



## REVIEW ARTICLE

## The Western Pacific Regional Child Survival Strategy: Progress and challenges in implementation

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**Abstract:** The Regional Child Survival Strategy (RCSS) was launched by the World Health Organization and United Nations Children's Fund in 2006. This initially involved the six highest mortality burden countries in the region (Cambodia, China, Laos PDR, Papua New Guinea, Philippines and Vietnam). This paper aimed to describe the experiences of countries in the region in adopting and implementing the RCSS, and to identify factors that promote and impede progress. Child mortality has fallen substantially since 1990, and the region as a whole is on track to achieve the Millennium Development Goal 4 (MDG-4) targets. Some countries have made slower progress and are struggling. There is an urgent need to support countries that have, until now, not been included in the RCSS, particularly smaller Pacific Island nations, and to provide greater support to the poorest countries if MDG-4 targets for the region are to be achieved.

**Key words:** child mortality; developing countries; Millennium Development Goals; Western Pacific.

### Introduction

The 1980s saw the United Nations Children's Fund (UNICEF) begin a 'Child Survival revolution' which included the introduction of the 'GOBI' Initiative (Growth monitoring, Oral rehydration solution, Breastfeeding and Immunization). This initiative was estimated to save over 12 million lives during the 1980s.<sup>1</sup> In September 1990, the historic United Nations World Summit for Children was held in New York and called for a reduction of under-five child mortality rates (U5MR) by one-third, or to a rate of 70 per 1000 live births, whichever is the greater reduction, by the year 2000.<sup>2</sup> Most industrialized countries exceeded these targets with most countries in the Organization for Economic Cooperation and Development reducing their U5MR to four to five per 1000 live births. However, much of Sub-Saharan Africa

and many countries in Asia, North Africa and the Pacific regions were unable to come close to their targets.<sup>3</sup>

In light of this, in November 2000 the United Nations met again to develop the Millennium Declaration and the Millennium Development Goals (MDG). Similar to the targets created at the World Summit for Children 10 years earlier, the fourth Millennium Development Goal (MDG-4) aims that by 2015, there should be a two-thirds reduction in U5MR from the rate in 1990.<sup>4</sup> The other seven MDG are closely interlinked with child health, particularly MDG-5 – the aim to reduce maternal mortality and improve access to maternal and reproductive health care. While progress has been made towards reaching these targets, in many developing countries, there is still a long way to go.<sup>5</sup>

In 2005, the World Health Organization (WHO) and UNICEF, together with representatives from seven countries in the Western Pacific Region, developed the Regional Child Survival Strategy (RCSS) to accelerate progress towards MDG-4.<sup>6</sup> Based on improving the delivery of simple, low-cost and evidence-based interventions in an integrated way, the RCSS was designed to place child health higher on the political, economic and health agendas, and reinvigorate efforts to reduce child mortality. The strategy was endorsed in September 2005 at the 56th session of WHO's Western Pacific Regional Committee, and was launched in Vientiane in 2006. The strategy involved and has been promoted in Cambodia, Lao PDR, Mongolia, Philippines, Papua New Guinea, Vietnam and China.<sup>7,8</sup>

The RCSS focuses on the importance of integrated service delivery and continuum of care, quality improvement at all levels of the health system and universal access to child survival interventions: the 'essential package' (Textbox 1). In some countries, the package also includes human immunodeficiency virus (HIV) prevention and antiretroviral treatment, scaling-up tuberculosis prevention and treatment, and promoting family planning.

### Key Points

- 1 In the last 20 years there have been substantial falls in child mortality in the countries of the Western Pacific region, but both between- and within-country inequity remains significant.
- 2 The Western Pacific Regional Child Survival Strategy has provided a framework for better coordination, oversight and monitoring of child health programmes in some countries.
- 3 Insufficient support for practical implementation, failure to address human resource needs and lack of inclusion of poorer Pacific Island nations will limit the impact of the Strategy on child health outcomes in the region.

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**Textbox 1 The Essential Package for Child Survival:**

Skilled attendance during pregnancy, delivery and immediate post partum;  
 Care of the newborn infant;  
 Promotion of breastfeeding and complementary feeding;  
 Micronutrient supplementation;  
 Immunization of children and mothers;  
 Integrated case management of diarrhoea, pneumonia and malaria; and  
 Insecticide-treated bed-nets.

In addition to these interventions, the RCSS also calls for necessities at a higher level, including, in each country:

- One effective high-level coordination mechanism (e.g. a Child Health Committee)
- One integrated national plan for child survival
- One national monitoring and evaluation system measuring core child survival indicators
- Advocacy strategy for political and community engagement
- Mobilization of sufficient resources

We aimed to understand the approaches of countries in the Asia Pacific in adopting and implementing the RCSS, to document recent developments in coordination and planning of national child health programmes, briefly review progress in coverage for child survival interventions, and to identify factors that promote and impede such progress.

**Methods**

A systematic literature search was conducted in OVID-Medline (1950 July week 1 2009) and Embase (1980 to 2009 Week 27) using the search strategy outlined in Table 1. Web of Science, CINAHL and the Cochrane database were further searched using various combinations of MeSH terms and key words from the search strategy. There were no pre-set limits. Inclusion and exclusion criteria (Table 2) were designed to identify literature that addresses any of the following:

- A description of the process leading to the development and planning for the RCSS
- Recent approaches for child survival adopted in the Western Pacific high mortality burden countries – Vietnam, Papua New Guinea, Lao PDR, Cambodia, Philippines, China, Mongolia, and the experiences with the RCSS in these countries
- Reviews of child survival and coverage of national programmes in countries in the Western Pacific Region

All results were assessed for relevance by the authors, and the abstracts of potentially relevant papers were reviewed. Full texts of those papers which fulfilled the inclusion criteria were then obtained. Reference lists from the short-listed papers were used to widen the search.

The grey literature was selectively searched using combinations of the search strategy MeSH terms and keywords entered in the WHO and UNICEF search engines. Retrieved publications and reports from these databases were further used to identify other relevant sources of data.

One of the authors (TD) attended the Regional Meeting on Child Survival in Xi'an, China, in 2009, which brought

**Table 1** Search strategy for OVID-Medline and Embase

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((*morbidity/ or *incidence/ or *prevalence/ or (*health planning/ or
*health care rationing/ or *health plan implementation/ or *health
planning guidelines/ or *health priorities/ or *health resources/ or
exp *health services research/) or (*health planning/ or *regional
health planning/ or *community health planning/ or exp *health
facility planning/ or *health systems plans/) or exp *Health Policy/ or
*Primary Health Care/ or (*immunization/ or exp *immunization,
passive/ or *immunization schedule/ or *immunization, secondary/
or *mass immunization/) or *Cause of Death/ or exp *Malaria/pc,
mo, ep or exp *Diarrhea/pc, ep, mo or exp *Respiratory Tract
Infections/pc, ep, mo or *Tuberculosis/pc, ep, mo or exp *hiv/ or
*Referral and Consultation/) and (*international cooperation/ or
*developing countries/ or (*melanesia/ or *fiji/ or *Papua New
Guinea/ or (*cambodia/ or *east timor/ or *indonesia/ or *laos/ or
*philippines/ or *vietnam/ or *mongolia/)) OR (*Child Welfare/ or
(*child mortality/ or *hospital mortality/ or *infant mortality/ or
*maternal mortality/ or *perinatal mortality/) or (exp *child
nutritional physiology phenomena/ or exp *maternal nutritional
physiological phenomena/) or *Maternal Welfare/ or (*community
health services/ or exp *child health services/ or *community health
nursing/ or *family planning services/ or exp *home care services/ or
exp *maternal health services/ or exp *preventive health services/)
or (*ambulatory care/ or *perinatal care/ or *postnatal care/ or
*prenatal care/) or (*adolescent health services/ or exp *child care/)
or (*imci/ or (*child health/ and *determinant$/ or (*Mothers/ and
exp *Educational Status/) or (*minority groups/ or exp *social class/
or exp *social environment/ or exp *social isolation/) or (exp
*Breastfeeding/ and exp *Programme Development/) or *Poverty/ or
*Health Services Accessibility/))
AND
(*Asia, Central/ or exp Asia/ or Asia, Western/ or exp Asia,
Southeastern/ or *melanesia/ or *fiji/ or *Papua New Guinea/) or
*laos/ or *vietnam or Solomon Islands/))
OR
(Child survival AND National)
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together key people from the seven countries with the highest mortality burdens (China, Cambodia, Lao PDR, Mongolia, Papua New Guinea, Philippines and Vietnam) to review progress. The proceedings of this meeting provide the most comprehensive and up-to-date review of the implementation of the RCSS in these countries. The report of the meeting is yet to be published. The main findings and points raised are used where appropriate in the results, with primary references, when possible.

Results from the published and grey literature were reviewed by the authors, and relevant data were extracted and summarized in a database that recorded: publication type and study methods (published/unpublished, reviews, randomized controlled trials, observational studies, reports), setting (global/multi-country reviews, national reviews, primary research at a national, health facility or community level), focus (health system/programme planning, implementation, evaluation), topic (health system planning and policy, implementation, evaluation) and main findings.

**Table 2** Inclusion and exclusion criteria

## Inclusion criteria

Published literature was included if it addressed:

- Aspects of planning, implementation or evaluation related to the RCSS
- Details of the child health system in high priority countries in the Western Pacific Region
- Aspects of the state of child health or outlines of widely implemented programme areas for child health in the high priority countries in the Western Pacific Region
- The wider determinants of health, including poverty, maternal education and sanitation / hygiene, environmental health in the high priority countries in the Western Pacific Region
- Models of implementation of child health interventions, including community neonatal care or home-based case-management in the high priority countries in the Western Pacific Region
- Major global reviews relevant to child survival

## Exclusion criteria

The following published literature was excluded:

- Papers specific to other countries AND the findings had no direct relevance to countries or the Asia Pacific Region
- Primary research or reviews that deal with the *efficacy* of health interventions but provide no data on their implementation or impact on global child survival or child survival in the high-priority countries or the Asia Pacific Region
- Global reviews or estimates of health indicators before the year 1990
- Studies from the developed regions
- Letters, news pieces and comments

## Results

### Gains in child survival

Some countries in Asia and the Pacific such as China, Philippines and Mongolia have either achieved or are approaching their MDG-4 targets. The Inter-agency group for Child Mortality Estimation reports an average of 3.6% per annum reduction in under-five mortality rates in UNICEF's East Asia and Pacific Region. The estimated number of annual deaths in the region has fallen from 2.2 million to 800 000 between 1990 and 2008.<sup>9</sup> Within the Western Pacific Region, WHO officials report that since 1990, the annual deaths in children under the age of 5 years in the region's highest priority countries had fallen from over 1.5 million to 567 000 (personal correspondence, WPRO). However some countries in the region have made slower progress, and in all there are the problems of inequity.<sup>10</sup>

The examples of Mongolia and Cambodia demonstrate that although progress has not been even between or within countries, absolute reductions in child mortality have occurred even in countries with poor economic status. Mongolia's gross domestic product per capita (US\$ 1500) is nearly 2.5 times that of Cambodia (US\$ 630), and its U5MR in 2000 was 41 per 1000 live births, compared with 123 per 1000 live births.<sup>11</sup> Despite such disparities, progress has been made in both countries, with

U5MR reducing to 23.2 by 2007 in Mongolia (43% reduction) and 83 per 1000 live births by 2005 in Cambodia (31% reduction).<sup>12,13</sup>

### National plans and policies

Since 2005, all seven Western Pacific high-mortality burden countries have developed national plans for child survival. Some (Lao PDR, Cambodia) have combined national plans for maternal, newborn and child health while others (China, Vietnam) have several plans covering various aspects of child survival, health, protection and development.

All countries have made policy reforms and most have established coordinating committees; however, gaps still exist in policies in almost all countries. Both seemingly minor – such as the lack of policy on zinc in some countries – and major challenges exist, such as how to make decentralized health systems work in favour of child and maternal health. The lack of costing of national plans has also been an obstacle to implementation and gaining government and donor support; however, the tools for costing have only recently been developed and have significant limitations.<sup>14</sup> A lack of government policy on subsidising health-care costs, particularly for women and children, is a deficiency in some countries, although this is being addressed or proposed in all countries.

### Spending on child health

Data on total health expenditures for child health (or for sub-categories such as newborn health) are not readily available in any of the countries, despite this being a reporting obligation under the Convention of the Rights of the Child. One of the difficulties in estimating total expenditure on Maternal and Child Health (MCH) is the decentralized nature of health systems in most countries. Much of the budgeting and spending on service delivery and training occurs at a provincial or district level, and the proportions spent on MCH vary widely. Furthermore, much of child and maternal health services are shared health systems costs.

New tools are available for reviewing the impact of child health interventions and tracking expenditures, but these have limitations, and no country with decentralized systems has yet provided data on expenditure that includes all service levels.<sup>15</sup>

### Coverage of interventions in the 'essential package'

In all of the countries, the most available and reliable data on coverage was from routinely conducted population surveys, such as the Demographic and Health Survey (DHS), Census or Multiple Indicator Cluster Survey (MICS). Their methodologies are validated, and the surveys are usually funded by donor agencies, so they do not drain national health or government budgets. The results are generally representative of the entire population and the information provided has broader health sector relevance than just MCH, and can be used to leverage political support from other parts of the health service and government.

**Table 3** Core indicators for child survival

Indicators	Generally available sources of the data	Problems with these data if derived from other sources
Proportion of births assisted by skilled personnel	DHS, MICS, census	NHIS data inappropriate because deliveries outside health facilities will not be included
Proportion of infants less than 12 months of age with breastfeeding initiated within one hour of birth	National nutrition surveys, DHS, however recall likely to be poor	NHIS give no indication of practices of breastfeeding for babies born at home Data difficult to record in a health facility where midwives are busy with many tasks
Proportion of infants less than 6 months of age exclusively breastfed	DHS, National nutrition surveys	
Proportion of infants 6–9 months of age receiving breast milk and complementary food	DHS, National nutrition surveys	Statistic, even from well conducted population-based studies does not capture inappropriately early complementary feeding, or quality of complementary feeding
Proportion of children 6–59 months old who have received vitamin A in the past 6 months	DHS, National nutrition surveys, EPI programme data	If EPI data is used, may not take account of multiple doses of vitamin A given to the one child, so may overestimate coverage
Proportion of 1-year-old children immunized against measles	DHS, EPI programme data	Often problems with the denominator in EPI programme data
Proportion of 1-year-old children protected against neonatal tetanus through immunization of their mothers	DHS, EPI programme data	Often problems with the denominator in EPI
Proportion of children 0–59 months of age who had diarrhoea in the past 2 weeks and were treated with ORT	DHS	Trends between DHS may not be accurate if there have been recent outbreaks of viral infection
Proportion of children 0–59 months of age who had suspected pneumonia in the past 2 weeks and were taken to an appropriate health care provider	DHS	Trends between DHS may not be accurate if there have been recent outbreaks of viral infection
Proportion of children 0–59 months of age who slept under an insecticide-treated net the previous night	DHS, malaria programme surveys	

ORT, oral rehydration therapy; DHS, Demographic and Health Surveys; MICS, Multiple Indicator Cluster Survey; EPI, Expanded Programme for Immunization; NHIS, National Health Information System.

Few countries have functioning vital registration systems, and in low-income countries they under-represent the poor, which does not help to reduce health inequity. Few have been able to institute 'occasional surveys', such as 'household surveys', to track progress on the 10 core indicators suggested by WHO in 2007.<sup>16</sup> Table 3 describes the commonly available data sets to measure the 10 RCSS 'core indicators' of child survival. Some of the problems in the interpretation of other data – such as National Health Information Systems (NHIS) data – are also described.

### Interventions for which coverage is high or increasing

Strategies that had improved coverage since 1990 in almost all countries were the 'scheduled interventions' (delivered at discrete times, often in population campaigns), particularly immunization. High percentage coverage gains were also made in all countries for those interventions that had very low baseline coverage in the 1990s, particularly vitamin A supplementation and insecticide-treated bed-nets.

### Interventions for which coverage is low or has declined

In most countries, case management interventions, such as antibiotics for pneumonia and oral rehydration solution (ORS) for diarrhoea, had lower increases in coverage. In some countries, including Cambodia and Philippines, the proportion of children receiving ORS for diarrhoea had fallen.

There are many potential reasons proposed for reduced ORS coverage. To be optimally effective, case management interventions must be available 24 h a day and require functioning and accessible health systems, and these are deficient in many of the poorer countries in the Region. In the 1980s, the GOBI strategy was effective in delivering simple messages on diarrhoea treatment. Now with Integrated Management of Childhood Illness (IMCI) algorithm having increased complexity and the public education campaigns and health worker training not as strong, such awareness is not as common. In China and the Philippines, pressure from consumers and health professionals has meant that many families equate quality management of diarrhoea (and other conditions) with intravenous therapy, and there are financial incentives on doctors to prescribe antibiotics. Mongolia

has solved some of these problems by providing free public health care and access to medicines, removing any financial incentive for doctors to over-prescribe.

### Breastfeeding

Levels of exclusive breastfeeding to 6 months remain low in many countries, though there has been progress. Cambodia reported major increases in early and exclusive initiation of breastfeeding between 2000 and 2008 (exclusive breastfeeding for 6 months from 11% in 2000 to 66% in 2008)<sup>17,18</sup> through a multi-faceted strategy of endorsing the *International Code of Marketing of Breast Milk substitutes*, and health promotion activities.<sup>19</sup> This involved a major mass media campaign, education to new mothers through health centres, endorsement and enforcement of the Code, and reinvigoration of the Baby Friendly Hospital Initiative (BFHI).<sup>20</sup>

High rates of complementary feeding at 6 months may be because many infants are fed solids long before it is safe to do so: 20% of infants in Lao and at least 10% of infants in Papua New Guinea are given complementary feeds in the first few weeks of life.<sup>21,22</sup> In Vietnam, the most common early complementary foods were water/sugar, water and milk.<sup>23</sup> There is a need to define standards of complementary feeding, especially fortified complementary feeds, as the quality of foods from 6 months of age is even more important than the time it is introduced.

Some of the obstacles to improving rates of exclusive breastfeeding include aggressive marketing of breast milk substitutes, cultural barriers (discarding of colostrum in some countries), inadequate support from health professionals (often influenced by formula manufacturers) and lack of human resources for breastfeeding counselling. The BFHI is important in promoting better breastfeeding practices, but has received inadequate support in recent years.<sup>20</sup> Some countries and the UNICEF reported plans to re-launch the initiative, by making BFHI status a prerequisite for hospitals where maternal services are accredited.

### Malnutrition

Overall rates of malnutrition have decreased, but in many countries, stunting (signifying chronic under-nutrition) and anaemia continue to be high. Stunting is a major problem in all seven countries (prevalence rates varied from 15% in China to 40% in Lao PDR).<sup>24,25</sup> Poor breastfeeding practices, inadequate complementary feeding, low maternal nutrition, childhood illnesses, particularly anaemia and worm infestation, all are causative.<sup>26,27</sup> In the Western Pacific Region, more than 35% of diseases causing child death are associated with inadequate nutrition.<sup>28</sup>

China and the Philippines are starting preventative supplementation with weekly iron and folic acid in schools which has been shown to reduce low birth weight and have beneficial effects on later maternal health. There is a need to gather more information on the effectiveness of such nutritional interventions.

Anaemia is still a problem in most countries, with prevalence rates from 20% in China to 63% in Cambodia in children under the age of 5 years.<sup>25,29</sup> There is a need to clarify recommendations on fortified complementary feeding for young children

and pre-schoolers, including the roles of industry fortification, and point of use fortification with micronutrients – ‘sprinkles’. UNICEF and WHO are working on developing standards for what can validly be marketed as complementary feeds and a policy on micronutrient supplementation.

There are variations in nutrition levels between sub-populations, regions and by education level, which tracks other trends in inequity, particularly mortality risk.

Human resources to address nutrition have not been adequately addressed. Few countries in the Western Pacific have sufficient nutritionist training courses. Even in the Philippines where such courses exist, recruitment is difficult. Other countries (Papua New Guinea, Lao, Cambodia and Solomon Islands) do not have courses in nutrition, and capacity for implementation of nutritional interventions is even weaker than in the Philippines. There is also a need to review curricula for doctors, nurses and midwives to ensure it contains current recommendations on nutrition.

### Zinc

Since 2000, there has been compelling evidence from multiple randomized clinical trials that zinc sulphate is effective in reducing the duration and severity of acute and persistent diarrhoea,<sup>30,31</sup> reducing mortality from severe malnutrition, and reducing morbidity in low birth weight babies.<sup>32,33</sup> Zinc supplementation is also effective in preventing diarrhoea, and pneumonia in some communities.<sup>34</sup> However, no country in the Western Pacific Region has successfully introduced zinc. The reasons are multi-factorial: lack of inclusion into therapeutic guidelines or the national essential medicines list; delayed endorsement of zinc as a new therapeutic agent by health departments; lack of policy outlining its use; and difficulties in finding suppliers. Representatives from some countries said that when global agencies, particularly the WHO and UNICEF, first promoted zinc, they were led to believe that these agencies would supply it, as had been the case in many countries with vitamin A originally.

### Maternal and newborn care

Rates of hospital deliveries increased markedly in China and Mongolia since 2000 to above 90%, and were associated with falls in maternal mortality. Improvements have been achieved by policies for free hospital delivery and improving the quality of care. Pre-eclampsia/eclampsia and maternal anaemia are important causes of maternal morbidity and mortality in Mongolia, highlighting the need to improve the quality of care in antenatal visits.<sup>12</sup> In Lao PDR, less than 20%, and in Papua New Guinea around 50%, of deliveries are in a health facility with a skilled birth attendant.<sup>21,22</sup>

The proportion of newborns protected against neonatal tetanus shows improvement in most countries, although Papua New Guinea, Lao and Cambodia have not reached the goal of tetanus elimination.

In remote Vietnam, a trial of training local village women as ‘ethnic midwives’ in a truncated 6-month skilled birth attendant course is being conducted. This does not train to the level of a midwife, but aims to provide more competency than a traditional birth attendant.

## Neonatal mortality

While rates of neonatal mortality have fallen slightly in many countries, the reduction has been less than that for post-neonatal mortality, and now a higher proportion of overall child mortality occurs in the first 28 days of life in all countries than in 1990. The proportion of child deaths in the neonatal period varies from 59% in China to 31% in Laos.<sup>21,35</sup>

Reliable data on cause-specific neonatal deaths are lacking, as are data on how newborns are cared for in health facilities and in homes. The Philippines has recently conducted a detailed study of the practices in the first hour of life in over 50 hospitals, which showed much scope for improving essential newborn care, especially early breastfeeding, skin to skin warming and resuscitation when needed. Mongolia and China have addressed neonatal mortality with approaches that include training in essential newborn care and neonatal resuscitation, referral level neonatal care and post-natal visits. Vietnam has a major focus on neonatal mortality reduction, with similar programmes being put in place.

Some additional avenues that were proposed to improving neonatal care included establishment of financial incentives for skilled birth attendants, support for institutions of training of midwives or other skilled birth attendants (such as community health workers), and requisite workforce planning to ensure adequate human resourcing.

## Expanded Programme for Immunization (EPI)

Overall, the region has sustained high vaccine coverage rates, and there has been >90% reduction in diphtheria and pertussis, and >60% decline in tetanus since 1990. Further increases will only occur by reaching poorer or remote communities.<sup>36</sup>

Supplemental immunization activities (SIA) have been highly successful in many countries. In the Philippines, there were 351 deaths from measles in 2004, and this was reduced to four deaths following SIA in 2004–2006. In Papua New Guinea, SIA were introduced in 2002–2004 and 2007–2008 in response to a deadly outbreak of measles, with tens of thousands of cases reported and hundreds of documented deaths between 1998 and 2002. The number of measles cases has dropped dramatically, almost certainly averting a measles epidemic in the interval years.

The regional goal to control hepatitis B is to achieve 70% coverage with the birth dose of hepatitis B vaccine and >85% coverage with the three doses of the vaccine. Papua New Guinea and Lao have not achieved either coverage goal, while Cambodia, Philippines and Vietnam have not achieved the 70% target for the birth dose, but have achieved >80% coverage with the three doses. Coverage of the birth dose of the vaccine is linked to the proportion of deliveries taking place in a health facility.

EPI coverage rates are not even across any given country, and all countries have low performing districts. WHO has been promoting the *Reaching Every District* (RED) strategy, which focuses on district micro-planning, monitoring, supervision and using practical tools to measure coverage at service delivery level. Haemophilus influenzae type b vaccine is now a part of the EPI schedule in several Western Pacific countries, albeit in some, such as Laos, with very limited burden of disease data. Many

countries are struggling with the next priority in vaccines; conjugate pneumococcal vaccine, rotavirus or human papilloma virus vaccines.

## Integrated Management of Childhood Illness

For many low-income countries, IMCI represented the first integrated and standardized case management strategy that could be taught to nurses and community health workers, and was initially strongly funded in the 1990s. However, within 10 years, global donor support for IMCI had waned. This lack of funding, incomplete integration within budget-lines and training institutions, and lack of follow-up and supervision after staff training have been important hurdles to progress in improving case management.<sup>37</sup> Furthermore, the lack of technical guidelines on delivering community IMCI, and more significantly, the lack of an adequate and established cadre of health workers at a community level were barriers to progress in many countries in community-based IMCI.

Countries in the region have faced similar challenges in implementing IMCI; however, coverage data is not widely available. If the proportion of children with diarrhoea receiving rehydration therapy, as measured by population surveys, is taken as a surrogate marker for the quality of case management (encompassing many other factors one of which is IMCI), this improved in Mongolia (48% in 2003 to 83% in 2008), Vietnam (42% in 2002 to 65% in 2006), was constant in Papua New Guinea (16% in 1996 to 15% in 2006), and reduced in Cambodia (74% in 2000 to 58% to 2005).<sup>12,22,24,38</sup> In China, where pre-post facility-based studies were conducted to evaluate the effect of IMCI between 2004–2006, the proportion of sick children for whom danger signs were correctly identified increased from 15% to 90%; and the proportion of children who received appropriate treatment increased from 20% to 80% (Health facility survey, unpublished data).

## Financial protection

The approaches to financial protection vary. In Mongolia, free services are provided, and the Philippines is aiming for 100% insurance coverage. Cambodia has implemented 'Health Equity Funds': government and non-government organization funds managed at a district level that pay the costs of access of the poor to health facilities, including medical fees, transport and food costs. Evaluation has shown this approach to be sustainable and effective.<sup>39</sup> In both Laos and Cambodia, there are conditional cash transfers to mothers.

## Integration/single point of delivery/mass campaigns

National Health Days (or Week) are an increasing global trend, where immunization, insecticide-treated bed-nets, vitamin A supplementation and deworming, plus messages on key behaviours, including breastfeeding and sanitation are given. No countries in the Western Pacific have fully adopted this practice. Several countries, in conducting successful SIA, have added vitamin A administration during these campaigns.

## Audit, monitoring and evaluation for improving child survival

Current data from most countries in the region is derived from population surveys such as the DHS and census. Information of births and deaths is retrospective, and little information is available about causes of death, mostly relying on the mother's recall. An estimated 20% of births in East Asia and the Pacific are unregistered,<sup>40</sup> while audits of mortality have generally been limited to isolated studies, with few national programmes.

In Papua New Guinea, audits of the aetiology of childhood admissions and mortality have been important in prioritizing immunization, acute respiratory infection control, measles and neonatal care.<sup>41,42</sup> These audits were followed by implementation of SIAs (2002 and 2007), a programme for improving oxygen therapy for the management of acute respiratory infections (2004) and instigation of national standards for neonatal care (2000). More recently, a programme is being nationally implemented that collects cause-specific data on childhood illnesses and frequency of important co-morbidities, including malnutrition, anaemia and HIV. It also enables a more specific understanding of the causes of neonatal deaths across the country and of pneumonia case fatality rates according to disease severity.<sup>43</sup>

## Human resources

Limited human resources for child health remain a major impediment to progress. The countries in the Western Pacific where child mortality rates have remained high (Cambodia, Lao PDR, Papua New Guinea and Solomon Islands) have among the lowest health worker numbers per capita in the world. On the other hand, China, Mongolia and Philippines, and increasingly Vietnam have strong institutions of training for midwives, doctors and child health nurses. Mongolia has among the highest health worker densities in the world, with a hierarchical system of primary, secondary and tertiary care, with fieldworkers, doctors and nurses working at a primary level, and paediatricians and obstetricians at secondary and tertiary levels.

Distribution equity and quality of health professionals is also vital. If health departments map the number and distribution of midwives, child health nurses, paediatricians and community health workers in the country this may provide ministries of health with a better understanding of where human resource gaps are. Currently in no country was such information readily available.

## Improving education for girls

There is a direct relationship between maternal education and U5MR. In Papua New Guinea, children of mothers with no education have more than double the risk of dying before the age of 5 (95 deaths per 1000 live births) when compared with those of mothers who have completed grade 7 (45 deaths per 1000 live births).<sup>22</sup> Lao, Vietnam and Mongolia reported similar findings from the DHS. In Papua New Guinea, this dramatic impact of maternal education on child survival is partly due to the following factors: vaccine coverage is higher in infants of

educated mothers; educated mothers are more likely to deliver a baby in hospital, and have a skilled birth attendant (doctor, nurse, midwife); educated mothers are more likely to send their children to school; the duration of breastfeeding is longer among primary school educated mothers than mothers with no education; and educated mothers are more likely to take their infant to a health facility if they have symptoms of ill health than mothers with no education.

## Inequity

Despite major reductions in child deaths throughout the Western Pacific Region, inequity still exists, closely related to combinations of poverty, geographical isolation, and in many countries, ethnic minority inequity. In Vietnam, despite very substantial progress in reducing child mortality, people in poor rural mountainous regions and indigenous populations have neonatal and U5MR three times higher than in major cities.<sup>44</sup> In China, provinces in the west have three times higher mortality than those in the east.<sup>35</sup> In Papua New Guinea, highlands mortality is 40% greater than in the low-lands regions.<sup>22</sup>

Several factors have accentuated such in-country inequity in recent times including the move towards privatization and decentralization of governance.

In the mid-1980s, Vietnam legalized private health services and user fees for health services were introduced. Health service delivery and outcomes improved for those who could afford the many costs (mostly unregulated) of consultations, medical investigations and drugs. However, with a profit-driven health sector, these reforms have particularly disadvantaged ethnic minorities, who are more likely to be geographically isolated and poor.<sup>45</sup>

Similarly, Cambodia, having emerged from 30 years of conflict and civil wars, embarked on a process of decentralization and economic liberalization. As is Vietnam, this resulted in marked economic growth and reductions in under-five and neonatal mortality rates. However, in 2005, U5MR was almost three times greater amidst the poorest-quintile than the richest quintile (127 vs. 43 per 1000 live births), and 2.5 times greater amidst the least educated mothers (135.7 vs. 53 per 1000 live births).<sup>46</sup>

In Mongolia, access and availability of health services remains limited particularly for poor, rural and migrating, unregistered communities. Proposed solutions to improve equity included developing incentives and policies to encourage the private sector to serve poor populations, and the provision of free essential drugs for children under-5 years.<sup>12</sup>

## Discussion

Significant reductions in under-five and infant mortality have been seen in many countries since 1990, including in all countries in the Western Pacific Region. To varying extents, the seven high-mortality burden countries have incorporated the components of the RCSS into their government sector programmes for health: developing plans for child health, having a multi-disciplinary review body for child health that meets regularly and is functional, and putting in place new surveillance and monitoring activities, or strengthened existing ones. However,

the RCSS has not involved smaller Pacific Island nations, including Solomon Islands, Kiribati, Fiji, Vanuatu and Samoa. While these countries have a much lower total burden of mortality than the 'high priority countries', rates of mortality are still high, and they require support.

The experience of countries both within and outside the Western Pacific region that have successfully reduced child mortality is that the focus on a defined set of effective, low-cost interventions saw marked reductions in mortality from diarrhoea, vaccine preventable diseases, improvements in childhood nutrition and improvements in survival by as much as 64% over 25 years.<sup>47</sup> Within the regions, gains in the delivery of single-point interventions, such as vaccinations, have been encouraging. But these have highlighted other deficiencies and particularly, the need to make more progress in strengthening local health systems. The common national experience was that technical child health interventions need to be supported by political commitment, eliminating financial barriers to access, improved human resources, quality of service delivery, and ongoing monitoring of progress.

Addressing important non-health sector factors will be vital to sustain improvements in child survival in the region. Education for girls has been shown to be one of the highest impact interventions for reducing child mortality, and this should provide even more impetus to ensure universal access to primary education. Inequity in access to health care, precipitated by poverty, isolation and ethnic and minority group disadvantage will need to be reduced through initiatives such as safety nets. Equally important is making decentralization work in favour of child health systems, by ensuring adequate funding for child health at the provincial and district level, and by focussing on building programme management and clinical capacity outside metropolitan/urban centres.

Textbox 2 is a summary of the lessons learned so far from implementing the RCSS in select countries in the region. Listed are health system and non-health sector factors that need to be addressed in order to achieve equity in coverage of interventions and survival gains.

Today's world context is more complex than 30 years ago, when child survival was first promoted. Unequal economic advancements and HIV epidemics are among many of the more recent issues affecting child survival. And despite calls for integration, increasing vertical funding streams challenge the ability to make creative use of these funding sources to build strong health systems.<sup>48</sup> Prior to the recent global economic crisis, there were one billion people living in the least developed countries that have not benefited from the economic growth of the past 20 years.<sup>49</sup> Child health, more than ever, is hampered by the adverse effects of globalization, urbanization, overpopulation, global warming and other unfavourable environmental conditions.<sup>50</sup> In this context, much more support is needed if the progress that has occurred since 1990 is to be maintained in the poorest countries.

Political instability and civil conflict distracts from any government's focus on child and maternal health, and impedes the best efforts of communities. This has affected several countries in the Western Pacific Region intermittently over the last two decades, including Solomon Islands, Timor Leste and Fiji, with dire effects on child and maternal health.

## Limitations of data

Publication bias means that only countries that can demonstrate positive results publish these experiences, and it is often difficult to identify and explore the challenges and factors leading to less successful implementation. Published experiences tend to represent those countries in which detailed current and historical data exist, but this is not the case in many lower-income countries. We have attempted to minimize this bias by reporting on the results of regional meetings, in which positive and negative results are presented and discussed. There continues to be a scarcity of literature on the process and effectiveness of implementation of national programmes for child health, particularly in the Western Pacific Region. With the call of the RCSS to improve the collection and use of local data, there needs to be increased support for such research, especially where it relies on routinely collected data.

## Conclusions

The RCSS has been an important initiative for countries in the Western Pacific Region. It has raised the profile of persistently high child mortality, put a focus on countries with large numbers of child deaths, and provided them with a framework for strengthening programmes for child health and survival. However the strategy and processes that have arisen from the RCSS are fragile. Without ongoing support and funding there is a risk that these will be discarded as yet another global strategy that failed to sustain political interest for sufficient time to have a measurable outcome. The experience in these countries demonstrates that the RCSS best helps countries when it is considered as a framework for strengthening their existing child health services, suggesting that approaches which support local health systems, by building local leadership, clinical paediatrics and management capacity are equally as important, and go hand in hand with approaches for improving coverage of technical interventions. Non-health issues – education for girls, and managing decentralized systems – are also important. Smaller Pacific island nations have not had the benefit of involvement in the RCSS, and this needs to be urgently addressed.

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**Textbox 2 What is required to further implement the RCSS and lower child mortality in the Western Pacific region?***Access and equity*

- Free maternal care – including hospital delivery – and free health care for children, as seen in Mongolia, or programmes to improve access for the poor (e.g. dedicated government funds, incentives for services by the private sector)
- A 'pro-poor' approach; a focus on areas where services are poorest, barriers to access (geographical, social or cultural) exist and child mortality rates highest.
- Increased education for girls. Literacy rates for women should be an indicator of non-health sector commitment to child health and survival.

*Health system structuring*

- Increasing financial and technical support to provincial/district programme managers implementing child health programmes. Some of the requirements include pooled government and donor funds that are easily accessible by provinces and districts, paediatricians providing technical advice to district and provincial health officials on child health policy and practice, and supporting local collection and use of child health data.

*Child health interventions*

- Appropriate systems for management of pneumonia, diarrhoea and neonatal problems at a community level.
- A focus on quality neonatal services at all levels, from community essential newborn and post-natal care to primary, referral and tertiary level care.
- Improvements in quality of referral level (district and provincial) hospital care for children through the implementation of the WHO *Pocketbook of Hospital Care for Children*, improving essential medicines for children, appropriate technology, particularly oxygen concentrators and pulse oximeters, staff training and clinical audit.
- Consideration of the role of National Health Weeks, where immunization, distribution of Insecticide Treated Nets, vitamin A supplementation and de-worming, plus health education messages are given, ideally in low performing districts to support a pro-poor approach.

*Nutrition and breast feeding*

- Improvements in early and exclusive breastfeeding, by multifaceted approaches, such as has been successful in Cambodia
- Strengthening of the adoption and regulation of the *International Code of Marketing of Breast Milk substitutes* in each country.
- Increasing the involvement of the agricultural and food manufacturing sectors in addressing food security and quality food production.

*Human resources and training*

- Increased human resources for maternal and child health. This requires much increased donor and government support for local institutions of training, including schools of nursing, midwifery, paediatric and child health nursing, community health workers, nutritionists, paediatricians and obstetricians. Increased output, especially for well trained nurses and community health workers is vital, as is workforce planning to ensure more health workers are available at a district level
- Development of a national training framework. It would help integrate the health and education sectors, NGOs, churches, international agencies. This would also promote standardization of curricula for all cadres of health workers, and alignment with government policy and clinical guidelines. It would avoid agencies insisting on using their own training programmes.
- Introduce incentives for health workers to work in rural and remote areas, where health worker density is lowest.
- Improve training programmes for nutritionists and establish a minimal standard of nutritionists per population.

*Monitoring and evaluation*

- Improvements in quality and use of maternal and child health data at a health facility and population level.
- Improve routine data sources to derive disease- and age-specific case fatality-rate data, and better communicate the results of DHS and other population-based surveys in plain language.
- Map the number and distribution of midwives, child health nurses, paediatricians and community health workers in the country, to identify gaps and inequities.

*Scope*

- Actively involve smaller island nations, including Solomon Islands, Kiribati, Fiji, Vanuatu, Samoa, Tonga and Timor Leste with the RCSS.

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