CANCER REGISTRATION IN CHINA

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History of Cancer Registration in China

Surveillance of Cancer Mortality in 1973-75

At the end of 1970's, the most unforgettable and important event in cancer control of China was the national survey of cancer mortality for the period of 1973 – 1975, which was organized by the Chinese Ministry of Public Health. For the first time, this gave a clear picture of the geographic distribution of different cancers in Mainland China. The survey covered almost every corner of China, and provided very reliable information on cancer mortality. The best known publication was the Atlas of Cancer Mortality in the People's Republic of China, edited by Li Junyao and 30 others, and published by the China Map Press in 1979. After publication of the survey results, a number of international collaborative studies were conducted in those areas with a high mortality from specific cancers, such as esophageal cancer in Linzhou city (Lin Xian county) and liver cancer in Qidong city (Qidong county). There has been no other comparable achievement in the descriptive epidemiology of cancer in China.

Survey of Cancer Prevalence

After 1977, many new cancer hospitals and cancer institutes were established nationwide. For many of these new institutions, cancer epidemiology was a key task, due to the healthcare policy at that time, emphasising "prevention is more important than treatment". Cancer registration was conducted in some areas. For those without constant cancer registration, a survey of cancer prevalence was thought to be an easy way to have information about cancer incidence and mortality rates. Due to shortage of funds, lack of experienced staff, and other reasons, only a few cancer registries were able to develop to international standards in a short time, and these have become the main resource for data on cancer incidence data in China.

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Present Status

Current Cancer Registries in Mainland China

In China, the first cancer registry to contribute data to the publication, Cancer Incidence in Five Continents (CI5), was the Shanghai Cancer Registry, which was established in 1963. Their data was first appeared in CI5 Volume IV. Tianjin Cancer Registry was established in 1978 and contributed data to CI5 Volume V. Shanghai and Tianjin were the first and the third largest cities in China at that time. The next data to be published were from Qidong Cancer Registry, in CI5 Volume 6. Qidong is a very special area (now Qidong City) with very high rate of liver cancer.

In addition to these three registries, there are several others where cancer registration is a continuing activity. The pricipal ones are, in cities: Beijing, Harbin, Chongqing, Wuhan and Guanzhou. Cancer registries set up in special "high risk" populations include Linxian (esophagus cancer), Cixian (stomach cancer), Changle (stomach cancer), Jiashan (colon cancer), Fusui (liver cancer). (See Table 1 and Fig 1)

Figure 1. Locations of Cancer Registries in China

National Policy for Registration

Currently, there is no national policy for cancer registration in China. Professionals working in the field of cancer

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epidemiology and chronic disease control have been trying to establish a national network which will ensure that a much greater proportion of the population than currently is covered by cancer registration. However, at the present time, there is a long way to go in obtaining government administrative support, funds and qualified professionals.

Municipal based cancer registration:

For those cities with cancer registration, they are mainly under the administrative regulations issued by municipal government. Most of them are funded by local government and related institutions. It is a burden to carry out cancer registration today in China, so that some of them were aborted after several years, or have been kept running but at a low level, inefficient way. At the same time, the new as well as older registries have put more funds and effort into improving their data quality, in order to meet the standards of IACR, in the hope that their data could be included in the cancer incidence series publication. For CI5 volume VIII, a total 8 cancer registries, including Shanghai, Tianjin and Qidong, have submitted their data for possible inclusion (Table 1).

The Ninth Five-Year Project of China on Cancer Registration:

The one of most important research programmes is the Ninth Five-Year Project of China on cancer monitoring including cancer registration, which is led by Professor Liandi Li, the director of National Office for Cancer Prevention and Treatment. In this central government funded project, the methods to monitor cancer incidence, mortality and risk factors nationwide were studied, so that a number of valuable publications have been prepared. A total of 14 areas participated this project. Among them, 8 registries prepared data for CI5 Volume VIII.

Incidence Data

National Estimation of Incidence and Mortality

Methods of estimating national cancer incidence: Recent estimations of cancer incidence and mortality were made by Dr. Parkin and Dr. Pisani for the year of 1990. For China, ratios of mortality and incidence were based on the data of Shanghai, Tianjin and Qidong. The mortality rates for 1990 came from the database of some 100 "Disease Surveillance Points (DSP)". The DSP in 1995 covers 145 points with a population of 9048572 (Total population in China is 1204790809 in 1995), or about about 0.75% of the total population.

New approach to estimate national cancer rates: Based on limited data, it is always difficult to estimate national cancer rates. For this purpose, a new approach was explored. The data from the national surveillance of cancer mortality in 1973 – 1975, and Tianjin Cancer Registry results for 1993-1997 were used in the approach. As a first step, the ratios of cancer mortality between Tianjin and the whole of China in 1973-5 were calculated. The second step used these ratios, and the observed incidence rates in Tianjin for the period of 1993-97,to estimate cancer rates for the whole of China, for each cancer site. This approach is based on four assumptions:

1. The data of 1973-75 are more reliable than sampling data. This is absolutely true.
2. The time trends in cancer incidence in Tianjin is highly

Table 1. Cancer Registries in Mainland China

Registry	Population covered in 1990 (million)	Urban/County	C15 Volume
With data presented in the National Co-study for 1996-2000			
Shanghai	7.110#	urban	IV-VIII*
Tianjin	3.565	urban	V-VIII
Qidong/Jiangsu**	1.152	county	VI-VIII
Beijing	2.420	part of urban	VIII
Wuhan/Hubei	3.686	urban	VIII
Harbin /Heilongjiang	0.715	part of urban	
Cixian/Hebei	0.557	County	VIII
Jiashan/Zhejiang	0.367	County	VIII
Fusui/Guangxi	0.391	County	
Changle/Fujian	0.743	County	VIII
Linzhou/Henan	0.925	County	VIII
Total	21.522 The above registries covers 1.89% population		
Without data presented in the National Co-study for 1996-2000			
Zhongshan		county	VIII
Yangzhong	0.279	county	
Chongqing	2.401	Part of urban	
Sihui	0.386	county	

\# Population in 1990

* Volume VIII means data were sent to Lyon for validation of publication

* * Registry/Province

correlated with that in whole China. This could be true.
3. The Tianjin data are reliable and constant. Tianjin is one of the approved cancer registries.
4. Even through there is no estimation by age group, the age distribution of cases between Tianjin and whole China might be comparable.

For the above reasons, we believe that the results from the new approach can be considered as reference data.

National Estimation of Cancer Incidence and Mortality

The national estimation for all cancers, and for each site, was calculated according to the method described. There were 1319244 incident cancers in males estimated for 1995, and 989598 cases in females, with 795891 (males) and 515649 (females) deaths. The crude incidence rate, and age adjusted incidence rates, were 216.9 and 186.7 per 100,000 in males, and 169.6 and 127.6 in females (see table 2).

The most common cancers are, for men, stomach cancer (17.0%), lung cancer (16.6%), liver cancer (11.1%), oesophagus cancer (8.2%) and cancers of the colon and rectum (7.2%). In women, the most common cancers are stomach (12.3%), breast (10.0%), lung (8.7%), cancer of the colon and rectum (8.0%) and liver cancer (6.5%). (Fig 2). Cervix cancer is now remarkably rare in China, with an estimated 9632 cases in 1995 (about 1% of cancers in women).

Regional Variation

Based on the mortality data of 1973-75 and many resources of cancer incidence and mortality data, there are no doubt huge variations by area, especially for liver cancer, esophageal cancer, stomach cancer, nasopharyngeal cancer and lung cancer. The variation in incidence can be confirmed in the data from five urban and six county cancer registries for the period 1988-1992. Thus, the age adjusted incidence of stomach cancer for males varies from 5.3 to 60.0 per 100,000, for liver cancer from 17.3 to 97.7, for esophageal cancer from <2.8 to 147.5 and for colon-rectum from <2.8 to 26.3. In females, breast cancer incidence ranges from 2.8 to 24.6 per 100,000.

Studies of Survival

For the past 2 decades, a number of areas have calculated relative survival rates for common cancer sites. Table 3 shows some of the results from Tianjin, Shanghai, Qidong and Changle.

The lack of formal publication of survival data is in part the result of weaknesses in the necessary analytical skills for survival data, lack of reliable data from population based cancer registration, availability of suitable software, difficulties in follow-up (no national computer network to store information on all residents and infrequent use of personal ID number) and misunderstanding of the importance of collecting related data. The problems are not dissimilar from those confronting cancer registration in general.

Other Studies

Epidemiological: There have been three stages in cancer epidemiological research since the 1970's: descriptive, descriptive + analytical and descriptive + analytical + molecular/genetic epidemiology. As far as analytical research is concerned, there have been studies on all of the most common cancers in China. The current hot point is molecular/genetic epidemiology, which is able to attact the most funds, and support.

Prevention: Cancer prevention is more likely a slogan in some areas. Lack of government support is the main problem now, since more funding has been devoted to economic development and to the control of communicable diseases. Professionals in the field of public health have been struggling for more input into cancer prevention, in the hope of having a brighter future for research and practice of cancer prevention.

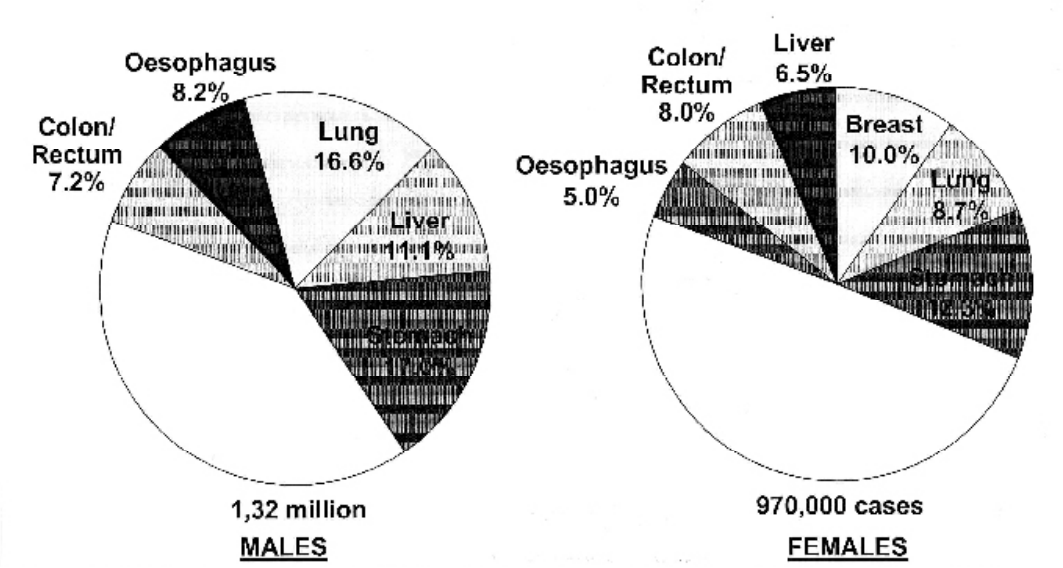

Figure 2. Relative Predominance of Different Cancers in China (1995)

Table 2. Estimation of cancer incidence and mortality in mainland China in 1995

	Male				Female			
	Incident Cases	CR	AR	Mortality Cases	Incident Cases	CR	AR	Mortality Cases
All cancers (140-208)	1319244	216.88	186.70	795891	969598	169.62	127.58	515649
Lip (140)	1060	.17	.15	122	257	.05	.04	29
Tongue (141)	2323	.38	.34	1100	1829	.32	.24	514
Salivary gland (142)	1834	.30	.25	326	1372	.24	.17	200
Mouth (143-145)	4198	.69	.57	1630	2144	.38	.28	943
Oropharynx (146)	978	.16	.13	408	314	.06	.05	86
Nasopharynx (147)	23621	3.88	3.48	11456	8168	1.43	1.05	4084
Hypopharynx (148)	1182	.19	.15	163	86	.02	.01	
Other Lip, mouth and pharynx (149)	326	.05	.04	245	86	.02	.01	86
Esophagus (150)	107723	17.71	14.81	76647	48609	8.50	6.01	37845
Stomach (151)	223820	36.80	30.80	141448	119650	20.93	14.72	80686
Small intestine (152)	2079	.34	.29	489	1258	.22	.17	314
colon (153)	37396	6.15	5.03	14941	29848	5.22	3.83	13192
Rectum (154)	58030	9.54	6.48	24912	48031	8.40	5.19	24198
Liver (155)	147182	24.20	20.98	111797	62548	10.94	8.00	51625
Gallbladder (156)	14101	2.32	1.89		8832	1.55	1.12	
Pancreas (157)	28610	4.70	3.94	20622	16177	2.83	2.10	11461
Peritoneum (158)	2853	.47	.44	1630	2229	.39	.33	943
Sinonasal (160)	3301	.54	.43	1141	1172	.21	.16	200
Larynx (161)	18462	3.04	2.49	8192	6660	1.17	.87	3058
Trachea, bronchus, lung (162)	218573	35.93	24.19	153508	84030	14.70	10.23	62890
Pleura (163)	2282	.38	.32	1141	600	.11	.07	229
Thymus, heart, mediastinum (164)	2731	.45	.40	1141	1801	.32	.24	686
Bone (170)	10311	1.70	1.50	7214	6459	1.13	.86	5116
Connective other soft tissue (171	6276	1.03	.91	1589	2715	.48	.39	486
Melanoma of skin (172)	1060	.17	.17	245	600	.11	.08	286
Other skin (173)	5583	.92	.75	1386	3001	.53	.39	657
Breast-female (174)					96520	16.89	12.74	19864
Breast-male (175)	856	.14	.11	326				
Uterus, unspecified (179)					5974	1.05	.77	6059
Cervix uteri (180)					9632	1.69	1.22	5202
Placenta (181)					2005	.35	.36	295
Body of uterus (182)					13290	2.33	1.80	743
Ovary (183)					43063	7.53	5.32	14291
Other female genital Organs (184)					1429	.25	.19	572
Prostate (185)	9903	1.63	2.07	4442				
Testis (186)	5201	.86	.56	1981				
Other genital organs (187)	2323	.38	.32	448				
Bladder (188)	32318	5.31	3.35	32318	8435	1.48	.88	4074
Kidney (189)	21885	3.60	3.08	8233	7517	1.32	.98	3287
Eye (190)	408	.07	.08	82	314	.06	.11	86
Brain, nervous system (191-2)	30933	5.09	4.56	15772	24237	4.24	3.40	10604
Thyroid (193)	3672	.64	.50	1223	7346	1.29	.99	1343
Other endocrine glands (194)	6072	1.00	.85	530	4573	.80	.64	286
Unspecified, Secondary (195-9)	27469	4.52	3.86	9740	16149	2.83	2.19	5888
Non-Hodgkin's lymphoma (200, 202)	12879	2.12	1.82	6969	6031	1.06	.80	3801
Hodgkin's disease (201)	1834	.30	.32	163	457	.08	.07	29
Multiple myeloma (203)	1549	.25	.21	897	715	.13	.10	457
Lymphoid leukemia (204)	3464	.57	.71	734	1401	.25	.27	257
Myeloid leukemia (205)	4320	.71	.67	937	2915	.51	.41	829
Monocytic leukemia (206)	489	.08	.09	122	57	.01	.01	29
Other specified leukemia (207)	122	.02	.02	41	29	.01	.02	

Screening: In comparison with 10 years ago, cancer screening is becoming a personal activity or one that is organised at the level of the individual company/group. As a result, the number of persons being screened regularly has reduced remarkably. Now cancer screening is more likely regulated by market forces, instead of mass movement which was the norm 10 years ago.

Medical care: Medical insurance is gradually becoming the main medical system in China in recent years. Professionals hope that the new medical care system will be able to cover cancer screening, health education and prevention activities.

Significant Publications

In the field of cancer registration, there are a number of publications which should mentioned here.

The National Office for Cancer Prevention and Treatment: The Handbook of Cancer Registration in China, the first edition in 1982, the second edition in 1988 publication

The National Office for Cancer Prevention and Treatment: The serial publications of cancer mortality data in 1973-75

Qingsheng Wang et al: Cancer Incidence by Occupation and Industry in Tianjin, China, IARC, Lyon, 1994

The National Office for Cancer Prevention and Treatment: The Handbook of Cancer Registration in China, the third edition in publication

Lian-di Li et al: Cancer Incidence and Mortality in 11 Areas of China, in publication

Ke-qin Rao et al: Cancer Risk Factors in China, Volume 1, in publication

Yu-tang Gao et al: Cancer Incidence in Shanghai, in Cancer Incidence in Five Continents, Volume IV-VII

Qingsheng Wang et al: Cancer Incidence in Tianjin, in Cancer Incidence in Five Continents, Volume V-VII

Wen-guang Li et al: Cancer Incidence in Qidong, in Cancer Incidence in Five Continents, Volume VI-VII

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Qidong Cancer Registry

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Table 3. Five year Relative Survival from Cancer, in Selected Cities.

Cancer SITE	Tianjin Male 1981-85	Tianjin Female 1981-85	Shanghai Male 1988-91	Shanghai Female 1988-91	Qidong Male 1982-91	Qidong Female 1982-91	Beijing M+F 1982-87	Beijing M+F 1988-92	Changle Male 1988-93	Changle Female 1988-93
Esophagus (150)	13.82	14.09	10.5	12.7	4.2	4.0	8.8	10.7	6.62	3.51
Stomach (151)	24.86	15.85	24.8	22.3	15.1	13.0	12.9	7.8	13.09	7.54
Colon (l53)	36.42	30.30	43.1	44.0	29.8	32.8				
Rectum (154)	28.61	29.70	41.3	44.3	26.9	23.1	28.9*	36.1*	24.88*	36.70*
Liver (155)	7.00	6.33	4.3	4.8	1.8	2.7			1.31	2.55
Trachea, bronchus, lung (162)	30.08	12.04	12.1	11.3	3.4	4.1	6.5	9.8	5.48	3.91
Breast-female (174)		60.64		72.0		55.7	66.3	72.0		41.01
Cervix uteri (180)		45.79		51.9		33.6				
Body of uterus (182)		60.49		76.8						
Ovary (183)		36.32		44.2						
Bladder (188)	49.94	26.66	64.1	51.2	43.7	21.3				
Kidney (189)	44.16	36.76	46.5	49.4						
Thyroid (193)	75.32	76.41	71.7	82.8						
Non-Hodgkin's lymphoma (200, 202)	25.5	22.8	51.0	44.4						
Hodgkin's disease (201)	27.83	45.81	31.8	35.9						
Multiple myeloma (203)	25.53	20.1	26.4	18.6	1.4	3.3				
Leukemia	13.6	14.1	15.1	15.8	6.1	3.2			5.62	5.87

*Colon and rectum combined

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