health system and improving health outcomes for the country's most vulnerable citizens. The *Lancet* Pakistan Series further shows the knowledge and public health capability in Pakistan, and clearly points the way to health reform, particularly in the post-devolution scenario. But tough questions remain. Will the commitment and generosity of communities throughout Pakistan be mobilised to address the most devastating day-to-day public health disaster the country faces? Will policy makers use experience of disasters to expand health-care services in difficult-to-reach areas? Will political resolve be galvanised, reforms implemented, and resources made available?

Pakistan has shown some public health success in response to natural disasters and humanitarian emergencies. The lessons and opportunities must be applied to the health system to prevent the continued death of more than 400 000 children and 12 000 women each year.

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Medical education and research in Pakistan

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See Comment pages 2232 and 2236

See Series pages 2281 and 2291

The construction of health facilities, establishment of medical schools, and recruitment of health workers in the public sector have been important aspects of a popular political agenda in Pakistan, especially for elected governments. According to official reports, the number of medical graduates has increased from 500 in 1947 to 171 450 in 2012 and the number of medical colleges has increased from two to 88, respectively. The total budget of the Pakistan Medical Research Council (PMRC) has increased 2·5 times between the fiscal years 2007–08 and 2011–12; and the number of health research publications has increased 7·5 times between 2001 and 2011 (figure).[1,2] These increases give the illusion that the number of doctors in Pakistan who are capable and competent of providing needed clinical services to the population is adequate; that there is an increase in the number of research publications about health issues suggesting that we have skilled researchers; and that funding for health research by the government has gone up over the years.

The truth is not so auspicious. Over recent years the real increase in the number of medical graduates

has been due to an increase in the number of private medical schools, which charge higher tuition fees but provide varying quality of education and have essentially become a big business enterprise. Medical experts and the Pakistan Medical Association have decried the lack of faculty, facilities, and support to train students properly at these institutions. Concerns have been raised about the teaching hospitals affiliated with these colleges, shortage of full-time staff, reliance on part-time faculty, and inadequate availability of support facilities.[3,4] Moreover, Pakistan's traditional emphasis on the training of medical doctors rather than other health-care workers has led to greatly disproportionate human resource ratios and medicalisation of health, leading to an inequitable distribution of doctors in the country and reduced focus on health promotion and prevention.

Despite a visible increase in the number of peer-reviewed publications, research output by medical schools—based on bibliometric analyses—varies greatly, ranging from two to 521 publications per school per year. Most of these publications are not indexed in PubMed.[5,6] Only a few medical schools have more than 100 publications per year and the rest barely publish ten or more items a year, including non-indexed publications.[5,6] Equally important is how this research is used. The primary purpose of any research is to contribute to existing knowledge so that informed decisions can be made to improve population health. Recent discussions with policy makers and health managers showed that health research published in Pakistan has rarely been used to inform decision making and national policy planning processes.[7]

One explanation for the low number of publications is that funding for health research in Pakistan comes mostly from the government and development partners, with the exception of pharmaceutical research. Most of this funding is from the public sector and PMRC is the lead agency responsible for funding and supporting medical (and public health) research in Pakistan. Despite the 2·5 times increase in its budget, the painful reality is that the PMRC's research budget has barely increased during 2007–12, and remains low (US$25 000 in 2007 and $32 000 in 2012). The overall budget increase is attributable primarily to staff salaries, but actual research funding remains low. Without research funding, staff are neither able to undertake nor commission any research in Pakistan.[1]

Furthermore, the governance of medical education and research is the primary responsibility of the Pakistan Medical and Dental Council (PMDC), which is also the licensing organisation for medical schools and public health institutions, and is responsible for setting standards for medical education and research. The Higher Education Commission (HEC), established in 2002, has also assumed a large role in teaching, training, and research, including training and research in health. The PMDC and HEC made research publications a requirement for faculty promotion; as a result, faculty members often publish articles in non-peer-reviewed journals, non-indexed journals, or journals owned by their medical colleges. 25% of the 88 medical schools have their own medical journals but only the *Journal of Ayub Medical College Abbottabad* is indexed in PubMed. Hence, only a few of the publications generated by medical research in Pakistan appear in indexed journals.

Therefore, despite what seem to be impressive gains in medical education and health research in Pakistan, the actual state of affairs is neither exciting nor remarkable. Pakistan now needs to invest in human and other resources to generate and use policy-relevant knowledge in health. This investment will not only enable informed decisions to be made but will also improve the performance of the national health systems. The positive roles of regulatory organisations like the PMDC and HEC are essential. However, if Pakistan wishes to

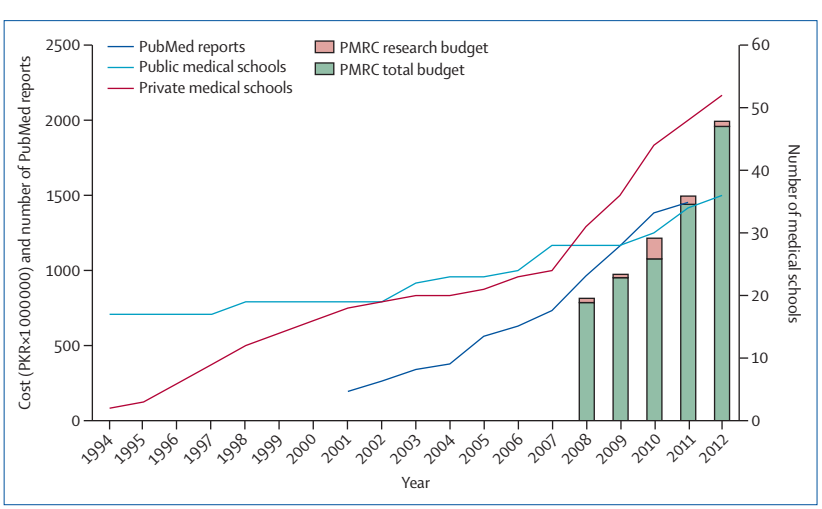

Figure: **Increases in the number of medical and public health schools in Pakistan during 1994–2012, total costs and research budget of PMRC during 2008–12, and number of PubMed reports published by medical schools during 2001–11**
PMRC=Pakistan Medical Research Council.

use research evidence for improved policy and management decision making, appropriate funding for crucial research, good research management, fair incentives for research production, appropriate recognition by the government, and strong support from the development community are all important components.

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Philanthropic funding for health in Pakistan

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Although increasing use of technology continues to escalate health-care costs, Pakistan's experience shows how in a low-income country that allocates little public funding for the health sector,[1] more privileged individuals are assisting those who are less privileged. Sadly, similar to public funding, private donations mainly support curative efforts with little spent on preventive care. Health professionals, particularly physicians, have an important role in persuading philanthropists to redress this imbalance.

With no national health insurance and a weak social protection system in Pakistan, individual donors, foundations, business corporations, and community and faith-based organisations have stepped in to support health-care activities, including service delivery. Of the nationwide 261 civil society organisations certified by the Pakistan Centre for Philanthropy, 32% work in the health sector (figure).[2]

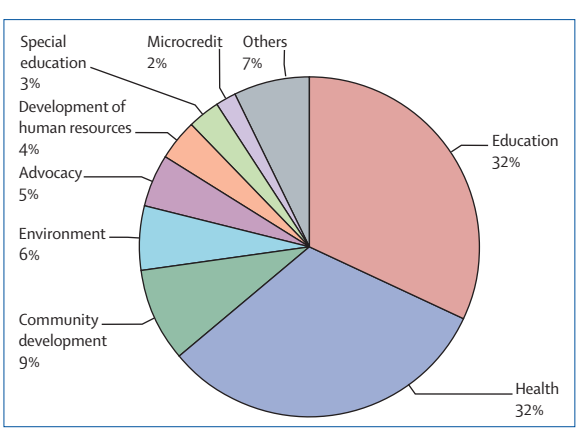

Figure: **Civil society organisations certified by the Pakistan Centre for Philanthropy by sector**
Data are from the Pakistan Centre for Philanthropy.[2]

The amount, patterns, and forms of philanthropy in Pakistan remain poorly characterised. Results of previous studies indicate a strong giving and volunteering tradition rooted in religion, civic duty, and social responsibility. The findings of the first ever national study of individual philanthropy in Pakistan (2000)[3] show that individuals gave an estimated PKR70 billion (US$1·4 billion) in cash, in kind, and in voluntary time. By 2010, the amount had increased to an estimated PKR198 billion ($2·32 billion at prevailing parity),[4] substantially higher than the largest ever yearly aid package of $1·5 billion authorised to Pakistan by the USA under the Kerry-Lugar Bill (2009). In Punjab (home to two-thirds of the population of Pakistan), individual donation in 2008 amounted to PKR103·6 billion ($1·6 billion).[4] The same year, family foundations in Punjab donated PKR3·6 billion, with 73% engaged in the health sector.[5]

Zakat (obligatory Islamic poor tax of at least 2·5% per year on financial assets) is the most common form of charity in Pakistan and is one of the five pillars of Islam. It constitutes both private and voluntary donations by individuals and officially administered donations. The officially administered zakat is deducted at a rate of 2·5% per year on the value of financial assets of Muslims who authorise such deductions. Despite growth in gross domestic product and rising inflation, official zakat collection has stagnated in recent years