

## Original Article

## Report of Incidence and Mortality in China Cancer Registries, 2008

Wan-qing Chen<sup>1</sup>, Rong-shou Zheng<sup>1</sup>, Si-wei Zhang<sup>1</sup>, Ni Li<sup>1</sup>, Ping Zhao<sup>1</sup>,  
Guang-lin Li<sup>2</sup>, Liang-you Wu<sup>2</sup>, Jie He<sup>1\*</sup>

<sup>1</sup>National Cancer Center, Beijing 100021, China

<sup>2</sup>Disease Prevention and Control Bureau, Ministry of Health, Beijing, 100044, China

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## ABSTRACT

**Objective:** Annual cancer incidence and mortality in 2008 were provided by National Central Cancer Registry in China, which data were collected from population-based cancer registries in 2011.

**Methods:** There were 56 registries submitted their data in 2008. After checking and evaluating the data quality, total 41 registries' data were accepted and pooled for analysis. Incidence and mortality rates by area (urban or rural areas) were assessed, as well as the age- and sex-specific rates, age-standardized rates, proportions and cumulative rate.

**Results:** The coverage population of the 41 registries was 66,138,784 with 52,158,495 in urban areas and 13,980,289 in rural areas. There were 197,833 new cancer cases and 122,136 deaths in cancer with mortality to incidence ratio of 0.62. The morphological verified rate was 69.33%, and 2.23% of cases were identified by death certificate only. The crude cancer incidence rate in all areas was 299.12/100,000 (330.16/100,000 in male and 267.56/100,000 in female) and the age-standardized incidence rates by Chinese standard population (ASIRC) and world standard population (ASIRW) were 148.75/100,000 and 194.99/100,000, respectively. The cumulative incidence rate (0–74 years old) was of 22.27%. The crude incidence rate in urban areas was higher than that in rural areas. However, after adjusted by age, the incidence rate in urban was lower than that in rural. The crude cancer mortality was 184.67/100,000 (228.14/100,000 in male and 140.48/100,000 in female), and the age-standardized mortality rates by Chinese standard population (ASMRC) and by world population were 84.36/100,000 and 114.32/100,000, respectively. The cumulative mortality rate (0–74 years old) was of 12.89%. Age-adjusted mortality rates in urban areas were lower than that in rural areas. The most common cancer sites were lung, stomach, colon-rectum, liver, esophagus, pancreas, brain, lymphoma, breast and cervix which accounted for 75% of all cancer incidence. Lung cancer was the leading cause of cancer death, followed by gastric cancer, liver cancer, esophageal cancer, colorectal cancer and pancreas cancer, which accounted for 80% of all cancer deaths. The cancer spectrum varied by areas and sex in rural areas, cancers from digestive system were more common, such as esophageal cancer, gastric cancer and liver cancer, while incidence rates of lung cancer and colorectal cancer were much higher in urban areas. In addition, breast cancer was the most common cancer in urban women followed by liver cancer, gastric cancer and colorectal cancer.

**Conclusion:** Lung cancer, gastric cancer, colorectal cancer, liver cancer, esophageal cancer and female breast cancer contributed to the increased incidence of cancer, which should be paid more attention to in further national cancer prevention and control program. Different cancer control strategies should be carried out due to the varied cancer spectrum in different groups.

**Key words:** Cancer registry; Incidence; Mortality; Epidemiology, China

## INTRODUCTION

Population-based cancer registries collect the data on cancer new cases and deaths from covered population to describe and surveille the cancer incidence, mortality and survival. The data from cancer registration can not only be utilized for plan, imple-

ment and evaluation on cancer prevention and control but also for scientific research. Since 2006 when Disease Prevention and Control Bureau, Ministry of Health of China started to publish cancer data annually, National Central Cancer Registry (NCCR) of China has been responsible for collecting data from all local registries, calculating the statistical items accurately, analyzing the data of cancer incident cases and deaths from registration areas, and then released the updated cancer statistics in annual cancer report. All the information

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\*Corresponding author.

E-mail: prof.hejie@263.net

has been very useful in scientific researches, clinical trials and decision of cancer prevention and control strategies.

## MATERIALS AND METHODS

### Data Source

There were 56 cancer registries from 19 provinces submitted cancer registration data in 2008, 8 registries more than last year. For total 56 registries, 38 registries were from local Centers for Disease Control and Prevention and 18 were from cancer institutes; 26 registries were located in urban areas and 30 were located in rural areas.

The coverage population of all 56 registries was 82,433,497 (41,621,780 men and 40,811,717 women), which accounted for 6.21% of whole national population by the end of 2008. The total cancer incident cases were 227,555 (127,765 for male and 99,790 for female) and deaths were 139,240 (87,349 for male and 51,891 for female), respectively.

### Quality Control

Proportion of morphological verification (MV%), percentage of cancer cases identified with death certification only (DCO%), mortality to incidence ratio (M/I), percentage of uncertified cancer (UB%) and percentage of cancer with undefined or unknown primary site (secondary) (O&U%) were used to evaluate the completeness, validity and reliability of cancer statistics. According to NCCR acceptable criterion, the MV% should be higher than 66%, DCO% less than 15% and MI between 0.6 and 0.8.

The one of advantages of cancer registration data was timely report of cancer. However, for the completeness, validity and reliability of cancer statistics, the time gap between data updating and analyzing might exist<sup>[1]</sup>. NCCR ruled that every registry should upload the cancer registry data of 2008 before July 15th 2011, which was 30 months after cancer diagnosis.

### Statistical Analysis

The quality of data was assessed based on "Guideline of Chinese Cancer Registration"<sup>[2]</sup> and referred to the criteria for "Cancer Incidence in Five Continents Volume IX"<sup>[3]</sup> by The International Agency for Research on Cancer (IARC)/The International Agency for Cancer Registry (IACR)<sup>[4-6]</sup>. Once the cancer registration data met the criteria of quality on completeness, comparability and validity, it would be accepted for final analysis.

Crude incidence and mortality rates in both rural and urban areas were calculated stratified by cancer type, sex, areas (urban or rural) and age-group (0, 1–4, 5–9, ..., 80–84, 85 years old and above), age-

standardized to the 1982 Chinese population and world Segi's population. IARC-crgTools issued by IARC/IACR<sup>[4-6]</sup> were used for data check and evaluation<sup>[7]</sup>.

## RESULTS

### Data Pooling and Quality Evaluation

In 2008, 41 cancer registries' data, including 19 from urban areas and 22 from rural areas, met the criteria for data quality and then were pooled for national annual report. The population covered by the 41 cancer registries was 66,138,784 (33,340,597 in male and 32,798,187 in female), with 52,158,495 in urban (78.86%) and 13,980,289 in rural (21.14%). The total new cancer cases and deaths were 197,833 and 122,136, respectively. Detailed information in each cancer registry is shown in Table 1.

The MV%, DCO%, and M/I ratio for the national pooled data was 69.33%, 2.23% and 0.62, respectively. The MV%, DCO%, and M/I ratio in cancer registries of urban areas were 70.53%, 2.49% and 0.59, respectively, whereas in rural areas, that were 64.22%, 1.12% and 0.73. The quality for each cancer registry in both urban and rural areas is presented in Table 2.

### Main Results Of Cancer (ICD10: C00–C97) In China Registries, 2008

#### *Incidence Rate Of All Cancers In Registration Areas*

The crude incidence rate of all cancers in registration areas was 299.12/100,000 in 2008 (330.16/100,000 in males and 267.56/100,000 in females). The age-standardized incidence rate was 148.75/100,000 and 194.99/100,000 by China (ASIRC) and World population (ASIRW), respectively. Among the patients aged 0–74 years, the cumulative incidence rate was 22.27%. The crude cancer incidence rate for both males and females in urban areas was higher than that in rural areas. While, the age-standardized rates and cumulative incidence rate in urban areas were lower than that in rural areas for all and males. But for females, the age-standardized rates and cumulative incidence rate were higher in urban than in rural areas (Table 3).

#### *Age-Specific Incidence Rate in Cancer Registration Areas*

Table 4 shows the age-specific incidence rates for all cancer sites by sex and region. Cancer incidence was relatively lower before 39 years old, then increased dramatically after 40 years old and finally peaked after 85 years old (Table 4, Figure 1). The pattern was similar between urban and rural areas. However, the incidence peaked in the age group of 80 years and then decreased after 85 years in rural area, while kept increased and peaked after 85 years old in urban areas.

Comparing the age-specific incidence rate between urban and rural areas, we found that, in males, the