Research in Resource-limited Settings

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Abstract

After long periods of vast child health disparities between industrialized countries and Resource-limited Settings (RLS) a wave of research has started to address and reduce the gap. Major global collaborations have been mutually rewarding and have established funding and career structures unthinkable even 25 years ago. Despite this progress, work remains to ensure academic and funding equity and ethical parity. This paper outlines the background to and history of research in RLS, illustrates the current situation and points to potential future developments.

Keywords Millennium Development Goals (MDGs); research ethics; Resource-limited Settings (RLS); United Nations Children's Fund (UNICEF); World Health Organisation (WHO)

Introduction

Imagine that global health research resources: financial, academic and human, were distributed proportional to needs as defined by perinatal, neonatal and child morbidity and mortality. In that Utopia, those countries classed Lower and Middle Income (LMIC or alternatively Resource-limited Settings) would be swamped with the means to improve their health trajectories.

Despite the high ideals of the Millennium Development Goals (MDGs) and some recent if limited progress towards their targets, the world, sadly, remains inequitable. Typical sub-Saharan African and south Asian mortality rates of 60/1000 (perinatal), 100/1000 (infant) and 160/1000 (under five) of largely preventable causes compare starkly with industrialized rates in the order of 3, 5 and 10/1000 respectively. Data from global sources such as the WHO, UNICEF and the Global Health Council show consistent unacceptable differences in both infant and under-five mortality between industrialized and RLS from eminently preventable causes. This is compounded by malnutrition which contributes to 2 million childhood deaths (attributable to stunting, wasting and restricted intrauterine growth) half of which are at least partially attributable to micronutrient deficiencies Figures 1–3.

The tide, however, does seem to be slowly turning and a number of recent measures have generated an impetus. These include: the Millennium Development Goals (part 'carrot', part 'stick'), high profile philanthropic donations typified by Bill and Melinda Gates, pharmaceutical assistance in the form of subsidized drug treatments, and greater weight to RLS research from the large research foundations.

There is no such entity as a definitive review of paediatric research in RLS but this review will set out to introduce the following: history, ethics, current activity and deficits, donor politics, and careers within such research.

For the sake of clarity we will define what we mean by LMIC using the World Bank 2013 criterion which considers countries by their Gross National Income (GNI) per capita. Economic criteria classifies countries as low income when its GNI is US $ less than 1035; lower–middle when it is US $ 1036–4085; higher middle when it is US $ 4086–12615; and high income when it is US $ more than 12,616.

History

Though the major tropical academic institutes, Liverpool, London and Amsterdam were founded over a century ago, research has, until recently been of lower profile than 'traditional' overseas expatriate work involving direct clinical care or education. Typical examples of the latter would be either a stable clinic or hospital often founded and supported by religious foundations. This was, and still is, most obvious in sub-Saharan Africa where the evangelical legacy remains very strong amongst all the previous European colonies. An alternative more recent approach is the rapid response style as typified by the International Committee of Red Cross (ICRC) and Mèdecins Sans Frontières (founded in the early 1970s) and numerous non-governmental organisations (NGOs) in reaction to war or natural disasters. For many such organizations, work continues beyond the resolution of the immediate humanitarian crises to improve the often paltry infrastructure and to assist in the creation of systems sustainable independently locally.

The evolution of the Liverpool School of Tropical Medicine (LSTM) illustrates the history of recent research well. The LSTM, the oldest tropical research institute in the world was established at the turn of the 20th century and built its first overseas research lab in Sierra Leone in 1921. After a wave of discovery including establishing the ground-breaking link between the black fly vector, filaria and river blindness, momentum slowed until after World War II.

Post war, a number of major Western institutions forged academic partnerships and research activity burgeoned. The research however was patchy and often disorganized. Studies were largely observational and when trials were conducted, ethical considerations such as consent and unnecessary enrolment beyond positions of equipoise were a commonplace.

Interest in conducting trials in RLS was also until recently largely driven by and dependent upon the perceived potential profit for pharmaceutical companies developing newer therapies. The classic example is HIV where huge amounts of money have been invested in drug development in the West, where profit is

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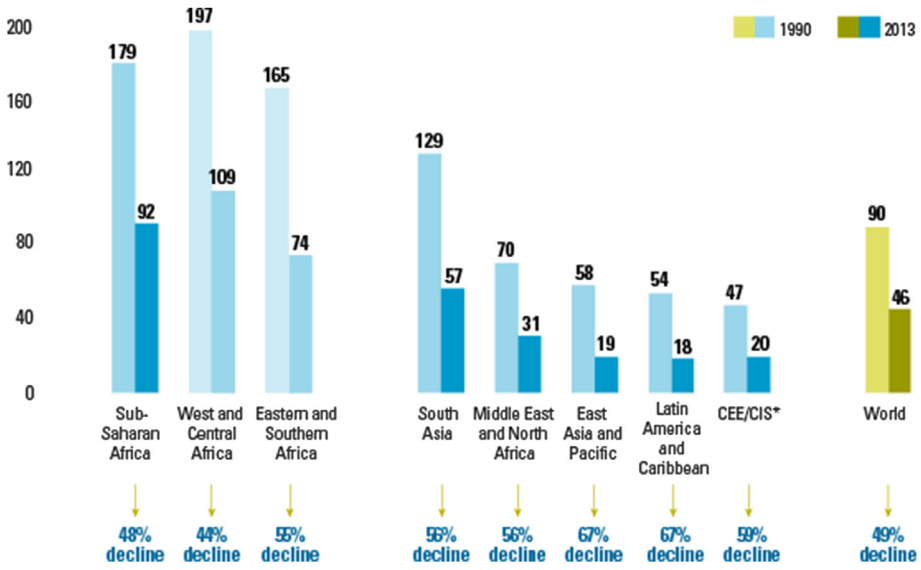

Figure 1 Despite progress, under-five mortality rates are still far higher in low-income countries than in high-income countries. Under-five mortality rates (vertical axis) and number of deaths (bubble size) by income level, 1990 and 2015. Note: The vertical axis refers to the under-five mortality rate and the size of the bubble is proportional to the number of under-five deaths. Source: Committing to Child Survival: A Promise Renewed, Progress Report 2015 (UNICEF, with permission)

guaranteed; while the majority of the world's HIV infected population in sub-Saharan Africa (SAA) was offered pitifully limited access to even the cheapest anti-retroviral drugs.

In the last quarter century emphasis has shifted towards trial based research and this has gathered momentum near exponentially since the millennium. This has been facilitated by support from philanthropic donors such as the Bill and Melinda Gates Foundation (the example par excellence), and enhanced funding of established institutions such as the Wellcome Trust, Department for International Development (DFID), the National Institute for Health (NIH) in the US. Contemporaneously, academic tropical research has developed a formal career structure and is no longer seen as the Cinderella 'overseas-see-the-world-experience' it was even a decade ago.

This progress has to be placed in perspective however, and Figure 4 illustrates the ongoing disparities in research activity.

Priorities of research in RLS

Limited financial resources make it necessary that the health authorities in developing countries set priorities in research as per the health needs. In this, again priorities need to be set for basic research, clinical research, vaccine trials, intervention studies and operational research. The MDGs, adopted by 189 nations in the United Nations Millennium Declaration in September 2000, have provided a source of priorities. Specific goals address the need to reduce burden of child and maternal mortality, and of HIV/AIDS, malaria and other diseases. The Partnership for Maternal, Newborn and Child Health (PMNCH) joins the reproductive, maternal, newborn and child health (RMNCH) communities into an alliance of more than 500 members, across seven constituencies: academic, research and teaching institutions; donors and foundations; healthcare

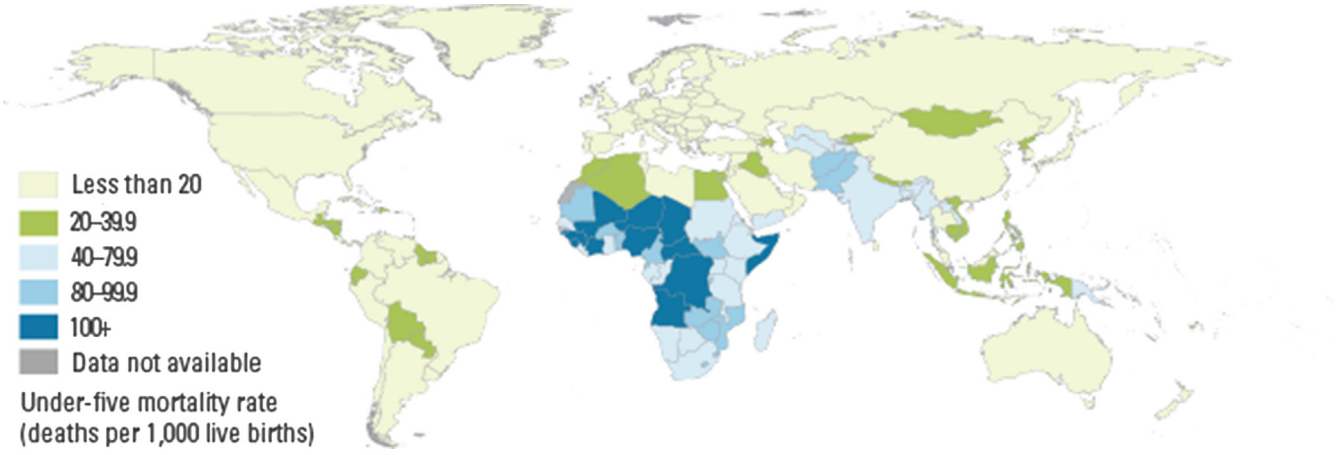

Figure 2 Under-five mortality rate and under-five deaths by country, 2015. The highest national under-five mortality rates are found in sub-Saharan Africa. Source: Committing to Child Survival: A Promise Renewed, Progress Report 2015 (UNICEF, with permission)