

Perspective

# Current status of breast cancer prevention in China

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Breast cancer is the most common malignancy and the fourth leading cause of cancer-related death among Chinese females. And in the past two decades, there has been an ever-increasing incidence of breast cancer in both urban and rural areas in China, resulting in a great social and economic burden. Prevention has been proved to be one of the most important ways to control disease burden. However, because of the national condition, currently the prevention of breast cancer in China is far away from being satisfactory or effective. Here, we reviewed the epidemiology characteristics, the risk factors, and the current screening efforts of breast cancer in China. Also, we discuss alternative ways to improve the prevention work of breast cancer in China.

Breast cancer is the second most common cancer in the world and the most frequent cancer among women

with an estimated 1.67 million new cancer cases diagnosed in 2012 (25% of all cancers).<sup>1</sup> Traditionally, China was believed to be among low-incidence areas of breast cancer.<sup>2</sup> However, in the past two decades, China experienced an ever-increasing incidence of breast cancer, twice as fast as global rates.<sup>2</sup> According to the latest Chinese Cancer Registry Annual Report,<sup>3</sup> breast cancer has become the most common cancer among Chinese women and ranked the fifth leading cause of cancer-related deaths. In consideration of the huge population base of 1.34 billion,<sup>4</sup> China is facing increasing enormous social and economic burden of breast cancer. Prevention has been proved to be one of the most effective methods to hold the increasing chronic disease burden. However, because of the socioeconomic disparities and insufficient financial resources, by far, prevention of breast cancer has not been well carried out in China.<sup>5,6</sup> Health ministry and health-care systems are facing many challenges caring for patients with breast cancer and population at increased risk of breast cancer: inadequate funding; inequitable distribution of resources and services; inadequate numbers, training, and distribution of health-care personnel and equipment; lack of adequate care for many populations based on socioeconomic, geographic and other factors.

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### Disease burden of breast cancer

According to Globocan 2012 by WHO,<sup>1</sup> an estimated 187,000 new breast cancer cases were diagnosed in China in 2012, accounting for nearly 12% of the whole world new breast cancer cases, with an age-standardized rate (ASR) of 22.1 cases per 100,000 women, while 48,000 females died from breast cancer, accounting for about 9% of the whole world, with an ASR of 5.4 cases per 100,000 women. The Chinese Cancer Registry Annual Report 2013<sup>3</sup> showed that breast cancer is the most common malignancy among Chinese females, with an estimated incidence of 25.89 cases per 100,000 women. On the other hand, breast cancer is the fourth leading cause of cancer-related death among Chinese females, after lung cancer, gastric cancer, and liver cancer, with an estimated mortality of 6.56 cases per 100,000 women. Similar to other regions, there was an obvious urban–rural difference in incidence of breast cancer. The incidence in urban areas (47.79 cases per 100,000 women) is nearly twice as high as that in rural areas (27.72 cases per 100,000 women). And this urban–rural difference pattern was also observed in local cancer registry report, such as Jiangsu Province.<sup>7</sup> In the past 15 years between 1993 and 2008, there has been a sharp increase in breast cancer incidence in both urban and rural areas, with an estimated annual increase rate of 3.7% and 8.9%, respectively.<sup>8,9</sup> As a result, the gap in breast cancer incidence between rural and urban areas has been narrowing, especially in some developed areas such as Beijing.<sup>10</sup> And a cross-sectional study covering Shandong Province, Jiangsu Province, Hebei Province, and Tianjin also demonstrated a similar prevalence of breast cancer between urban and rural areas.<sup>11</sup> This narrowing trend may be related to the national urbanization. And at the above increase rate, it was expected that there would be more than 2.5 million breast cancer cases by 2021.<sup>12</sup>

The mean age at diagnosis of breast cancer in China is 45–55 years, much more younger than 65 years in the United States and as well as other western countries.<sup>13</sup> Traditionally, there is an interesting double-peak pattern in age-specific incidence curve of breast cancer in the mainland of China, one peak at about 45–55 years and another at 70–74 years.<sup>2,14</sup> Similarly in Taiwan of China and Hong Kong of China, such double-peak

pattern was reported.<sup>15–17</sup> The unique peak in age-specific incidence at 45–55 years might be due to shifts in risk factor profiles such as menstrual and reproductive characteristics.<sup>18</sup> However, data from Beijing<sup>10</sup> showed that during 2004 and 2008, the peak age group of the female breast cancer incidence in urban areas was 60–64 years, whereas in rural areas the peak was, respectively, at 50–54 and 80–84 years. This result indicated a shift trend to western patterns with an older median age at diagnosis, especially in developed areas. It was estimated that by 2030, 27.0% of breast cancer cases would be diagnosed at age older than 65 years, while in 2008 this number is only 16.6%.<sup>19</sup>

Data from 16 population-based cancer registries during 2003–2005<sup>20</sup> showed that the 5-year survival rate of female breast cancer cases in China was 73.0%, ranking the first in all cancers. And survival for rural patients was about half that of their urban counterparts. Compared to 89.0% of the United States,<sup>21</sup> there is still quite a lot to be improved.

However, it is not possible to describe the accurate incidence and mortality of breast cancer in China, because the cancer registry system is not well established.<sup>22,23</sup> By 2013, there were only 249 cancer registries in China, covering 31 provinces with about 200 million people, accounting for about 15.42% of Chinese population.<sup>22</sup> While in the United States, about 96% patients were included in health-care system such as National Program of Cancer Registries (NPCR) by Centers for Disease Control<sup>23</sup> and Surveillance, Epidemiology, and End Results (SEER) Program by National Cancer Institute.<sup>24</sup> This deficiency of data has become a big bottleneck for the development of cancer control policy. Since 2012, cancer registry programs based on hospitals have been carried out in several provinces in China, but still not well developed. And there are some shortcomings in the above programs, such as insufficient extensions and integrity, distribution disproportion, lacking of necessary quality control and like.<sup>25</sup> With the expansion of China's cancer registry, anyhow, the accuracy of breast cancer burden estimates would be improved and more representative.

### Risk factors of breast cancer in China

A number of case–control studies have been conducted to explore the risk factors of breast cancer in different areas, but resulted in a relatively consistent conclusion.<sup>26</sup> Traditional risk factors such as a long menstrual life, nulliparity, later age at first birth, and limited breastfeeding are associated with increased risk of breast cancer in the Chinese population,<sup>11,27,28</sup>

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