Announcements

The 20th World Cancer Day — February 4, 2020

World Cancer Day is organized by the Union for International Cancer Control (UICC) and celebrated annually on February 4 since 2000. This year's global observance marks the 20th World Cancer Day and raises awareness for cancer and for its prevention, detection, and treatment.

In 2018, an estimated 18.1 million new cancer cases and 9.6 million cancer deaths occurred globally (*1*), and according to the National Central Cancer Registry of China, about 4.28 million new cancer cases and 2.86 million cancer deaths occurred in China, which accounted for about 23.7% and 30.0% of the global cancer incidence and deaths, respectively. Cancer has become a leading cause of death in China over the past 40 years and contributes an increasing burden of cancer due to population aging. Furthermore, factors such as increasing prevalence of physical inactivity and obesity, decreasing prevalence of infection-related disease, high prevalence of smoking in males, and air pollution may contribute to the changing profile of the cancer burden in China (*2*). Though serious challenges remain, significant progress has been made in cancer prevention and control in China as the highest cancer-specific mortality rates (stomach, esophageal, and liver) decreased over a recent 15-year period (*3*).

World Cancer Day's 2019–2021 campaign theme is "I Am and I Will" and calls for personal commitment and prompt action to reduce the growing burden of cancer. This theme emphasizes personal responsibility, making healthier lifestyle choices, supporting cancer patients and survivors, and fighting for a cancer-free world.

References

1. Bray F, Ferlay J, Soerjomataram I, Siegel RL, Torre LA, Jemal A. Global cancer statistics 2018: GLOBOCAN estimates of incidence and mortality worldwide for 36 cancers in 185 countries. CA: A Cancer J Clin 2018;68(6):394 – 424. http://dx.doi.org/10.3322/caac.21492.
2. Chen WQ, Zheng RS, Baade PD, Zhang SW, Zeng HW, Bray F, et al. Cancer statistics in China, 2015. CA: A Cancer J Clin 2016;66(2):115 – 32. http://dx.doi.org/10.3322/caac.21338.
3. Chen WQ, Zheng RS, Zhang SW, Zeng HM, Xia CF, Zuo TT, et al. Cancer incidence and mortality in China, 2013. Cancer Lett 2017;401:63 – 71.http://dx.doi.org/10.1016/j.canlet.2017.04.024.

Vital Surveillances

Cancer Mortality — China, 2018

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Abstract

Introduction Cancer is an important public health concern with heavy disease burden in China. In 2017, cancer is the leading cause of death, with around 2.60 million deaths, which accounts for 26.07% of all deaths. This study aims to present cancer mortality in China in 2018 to provide evidence for cancer control and prevention.

Methods Mortality data from China Cause of Death Reporting System (CDRS) and population data from National Bureau of Statistics are used for cancer mortality estimation. A descriptive analysis was conducted to demonstrate the results.

Results A total of 2,557,297 cancer deaths were estimated in China in 2018 with a mortality rate and age-standardized mortality rate of 183.89 and 145.60 per 100,000, respectively. Lung, liver, and stomach cancer were the three leading causes of cancer death and accounted for around 56.75% of all cancer deaths. The age-standardized mortality rate was higher in men (194.37 per 100,000) than in women (99.47 per 100,000), in urban areas (148.25 per 100,000) than in rural areas (144.62 per 100,000), and in eastern regions (150.57 per 100,000) than in central (142.09 per 100,000)/western regions (141.54 per 100,000). The age-specific mortality rate remains low for the population younger than 44 years old and reaches its peak after 80 years old. Leukemia is the leading cause of cancer death among those aged 0–14 years in both sexes, while breast cancer is the leading cause of cancer death in women aged 15–44 years.

Conclusions and Implications for Public Health Practice The cancer mortality patterns show substantial disparities among sexes, age groups, areas, and regions. Healthy lifestyle promotion, active vaccination uptake, and environmental governance are essential to eliminate cancer-related risk factors in the overall population. Tailored strategies for the early screening

and diagnosis, therapeutic management, and palliative care should be a top priority for enforcement among target populations and regions.

Introduction

In China, the increased cancer mortality making it the leading cause of death since 2010 and a dominant public health problem (*1*). In 2017, around 2.60 million individuals died from cancer, which accounts for 26.07% of all deaths in China (*2*). The number is projected to grow substantially in the coming years due to population aging, socio-economic transitions, and unhealthy lifestyle adoption (*3*). Specific strategies should be initiated to reduce the burden of cancer mortality in China.

Cancer control and prevention rely on population-based mortality data to identify the scope of priorities and to map out enforcement of solutions (*1*). This report provides a detailed picture about the level and distribution of cancer mortality nationwide in 2018, targets that have the greatest need to be prioritized, and a baseline for assessing effectiveness of cancer control efforts in the future (*1*).

Methods

An integrated China Cause of Death Reporting System (CDRS) was established in combination with the Disease Surveillance Points System (DSPs) and National Vital Registration System in 2013. The system covers over 300 million individuals from 605 disease surveillance points in 31 provincial-level administrative divisions that account for 24% of China's population and routinely collects individual details of death information in real time through an internet-based approach. Detailed descriptions of stratified methods, selection of surveillance points, and determination of national representativeness have been reported elsewhere (*4*).

Primary quality control of mortality data was conducted mainly based on comprehensive evaluation criteria for validity, reliability, and completeness (*5*). 512 out of 605 disease surveillance points met the quality control criteria and were included in pooled data. The eligible points covered a population of 272 million, among which a total of 1,822,530 all-cause deaths were reported (*5*). International Classification of Diseases, 10th revision (ICD-10) was used to identify cancer deaths. Cancer-specific mortality data was obtained and stratified by sex, age group, area (urban/rural), and region (eastern/central/western). National population data was obtained from National Bureau of Statistics in 2018 with identical stratification as the mortality data (*6*).

Crude mortality rate of cancer in each stratum by sex, age group, area, and region was calculated using mortality data from eligible points and respective population. In consideration of potential CDRS under-reporting, the mortality rate presented in this report was adjusted through a formula: mortality rate = crude morality rate/(1-under-reporting rate) (*7*). By multiplying the mortality rate with the population in each stratum and calculating the sum, estimated cancer deaths with scaled-up aggregation data in each stratum was acquired. The Sixth National Population Census in 2010 was used for age-standardized mortality rate (ASMR) estimation (*6*). SAS software (version 9.4, SAS Institute Inc., Cary, USA) was applied for statistical analysis.

Results

Table 1 displays the mortality rate, ASMR, and estimated cancer deaths by sex in 2018 nationwide. A total number of 2,557,297 cancer deaths were estimated, with 1,658,302 men and 898,995 women. The mortality rate and ASMR for all cancer sites were 183.89 and 145.60 per 100,000, with 233.74 and 194.37 per 100,000 in men, 132.27 and 99.47 per 100,000 in women, respectively. Lung, liver, and stomach cancer were the three leading causes of cancer death for both sexes and having 1,451,345 estimated deaths in total, which accounts for 56.75% of all cancer deaths with 1,028,777 (62.04%) in men and 422,568 (47.00%) in women. Men showed a higher ASMR than women for nearly all cancer types. For overall cancer and the three leading causes of cancer death, men exceeded women with rates of 194.37 *vs.* 99.47 per 100,000, 60.13 *vs.* 23.72 per 100,000, 35.18 *vs.* 11.52 per 100,000, and 25.08 *vs.* 10.31 per 100,000, respectively.

Table 2 displays the morality rate and ASMR of cancer in different areas and regions. ASMR in urban areas showed a slightly higher value than rural areas at 148.25 and 144.62 per 100,000 respectively. Eastern regions showed the highest ASMR (150.57 per 100,000), followed by central (142.09 per 100,000) and western regions (141.54 per 100,000). Lung, liver, and stomach cancers still rank as the three leading causes of cancer death in both urban and rural areas as well as eastern/central/western regions.

TABLE 1. Mortality rate, age-standardized mortality rate, and estimated deaths of cancer by sex in China, 2018.

ICD-10	Sites	Mortality rate (per 100,000)			ASMR (per 100,000)			Estimated deaths		
		Both sexes	Males	Females	Both sexes	Males	Females	Both sexes	Males	Females
C00-C97	All sites	183.89	233.74	132.27	145.60	194.37	99.47	2,557,297	1,658,302	898,995
C00-C14	Mouth and oropharynx	3.46	5.05	1.81	2.85	4.33	1.40	48,125	35,816	12,309
C15	Esophageal	14.19	20.77	7.38	10.84	16.92	5.02	197,519	147,373	50,146
C16	Stomach	22.61	30.70	14.21	17.48	25.08	10.31	314,459	217,843	96,616
C18-C21	Colon and rectal	13.30	15.59	10.92	10.28	12.87	7.89	184,819	110,627	74,192
C22	Liver	28.31	40.85	15.33	23.30	35.18	11.52	394,028	289,846	104,182
C25	Pancreas	6.39	7.36	5.41	5.00	6.08	3.96	88,930	52,172	36,758
C33-C34	Trachea, bronchus, and lung	53.40	73.44	32.63	41.43	60.13	23.72	742,858	521,088	221,770
C43-C44	Melanoma and other skin	0.85	0.91	0.80	0.66	0.76	0.56	11,848	6,405	5,443
C50	Breast	4.45	0.16	8.91	3.82	0.13	7.48	61,646	1,100	60,546
C53	Cervix uteri	3.15	NA	6.41	2.67	NA	5.32	43,525	NA	43,525
C54-C55	Corpus uteri	1.21	NA	2.46	1.00	NA	1.98	16,719	NA	16,719
C56	Ovarian	1.46	NA	2.96	1.22	NA	2.43	20,121	NA	20,121
C61	Prostate	2.00	3.92	NA	1.42	3.14	0.00	27,783	27,783	NA
C67	Bladder	2.26	3.47	1.02	1.66	2.81	0.68	31,567	24,590	6,977
C81-C90, C96	Lymphomas and multiple myeloma	3.90	4.76	3.01	3.18	4.04	2.35	54,264	33,782	20,482
C91-C95	Leukemia	4.16	4.76	3.52	3.64	4.29	3.00	57,752	33,788	23,964
C17, C23, C24, C26–C32, C37–C41, C45–C49, C51, C52, C57–C60, C62–C66, C68–C80, C97	Other sites	18.79	22.00	15.49	15.16	18.61	11.86	261,334	156,089	105,245

Abbreviation: ASMR=Age-standardized mortality rate; NA=Not applicable.

Table 3 displays the ASMR of cancer in different age groups by sex. The ASMR was relatively low for those 45 years and younger, but then increased drastically by reaching its peak for those 80 years old with rate of 1486.30 per 100,000. Major causes of cancer death differ between age groups. Among the population aged 0–14 years old for both sexes, leukemia, lymphomas and multiple myeloma, and liver cancer are the major causes. While in those aged 60 years or older, lung cancer is the leading cause of cancer. For males aged 15–59 years and female aged 15–44 years, liver cancer and breast cancer are the leading cause of cancer death, respectively.

Discussion

This study presents an up-to-date overview of cancer mortality in China in 2018 with particularly attention paid to population distribution and spatial patterns. This report illustrates a national profile of cancer mortality and creates rational evidence for forming specific strategies in cancer prevention and control (*8*).

Cancer is a major public health problem and the leading cause of death in China. Our results were consistent with GBD2017 estimates (with 2,606,907 deaths, a mortality rate of 184.56 per 100,000, and an ASMR 138.13 per 100,000) (*2*). Lung, liver, and stomach cancers are the leading three causes of cancer death in overall population. Previous studies concluded that nearly 60% of cancer deaths can be avoided by common and modifiable risk factors such as unhealthy lifestyle choices like tobacco consumption, alcohol drinking, physical inactivity, and unbalanced dietary habits (*9*). As one of the leading contributors to premature death, tobacco smoking accounts for 22.6% of all cancer deaths in China and is expected to increase in near future (*9*). Chronic infection contributes to 29% of cancer deaths, predominantly from liver cancer potentially caused by hepatitis B virus and hepatitis C virus, stomach cancer caused by *Helicobacter pylori*, and cervical cancer caused by

TABLE 2. Mortality rate (per 100,000) and age-standardized mortality rate (per 100,000) by area and region in China, 2018.

Sites	Urban		Rural		East		Central		West	
	Mortality rate	ASMR	Mortality rate	ASMR	Mortality rate	ASMR	Mortality rate	ASMR	Mortality rate	ASMR
All sites	187.35	148.25	182.10	144.62	207.73	150.57	173.78	142.09	161.25	141.54
Mouth and oropharynx	3.40	2.79	3.49	2.89	3.90	3.00	2.89	2.46	3.54	3.17
Esophageal	12.64	9.76	14.99	11.40	16.60	11.56	12.00	9.47	13.47	11.48
Stomach	21.03	16.41	23.42	18.05	26.07	18.38	21.78	17.45	18.44	15.89
Colon and rectal	15.96	12.31	11.91	9.28	16.08	11.25	11.30	9.10	11.73	10.13
Liver	25.07	20.52	30.00	24.80	28.06	21.46	29.27	24.57	27.43	24.75
Pancreas	7.69	6.03	5.73	4.49	8.32	5.92	5.53	4.50	4.64	4.02
Trachea, bronchus, and lung	56.43	44.00	51.83	40.21	60.42	42.85	52.47	42.11	43.96	37.96
Melanoma and other skin	0.78	0.61	0.90	0.69	0.92	0.62	0.80	0.64	0.83	0.72
Breast	5.30	4.45	4.02	3.50	5.35	4.28	4.18	3.66	3.47	3.23
Cervix uteri	2.72	2.32	3.36	2.85	2.73	2.20	3.49	2.99	3.31	3.05
Corpus uteri	1.08	0.88	1.27	1.06	1.30	1.00	1.11	0.94	1.19	1.09
Ovarian	1.88	1.57	1.23	1.04	1.85	1.45	1.25	1.08	1.13	1.03
Prostate	2.63	1.91	1.65	1.18	2.54	1.58	1.57	1.18	1.72	1.44
Bladder	2.68	1.99	2.06	1.50	2.77	1.79	2.00	1.54	1.87	1.57
Lymphomas and multiple myeloma	4.48	3.61	3.61	2.97	4.43	3.32	3.74	3.15	3.31	2.97
Leukemia	4.09	3.51	4.19	3.71	4.76	3.92	3.82	3.43	3.69	3.43
Other sites	19.46	15.60	18.46	14.98	21.61	15.96	16.57	13.80	17.53	15.61

Abbreviation: ASMR=Age-standardized mortality rate.

human papillomavirus. In addition, environmental carcinogens like indoor and outdoor air pollution, contaminated soil and drinking water also pose major risks for population cancer mortality (*1*).

Major differences based on sex could be seen in nearly all cancer types. The ASMR in men is approximately two to three times as high as that of their female counterparts, particularly in three leading causes of cancer death. The disparity could be primarily driven by variations in exposure prevalence to cancer-specific risk factors (*3*). For example, the prevalence of daily smoking in men was 45% and 2% for women in 2012, suggesting that underlying potential to reduce cancer levels through reducing tobacco consumption among men (*10*). Men are also more likely to be exposed to occupational hazards in poor working environments compared with women, and this may also increase the risk of cancer-specific mortality (*11*). In contrast, colon cancer ranks fourth for women, which could be explained by higher prevalence of low fruit intake and physical inactivity compared with men (*3*).

Cancer is a chronic disease that is closely related to age. Our results showed the highest cancer mortality among the population aged over 60 years old, and lung, liver, stomach, esophageal, and colon cancers are the primary contributors. Although cancer mortality in children is not as high as in the aging population, certain cancers largely influenced by metabolic and congenital factors pose a heavy burden for children, such as leukemia. Special attention should also be paid to lung cancer in adult males, and breast and cervical cancer in adult females. Early screening, detection, diagnosis, and health promotion is of great necessity. In addition, different strategies should be conducted in accordance with specific populations for cancer control and prevention (*12*).

The spectrum of cancer mortality differs based on area and region for nearly all cancer types in China, which reflects the spatial discrepancies in living habits and healthcare level. In 2018, urban areas and eastern regions were cancer epicenters. Most of the results could be partially explained by rising socioeconomic status, population aging, westernized lifestyle, and endocrine and reproductive factors such as female breast and colon cancer. Despite a slightly lower cancer mortality rate compared with urban areas, digestive-system-related cancers were still the most frequent cancers in rural areas and might be due to factors including limited medical resources, unsatisfactory

TABLE 3. Age-specific mortality rate (per 100,000) of all cancer and five leading types of cancer by sex and age in China, 2018.

Age groups (years old)	Both		Males		Females	
	Sites	Age-specific mortality rate	Sites	Age-specific mortality rate	Sites	Age-specific mortality rate
All	All sites	183.89	All sites	233.74	All sites	132.27
	Trachea, bronchus, and lung	53.40	Trachea, bronchus, and lung	73.44	Trachea, bronchus, and lung	32.63
	Liver	28.31	Liver	40.85	Liver	15.33
	Stomach	22.61	Stomach	30.70	Stomach	14.21
	Esophageal	14.19	Esophageal	20.77	Colon and rectal	10.92
	Colon and rectal	13.30	Colon and rectal	15.59	Breast	8.91
0–14	All sites	3.90	All sites	4.37	All sites	3.35
	Leukemia	1.71	Leukemia	1.94	Leukemia	1.45
	Lymphomas and multiple myeloma	0.31	Lymphomas and multiple myeloma	0.38	Lymphomas and multiple myeloma	0.23
	Liver	0.15	Liver	0.18	Liver	0.12
	Trachea, bronchus, and lung	0.04	Trachea, bronchus, and lung	0.06	Mouth and oropharynx	0.02
	Mouth and oropharynx	0.02	Mouth and oropharynx	0.02	Trachea, bronchus, and lung	0.01
15–44	All sites	18.29	All sites	21.80	All sites	14.67
	Liver	4.56	Liver	7.68	Breast	2.32
	Trachea, bronchus, and lung	2.36	Trachea, bronchus, and lung	2.98	Trachea, bronchus, and lung	1.72
	Leukemia	1.74	Leukemia	2.12	Cervix uteri	1.40
	Stomach	1.33	Stomach	1.46	Leukemia	1.36
	Breast	1.16	Colon and rectal	1.23	Liver	1.34
45–59	All sites	159.37	All sites	206.61	All sites	111.16
	Trachea, bronchus, and lung	38.58	Liver	57.86	Trachea, bronchus, and lung	21.80
	Liver	35.55	Trachea, bronchus, and lung	55.03	Breast	15.07
	Stomach	15.16	Stomach	21.27	Liver	12.79
	Colon and rectal	9.42	Esophageal	14.69	Cervix uteri	10.57
	Esophageal	8.43	Colon and rectal	11.56	Stomach	8.92
60–79	All sites	688.91	All sites	932.01	All sites	448.68
	Trachea, bronchus, and lung	217.96	Trachea, bronchus, and lung	318.85	Trachea, bronchus, and lung	118.27
	Liver	96.87	Liver	138.87	Liver	55.37
	Stomach	90.53	Stomach	132.42	Stomach	49.13
	Esophageal	59.46	Esophageal	91.83	Colon and rectal	35.84
	Colon and rectal	47.83	Colon and rectal	59.96	Esophageal	27.46
80+	All sites	1486.30	All sites	2004.11	All sites	1103.11
	Trachea, bronchus, and lung	452.43	Trachea, bronchus, and lung	645.06	Trachea, bronchus, and lung	309.89
	Stomach	207.59	Stomach	290.90	Stomach	145.94
	Liver	154.51	Liver	205.05	Colon and rectal	119.13
	Colon and rectal	145.83	Esophageal	190.57	Liver	117.12
	Esophageal	135.23	Colon and rectal	181.90	Esophageal	94.28

Note: “Both” represents the total population.

medical treatment, and late cancer diagnosis in underdeveloped regions, all of which should also be tackled with target strategies (*8*,*13*).

During past decades, several programs related to

cancer control and prevention have been launched in China and yielded profound benefits, such as cancer screening for esophageal, stomach, liver, female breast and cervical cancer. Nevertheless, although China has implemented basic medical insurance coverage, solutions to address the geographic variations and unequal distribution of resources, limitations in the availability, accessibility, affordability of medical resources, compliance to treatment, understaffing, lack of professional staff capacity, and insufficient funding reduces the efficacy of existing cancer intervention strategies. In 2016, the government released the "Healthy China 2030" policy, which set an ultimate goal to reduce premature mortality from major noncommunicable diseases by 30% from 2015 to 2030. Since cancer is one of the most fundamental noncommunicable diseases and the leading cause of death, improvement of effective cancer prevention and control interventions will play a key role in achieving the goal (*8*). Interventions such as early screening and diagnosis and therapeutic management among high risk populations and regions are urgently needed (*1*). To eliminate cancer-related risk factors, strategies such as healthy lifestyle promotion, active vaccination uptake, and environmental governance should also be prioritized (*12*).

The findings in this report are subject to some limitations, one of which is reporting accuracy of underlying cause-of-death. Ascertainment bias in cancer diagnosis remains the greatest concern in attenuating the quantity and quality of cancer mortality estimations, which requires correction for redistribution algorithms for implausible diagnostic codes (*14*).

Cancer mortality is expected to increase with existing risk factors explosion and potential ones emerging in the coming years. This report helps to identify heterogeneity in cancer mortality patterns and is of great value for tailoring priorities in cancer control and prevention in China.

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References

1. Chen WQ, Zheng RS, Baade PD, Zhang SW, Zeng HM, Bray F, et al. Cancer statistics in China, 2015. CA: A Cancer J Clin 2016;66(2):115 – 32. http://dx.doi.org/10.3322/caac.21338.
2. GBD 2017 Causes of Death Collaborators. Global, regional, and national age-sex-specific mortality for 282 causes of death in 195 countries and territories, 1980-2017: a systematic analysis for the Global Burden of Disease Study 2017. Lancet 2018;392(10159):1736 – 88. http://dx.doi.org/10.1016/S0140-6736(18)32203-7.
3. Chen WQ, Xia CF, Zheng RS, Zhou MG, Lin CQ, Zeng HM, et al. Disparities by province, age, and sex in site-specific cancer burden attributable to 23 potentially modifiable risk factors in China: a comparative risk assessment. Lancet Glob Health 2019;7(2):e257 – 69. http://dx.doi.org/10.1016/S2214-109X(18)30488-1.
4. Liu SW, Wu XL, Lopez AD, Wang LJ, Cai Y, Page A, et al. An integrated national mortality surveillance system for death registration and mortality surveillance, China. Bull World Health Organ 2016;94(1):46 – 57. http://dx.doi.org/10.2471/BLT.15.153148.
5. National Health Commission, Chinese Center for Disease Control and Prevention. China mortality surveillance yearbook, 2018. Beijing: China Science and Technology Press, 1st ed, 2019. (In Chinese)
6. National Data. Tabulation on the 2010 population census of the People's Republic of China. [2020-01-18]. http://data.stats.gov.cn/.
7. Guo K, Yin P, Wang LJ, Ji YB, Li QF, Bishai D, et al. Propensity score weighting for addressing under-reporting in mortality surveillance: a proof-of-concept study using the nationally representative mortality data in China. Popul Health Metr 2015;13:16. http://dx.doi.org/10.1186/s12963-015-0051-3.
8. Chen WQ, Sun KX, Zheng RS, Zeng HM, Zhang SW, Xia CF, et al. Cancer incidence and mortality in China, 2014. Chin J Cancer Res 2018;30(1):1 – 12. http://dx.doi.org/10.21147/j.issn.1000-9604.2018.01.01.
9. Wang JB, Jiang Y, Liang H, Li P, Xiao HJ, Ji J, et al. Attributable causes of cancer in China. Ann Oncol 2012;23(11):2983 – 9. http://dx.doi.org/10.1093/annonc/mds139.
10. Ng M, Freeman MK, Fleming TD, Robinson M, Dwyer-Lindgren L, Thomson B, et al. Smoking prevalence and cigarette consumption in 187 countries, 1980-2012. JAMA 2014;311(2):183 – 92. http://dx.doi.org/10.1001/jama.2013.284692.
11. Global Burden of Disease 2017 Risk Factor Collaborators. Global, regional, and national comparative risk assessment of 84 behavioral, environmental and occupational, and metabolic risks or clusters of risks for 195 countries and territories, 1990-2017: a systematic analysis for the Global Burden of Disease Study 2017. Lancet 2018;392(10159):1923 – 94. http://dx.doi.org/10.1016/S0140-6736(18)32225-6.
12. Chen WQ, Zheng RS, Zhang SW, Zeng HM, Xia CF, Zuo TT, et al. Cancer incidence and mortality in China, 2013. Cancer Lett 2017;401:63 – 71. http://dx.doi.org/10.1016/j.canlet.2017.04.024.
13. Chen WQ, Zheng RS, Zuo TT, Zeng HM, Zhang SW, He J. National cancer incidence and mortality in China, 2012. Chin J Cancer Res 2018;28(1):1 – 11. http://dx.doi.org/10.3978/j.issn.1000-9604.2016.02.08.
14. Global Burden of Disease Cancer Collaboration. Global, regional, and national cancer incidence, mortality, years of life lost, years lived with disability, and disability-adjusted life-years for 29 cancer groups, 1990 to 2017: a systematic analysis for the global burden of disease study. JAMA Oncol 2019;5(12):1749 – 68. http://dx.doi.org/10.1001/jamaoncol.2019.2996.