Table 2. Trends in age-adjusted lung cancer incidence rates per 100 000 person-years according to histological type

Histological type	Incident year					
	1975–78	1979–83	1984–88	1989–93	1994–98	1999–2003
Men						
Adenocarcinoma	15.5	18.9	21.7	22.3	26.0	27.2
Squamous cell carcinoma	20.4	22.2	25.0	25.6	24.8	22.3
Small cell carcinoma	6.0	7.6	10.1	11.1	10.8	10.0
All histological types	46.2	53.7	62.9	64.7	66.5	64.3
Women						
Adenocarcinoma	7.9	9.2	10.5	11.3	13.1	13.8
Squamous cell carcinoma	2.8	3.0	3.8	3.5	3.4	3.1
Small cell carcinoma	1.0	2.0	2.3	2.5	2.4	2.3
All histological types	12.9	15.2	17.9	18.6	19.9	20.2

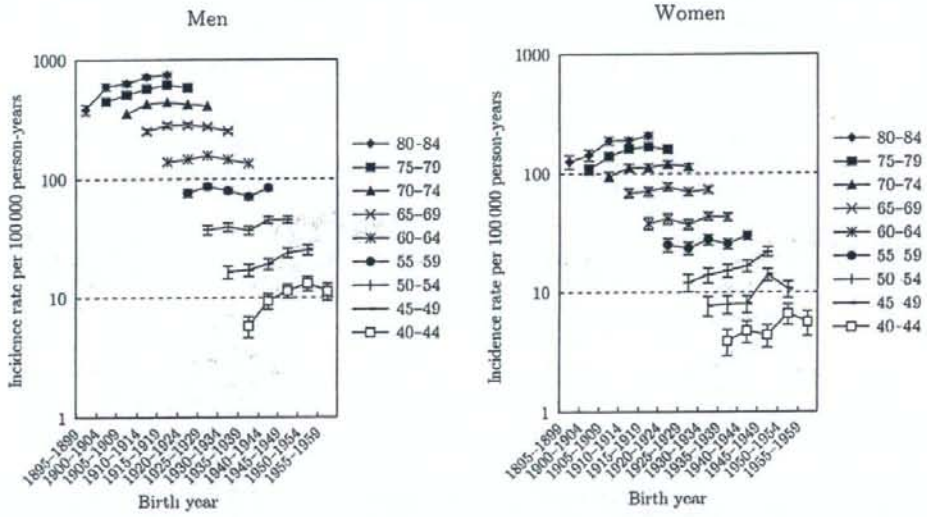

Figure 1. Trends in age-group-specific lung cancer incidence rates with 95% confidence interval by birth-cohort for all histological types.

Figs 2–4 show the trends in the age-specific incidence rates with 95% confidence interval by birth-cohort for ADC, SQCC and SMCC, respectively. The rates for ADC among men increased gradually for all age groups, but the declining tendency appeared in 1955–59 birth-cohorts. Furthermore, it seemed that there was a slight trough in rates in 1935–39 birth-cohorts, as well as findings in all histological types. The trends in ADC among women were almost similar with those in all histological types. The rates for SQCC among men peaked in 1910–14 birth-cohorts and decreased in the subsequent birth-cohorts. The trough in rates during 1935–39 birth-cohorts was not clear for SQCC among men. Trends in the rates for SQCC among women aged ≥65 years were similar with those among men. The trends in aged <65 years were, however, unclear because of the wide confidence interval. The rates for SMCC among men peaked around 1920s birth-cohorts and turned to slightly decrease or level off in the subsequent birth-cohorts. The rates for SMCC among women were unclear because of the wide confidence interval.

DISCUSSION

In the present study, we reported the population-based trends in lung cancer incidence including birth-cohort analyses according to histological type using OCR. The number of lung cancer incidence per year increased continuously because of the population aging. The main histological type of lung cancer switched from SQCC to ADC among men in

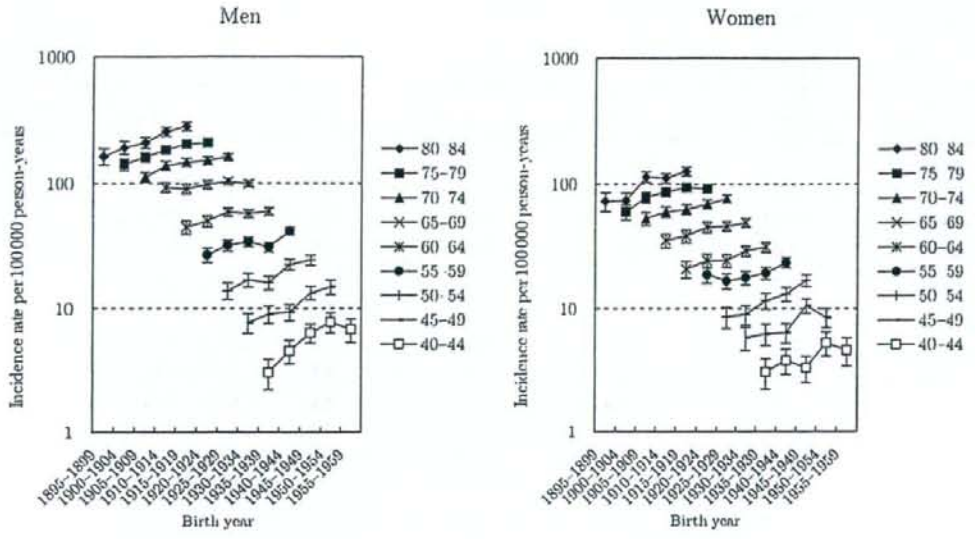

Figure 2. Trends in age-group-specific incidence rates with 95% confidence interval by birth-cohort for adenocarcinoma.

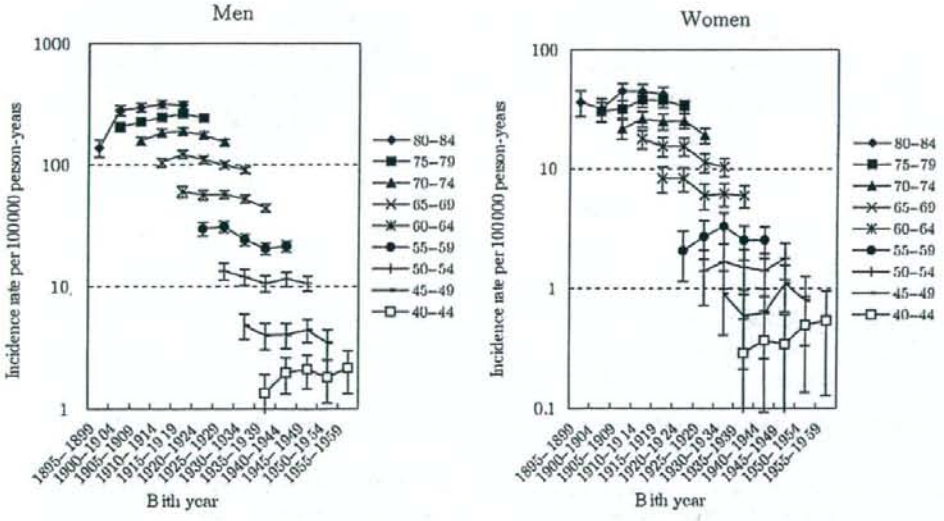

Figure 3. Trends in age-group-specific incidence rates with 95% confidence interval by birth-cohort for squamous cell carcinoma.

1990s. The declining trends for SQCC and SMCC continued in the updated present study.

Smoking prevalence by birth-cohort among Japanese men was reported to have two peaks: around the 1925 birth-cohort and around the 1950 birth-cohort (11). In addition, there was a trough of smoking prevalence in 1930–40 birth-cohorts because of the limited cigarette supply just after World War II (11). In general, the trends in lung cancer incidence or mortality by birth-cohort were parallel to the trends in the smoking prevalence. Our results were consistent with the findings from previous studies, showing that lung cancer mortality and incidence rates among men in 1935–39 birth-cohorts were lower than the subsequent birth-cohorts (6–10). Since the smoking prevalence among Japanese men was declining after 1950s birth-cohorts, the appearance of declining trends of lung cancer incidence among men in 1955–59 birth-cohorts was an expected result.

Classically, smoking behavior was considered to be more strongly associated with SQCC than with ADC. However, SQCC incidence rates by birth-cohort among men were not

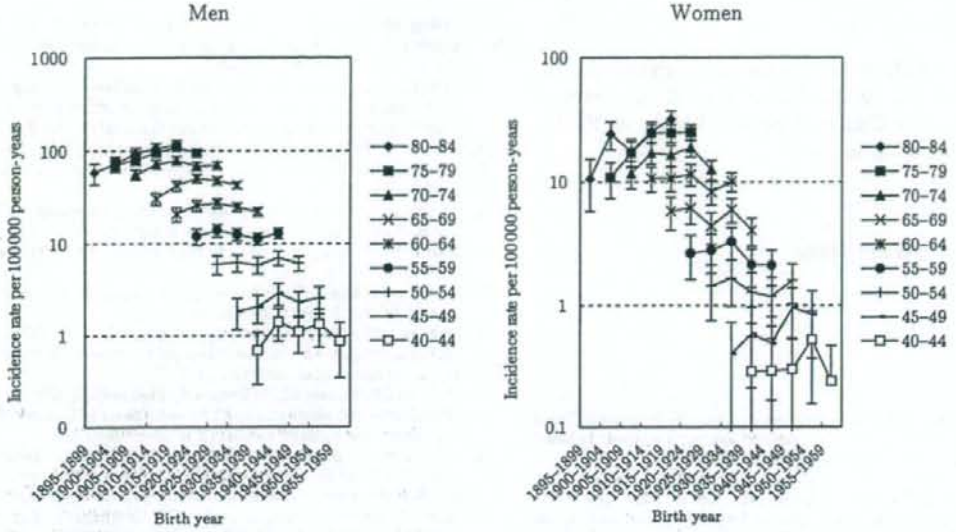

Figure 4. Trends in age-group-specific incidence rates with 95% confidence interval by birth-cohort for small cell carcinoma.

parallel to the smoking prevalence by birth-cohort. SQCC incidence rates among men after 1940–44 birth-cohorts leveled off, whereas the smoking prevalence among men after 1940–44 birth-cohorts increased. One reason would be the switching from non-filtered cigarettes to filtered cigarettes. Filtered cigarettes were considered to be associated with peripheral ADC because of the deep inhalation (3,12,13). According to the information from Japan Tobacco Inc., the switching from non-filtered cigarettes to filtered cigarettes occurred in the 1960s in Japan (14). The shift from SQCC to ADC among men in 1990s observed in the present study might have been the result of this shift in cigarette types.

The smoking prevalence by birth-cohort among women is continuously increasing after 1930s birth-cohorts (11). However, lung cancer incidence among women in 1950s birth-cohorts, particularly for ADC, seemed to be leveling off or decreasing. Marugame et al. (15) also reported the trends in lung cancer mortality by birth-cohort using the National Vital Statistics. In that study, lung cancer mortality trends appeared to be decreasing for female birth-cohorts born after 1960. Although our results were unstable because of the wide confidence intervals, those were not contradictory to this previous study. There is no clear explanation for these findings among younger Japanese women. There would be some factors other than active smoking for lung cancer incidence among them.

The present study has some limitations. First, there may be some missing cases in the OCR. The proportion of death certificate only for lung cancer in OCR was 19.3% in 1998–2002 (16). Therefore, lung cancer incidence may be under-estimated as a whole. Secondly, the trends by histological type among young women were unstable because of the small number of incidence; the number of lung cancer incidence among women aged <50 years per year was ~80 cases in 2003. Finally, the data from OCR included many lung cancer cases without specific histological diagnoses. We had to use assumption in order to calculate the number of incidence according to histological type. The proportions of lung cancer cases without histological diagnoses for aged <80 years decreased between 1975–78 and 1999–2003; from 49.7 to 16.4% among aged 40–49 years, from 47.4 to 17.6% among aged 50–59 years, from 55.9 to 22.7% among aged 60–69 years and from 70.8 to 31.6% among aged 70–79 years, respectively. However, those for aged ≥80 years were still high: from 78.9 to 64.1%. Therefore, we require carefulness to interpret the findings, particularly for elderly.

In conclusion, we reported recent trends in lung cancer incidence according to histological type. The increase in ADC incidence and the decrease in SQCC and SMCC incidence were confirmed. The trends in lung cancer incidence among young women in 1950s birth-cohorts, particularly for ADC, were not parallel to the smoking prevalence. We need careful monitoring of the trends in lung cancer incidence, particularly for ADC among young women.

Acknowledgements

We would like to thank Dr Akira Oshima, Cancer Patients Information Service, Osaka Medical Center for Cancer and Cardiovascular Disease, and Professor Hiroyasu Iso, Public Health, Department of Social and Environmental Medicine, Osaka University Graduate School of Medicine for their valuable comments. We also thank the staff at the Osaka Cancer Registry for data collection.

Funding

Funding to pay the Open Access publication charges for this article was provided by 'The Third-Term Comprehensive 10-Year Strategy for Cancer Control', Ministry of Health, Labour and Welfare, Japan.

Conflict of interest statement

None declared.

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Reprinted from
Jpn J Clin Oncol 2008;38(2)146–157
doi:10.1093/jjco/hym156

Partial Cancer Prevalence in Japan up to 2020: Estimates Based on Incidence and Survival Data from Population-based Cancer Registries

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Epidemiology Report

Partial Cancer Prevalence in Japan up to 2020: Estimates Based on Incidence and Survival Data from Population-based Cancer Registries

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Received June 25, 2007; accepted November 4, 2007; published online February 1, 2008

Measuring cancer prevalence in Japan has been difficult because population-based cancer registries have been conducted in limited areas. The purpose of this study was to estimate cancer prevalence in Japan from 1995 to 2020 for 5-year periods based on selected population-based cancer registry data. 1-, 2–3-, 4–5- and 5-year partial prevalence were estimated using incidence and survival data. Incidence and survival were calculated using data from selected cancer registries. We estimated the cancer survival by age group, primary site, and sex using the mixture cure fraction model. Kaplan–Meier estimates were applied to subgroups for which the survival did not converge to the estimated model. We projected that 1-year cancer prevalence for all sites would increase from 209 971 to 367 354 for men and from 164 622 to 275 776 for women, that 2–3-year prevalence would increase from 288 284 to 508 731 for men and from 255 684 to 418 630 for women, that 4–5-year prevalence would increase from 216 834 to 379 461 in men and from 211 764 to 342 031 in women, and that 5-year prevalence would increase from 715 089 to 1 255 546 in men and from 632 070 to 1 036 437 in women. This study is the first estimate of cancer prevalence in the future in Japan.

Key words: cancer – prevalence – cancer registry

INTRODUCTION

Cancer is still the first cause of death in both men and women in Japan, although early diagnosis by screening and the efficacy of cancer treatment have improved the prognosis for cancer patients in recent years. Therefore, monitoring cancer prevalence enables policymakers to grasp the numbers of cancer patients who need care and resources. In this paper, prevalence is defined as the number of patients diagnosed at the beginning of a fixed period (1, 2–3, 4–5 or 5 years) and surviving at the end of that period. The length of the period is significant. Prevalence at 1, 2–3 and 4–5 years are applicable to the effect of initial treatment for cancer, clinical follow-up and point of cure (1). And 5-year prevalence indicated the total uncured patients (2). In Japan, we do not have a national cancer registration system. Therefore, in this study, 1-, 2–3-, 4–5- and 5-year age-specific cancer prevalence by primary site (for 13 sites) and sex were estimated from 1995 to 2020 for 5-year periods based on selected population-based cancer registries.

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METHOD

Method of Estimation

First, we calculated survival of cancer patients by age (15–44, 45–54, 55–64, 65–74 and 75+ years old) and sex for 13 primary sites using the Kaplan–Meier method. Then the survival was applied to the mixture cure fraction model (3,4). The Kaplan–Meier estimates were applied to subgroups for which the survival did not converge to estimates of the mixture cure fraction model. Prevalence was estimated by incidence and year-specific survival using

$$P(x : n - \text{years cases}) = \sum_{t=1}^{n} I(x - t + 1)S(t - 0.5), \quad (2)$$

where P is n-year prevalence at time x, $I(x)$ is the annual number of new cases, $S(t)$ is survival estimated by the mixture cure fraction model or the Kaplan–Meier method at time t after diagnosis. In this study, we used survival calculated using data from patients diagnosed in 1993–96 based on the assumption that future survival would be the same.

Source of Survival

We used data from seven population-based cancer registries (for Miyagi, Yamagata, Niigata, Fukui, Osaka, Tottori and Nagasaki prefectures) that met the required standards (5) for quality of registration and prognosis investigation that were constructed by the Collaborative Study of Population-Based Cancer Registries in Japan.

We analyzed cancer prevalence for 13 sites: esophagus (C15), stomach (C16), colon (C18), rectum (C19–C21), liver (C22), gallbladder (C23–C24), pancreas (C25), lung (C33–C34), breast (C50, D05), uterus (C53–C55, D06), prostate (C61), bladder (C67) and all sites (C00–C96, D05–D06). We excluded breast cancer cases in men and cases for patients under 15 years old from the analysis.

Incidence Data

We applied the incidence data estimated from 11 cancer registries provided by the Center for Cancer Control and Information Services, National Cancer Center, Japan, to estimate prevalence in 1995 and 2000 (6). To project future prevalence (from 2005 to 20), we applied the incidence estimated by Ohno et al. using the Bayesian age-period-cohort model based on the incidence data in Japan (7).

RESULTS

Tables 1–4 show 1-, 2–3-, 4–5- and 5-year age-specific cancer prevalence by sites and sex from 1995 to 2020 for 5-year periods. We estimated that 1-year cancer prevalence for all sites would increase from 209 971 to 367 354 for men and from 164 622 to 275 776 for women. For 2–3-year prevalence, it would increase from 288 284 to 508 731 for men and from 255 684 to 418 630 for women. For 4–5-year prevalence, it would increase from 216 834 to 379 461 in men and from 211 764 to 342 031 in women. For 5-year prevalence, it would increase from 715 089 to 1 255 546 in men and from 632 070 to 1 036,437 in women. For all sites and each primary site in both sexes, prevalence increased from 1995 to 2020.

In our projections, the highest prevalence was shown in stomach for both sexes in 1995. In case of men, the second highest prevalence was shown in lung and the third was in colon and the forth was shown in liver. In case of women, the second highest prevalence was shown in breast, the third was in colon and the forth was shown in uterus. Meantime, in 2020, the highest prevalence for men was shown in prostate, the second was in stomach, the third was in lung and the forth was shown in colon. For women, the highest prevalence was shown in breast, the second was in colon and the third was in uterus (include CIS) and the forth was shown in stomach.

During the quarter century, the prevalence of prostate, lung, colon and rectal cancer increased rapidly, however, that of stomach and liver cancer showed slightly increase in men. For women, prevalence of colon, breast and uterus increased prominently, on the other hand, the prevalence of stomach and gallbladder showed rather stable.

Prevalence for patients over 75 years old increased the most remarkably among all age groups except uterus. In addition, prevalence in 15–44-year-old patients declined for all sites except breast and uterus.

DISCUSSION

Partial cancer prevalence is usually proposed as an index of actual cancer revelation instead of total prevalence for the reason that it is difficult to count up all the cancer patient through several decades even in a country providing fairly well-managed cancer registry system. Using the estimated incidence and survival function, in this study we calculated less than 5-year prevalence that is regarded as a reference index of cancer treatment, though there exist apparent differences of prognosis among sites (8).

Relating to the Survival Function Used in the Future Projection

In order to estimate the future partial cancer prevalence, survival and incidence are necessary to calculate. Survival for some sites is improving due to the progress of medical technology and the increase of early-detected cases; however, we employed the survival of cancer patients diagnosed between 1993 and 1996 to estimate the future prevalence. For the up-to-date calculation of partial prevalence, sequential revision of survival using with period analysis or other mathematical model and more long-term survival would be imperative (9,10).

Table 1. One-year cancer prevalence in Japan according to sex, age group and primary site

Primary sites	ICD-10th	Year	Both sexes all ages	Male						Female					
				15–44	45–54	55–64	65–74	75+	All ages	15–44	45–54	55–64	65–74	75+	All ages
All sites (Incl.CIS)	C00–C96	1995	374 593	9305	23 410	52 640	72 624	51 992	209 971	18 793	28 347	32 787	41 829	42 866	164 622
	D05–D06	2000	417 568	8163	22 814	51 468	86 738	65 289	234 472	18 263	28 859	35 449	46 462	54 063	183 096
		2005	509 322	9552	21 808	63 390	104 069	92 252	291 071	22 798	29 201	46 825	52 701	66 726	218 251
		2010	565 272	9868	18 509	67 909	105 563	122 704	324 553	23 386	28 091	50 955	58 163	80 124	240 719
		2015	610 238	9819	19 584	57 360	119 653	143 883	350 299	22 680	30 804	44 933	69 664	91 858	259 939
		2020	643 130	8455	21 792	49 109	126 808	161 190	367 354	19 566	32 966	42 661	74 703	105 880	275 776
All sites	C00–C96	1995	369 695	9305	23 410	52 640	72 624	51 992	209 971	16 121	26 912	32 272	41 626	42 793	159 724
		2000	412 010	8163	22 814	51 468	86 738	65 289	234 472	15 237	27 514	34 772	46 083	53 932	177 538
		2005	500 267	9552	21 808	63 390	104 069	92 252	291 071	17 702	26 275	45 681	52 591	66 947	209 196
		2010	554 261	9868	18 509	67 909	105 563	122 704	324 553	18 231	23 620	49 040	58 033	80 784	229 708
		2015	597 351	9819	19 584	57 360	119 653	143 883	350 299	17 835	25 087	41 851	69 185	93 094	247 052
		2020	628 238	8455	21 792	49 109	126 808	161 190	367 354	15 499	27 092	37 257	73 302	107 734	260 884
Esophagus	C15	1995	8707	76	934	2268	2590	1393	7261	29	143	321	425	528	1446
		2000	10 506	73	874	2632	3340	1891	8810	27	166	339	467	697	1696
		2005	13 085	79	1057	3369	4118	2487	11 110	23	138	412	593	809	1975
		2010	15 528	86	964	3851	5027	3362	13 290	25	126	431	700	956	2238
		2015	17 903	98	1016	3801	6216	4271	15 402	28	132	367	796	1178	2501
		2020	20 027	85	1118	3543	7091	5444	17 281	24	145	340	815	1422	2746
Stomach	C16	1995	81 030	2144	6589	14 297	18 568	12 222	53 820	1886	3332	5096	7989	8907	27 210
		2000	81 527	1525	6020	13 111	20 587	13 973	55 216	1310	2883	4591	7506	10 021	26 311
		2005	84 480	1835	5419	13 590	20 289	15 924	57 057	1476	2605	5283	7819	10 240	27 423
		2010	85 209	1987	4430	13 236	19 026	18 748	57 427	1595	2177	5164	7603	11 243	27 782
		2015	85 705	2043	4672	10 749	19 941	20 083	57 488	1606	2295	4179	8069	12 068	28 217
		2020	85 192	1790	5163	9104	19 736	20 976	56 769	1401	2532	3571	8035	12 884	28 423
Colon	C18	1995	44 765	808	3076	7001	8843	5713	25 441	686	2331	4002	5888	6417	19 324
		2000	52 259	864	2956	7025	11 041	7728	29 614	653	2076	4346	7006	8564	22 645
		2005	66 453	521	2649	8103	14 084	10 272	35 629	544	2656	6641	8981	12 002	30 824
		2010	75 469	564	2447	8216	14 632	14 012	39 871	614	2553	7092	10 249	15 090	35 598
		2015	82 392	639	2589	7094	15 518	17 209	43 049	697	2722	6079	12 028	17 817	39 343
		2020	87 448	560	2856	6629	15 642	19 389	45 076	604	2996	5673	12 293	20 806	42 372
Rectum	C19–C21	1995	25 634	646	2329	4649	5295	3113	16 032	419	1354	2403	2802	2624	9602
		2000	28 917	572	2295	5077	6759	3884	18 587	421	1377	2340	2928	3264	10 330
		2005	34 558	355	1790	5833	8543	5442	21 963	246	1082	2998	4075	4194	12 595
		2010	39 000	385	1663	5955	9232	7629	24 864	267	1004	2877	4615	5373	14 136
		2015	42 710	436	1761	5051	10 371	9570	27 189	300	1061	2447	5058	6655	15 521
		2020	45 338	382	1945	4734	10 460	11 212	28 733	260	1169	2286	4854	8036	16 605
Liver	C22	1995	28 272	315	2168	6878	7539	3012	19 912	115	374	1771	3513	2587	8360
		2000	27 462	249	1808	4869	8149	3703	18 778	99	278	1439	3715	3153	8684
		2005	29 375	198	1470	4811	8473	5090	20 042	63	318	1613	3522	3817	9333
		2010	30 886	206	1299	5024	6782	7293	20 604	68	292	1599	3476	4847	10 282
		2015	32 457	231	1360	4129	7363	8316	21 399	77	308	1381	3681	5611	11 058
		2020	33 524	202	1500	3877	7888	8511	21 978	66	338	1280	3611	6251	11 546
Gallbladder	C23–C24	1995	8431	76	312	790	1439	1489	4106	59	237	706	1315	2008	4325

Continued

Table 1. *Continued*

Primary sites	ICD-10th	Year	Both sexes all ages	Male						Female					
				15–44	45–54	55–64	65–74	75+	All ages	15–44	45–54	55–64	65–74	75+	All ages
		2000	8957	47	306	794	1565	1787	4499	38	183	671	1178	2388	4458
		2005	10 271	62	421	1010	2032	2399	5924	30	162	535	1063	2557	4347
		2010	11 341	66	386	1215	2173	3069	6909	31	144	486	949	2822	4432
		2015	12 540	75	408	1262	2459	3763	7967	35	151	402	957	3028	4573
		2020	13 731	66	450	1176	3004	4364	9060	30	166	375	911	3189	4671
Pancreas	C25	1995	5896	113	382	859	1193	626	3173	63	209	477	798	1176	2723
		2000	6794	89	399	971	1355	736	3550	69	215	547	867	1546	3244
		2005	6630	84	369	913	1246	912	3524	31	160	467	806	1642	3106
		2010	7089	90	339	1010	1236	1108	3783	34	147	437	787	1901	3306
		2015	7576	101	358	937	1488	1221	4105	38	155	365	831	2082	3471
		2020	7962	89	396	877	1652	1356	4370	33	171	340	776	2272	3592
Lung	C33–C34	1995	36 263	575	1810	5109	10 280	7809	25 583	357	1008	2059	3576	3680	10 680
		2000	43 106	489	2143	5311	11 970	10 028	29 941	317	1102	2578	4263	4905	13 165
		2005	53 453	470	2305	6778	13 447	14 227	37 227	284	872	3057	5412	6601	16 226
		2010	61 522	518	2088	8498	13 531	18 334	42 969	326	796	3040	6058	8333	18 553
		2015	69 147	543	2209	8410	17 119	20 638	48 919	341	849	2449	6866	9723	20 228
		2020	76 073	475	2435	7664	21 219	23 086	54 879	297	935	2151	6486	11 325	21 194
Breast (Incl.CIS)	C50 D05	1995	30 675	—	—	—	—	—	—	5678	10 224	6524	5218	3031	30 675
		2000	36 753	—	—	—	—	—	—	5794	11 341	8452	6612	4554	36 753
		2005	40 751	—	—	—	—	—	—	6604	9757	10 902	7327	6161	40 751
		2010	44 718	—	—	—	—	—	—	7272	8838	12 008	8855	7745	44 718
		2015	47 530	—	—	—	—	—	—	7352	9574	10 136	11 182	9286	47 530
		2020	49 183	—	—	—	—	—	—	6424	10 738	8870	11 877	11 274	49 183
Uterus (Incl.CIS)	C53–C55 D06	1995	17 738	—	—	—	—	—	—	5646	4444	3348	2364	1936	17 738
		2000	18 544	—	—	—	—	—	—	5925	4245	3537	2669	2168	18 544
		2005	24 890	—	—	—	—	—	—	12 556	4799	3639	1972	1924	24 890
		2010	29 931	—	—	—	—	—	—	14 896	7066	4061	1987	1921	29 931
		2015	34 537	—	—	—	—	—	—	14 683	11 372	4190	2418	1874	34 537
		2020	38 178	—	—	—	—	—	—	12 843	14 393	6311	2704	1927	38 178
Uterus	C53–C55	1995	12 718	—	—	—	—	—	—	2767	3034	2859	2172	1886	12 718
		2000	13 517	—	—	—	—	—	—	2794	3210	3011	2399	2103	13 517
		2005	16 001	—	—	—	—	—	—	5450	3131	3217	2039	2164	16 001
		2010	18 069	—	—	—	—	—	—	6511	3971	3386	1989	2212	18 069
		2015	19 922	—	—	—	—	—	—	6463	5997	3083	2248	2131	19 922
		2020	21 525	—	—	—	—	—	—	5656	7482	3971	2306	2110	21 525
Prostate	C61	1995	11 886	—	159	1278	4298	6151	11 886	—	—	—	—	—	—
		2000	18 605	—	217	2006	7581	8801	18 605	—	—	—	—	—	—
		2005	34 516	—	127	1889	11 481	21 019	34 516	—	—	—	—	—	—
		2010	49 450	—	119	2238	13 145	33 948	49 450	—	—	—	—	—	—
		2015	62 418	—	126	1943	13 906	46 443	62 418	—	—	—	—	—	—
		2020	72 371	—	137	1767	15 052	55 415	72 371	—	—	—	—	—	—

Continued

Table 1. *Continued*

Primary sites	ICD-10th	Year	Both sexes all ages	Male						Female					
				15–44	45–54	55–64	65–74	75+	All ages	15–44	45–54	55–64	65–74	75+	All ages
Bladder	C67	1995	10 748	270	755	1658	2772	2710	8165	63	155	356	734	1275	2583
		2000	12 367	176	730	1639	3239	3496	9280	64	191	355	899	1578	3087
		2005	12 835	123	616	1856	2906	3896	9397	25	140	442	1040	1791	3438
		2010	14 319	133	570	2023	3006	4686	10 418	28	130	470	1047	2226	3901
		2015	15 658	151	603	1772	3584	5199	11 309	32	138	400	1195	2584	4349
		2020	16 823	132	666	1659	3900	5745	12 102	27	151	371	1242	2930	4721

ICD-10th, Intenational Classification of Diseases, 10th edition; CIS, carcinoma *in situ*.

Table 2. Two to three-year cancer prevalence in Japan according to sex, age group and primary site

Primary sites	ICD-10th	Year	Both sexes all ages	Male						Female					
				15–44	45–54	55–64	65–74	75+	All ages	15–44	45–54	55–64	65–74	75+	All ages
All sites (Incl.CIS)	C00–C96	1995	543 968	17 263	34 174	82 259	94 351	60 237	288 284	38 095	46 892	54 840	62 579	53 278	255 684
	D05–D06	2000	610 135	13 893	34 189	79 191	125 889	75 854	329 016	31 506	49 512	59 020	71 026	70 055	281 119
		2005	733 534	15 512	35 411	92 709	149 756	107 963	401 351	39 580	52 548	72 824	80 752	86 479	332 183
		2010	813 291	16 076	30 097	100 677	154 087	146 435	447 372	41 337	49 499	81 674	88 515	104 894	365 919
		2015	878 956	16 174	29 771	91 406	169 344	177 099	483 794	40 764	52 250	76 706	103 734	121 708	395 162
		2020	927 361	14 569	32 668	77 911	182 801	200 782	508 731	36 492	56 299	71 157	114 595	140 087	418 630
All sites	C00–C96	1995	534 692	17 263	34 174	82 259	94 351	60 237	288 284	32 526	44 654	54 005	62 068	53 155	246 408
		2000	601 041	13 893	34 189	79 191	125 889	75 854	329 016	26 437	47 101	58 058	70 524	69 905	272 025
		2005	718 564	15 512	35 411	92 709	149 756	107 963	401 351	30 991	47 815	71 175	80 516	86 716	317 213
		2010	794 921	16 076	30 097	100 677	154 087	146 435	447 372	32 189	42 510	78 902	88 321	105 627	347 549
		2015	857 232	16 174	29 771	91 406	169 344	177 099	483 794	31 971	42 936	72 209	103 146	123 176	373 438
		2020	902 345	14 569	32 668	77 911	182 801	200 782	508 731	28 838	46 151	63 408	112 827	142 390	393 614
Esophagus	C15	1995	8716	130	967	2286	2589	1050	7022	25	201	357	561	550	1694
		2000	10 928	107	932	2830	3781	1390	9040	24	202	440	596	626	1888
		2005	13 327	91	1177	3527	4497	1872	11 164	20	169	477	729	768	2163
		2010	15 792	97	1103	4104	5446	2592	13 342	21	150	509	869	901	2450
		2015	18 226	108	1116	4217	6712	3341	15 494	23	151	461	999	1098	2732
		2020	20 369	103	1213	3998	7815	4253	17 382	22	164	415	1053	1333	2987
Stomach	C16	1995	13 1874	4893	11 638	25 866	28 323	16 422	87 142	4198	5691	9242	13 283	12 318	44 732
		2000	13 0031	2916	10 176	22 787	33 518	18 120	87 517	2432	5090	8344	12 484	14 164	42 514
		2005	13 3707	3173	9929	22 649	33 303	20 999	90 053	2429	4753	8848	13 002	14 622	43 654
		2010	13 4084	3380	8023	22 265	31 316	25 159	90 143	2582	3887	8769	12 612	16 091	43 941
		2015	13 4338	3526	7814	19 168	31 756	27 641	89 905	2654	3812	7541	13 046	17 380	44 433
		2020	13 3526	3246	8525	16 006	31 957	29 074	88 808	2421	4152	6327	13 234	18 584	44 718
Colon	C18	1995	72 422	1779	5263	12 493	13 992	7878	41 405	1429	3806	7272	9482	9028	31 017
		2000	83 814	1486	5136	12 288	18 788	10 343	48 041	1008	3421	7748	11 484	12 112	35 773
		2005	10 4346	897	4876	13 775	23 220	14 102	56 870	870	4591	10 518	14 427	17 070	47 476
		2010	11 9063	961	4399	14 079	24 710	19 617	63 766	978	4334	11 690	16 565	21 730	55 297
		2015	13 0758	1077	4467	12 778	26 053	24 712	69 087	1108	4483	10 714	19 296	26 070	61 671

Continued

Table 2. *Continued*

Primary sites	ICD-10th	Year	Both sexes all ages	Male						Female					
				15–44	45–54	55–64	65–74	75+	All ages	15–44	45–54	55–64	65–74	75+	All ages
		2020	13 9342	1017	4872	11 644	26 651	28 475	72 659	1041	4890	9731	20 491	30 530	66 683
Rectum	C19–C21	1995	38 687	1114	3403	8147	7362	3895	23 921	840	2057	3990	4350	3529	14 766
		2000	45 928	901	3812	8491	10 921	5002	29 127	709	2189	4149	5061	4693	16 801
		2005	53 284	585	3165	9586	13 394	7013	33 743	406	1913	4919	6502	5801	19 541
		2010	60 173	628	2851	10 013	14 795	9941	38 228	434	1723	4902	7441	7445	21 945
		2015	65 944	704	2904	8995	16 444	12 801	41 848	484	1752	4331	8230	9299	24 096
		2020	70 151	665	3171	8165	17 095	15 258	44 354	453	1908	3927	8208	11 301	25 797
Liver	C22	1995	29 514	532	2277	8785	7442	2388	21 424	105	509	2197	3475	1804	8090
		2000	32 498	318	2111	6911	10 115	3150	22 605	82	449	2063	4521	2778	9893
		2005	33 653	257	1908	6212	10 727	4213	23 317	56	470	2150	4362	3298	10 336
		2010	34 691	260	1606	6376	9063	6135	23 440	60	423	2167	4355	4246	11 251
		2015	35 865	285	1599	5634	8979	7374	23 871	67	428	1952	4522	5025	11 994
		2020	36 985	269	1740	5074	9654	7764	24 501	63	465	1769	4533	5654	12 484
Gallbladder	C23–C24	1995	8298	133	364	966	1501	943	3907	96	300	831	1569	1595	4391
		2000	8938	80	326	897	1686	1304	4293	48	210	891	1457	2039	4645
		2005	9614	83	470	1065	2045	1675	5338	42	209	627	1266	2132	4276
		2010	10 435	88	446	1251	2200	2172	6157	43	178	576	1108	2373	4278
		2015	11 401	98	452	1350	2452	2690	7042	47	177	492	1077	2566	4359
		2020	12 420	92	493	1299	2938	3162	7984	44	192	442	1043	2715	4436
Pancreas	C25	1995	3612	113	344	568	648	434	2107	57	158	296	440	554	1505
		2000	4227	63	339	594	857	535	2388	59	160	351	484	785	1839
		2005	4133	65	329	567	796	656	2413	29	124	281	455	831	1720
		2010	4420	68	301	634	783	807	2593	31	111	271	447	967	1827
		2015	4726	77	306	618	896	912	2809	34	113	235	461	1074	1917
		2020	4993	71	334	577	1015	1011	3008	32	122	212	446	1173	1985
Lung	C33–C34	1995	34 489	617	1823	5855	9289	5783	23 367	378	1279	2472	3970	3023	11 122
		2000	42 007	490	2140	5569	12 229	7503	27 931	338	1488	3103	4817	4330	14 076
		2005	50 985	480	2423	6707	13 638	10 699	33 947	313	1209	3567	6148	5801	17 038
		2010	58 523	524	2256	8387	13 687	14 146	39 000	357	1082	3739	6961	7384	19 523
		2015	65 789	556	2282	8833	16 318	16 452	44 441	382	1104	3217	7864	87 81	21 348
		2020	72 361	514	2488	8248	20 325	18 434	50 009	352	1204	2747	7816	10 233	22 352
Breast (Incl.CIS)	C50 D05	1995	55 386	—	—	—	—	—	—	12 312	16 902	11 980	9075	5117	55 386
		2000	63 201	—	—	—	—	—	—	10 379	20 021	14 622	11 328	6851	63 201
		2005	73 106	—	—	—	—	—	—	12 083	19 160	18 905	13 137	9821	73 106
		2010	80 582	—	—	—	—	—	—	13 346	17 153	21 784	15 696	12 603	80 582
		2015	86 273	—	—	—	—	—	—	13 827	17 610	19 944	19 600	15 292	86 273
		2020	89 763	—	—	—	—	—	—	12 641	19 561	17 247	21 807	18 507	89 763
Uterus (Incl.CIS)	C53–C55 D06	1995	29 875	—	—	—	—	—	—	10 880	6941	5682	3871	2501	29 875
		2000	30 203	—	—	—	—	—	—	9810	7430	5849	4225	2889	30 203
		2005	41 665	—	—	—	—	—	—	21 177	8448	5985	3403	2652	41 665
		2010	50 501	—	—	—	—	—	—	26 358	11 338	6823	3289	2693	50 501

Continued

Table 2. *Continued*

Primary sites	ICD-10th	Year	Both sexes all ages	Male						Female					
				15–44	45–54	55–64	65–74	75+	All ages	15–44	45–54	55–64	65–74	75+	All ages
		2015	58 918	—	—	—	—	—	—	27 374	17 902	7197	3800	2645	58 918
		2020	65 671	—	—	—	—	—	—	24 857	23 939	9851	4345	2679	65 671
Uterus	C53–C55	1995	20 850	—	—	—	—	—	—	5151	4937	4928	3419	2415	20 850
		2000	21 469	—	—	—	—	—	—	4413	5385	5050	3834	2787	21 469
		2005	26 621	—	—	—	—	—	—	9212	5641	5330	3487	2951	26 621
		2010	30 285	—	—	—	—	—	—	11 498	6600	5782	3325	3080	30 285
		2015	33 715	—	—	—	—	—	—	12 023	9570	5500	3604	3018	33 715
		2020	36 621	—	—	—	—	—	—	10 945	12 488	6427	3797	2964	36 621
Prostate	C61	1995	16 811	—	188	1925	6256	8442	16 811	—	—	—	—	—	—
		2000	25 193	—	303	3013	10 950	10 927	25 193	—	—	—	—	—	—
		2005	48 629	—	212	3101	18 212	27 104	48 629	—	—	—	—	—	—
		2010	70 602	—	200	3649	21 615	45 138	70 602	—	—	—	—	—	—
		2015	91 045	—	206	3467	23 369	64 003	91 045	—	—	—	—	—	—
		2020	107 403	—	222	3107	25 132	78 942	107 403	—	—	—	—	—	—
Bladder	C67	1995	16 067	500	1172	2875	4222	3668	12 437	87	205	622	1207	1509	3630
		2000	20 698	405	1271	2929	6292	5093	15 990	136	275	723	1487	2087	4708
		2005	20 599	232	1202	3245	5174	5529	15 382	47	253	753	1787	2377	5217
		2010	22 937	249	1091	3611	5271	6809	17 031	51	230	822	1848	2955	5906
		2015	25 090	278	1109	3378	6044	7716	18 525	57	233	748	2036	3491	6565
		2020	26 983	263	1209	3096	6741	8537	19 846	54	254	675	2170	3984	7137

Table 3. Four to five-year cancer prevalence in Japan according to sex, age group and primary site

Primary sites	ICD-10th	Year	Both sexes all ages	Male						Female					
				15–44	45–54	55–64	65–74	75+	All ages	15–44	45–54	55–64	65–74	75+	All ages
All sites (Incl.CIS)	C00–C96 D05–D06	1995	428 598	17 388	27 355	68 197	65 536	38 358	216 834	38 661	38 391	47 522	50 072	37 118	211 764
		2000	472 864	12 505	29 759	65 259	91 405	47 121	246 049	29 228	44 943	47 944	57 430	47 270	226 815
		2005	565 146	13 530	32 031	72 377	114 864	63 444	296 246	35 050	49 453	58 548	66 399	59 450	268 900
		2010	628 080	14 084	27 273	80 179	120 598	89 019	331 153	37 544	45 341	68 703	72 064	73 275	296 927
		2015	680 957	14 385	24 683	80 114	126 746	113 193	359 121	37 867	45 410	70 219	81 729	86 611	321 836
		2020	721 492	13 735	26 541	67 917	140 567	130 701	379 461	35 528	49 411	63 234	94 383	99 475	342 031
All sites	C00–C96	1995	420 501	17388	27 355	68 197	65 536	38 358	216 834	33 553	36 665	46 761	49 671	37 017	203 667
		2000	464 991	12505	29 759	65 259	91 405	47 121	246 049	24 705	42 684	47 244	57 118	47191	218 942
		2005	552 714	13530	32 031	72 377	114 864	63 444	296 246	27 771	45 630	57 386	66 124	59 557	256 468
		2010	612 640	14 084	27 273	80 179	120 598	89 019	331 153	29 188	40 012	66 735	71 910	73 642	281 487
		2015	662 384	14 385	24 683	80 114	126 746	113 193	359 121	29 597	37 796	66 977	81 417	87 476	303 263
		2020	699 961	13 735	26541	67 917	140 567	130 701	379 461	27 994	40 355	57 825	93 378	100 948	320 500
Esophagus	C15	1995	5434	106	609	1607	1498	475	4295	29	126	205	449	330	1139
		2000	6681	54	668	1884	2289	581	5476	18	132	266	456	333	1205
		2005	8252	57	812	2272	2872	765	6778	18	152	313	534	457	1474
		2010	9787	60	790	2724	3431	1110	8115	19	131	344	647	531	1672
		2015	11 341	67	753	2971	4208	1466	9465	22	125	338	754	637	1876

Continued

Table 3. *Continued*

Primary sites	ICD-10th	Year	Both sexes all ages	Male						Female					
				15–44	45–54	55–64	65–74	75+	All ages	15–44	45–54	55–64	65–74	75+	All ages
		2020	12 742	69	804	2884	5061	1866	10 684	22	133	295	829	779	2058
Stomach	C16	1995	114 367	5733	10 729	24 045	22 744	11 698	74 949	4354	5020	9060	11 574	9410	39 418
		2000	110 865	3085	9775	21 007	27 474	12 532	73 873	2432	5010	7695	11 372	10 483	36 992
		2005	114 014	2921	9914	20 172	29 109	13 989	76 105	2187	4798	7999	11 790	11 135	37 909
		2010	113 592	3042	7903	20 079	27 470	17 231	75 725	2273	3824	8076	11 399	12 295	37 867
		2015	113 177	3241	6950	18 592	26 638	19 660	75 081	2403	3417	7491	11 383	13 402	38 096
		2020	112 541	3180	7439	15 267	27 432	20 891	74 209	2322	3654	6150	11 846	14 360	38 332
Colon	C18	1995	55 960	1762	4367	10 474	9489	5396	31488	1553	3170	5873	7523	6353	24 472
		2000	68 154	1268	4794	11 349	14 818	7039	39 268	974	3410	6340	9524	8638	28 886
		2005	83 952	791	4711	12 122	19 177	9348	46 149	743	4256	8547	12 004	12 253	37 803
		2010	96 722	834	4127	12 526	21 124	13 448	52 059	830	3923	10 083	13 910	15 917	44 663
		2015	107 288	916	3970	12 126	22 088	17 659	56 759	938	3892	10 097	16 023	19 579	50 529
		2020	115 092	961	4255	10 705	23 059	21 059	60 039	982	4192	8862	17 987	23 030	55 053
Rectum	C19–C21	1995	30 254	1006	2608	6505	5300	2664	18 083	760	1896	3348	3664	2503	12 171
		2000	35 554	807	3206	6826	7989	3340	22 168	557	2033	3419	4243	3134	13 386
		2005	41 008	492	2868	7808	10 289	4337	25 794	328	1754	4043	5171	3918	15 214
		2010	46 599	518	2485	8427	11 740	6267	29 437	345	1523	4243	6011	5040	17 162
		2015	51 304	570	2403	8154	12 848	8432	32 407	377	1469	3936	6735	6380	18 897
		2020	54 884	598	2579	7112	13 947	10 328	34 564	393	1573	3436	7086	7832	20 320
Liver	C22	1995	15 996	490	1420	5454	3392	987	11 743	72	394	1333	1725	729	4253
		2000	17 827	237	1329	4431	5376	1233	12 606	35	328	1376	2423	1059	5221
		2005	17 884	179	1284	3555	5968	1523	12 509	25	356	1321	2422	1251	5375
		2010	18 248	176	1018	3559	5401	2286	12 440	26	312	1362	2459	1649	5808
		2015	18 472	188	947	3460	4739	3006	12 340	28	299	1297	2482	2026	6132
		2020	18 956	195	1008	2955	5122	3305	12 585	29	320	1143	2565	2314	6371
Gallbladder	C23–C24	1995	5349	108	228	630	832	450	2248	95	223	688	1183	912	3101
		2000	5678	64	252	609	995	612	2532	59	187	682	1116	1102	3146
		2005	6057	62	328	700	1278	746	3114	35	178	498	1035	1197	2943
		2010	6435	65	324	793	1388	989	3559	35	143	464	885	1349	2876
		2015	6924	71	310	909	1512	1246	4048	37	134	411	819	1475	2876
		2020	7495	75	333	914	1756	1499	4577	38	143	352	811	1574	2918
Pancreas	C25	1995	1801	91	161	286	323	201	1062	53	94	175	229	188	739
		2000	2028	53	189	284	418	247	1191	30	92	188	262	265	837
		2005	2072	46	198	273	442	302	1261	22	86	156	250	297	811
		2010	2198	48	180	313	430	378	1349	22	74	158	246	349	849
		2015	2331	51	173	327	454	443	1448	25	71	143	247	397	883
		2020	2476	55	185	304	532	490	1566	26	76	123	251	434	910
Lung	C33–C34	1995	20 508	510	1105	3918	5250	2666	13 449	298	764	1766	2624	1607	7059
		2000	24 498	384	1377	3548	7215	3356	15 880	280	1009	1993	3141	2195	8618
		2005	29 760	349	1664	4040	8591	4548	19 192	211	916	2414	4033	2994	10 568
		2010	34 202	374	1608	5032	8589	6303	21 906	241	799	2742	4651	3863	12 296
		2015	38 411	406	1526	5836	9326	7744	24 838	268	765	2569	5227	4744	13 573

Continued

Table 3. *Continued*

Primary sites	ICD-10th	Year	Both sexes all ages	Male						Female					
				15–44	45–54	55–64	65–74	75+	All ages	15–44	45–54	55–64	65–74	75+	All ages
		2020	42 425	403	1636	5637	11 713	8699	28 088	265	825	2118	5597	5532	14 337
Breast (Incl.CIS)	C50 D05	1995	46 072	—	—	—	—	—	—	12 560	12 973	9838	7093	3608	46 072
		2000	53 022	—	—	—	—	—	—	9213	18 113	11 566	9340	4790	53 022
		2005	63 405	—	—	—	—	—	—	10 651	18 699	15 441	11 377	7237	63 405
		2010	70 337	—	—	—	—	—	—	11 815	16 502	19 057	13 362	9601	70 337
		2015	76 113	—	—	—	—	—	—	12 666	15 771	19 407	16 397	11 872	76 113
		2020	79 936	—	—	—	—	—	—	12 277	17 277	16 543	19 544	14 295	79 936
Uterus (Incl.CIS)	C53–C55 D06	1995	26 763	—	—	—	—	—	—	10 299	5754	5349	3500	1861	26 763
		2000	27 835	—	—	—	—	—	—	9833	7320	5172	3537	1973	27 835
		2005	35 125	—	—	—	—	—	—	17 398	7697	5031	3131	1868	35 125
		2010	43 075	—	—	—	—	—	—	23 395	8949	5922	2864	1945	43 075
		2015	51 264	—	—	—	—	—	—	26 169	13 653	6446	3068	1928	51 264
		2020	58 116	—	—	—	—	—	—	24 930	20 052	7592	3630	1912	58 116
Uterus	C53–C55	1995	18 547	—	—	—	—	—	—	4943	4295	4512	3048	1749	18 547
		2000	19 289	—	—	—	—	—	—	4607	5061	4453	3249	1919	19 289
		2005	22 651	—	—	—	—	—	—	7600	5301	4530	3171	2049	22 651
		2010	25 977	—	—	—	—	—	—	10 178	5525	5138	2933	2203	25 977
		2015	29 330	—	—	—	—	—	—	11 461	7479	5181	2997	2212	29 330
		2020	32 197	—	—	—	—	—	—	10 975	10 521	5269	3284	2148	32 197
Prostate	C61	1995	10 314	—	125	1592	3834	4763	10 314	—	—	—	—	—	—
		2000	16 419	—	220	2264	7374	6561	16 419	—	—	—	—	—	—
		2005	29 815	—	164	2402	13 087	14 162	29 815	—	—	—	—	—	—
		2010	44 427	—	157	2797	16 430	25 043	44 427	—	—	—	—	—	—
		2015	59 343	—	152	3012	18 333	37 846	59 343	—	—	—	—	—	—
		2020	71 602	—	163	2648	19 537	49 254	71 602	—	—	—	—	—	—
Bladder	C67	1995	13 576	603	979	2778	3386	2550	10 296	124	191	678	1163	1124	3280
		2000	16 146	446	1307	2723	4751	3361	12 588	107	226	586	1154	1485	3558
		2005	16 672	218	1198	2804	4575	3630	12 425	46	253	655	1583	1710	4247
		2010	18 551	230	1061	3215	4568	4643	13 717	49	224	739	1696	2126	4834
		2015	20 306	253	1022	3285	4947	5433	14 940	54	216	737	1777	2582	5366
		2020	21 908	266	1096	2930	5724	6020	16 036	57	231	642	1969	2973	5872

Table 4. Five-year cancer prevalence in Japan according to sex, age group and primary site

Primary sites	ICD-10th	Year	Both sexes all ages	Male						Female					
				15–44	45–54	55–64	65–74	75+	All ages	15–44	45–54	55–64	65–74	75+	All ages
All sites (Incl.CIS)	C00–C96	1995	1 347 159	43 956	84939	203 096	232 511	150 587	715 089	95 549	113 630	135 149	154 480	133 262	632 070
	D05–D06	2000	1 500 567	34 561	86762	195 918	304 032	188 264	809 537	78 997	123 314	142 413	174 918	171 388	691 030
		2005	1 808 002	38 594	89250	228 476	368 689	263 659	988 668	97 428	131 202	178 197	199 852	212 655	819 334
		2010	2 006 643	40 028	75879	248 765	380 248	358 158	1 103 078	102 267	122 931	201 332	218 742	258 293	903 565

Continued

Table 4. *Continued*

Primary sites	ICD-10th	Year	Both sexes all ages	Male						Female					
				15–44	45–54	55–64	65–74	75+	All ages	15–44	45–54	55–64	65–74	75+	All ages
		2015	2 170 151	40 378	74038	228 880	415 743	434 175	1 193 214	101 311	128 464	191 858	255 127	300 177	976 937
		2020	2 291 983	36 759	81001	194 937	450 176	492 673	1 255 546	91 586	138 676	177 052	283 681	345 442	1 036 437
All sites	C00–C96	1995	1 324 888	43 956	84939	203 096	232 511	150 587	715 089	82 200	108 231	133 038	153 365	132 965	609 799
		2000	1 478 042	34 561	86762	195 918	304 032	188 264	809 537	66 379	117 299	140 074	173 725	171 028	668 505
		2005	1 771 545	38 594	89250	228 476	368 689	263 659	988 668	76 464	119 720	174 242	199 231	213 220	782 877
		2010	1 961 822	40 028	75879	248 765	380 248	358 158	1 103 078	79 608	106 142	194 677	218 264	260 053	858 744
		2015	2 116 967	40 378	74038	228 880	415 743	434 175	1 193 214	79 403	105 819	181 037	253 748	303 746	923 753
		2020	2 230 544	36 759	81001	194 937	450 176	492 673	1 255 546	72 331	113 598	158 490	279 507	351 072	974 998
Esophagus	C15	1995	22 857	312	2510	6161	6677	2918	18 578	83	470	883	1435	1408	4279
		2000	28 115	234	2474	7346	9410	3862	23 326	69	500	1045	1519	1656	4789
		2005	34 664	227	3046	9168	11487	5124	29 052	61	459	1202	1856	2034	5612
		2010	41 107	243	2857	10 679	13904	7064	34 747	65	407	1284	2216	2388	6360
		2015	47 470	273	2885	10 989	17136	9078	40 361	73	408	1166	2549	2913	7109
		2020	53 138	257	3135	10 425	19967	11 563	45 347	68	442	1050	2697	3534	7791
Stomach	C16	1995	327 271	12 770	28956	64 208	69 635	40 342	215 911	10 438	14 043	23 398	32 846	30 635	111 360
		2000	322 423	7526	25971	56 905	81 579	44 625	216 606	6174	12 983	20 630	31 362	34 668	105 817
		2005	332 201	7929	25262	56 411	82 701	50 912	223 215	6092	12 156	22 130	32 611	35 997	108 986
		2010	332 885	8409	20356	55 580	77 812	61 138	223 295	6450	9888	22 009	31 614	39 629	109 590
		2015	333 220	8810	19436	48 509	78 335	67 384	222 474	6663	9524	19 211	32 498	42 850	110 746
		2020	331 259	8216	21127	40 377	79 125	70 941	219 786	6144	10 338	16 048	33 115	45 828	111 473
Colon	C18	1995	173 147	4349	12706	29 968	32 324	18 987	98 334	3668	9307	17 147	22 893	21 798	74 813
		2000	204 227	3618	12886	30 662	44 647	25 110	116 923	2635	8907	18 434	28 014	29 314	87 304
		2005	254 751	2209	12236	34 000	56 481	33 722	138 648	2157	11 503	25 706	35 412	41 325	116 103
		2010	291 254	2359	10973	34 821	60 466	47 077	155 696	2422	10 810	28 865	40 724	52 737	135 558
		2015	320 438	2632	11026	31 998	63 659	59 580	168 895	2743	11 097	26 890	47 347	63 466	151 543
		2020	341 882	2538	11983	28 978	65 352	68 923	177 774	2627	12 078	24 266	50 771	74 366	164 108
Rectum	C19–C21	1995	94 575	2766	8340	19 301	17 957	9672	58 036	2019	5307	9741	10 816	8656	36 539
		2000	110 399	2280	9313	20 394	25 669	12 226	69 882	1687	5599	9908	12 232	11 091	40 517
		2005	128 850	1432	7823	23 227	32 226	16 792	81 500	980	4749	11 960	15 748	13 913	47 350
		2010	145 772	1531	6999	24 395	35 767	23 837	92 529	1046	4250	12 022	18 067	17 858	53 243
		2015	159 958	1710	7068	22 200	39 663	30 803	101 444	1161	4282	10 714	20 023	22 334	58 514
		2020	170 373	1645	7695	20 011	41 502	36 798	107 651	1106	4650	9649	20 148	27 169	62 722
Liver	C22	1995	73 782	1337	5865	21 117	18 373	6387	53 079	292	1277	5301	8713	5120	20 703
		2000	77 787	804	5248	16 211	23 640	8086	53 989	216	1055	4878	10 659	6990	23 798
		2005	80 912	634	4662	14 578	25 168	10 826	55 868	144	1144	5084	10 306	8366	25 044
		2010	83 825	642	3923	14 959	21 246	15 714	56 484	154	1027	5128	10 290	10 742	27 341
		2015	86 794	704	3906	13 223	21 081	18 696	57 610	172	1035	4630	10 685	12 662	29 184
		2020	89 465	666	4248	11 906	22 664	19 580	59 064	158	1123	4192	10 709	14 219	30 401
Gallbladder	C23–C24	1995	22 078	317	904	2386	3772	2882	10 261	250	760	2225	4067	4515	11 817
		2000	23 573	191	884	2300	4246	3703	11 324	145	580	2244	3751	5529	12 249
		2005	25 942	207	1219	2775	5355	4820	14 376	107	549	1660	3364	5886	11 566
		2010	28 211	219	1156	3259	5761	6230	16 625	109	465	1526	2942	6544	11 586
		2015	30 865	244	1170	3521	6423	7699	19 057	119	462	1305	2853	7069	11 808
		2020	33 646	233	1276	3389	7698	9025	21 621	112	501	1169	2765	7478	12 025

Continued

Table 4. *Continued*

Primary sites	ICD-10th	Year	Both sexes all ages	Male						Female					
				15–44	45–54	55–64	65–74	75+	All ages	15–44	45–54	55–64	65–74	75+	All ages
Pancreas	C25	1995	11 309	317	887	1713	2164	1261	6342	173	461	948	1467	1918	4967
		2000	13 049	205	927	1849	2630	1518	7129	158	467	1086	1613	2596	5920
		2005	12 835	195	896	1753	2484	1870	7198	82	370	904	1511	2770	5637
		2010	13 707	206	820	1957	2449	2293	7725	87	332	866	1480	3217	5982
		2015	14 633	229	837	1882	2838	2576	8362	97	339	743	1539	3553	6271
		2020	15 431	215	915	1758	3199	2857	8944	91	369	675	1473	3879	6487
Lung	C33–C34	1995	91 260	1702	4738	14 882	24 819	16 258	62 399	1033	3051	6297	10 170	8310	28 861
		2000	109 611	1363	5660	14 428	31 414	20 887	73 752	935	3599	7674	12 221	11 430	35 859
		2005	134 198	1299	6392	17 525	35 676	29 474	90 366	808	2997	9038	15 593	15 396	43 832
		2010	154 247	1416	5952	21 917	35 807	38 783	103 875	924	2677	9521	17 670	19 580	50 372
		2015	173 347	1505	6017	23 079	42 763	44 834	118 198	991	2718	8235	19 957	23 248	55 149
		2020	190 859	1392	6559	21 549	53 257	50 219	132 976	914	2964	7016	19 899	27 090	57 883
Breast (Incl.CIS)	C50 D05	1995	132 133	—	—	—	—	—	—	30 550	40 099	28 342	21 386	11 756	132 133
		2000	152 976	—	—	—	—	—	—	25 386	49 475	34 640	27 280	16 195	152 976
		2005	177 262	—	—	—	—	—	—	29 338	47 616	45 248	31 841	23 219	177 262
		2010	195 637	—	—	—	—	—	—	32 433	42 493	52 849	37 913	29 949	195 637
		2015	209 916	—	—	—	—	—	—	33 845	42 955	49 487	47 179	36 450	209 916
		2020	218 882	—	—	—	—	—	—	31 342	47 576	42 660	53 228	44 076	218 882
Uterus (Incl.CIS)	C53–C55 D06	1995	74 376	—	—	—	—	—	—	26 825	17 139	14 379	9735	6298	74 376
		2000	76 582	—	—	—	—	—	—	25 568	18 995	14 558	10 431	7030	76 582
		2005	101 680	—	—	—	—	—	—	51 131	20 944	14 655	8506	6444	101 680
		2010	123 507	—	—	—	—	—	—	64 649	27 353	16 806	8140	6559	123 507
		2015	144 719	—	—	—	—	—	—	68 226	42 927	17 833	9286	6447	144 719
		2020	161 965	—	—	—	—	—	—	62 630	58 384	23 754	10 679	6518	161 965
Uterus	C53–C55	1995	52 115	—	—	—	—	—	—	12 861	12 266	12 299	8639	6050	52 115
		2000	54 275	—	—	—	—	—	—	11 814	13 656	12 514	9482	6809	54 275
		2005	65 273	—	—	—	—	—	—	22 262	14 073	13 077	8697	7164	65 273
		2010	74 331	—	—	—	—	—	—	28 187	16 096	14 306	8247	7495	74 331
		2015	82 967	—	—	—	—	—	—	29 947	23 046	13 764	8849	7361	82 967
		2020	90 343	—	—	—	—	—	—	27 576	30 491	15 667	9387	7222	90 343
Prostate	C61	1995	39 011	—	472	4795	14 388	19 356	39 011	—	—	—	—	—	—
		2000	60 217	—	740	7283	25 905	26 289	60 217	—	—	—	—	—	—
		2005	112 960	—	503	7392	42 780	62 285	112 960	—	—	—	—	—	—
		2010	164 479	—	476	8684	51 190	104 129	164 479	—	—	—	—	—	—
		2015	212 806	—	484	8422	55 608	148 292	212 806	—	—	—	—	—	—
		2020	251 376	—	522	7522	59 721	183 611	251 376	—	—	—	—	—	—
Bladder	C67	1995	40 391	1373	2906	7311	10 380	8928	30 898	274	551	1656	3104	3908	9493
		2000	49 211	1027	3308	7291	14 282	11 950	37 858	307	692	1664	3540	5150	11 353
		2005	50 106	573	3016	7905	12 655	13 055	37 204	118	646	1850	4410	5878	12 902
		2010	55 807	612	2722	8849	12 845	16 138	41 166	128	584	2031	4591	7307	14 641
		2015	61 054	682	2734	8435	14 575	18 348	44 774	143	587	1885	5008	8657	16 280
		2020	65 714	661	2971	7685	16 365	20 302	47 984	138	636	1688	5381	9887	17 730

Relating to the Incidence in the Future Projection

We applied the estimated cancer incidence presented by Ohno *et al.* for the projection of prevalence (7). Applying the Bayesian age-period-cohort model to the past age-specific cancer incidence data from 1975 to 1994 by sites and sex, there obtained longitudinal changes of the three effects, namely age, period and cohort. Using the value of the three effects, the age-specific incidence at any year by site and sex could be calculated. Furthermore, the future trends in three effects would be projected assuming some adaptive scenarios, for details, age effect was assumed the same as those estimate and the period effect was extrapolating using an adequate function chosen among constant, linear, and quadratic functions and the cohort effect was set at the latest birth cohort. The future incidence reflecting the change of the age distribution, period effect and cohort effect was applied to the future prevalence estimation.

Further Discussions

This is the first estimate of cancer prevalence in the future in Japan. We will need to evaluate the accuracy of this estimate in a few years. The quality of cancer registration in Japan has not been reliable, but concerted efforts are being made to improve the quality of registration in the future. Thus, the incidence and survival data will be changed, so we will need to consider them when we analyze future data. In addition, we need to construct the system and estimate cancer prevalence regularly, because it is important data for cancer control program.

Funding

This study was supported by a Grant-in-Aid for Cancer Research from the Japanese Ministry of Health, Labour and Welfare: (14-2) and was carried out under the ISM Cooperative Research Program (2004-ISM CRP-2037).

Conflict of interest statement

None declared.

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特集　新しいがん診療体制の構築をめぐって

地域がん登録の現状と将来展望

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別刷
日本医師会雑誌
第137巻・第2号
平成20（2008）年5月

地域がん登録の現状と将来展望

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キーワード　地域がん登録　法的根拠　機密保護　がん対策

はじめに

大阪府では1962年12月より，大阪府医師会，大阪府健康福祉部，大阪府立成人病センターの3者の密接な協力関係の下，大阪府全域を対象とする地域がん登録事業が実施されている（図1）．大阪府医師会が，府内医療機関からのがん患者の診断・治療情報の届出の依頼と受け付け，届出漏れとなっている患者情報の問い合わせ，届出謝金の支払い，登録事業の広報等を担当し，大阪府立成人病センター調査部は，届出情報の内容点検やコード化，がん死亡情報に基づく補完登録，集計と解析，報告書作成等，中央登録作業のすべてを担当している．大阪府健康福祉部は必要な予算を計上し，人口動態死亡情報のがん登録事業における利用の確保や登録患者の予後調査等を担当している．

大阪府個人情報保護条例の定めに基づき，1996年に開催された個人情報保護審議会において，大阪府がん登録事業は公益上必要であり，大阪府が実施主体となって事業を継続することが明記された．筆者は大阪府立成人病センターにおいて，大阪府がん登録の中央登録室を担当する立場にある．

本稿では，わが国の地域がん登録の現状と課題を示し，将来展望についての私見を述べる．

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Ⅰ．地域がん登録の現状

1．実施状況

表1に，わが国の地域がん登録の実施地域の一覧を示した．2007年4月現在，35道府県1市で実施されている[1]．わが国では1951年に東北大学の瀬木三雄教授が宮城県において最初に地域がん登録を開始し，その後1957年に広島市で，1958年に長崎市で，地元医師会と原爆傷害調査委員会（現放射線影響研究所）が協力して，それぞれ広島市民，長崎市民を対象とする腫瘍・組織登録が実施された．1962年には愛知県，大阪府で，府県の事業として地域がん登録が開始され，1970年代には神奈川県，鳥取県，高知県，千葉県でも開始されるようになった．1983年の老人保健法の施行の前後には地域がん登録事業を開始する府県が急増し，今日に至っている[2]．

2．精度向上・標準化

わが国の地域がん登録は，1975年に発足した厚生省（現厚生労働省）がん研究助成金による「地域がん登録」研究班（主任研究者：藤本伊三郎，福間誠吾，花井　彩，大島　明，津熊秀明）が中心となって，国際がん研究機関IARC（International Agency for Research on Cancer）に本部を置く国際がん登録協議会IACR（International Association of Cancer Registries）の活動とも密接な連携を保ちつつ，地域がん登録の精度向上と活用に関する研究が行わ

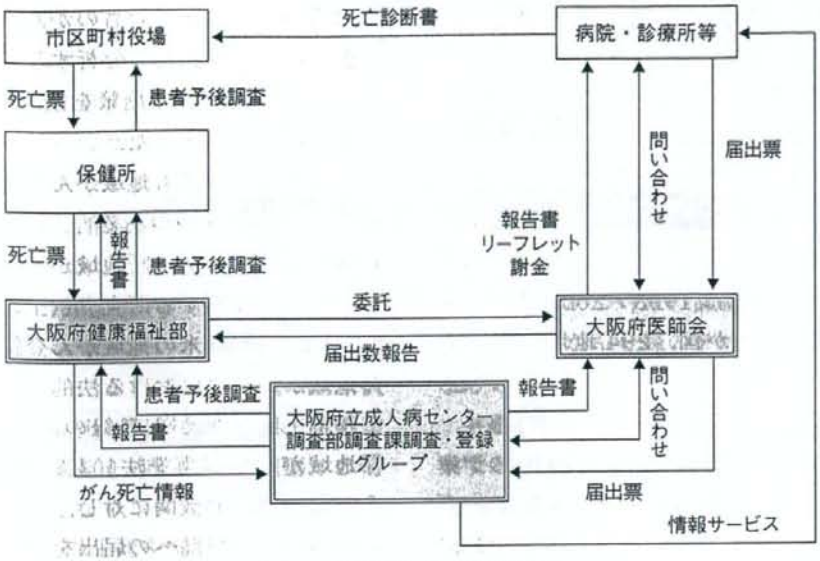

図1　大阪府がん登録の仕組み

表1　地域がん登録実施道府県市(2007年4月現在)

地方	地域がん登録実施道府県市名
北海道	北海道
東北	青森, 岩手, 宮城[a,b], 秋田, 山形[a,b]
関東・甲信越	茨城, 栃木, 群馬, 千葉, 神奈川[a], 新潟[a], 山梨
中部・北陸	富山, 石川, 福井[a,b], 岐阜, 愛知[b]
近畿	滋賀[a], 京都, 大阪[a,b], 兵庫
中国	鳥取, 岡山[a], 広島県, 広島市[b], 山口
四国	徳島, 香川, 愛媛, 高知
九州	佐賀[a], 長崎[a,b], 熊本, 鹿児島, 沖縄

[a] 2001年の全国がん罹患数・率推計に採用された地域

[b] *Cancer Incidence in Five Continents* Vol. IX (1998～2002年を中心とする値)に収録の地域．ただし，愛知は特定地域，広島市は1996～2000年．

れてきた．1992年には，各道府県市の地域がん登録および関連の研究組織が構成団体となって地域がん登録全国協議会が結成され（理事長：藤本伊三郎，大島　明，岡本直幸），地域がん登録に関する諸課題に協同して取り組む体制ができた．

2004年には第3次対がん総合戦略研究事業による「がん罹患・死亡動向の実態把握の研究」班（主任研究者：祖父江友孝）が発足し，地域がん登録の精度向上と標準化に向けての活動が国立がんセンターがん対策情報センターがん情報・統計部を中心に加速することになった．具体的には地域がん登録の標準登録様式が定められ，登録作業を標準化するための標準データベースシステムが放射線影響研究所情報技術部（部長：片山博昭）により開発され，研究班から全国の地域がん登録事業に提供されることになった[2]．

3. 罹患数・率の全国推計への参加，*Cancer Incidence in Five Continents* への収録

わが国では厚生労働省の班研究として，登録精度の比較的良好な地域の資料を用いて，がん罹患率の全国値を毎年推計してきた．

2006年度は，「がん罹患・死亡動向の実態把握の研究」班が，参加登録の2000～2002年診断の3年間の罹患データから，中間年の2001年値を推計し，公表した[3]．ここで用いた登録の精度基準は，推計年を含む前後3年間の罹患者中死亡情報のみで登録された患者（DCO）割合，死亡情報で初めて把握された患者（DCN）割合，罹患数(I)とがん死亡数(D)との比のおのおのを計算し，全部位のDCO割合が25%未満，またはDCN割合が30%未満で，かつI/D比が