

Global child health

Towards Millennium Development Goal Four

M Ellis, S Allen

The second child survival revolution

The first child survival revolution led by UNICEF saw a fall in global under five child mortality (U5MR) from 121 in 1980 to 88 in 1986.¹ It brought together the big players in international health and built momentum through a strategy of social mobilisation. This focused on four low cost primary care interventions (growth monitoring, oral rehydration, breast feeding, and immunisation). The second child survival revolution is now gathering pace and paediatricians are being called on to play our part.

CHILD SURVIVAL

The Child Survival Countdown to 2015 Conference held in London in December 2005 provided the first of what are planned to be biennial opportunities to review progress. In his commentary on the meeting, the editor of *The Lancet* calls for a strengthening of the science base of child health and specifically charges paediatric organisations from high income countries to do more to build collaborations with colleagues in lower income settings.² He urges us all to do more to increase the visibility of child and maternal survival on the global political agenda. What are the issues and how best can we engage?

THE MILLENNIUM DEVELOPMENT GOALS

The Millennium Development Goals (MDGs) are the latest of a series of targets set by the UN to express the world's aspirations and focus efforts for global human development.³ Using baseline data from 1990, the Goals set for 2015 include:

- Halving poverty and hunger
- Achieving universal primary education and gender equality
- Reducing child (under 5) mortality by two thirds (MDG 4)
- Reducing maternal mortality by three quarters (MDG 5)
- Reversing the spread of HIV/AIDS (MDG 6)

- Halving the proportion of people without access to safe water.

INFORMATION FOR CHANGE

A WHO led epidemiological effort has achieved a revised consensus on the current global causes of child death.⁴ In each of the first three years of the 21st century, it is estimated that of the 10.5 million under 5 year olds who died:

- 2.0 million died of pneumonia
- 1.9 million died of diarrhoea
- 0.8 million died of malaria
- 1.0 million died of neonatal infection
- 1.0 million died from the complications of prematurity
- 0.8 million died from birth asphyxia
- Under nutrition is an underlying cause of death in 53% of all deaths.

The publication in *The Lancet* in 2003 of the Bellagio Child Survival Series and in 2005 of the Neonatal Survival Series has provided compelling evidence that 60–70% of child deaths can be affordably prevented with current knowledge.^{5–10} The 19 recommended interventions focus on:

- Newborn health care (skilled birth attendant, prevention of vertical HIV transmission and tetanus protection, early postnatal visit)
- Nutrition (emphasising exclusive breast feeding and weaning with appropriate complementary feeding at 6 months)
- Vaccination (measles, DPT3, and Hib)
- Preventive measures, including clean water and sanitation, vitamin supplements, and chemically treated bednets to combat malarial transmission
- Case management, emphasising early appropriate use of oral rehydration therapy, antibiotics, and antimalarials.

An attempt to cost this model envisages an ambitious programme of 18 contacts with a primary care provider between one month before birth and the age of 5.¹¹

TRACKING PROGRESS

Of the 10.5 million under-5 deaths each year, 94% occur in 60 countries which are home to 500 million children (75% of the world's children).¹² These countries either have a total number of under-5 deaths in excess of 50 000 or an under-5 mortality rate equal to or greater than 90 per thousand.

UNICEF proposes to monitor intervention coverage in these 60 countries.¹⁴ Current coverage rates (as percentages of the at-risk child population receiving the intervention) vary: 74% for measles vaccination, 59% for skilled birth attendants, 61% for one or more doses of vitamin A, 36% for exclusive breast feeding, 20% for antibiotics for pneumonia, and 3% for insecticide impregnated bed nets.¹³ These averages obscure enormous inequity in coverage. It is proposed to include a country level measure of equity of access to child health interventions by comparing coverage rates between the poorest and least poor quintiles for each country's child population.

Taking the 60 countries together, an 8% annual decrease in U5MR is required to achieve MDG 4—the current average decline is 1%. However, the averages hide wide differences between countries. Seven of the 60 countries are on track to achieve MDG 4—Bangladesh, Brazil, Egypt, Indonesia, Mexico, Nepal, and the Philippines. Based on the preliminary analysis of the baseline date, UNICEF has put 19 countries on “red alert”—requiring intensified efforts to urgently save child lives. Between 1990 and 2004 it is estimated that the under-5 mortality rate rose in 15 of these countries—12 in sub-Saharan Africa, where 2 million children are living with HIV and 12 million are orphaned by AIDS. These stark data emphasise the interdependence of development efforts to meet the MDGs.

IMCI

The Integrated Management of Childhood Illness (IMCI) is the key strategic approach currently proposed by WHO to meet the challenge of expanding intervention coverage to meet MDG 4.^{15, 16} It began as a series of evidence based guidelines defining case management of the five diseases to which were then attributed 70% of all deaths between 1 month and 5 years of age in high mortality populations.¹⁷ In this introductory phase IMCI notably omitted any attempt to address the neonatal period. It evolved into a health worker training and supervision package that implicitly and more recently explicitly required health service strengthening (e.g. district level management tools, clinical supervision, and

essential drugs). It has come to incorporate, under the rather awkward term of Community-IMCI, those family and community practices that underlie the take up and implementation of the key child health interventions highlighted by the Bellagio group and others.

First introduced in Tanzania and Uganda in 1996 over the last ten years, IMCI has expanded to over 100 countries. The recently published multi-country evaluation (MCE-IMCI) describes the effectiveness, cost, and impact in five countries in a series of site specific, but, the authors argue, compatible studies.¹⁸ These studies document how IMCI has evolved to meet the challenges posed by the increasing awareness of the importance of neonatal deaths, and secondly, by the HIV pandemic. Unsurprisingly, implementation has been most difficult in countries with the weakest health services and the highest mortality rates. Reassuringly, IMCI training does improve quality of care (as evidenced by more thorough assessment, more accurate treatment, with carers more likely to receive key messages).¹⁹ However, training alone has limited impact without the strengthening of the health system.²⁰

The report emphasises the need to achieve and sustain equity of programme coverage. This requires facilities to be staffed, functioning, and crucially used by local people.

The baseline data highlights low utilisation rates of government health facilities by the families of sick children (8% in Uganda and Bangladesh, reaching 40% only in Tanzania of the five countries studied).^{21–25} Does IMCI improve these utilisation rates? It did in Bangladesh where, after IMCI implementation, 16% of sick children attended IMCI facilities—more than doubling consultation rates from 0.6 to 1.9 visits/child/year. However, there was no improvement seen in Tanzania.

Finally, the investigators report on whether all three components of IMCI could be implemented in a time frame of 3–5 years.¹⁸ Of the 12 “high performing” countries implementing IMCI, most (n = 10) had “strongly implemented” health worker training, but few (n = 5) had even weakly set about improving the health system or family health practices. Implementation of IMCI beyond health worker training seems to be stalled.

The investigators feel that the question “does IMCI work” is “reductionist”. Nevertheless, the readers of *Archives* will want to know the answer! In Tanzania (baseline U5MR = 120) the investigators found a 13% reduction in mortality associated with IMCI

implementation with 95% confidence limits that do or do not include zero, according to whether allowance is made for between district variation. In Brazil (mean U5MR = 34) and Peru (mean U5MR = 29) there was no measurable impact on mortality using routine surveillance data.²⁶ The authors call for more and better effectiveness evaluations, focusing on the feasibility of attaining and sustaining high coverage with community based delivery strategies.

It would appear that IMCI will only produce measurable improvement in the 60 target countries with high U5MR, if health services are able to provide and sustain the key interventions, and they are used by a substantial proportion of the population. In short, the preconditions require both well targeted “top down” (supply side) health service strengthening and “bottom up” (demand side) community mobilisation.

TOP DOWN AND BOTTOM UP

A recent costing suggests a price tag of US\$5 billion to save 6 million child lives in 42 countries.¹¹ The case for a new Global Fund for maternal, neonatal, and child survival of this order of magnitude has been made elsewhere.²⁷ This costing emphasises the cost effectiveness of integrated delivery strategies and assumes a large role for community based provision by health workers. This is seen as critical to achieve high coverage and equity of provision, without which impact will be limited. Who and where are these community health workers?

The IMCI evaluation report (MCE-IMCI) notes that high staff turnover was a serious impediment to sustained implementation of IMCI in three of the five study sites. These were facility based staff subject to the vagaries of transfer. The solution may be to invest in locally based women to scale up these interventions. Several studies have now demonstrated the effectiveness of this approach to improve neonatal intervention coverage.^{28–30} Linkage between community based women and facility based staff remains a challenge but can be promoted by strengthening local accountability.

THE ROLE OF PAEDIATRICIANS

This second child survival revolution is being led by a new consortium of major players, an ethos of social mobilisation, and a programme of evidence based interventions. Paediatricians need to advocate for funding and equity of provision at all levels. We need to focus on the extension of equitable coverage of the effective, feasible, and affordable interventions outlined above.

The NHS links network is a potential vehicle for UK based clinicians to lend their support to hard pressed colleagues overseas.³¹ The International Child Health Group (ICHG) is currently developing with Global Healthcare Information Net,³² an e-forum for child health designed to facilitate knowledge transfer between colleagues in different contexts. A workshop to develop more effective international training links in child health will be held in the autumn of 2006. Paediatricians need to maintain a public health perspective and support programmes designed to empower mothers everywhere if we are to contribute in the push towards MDG 4.

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Authors' affiliations

M Ellis, Centre for Child and Adolescent

Health, Hampton House, Bristol, UK

S Allen, The School of Medicine, Singleton Park, Swansea University, Swansea, UK

Correspondence to: Dr M Ellis, Centre for Child and Adolescent Health, Hampton House, Cotham Hill, Bristol BS6 6JS, UK; m.ellis@bristol.ac.uk

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Preventive children's services

From health surveillance to health promotion: the changing focus in preventive children's services

M Blair, D Hall

The shift from surveillance to promotion requires paediatricians to play several roles in a larger multidisciplinary and multi-agency team

Child health surveillance programmes aim to prevent disease, detect physical and developmental abnormalities, and promote optimum health and development. There is growing evidence over the past decade that early intervention can change the life course for disadvantaged children. The emphasis has shifted from detecting developmental problems to preventing them and, in recognition of this change, the term "child health surveillance programme" has given way to "child health promotion programme". Putting this programme into practice calls for awareness of the evidence as to what works. The evidence supports the need for a universal preschool service for all families and targeted intensive home visiting for high risk children. Preschool intervention and education benefit all children but particularly those at risk of educational failure. Children's Centres may offer the opportunity to provide a more effective integrated service. The shift from surveillance to promotion requires paediatricians to play several roles in a larger multidisciplinary and

multi-agency team, contributing to health promotion as well as facilitating early identification and providing expert diagnostic and management services.

The current interest and investment in the promotion of optimum health and development for children is the result of emerging evidence that outcomes and life chances can be improved by preschool intervention programmes, coupled with growing concerns about health inequalities, educational underachievement, juvenile crime, and social exclusion.¹ Such concerns are not new; efforts to address their root causes date from the 19th century when there was a major public investment in sanitary reform and other environmental improvements. In the first half of the twentieth century, the major health concerns were nutritional deficiencies and infectious diseases. As these scourges came under control, more attention could be devoted to child rearing issues, behavioural problems, chronic disorders, and preventive medicine.² Routine well-child examination schedules evolved that also included

nutritional advice and immunisation; the whole package was designated the Child Health Surveillance (CHS) programme.³ Its focus was on the under-5s and the three main aims were disease prevention, health promotion, and early detection and intervention for physical and developmental abnormalities (fig 1).

Over the past 20 years the content of the CHS programme has been reviewed and updated four times by the UK Joint Working Parties on Child Health Surveillance.⁴ Their reports take an evidence based approach and argue that, while these three aims are as important as ever, the investment in routine examinations to detect occult disorders should be rationalised and reduced, whereas health promotion deserves a much greater commitment. This analysis is endorsed by the National Service Framework for Children, Young People and Maternity Services (NSF),⁵ published in 2004 by England's Departments of Health and of Education and Skills, which proposes that the term CHS be replaced by "Child Health Promotion Programme". The details of this new programme are set out in Standard One of the NSF.

The NSF programme emphasises the importance of implementing what is already known about prevention, early detection, and health promotion. Screening procedures are kept under regular review by the UK National Screening Committee, while many aspects of health promotion have been extensively studied and some have been the subject of systematic review. Examples of effective interventions include immunisation, promotion of breastfeeding, campaigns to reduce the risk of sudden infant death, injury prevention programmes, and support for depressed mothers. Although much