

# High-impact child survival interventions in China: a cost-effectiveness analysis

Yue Xiao, Yingpeng Qiu, Liwei Shi, Kun Zhao, Robert Scherpbier, Xiaona Huang, Xiaobo Tian

## Abstract

**Background** With the aim to support planning of essential child care in the 13th Five-year Plan Period (2016–20), a number of core child survival interventions were identified and analysed in terms of cost-effectiveness with participation of UNICEF experts and the Chinese health decision-makers.

**Methods** After systematic comparison of the China Child Survival Strategy (CSS) interventions and the Global Catalogue of Key Interventions Related to Reproductive Maternal and Child Health by WHO, the research team identified 24 evidenced high-impact child survival interventions that are feasible for implementation in China after several rounds of expert consultation. The intervention package module was established with the aid of “OneHealth Tool” (OHT), a health planning tool developed by the WHO and other international organizations, to perform cost estimation and cost-effectiveness analysis of 24 interventions. Direct programme cost was calculated, including drug, consumable, and medical tests. A measure of maternal and child deaths averted was used as the effectiveness indicator. Cost per life saved was calculated for each intervention. The national and provincial level (Guangdong, Guizhou, and Qinghai) parameters were collected.

**Findings** Implementation of 24 interventions is estimated to reduce maternal mortality from 21.7 deaths per 100 000 livebirths at 2015 to 13.67 deaths per 100 000 livebirths at 2020, infant mortality from 8.90 deaths per 1000 livebirths at 2015 to 6.21 deaths per 1000 livebirths at 2020, and under-5 mortality from 11.7 deaths per 1000 livebirths at 2015 to 8.26 deaths per 1000 livebirths at 2020 by 2020. The deaths of 79 000 neonates and 126 000 children younger than 5 years could be averted, with 123.92 billion Yuan total investment by the end of 2020. Based on cost-effectiveness, we rearranged the 24 interventions in three subgroups: package I (top six effective and cost-effective interventions, including C-section on indication, newborn resuscitation, newborn sepsis management, pneumonia management with antibiotics, exclusive breastfeeding, Kangaroo Mother Care), package II (package I with addition of four cost-effective interventions (Neonatal sepsis (antibiotic injections), prevention and treatment of abortion complications, prevention and management of postpartum haemorrhage, and breastfeeding and complementary feeding for infants between 6 months and 2 years) and package III (package II with addition of four effective interventions (including pneumococcal vaccine, Hib vaccine, diarrhoea management (oral rehydration salts), multi-micronutrients (folic acid, ferrum and calcium) supplementation for pregnant woman). Package I could avert 70% of total deaths at a very low cost (0.6% of the total cost of 24 interventions). Based on population size and the baseline coverage, the estimation results show some differences in cost-effectiveness between the three provinces.

**Interpretation** China could save more lives of women and children at low costs through implementing effective interventions. We recommend including these 24 interventions in the essential package for children in China in a stepwise way.

**Funding** The Hongkong Committee.

## Contributors

KZ and YX designed the study. YX wrote the article together with YQ. YX and LS organised expert consultation activities and collected data from various sources. YX and YQ worked on the OneHealth Tool software and designed the modules based on the local context. RS, XH, and XT gave valuable feedbacks on the Abstract.

## Declaration of interests

All authors' expenses related to this study were sponsored by the Hongkong Committee. We declare no competing interests.

Published Online  
October 26, 2018

Division of Health Policy  
Evaluation and Technology  
Assessment, China National  
Health Development Research  
Center, Beijing, China  
(Y Xiao MA, Y Qiu MSc, L Shi MSc,  
K Zhao MD); Global Financing  
Facility, Washington DC, USA  
(R Scherpbier MD); and UNICEF  
China Office, Beijing, China  
(X Huang PhD, X Tian MSc)

Correspondence to:  
Dr Kun Zhao, Division  
of Health Policy Evaluation  
and Technology Assessment,  
China National Health  
Development Research Center,  
Haidian District, Beijing,  
100191, China  
zk317@yahoo.com

Reproduced with permission of copyright owner. Further reproduction prohibited without permission.