

Child health in China in the Millennium Development Goal era

Bo Sun,¹ Kun Liang,² Bin Yi,³ Li Zhang⁴

¹Laboratory of Neonatal Medicine of National Health and Family Planning Commission, Departments of Pediatrics and Neonatology, Children's Hospital of Fudan University, Shanghai, China

²Departments of Pediatrics and Neonatology, First Hospital of Kunming Medical University, Kunming, Yunnan, China

³Department of Neonatology, Gansu Provincial Women and Children's Hospital (Gansu Provincial Maternity Hospital), Lanzhou, Gansu, China

⁴Department of Neonatology, Northwest Women and Children's Hospital (Shaanxi Provincial Maternity Hospital), Xi'an, Shaanxi, China

Correspondence to

Professor Bo Sun, Departments of Pediatrics and Neonatology, Children's Hospital of Fudan University, and the Laboratory of Neonatal Medicine of National Health and Family Planning Commission, Shanghai 201102, China; bsun@shmu.edu.cn

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The Millennium Developmental Goal (MDG) 4, initiated in 1990 aiming to reduce mortality of children under 5 years of age (U5M) by two-third in 2015, was achieved in China to an average level lower than 15/1000 in 2012^{1–3} (table 1). Given China's size (1.34 billion population with 16 million deliveries annually), this milestone has worldwide implications. This milestone was achieved through a combination of efforts: social, economic, governmental and medical.⁴ Over the two and half decades, U5M has undergone three phases of dramatic changes in China. First, the reduction of diarrhoea and pneumonia occurred between 1990 and 1999 as a result of enhanced public health policy in effect and living standard improvement when China was in transition from a low-income country towards a low-to-middle-income developing country, accounted for by improved public healthcare system through vaccination in infancy and childhood, housing and water supply, sanitation and essential healthcare.

Another prominent advance was significant reduction of maternal and infant mortality between 2000 and 2008,^{3,4} achieved by prenatal monitoring of high-risk pregnancy complication and in-hospital delivery, by eradication of neonatal tetanus and alleviation of birth asphyxia and by prevention and treatment of various neonatal diseases, including prenatal diagnosis and neonatal surgery. In general, in this period, there was rapid urbanisation so that maternal and infant healthcare was more efficient than that in rural areas in each province until 2010 when urban residents exceeded 50% of the total population. More very preterm infants survived from perinatal risks,⁵ and disparities of maternal and neonatal mortalities between rural and urban regions were narrowed from 4–5 times to 1–2 times (table 1), indicating the effectiveness of sustained policies and programme enforcement.

Finally, in 2009–2014, there was an introduction of widely established healthcare system, especially for nationwide rural residents subjected to New Rural Cooperative Medical Scheme to tackle availability and affordability of healthcare in neonate, infant and childhood in low-economic development provinces and regions.¹ This universal healthcare insurance policy is based on voluntary participation for all rural families and individuals through payment of premium to achieve an average of 300–350 Chinese Yuan (CNY) per year per head, and national and provincial government finance will cover 80%–85% of it. This pool of health insurance collected is integrated to cover costs on stratified total sum and hospital service levels, reimbursing up to 70%–80% of the total patient hospitalised care costs, equivalent to 4–6 times of the local rural family annual total income.

Up to 2013, all the provinces and most of the rural residents were enrolled and subjected to this insurance. Adjustments were also made to enable those treated by provincial public healthcare services at non-resident registry area or eligible to special therapies for severe and chronic diseases to maximise the benefit for the rural participants. For newborn infants, their hospitalised costs are covered with their maternal insurance for up to 50% of the total sum.

In contrast to the cause of death of neonates and postneonatal infancy, the leading cause of U5M is associated with pulmonary infection (pneumonia) and sepsis, but unexpected asphyxia, traffic accident, near drowning, trauma and causes other than infection tended to become major ones impacting on paediatric emergency and intensive care. Congenital heart disease, tumour and malignancy, congenital malformation and genetically inherited metabolic disorders, and transmissible viral infection remain important morbidities contributing to U5M, which promoted establishment and improvement of paediatric surgical and paediatric critical care in almost all provincial and most subprovincial central hospitals. This was initiated by national and provincial special funds-based programmes to each county general or maternity hospitals of midland and west provinces to upgrade their paediatric critical care service standard that may serve for unexpected events of pandemics of severe systemic and respiratory viral infectious diseases and accidental traumatic hazard in children, in addition to daily care of neonatal and infant emergency needs.

Now, challenges for the post-MDG4 era will be the goal of the so-called 'women and children's healthcare plan', mainly at provincial and subprovincial levels by integrated efforts from public health and clinical medical care, social development and planning, finance and social welfare aspects, executed by the office from provincial commission of health and family planning (former provincial department of health) and its subsidiaries at subprovincial (city and regional) and county levels. The year 2014 is also designated as 'the year for women and children's healthcare service' by the National Health and Family Planning Commission¹ to emphasise the importance of this plan through nationwide campaign. This plan aims to mitigate gaps between rural and urban areas by ensuring widely established monitoring and management of high-risk pregnancy through telemedicine, emergency transport and hospital delivery, thereby reducing maternal and neonatal death rate. This plan also promotes antenatal diagnostic and postdelivery recovery techniques, vaginal delivery and caesarean delivery restriction.



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Table 1 Maternal, neonatal, infant and under five children's mortality rate in 1991, 2005 and 2012 by national sampling surveillance system^{1 2}

	Year	Total	Urban	Rural
Maternal (1/100 000)	1991	80	46.3	100
	2005	47.7	25.0	53.8
	2012	24.5	22.2	25.6
Neonatal (1/1000)	1991	33.1	12.5	37.9
	2005	13.2	7.5	14.7
	2012	6.9	3.9	8.1
Infant (1/1000)	1991	50.2	17.3	58
	2005	19.0	9.1	21.6
	2012	10.3	5.2	12.4
Children <5 years of age (1/1000)	1991	61	20.9	71.1
	2005	22.5	10.7	25.7
	2012	13.2	5.9	16.2

As neonatal death accounts for 50%–60% of U5M and almost 70%–75% of infant mortality, and more preterm neonates survive from initial birth-related diseases due to more effective perinatal intervention, there are several issues in daily neonatal and postneonatal care to be dealt with, such as how to restrict caesarean section from non-medical indication or low-risk pregnancy. Currently, nationwide average caesarean section rate should be around 35%, 40%–60% in east provinces and major municipalities, but 20%–30% in many west provinces. How to keep increased very preterm infant survival with good quality of life is of importance in neonatal and developmental paediatric service. Composite preterm birth rate should be around 4%–5% of total births in both urban and rural areas.⁵ Very few data are published regarding gender ratio based on complete birth population from provincial and subprovincial regional vital statistics.⁵ High rate of parental give-up or withdrawal when treatment is effective in critically ill neonates and infants or concerns about long-term burden of worse prognoses in neurodevelopment are still challenges now.

With regards to limitations of the birth data through sampling of nationwide county and city district birth registry for vital statistics, many midland and west provinces started accumulating complete birth population-based annual reporting of these vital statistics as a part of the 'women and children's healthcare plan'. One of the most intriguing subjects is whether definition

of perinatology should include those from 25 weeks (and up) of gestation, and perinatal death rate should be provided in the annual vital statistics regarding accurate registry of fetal death, stillbirth and early neonatal death. We found, in a regional complete birth registry-based survey,⁵ that perinatal and neonatal mortalities were associated with a cumulated 50% survival rate in 29–30 weeks of gestation and in 1200–1300 g birth weight in contrast to that seen in the 23–25 weeks in developed countries.

To continue keeping U5M to a lower level, China's perinatal–neonatal care is relying on, and interacting with, public health and paediatric service to ensure the improvement of community-based women and children's healthcare standard. We anticipate that, in the next 5–10 years with more concrete data coming out of the current practice and high-quality research, such improvement in the infrastructure for maternal and infant healthcare would show more conceivable progression, especially in rural regions of the west provinces.

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