Original Article

Comparison of Undernutrition Prevalence of Children under 5 Years in China between 2002 and 2013

YU Dong Mei[1,^], ZHAO Li Yun[1,^], YANG Zhen Yu[1], CHANG Su Ying[2], YU Wen Tao[1], FANG Hong Yun[1], WANG Xun[1], YU Dan[1], GUO Qi Ya[1], XU Xiao Li[1], FANG Yue Hui[1], ZHAO Wen Hua[1], YANG Xiao Guang[1], DING Gang Qiang[1,#], and LIANG Xiao Feng[3,#]

1. National Center for Nutrition and Health, Chinese Center for Disease Control and Prevention, Beijing 100050, China; 2. United Nations Children's Fund, Beijing 100600, China; 3. Chinese Center for Disease Control and Prevention, Beijing 102206, China

Abstract

Objective To describe the undernutrition status of children under 5-year in China, and study the trend between 2002 and 2013.

Methods The study was based on two national surveys. Undernutrition was determined against WHO's 2006 growth standards. The prevalence in 2013 and 2002 was weighted by China sixth National Population Census (2010). The relationship between undernutrition and gender/age groups/different areas use weighted logistic regression.

Results The results indicated the overall prevalence of stunting, underweight, and wasting of Chinese children under 5-year was 8.1%, 2.4%, and 1.9% in 2013, respectively. The prevalence of stunting was higher for children aged 12-47 month, while underweight was higher for children aged 48-59 month. The prevalence of undernutrition was higher in rural areas than in urban areas, especially in poor rural areas. There was a decline of stunting, underweight, and wasting between 2002 and 2013 among the children, with greater reduction in rural areas than in urban areas.

Conclusion The prevalence of undernutrition of children under 5-year remains high in rural areas especially in poor rural areas in China. It is urgent to take action to control undernutrition in the vulnerable areas and subgroups.

Key words: Undernutrition; Prevelence; Children under 5

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INTRODUCTION

Undernutrition of children under five remains a public health challenge. Linear growth retardation (stunting) is highly prevalent worldwide[1]. Poor nutrition in the first 1000 days of life can lead to stunted growth, which is irreversible and associated with impaired cognitive development, and reduced school and work performance[2].

UNICEF, WHO, and the World Bank Group reported joint child malnutrition estimates in 2015. Child malnutrition is still a big global problem[2]. The *Lancet* series in 2013 presented a context of maternal and child underweight and overweight in low-income and middle-income countries. The prevalence of stunting is decreasing globally, but still affected at least 165 million children under 5 in 2011; while wasting affected at least 52 million children. It's estimated that undernutrition include fetal

[^]YU Dong Mei and ZHAO Li Yun contributed equally to the work.

[#]Correspondence should be addressed to LIANG Xiao Feng, E-mail: Liangxf@Chinacdc.cn; DING Gang Qiang, E-mail: dinggq@Chinacdc.cn

Biographical notes of the first authors: YU Dong Mei, femal, MD, Associate Professor, majoring in nutrition and health epidemiology; ZHAO Li Yun, femal, MPH, Professor, majoring in nutrition and health epidemiology.

growth restriction, stunting, wasting, and deficiencies of vitamin A and zinc along with suboptimum breastfeeding may cause 3.1 million child deaths annually or 45% of all child deaths in 2011[1].

China has undergone a rapid society, economic, and culture changes during the past two decades. Under the framework of Millennium Development Goals (MDGs)[3] and other global initiatives, the Chinese government paid much attention to child health and development and issued a series of policies, notably the National Program of Action for Child Development in China (2011-2020) with goals for exclusive breastfeeding, prevalence of stunting, and prevalence of underweight[4]. Subsequently, the overall prevalence of stunting, underweight, and wasting among children younger than 5 years has decreased, while remaining high in children under 2 years old and in children living in rural, and especially in poor rural areas[5-9]. The studies demonstrated that undernutrition during childhood may increase susceptibility to disease, and adult obesity, reduce child survival, and ultimately lead to productivity loss[1]. One study estimated that the actual reduction in underweight between 1992 and 2001 (from 15.7% to 10.1%) resulted in saving 176,000 child lives in China. A further reduction of underweight prevalence from 10.1% to 8.0% could save an additional 62,000 lives[10]. Another study calculated that the reductions in child stunting from 1992 to 2001 in China would result in future economic productivity gains with the value of CNY 101 billion. While reducing stunting further over the next 10 years would gain CNY 20 billion[11].

To monitor the extent of nutritional problems in China's children, information from the national nutrition surveillance system on children younger than 5 years needs to be analysed and reviewed regularly. This study comparing undernutrition in children between 2002 and 2013 will provide the most recent national evidence for policy making on improving child nutrition in China.

METHODS

Data Resources

Chinese Nutrition and Health Surveillance in 2013 (CNHS 2013) Chinese Nutrition and Health Surveillance (2010-2013) was deigned to be a representative survey in China. In 2010-2012, a stratified multistage cluster sampling was used from 31 provinces, autonomous regions, and municipalities and selected 150 districts/counties. The study objects were people aged 6 and over. The sample was selected through the method of Probability Proportion to Size (PPS). As a part of the national nutrition surveillance in 2010-2013, Chinese Nutrition and Health Surveillance in 2013 was a cross-sectional survey which focus on children under 6 years and lactating women that covered 30 provinces, autonomous regions and the municipalities in Mainland China (Tibet Autonomous Region was not included).

Sampling The sample of surveillance in 2013 was selected through multi-stage stratified cluster sampling.

Stage 1: the 2865 districts/counties/ county-level cities in China were categorized into 4 strata (large cities, medium and small cities, general rural areas, and poor rural areas) based on the population size and the definition of urban or rural from National Bureau of Statistics of the People's Republic of China. The population size was more than 1000,000 can be defined as large cities, and other cities were belong to medium and small cities. The definition of poor rural areas and general rural areas was defined according to the framework for poverty alleviation and development for the next decade, 2011-2020. Finally a total of 55 districts/counties/county-level cities were selected as the national representative survey sites. The 55 survey sites included 12 large cities, 15 medium and small cities, 18 general rural areas, and 10 poor rural areas.

Stage 2: three sub-districts/townships were selected using systematic sampling in each survey site. Totally 165 sub-districts/townships were selected in this stage.

Stage 3: three neighborhood/village committees were randomly selected in each sub-districts/ townships. There were 495 neighborhood/village committees in this stage.

Stage 4: finally 70 children were selected through the local planned immune system using a cluster sampling method in each neighborhood/ village committees. There were 10 children in each age group (0-5, 6-11, 12-23, 24-35, 36-47, 48-59, and 60-71 months) with equal number of boys and girls. The lactating women were defined as the mother of children younger than 2 years. A total of 200 mothers included lactating women and non-lactating women. A total of 34,650 children under 6 and 11,000 mothers were sampled.