.8	155.1	165.1	158.0	159.4	142.3
	(95% CI)	(117.6-126.1)	(150.7-159.4)	(161.0-169.2)	(154.3-161.6)	(156.1-162.7)	(139.4-145.2)
Female	No.	2190	3225	4280	5104	6365	7054
	ASMR	67.6	86.5	96.4	95.1	96.4	88.7
	(95% CI)	(64.7-70.5)	(83.4-89.5)	(93.4-99.3)	(92.5-97.8)	(94.0-98.9)	(86.6-90.8)
All	No.	5862	8557	10823	12553	15396	16653
	ASMR	93.3	118.9	128.5	124.3	125.6	113.2
	(95% CI)	(90.8-95.8)	(116.4-121.5)	(126.1-131.0)	(122.1-126.5)	(123.6-127.7)	(111.4-114.9)
		1998-2002	2003-2007	2008-2012	2013-2017	2018-2019	2015-2019
Male	No.	11539	11690	13337	15191	6379	**15605**
	ASMR	145.0	123.9	111.4	99.7	88.5	**93.3**
	(95% CI)	(142.3-147.7)	(121.6-126.2)	(109.5-113.3)	(98.1-101.3)	(86.3-90.7)	**(91.8-94.8)**
Female	No.	8621	9181	11041	12539	5256	**12940**
	ASMR	89.1	78.1	74.7	68.5	62.3	**65.1**
	(95% CI)	(87.1-91.0)	(76.4-79.7)	(73.2-76.1)	(67.2-69.7)	(60.5-64.1)	**(63.9-66.3)**
All	No.	20160	20871	24378	27730	11635	**28545**
	ASMR	114.4	98.4	90.8	82.3	73.9	**77.6**
	(95% CI)	(112.8-116.0)	(97.0-99.7)	(89.6-92.0)	(81.3-83.3)	(72.5-75.3)	**(76.7-78.5)**

Figure 1.1.2 Ten most frequent incident cancers and cancer deaths by gender, 2015-2019
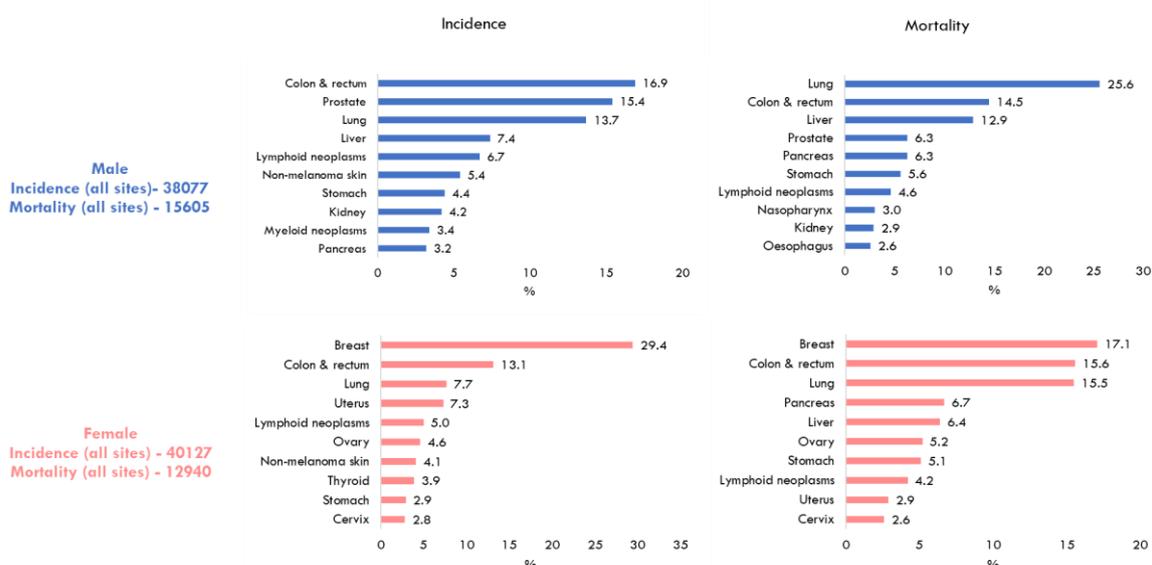
Table 1.1.3 Ten most frequent incident cancers and cancer deaths by gender, 2015-2019

Gender	Rank	Incidence			Mortality		
		Site	No.	%	Site	No.	%
Male	1	Colon & rectum	6436	16.9	Lung	3997	25.6
	2	Prostate	5875	15.4	Colon & rectum	2264	14.5
	3	Lung	5218	13.7	Liver	2019	12.9
	4	Liver	2834	7.4	Prostate	989	6.3
	5	Lymphoid neoplasms	2569	6.7	Pancreas	976	6.3
	6	Non-melanoma skin	2050	5.4	Stomach	869	5.6
	7	Stomach	1679	4.4	Lymphoid neoplasms	713	4.6
	8	Kidney	1605	4.2	Nasopharynx	474	3.0
	9	Myeloid neoplasms	1306	3.4	Kidney	452	2.9
	10	Pancreas	1208	3.2	Oesophagus	410	2.6
		All sites	**38077**	**100**	**All sites**	**15605**	**100**
Female	1	Breast	11805	29.4	Breast	2208	17.1
	2	Colon & rectum	5253	13.1	Colon & rectum	2015	15.6
	3	Lung	3074	7.7	Lung	2008	15.5
	4	Uterus	2919	7.3	Pancreas	869	6.7
	5	Lymphoid neoplasms	1990	5.0	Liver	831	6.4
	6	Ovary	1860	4.6	Ovary	674	5.2
	7	Non-melanoma skin	1651	4.1	Stomach	658	5.1
	8	Thyroid	1562	3.9	Lymphoid neoplasms	543	4.2
	9	Stomach	1157	2.9	Uterus	371	2.9
	10	Cervix	1107	2.8	Cervix	331	2.6
		All sites	**40127**	**100**	**All sites**	**12940**	**100**

1.1 Gender trends for incidence and mortality of cancer, 1968-2019

KEY POINTS

- The age-standardised incidence rate of cancer had risen for both males (from 228.2 to 238.6 per 100,000 population) and females (from 155.0 to 235.4 per 100,000 population) during the period from 1968-1972 to 2015-2019.
- During this same period, while age-standardised mortality rates of cancer for males decreased (from 121.8 to 93.3 per 100,000 population), that of females remained relatively stable (from 67.6 to 65.1 per 100,000 population).
- Over the years, there has been a narrowing of the gender gap for both cancer incidence and mortality.
- 38,077 males and 40,127 females were diagnosed with cancer in 2015-2019.
- 15,605 males and 12,940 females died of cancer in 2015-2019.
- Three most frequent incident cancers (2015-2019):
  - Males – colorectal (16.9% of all cancers diagnosed for males), prostate (15.4%), lung (13.7%)
  - Females – breast (29.4% of all cancers diagnosed for females), colorectal (13.1%), lung (7.7%)
- Three leading causes of cancer deaths (2015-2019):
  - Males – lung (25.6% of cancer deaths for males), colorectal (14.5%), liver (12.9%)
  - Females – breast (17.1% of cancer deaths for females), colorectal (15.6%), lung (15.5%)

1.2 Ethnic trends

Incidence and mortality of cancer by gender and ethnicity, 1968-2019

While the ASIR of cancer among Chinese males had decreased from 258.1 per 100,000 population in 1968-1972 to 244.2 per 100,000 population in 2015-2019, it had risen among Malay and Indian males, doubling from 96.2 to 220.8 per 100,000 population for the former and rising less drastically with some fluctuations over the years from 125.4 to 157.2 per 100,000 population for the latter (Figure 1.2.1(a), Table 1.2.1(a)).

The same pattern was not observed in females – an increases in the ASIR of cancer was observed for all three ethnic groups (Figure 1.2.1(b), Table 1.2.1(b)). Among Chinese females, the ASIR of cancer rose from 158.5 to 238.1 per 100,000 population. Similar to their male counterparts, the ASIR of cancer among Malay females more than doubled over the years, from 98.5 per 100,000 population in 1968-1972 to 229.7 per 100,000 population in 2015-2019. The increase in cancer incidence among Indian females was the least drastic, rising from 181.9 to 191.7 per 100,000 population over the same period.

The trend for cancer mortality rates by ethnicity among males was similar to that observed for the incidence rates. While cancer mortality had decreased from 140.1 to 94.9 per 100,000 population for Chinese males (Figure 1.2.1(a), Table 1.2.2(a)), it had risen among Malay and Indian males – especially for the former – increasing more than twofold from 45.8 to 105.1 for the former and less drastically from 57.8 to 63.4 per 100,000 population for the latter between 1968-1972 and 2015-2019.

While an increase in ASIR of cancer among females was observed for all three ethnic groups, cancer mortality rates was found to have only increased for Malay females – from 46.6 to 82.6 per 100,000 population between 1968-1972 and 2015-2019, an almost twofold increase. In contrast, during the same period, cancer mortality rates among Chinese females decreased slightly from 68.4 to 63.7 per 100,000 population and mortality rates among Indian females decreased more sharply from 82.6 to 53.1 per 100,000 population (Figure 1.2.1(b), Table 1.2.2(b)).

Ten most frequent incident cancers by gender and ethnicity, 2015-2019

A total of 31,567 Chinese males and 32,705 Chinese females were diagnosed with cancer in 2015-2019. 3,562 Malay males and 4,139 Malay females were diagnosed with cancer; while 1,770 Indian males and 2,201 Indian females were diagnosed with cancer over this period (Figure 1.2.2, Table 1.2.3).

While colorectal, prostate, and lung cancer were the three most frequent incident cancers among Chinese and Indian males, lung and colorectal cancer and lymphoid neoplasms were the three most frequent incident cancers among Malay males (Figure 1.2.2, Table 1.2.3). The three most frequent incident cancers among Chinese, Malay and Indian males accounted for approximately 40-47% of all diagnoses among each ethnicity.

Breast cancer was by far the most frequent incident cancer among females across all three ethnicities; especially among Indian females, where it accounted for more than one-third of all cancer diagnoses in 2015-2019 (Figure 1.2.2, Table 1.2.3). Colorectal and uterine cancer were also among the three most frequent incident cancers among Malays and Indians, whereas colorectal and lung cancer were the second and third most commonly diagnosed cancers in Chinese females. Notably, while cervical cancer was the tenth most frequent incident cancer among all females during 2015-2019 (Figure 1.1.2, Table 1.1.3), it was observed to be the 8th most commonly diagnosed cancer among the Malays and to have fallen out of the top ten list for both Chinese and Indian females during this period.

Figure 1.2.1(a) Age-standardised incidence and mortality rate (per 100,000 population) of cancer in males by ethnicity, 1968-2019
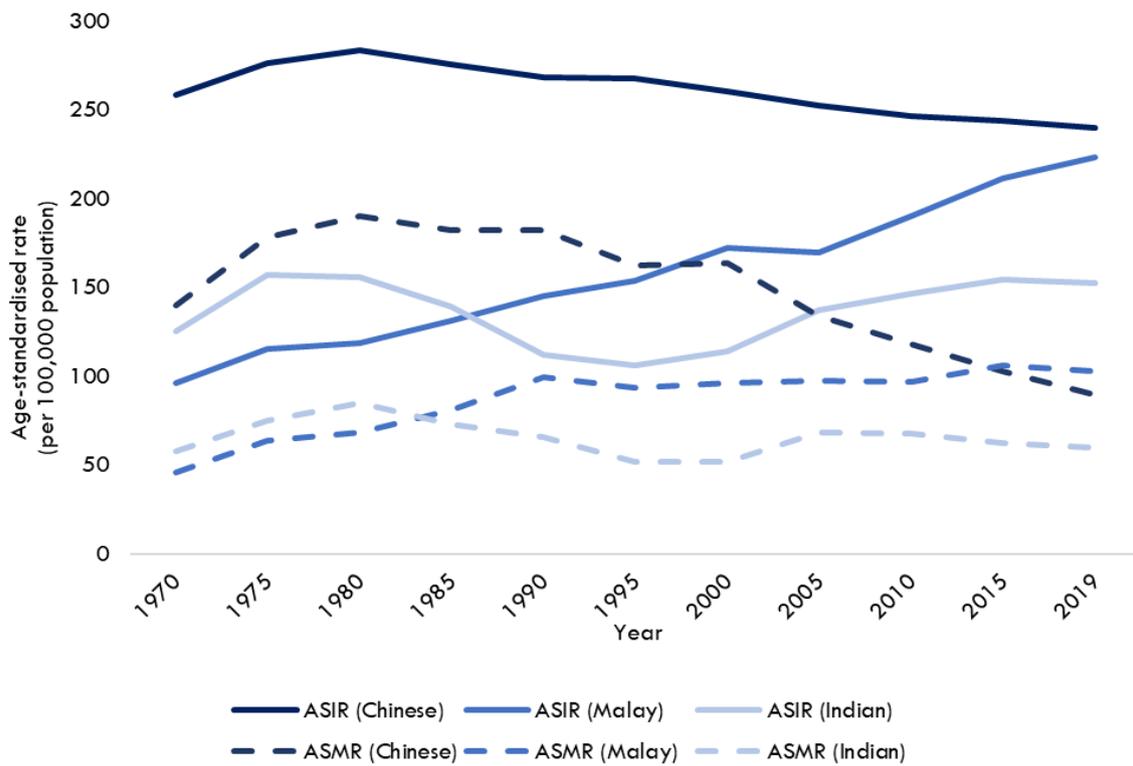
Figure 1.2.1(b) Age-standardised incidence and mortality rate (per 100,000 population) of cancer in females by ethnicity, 1968-2019
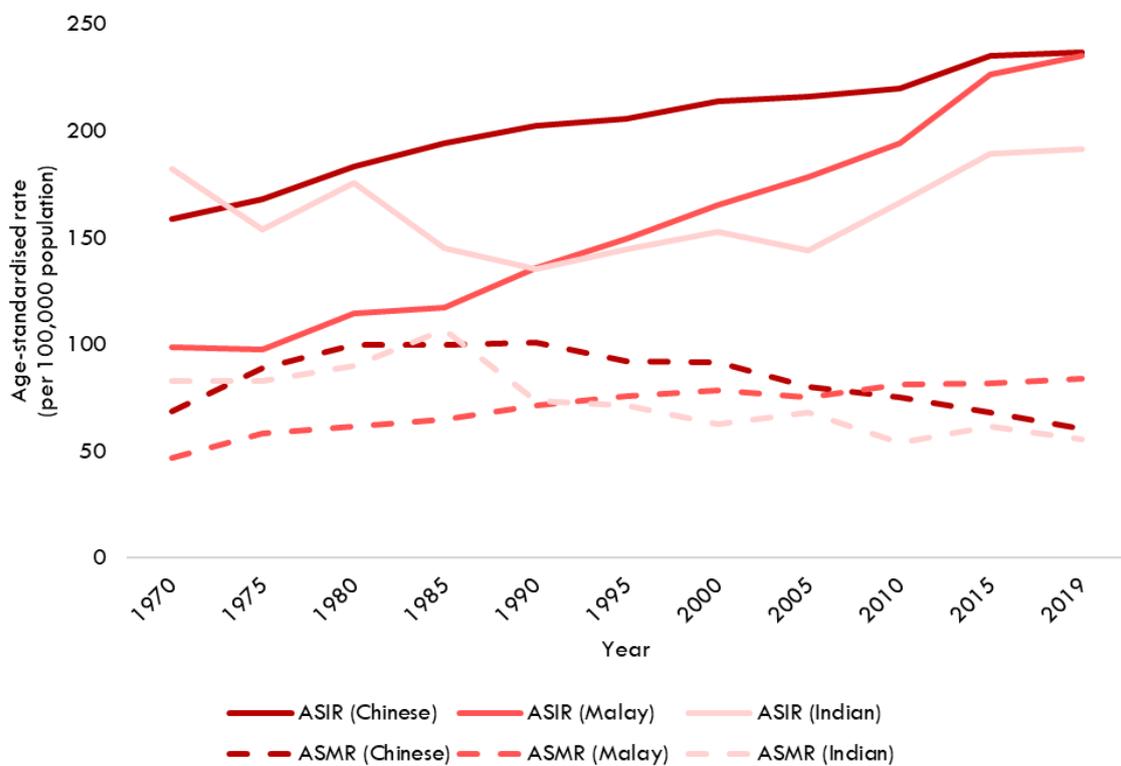
Table 1.2.1(a) Incidence number and age-standardised incidence rate (per 100,000 population) of cancer in males by ethnicity, 1968-2019

		1968-1972	1973-1977	1978-1982	1983-1987	1988-1992	1993-1997
Chinese	**No.**	6166	7467	8881	10157	11815	14090
	ASIR	258.1	276.2	283.7	275.6	268.6	267.6
	(95% CI)	(251.2-264.9)	(269.7-282.7)	(277.7-289.7)	(270.1-281.0)	(263.6-273.5)	(263.1-272.1)
Malay	**No.**	357	508	606	787	1013	1242
	ASIR	96.2	115.6	118.7	131.1	145.2	154.1
	(95% CI)	(84.5-107.9)	(104.6-126.6)	(108.6-128.9)	(121.5-140.8)	(136.0-154.4)	(145.2-163.0)
Indian	**No.**	398	499	537	622	624	696
	ASIR	125.4	157.3	155.9	139.0	112.1	105.8
	(95% CI)	(109.2-141.5)	(140.5-174.1)	(140.9-170.9)	(127.1-150.9)	(102.9-121.3)	(97.6-114.0)
		1998-2002	2003-2007	2008-2012	2013-2017	2018-2019	2015-2019
Chinese	**No.**	16353	19170	23533	29080	13213	**31567**
	ASIR	260.7	252.6	246.3	244.0	239.9	**244.2**
	(95% CI)	(256.6-264.8)	(249.0-256.2)	(243.0-249.5)	(241.1-247.0)	(235.6-244.3)	**(241.3-247.0)**
Malay	**No.**	1591	1780	2365	3178	1532	**3562**
	ASIR	172.0	169.4	190.5	211.3	223.6	**220.8**
	(95% CI)	(163.2-180.8)	(161.1-177.6)	(182.5-198.5)	(203.7-218.9)	(212.2-235.0)	**(213.4-228.3)**
Indian	**No.**	829	994	1282	1629	717	**1770**
	ASIR	114.2	137.1	146.7	154.3	152.2	**157.2**
	(95% CI)	(106.0-122.4)	(128.1-146.0)	(138.2-155.2)	(146.4-162.2)	(140.7-163.8)	**(149.6-164.9)**

Table 1.2.1(b) Incidence number and age-standardised incidence rate (per 100,000 population) of cancer in females by ethnicity, 1968-2019

		1968-1972	1973-1977	1978-1982	1983-1987	1988-1992	1993-1997
Chinese	**No.**	4460	5471	7031	8889	11202	13630
	ASIR	158.5	167.7	183.2	194.0	202.3	205.4
	(95% CI)	(153.8-163.2)	(163.2-172.2)	(178.9-187.6)	(189.9-198.1)	(198.4-206.2)	(201.8-208.9)
Malay	**No.**	368	411	574	734	1010	1336
	ASIR	98.5	97.3	114.5	117.0	135.6	149.6
	(95% CI)	(87.0-110.0)	(86.9-107.6)	(104.3-124.7)	(108.0-126.1)	(126.8-144.3)	(141.3-158.0)
Indian	**No.**	168	223	298	345	428	609
	ASIR	181.9	153.6	175.7	144.9	135.2	144.5
	(95% CI)	(146.2-217.5)	(129.5-177.6)	(152.1-199.4)	(127.2-162.6)	(121.2-149.2)	(131.8-157.2)
		1998-2002	2003-2007	2008-2012	2013-2017	2018-2019	2015-2019
Chinese	**No.**	17034	20069	24334	30451	13575	**32705**
	ASIR	213.5	215.9	220.0	235.2	236.4	**238.1**
	(95% CI)	(210.2-216.8)	(212.8-219.0)	(217.1-222.9)	(232.4-238.0)	(232.1-240.7)	**(235.3-240.9)**
Malay	**No.**	1745	2208	2879	3854	1767	**4139**
	ASIR	165.0	178.0	194.0	226.2	235.2	**229.7**
	(95% CI)	(156.9-173.1)	(170.3-185.8)	(186.7-201.4)	(218.9-233.6)	(223.9-246.5)	**(222.5-236.9)**
Indian	**No.**	850	1012	1466	2011	924	**2201**
	ASIR	152.4	143.7	166.0	189.1	191.5	**191.7**
	(95% CI)	(141.5-163.3)	(134.4-153.0)	(157.2-174.7)	(180.6-197.6)	(178.8-204.1)	**(183.5-200.0)**

Table 1.2.2(a) Mortality number and age-standardised mortality rate (per 100,000 population) of cancer in males by ethnicity, 1968-2019

		1968-1972	1973-1977	1978-1982	1983-1987	1988-1992	1993-1997
Chinese	No.	3316	4753	5869	6614	7896	8381
	ASMR	140.1	178.0	190.5	182.4	182.3	162.2
	(95% CI)	(135.1-145.2)	(172.7-183.2)	(185.6-195.5)	(177.9-186.9)	(178.2-186.3)	(158.6-165.7)
Malay	No.	164	300	343	476	686	730
	ASMR	45.8	63.9	68.3	80.9	99.7	93.6
	(95% CI)	(37.6-54.0)	(56.0-71.8)	(60.5-76.1)	(73.2-88.5)	(92.0-107.4)	(86.6-100.6)
Indian	No.	166	237	279	312	359	346
	ASMR	57.8	74.8	85.1	72.8	65.7	52.0
	(95% CI)	(45.6-70.0)	(63.9-85.6)	(73.6-96.6)	(64.0-81.7)	(58.5-72.9)	(46.3-57.7)
		1998-2002	2003-2007	2008-2012	2013-2017	2018-2019	2015-2019
Chinese	No.	10051	10066	11420	12731	5286	12950
	ASMR	163.8	134.0	118.2	102.8	89.6	94.9
	(95% CI)	(160.6-167.0)	(131.3-136.7)	(116.0-120.4)	(101.0-104.7)	(87.1-92.0)	(93.2-96.6)
Malay	No.	868	1004	1188	1606	716	1706
	ASMR	96.3	97.7	97.0	106.3	103.1	105.1
	(95% CI)	(89.7-103.0)	(91.4-104.1)	(91.2-102.7)	(100.9-111.6)	(95.4-110.8)	(99.9-110.2)
Indian	No.	396	505	580	661	289	724
	ASMR	52.1	68.2	67.8	62.6	60.0	63.4
	(95% CI)	(46.6-57.5)	(62.0-74.5)	(62.0-73.6)	(57.6-67.6)	(53.0-67.0)	(58.6-68.1)

Table 1.2.2(b) Mortality number and age-standardised mortality rate (per 100,000 population) of cancer in females by ethnicity, 1968-2019

		1968-1972	1973-1977	1978-1982	1983-1987	1988-1992	1993-1997
Chinese	No.	1912	2844	3788	4531	5616	6131
	ASMR	68.4	89.0	99.7	99.6	100.8	91.9
	(95% CI)	(65.3-71.5)	(85.7-92.2)	(96.5-102.9)	(96.7-102.6)	(98.1-103.6)	(89.5-94.3)
Malay	No.	166	223	291	368	497	640
	ASMR	46.6	58.2	61.4	64.8	71.3	75.9
	(95% CI)	(38.6-54.5)	(49.8-66.6)	(53.7-69.0)	(57.8-71.8)	(64.8-77.8)	(69.8-82.0)
Indian	No.	75	113	151	156	198	228
	ASMR	82.6	90.0	106.6	73.4	71.3	62.4
	(95% CI)	(59.0-106.3)	(70.1-109.9)	(87.0-126.2)	(60.1-86.8)	(60.5-82.1)	(53.5-71.3)
		1998-2002	2003-2007	2008-2012	2013-2017	2018-2019	2015-2019
Chinese	No.	7404	7861	9237	10332	4257	10549
	ASMR	91.5	80.2	74.9	67.8	60.5	63.7
	(95% CI)	(89.3-93.7)	(78.3-82.0)	(73.3-76.5)	(66.4-69.2)	(58.5-62.4)	(62.4-65.0)
Malay	No.	779	887	1165	1447	671	1579
	ASMR	78.4	75.4	81.0	81.6	83.8	82.6
	(95% CI)	(72.7-84.1)	(70.3-80.6)	(76.2-85.9)	(77.2-85.9)	(77.3-90.3)	(78.4-86.8)
Indian	No.	343	351	511	592	262	632
	ASMR	68.1	53.7	61.3	55.5	51.2	53.1
	(95% CI)	(60.4-75.8)	(47.8-59.5)	(55.8-66.8)	(50.9-60.1)	(44.9-57.5)	(48.8-57.3)

Figure 1.2.2 Ten most frequent incident cancers by gender and ethnicity, 2015-2019

Male

Female

Chinese
Male (all sites) - 31567
Female (all sites) - 32705

Male
Cancer	%
Colon & rectum	17.4
Prostate	16.1
Lung	13.5
Liver	7.4
Lymphoid neoplasms	6.0
Non-melanoma skin	5.2
Stomach	4.7
Kidney	4.3
Pancreas	3.3
Myeloid neoplasms	3.2

Female
Cancer	%
Breast	28.9
Colon & rectum	13.6
Lung	8.3
Uterus	7.0
Lymphoid neoplasms	4.6
Non-melanoma skin	4.4
Ovary	4.3
Thyroid	3.7
Stomach	3.2
Pancreas	2.7

Malay
Male (all sites) - 3562
Female (all sites) - 4139

Male
Cancer	%
Lung	17.7
Colon & rectum	16.0
Lymphoid neoplasms	12.0
Prostate	10.7
Liver	8.5
Myeloid neoplasms	5.2
Kidney	3.3
Stomach	2.7
Bladder	2.4
Pancreas	2.4

Female
Cancer	%
Breast	29.0
Colon & rectum	12.2
Uterus	8.4
Lymphoid neoplasms	7.7
Ovary	6.5
Lung	5.6
Thyroid	4.4
Cervix	4.1
Myeloid neoplasms	3.0
Liver	2.7

Indian
Male (all sites) - 1770
Female (all sites) - 2201

Male
Cancer	%
Colon & rectum	14.8
Prostate	13.4
Lung	12.3
Lymphoid neoplasms	9.5
Liver	7.2
Stomach	5.2
Kidney	5.0
Myeloid neoplasms	3.6
Pancreas	3.1
Brain & Central Nervous System	2.1

Female
Cancer	%
Breast	35.7
Uterus	9.9
Colon & rectum	9.3
Lymphoid neoplasms	5.6
Ovary	5.6
Thyroid	4.8
Lung	3.5
Myeloid neoplasms	2.7
Stomach	2.4
Pancreas	2.4

Table 1.2.3 Ten most frequent incident cancers by gender and ethnicity, 2015-2019

Ethnicity	Rank	Male			Female		
		Site	No.	%	Site	No.	%
Chinese	1	Colon & rectum	5489	17.4	Breast	9460	28.9
	2	Prostate	5096	16.1	Colon & rectum	4449	13.6
	3	Lung	4269	13.5	Lung	2699	8.3
	4	Liver	2344	7.4	Uterus	2281	7.0
	5	Lymphoid neoplasms	1883	6.0	Lymphoid neoplasms	1492	4.6
	6	Non-melanoma skin	1649	5.2	Non-melanoma skin	1453	4.4
	7	Stomach	1469	4.7	Ovary	1415	4.3
	8	Kidney	1363	4.3	Thyroid	1222	3.7
	9	Pancreas	1038	3.3	Stomach	1036	3.2
	10	Myeloid neoplasms	1024	3.2	Pancreas	886	2.7
		All sites	**31567**	**100**	**All sites**	**32705**	**100**
Malay	1	Lung	631	17.7	Breast	1202	29.0
	2	Colon & rectum	569	16.0	Colon & rectum	504	12.2
	3	Lymphoid neoplasms	426	12.0	Uterus	347	8.4
	4	Prostate	380	10.7	Lymphoid neoplasms	320	7.7
	5	Liver	303	8.5	Ovary	269	6.5
	6	Myeloid neoplasms	186	5.2	Lung	233	5.6
	7	Kidney	118	3.3	Thyroid	182	4.4
	8	Stomach	96	2.7	Cervix	169	4.1
	9	Bladder	87	2.4	Myeloid neoplasms	125	3.0
	10	Pancreas	85	2.4	Liver	112	2.7
		All sites	**3562**	**100**	**All sites**	**4139**	**100**
Indian	1	Colon & rectum	262	14.8	Breast	785	35.7
	2	Prostate	238	13.4	Uterus	217	9.9
	3	Lung	218	12.3	Colon & rectum	204	9.3
	4	Lymphoid neoplasms	169	9.5	Lymphoid neoplasms	124	5.6
	5	Liver	128	7.2	Ovary	123	5.6
	6	Stomach	92	5.2	Thyroid	106	4.8
	7	Kidney	89	5.0	Lung	77	3.5
	8	Myeloid neoplasms	64	3.6	Myeloid neoplasms	60	2.7
	9	Pancreas	54	3.1	Stomach	53	2.4
	10	Brain & Central Nervous System	38	2.1	Pancreas	52	2.4
		All sites	**1770**	**100**	**All sites**	**2201**	**100**

1.2 Ethnic trends for incidence and mortality of cancer, 1968-2019

KEY POINTS

- The age-standardised incidence rate of cancer had decreased for Chinese males (from 258.1 to 244.2 per 100,000 population), but increased for Malay and Indian males (from 96.2 to 220.8 per 100,000 population and from 125.4 to 157.2 per 100,000 population respectively) between 1968-1972 and 2015-2019.
- The age-standardised incidence rate of cancer had increased for females across all three ethnic groups between 1968-1972 and 2015-2019 (Chinese: 158.5 to 238.1 per 100,000 population; Malay: 98.5 to 229.7 per 100,000 population; Indian: 181.9 to 191.7 per 100,000 population).
- The age-standardised mortality rate of cancer decreased among Chinese males over the years (from 140.1 to 94.9 per 100,000 population) but increased for Malay and Indian males (from 45.8 to 105.1 and 57.8 to 63.4 per 100,000 population respectively).
- The age-standardised mortality rate of cancer fell for Chinese and Indian females (from 68.4 to 63.7 and 82.6 to 53.1 per 100,000 respectively) but increased for Malay females (from 46.6 to 82.6 per 100,000 population).
- Among males, colorectal and lung cancer were among the three most frequent incident cancers in all ethnic groups, each accounting for approximately 12-18% of all diagnoses within each ethnic group.
- Breast cancer was by far the leading cancer diagnosed among females across all three ethnic groups, accounting for about 29-36% of all diagnoses within each group.

1.3 Age group trends

Incidence and mortality of cancer by age group, 1968-2019

Between 1968-1972 and 2015-2019, the proportion of all cancer diagnoses among the younger age groups had fallen; while that among the older age groups had correspondingly increased (Figure 1.3.1(a), Figure 1.3.1(b)). This pattern was observed for both males and females, resulting in an increase in the median age at cancer diagnosis for both genders (Table 1.3.1(a), Table 1.3.1(b)). This observed trend is because of an increase in life expectancy over the years, as more individuals are expected to live past their 80s, when age-specific incidence rate of cancer is at its highest.

Among males, the proportion of individuals diagnosed with cancer under 40 years old had fallen from 12.1% in 1968-1972 to 4.4% in 2015-2019 (Table 1.3.1(a)). In contrast, the proportion of diagnoses at ages 70 years and above had risen from 15.7% to 42.3% during the same period. Across the years, individuals aged 60-69 years made up the largest proportion of newly diagnosed cancer patients in almost every five-year period. The median age at diagnosis for males had risen from 59.6 years in 1968-1972 to 67.8 years in 2015-2019.

Among females, 16.9% of all cancer diagnoses occurred under the age of 40 years in 1968-1972, and this had fallen to 7.4% in 2015-2019 (Table 1.3.1(b)). Correspondingly, the proportion of diagnoses among those aged 70 years and above had risen from 17% to 32.6% over the same period. Similar to the trends observed for their male counterparts, the 60-69 years age band was also the largest age group among females diagnosed with cancer across most five-year periods from 1968-2019 and the median age at diagnosis for females had also risen from 57.3 years in 1968-1972 to 62.9 years in 2015-2019. However, the median age at diagnosis for females remained lower than that of males for every five-year period.

The risk of developing and dying from cancer increases with age, as shown by the increase in both the age-specific incidence and mortality rates of cancer for males as well as females (Figure 1.3.2). In 2015-2019, while females had a higher age-specific incidence rate of cancer for individuals below 60 years old as compared to males, the age-specific incidence rate of cancer among males increased sharply after 60 years of age and overtook that of females (Table 1.3.2(a), Table 1.3.2(b)).

In 2015-2019, the age-specific incidence rate of cancer among males under 30 years old was 23.8 per 100,000 population, and this rose to 2,919.6 per 100,000 population among the oldest age group of 80 years and above – an increase of more than a hundred-fold (Table 1.3.2(a)). Similarly, the age-specific incidence rate of cancer among females also rose from 27.9 per 100,000 for those below 30 years old to 1,818.7 per 100,000 population from those aged 80 and above (Table 1.3.2(b)). Similar to the age-specific incidence trends, the age-specific cancer mortality rates increased from 2.9 and 2.1 per 100,000 population for males and females under 30 years old to 1,940.9 and 1,196.7 per 100,000 population respectively for males and females aged 80 years and above.

Ten most frequent incident cancers by gender and age group, 2015-2019

The pattern of the ten most frequent incident cancers for males and females also differed by age group (Figure 1.3.3, Table 1.3.3). In the period 2015-2019, lymphoid neoplasm was the most common diagnosis in males below 30 years old, accounting for one in three cancer diagnoses in this age group. Lung cancer, while less common in younger males, was the most common diagnosis in males aged 80 years and above, accounting for about one in six incident cancers among males in that age group. The two other most common cancers diagnosed in males 50 years and above were colorectal and prostate cancer.

Among females, lymphoid neoplasm was also the most common diagnosis for those below 30 years old, accounting for about one-fifth of all incident cases of cancer in that age group. Between the ages of 30 to 79 years, breast cancer was the most common diagnosis and accounted for nearly half of all cancer diagnoses within the 40-49 age band. As with males, colorectal and lung cancer were also common among older females.

Figure 1.3.1(a) Distribution of age at diagnosis (%) of all cancer in males, 1968-2019
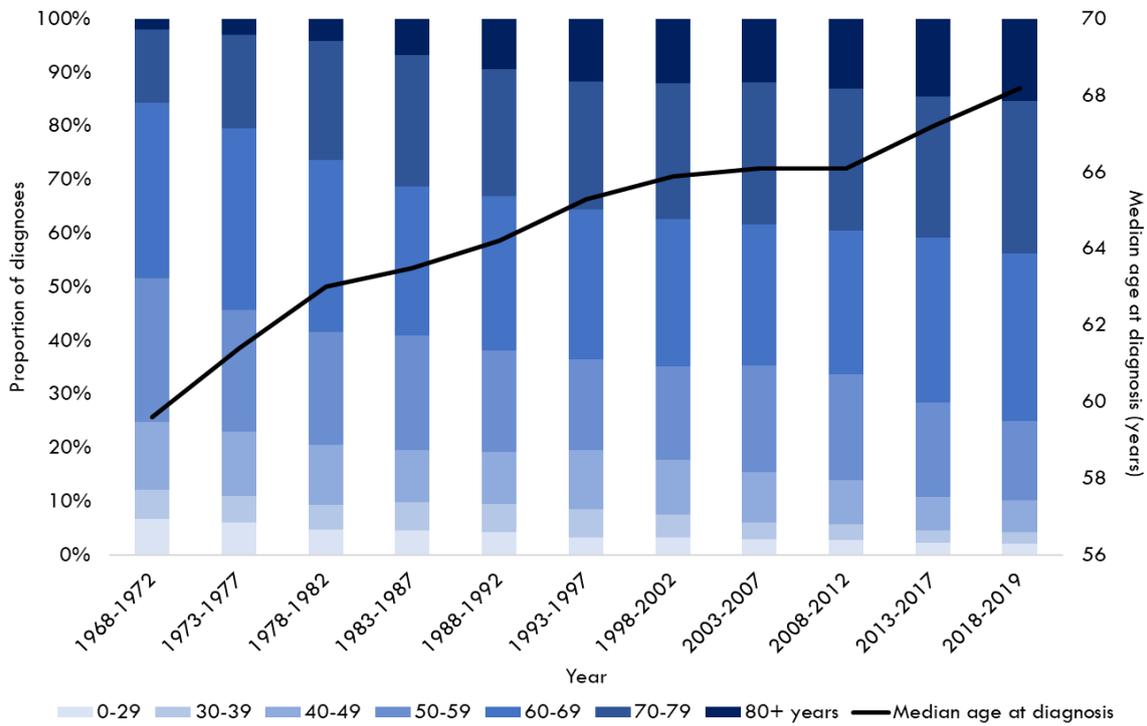
0-29   30-39   40-49   50-59   60-69   70-79   80+ years   —Median age at diagnosis

Figure 1.3.1(b) Distribution of age at diagnosis (%) of all cancer in females, 1968-2019

0-29   30-39   40-49   50-59   60-69   70-79   80+ years   —Median age at diagnosis
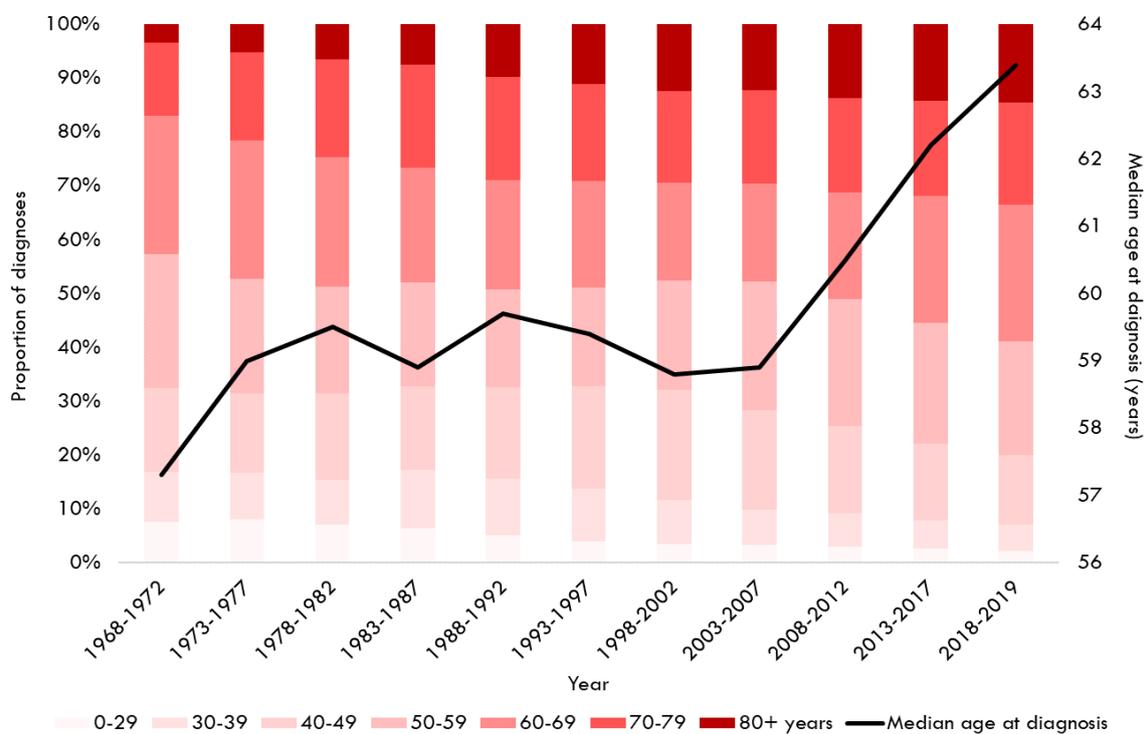
Table 1.3.1(a) Distribution of age at diagnosis (%) of all cancer in males, 1968-2019

Age group	1968-1972	1973-1977	1978-1982	1983-1987	1988-1992	1993-1997
0-29 years	6.8	6.0	4.7	4.6	4.3	3.3
30-39 years	5.3	5.0	4.7	5.3	5.2	5.2
40-49 years	12.7	12.0	11.1	9.7	9.7	11.0
50-59 years	26.8	22.6	21.1	21.4	19.0	17.0
60-69 years	32.7	34.0	32.1	27.7	28.8	28.0
70-79 years	13.7	17.3	22.2	24.6	23.7	23.9
80+ years	2.0	3.0	4.1	6.7	9.3	11.7
Median age at diagnosis	59.6	61.4	63.0	63.5	64.2	65.3
Age group	1998-2002	2003-2007	2008-2012	2013-2017	2018-2019	2015-2019
0-29 years	3.3	2.9	2.8	2.3	2.1	2.2
30-39 years	4.2	3.1	3.0	2.3	2.2	2.2
40-49 years	10.3	9.5	8.2	6.3	5.8	5.9
50-59 years	17.4	19.8	19.7	17.6	14.9	16.0
60-69 years	27.4	26.4	26.8	30.7	31.3	31.5
70-79 years	25.4	26.6	26.5	26.4	28.4	27.3
80+ years	12.0	11.8	13.0	14.5	15.3	15.0
Median age at diagnosis	65.9	66.1	66.1	67.2	68.2	67.8

Table 1.3.1(b) Distribution of age at diagnosis (%) of all cancer in females, 1968-2019

Age group	1968-1972	1973-1977	1978-1982	1983-1987	1988-1992	1993-1997
0-29 years	7.6	8.1	7.0	6.4	5.1	3.9
30-39 years	9.3	8.7	8.4	10.7	10.5	9.9
40-49 years	15.5	14.6	16.0	15.7	17.1	18.9
50-59 years	24.8	21.4	19.9	19.3	18.2	18.3
60-69 years	25.7	25.7	24.0	21.2	20.3	19.8
70-79 years	13.7	16.5	18.3	19.2	19.2	18.1
80+ years	3.3	5.1	6.4	7.4	9.7	11.0
Median age at diagnosis	57.3	59.0	59.5	58.9	59.7	59.4
Age group	1998-2002	2003-2007	2008-2012	2013-2017	2018-2019	2015-2019
0-29 years	3.5	3.3	3.0	2.6	2.1	2.4
30-39 years	8.1	6.6	6.1	5.2	5.0	5.0
40-49 years	20.5	18.4	16.3	14.3	12.8	13.5
50-59 years	20.3	23.9	23.5	22.5	21.2	21.8
60-69 years	18.2	18.2	19.8	23.6	25.3	24.7
70-79 years	17.2	17.4	17.6	17.6	19.0	18.1
80+ years	12.3	12.2	13.6	14.2	14.5	14.5
Median age at diagnosis	58.8	58.9	60.5	62.2	63.4	62.9

Figure 1.3.2 Age-specific incidence and mortality rate (per 100,000 population) of cancer by gender, 2015-2019
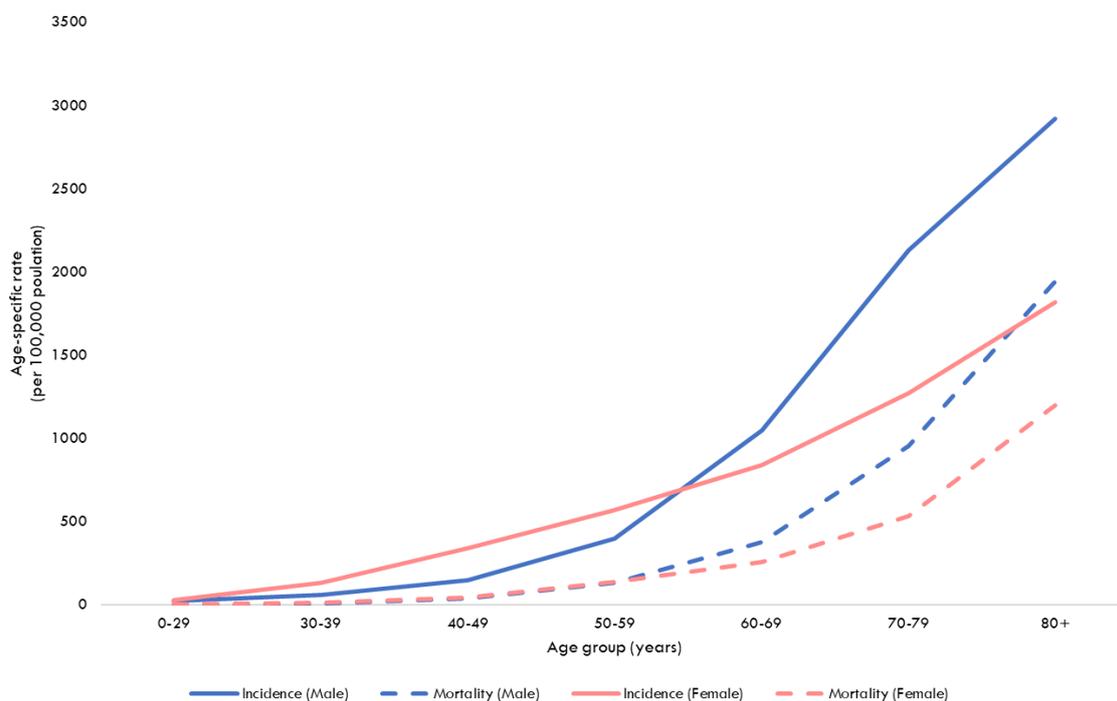
Table 1.3.2(a) Age-specific incidence and mortality number and rate (per 100,000 population) of cancer in males, 2015-2019

		0-29	30-39	40-49	50-59	60-69	70-79	80+
Incidence	**No.**	826	832	2242	6099	11990	10387	5701
	Age-specific rate (95% CI)	23.8 (22.2-25.5)	59.6 (55.6-63.7)	150.1 (143.8-156.3)	398.2 (388.2-408.2)	1046.8 (1028.0-1065.5)	2131.5 (2090.5-2172.5)	2919.6 (2843.8-2995.4)
Mortality	**No.**	100	134	571	2034	4330	4646	3790
	Age-specific rate (95% CI)	2.9 (2.3-3.5)	9.6 (8.0-11.2)	38.2 (35.1-41.4)	132.8 (127.0-138.6)	378.0 (366.8-389.3)	953.4 (926.0-980.8)	1940.9 (1879.1-2002.7)

Table 1.3.2(b) Age-specific incidence and mortality number and rate (per 100,000 population) of cancer in females, 2015-2019

		0-29	30-39	40-49	50-59	60-69	70-79	80+
Incidence	**No.**	945	2016	5419	8738	9915	7278	5816
	Age-specific rate (95% CI)	27.9 (26.1-29.7)	130.6 (124.9-136.3)	343.1 (333.9-352.2)	571.1 (559.1-583.1)	841.8 (825.2-858.3)	1269.4 (1240.3-1298.6)	1818.7 (1771.9-1865.4)
Mortality	**No.**	71	193	672	2088	3024	3065	3827
	Age-specific rate (95% CI)	2.1 (1.6-2.6)	12.5 (10.7-14.3)	42.5 (39.3-45.8)	136.5 (130.6-142.3)	256.7 (247.6-265.9)	534.6 (515.7-553.5)	1196.7 (1158.8-1234.6)

Figure 1.3.3 Ten most frequent incident cancers by gender and age group, 2015-2019

Male

Female

0-29 years
Male (all sites) - 826
Female (all sites)- 945

Male:
Cancer	%
Lymphoid neoplasms	33.3
Testis	9.7
Brain & Central Nervous System	8.6
Myeloid neoplasms	7.7
Connective tissue	5.6
Thyroid	5.2
Bone	5.1
Heart, thymus, & mediastinum	4.0
Colon & rectum	3.8
Other endocrine	3.4

Female:
Cancer	%
Lymphoid neoplasms	18.8
Ovary	14.6
Thyroid	13.9
Breast	9.6
Myeloid neoplasms	7.7
Brain & Central Nervous System	6.6
Uterus	3.8
Bone	3.5
Connective tissue	3.1
Other endocrine	2.4

30-39 years
Male (all sites) - 832
Female (all sites) - 2016

Male:
Cancer	%
Lymphoid neoplasms	13.6
Colon & rectum	11.7
Nasopharynx	10.3
Testis	7.8
Myeloid neoplasms	7.2
Thyroid	7.1
Non-melanoma skin	5.6
Connective tissue	4.3
Kidney	4.3
Brain & Central Nervous System	3.8

Female:
Cancer	%
Breast	33.2
Thyroid	12.4
Uterus	9.2
Cervix	8.1
Ovary	7.1
Lymphoid neoplasms	5.6
Colon & rectum	4.2
Myeloid neoplasms	3.1
Lung	1.9
Brain & Central Nervous System	1.7

40-49 years
Male (all sites) - 2242
Female (all sites) - 5419

Male:
Cancer	%
Colon & rectum	16.5
Nasopharynx	11.3
Lymphoid neoplasms	10.3
Kidney	8.0
Lung	7.8
Non-melanoma skin	7.0
Liver	5.0
Thyroid	4.5
Myeloid neoplasms	4.3
Stomach	3.7

Female:
Cancer	%
Breast	46.8
Uterus	9.9
Thyroid	6.4
Ovary	6.1
Colon & rectum	5.9
Cervix	4.3
Lung	3.2
Lymphoid neoplasms	2.8
Myeloid neoplasms	1.6
Non-melanoma skin	1.5

50-59 years
Male (all sites) - 6099
Female (all sites) - 8738

Male:
Cancer	%
Colon & rectum	19.1
Lung	11.7
Prostate	7.9
Liver	7.9
Lymphoid neoplasms	7.2
Kidney	5.8
Nasopharynx	5.2
Non-melanoma skin	4.7
Stomach	4.1
Myeloid neoplasms	3.6

Female:
Cancer	%
Breast	36.6
Uterus	11.2
Colon & rectum	11.0
Ovary	6.4
Lung	5.5
Thyroid	4.2
Lymphoid neoplasms	4.1
Cervix	3.0
Kidney	1.9
Stomach	1.8

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Male

Female

60-69 years
Male (all sites) - 11990
Female (all sites) - 9915

Male

Site	%
Colon & rectum	18.7
Prostate	18.3
Lung	13.5
Liver	8.3
Lymphoid neoplasms	5.7
Kidney	4.4
Non-melanoma skin	4.1
Stomach	3.8
Pancreas	3.3
Myeloid neoplasms	2.8

Female

Site	%
Breast	30.5
Colon & rectum	14.5
Lung	8.7
Uterus	7.5
Lymphoid neoplasms	5.2
Ovary	4.1
Non-melanoma skin	3.2
Pancreas	3.1
Stomach	2.7
Thyroid	2.7

70-79 years
Male (all sites) - 10387
Female (all sites) - 7278

Male

Site	%
Prostate	22.0
Lung	16.3
Colon & rectum	15.7
Liver	7.6
Lymphoid neoplasms	5.4
Non-melanoma skin	5.2
Stomach	4.8
Pancreas	3.5
Kidney	3.2
Myeloid neoplasms	3.1

Female

Site	%
Breast	21.2
Colon & rectum	17.1
Lung	11.2
Non-melanoma skin	6.2
Lymphoid neoplasms	5.7
Liver	4.6
Uterus	4.5
Stomach	4.2
Pancreas	3.9
Kidney	2.7

80 years+
Male (all sites) - 5701
Female (all sites) - 5816

Male

Site	%
Lung	17.4
Colon & rectum	15.8
Prostate	15.2
Non-melanoma skin	9.2
Liver	7.7
Stomach	6.2
Lymphoid neoplasms	4.7
Myeloid neoplasms	3.6
Pancreas	3.0
Bladder	2.8

Female

Site	%
Colon & rectum	20.5
Breast	12.8
Lung	12.2
Non-melanoma skin	10.5
Stomach	5.9
Liver	5.4
Lymphoid neoplasms	4.6
Pancreas	4.3
Myeloid neoplasms	3.5
Kidney	2.2

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Table 1.3.3 Ten most frequent incident cancers by gender and age group, 2015-2019

Age group	Rank	Male Site	No.	%	Female Site	No.	%
0-29 years	1	Lymphoid neoplasms	275	33.3	Lymphoid neoplasms	178	18.8
	2	Testis	80	9.7	Ovary	138	14.6
	3	Brain & Central Nervous System	71	8.6	Thyroid	131	13.9
	4	Myeloid neoplasms	64	7.7	Breast	91	9.6
	5	Connective tissue	46	5.6	Myeloid neoplasms	73	7.7
	6	Thyroid	43	5.2	Brain & Central Nervous System	62	6.6
	7	Bone	42	5.1	Uterus	36	3.8
	8	Heart, thymus, & mediastinum	33	4.0	Bone	33	3.5
	9	Colon & rectum	31	3.8	Connective tissue	29	3.1
	10	Other endocrine	28	3.4	Other endocrine	23	2.4
		All sites	**826**	**100**	**All sites**	**945**	**100**
30-39 years	1	Lymphoid neoplasms	113	13.6	Breast	670	33.2
	2	Colon & rectum	97	11.7	Thyroid	250	12.4
	3	Nasopharynx	86	10.3	Uterus	186	9.2
	4	Testis	65	7.8	Cervix	164	8.1
	5	Myeloid neoplasms	60	7.2	Ovary	144	7.1
	6	Thyroid	59	7.1	Lymphoid neoplasms	112	5.6
	7	Non-melanoma skin	47	5.6	Colon & rectum	85	4.2
	8	Kidney	36	4.3	Myeloid neoplasms	63	3.1
	9	Connective tissue	36	4.3	Lung	39	1.9
	10	Brain & Central Nervous System	32	3.8	Brain & Central Nervous System	34	1.7
		All sites	**832**	**100**	**All sites**	**2016**	**100**
40-49 years	1	Colon & rectum	369	16.5	Breast	2538	46.8
	2	Nasopharynx	254	11.3	Uterus	534	9.9
	3	Lymphoid neoplasms	232	10.3	Thyroid	349	6.4
	4	Kidney	179	8.0	Ovary	331	6.1
	5	Lung	175	7.8	Colon & rectum	319	5.9
	6	Non-melanoma skin	158	7.0	Cervix	235	4.3
	7	Liver	111	5.0	Lung	171	3.2
	8	Thyroid	102	4.5	Lymphoid neoplasms	154	2.8
	9	Myeloid neoplasms	96	4.3	Myeloid neoplasms	89	1.6
	10	Stomach	82	3.7	Non-melanoma skin	82	1.5
		All sites	**2242**	**100**	**All sites**	**5419**	**100**
50-59 years	1	Colon & rectum	1167	19.1	Breast	3200	36.6
	2	Lung	713	11.7	Uterus	975	11.2
	3	Prostate	481	7.9	Colon & rectum	957	11.0
	4	Liver	480	7.9	Ovary	563	6.4
	5	Lymphoid neoplasms	442	7.2	Lung	477	5.5
	6	Kidney	352	5.8	Thyroid	368	4.2
	7	Nasopharynx	317	5.2	Lymphoid neoplasms	354	4.1
	8	Non-melanoma skin	285	4.7	Cervix	264	3.0
	9	Stomach	253	4.1	Kidney	162	1.9
	10	Myeloid neoplasms	220	3.6	Stomach	156	1.8
		All sites	**6099**	**100**	**All sites**	**8738**	**100**
60-69 years	1	Colon & rectum	2245	18.7	Breast	3022	30.5
	2	Prostate	2195	18.3	Colon & rectum	1436	14.5
	3	Lung	1613	13.5	Lung	858	8.7
	4	Liver	995	8.3	Uterus	741	7.5
	5	Lymphoid neoplasms	683	5.7	Lymphoid neoplasms	512	5.2
	6	Kidney	528	4.4	Ovary	408	4.1
	7	Non-melanoma skin	487	4.1	Non-melanoma skin	313	3.2
	8	Stomach	459	3.8	Pancreas	309	3.1
	9	Pancreas	399	3.3	Stomach	269	2.7
	10	Myeloid neoplasms	338	2.8	Thyroid	264	2.7
		All sites	**11990**	**100**	**All sites**	**9915**	**100**
70-79 years	1	Prostate	2289	22.0	Breast	1541	21.2
	2	Lung	1689	16.3	Colon & rectum	1244	17.1
	3	Colon & rectum	1627	15.7	Lung	814	11.2
	4	Liver	791	7.6	Non-melanoma skin	449	6.2
	5	Lymphoid neoplasms	557	5.4	Lymphoid neoplasms	415	5.7
	6	Non-melanoma skin	536	5.2	Liver	337	4.6
	7	Stomach	500	4.8	Uterus	325	4.5
	8	Pancreas	363	3.5	Stomach	306	4.2
	9	Kidney	335	3.2	Pancreas	281	3.9
	10	Myeloid neoplasms	320	3.1	Kidney	193	2.7
		All sites	**10387**	**100**	**All sites**	**7278**	**100**
80+ years	1	Lung	994	17.4	Colon & rectum	1193	20.5
	2	Colon & rectum	900	15.8	Breast	743	12.8
	3	Prostate	868	15.2	Lung	710	12.2
	4	Non-melanoma skin	524	9.2	Non-melanoma skin	610	10.5
	5	Liver	441	7.7	Stomach	344	5.9
	6	Stomach	353	6.2	Liver	316	5.4
	7	Lymphoid neoplasms	267	4.7	Lymphoid neoplasms	265	4.6
	8	Myeloid neoplasms	208	3.6	Pancreas	252	4.3
	9	Pancreas	173	3.0	Myeloid neoplasms	201	3.5
	10	Bladder	159	2.8	Kidney	129	2.2
		All sites	**5701**	**100**	**All sites**	**5816**	**100**

1.3 Age group trends for incidence and mortality of cancer, 1968-2019

KEY POINTS

- There had been a shift towards a greater proportion of cancer diagnoses among the older age groups. The proportion of diagnoses at the age of 70 and above had risen from 15.7% in 1968-1972 to 42.3% in 2015-2019 for males, and from 17% to 32.6% in females.
- From 1968-1972 to 2015-2019, while the median age at diagnosis for cancer had risen for both genders, it was observed to be consistently higher for males than females (males: 59.6 to 67.8 years; females: 57.3 to 62.9 years).
- Individuals aged 60-69 years old made up the largest age group among all cancer diagnoses for the majority of the five-year periods for both males and females.
- The risk of developing and dying from cancer increased with age as age-specific incidence and mortality rates rose with age.
- Lymphoid neoplasm was the most common diagnosis in younger males while lung, colorectal, and prostate cancer were more common among older males.
- Breast cancer was the most common diagnosis in females aged 30 – 79 years; colorectal and lung cancer were also common among older females.

(2) TRENDS IN CANCER SURVIVAL, 1968-2019

2.1 Five-year age-standardised relative survival (ASRS) for all cancers, 1968-2019

2.1.1 Gender trends

The five-year age-standardised relative survival (ASRS) of all cancers had improved for males and females over the years (Figure 2.1.1, Table 2.1.1). The five-year ASRS increased from 13.2% to 53.5% for males from 1973-1977 to 2015-2019 and rose from 28.0% to 62.0% for females over the same period. Notably, the five-year ASRS in every five-year period was higher for females than for males.

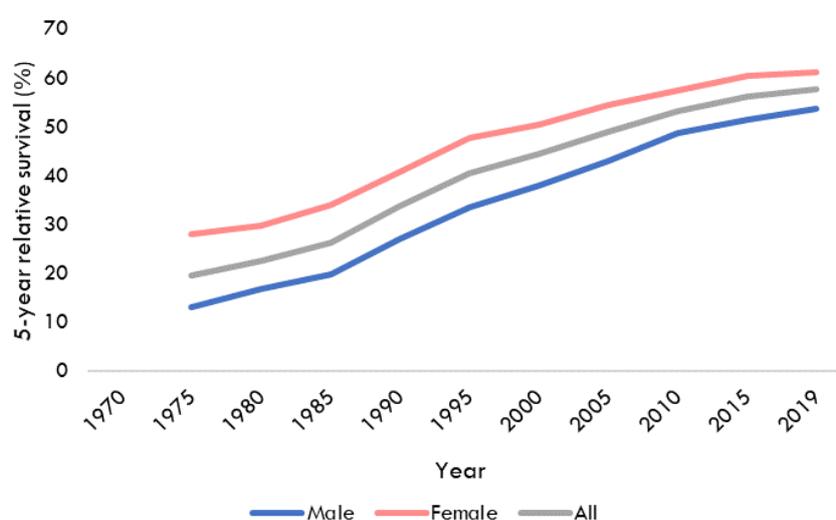**Figure 2.1.1** Five-year age-standardised relative survival rate (%) of cancer by gender, 1968-2019

Table 2.1.1 Five-year age-standardised relative survival rate (%) of cancer by gender, 1968-2019

		1968-1972	1973-1977	1978-1982	1983-1987	1988-1992	1993-1997
Male	**5-year ASRS**	-	13.2	16.8	19.9	27.1	33.4
	(95% CI)	-	(12.3-14.1)	(15.9-17.7)	(18.9-20.8)	(26.1-28.1)	(32.4-34.3)
Female	**5-year ASRS**	-	28.0	29.9	34.0	40.8	47.6
	(95% CI)	-	(26.6-29.5)	(28.7-31.2)	(32.9-35.2)	(39.7-41.9)	(46.7-48.6)
All	**5-year ASRS**	-	19.5	22.5	26.4	33.8	40.4
	(95% CI)	-	(18.7-20.3)	(21.8-23.3)	(25.7-27.1)	(33.0-34.5)	(39.7-41.1)
		1998-2002	2003-2007	2008-2012	2013-2017	2018-2019	2015-2019
Male	**5-year ASRS**	38.0	43.0	48.7	51.4	53.8	**53.5**
	((5% CI)	(37.2-38.9)	(42.2-43.8)	(48.0-49.4)	(50.8-52.1)	(52.8-54.7)	**(52.9-54.2)**
Female	**5-year ASRS**	50.5	54.5	57.4	60.4	61.1	**62.0**
	(95% CI)	(49.7-51.3)	(53.8-55.2)	(56.7-58.0)	(59.8-60.9)	(60.3-61.9)	**(61.4-62.5)**
All	**5-year ASRS**	44.4	48.9	53.2	56.1	57.6	**57.9**
	(95% CI)	(43.8-44.9)	(48.4-49.5)	(52.7-53.7)	(55.6-56.5)	(57.0-58.2)	**(57.5-58.4)**

2.1.2 Ethnic trends

From 1973-1977 onwards, the five-year ASRS of cancer has increased for all three ethnic groups (Figure 2.1.2, Table 2.1.2). From 1973-1977 to 2015-2019, the five-year ASRS of cancer rose from 19.6% to 58.9%, 17.0% to 45.9%; and 24.6% to 57.2% for the Chinese, Malays and Indians respectively. Aside from some fluctuation in the five-year ASRS during the earlier time periods, the survival rates of cancer

for the Chinese and Indians remained fairly similar. However, the Malays consistently had the lowest five-year ASRS throughout the years.

Figure 2.1.2 Five-year age-standardised relative survival rate (%) of cancer by ethnicity, 1968-2019
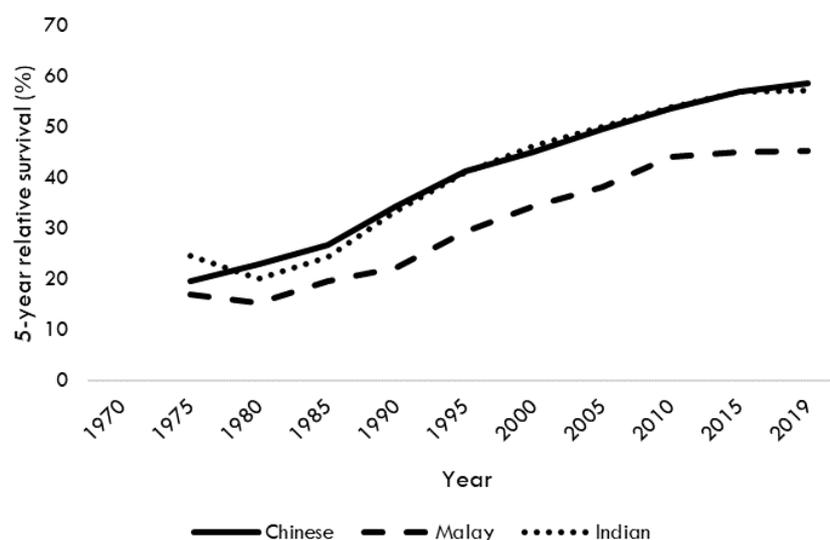

Table 2.1.2 Five-year age-standardised relative survival rate (%) of cancer by ethnicity, 1968-2019

		1968-1972	1973-1977	1978-1982	1983-1987	1988-1992	1993-1997
Chinese	5-year ASRS	-	19.6	23.0	26.8	34.4	41.2
	(95% CI)	-	(18.7-20.5)	(22.1-23.8)	(26.0-27.6)	(33.7-35.2)	(40.4-41.9)
Malay	5-year ASRS	-	17.0	15.4	19.7	22.1	29.4
	(95% CI)	-	(13.8-20.6)	(12.9-18.2)	(17.3-22.3)	(19.8-24.5)	(27.3-31.6)
Indian	5-year ASRS	-	24.6	20.0	24.3	33.4	40.9
	(95% CI)	-	(19.9-29.6)	(16.6-23.6)	(20.7-28.2)	(29.7-37.2)	(37.5-44.3)
		1998-2002	2003-2007	2008-2012	2013-2017	2018-2019	2015-2019
Chinese	5-year ASRS	44.9	49.5	53.5	56.8	58.5	58.9
	(95% CI)	(44.3-45.6)	(48.9-50.1)	(53.0-54.0)	(56.3-57.3)	(57.8-59.2)	(58.5-59.4)
Malay	5-year ASRS	34.3	38.2	44.0	45.1	45.3	45.9
	(95% CI)	(32.4-36.2)	(36.5-39.9)	(42.5-45.6)	(43.8-46.4)	(43.5-47.1)	(44.7-47.2)
Indian	5-year ASRS	46.3	50.0	53.7	57.0	57.2	57.2
	(95% CI)	(43.4-49.2)	(47.4-52.6)	(51.5-55.9)	(55.1-58.9)	(54.5-59.9)	(55.4-59.0)

2.1.3 Age group trends

The five-year age-specific relative survival of cancer had seen an overall increase across all the different age groups. This was so even among the oldest age groups (70-79 years and 80 years and above), where relative survival rose from 13.3% in 1973-1977 to 52.8% in 2015-2019 for the former and from 22.4% to 37.5% over the same period for the latter (Figure 2.1.3(a), Table 2.1.3). In the 2015-2019 period, the five-year age-specific relative survival of cancer was observed to decrease with age, particularly after the age of 49 years, dropping from 85.5% among individuals under 30 years of age to 37.5% in those aged 80 years and above (Figure 2.1.3(b), Table 2.1.3).

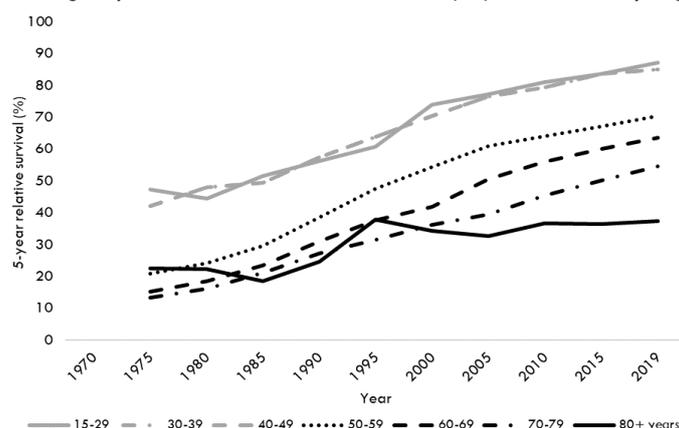**Figure 2.1.3(a)** Five-year age-specific relative survival rate (%) of cancer by age group, 1968-2019

Figure 2.1.3(b) Five-year age-specific relative survival rate (%) of cancer by age group, 2015-2019
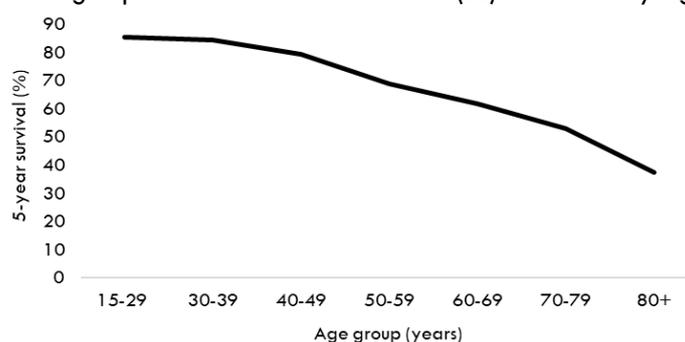

Table 2.1.3 Five-year age-specific relative survival rate (%) of cancer by age group, 1968-2019

		15-29	30-39	40-49	50-59	60-69	70-79	80+
1968-1972	5-year ASRS	-	-	-	-	-	-	-
	(95% CI)	-	-	-	-	-	-	-
1973-1977	5-year ASRS	47.2	42.1	29.0	20.7	15.0	13.3	22.4
	(95% CI)	(42.7-51.7)	(38.5-45.7)	(26.7-31.3)	(19.1-22.3)	(13.8-16.3)	(11.5-15.3)	(15.0-31.7)
1978-1982	5-year ASRS	44.3	48.0	37.4	24.1	18.4	16.0	22.2
	(95% CI)	(40.4-48.2)	(44.7-51.2)	(35.2-39.7)	(22.5-25.7)	(17.1-19.7)	(14.4-17.8)	(16.9-28.5)
1983-1987	5-year ASRS	51.5	49.4	43.5	29.4	23.3	21.0	18.5
	(95% CI)	(47.5-55.3)	(46.5-52.2)	(41.4-45.6)	(27.8-31.0)	(21.9-24.7)	(19.4-22.7)	(15.0-22.5)
1988-1992	5-year ASRS	56.1	57.3	52.8	38.4	31.0	27.2	24.6
	(95% CI)	(52.2-59.7)	(54.9-59.7)	(50.9-54.7)	(36.9-40.0)	(29.6-32.4)	(25.6-28.8)	(21.2-28.3)
1993-1997	5-year ASRS	60.6	63.6	59.7	47.3	37.6	31.3	37.8
	(95% CI)	(56.7-64.4)	(61.5-65.7)	(58.1-61.3)	(45.8-48.8)	(36.3-38.8)	(29.8-32.8)	(34.6-41.2)
1998-2002	5-year ASRS	73.8	70.2	65.7	54.2	41.7	36.1	34.2
	(95% CI)	(70.4-76.9)	(68.3-72.0)	(64.4-67.0)	(52.9-55.4)	(40.6-42.9)	(34.8-37.4)	(32.0-36.5)
2003-2007	5-year ASRS	77.1	76.3	70.1	60.9	50.4	39.5	32.5
	(95% CI)	(74.0-79.8)	(74.4-78.0)	(68.9-71.2)	(59.9-62.0)	(49.3-51.5)	(38.3-40.7)	(30.5-34.5)
2008-2012	5-year ASRS	80.8	79.2	75.1	63.9	55.9	45.3	36.5
	(95% CI)	(78.0-83.2)	(77.5-80.8)	(74.1-76.2)	(63.0-64.8)	(54.9-56.8)	(44.2-46.4)	(34.7-38.3)
2013-2017	5-year ASRS	83.5	83.5	77.6	67.1	60.0	50.0	36.4
	(95% CI)	(81.1-85.6)	(82.0-85.0)	(76.5-78.5)	(66.3-68.0)	(59.2-60.8)	(49.0-51.0)	(35.0-37.8)
2018-2019	5-year ASRS	87.1	85.0	80.1	70.2	63.5	54.6	37.2
	(95% CI)	(83.6-89.9)	(82.7-87.0)	(78.6-81.6)	(68.9-71.4)	(62.3-64.6)	(53.2-56.0)	(35.2-39.3)
2015-2019	5-year ASRS	**85.5**	**84.4**	**79.3**	**69.0**	**61.9**	**52.8**	**37.5**
	(95% CI)	**(83.3-87.5)**	**(82.9-85.7)**	**(78.3-80.2)**	**(68.2-69.8)**	**(61.2-62.7)**	**(51.9-53.7)**	**(36.1-38.8)**

2.1 Five-year relative survival of cancer by gender, ethnicity and age group

KEY POINTS

- From 1973-1977 to 2015-2019, while the five-year relative survival rate had improved significantly for both males and females (13.2% to 53.5% and 28% to 62% respectively), females were observed to consistently have a higher survival rate compared to males.
- While the five-year relative survival rate improved for all three ethnic groups over the years, Malays were found to have the lowest survival rates (Chinese: 19.6% to 58.9%; Malay: 17% to 45.9%; Indian: 24.6% to 57.2%).
- The five-year relative survival rates decreased with age where in 2015-2019, the 5-year ASRS for individuals aged 15-29 years was 85.5%, compared to only 37.5% for those aged 80 years and above.

2.2 Five-year age-standardised relative survival rate (%) for ten most frequent incident cancers by gender, 2015-2019

Of the ten most frequent incident cancers for both genders in 2015-2019, non-melanoma skin cancer had the highest five-year ASRS, at 95.0% and 98.6% respectively for males and females (Figure 2.2.1, Figure 2.2.2). Prostate cancer in males as well as breast and thyroid cancer in females also had high survival rates that exceeded 80%. Cancer of the stomach, liver, lung and pancreas had poorer survival rates on the whole. Of the ten most frequent incident cancers among males, pancreatic cancer had the lowest five-year ASRS at 12.2% followed by lung and liver cancer at 16.3% and 25.3% respectively. Lung cancer had the lowest five-year ASRS among the top ten most commonly diagnosed cancers in females at 29.3%, followed by stomach and ovarian cancer at 39.7% and 43.2% respectively.

Figure 2.2.1 Five-year age-standardised relative survival rate (%) for ten most frequent incident cancers in males, 2015-2019
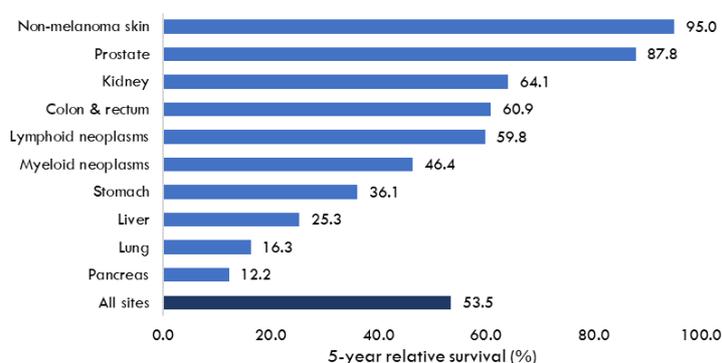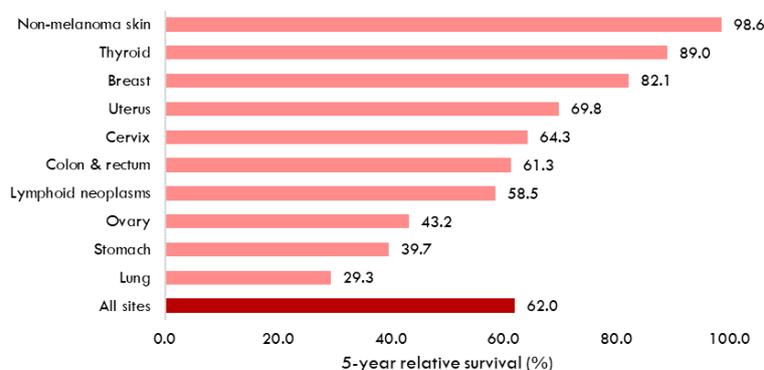

Figure 2.2.2 Five-year age-standardised relative survival rate (%) for ten most frequent incident cancers in females, 2015-2019

2.2 Five-year relative survival of ten most frequent incident cancers by gender

KEY POINTS

- Non-melanoma skin cancer had the highest five-year survival rates among the most common incident cancers in both males (95%) and females (98.6%) for the period 2015-2019.
- Prostate cancer in males (87.8%) as well as thyroid and breast cancer in females (89.0% and 82.1% respectively) were among the common incident cancers in the 2015-2019 period with the highest survival rates.
- Among the most common incident cancers for 2015-2019, pancreatic, lung, and liver cancer had the poorest survival rates for males (12.2%, 16.3%and 25.5% respectively); and lung, stomach, and ovarian cancer had the lowest survival rates for females (29.3%, 39.7%and 43.2% respectively).

2.3 Age-standardised relative survival rate (%) five years following diagnosis for ten most frequent incident cancers by gender, 2015-2019

While the ASRS of cancer for both genders decreased with each year post-diagnosis, the survival for some cancers deteriorated more rapidly in comparison to others. The cancer survival rate for each year following diagnosis for all cancers was better among for females compared than males.

Among males, the one-year survival rate for all cancers was 73.6%, and by the five-year mark, this had decreased gradually to 53.5% (Figure 2.3.1, Table 2.3.1). Non-melanoma skin and prostate cancer had the highest survival rate at every one-year interval after diagnosis. Pancreatic, lung, and liver cancer had the poorest survival rates among males for each year after diagnosis, with the most rapid deterioration occurring between the first and second year.

For females, the ASRS declined gradually from 78.9% at the one-year mark to 62.0% after five years (Figure 2.3.2, Table 2.3.2). Non-melanoma skin, thyroid, and breast cancer consistently had the best survival rates out of the most frequent incident cancers among females, with the survival rate for non-melanoma skin cancer being consistently the highest over the five years following diagnosis. In contrast, lung and stomach cancer had consistently poorer survival rates than other commonly diagnosed cancers in females in the five years following diagnosis, with the most rapid declines observed between the first and second year.

Figure 2.3.1 Age-standardised relative survival rate (%) five years following diagnosis for ten most frequent incident cancers in males, 2015-2019

Figure 2.3.2 Age-standardised relative survival rate (%) five years following diagnosis for ten most frequent incident cancers in females, 2015-2019

Table 2.3.1 Age-standardised relative survival rate (%) five years following diagnosis for ten most frequent incident cancers in males, 2015-2019

		Years after diagnosis				
		1	2	3	4	5
Male	Colon & rectum	82.7 (81.6-83.6)	73.1 (71.8-74.3)	67.5 (66.2-68.8)	63.8 (62.4-65.2)	60.9 (59.4-62.4)
	Prostate	98.0 (97.3-98.5)	95.1 (94.2-95.9)	91.7 (90.6-92.8)	89.4 (88.1-90.7)	87.8 (86.3-89.2)
	Lung	47.3 (45.9-48.8)	31.8 (30.5-33.2)	23.1 (21.9-24.4)	18.6 (17.5-19.8)	16.3 (15.2-17.5)
	Liver	49.7 (47.7-51.6)	38.8 (36.9-40.7)	32.8 (31.0-34.7)	27.9 (26.2-29.8)	25.3 (23.5-27.1)
	Lymphoid neoplasms	76.2 (74.4-78.0)	69.5 (67.5-71.5)	65.1 (62.9-67.2)	61.6 (59.3-63.8)	59.8 (57.4-62.1)
	Non-melanoma skin	98.2 (97.1-99.1)	96.8 (95.3-98.1)	95.7 (93.9-97.4)	95.1 (93.0-97.0)	95.0 (92.7-97.2)
	Stomach	60.8 (58.3-63.3)	46.6 (44.0-49.2)	40.9 (38.2-43.5)	38.2 (35.5-40.9)	36.1 (33.4-38.9)
	Kidney	81.8 (79.7-83.7)	75.4 (73.0-77.6)	71.1 (68.5-73.6)	67.3 (64.5-70.0)	64.1 (61.1-67.0)
	Myeloid neoplasms	71.8 (69.1-74.3)	60.5 (57.5-63.3)	53.0 (50.0-56.0)	47.6 (44.4-50.7)	46.4 (43.2-49.6)
	Pancreas	32.0 (29.3-34.6)	18.9 (16.7-21.2)	14.2 (12.1-16.3)	12.7 (10.7-14.8)	12.2 (10.2-14.3)
	All sites	**73.6 (73.1-74.1)**	**64.4 (63.8-64.9)**	**59.1 (58.5-59.6)**	**55.7 (55.1-56.3)**	**53.5 (52.9-54.2)**

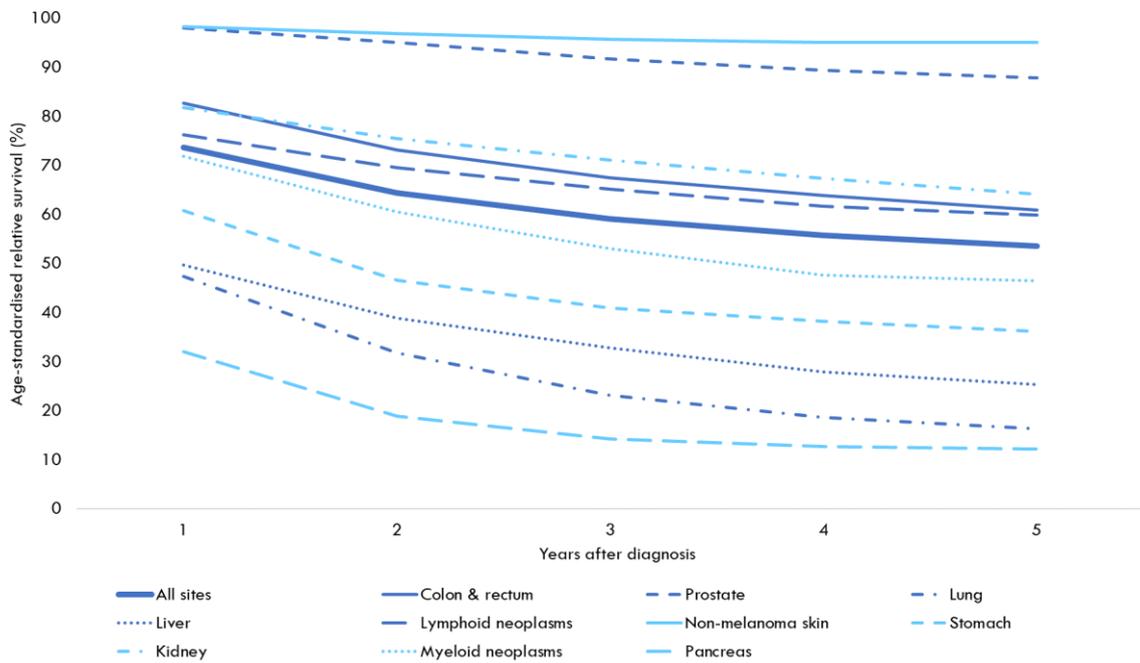**Table 2.3.2** Age-standardised relative survival rate (%) five years following diagnosis for ten most frequent incident cancers in females, 2015-2019

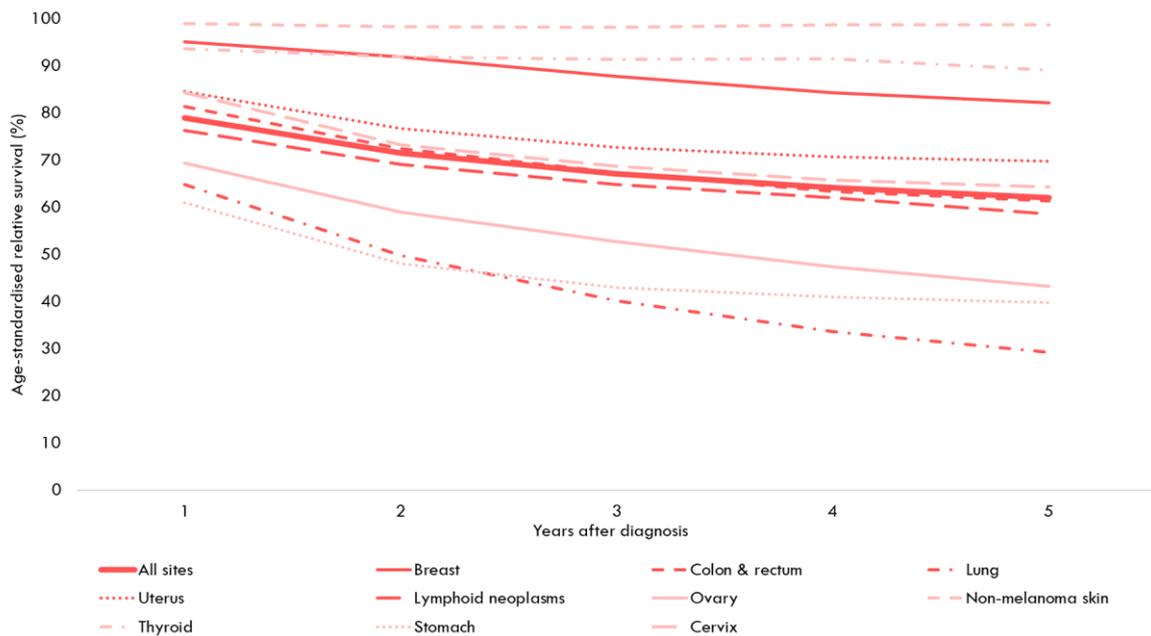|		Years after diagnosis				
		1	2	3	4	5
Female	Breast	95.1 (94.7-95.6)	91.9 (91.4-92.5)	87.7 (87.0-88.3)	84.3 (83.5-85.1)	82.1 (81.2-83.0)
	Colon & rectum	81.3 (80.2-82.4)	72.4 (71.1-73.7)	67.3 (65.8-68.7)	63.3 (61.8-64.8)	61.3 (59.7-62.9)
	Lung	64.8 (63.0-66.6)	49.7 (47.8-51.6)	40.1 (38.2-42.0)	33.7 (31.8-35.6)	29.3 (27.4-31.2)
	Uterus	84.5 (83.1-85.7)	76.7 (75.1-78.2)	72.7 (71.0-74.4)	70.7 (68.9-72.4)	69.8 (67.9-71.6)
	Lymphoid neoplasms	76.3 (74.2-78.2)	69.1 (66.8-71.2)	64.8 (62.4-67.1)	62.0 (59.5-64.4)	58.5 (55.9-61.0)
	Ovary	69.4 (67.3-71.3)	59.0 (56.8-61.2)	52.7 (50.4-54.9)	47.4 (45.1-49.7)	43.2 (40.9-45.5)
	Non-melanoma skin	98.9 (97.8-99.9)	98.2 (96.6-99.5)	98.1 (96.2-99.8)	98.6 (96.4-100.5)	98.6 (96.1-100.9)
	Thyroid	93.6 (92.3-94.7)	91.9 (90.4-93.3)	91.3 (89.7-92.8)	91.4 (89.7-92.9)	89.0 (87.0-90.7)
	Stomach	60.9 (57.9-63.8)	48.0 (44.9-51.1)	42.9 (39.8-46.0)	40.9 (37.7-44.0)	39.7 (36.4-42.9)
	Cervix	84.2 (82.0-86.2)	73.2 (70.5-75.6)	68.7 (65.9-71.3)	65.8 (62.9-68.6)	64.3 (61.3-67.2)
	All sites	**78.9 (78.5-79.3)**	**71.5 (71.1-72.0)**	**67.1 (66.6-67.6)**	**64.1 (63.6-64.6)**	**62.0 (61.4-62.5)**

2.3 Age-standardised relative survival five years following diagnosis for ten most frequent incident cancers by gender, 2015-2019

KEY POINTS

- While cancer survival rates decreased each year after diagnosis, the rate of decline was observed to be faster for some cancers compared to others.
- Among males, non-melanoma skin and prostate cancer had the highest survival rates for each year post-diagnosis (98.2% and 98% at one year and 95% and 87.8% at five years respectively), while pancreatic, lung, and liver cancer had the lowest survival rates at every one-year interval post-diagnosis (32%, 47.3%, 49.7% at one year and 12.2%, 16.3%, 25.3% at five years respectively).
- Among females, non-melanoma skin, thyroid, and breast cancer had the highest survival rates for each year post-diagnosis (98.9%, 93.6%, 95.1% at one year and 98.6%, 89%, 82.1% at five years respectively); while lung and stomach cancer had the poorest survival rates at every one-year interval post-diagnosis (64.8% and 60.9% at one year and 29.3% and 39.7% at five years respectively).

(3) TRENDS IN INCIDENCE, MORTALITY AND SURVIVAL OF SELECTED CANCERS, 1968-2019

3.1 Age-standardised incidence, age-standardised mortality, and five-year age-standardised relative survival for selected cancers in males and females, 1968-2019

Males

Among the ten most frequent incident cancers in males for the period of 2015-2019, while there had been an overall increase in the five-year age-standardised survival rates across the board from 1968-2019, differing trends can be observed for the incidence and mortality rates of these cancers (Figure 3.1.1, Table 3.1.1).

From the period of 1968-1972 to 2015-2019, there was a notable rise in the ASIR for colorectal and prostate cancer from 19.4 to 39.1 per 100,000 population and 4.0 to 34.6 per 100,000 population (a rise of more than 8 times) respectively. However, there were also significant decreases in the incidence of other cancers during the same period. The ASIR of lung, liver and stomach cancer dropped from 47.3 to 31.1 per 100,000 population, 28.7 to 17.0 per 100,000 population; and 37.7 to 10.1 per 100,000 population respectively.

Similar to the trends observed for ASIR, the ASMR for stomach cancer also fell from 26.2 per 100,000 population in 1968-1972 to 5.1 per 100,000 population in 2015-2019. The ASMR of colorectal and prostate cancer in males, likewise, had risen from 1968-1972 to 2015-2019, alongside the rise in its incidence rate from 8.9 to 13.5 per 100,000 population and 1.2 to 5.6 per 100,000 population respectively. Unfortunately during the same period, pancreatic cancer, which has a low survival rate, also exhibited an increasing mortality rate alongside its increasing incidence, where its ASMR rose from 1.7 to 5.8 per 100,000 population – an increase of more than threefold.

Despite exhibiting differing trends in incidence and mortality over the years, there had been improvements in the survival across all ten commonly diagnosed cancers. For instance, while the five-year ASRS of colorectal cancer was 24.4% in 1973-1977, it climbed to 60.9% in 2015-2019. Likewise, the survival of prostate cancer had increased from 47.3% to 87.8% during this period. Even among cancers with generally poorer survival rates, there had been significant improvements in the five-year ASRS over the years – in 1973-1977, the five-year ASRS of lung and liver cancer were 3.0% and 0.2% respectively, but in 2015-2019, these figures had risen to 16.3% and 25.3% respectively.

Females

As with the trends observed for males, the ten most frequent incident cancers of 2015-2019 among females also displayed differing incidence and mortality trends over the years from 1968-2019. However, there had been a consistent pattern of an overall increase in survival rates for all ten common cancers (Figure 3.1.2, Table 3.1.2).

Notably, the ASIR of breast cancer, which is the most common cancer diagnosis in females, had risen about 3.5 times from 20.1 per 100,000 population in 1968-1972 to 72.6 per 100,000 population in 2015-2019. Similarly, the ASIR of uterine and ovarian cancer had also risen significantly over the same period, from 4.9 to 18.1 per 100,000 population and 5.9 to 12.4 per 100,000 population – registering increases of approximately 3.5 and 2 times respectively. On the other hand, as with males, the ASIR of stomach cancer in females had also decreased significantly, from 17.4 per 100,000 population in 1968-1972 to 5.8 per 100,000 population in 2015-2019. During the same period, the ASIR of cervical cancer had also fallen drastically from 18.0 to 7.0 per 100,000 population.

The trends for mortality rate of many common cancers in females had risen or fallen alongside that of the trends observed for their incidence rates. For example, the ASMR of breast cancer rose from 5.7 per

100,000 population in 1968-1972 to 12.2 per 100,000 population in 2015-2019. During the same period, the ASMR of ovarian cancer had also increased from 1.4 per 100,000 population to 3.7 per 100,000 population, in tandem with an increasing incidence rate. On the other hand, the ASMR of stomach cancer had fallen drastically from 11.9 per 100,000 population in 1968-1972 to 3.1 per 100,000 population in 2015-2019. Similarly, the ASMR of cervical cancer had also decreased from 4.9 to 1.8 per 100,000 population over the same period.

Significant improvements were observed in the survival rates for many common cancers. The five-year ASRS of the most common incident cancer in females – breast cancer – had significantly improved from 49.9% in 1973-1977 to 82.1% in 2015-2019. Similarly, the five-year ASRS for uterine cancer had also increased from 48.3% to 69.8% during this period. As with males, improvements were also observed for other common cancers with generally poorer survival rates such as lung and stomach cancer, where five-year ASRS improved from 5.3% to 29.3% and 6.4% to 39.7% respectively.

Figure 3.1.1 Age-standardised incidence rate (per 100,000 population), age-standardised mortality rate (per 100,000 population) and five-year age-standardised relative survival rate (%) of selected cancers in males, 1968-2019

Table 3.1.1 Incidence number and age-standardised incidence rate (per 100,000 population), age-standardised mortality rate (per 100,000 population) and five-year age-standardised relative survival rate (%) of selected cancers in males, 1968-2019
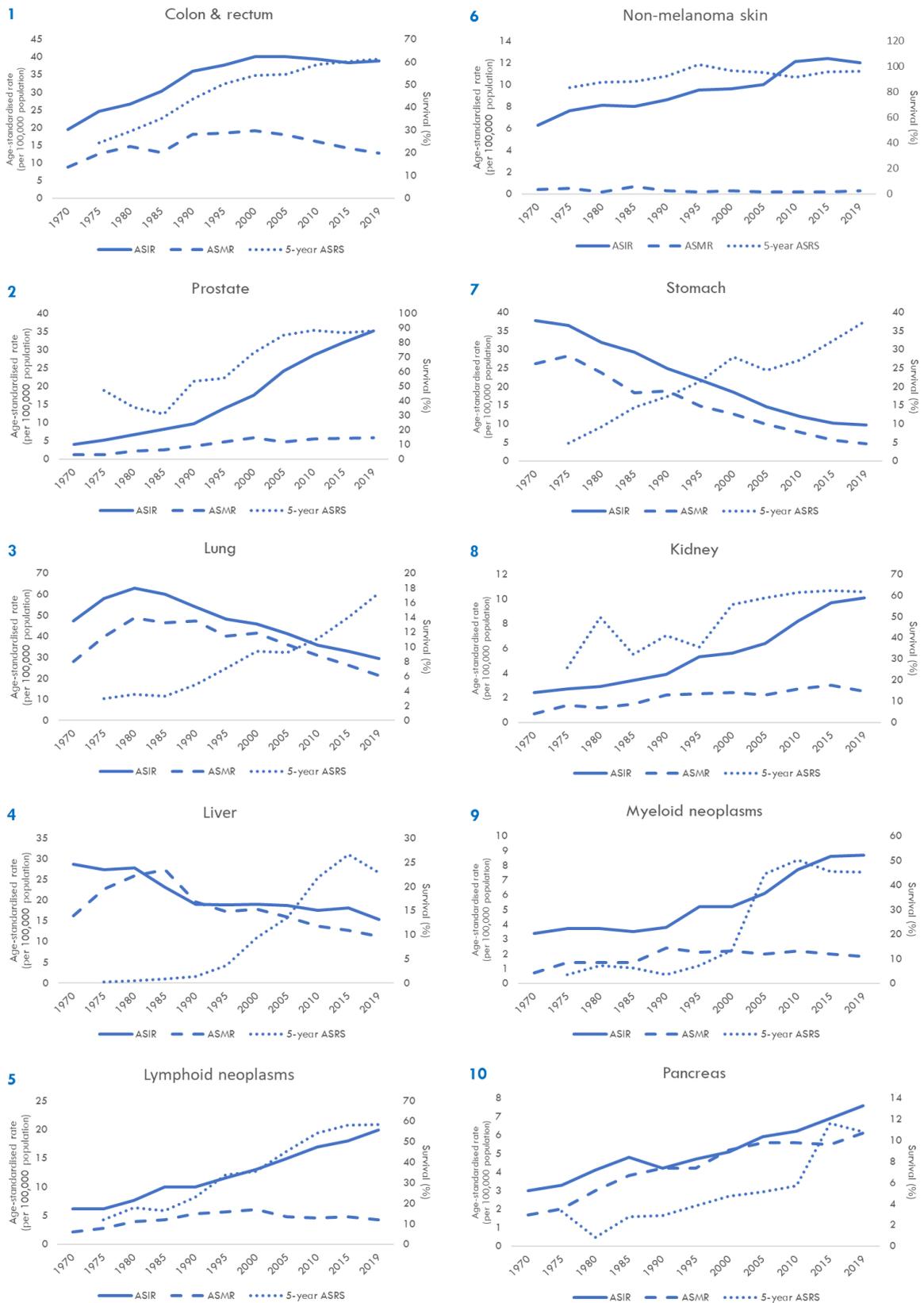
Site	Year	Number	ASIR (95% CI)*	ASMR (95% CI)*	ASRS (95% CI)
Colon & rectum	1968-1972	563	19.4 (17.6-21.2)	8.9 (7.7-10.1)	
	1973-1977	824	24.6 (22.8-26.4)	12.6 (11.3-13.9)	24.4 (20.2-28.9)
	1978-1982	1057	26.7 (25.0-28.4)	14.6 (13.3-15.8)	29.6 (25.9-33.5)
	1983-1987	1435	30.2 (28.6-31.8)	12.9 (11.9-14.0)	35.2 (31.7-38.8)
	1988-1992	2052	36.0 (34.4-37.6)	18.1 (16.9-19.2)	43.5 (40.5-46.6)
	1993-1997	2553	37.7 (36.2-39.2)	18.5 (17.5-19.6)	50.4 (47.7-53.1)
	1998-2002	3252	40.1 (38.7-41.5)	19.1 (18.1-20.0)	54.1 (51.8-56.4)
	2003-2007	3849	40.0 (38.7-41.3)	17.9 (17.0-18.7)	54.7 (52.6-56.6)
	2008-2012	4790	39.3 (38.2-40.4)	16.0 (15.3-16.7)	58.9 (57.1-60.7)
	2013-2017	5821	38.4 (37.4-39.4)	14.1 (13.5-14.7)	60.1 (58.5-61.6)
	2018-2019	2720	38.9 (37.4-40.4)	12.7 (11.9-13.5)	61.3 (59.0-63.5)
	2015-2019	**6436**	**39.1 (38.1-40.1)**	**13.5 (12.9-14.1)**	**60.9 (59.4-62.4)**
Prostate	1968-1972	94	4.0 (3.1-4.8)	1.2 (0.8-1.7)	
	1973-1977	144	5.2 (4.3-6.0)	1.3 (0.9-1.7)	47.3 (33.6-61.6)
	1978-1982	240	6.8 (5.9-7.7)	2.2 (1.7-2.7)	35.4 (25.5-46.2)
	1983-1987	356	8.2 (7.4-9.1)	2.5 (2.1-3.0)	30.8 (24.0-38.1)
	1988-1992	529	9.7 (8.9-10.6)	3.6 (3.1-4.1)	53.4 (46.0-60.7)
	1993-1997	902	13.8 (12.9-14.7)	4.8 (4.3-5.4)	55.3 (49.9-60.6)
	1998-2002	1359	17.6 (16.7-18.5)	5.9 (5.4-6.5)	73.0 (68.9-76.9)
	2003-2007	2211	24.2 (23.2-25.3)	4.8 (4.3-5.2)	85.0 (82.2-87.7)
	2008-2012	3337	28.6 (27.6-29.6)	5.6 (5.2-6.0)	88.5 (86.5-90.4)
	2013-2017	4908	32.1 (31.2-33.0)	5.7 (5.3-6.1)	86.9 (85.3-88.5)
	2018-2019	2595	35.2 (33.8-36.6)	5.9 (5.4-6.5)	87.8 (85.6-89.9)
	2015-2019	**5875**	**34.6 (33.7-35.5)**	**5.6 (5.2-5.9)**	**87.8 (86.3-89.2)**
Lung	1968-1972	1361	47.3 (44.6-49.9)	28.0 (25.9-30.0)	
	1973-1977	1920	57.9 (55.3-60.6)	39.9 (37.7-42.2)	3.0 (2.1-4.0)
	1978-1982	2440	63.0 (60.4-65.5)	48.8 (46.5-51.0)	3.5 (2.7-4.4)
	1983-1987	2770	60.1 (57.9-62.4)	46.6 (44.6-48.6)	3.3 (2.7-4.1)
	1988-1992	2971	54.1 (52.1-56.0)	47.3 (45.5-49.1)	4.9 (4.0-5.8)
	1993-1997	3168	48.1 (46.4-49.8)	40.0 (38.4-41.5)	7.1 (6.0-8.2)
	1998-2002	3599	45.8 (44.3-47.3)	41.6 (40.1-43.0)	9.4 (8.4-10.5)
	2003-2007	3862	41.3 (39.9-42.6)	36.2 (34.9-37.4)	9.2 (8.2-10.3)
	2008-2012	4291	35.7 (34.6-36.8)	30.9 (29.9-31.9)	11.1 (10.1-12.2)
	2013-2017	5052	33.0 (32.0-33.9)	26.2 (25.4-27.0)	14.0 (12.9-15.1)
	2018-2019	2120	29.4 (28.2-30.7)	21.3 (20.2-22.4)	17.3 (15.5-19.2)
	2015-2019	**5218**	**31.1 (30.2-31.9)**	**23.4 (22.7-24.2)**	**16.3 (15.2-17.5)**
Liver	1968-1972	898	28.7 (26.7-30.6)	16.2 (14.7-17.7)	
	1973-1977	965	27.4 (25.6-29.3)	22.7 (21.0-24.3)	0.2 (0.1-0.4)
	1978-1982	1126	27.8 (26.1-29.4)	25.9 (24.3-27.5)	0.5 (0.3-1.0)
	1983-1987	1095	23.2 (21.8-24.5)	27.4 (25.9-29.0)	0.8 (0.4-1.3)
	1988-1992	1089	19.0 (17.8-20.1)	19.6 (18.4-20.8)	1.4 (0.7-2.4)
	1993-1997	1302	18.9 (17.9-20.0)	17.2 (16.2-18.2)	3.6 (2.5-5.0)
	1998-2002	1554	19.1 (18.1-20.0)	17.9 (16.9-18.8)	9.4 (7.8-11.2)
	2003-2007	1788	18.7 (17.8-19.6)	15.9 (15.1-16.7)	13.6 (11.7-15.6)
	2008-2012	2138	17.6 (16.8-18.4)	13.8 (13.1-14.5)	21.8 (19.7-23.9)
	2013-2017	2757	18.1 (17.4-18.7)	12.7 (12.1-13.3)	26.6 (24.7-28.5)
	2018-2019	1106	15.3 (14.4-16.2)	11.2 (10.5-12.0)	22.8 (20.2-25.5)
	2015-2019	**2834**	**17.0 (16.4-17.7)**	**12.0 (11.5-12.5)**	**25.3 (23.5-27.1)**
Lymphoid neoplasms	1968-1972	252	6.2 (5.4-7.1)	2.2 (1.7-2.7)	
	1973-1977	261	6.2 (5.4-7.0)	2.8 (2.3-3.4)	12.0 (7.4-17.8)
	1978-1982	351	7.7 (6.9-8.6)	4.0 (3.4-4.7)	17.9 (12.5-24.2)
	1983-1987	510	10.0 (9.1-10.9)	4.3 (3.7-4.8)	16.5 (12.1-21.5)
	1988-1992	602	10.0 (9.2-10.8)	5.3 (4.7-5.9)	23.0 (19.0-27.4)
	1993-1997	825	11.6 (10.8-12.4)	5.6 (5.0-6.2)	33.7 (29.3-38.2)
	1998-2002	1047	13.0 (12.2-13.8)	6.1 (5.5-6.6)	35.5 (32.0-39.2)
	2003-2007	1351	14.9 (14.1-15.7)	4.8 (4.3-5.2)	45.3 (42.0-48.6)
	2008-2012	1846	16.9 (16.1-17.7)	4.6 (4.2-5.0)	54.2 (51.4-57.0)
	2013-2017	2289	18.0 (17.2-18.8)	4.8 (4.4-5.1)	58.0 (55.6-60.5)
	2018-2019	1145	19.9 (18.6-21.2)	4.3 (3.8-4.8)	58.5 (54.9-61.9)
	2015-2019	**2569**	**18.8 (18.0-19.6)**	**4.4 (4.1-4.8)**	**59.8 (57.4-62.1)**
Non-melanoma skin	1968-1972	167	6.3 (5.2-7.4)	0.4 (0.2-0.6)	
	1973-1977	247	7.6 (6.6-8.6)	0.5 (0.2-0.9)	83.5 (70.7-95.1)
	1978-1982	319	8.1 (7.1-9.0)	0.2 (0.1-0.3)	87.8 (79.2-95.5)
	1983-1987	371	8.0 (7.1-8.8)	0.7 (0.5-1.0)	88.2 (79.6-96.0)
	1988-1992	501	8.6 (7.9-9.4)	0.3 (0.2-0.5)	92.5 (85.7-98.7)
	1993-1997	667	9.5 (8.8-10.3)	0.2 (0.1-0.3)	101.4 (95.7-106.4)
	1998-2002	790	9.6 (8.9-10.3)	0.3 (0.1-0.4)	96.5 (91.8-100.8)
	2003-2007	957	10.0 (9.4-10.7)	0.2 (0.1-0.3)	95.2 (91.4-98.6)
	2008-2012	1470	12.1 (11.4-12.7)	0.2 (0.1-0.3)	91.3 (88.1-94.2)
	2013-2017	1882	12.4 (11.8-13.0)	0.2 (0.1-0.2)	95.7 (93.3-98.0)
	2018-2019	845	12.0 (11.2-12.8)	0.3 (0.1-0.4)	96.2 (92.5-99.5)
	2015-2019	**2050**	**12.5 (11.9-13.0)**	**0.2 (0.1-0.3)**	**95.0 (92.7-97.2)**

Site	Year	Number	ASIR (95% CI)*	ASMR (95% CI)*	ASRS (95% CI)
Stomach	1968-1972	1094	37.7 (35.3-40.2)	26.2 (24.2-28.2)	
	1973-1977	1216	36.5 (34.3-38.6)	28.3 (26.4-30.2)	4.8 (3.6-6.4)
	1978-1982	1233	31.8 (29.9-33.6)	23.8 (22.2-25.4)	9.2 (7.4-11.3)
	1983-1987	1334	29.3 (27.7-30.9)	18.3 (17.1-19.6)	14.4 (12.2-16.8)
	1988-1992	1374	24.8 (23.4-26.1)	18.9 (17.7-20.0)	17.3 (15.1-19.8)
	1993-1997	1442	21.7 (20.5-22.8)	14.8 (13.9-15.8)	21.5 (18.9-24.2)
	1998-2002	1452	18.5 (17.5-19.4)	12.6 (11.8-13.4)	28.0 (25.4-30.6)
	2003-2007	1380	14.6 (13.8-15.4)	9.9 (9.2-10.5)	24.4 (21.9-27.1)
	2008-2012	1451	12.0 (11.4-12.7)	7.7 (7.2-8.3)	27.1 (24.4-29.8)
	2013-2017	1564	10.2 (9.7-10.8)	5.6 (5.2-6.0)	32.4 (29.7-35.1)
	2018-2019	694	9.7 (8.9-10.4)	4.7 (4.2-5.2)	37.7 (33.5-42.0)
	2015-2019	**1679**	**10.1 (9.6-10.6)**	**5.1 (4.8-5.5)**	**36.1 (33.4-38.9)**
Kidney	1968-1972	77	2.4 (1.8-3.0)	0.7 (0.4-1.0)	
	1973-1977	100	2.7 (2.2-3.3)	1.4 (1.0-1.8)	25.7 (15.5-37.7)
	1978-1982	118	2.9 (2.3-3.4)	1.2 (0.9-1.6)	49.6 (33.8-65.7)
	1983-1987	161	3.4 (2.8-3.9)	1.5 (1.2-1.9)	32.1 (22.5-42.8)
	1988-1992	223	3.9 (3.4-4.5)	2.2 (1.8-2.5)	41.0 (32.4-49.9)
	1993-1997	366	5.3 (4.7-5.9)	2.3 (1.9-2.7)	35.7 (29.2-42.5)
	1998-2002	469	5.6 (5.1-6.1)	2.4 (2.1-2.8)	55.8 (50.0-61.6)
	2003-2007	644	6.4 (5.9-6.9)	2.2 (1.9-2.5)	58.9 (53.8-63.8)
	2008-2012	1007	8.2 (7.7-8.7)	2.7 (2.4-3.0)	61.4 (57.3-65.3)
	2013-2017	1438	9.7 (9.2-10.3)	3.0 (2.7-3.3)	62.3 (59.0-65.4)
	2018-2019	666	10.1 (9.3-10.9)	2.5 (2.2-2.9)	61.6 (57.2-65.8)
	2015-2019	**1605**	**10.2 (9.7-10.7)**	**2.7 (2.5-3.0)**	**64.1 (61.1-67.0)**
Myeloid neoplasms	1968-1972	145	3.4 (2.8-4.1)	0.7 (0.5-1.0)	
	1973-1977	172	3.7 (3.1-4.3)	1.4 (1.0-1.7)	3.5 (1.4-7.5)
	1978-1982	180	3.7 (3.1-4.3)	1.4 (1.0-1.7)	7.2 (3.7-12.4)
	1983-1987	193	3.5 (3.0-4.1)	1.4 (1.1-1.8)	6.2 (2.9-11.5)
	1988-1992	239	3.8 (3.3-4.3)	2.4 (2.0-2.8)	3.4 (1.6-6.1)
	1993-1997	378	5.2 (4.7-5.8)	2.1 (1.7-2.4)	7.2 (4.2-11.4)
	1998-2002	436	5.2 (4.7-5.7)	2.2 (1.9-2.5)	13.3 (9.3-18.0)
	2003-2007	580	6.1 (5.6-6.6)	2.0 (1.7-2.3)	44.6 (38.9-50.2)
	2008-2012	905	7.7 (7.2-8.3)	2.2 (1.9-2.5)	50.2 (46.0-54.4)
	2013-2017	1207	8.6 (8.1-9.1)	2.0 (1.7-2.2)	45.5 (42.2-48.9)
	2018-2019	557	8.7 (7.9-9.5)	1.8 (1.5-2.2)	45.2 (40.5-49.9)
	2015-2019	**1306**	**8.6 (8.1-9.1)**	**1.9 (1.6-2.1)**	**46.4 (43.2-49.6)**
Pancreas	1968-1972	92	3.0 (2.4-3.7)	1.7 (1.2-2.2)	
	1973-1977	112	3.3 (2.7-3.9)	2.0 (1.5-2.5)	3.3 (0.9-8.5)
	1978-1982	161	4.1 (3.4-4.7)	3.0 (2.5-3.6)	0.8 (0.2-2.6)
	1983-1987	224	4.8 (4.1-5.4)	3.8 (3.2-4.4)	2.8 (0.9-6.7)
	1988-1992	239	4.2 (3.7-4.8)	4.2 (3.7-4.7)	2.9 (1.1-6.2)
	1993-1997	310	4.7 (4.1-5.2)	4.2 (3.7-4.7)	3.8 (1.7-7.2)
	1998-2002	410	5.1 (4.6-5.6)	5.2 (4.7-5.7)	4.7 (2.9-7.0)
	2003-2007	579	5.9 (5.4-6.4)	5.6 (5.1-6.0)	5.1 (3.4-7.5)
	2008-2012	746	6.2 (5.7-6.6)	5.6 (5.1-6.0)	5.7 (4.0-7.8)
	2013-2017	1064	6.9 (6.5-7.3)	5.5 (5.1-5.9)	11.6 (9.5-13.9)
	2018-2019	540	7.6 (7.0-8.3)	6.1 (5.5-6.7)	10.8 (8.1-13.9)
	2015-2019	**1208**	**7.2 (6.8-7.6)**	**5.8 (5.4-6.1)**	**12.2 (10.2-14.3)**

* per 100,000 resident population

Figure 3.1.2 Incidence number and age-standardised incidence rate (per 100,000 population), age-standardised mortality rate (per 100,000 population) and five-year age-standardised relative survival rate (%) of selected cancers in females, 1968-2019

Table 3.1.2 Incidence number and age-standardised incidence rate (per 100,000 population), age-standardised mortality rate (per 100,000 population) and five-year age-standardised relative survival rate (%) of selected cancers in females, 1968-2019

Site	Year	Number	ASIR (95% CI)*	ASMR (95% CI)*	ASRS (95% CI)
Breast	1968-1972	672	20.1 (18.5-21.6)	5.7 (4.9-6.6)	
	1973-1977	863	22.1 (20.6-23.6)	8.5 (7.5-9.4)	49.9 (45.2-54.6)
	1978-1982	1237	26.9 (25.3-28.4)	11.6 (10.6-12.6)	50.8 (46.7-54.9)
	1983-1987	1739	31.1 (29.6-32.6)	8.6 (7.8-9.4)	55.4 (52.0-58.8)
	1988-1992	2634	38.6 (37.1-40.1)	12.9 (12.0-13.8)	63.7 (61.1-66.2)
	1993-1997	3605	43.6 (42.1-45.0)	12.6 (11.8-13.3)	74.9 (72.9-77.0)
	1998-2002	5581	55.7 (54.2-57.2)	13.9 (13.1-14.7)	76.6 (75.0-78.1)
	2003-2007	6858	58.9 (57.5-60.4)	13.6 (12.9-14.3)	76.1 (74.8-77.4)
	2008-2012	8565	63.0 (61.7-64.4)	14.2 (13.6-14.9)	79.4 (78.3-80.5)
	2013-2017	10885	70.2 (68.8-71.5)	13.0 (12.4-13.5)	80.8 (79.8-81.7)
	2018-2019	4940	73.2 (71.1-75.3)	11.7 (10.9-12.5)	82.5 (81.2-83.7)
	2015-2019	**11805**	**72.6 (71.2-73.9)**	**12.2 (11.7-12.8)**	**82.1 (81.2-83.0)**
Colon & rectum	1968-1972	478	15.4 (14.0-16.8)	6.7 (5.7-7.6)	
	1973-1977	715	19.6 (18.1-21.1)	10.1 (9.0-11.1)	26.2 (21.9-30.8)
	1978-1982	1084	24.6 (23.1-26.1)	13.4 (12.3-14.5)	28.3 (24.7-32.0)
	1983-1987	1392	26.1 (24.7-27.5)	11.4 (10.4-12.3)	36.4 (33.1-39.8)
	1988-1992	1848	28.3 (27.0-29.6)	14.0 (13.1-14.9)	43.6 (40.6-46.6)
	1993-1997	2300	29.5 (28.2-30.7)	13.0 (12.2-13.8)	54.2 (51.5-56.9)
	1998-2002	2796	29.1 (28.0-30.3)	13.9 (13.1-14.6)	52.5 (50.2-54.7)
	2003-2007	3351	28.8 (27.8-29.8)	12.0 (11.4-12.7)	57.0 (54.9-59.1)
	2008-2012	3921	27.1 (26.2-27.9)	10.5 (10.0-11.1)	60.6 (58.8-62.5)
	2013-2017	4853	27.3 (26.5-28.1)	9.9 (9.4-10.3)	60.5 (58.8-62.2)
	2018-2019	2229	27.6 (26.4-28.8)	9.3 (8.7-10.0)	60.1 (57.6-62.4)
	2015-2019	**5253**	**27.4 (26.6-28.2)**	**9.5 (9.0-9.9)**	**61.3 (59.7-62.9)**
Lung	1968-1972	489	16.2 (14.7-17.6)	9.2 (8.1-10.2)	
	1973-1977	663	18.5 (17.1-19.9)	13.2 (12.0-14.4)	5.3 (3.6-7.4)
	1978-1982	893	20.8 (19.4-22.2)	15.9 (14.7-17.1)	4.1 (2.8-5.8)
	1983-1987	1072	20.4 (19.2-21.6)	18.5 (17.3-19.7)	5.1 (3.7-6.7)
	1988-1992	1174	18.0 (16.9-19.1)	15.9 (14.9-16.9)	5.9 (4.5-7.6)
	1993-1997	1444	18.3 (17.3-19.2)	14.9 (14.0-15.7)	8.1 (6.5-9.9)
	1998-2002	1602	16.4 (15.6-17.2)	14.6 (13.8-15.4)	11.0 (9.4-12.7)
	2003-2007	1906	16.3 (15.6-17.1)	13.0 (12.3-13.7)	13.9 (12.1-15.8)
	2008-2012	2264	15.4 (14.8-16.1)	12.2 (11.7-12.8)	16.2 (14.5-18.1)
	2013-2017	2831	15.6 (15.0-16.2)	10.5 (10.0-10.9)	24.5 (22.6-26.4)
	2018-2019	1289	15.9 (15.0-16.8)	8.8 (8.1-9.4)	32.2 (29.2-35.3)
	2015-2019	**3074**	**15.8 (15.2-16.4)**	**9.6 (9.1-10.0)**	**29.3 (27.4-31.2)**
Uterus	1968-1972	159	4.9 (4.1-5.7)	1.3 (0.9-1.7)	
	1973-1977	154	4.1 (3.5-4.8)	1.4 (1.0-1.8)	48.3 (37.8-58.7)
	1978-1982	217	4.9 (4.3-5.6)	0.5 (0.3-0.8)	59.1 (49.7-68.1)
	1983-1987	314	6.0 (5.3-6.7)	0.5 (0.3-0.7)	64.9 (57.2-72.0)
	1988-1992	435	6.8 (6.2-7.5)	1.4 (1.1-1.6)	56.7 (51.1-62.1)
	1993-1997	609	7.8 (7.2-8.4)	1.3 (1.1-1.6)	66.3 (61.3-71.0)
	1998-2002	909	9.5 (8.9-10.1)	1.1 (0.9-1.3)	66.4 (62.7-70.0)
	2003-2007	1357	11.9 (11.3-12.6)	1.1 (0.9-1.3)	68.0 (65.0-71.0)
	2008-2012	1786	13.1 (12.5-13.7)	1.5 (1.3-1.7)	72.7 (70.2-75.1)
	2013-2017	2620	17.0 (16.3-17.6)	1.8 (1.6-2.0)	68.9 (66.8-70.8)
	2018-2019	1221	18.4 (17.4-19.5)	2.0 (1.7-2.3)	70.2 (67.4-72.8)
	2015-2019	**2919**	**18.1 (17.4-18.8)**	**2.0 (1.8-2.2)**	**69.8 (67.9-71.6)**
Lymphoid neoplasms	1968-1972	150	3.7 (3.1-4.3)	1.7 (1.3-2.2)	
	1973-1977	178	4.2 (3.6-4.8)	1.6 (1.2-2.0)	21.2 (12.1-32.4)
	1978-1982	215	4.6 (4.0-5.2)	2.0 (1.6-2.4)	19.6 (13.3-27.0)
	1983-1987	348	6.4 (5.7-7.1)	2.2 (1.8-2.6)	33.3 (26.5-40.3)
	1988-1992	446	7.1 (6.4-7.8)	3.5 (3.0-4.0)	26.5 (21.6-31.7)
	1993-1997	552	7.2 (6.6-7.8)	3.1 (2.7-3.5)	36.2 (31.2-41.3)
	1998-2002	715	8.1 (7.5-8.7)	3.1 (2.7-3.5)	43.7 (39.4-48.0)
	2003-2007	1009	10.3 (9.6-11.0)	3.0 (2.7-3.4)	48.4 (44.6-52.2)
	2008-2012	1253	10.5 (9.9-11.2)	2.7 (2.4-3.0)	58.1 (54.9-61.2)
	2013-2017	1759	12.5 (11.9-13.2)	2.7 (2.5-3.0)	59.7 (56.9-62.4)
	2018-2019	863	13.1 (12.1-14.1)	2.8 (2.4-3.1)	57.3 (53.5-61.0)
	2015-2019	**1990**	**13.0 (12.3-13.6)**	**2.7 (2.5-3.0)**	**58.5 (55.9-61.0)**
Ovary	1968-1972	217	5.9 (5.1-6.7)	1.4 (1.0-1.8)	
	1973-1977	258	6.1 (5.4-6.9)	2.3 (1.8-2.7)	34.1 (26.8-41.6)
	1978-1982	410	8.6 (7.7-9.4)	3.9 (3.3-4.4)	33.4 (27.6-39.4)
	1983-1987	496	8.6 (7.8-9.4)	3.3 (2.8-3.8)	30.0 (25.0-35.2)
	1988-1992	691	10.2 (9.4-11.0)	3.5 (3.1-4.0)	39.5 (34.9-44.2)
	1993-1997	866	10.7 (9.9-11.4)	4.0 (3.6-4.5)	44.8 (40.8-48.8)
	1998-2002	1036	10.8 (10.1-11.5)	4.0 (3.6-4.5)	43.3 (40.1-46.5)
	2003-2007	1321	12.0 (11.3-12.6)	4.1 (3.7-4.5)	42.8 (39.9-45.6)
	2008-2012	1611	12.6 (11.9-13.2)	3.9 (3.5-4.2)	42.2 (39.6-44.8)
	2013-2017	1845	12.9 (12.3-13.5)	3.8 (3.5-4.1)	42.2 (39.8-44.5)
	2018-2019	733	11.6 (10.7-12.5)	3.6 (3.2-4.1)	37.6 (34.5-40.7)
	2015-2019	**1860**	**12.4 (11.8-13.0)**	**3.7 (3.4-4.0)**	**43.2 (40.9-45.5)**

Site	Year	Number	ASIR (95% CI)*	ASMR (95% CI)*	ASRS (95% CI)
Non-melanoma skin	1968-1972	153	5.2 (4.3-6.0)	0.2 (0.1-0.4)	
	1973-1977	198	5.4 (4.7-6.2)	0.3 (0.1-0.5)	104.0 (93.5-112.1)
	1978-1982	328	7.3 (6.5-8.1)	0.4 (0.2-0.5)	92.2 (83.2-100.0)
	1983-1987	374	6.9 (6.2-7.6)	0.3 (0.2-0.4)	91.3 (83.6-98.0)
	1988-1992	526	7.6 (7.0-8.3)	0.4 (0.2-0.5)	89.7 (83.7-94.9)
	1993-1997	666	8.1 (7.5-8.7)	0.3 (0.2-0.4)	101.6 (96.8-105.8)
	1998-2002	790	7.9 (7.4-8.5)	0.3 (0.2-0.4)	92.7 (88.7-96.2)
	2003-2007	802	6.7 (6.2-7.2)	0.1 (0.0-0.1)	96.0 (92.2-99.4)
	2008-2012	1217	8.0 (7.5-8.4)	0.1 (0.1-0.1)	97.5 (94.4-100.3)
	2013-2017	1513	8.0 (7.6-8.4)	0.1 (0.1-0.2)	97.7 (95.1-100.1)
	2018-2019	697	7.8 (7.2-8.4)	0.1 (0.1-0.2)	99.3 (95.4-102.7)
	2015-2019	**1651**	**7.9 (7.5-8.3)**	**0.1 (0.1-0.2)**	**98.6 (96.1-100.9)**
Thyroid	1968-1972	163	4.4 (3.7-5.1)	0.8 (0.5-1.1)	
	1973-1977	169	3.8 (3.2-4.4)	0.6 (0.4-0.9)	56.8 (46.7-66.3)
	1978-1982	226	4.2 (3.6-4.7)	0.9 (0.6-1.2)	54.1 (45.9-61.8)
	1983-1987	371	5.8 (5.2-6.4)	0.6 (0.4-0.8)	70.9 (64.8-76.5)
	1988-1992	436	6.0 (5.4-6.5)	0.9 (0.7-1.1)	67.8 (62.8-72.4)
	1993-1997	492	5.7 (5.2-6.2)	0.7 (0.5-0.9)	81.9 (77.5-85.7)
	1998-2002	655	6.7 (6.2-7.2)	0.7 (0.6-0.9)	76.6 (72.8-80.1)
	2003-2007	661	6.0 (5.5-6.4)	0.6 (0.5-0.8)	78.4 (74.9-81.5)
	2008-2012	991	7.9 (7.4-8.4)	0.5 (0.4-0.6)	84.0 (81.3-86.4)
	2013-2017	1434	10.3 (9.8-10.9)	0.4 (0.3-0.5)	89.7 (87.7-91.6)
	2018-2019	660	11.2 (10.4-12.1)	0.4 (0.3-0.5)	86.6 (83.4-89.3)
	2015-2019	**1562**	**10.9 (10.3-11.4)**	**0.4 (0.3-0.5)**	**89.0 (87.0-90.7)**
Stomach	1968-1972	542	17.4 (15.9-18.8)	11.9 (10.6-13.1)	
	1973-1977	610	16.6 (15.3-18.0)	13.3 (12.1-14.5)	6.4 (4.3-9.1)
	1978-1982	643	14.6 (13.4-15.7)	11.5 (10.5-12.5)	11.0 (8.4-14.1)
	1983-1987	772	14.3 (13.3-15.4)	9.4 (8.6-10.2)	13.6 (10.9-16.7)
	1988-1992	826	12.5 (11.6-13.3)	9.6 (8.8-10.3)	17.2 (14.4-20.2)
	1993-1997	917	11.4 (10.7-12.2)	8.1 (7.4-8.7)	22.6 (19.5-26.0)
	1998-2002	969	10.0 (9.3-10.6)	7.0 (6.5-7.6)	24.4 (21.5-27.4)
	2003-2007	889	7.4 (6.9-7.9)	5.0 (4.6-5.4)	25.6 (22.5-28.9)
	2008-2012	1077	7.1 (6.7-7.5)	4.4 (4.0-4.7)	26.6 (23.6-29.7)
	2013-2017	1153	6.2 (5.9-6.6)	3.5 (3.2-3.8)	35.6 (32.4-38.9)
	2018-2019	457	5.4 (4.9-6.0)	2.7 (2.3-3.1)	42.6 (37.4-47.7)
	2015-2019	**1157**	**5.8 (5.4-6.1)**	**3.1 (2.9-3.4)**	**39.7 (36.4-42.9)**
Cervix	1968-1972	603	18.0 (16.6-19.5)	4.9 (4.2-5.7)	
	1973-1977	676	17.6 (16.3-18.9)	7.0 (6.2-7.9)	47.7 (43.1-52.2)
	1978-1982	751	16.6 (15.4-17.8)	7.3 (6.5-8.1)	48.3 (44.0-52.5)
	1983-1987	898	16.2 (15.1-17.3)	6.0 (5.4-6.7)	47.3 (43.4-51.3)
	1988-1992	1002	15.3 (14.3-16.2)	6.0 (5.4-6.6)	55.5 (52.0-58.8)
	1993-1997	1128	13.9 (13.0-14.7)	5.4 (4.9-6.0)	59.8 (56.6-63.0)
	1998-2002	1040	10.7 (10.1-11.4)	4.5 (4.0-4.9)	63.7 (60.6-66.7)
	2003-2007	1015	8.9 (8.3-9.5)	3.4 (3.1-3.8)	61.5 (58.3-64.5)
	2008-2012	928	6.8 (6.4-7.3)	2.5 (2.2-2.8)	60.5 (57.3-63.6)
	2013-2017	1084	7.1 (6.7-7.6)	2.1 (1.9-2.3)	60.5 (57.5-63.5)
	2018-2019	459	7.0 (6.4-7.7)	1.5 (1.2-1.7)	65.5 (61.0-69.8)
	2015-2019	**1107**	**7.0 (6.6-7.4)**	**1.8 (1.6-2.0)**	**64.3 (61.3-67.2)**

* per 100,000 resident population

3.1 Trends in age-standardised incidence, mortality, and survival of selected cancers in males and females, 1968-2019

KEY POINTS

- Five-year age-standardised survival rates had increased over the years for all the top ten common cancers diagnosed in males and females; however, differing trends were observed for their age-standardised incidence and mortality rates.
- In males, there were notable rises in the age-standardised incidence rates of colorectal and prostate cancer (19.4 to 39.1 and 4.0 to 34.6 per 100,000 population respectively); but also significant decreases in that of lung, liver, and stomach cancer (47.3 to 31.1, 28.7 to 17.0 and 37.7 to 10.1 per 100,000 population respectively).
- While there was a noteworthy fall in the age-standardised mortality rate of stomach cancer in males (26.2 to 5.1 per 100,000 population), that of pancreatic and colorectal cancer had risen (1.7 to 5.8 and 8.9 to 13.5 per 100,000 respectively).
- In females, while the age-standardised incidence rates of breast, uterine, and ovarian cancer had risen significantly (20.1 to 72.6, 4.9 to 18.1, 5.9 to 12.4 per 100,000 population respectively), there were significant reductions in the age-standardised incidence rates of stomach and cervical cancer (17.4 to 5.8 and 18.0 to 7.0 per 100,000 population respectively).
- Age-standardised mortality rates for breast and ovarian cancer had risen significantly (from 5.7 to 12.2 and 1.4 to 3.7 per 100,000 population respectively), whereas that of stomach and cervical cancer had fallen (11.9 to 3.1 and 4.9 to 1.8 per 100,000 population respectively).
- Noteworthy increases in cancer survival included that of colorectal, prostate, lung, and liver cancer for males, and breast, uterine, lung, and stomach cancer in females.

3.2 Stage distribution for selected cancers, 2003-2019

The SCR began comprehensive collection of staging information in 2003. From 2003-2007 to 2013-2017, many commonly diagnosed cancers had experienced a shift towards being diagnosed at earlier stages (Stages I-II)[1]. Among males, prostate, liver and pancreatic cancer registered the biggest changes in the proportion of early-stage (stages I and II) and late-stage (stages III and IV) diagnoses (Table 3.2.1). The proportion of early-stage diagnosis for liver cancer rose from 23.8% in 2003-2007 to 44.4% in 2013-2017; while that for pancreatic cancer rose from 16.5% to 30.7% during the same period. However, the proportion of prostate cancer diagnosed at an early stage fell from 63.5% in 2003-2007 to 51.7% in 2013-2017.

In 2018-2019, lung, stomach, and pancreatic cancer had the lowest proportions of early-stage diagnoses among males (19.3%, 38.1%, and 25.6% respectively), and this pattern was also seen across earlier years (Figure 3.2.1, Table 3.2.1). This could partly explain the higher mortality rates for lung, stomach, and pancreatic cancer relative to their respective incidence rates, as well as lower survival rates.

Among females, the biggest changes in the proportion of early and late stage diagnoses occurred in lung, stomach, and cervical cancer (Table 3.2.2). 13.8% of lung cancer in females were diagnosed at Stages I and II in 2003-2007, and this increased to 23.2% in 2013-2017. For stomach cancer, 26.9% of diagnoses were made at earlier stages in 2003-2007, and this had increased to 37.7% in 2013-2017. However, the proportion of early-stage diagnoses of cervical cancer had fallen from 72.0% in 2003-2007 to 64.6% in 2013-2017.

While the proportion of early-stage diagnoses for lung and stomach cancer among females increased, these cancers still had the lowest proportions of early-stage diagnoses in 2018-2019 (27.4% and 37.6% respectively), and similar to that of males, this pattern was also observed for earlier years (Figure 3.2.2, Table 3.2.2). This could partly account for the higher mortality rates vis-à-vis the respective incidence rates, as well as the lower survival rates in contrast to breast and thyroid cancer, which consistently had a higher proportion of early-stage diagnoses.

Table 3.2.1 Stage distribution (%) of selected cancers in males, 2003-2019^

	2003-2007 (AJCC 6)				2008-2012 (AJCC 6 & 7)				2013-2017 (AJCC 7)				2018-2019 (AJCC 8)			
	Stage I	Stage II	Stage III	Stage IV	Stage I	Stage II	Stage III	Stage IV	Stage I	Stage II	Stage III	Stage IV	Stage I	Stage II	Stage III	Stage IV
Colon & rectum	12.5	27.8	36.6	23.0	16.0	27.0	33.1	23.9	18.1	24.7	32.8	24.4	20.7	21.6	32.6	25.1
Prostate	1.0	62.5	11.4	25.0	10.0	53.6	9.8	26.6	15.4	36.3	16.6	31.7	14.3	26.7	27.1	31.8
Lung	9.7	4.6	26.8	58.9	9.2	4.9	24.0	61.9	10.9	4.9	18.4	65.7	14.3	5.0	17.8	62.9
Liver	11.4	12.4	32.5	43.7	22.6	19.5	30.5	27.5	26.6	17.8	28.6	27.0	34.7	14.4	26.0	24.8
Non-melanoma skin*	81.0	8.0	7.4	3.7	76.8	18.1	2.3	2.8	75.7	21.3	1.2	1.9				
Stomach	17.3	11.0	17.9	53.8	17.0	11.3	24.8	46.8	22.0	12.2	23.1	42.6	26.4	11.7	21.6	40.3
Kidney	38.9	10.1	19.2	31.7	43.3	11.3	16.5	29.0	50.2	8.1	16.4	25.2	46.7	7.3	16.8	29.2
Pancreas	2.9	13.6	8.9	74.5	5.7	15.4	14.0	64.9	8.2	22.5	11.7	57.5	11.6	14.0	16.2	58.3

Table 3.2.2 Stage distribution (%) of selected cancers in females, 2003-2019^

	2003-2007 (AJCC 6)				2008-2012 (AJCC 6 & 7)				2013-2017 (AJCC 7)				2018-2019 (AJCC 8)			
	Stage I	Stage II	Stage III	Stage IV	Stage I	Stage II	Stage III	Stage IV	Stage I	Stage II	Stage III	Stage IV	Stage I	Stage II	Stage III	Stage IV
Breast	33.0	37.9	20.5	8.6	33.0	38.3	19.0	9.7	33.7	38.9	16.8	10.6	56.7	19.9	12.6	10.9
Colon & rectum	12.5	29.4	36.2	21.9	14.5	26.0	34.7	24.8	16.8	23.8	34.0	25.4	19.3	23.5	30.4	26.9
Lung	10.6	3.2	23.2	63.0	13.2	3.0	15.5	68.3	18.1	5.1	10.0	66.7	23.3	4.1	10.1	62.5
Uterus	66.4	9.1	16.2	8.2	67.2	8.5	14.4	9.8	68.3	6.6	14.4	10.8	64.5	6.7	16.5	12.3
Ovary	41.9	10.3	31.5	16.3	36.5	9.5	35.6	18.4	40.4	9.8	31.9	17.9	46.4	6.5	26.3	20.8
Non-melanoma skin*	84.2	11.3	4.5	0.0	82.5	16.2	0.9	0.4	81.1	16.4	0.4	2.0				
Thyroid	46.3	15.6	12.6	25.5	62.3	8.9	13.7	15.1	57.4	6.1	21.9	14.6	76.5	15.9	2.2	5.3
Stomach	16.1	10.8	19.6	53.6	18.4	10.8	22.7	48.1	24.8	12.9	21.0	41.3	26.3	11.3	16.5	46.0
Cervix	46.0	26.0	18.6	9.4	44.6	25.8	15.1	14.6	41.7	22.9	18.9	16.4	36.5	29.8	17.4	16.4

^ TNM staging is only available for some lymphoid and myeloid neoplasms
* Under the AJCC 8 staging system, only non-melanoma of the head & neck and trunk are staged; therefore, staging information for non-melanoma skin in 2018-2019 is omitted

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[1] The AJCC 6 & 7 are based on anatomic staging and are thus relatively comparable. In contrast, AJCC 8 is based on prognostic staging and is therefore not comparable to the AJCC 6 & 7 systems.

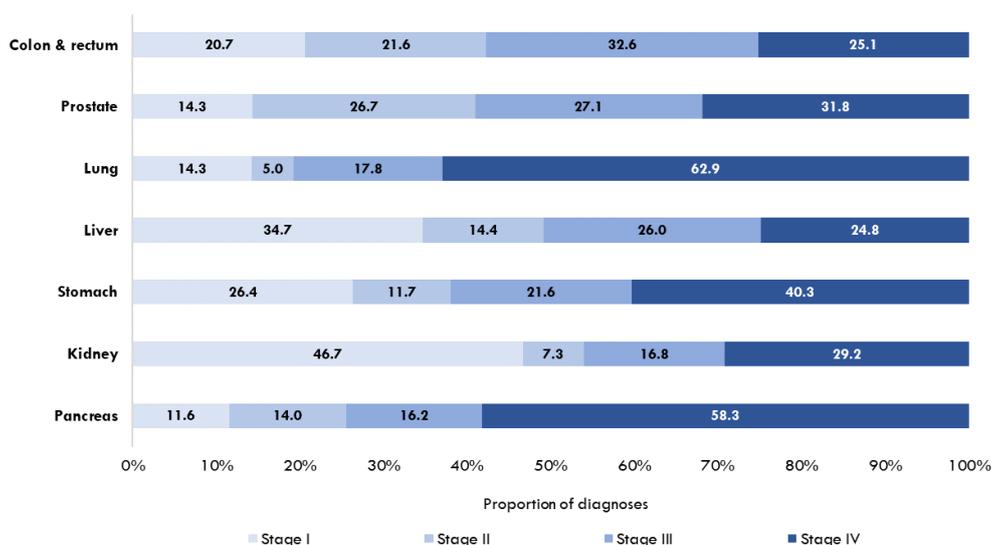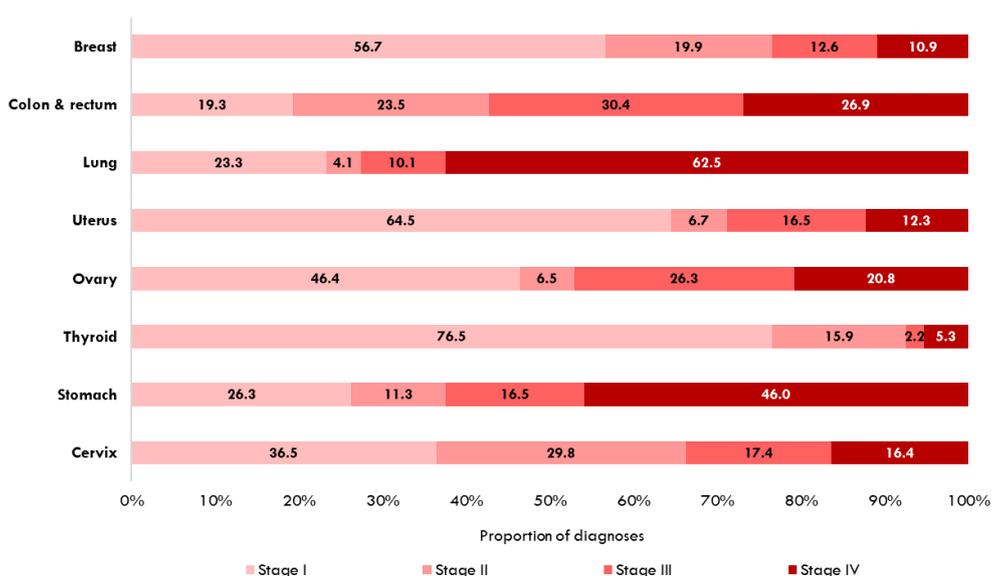**Figure 3.2.1** Stage distribution (%) of selected cancers in males, 2018-2019

Figure 3.2.1 Stage distribution (%) of selected cancers in males, 2018-2019

Cancer	Stage I	Stage II	Stage III	Stage IV
Colon & rectum	20.7	21.6	32.6	25.1
Prostate	14.3	26.7	27.1	31.8
Lung	14.3	5.0	17.8	62.9
Liver	34.7	14.4	26.0	24.8
Stomach	26.4	11.7	21.6	40.3
Kidney	46.7	7.3	16.8	29.2
Pancreas	11.6	14.0	16.2	58.3

Figure 3.2.2 Stage distribution (%) of selected cancers in females, 2018-2019

Figure 3.2.2 Stage distribution (%) of selected cancers in females, 2018-2019

Cancer	Stage I	Stage II	Stage III	Stage IV
Breast	56.7	19.9	12.6	10.9
Colon & rectum	19.3	23.5	30.4	26.9
Lung	23.3	4.1	10.1	62.5
Uterus	64.5	6.7	16.5	12.3
Ovary	46.4	6.5	26.3	20.8
Thyroid	76.5	15.9	2.2	5.3
Stomach	26.3	11.3	16.5	46.0
Cervix	36.5	29.8	17.4	16.4

3.2 Stage distribution for selected cancers by gender, 2003-2019

KEY POINTS

- From 2003-2007 to 2013-2017, there had been a slight increase in the proportion of diagnoses at early stages (Stage I and II) for most of the common cancers diagnosed in males and females.
- Staging distribution is linked in part to outcomes in terms of cancer mortality and survival.
- In 2018-2019, among males, lung, stomach, and pancreatic cancer were more likely to be diagnosed at later stages (80.7%, 61.9%, 74.5% respectively). This pattern is consistent across time.
- In 2018-2019, among females, lung and stomach cancer were more likely to be diagnosed at later stages (72.6% and 62.5% respectively). This was seen across all time periods.

APPENDIX 1

CANCER SITES AND GROUPS USED IN REPORT BY ICD-10 CODES

ICD-10 description	ICD 10 code	Label in report
Nasopharynx	C11	Nasopharynx
Oesophagus	C15	Oesophagus
Stomach	C16	Stomach
Colon	C18	Colon & rectum
Rectosigmoid & rectum	C19-C20	
Liver & intrahepatic bile ducts	C22	Liver
Pancreas	C25	Pancreas
Lung (incl. trachea & bronchus)	C33-C34	Lung
Connective & soft tissues (incl. peripheral nerves)	C47 & C49	Connective tissue
Other skin cancer	C44	Non-melanoma skin
Breast	C50	Breast
Cervix uteri	C53	Cervix
Corpus uteri	C54	Uterus
Ovary	C56.9	Ovary
Prostate	C61	Prostate
Urinary bladder	C67	Bladder
Kidney & renal pelvis	C64 - C66 & C68	Kidney
Brain & Central Nervous System (CNS)	C70, C71-C72	Brain & Central Nervous System
Thyroid gland	C73	Thyroid
Lymphoid neoplasms	C81-C85, C88, C90-C91, C96	Lymphoid neoplasms
Myeloid neoplasms	C92-C94	Myeloid neoplasms

HAEMATOLOGICAL MALIGNANCY GROUPS USED IN THIS REPORT

Lymphoid Neoplasms
Precursor Lymphoid Neoplasms
B Mature Neoplasms
T/NK Mature Neoplasms
Immunodeficiency-associated lymphoproliferative disorders
Histiocytic and Dendritic Cell Neoplasm
Malignant Lymphoma NOS
Myeloid Neoplasms and Acute Leukaemia
Acute leukaemia of ambiguous lineage
Acute Myeloid Leukaemia and related Precursor Neoplasms
Myeloproliferative Neoplasms
Myelodysplastic / Myeloproliferative Neoplasms

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