

Supplementary materials

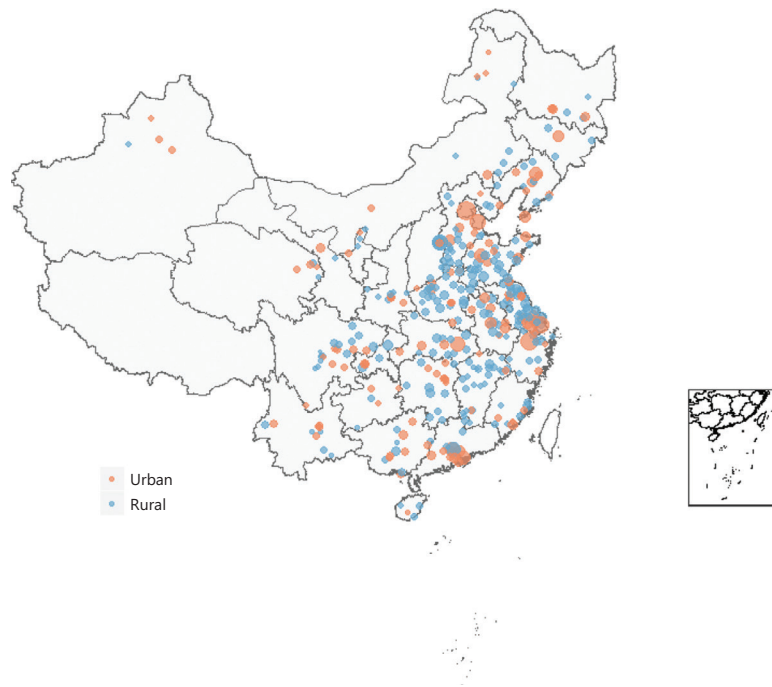


Figure S1 Distribution of 368 cancer registries in China. The map was obtained from Basic Geographic Information Data of China.

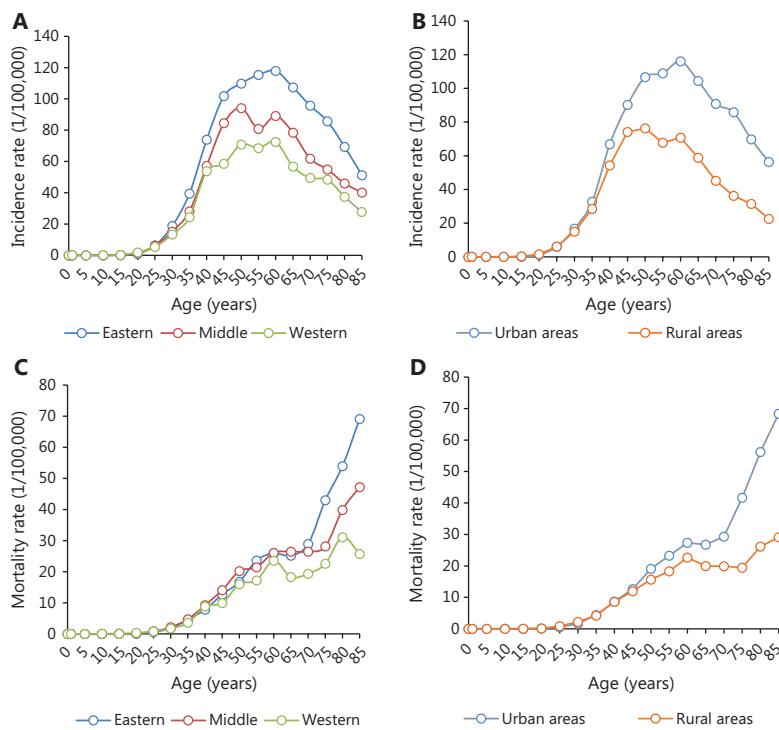


Figure S2 Age-specific incidence and mortality of breast cancer in women in different areas in China, 2015. (A and B) Incidence in the different areas; (C and D) mortality in the different areas.

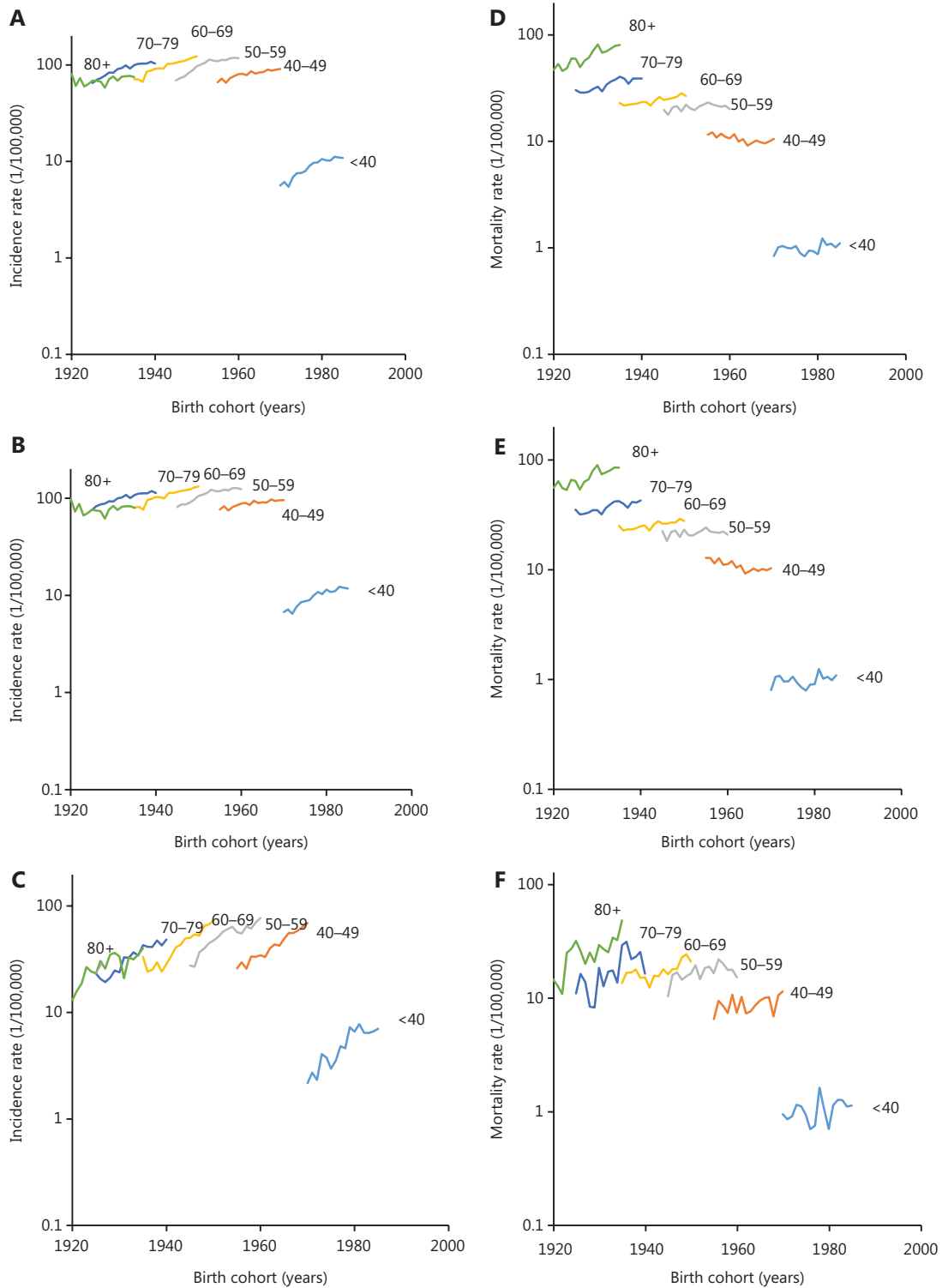


Figure S3 Breast cancer incidence and mortality rates with different birth cohorts by age group in China. (A) Total incidence; (B) urban incidence; (C) rural incidence; (D) total mortality; (E) urban mortality; (F) rural mortality.

Table S1 Quality control index of breast cancer in women in China in 2015

Areas	M/I	MV%	DCO%	UB%
Total	0.24	88.35	0.61	0.12
Urban areas	0.23	89.22	0.69	0.15
Rural areas	0.25	87.09	0.48	0.09
East areas	0.23	89.75	0.65	0.10
Middle areas	0.27	86.69	0.51	0.01
West areas	0.26	83.85	0.55	0.57

M/I, mortality to incidence rate ratio; MV%, percentage of proportion with morphological verification; DCO%, percentage of proportion with death certification only; UB%, percentage of proportion with unclear diagnosis.

Table S2 Breast cancer incidence trends by area and age, 2000–2015

Areas	Age (years)	Trend 1		Trend 2		Trend 3		AAPC 2000–2015
		Period	APC	Period	APC	Period	APC	
All areas	ASIR	2000–2006	5.3*	2006–2015	1.9*			3.3*
All areas	<40	2000–2009	7.0*	2009–2015	1.6*			4.8*
All areas	40–49	2000–2015	2.0*					2.0*
All areas	50–59	2000–2007	6.8*	2007–2015	1.2*			3.8*
All areas	60–69	2000–2015	3.9*					3.9*
All areas	70–79	2000–2007	5.3*	2007–2015	1.5*			3.3*
All areas	80+	2000–2015	0.8					0.8
Urban areas	ASIR	2000–2008	3.7*	2008–2015	1.2*			2.6*
Urban areas	<40	2000–2008	6.2*	2008–2015	2.1			4.3*
Urban areas	40–49	2000–2015	1.5*					1.5*
Urban areas	50–59	2000–2008	5.0*	2008–2015	0.8			3.0*
Urban areas	60–69	2000–2015	3.5*					3.5*
Urban areas	70–79	2000–2007	4.1*	2007–2015	1.5*			2.7*
Urban areas	80+	2000–2015	0.1					0.1
Rural areas	ASIR	2000–2015	6.9*					6.9*
Rural areas	<40	2000–2015	8.5*					8.5*
Rural areas	40–49	2000–2015	6.8*					6.8*
Rural areas	50–59	2000–2008	11.1*	2008–2011	–4.5	2011–2015	8.0*	7.0*
Rural areas	60–69	2000–2002	–12.4	2002–2015	9.2*			6.0*
Rural areas	70–79	2000–2002	–8.8*	2002–2008	11.5*	2008–2015	3.8*	5.0*
Rural areas	80+	2000–2015	5.5*					5.5*

APC, annual percentage change; AAPC, average annual percentage change; ASIR, age-standardized incidence rate using Segi's world standard population; *, The APC or AAPC is significantly different from zero ($P < 0.05$).

Table S3 Breast cancer incidence trends by histological type, 2008–2015

Histological subtype	Trend 1		Trend 2		AAPC 2008–2015
	Period	APC	Period	APC	
Invasive ductal carcinoma	2008–2012	5.6*	2012–2015	-1.7	3.9*
Invasive lobular carcinoma	2008–2011	7.1	2011–2015	-6.8	-1.1
Paget's disease	2008–2015	12.1*			12.1*
Medullary carcinoma	2008–2015	-11.2*			-11.2*

APC, annual percentage change; AAPC, average annual percentage change; ASMR, age-standardized mortality rate using Segi's world standard population; *, The APC or AAPC is significantly different from zero ($P < 0.05$).

Table S4 Breast cancer mortality trends by area and age, 2000–2015

Areas	Age (years)	Trend 1		Trend 2		Trend 3		AAPC 2000–2015
		Period	APC	Period	APC	Period	APC	
All areas	ASMR	2000–2015	1.0*					1.0*
All areas	<40	2000–2015	0.9					0.9
All areas	40–49	2000–2015	-1.3*					-1.3*
All areas	50–59	2000–2015	0.7					0.7
All areas	60–69	2000–2015	1.5*					1.5*
All areas	70–79	2000–2015	2.4*					2.4*
All areas	80+	2000–2015	3.8*					3.8*
Urban areas	ASMR	2000–2015	0.6*					0.6*
Urban areas	<40	2000–2015	0.7					0.7
Urban areas	40–49	2000–2015	-1.8*					-1.8*
Urban areas	50–59	2000–2015	0.3					0.3
Urban areas	60–69	2000–2015	1.3*					1.3*
Urban areas	70–79	2000–2015	1.9*					1.9*
Urban areas	80+	2000–2015	3.2*					3.2*
Rural areas	ASMR	2000–2015	2.7*					2.7*
Rural areas	<40	2000–2015	1.7					1.7
Rural areas	40–49	2000–2015	1.6					1.6
Rural areas	50–59	2000–2015	2.0*					2.0*
Rural areas	60–69	2000–2002	13.3	2002–2006	-6.4	2006–2015	6.0*	3.5
Rural areas	70–79	2000–2015	5.8*					5.8*
Rural areas	80+	2000–2015	6.3*					6.3*

APC, annual percentage change; AAPC, average annual percentage change; ASMR, age-standardized mortality rate using Segi's world standard population; *, The APC or AAPC is significantly different from zero ($P < 0.05$).

Table S5 Annual population of women in 10-year age groups, by region, 2016–2030 in China (thousands)

Region	Year	<40	40–49	50–59	60–69	70–79	80+
Total	2016	338,327	128,008	97,564	70,226	35,025	18,848
Total	2017	340,077	128,670	98,069	70,589	35,207	18,946
Total	2018	341,755	129,305	98,553	70,938	35,380	19,039
Total	2019	343,324	129,899	99,005	71,263	35,543	19,127
Total	2020	344,757	130,441	99,419	71,561	35,691	19,207
Total	2021	346,045	130,928	99,790	71,828	35,824	19,278
Total	2022	347,187	131,360	100,120	72,065	35,943	19,342
Total	2023	348,193	131,741	100,410	72,274	36,047	19,398
Total	2024	349,078	132,076	100,665	72,458	36,138	19,447
Total	2025	349,858	132,371	100,890	72,619	36,219	19,491
Total	2026	350,530	132,625	101,084	72,759	36,289	19,528
Total	2027	351,093	132,838	101,246	72,876	36,347	19,560
Total	2028	351,552	133,012	101,378	72,971	36,395	19,585
Total	2029	351,914	133,149	101,483	73,046	36,432	19,605
Total	2030	352,185	133,251	101,561	73,103	36,460	19,621
Urban	2016	182,920	76,926	59,101	40,010	20,351	11,035
Urban	2017	187,834	78,993	60,689	41,084	20,897	11,331
Urban	2018	192,641	81,014	62,242	42,136	21,432	11,621
Urban	2019	197,308	82,977	63,750	43,157	21,951	11,903
Urban	2020	201,813	84,872	65,205	44,142	22,453	12,175
Urban	2021	206,142	86,692	66,604	45,089	22,934	12,436
Urban	2022	210,288	88,435	67,943	45,996	23,395	12,686
Urban	2023	214,250	90,102	69,223	46,862	23,836	12,925
Urban	2024	218,034	91,693	70,446	47,690	24,257	13,153
Urban	2025	221,645	93,212	71,613	48,480	24,659	13,371
Urban	2026	225,079	94,656	72,722	49,231	25,041	13,578
Urban	2027	228,332	96,024	73,773	49,942	25,403	13,774
Urban	2028	231,406	97,317	74,767	50,615	25,745	13,960
Urban	2029	234,304	98,535	75,703	51,249	26,067	14,135
Urban	2030	237,030	99,682	76,584	51,845	26,371	14,299
Rural	2016	155,254	51,154	38,526	30,219	14,683	7,819
Rural	2017	151,642	49,964	37,630	29,516	14,341	7,637
Rural	2018	148,071	48,787	36,744	28,821	14,003	7,458
Rural	2019	144,540	47,623	35,868	28,134	13,670	7,280
Rural	2020	141,047	46,473	35,001	27,454	13,339	7,104

Table S5 Continued

Region	Year	<40	40–49	50–59	60–69	70–79	80+
Rural	2021	137,595	45,335	34,144	26,782	13,013	6,930
Rural	2022	134,192	44,214	33,300	26,119	12,691	6,759
Rural	2023	130,848	43,112	32,470	25,469	12,375	6,590
Rural	2024	127,576	42,034	31,658	24,832	12,065	6,425
Rural	2025	124,383	40,982	30,866	24,210	11,763	6,265
Rural	2026	121,274	39,958	30,094	23,605	11,469	6,108
Rural	2027	118,251	38,962	29,344	23,017	11,183	5,956
Rural	2028	115,316	37,995	28,616	22,445	10,906	5,808
Rural	2029	112,474	37,058	27,910	21,892	10,637	5,665
Rural	2030	109,728	36,154	27,229	21,358	10,377	5,526

Table S6 List of 368 cancer registries

Cancer registries	Cancer registries	Cancer registries
Beijing Shi	Huai'an Qu, Huai'an Shi	Tengzhou Shi
Rural areas of Beijing Shi	Huaiyin Qu, Huai'an Shi	Guangrao Xian
Tianjin Shi	Qingpu Qu, Huai'an Shi	Yantai Shi
Rural areas of Tianjin Shi	Lianshui Xian	Zhaoyuan Shi
Shijiazhuang Shi	Hongze Xian	Linqu Xian
Rural areas of Shijiazhuang Shi	Xuyi Xian	Gaomi Shi
Zanhuang Xian	Jinhu Xian	Wenshang Xian
Xinji Shi	Tinghu Qu, Yancheng Shi	Liangshan Xian
Qianxi Xian	Yandu Qu, Yancheng Shi	Ningyang Xian
Qian'an Shi	Binhai Xian	Feicheng Shi
Qinhuangdao Shi	Funing Xian	Rushan Shi
Daming Xian	Sheyang Xian	Laicheng Qu, Laiwu Shi
She Xian	Jianhu Xian	Yinan Xian
Ci Xian	Dongtai Shi	Yishui Xian
Wu'an Shi	Dafeng Qu, Yancheng Shi	Junan Xian
Xingtai Xian	Danyang Shi	Decheng Qu, Dezhou Shi
Lincheng Xian	Yangzhong Shi	Gaotang Xian
Neiqiu Xian	Taixing Shi	Bincheng Qu, Binzhou Shi
Ren Xian	Hangzhou Shi	Shan Xian
Baoding Shi	Jiangdong Qu, Ningbo Shi	Juye Xian
Wangdu Xian	Cixi Shi	Xiangfu Qu, Kaifeng Shi
Anguo Shi	Lucheng Qu, Wenzhou Shi	Luoyang Shi
Xuanhua Xian	Jiaxing Shi	Mengjin Xian
Zhangbei Xian	Jiashan Xian	Xin'an Xian
Shuangqiao Qu, Chengdu Shi	Haining Shi	Luanchuan Xian
Cangzhou Shi	Changxing Xian	Song Xian
Haixing Xian	Shangyu Qu, Shaoxing Shi	Ruyang Xian
Yanshan Xian	Yongkang Shi	Yiyang Xian
Jizhou Shi	Kaihua Xian	Luoning Xian
Yangquan Shi	Daishan Xian	Yanshi Shi
Pingshun Xian	Xianju Xian	Lushan Xian
Yangcheng Xian	Longquan Shi	Linzhou Shi
Shouyang Xian	Hefei Shi	Hebi Shi
Chifeng(Ulanhad) Shi	Changfeng Xian	Huixian Shi
Aohan Qi, Chifeng Shi	Feidong Xian	Hualong Qu, Puyang Shi

Table S6 Continued

Cancer registries	Cancer registries	Cancer registries
Kailu Xian	Feixi Xian	Puyang Xian
Naiman Qi	Lujiang Xian	Yuzhou Shi
Hailar Qu, Hulun Buir Shi	Chaohu Shi	Yuanhui Qu, Luohe Shi
Arun Qi	Wuhu Shi	Yancheng Qu, Luohe Shi
Ewenkizu Zizhiqi	Bengbu Shi	Shaoling Qu, Luohe Shi
Yakeshi Shi	Ma'anshan Shi	Sanmenxia Shi
Genhe Shi	Tongling Shi	Fangcheng Xian
Linhe Qu, Bayannur Shi	Yi'an Qu, Tongling Shi	Neixiang Xian
Xilin Hot Shi	Tianchang Shi	Sui Xian
Shenyang Shi	Yingdong Qu, Fuyang Shi	Yucheng Xian
Faku Xian	Yongqiao Qu, Suzhou Shi	Shihe Qu, Xinyang Shi
Dalian Shi	Lingbi Xian	Luoshan Xian
Zhuanghe Shi	Shou Xian	Shenqiu Xian
Anshan Shi	Mengcheng Xian	Dancheng Xian
Benxi Shi	Jing Xian	Xiping Xian
Dandong Shi	Fuqing Shi	Jiyuan Shi
Donggang Shi	Changle Shi	Wuhan Shi
Yingkou Shi	Xiamen Shi	Daye Shi
Fuxin Shi	Tong'an Qu, Xiamen Shi	Yunyang Qu, Shiyan Shi
Zhangwu Xian	Hanjiang Qu, Putian Shi	Yichang Shi
Liaoyang Xian	Yong'an Shi	Wufeng Tujiazu Zizhixian
Dawa Xian	Hui'an Xian	Jingshan Xian
Jianping Xian	Changtai Xian	Zhongxiang Shi
Dehui Shi	Xinluo Qu, Longyan Shi	Yunmeng Xian
Jilin Shi	Yongding Qu, Longyan Shi	Gong'an Xian
Meihekou Shi	Wanli Qu, Nanchang Shi	Honghu Shi
Yanji Shi	Xinjian Qu, Nanchang Shi	Macheng Shi
Daoli Qu, Harbin Shi	Xunyang Qu, Jiujiang Shi	Jiayu Xian
Nangang Qu, Harbin Shi	Wuning Xian	Tongcheng Xian
Xiangfang Qu, Harbin Shi	Zhanggong Qu, Ganzhou Shi	Enshi Shi
Shangzhi Shi	Gan Xian	Tianmen Shi
Boli Xian	Dayu Xian	Furong Qu, Changsha Shi
Mudanjiang Shi	Shangyou Xian	Tianxin Qu, Changsha Shi
Hailin Shi	Chongyi Xian	Yuelu Qu, Changsha Shi
Shanghai Shi	Longnan Xian	Kaifu Qu, Changsha Shi

Table S6 Continued

Cancer registries	Cancer registries	Cancer registries
Wuxi Shi	Xiajiang Xian	Shifeng Qu, Zhuzhou Shi
Jiangyin Shi	Anfu Xian	Hengdong Xian
Changzhou Shi	Wanzai Xian	Shaodong Xian
Liyang Shi	Shanggao Xian	Yueyanglou Qu, Yueyang Shi
Jintan Shi, Changzhou Shi	Jing'an Xian	Wuling Qu, Changde Shi
Suzhou Shi	Le'an Xian	Cili Xian
Changshu Shi	Yihuang Xian	Ziyang Qu, Yiyang Shi
Zhangjiagang Shi	Dongxiang Xian	Linwu Xian
Kunshan Shi	Xinzhou Qu, Shangrao Shi	Dao Xian
Taicang Shi	Guangfeng Qu, Shangrao Shi	Xintian Xian
Nantong Shi	Yanshan Xian	Mayang Miaozu Zizhixian
Hai'an Xian	Hengfeng Xian	Lianyuan Shi
Rudong Xian	Yugan Xian	Guangzhou Shi
Qidong Shi	Poyang Xian	Rural areas of Guangzhou Shi
Rugao Shi	Wannian Xian	Wengyuan Xian
Haimen Shi	Wuyuan Xian	Nanxiong Shi, Shaoguan Shi
Lianyungang Shi	Jinan Shi	Shenzhen Shi
Ganyu Qu, Lianyungang Shi	Zhangqiu Shi	Zhuhai Shi
Donghai Xian	Qingdao Shi	Nanhai Shi, Foshan Shi
Guanyun Xian	Huangdao Qu, Qingdao Shi	Shunde Shi, Foshan Shi
Guannan Xian	Linzi Qu, Zibo Shi	Jiangmen Shi
Shihezi Shi	Yiyuan Xian	Duanzhou Qu, Zhaoqing Shi
Sihui Shi	Heshan Shi	Langzhong Shi
Dongguan Shi	Fusui Xian	Changning Xian
Zhongshan Shi	Wuzhishan Shi	Guang' an Qu, Guang' an Shi
Luoding Shi	Qionghai Shi	Dazhu Xian
Jiangnan Qu, Nanning Shi	Changjiang Lizu Zizhixian	Yucheng Qu, Ya'an Shi
Xixiangtang Qu, Nanning Shi	Lingshui Lizu Zizhixian	Mingshan Qu, Ya'an Shi
Binyang Xian	Wanzhou Qu, Chongqing Shi	Yingjing Xian
Liuzhou Shi	Yuzhong Qu, Chongqing Shi	Hanyuan Xian
Guilin Shi	Shapingba Qu, Chongqing Shi	Shimian Xian
Wanxiu Qu, Wuzhou Shi	Jiulongpo Qu, Chongqing Shi	Tianquan Xian
Cangwu Xian	Jiangjin Qu, Chongqing Shi	Lushan Xian
Beihai Shi	Fengdu Xian	Baoxing Xian
Hepu Xian	Qingyang Qu, Chengdu Shi	Lezhi Xian

Table S6 Continued

Cancer registries	Cancer registries	Cancer registries
Gangbei Qu, Guigang Shi	Longquanyi Qu, Chengdu Shi	Kaiyang Xian
Luocheng Mulaozu Zizhixian	Pengzhou Shi, Chengdu Shi	Huichuan Qu, Zunyi Shi
Hongta Qu, Yuxi Shi	Ziliujing Qu, Zigong Shi	Bijiang Qu, Tongren Shi
Chengjiang Xian	Renhe Qu, Panzhihua Shi	Ceheng Xian
Yimen Xian	Guanghan Shi	Fuquan Shi
Longyang Qu, Baoshan Shi	Yanting Xian	Panlong Qu, Kunming Shi
Tengchong Shi	Jiange Xian	Guandu Qu, Kunming Shi
Gejiu Shi	Chuanshan Qu, Suining Shi	Xishan Qu, Kunming Shi
Pingbian Miaozu Zizhixian	Shizhong Qu, Leshan Shi	Zhongwei Shi
Beilin Qu, Xi'an Shi	Liangzhou Qu, Wuwei Shi	Tianshan Qu, Urtimqi Shi
Lianhu Qu, Xi'an Shi	Xining Shi	Karamay Shi
Weiyang Qu, Xi'an Shi	Ledu Xian, Haidong Shi	Diqishi
Yanta Qu, Xi'an Shi	Huzhu Tuzu Zizhixian	Xinyuan(Künes) Xian
Hu Xian	Xunhua Salarzu Zizhixian	Shangzhou Qu, Shangluo Shi
Gaoling Qu, Xi 'an Shi	Hainan Zangzu Zizhizhou	Jingtai Xian
Mei Xian	Helan Xian	Huinong Qu, Shizuishan Shi
Long Xian	Dawukou Qu, Shizuishan Shi	Qingtongxia Shi
Jingyang Xian	Tongguan Xian	