In this month's Bulletin

This month the *Bulletin* explores the challenges of supplying enough human resources to achieve universal health coverage. In the lead editorial, Mozart Sales at al. (798) introduce the issue and the Third Global Forum on Human Resources for Health at which it will be launched. Feng Zhao et al. (799) follow in explaining the necessity for change, Alexandre Padilha et al. (800) call on politicians worldwide to pay more attention to their health systems and Viroj Tangcharoensathien & David B Evans (801) argue for better training on health policy.

In the news section, Claudia Jurberg interviews Francisco Eduardo de Campos (806–807) about Brazil's effort to distribute doctors more evenly in rural areas. Priya Shetty (804–805) reports on efforts to train and employ more midwives in Ethiopia and Somalia.



How much do doctors cost?

P Hernandez-Peña et al. (808–815) quantify the wage bill for health workers.

Analysing the market

Barbara McPake et al. (841–846) examine factors influencing supply of – and demand for – health workers.

4 million missing

Robert Bollinger et al. (890–891) suggest that information technology can help fill workforce gaps.

Sticking to the code

Amani Siyam et al. (816–823) report use of the WHO Global Code of Practice on the International Recruitment of Health Personnel.

Rethinking the health system

Sania Nishtar & Johanna Ralston (895–896) suggest that the health workforce can catalyse change.

Covering all bases

Angelica Sousa et al. (892–894) propose a health labour market framework.

Debating the measures

Giorgio Cometto & Sophie Witter (881–885) weigh the options for benchmarks and monitoring frameworks. Ties Boerma & Amani Siyam (886) argue for definitions, registries and a census of health workers. James Campbell (886–887) advocates for a workforce that's fit for purpose. Xenia Scheil-Adlung (888) points out that health workforce benchmarks should be compatible with sustainable development. Brook K Baker (889) explains why targets need to be patient-centred.

Who delivers better care?

Zohra S Lassi et al. (824–833) review the evidence on mid-level health workers.

Human resources for universal health coverage: from evidence to policy and action

Mozart Sales,^a Marie-Paule Kieny,^b Ruediger Krech^c & Carissa Etienne^d

The seminal role of human resources for health (HRH) in the attainment of health-related goals has long been recognized and was recently reaffirmed by the United Nations General Assembly, which identified the need for "an adequate, skilled, well-trained and motivated workforce" to accelerate progress towards universal health coverage (UHC).¹ Yet, under existing affordability and sustainability constraints, countries at all levels of socioeconomic development are confronted with challenges in trying to match health worker supply and demand. Against this backdrop, the Third Global Forum on Human Resources for Health, which will take place in Recife, Brazil, from 10 to 13 November 2013, seeks to set out a contemporary and forward-looking HRH agenda and to bolster political commitment to support its implementation.

Health workforce development is partly a technical process and, as such, it requires expertise in human resource planning, education and management. It is also, however, a political process requiring the will and the capacity to coordinate efforts on the part of different sectors and constituencies in society and different levels of government. This theme issue on human resources for UHC covers both of these aspects by providing examples of how countries have aligned political will and sound technical strategies and by presenting new analytical tools and evidence surrounding successful or promising innovative approaches.

Several success stories – from Brazil to Sudan,² from Cameroon³ to Thailand,⁴ from Ghana to Mexico⁵ and Indonesia⁶ – have sprung from efforts to improve the availability, accessibility, acceptability and quality of the health workforce, with corresponding improvements in health outcomes. The pathways chosen have varied in accordance with the needs, contextual factors and opportunities specific to each setting. But as Padilha et al. point out, without high-level political commitment we will not be able to progress beyond piecemeal and short-term approaches and ensure the alignment and coordination of different sectors and constituencies in support of long-term human resource development efforts.⁶

Other articles in this theme issue contribute to strengthening the policy frameworks and evidence base surrounding HRH by: (i) helping us to understand the market forces affecting HRH;^{7,8} (ii) highlighting best practices and lessons learnt in relation to the retention of health workers in rural areas⁹ and the international migration of health workers;¹⁰ (iii) providing new evidence and recommendations on the effectiveness of mid-level¹¹ and community-based¹² health workers and on the system support they require; and (iv) identifying opportunities for innovation in HRH education and management support through the use of emerging technologies.13

As countries aspire to achieve UHC, new demands will be placed on health workers.¹⁴ New competencies will be required of them as part of a deeper transformation of professional education,¹⁵ which in future will have to contribute more broadly to building institutional capacities.¹⁶ Equipping trainees with clinical skills will not suffice.

Implementing an HRH agenda conducive to the attainment of UHC will require both more resources and their more efficient use. Domestic spending on HRH is lower than is typically assumed¹⁷ and in many countries larger investments are both necessary and possible. In settings where external support is still required, the impact of development assistance for HRH development can be maximized through more strategic targeting.¹⁸ Only systemic action can address deep-seated challenges in the area of HRH; only sustained political commitment can, in turn, provide a basis for such action. By linking the evidence to the policies and politics surrounding health workforce development, this theme issue provides a foundation for the Third Global Forum on Human Resources for Health and, more generally, for a health workforce discourse instrumental in the pursuit of UHC.¹⁹

We, the national and international partners convening the Third Global Forum on Human Resources for Health, encourage everyone to support an ambitious and transformative agenda that places citizens' right to health at the heart of development policies and that treats progress in the area of HRH as a key driver of broader health system development. We call upon national leaders to confirm their commitment to this agenda by creating a governance and policy environment that is conducive to the transformative development of HRH and by investing the necessary resources in health workforce development, deployment and management. We also call upon health workforce planners and managers to adopt and put in place effective, evidence-based policies. Finally, we call upon the international community to work together on the development of HRH as a shared global priority and to let all its actions be inspired by the principles of international solidarity, multilateral collaboration and mutual accountability.

References

Available at: http://www.who.int/bulletin/ volumes/91/11/13-131110

^a Ministry of Health, Brasilia, Brazil.

^b Global Health Workforce Alliance, World Health Organization, Geneva, Switzerland.

^c Ethics, Equity, Trade and Human Rights, World Health Organization, avenue Appia 20, 1211 Geneva 27, Switzerland.

^d Pan American Health Organization, Washington, United States of America.

Correspondence to Ruediger Krech (e-mail: krechr@who.int).

Investing in human resources for health: the need for a paradigm shift

Feng Zhao,^a Neil Squires,^b David Weakliam,^c Wim Van Lerberghe,^d Agnes Soucat,^a Kadidiatou Toure,^e George Shakarishvili,^f Estelle Quain^g & Akiko Maeda^h

Development partner strategies and support in the area of human resources for health (HRH) have been shaped by key reports and events over the past decade. Since 2004, when The Lancet published the Joint Learning Initiative's call to overcome the HRH crisis,¹ the global health community has been trying to address the critical issues surrounding HRH. The 10-year action plan on HRH proposed in The world health report 2006² and the establishment in the same year of the Global Health Workforce Alliance have drawn unprecedented attention to HRH. Thanks to a growing body of evidence,² HRH issues have gradually made their way into the global health arena. Consensus has emerged on the "power of health workers"1 and their critical importance to health system strengthening and disease control programmes.²

Increased international resources have flowed towards HRH over the past decade, either directly through targeted HRH funds or indirectly through programmes for disease control or health system strengthening. In some countries, development partners have contributed to the achievement of tangible results. Rwanda's performance-based payment to health workers and Ethiopia's health extension programme have both been heralded as successes.3 In spite of these efforts, however, global investment in HRH has suffered setbacks that have undermined its effectiveness and impact. Such investment remains uncoordinated and fragmented. International programmes sometimes compete for the few existing HRH, which exacerbates the HRH crisis. Furthermore, investment in HRH has been largely focused on short-term solutions to the crisis rather than on building sustainable HRH systems. The global health community needs to think strategically about how to make investments in HRH more efficient, effective and relevant to country needs. The following paradigm shifts will be critical to future international investment in HRH:

- i) From a global to a country-specific approach. HRH issues are not only multifaceted, but also specific to each country. Although this is not a new idea, it has yet to be fully translated into investment practice. International efforts first need to focus on helping countries to develop an HRH strategy reflective of specific domestic contexts and international best practices. Development partners then need to jointly align their resources with the country strategies while building on the experience of the International Health Partnership.
- ii) From short-term solutions to longterm system-building. Although health workforce remuneration and in-service training – the forms of support most commonly offered by development partners⁴ – are important, they maintain the workforce but do not truly strengthen the system. They may help redress acute shortages but cannot solve the system's deeper deficiencies. Development partners need to invest in building sustainable HRH systems through measures such as pre-service training.
- iii) From a public-sector-centric to a comprehensive labour market approach. Investment in HRH has traditionally been biased towards public-sector and supply-side solutions. With half of the health expenditures in Africa coming from private sources and the number of private medical and nursing schools rising in developing countries, this approach is outdated. The recent

labour market analysis³ lends support to a comprehensive approach to integrating supply and demand, the public and private sectors, and health and other critically important sectors. Unless the investment aligns with this integrated approach, it will only partially address the overall problem.

- iv) From the traditional health education model to a modernized production system. The field of health has evolved rapidly in recent decades, yet health workforce training curricula have barely changed. A shifting disease burden and strides in information and communication technologies make reforms in health education mandatory. Task delegation, the redistribution of responsibilities and patient empowerment are changing the workforce landscape in high- and low-income countries. Future investment, both international and domestic, will need to finance a modernized system for the production of a diversified workforce.
- v) Towards greater investment in building knowledge and in a comprehensive data system. A knowledge base to inform HRH policies and strategies must be created. We can only demonstrate results if countries put comprehensive information systems in place, but they often lack the resources to do so.

The global health community must embrace these paradigm shifts if it is to deal effectively with the critical issues surrounding HRH.

References

Available at: http://www.who.int/bulletin/ volumes/91/11/13-118687

^a African Development Bank, Rue de Ghana BP 323 – 1002 Tunis Belvédère, Tunisia.

^b Department for International Development, London, England.

^c Global Health Programme, Health Service Executive, Dublin, Ireland.

^d Institute of Hygiene and Tropical Medicine, University of Lisbon, Lisbon, Portugal.

^e The Partnership for Maternal, Newborn and Child Health, Geneva, Switzerland.

^f The Global Fund to Fight AIDS, Tuberculosis and Malaria, Geneva, Switzerland.

⁹ United States Agency for International Development, Washington, United States of America (USA).

^h The World Bank, Washington, USA.

Correspondence to Feng Zhao (e-mail: f.zhao@afdb.org).

Human resources for universal health coverage: leadership needed

Alexandre Padilha,^a Joseph Kasonde,^b Ghufron Mukti,^c Nigel Crisp,^d Keizo Takemi^e & Eric Buch^f

Global leaders have recently reaffirmed their commitment to the principle of universal health coverage (UHC).1 The experience of the health-related Millennium Development Goals (MDGs) has taught us, however, that to translate such a principle into reality, health systems must be strengthened. Key to such strengthening and to improving health service coverage and health outcomes is the availability of a sufficient, equitably distributed, skilled and motivated workforce.² Yet in many countries health workforce shortages and poor worker distribution, training and performance hinder the attainment of the health-related MDGs and UHC.

Human resources for health (HRH) challenges are complex. Piecemeal solutions, such as short-term in-service training initiatives, abound. However, strategies to systematically address deeprooted human resource problems require a long-term perspective and collaboration among many stakeholders and constituencies, brokered and led by national governments.³ Several different paths towards strengthening the health workforce are possible, as the following examples illustrate.

In Brazil, the Unified Health System, grounded in the national constitution, has brought improved HRH policy-making and management. It took intersectoral and interagency collaboration to secure the required thrust and resources. No single HRH plan was developed, and yet Brazil succeeded in achieving sustained growth and more equitable worker distribution. Between 1990 and 2007 physician density rose from 1.17 to 1.74 per 1000 population and family health teams were deployed to rural areas.⁴

In Indonesia, the HRH agenda was bolstered by the decentralization reforms of 1999, whereby almost 2.4 million central government civil servants were successfully reassigned to local governments.⁵ To overcome persistent worker shortages, maldistribution and dual practice, the government has enacted measures for improving health workforce education, equitable deployment and performance. HRH information systems have been strengthened. Coordination of national stakeholders has improved and resource allocation from both domestic and international sources has increased.⁶ The national density of physicians, nurses and midwives has risen from 1.25 per 1000 population in 1997 to 2.06 in 2012.^{7.8}

In Zambia, important innovations took place in HRH development, including initiatives to upgrade the training of existing staff, create new cadres to formalize task delegation and provide direct access to mid-level specialist training.⁹ A new national HRH strategy, built on lessons learnt in the last decade, complements the traditional focus on producing new health workers with improved worker management, performance, distribution and retention.

Brazil and Indonesia are on track to achieve MDG 4 and are making progress towards MDG 5 targets.¹⁰ Zambia has seen an important reduction in child mortality. In all three countries sustained, high-level political commitment across several sectors, including the health sector, accounts for these achievements.

In health service delivery, human resources are arguably the most critical component, alongside pharmaceutical products, information systems and equitable financing mechanisms. Weakness in any of these interdependent components can thwart efforts to attain UHC and undermine health service effectiveness. Without an adequate health workforce, UHC cannot be achieved.

Decisions influencing the health labour market – e.g. education policies, remuneration packages, employment conditions and private sector regulation – go beyond the technical and sectoral remit of health ministries. For instance, a national HRH strategy should take into account the health sector's potential as a source of qualified employment opportunities and a driver of economic growth,¹¹ but also its need to be compatible with a country's macroeconomic context.¹²

The multisectoral, long-term nature of HRH actions demands strategic leadership and robust coordination, nationally and locally, which only high-level political commitment can guarantee. Such commitment, which is necessary to align and sustain the efforts of different line ministries and other constituencies, should shape national health and broader development strategies, whose implementation should be regularly monitored.¹³

The international community can contribute by providing technical and financial assistance, aligned with national priorities, and by promoting periodic reviews of progress and opportunities for shared learning. Rather than copy staffing structures and arrangements from abroad, countries planning for UHC should meld these with lessons from their own rich traditions, especially in mid-level and community health worker programmes. This is an area in which everyone has something to teach and something to learn.

Advancing the 21st century HRH agenda towards UHC requires committed political leadership to match affordability and sustainability, demand and supply, to serve population needs. The upcoming Third Global Forum on Human Resources for Health can serve as a platform to jointly commit to this agenda. Much progress has been made towards resolving the global HRH crisis since the launch of the Global Health Workforce Alliance in 2006, but it is up to leaders around the globe to harness the resulting momentum towards making UHC a reality.

References

Available at: http://www.who.int/bulletin/ volumes/91/11/13-118661

^a Ministry of Health, Brasília, Brazil.

^b Ministry of Health, Lusaka, Zambia.

^c Ministry of Health, Jakarta, Indonesia.

^d House of Lords, London, England.

^e House of Councillors, Tokyo, Japan.

^f Faculty of Health Sciences, University of Pretoria, PO Box 667, Pretoria, 0001 South Africa.

Correspondence to Eric Buch (e-mail: eric.buch@up.ac.za).

Beyond clinical skills: key capacities needed for universal health coverage

Viroj Tangcharoensathien^a & David B Evans^b

Global commitment to achieving universal health coverage (UHC) has grown stronger in recent years.¹ With this commitment has come the realization that, for UHC to be attained, the health workforce must possess clinical and non-clinical skills and competencies that respond to actual population needs.² The workforce is vital to well-functioning health-care delivery systems and equitable access to health services, but it is not enough to produce more health workers and place them where they are needed: we must also transform their education.³

Several capacities beyond clinical skills that are key to attaining UHC are uncommon in the health sectors of low- and middle-income countries. Experiences in China,⁴ Mexico⁵ and Thailand,⁶ and in other countries rapidly progressing towards UHC, have demonstrated the need for capacity in two broad areas: policy formulation and policy implementation.

Policy formulation

In countries pursuing UHC, the health sector needs not only professionals who are clinically competent, but also people with the capacity to generate countryspecific evidence on the feasibility, sustainability and equity of different financing sources – e.g. taxes, health insurance premiums, out-of-pocket payments and donor contributions. It also needs professionals able to generate evidence on purchasing modalities and on the costeffectiveness of new health technologies for the design of benefit packages.

Another essential capacity is that of translating evidence into policy. This is a nonlinear process: analysing evidence for decision-making takes skill and long-term institutional capacity, which can be developed through mechanisms such as independent policy "think tanks".^{7,8} The process of informing policies must be country-led and executed through national institutions, not foreign experts. The capacity to design UHC systems is also critically important. All sorts of choices must be made, including how to pay providers, and each has implications for financial risk protection, access to care, health system accountability and responsiveness, cost containment and system efficiency.⁹ For example, certain measures introduced in countries of the Organisation for Economic Cooperation and Development, including closed-end payments, have resulted in improved microeconomic incentives for health-care providers.¹⁰

Also indispensable is the capacity to monitor progress towards UHC, including the level and distribution of service utilization and financial risk protection. Health sector professionals need to know how to track and analyse the evidence needed to monitor equity. They must also be adept at designing and adapting survey instruments and other means of collecting the evidence.¹¹

Finally, several longer-term, normative activities are required to feed into the process of generating and monitoring evidence. These involve the capacity to perform regular updates of national health accounts to show the nature of expenditures and service purchases by governments, donors and households. Evidence of changes in the burden of disease and exposure to risk factors, especially for noncommunicable diseases, laid the foundation for long-term health policy and systems research.

Policy implementation

The capacity to raise revenue is the foremost requirement when implementing policy. In a contributory scheme, collecting premium payments from informal sector workers is difficult because of their irregular incomes and high mobility. Under a mandatory system financed through payroll taxes, there must be enforceable sanctions for evading contributions and falsely reporting items such as payroll size and number of employees. Another requirement is active purchasing capacity. Measures to ensure that health-care providers act in the interests of the population and to counteract the unintended effects of either open- or close-end provider payments need to be supported by evidence and require operations skills. Medical and financial audits, rewards for good performance and sanctions for poor work promote mutual accountability between health-care providers and health service purchasers.

In the transition towards UHC, fragmented schemes targeting different population groups, a legacy from the past, must be dealt with.¹² Convening, negotiating and consensus-building capacities are needed to harmonize benefit packages and payment methods and to minimize gaps across schemes, but these skills are not traditionally taught to health sector professionals. Developing these capacities requires an enabling and supportive environment - facilitated through networking with partner institutes, such as research centres and academic institutions - and a sound insurance agency governance structure.¹³

Conclusion

The capacities described herein must be part of the discussion surrounding UHC and the necessary institutions must be in place to nurture them. UHC undoubtedly depends on doctors, nurses and allied health professionals, but also on researchers, policy analysts, economists, actuarial scientists, financial managers, auditors and lawyers. International development partners must help countries to strengthen the needed capacities and to share their experiences with other countries seeking to attain UHC.

References

Available at: http://www.who.int/bulletin/ volumes/91/11/13-121335

^a International Health Policy Programme, Ministry of Public Health, Muang District, Nonthaburi 11000, Bangkok, Thailand.

^b World Health Organization, Geneva, Switzerland.

Correspondence to Viroj Tangcharoensathien (e-mail: viroj@ihpp.thaigov.net).

Public health round-up

Diabetes education in the Russian Federation



People with diabetes attend group classes at a hospital in the Russian city of Stavropol on how to manage their condition. World Diabetes Day, on 14 November, marks the end of a four-year International Diabetes Federation campaign to raise awareness about the disease and how to prevent it.

Getting health into the 2015 climate change agreement

World Health Organization (WHO) experts will join their colleagues from health and environment nongovernmental organizations at a Climate and Health Summit on 16 November to prepare their case for the strong inclusion of health in a global climate agreement.

The one-day summit in Warsaw, Poland, will take place in parallel with climate change talks in the city from 11-22 November, during which about 200 participating nations will work towards a new global agreement on greenhouse gas emissions to be signed in 2015.

"The UN Framework Convention on Climate Change (UNFCCC) process is taking more account of health and WHO is involved in operational mechanisms established to support countries

to mitigate and adapt to the negative consequences of climate change," said Dr Diarmid Campbell-Lendrum, a scientist working with WHO's Evidence and Policy in Emerging Environmental Health Issues unit.

Health is included in two key articles of the UNFCCC and WHO is working with the UNFCCC secretariat to provide support to countries in designing the health component of national plans for adapting to climate change, he explained. In addition, WHO closely follows the UNFCCC process to identify opportunities for health - a key sector for building resilience to climate change effects.

"Countries are beginning to heed our message that well planned action to reduce greenhouse gas emissions can also bring big health gains, most obviously through reducing air pollution," Campbell-Lendrum said.

The climate change talks will consider the latest findings by the International Panel on Climate Change (IPCC), which has described different effects of climate change on human health in its reports since the early 1990s.

The IPCC's latest findings - the first of three parts of the Fifth Assessment Report - released in September, added even more weight to already substantial evidence that climate change is happening and that people are causing it.

The second part of that report, to be released early next year, will consider more fully both the potentially negative effects of climate change on human health and the health co-benefits of various strategies for reducing carbon emissions, Campbell-Lendrum said.

http://unfccc.int/2860.php; http:// www.ipcc.ch/report/ar5/

Cover photo

A community health worker visits the home of a sick patient in a rural area in Nepal, many kilometres from the nearest health clinic. This month's cover photo shows the importance of providing access to health care no matter where people live. It illustrates the theme of this month's issue: human resources for universal health coverage.



GAVI to consider Chinese vaccine

The GAVI Alliance board meeting in Cambodia this month will consider providing financial support for a Chinese vaccine against Japanese encephalitis that was prequalified by WHO last month.

The vaccine, known as the Japanese encephalitis (live) vaccine, was added to WHO's list of prequalified medicines last month.

Prequalification gives health products a WHO stamp of approval in terms of safety and efficacy, so that United Nations agencies can buy them in bulk. The Japanese encephalitis vaccine is the first vaccine produced in China to be prequalified by WHO.

If the GAVI board meeting agrees to provide financial support, countries that are eligible for this support will be able to apply from 2014 and the United Nations Children's Fund will lead international procurement efforts for the vaccine.

Japanese encephalitis is an inflammation of the brain caused by infection with a mosquito-borne virus.

It is a major public health problem in parts of China, south-eastern region of the Russian Federation, as well as in south and south-east Asia. As there is no specific treatment for Japanese encephalitis, supportive care in a medical facility is important to reduce the risk of death or disability. The disease can be prevented by vaccination. One dose of the vaccine is sufficient to confer protection and it can safely be administered to infants.

http://www.who.int/mediacentre/ news/releases/2013/japanese_encephalitis_20131009

Plan to stop child TB deaths

WHO and its partners launched a new plan last month to prevent an estimated 74 000 child deaths from tuberculosis around the world.

The plan known as *The roadmap* for childhood tuberculosis: towards zero deaths hinges on closer collaboration and joint planning between tuberculosis control programmes, maternal and child health services, and HIV services.

It estimates that US\$ 120 million per year would be needed to prevent these deaths; one third of this sum would provide HIV antiretroviral therapy and preventive therapy (to prevent active TB disease) to children co-infected with tuberculosis and HIV.

The funds would also contribute towards improving paediatric case detection and developing better medicines for children.

WHO estimates that up to 1 in 10 tuberculosis cases globally (6–10% of all cases) are among children aged 15 years and less. But the real figure could be even higher because many children with tuberculosis are not detected due to difficulties in making the diagnosis.

Getting more paediatric health professionals to actively screen for TB with better and more rapid diagnostics will help capture the full scope of the epidemic and reach more children with life-saving treatment sooner. Getting new drug formulations for children and ultimately a new vaccine would save thousands of lives.

Implementation research and why we need it

WHO released a new guidebook last month on implementation research, the study of how best to apply public health innovations to develop interventions in the field.

According to Implementation research in health: a practical guide many effective treatments, diagnostics, vaccines and medical devices exist, but there is often little understanding of how to deliver those interventions in the real world.

The guide provides an introduction to basic concepts and language in implementation research. It briefly outlines what this field of study involves, and discusses the potential benefits it holds for public health practitioners.

It argues that implementation research should be an integral part of programme planning and execution and, as such, should be incorporated into programmes at the very start.

http://who.int/alliance-hpsr/all liancehpsr_irpguide.pdf

IARC cancer monograph wins accolade

Volume 100 of a series of monographs published by the International Agency for Research on Cancer (IARC) has been "highly commended" in the Public Health category of the 2013 British Medical Association Medical Book Awards.

The shortlisted work, *Review of human carcinogens*, is in itself a six-volume summary of all the carcinogens included in the 99 preceding volumes of the series, known as the IARC Monographs on the Evaluation of Carcinogenic Risks to Humans, since 1971.

The IARC monographs identify environmental factors that can increase the risk of human cancer, including chemicals, occupational exposures, physical agents, biological agents and lifestyle factors. National health agencies can use this information as evidence for action to prevent exposure to potential carcinogens.

Commenting on Volume 100 of the IARC monographs, the judging panel said: "This is an important resource in that it defines the current state of evidence-based thinking on cancer-causing agents."

http://monographs.iarc.fr

Looking ahead

1 December – World AIDS Day http://www.who.int/campaigns/aidsday/2013/event

3 December – International Day of Disabled Persons

More midwives needed to improve maternal and newborn survival

Retention of midwives, especially in rural areas, is a major challenge for many countries, one that threatens to negate all the hard work and resources invested in their training. Priya Shetty reports.

"They are often accommodated in the most awful insanitary conditions, with no running water and these conditions are not limited to isolated rural areas. What's worse, it may be unsafe, especially for those doing 24-hour shifts." Frances McConville, midwifery expert at the World Health Organization (WHO) in Geneva, is not describing soldiers, but midwives in some of the world's poorest and most unstable regions.

In a way, these health workers are the warriors on the front-line of health care, battling to ensure that women survive childbirth and that babies are born safely even in the most marginalized areas.

Midwifery, a practice so ancient that it features in early Egyptian and Roman scrolls, is seeing a long awaited increase in global attention. Decades of neglect of the role of midwives, either because of the over-medicalization of pregnancy care or a lack of resources, has left a legacy of high rates of maternal and newborn mortality in developing countries. While these rates have fallen in recent years, more progress must be made in Asia and sub-Saharan Africa, where fewer than 50% of all births are assisted by a skilled birth attendant.

Now, grassroots, government and international initiatives are coming together to put midwives at centre stage in reproductive health programmes in countries like Ethiopia and Somalia. But for these efforts to succeed, investment in midwifery must be sustainable, covering more than just the initial training.

In 2011, the United Nations Population Fund (UNFPA) published a report – *The state of the world's midwifery 2011: delivering health, saving lives* – that offered a comprehensive look at midwifery around the globe. The report was "incredibly revealing" says McConville. Its analysis of 58 countries showed that there was a global shortage of an estimated 350 000 midwives, at least a third of whom were needed in the world's poorest countries.

Regional efforts to improve midwifery have increased with the launch this year of the Confederation of African Midwives Associations to advocate for better education and regulation of midwives.

Midwifery has come to the fore since maternal and newborn health were made the focus of two of the Millennium Development Goals (MDGs). And there is another reason for renewed attention: the world is facing an acute shortage of health-care workers. Overall, WHO estimated in 2006 that the world needs 4.2 million more health workers, with 1.5 million of those needed in African countries alone.

Increasing the number of skilled health workers is even more important



Midwives studying in Somalia

now that countries are striving towards universal health coverage. The growing support for task shifting, in which duties are redistributed so that doctors and nurses are not overburdened, has also created a greater demand for workers with midwifery skills, says McConville.



However, midwifery experts say that for a profession that is so old, it is remarkably poorly understood. "Midwives do far more than just catch babies," says Petra ten Hoope-Bender, a director for reproductive, maternal, newborn and child health at the *Instituto de Cooperación Social Integrare*, a research institute in Spain. The impact midwives have is not just on pregnancy outcomes, as is often assumed, she says, but extends to newborn care, breastfeeding, family planning, and sometimes also cervical and breast cancer screening.

Nevertheless, "in developing countries especially, midwives are often at the bottom of the ladder of the health system," says ten Hoope-Bender. She argues that midwives should be at the heart of the continuum of care, whether in terms of screening women for HIV infection, tuberculosis and malaria or of detecting early signs of noncommunicable diseases through routine antenatal checks, such as measuring blood pressure and testing for diabetes.

The linkages with infectious and chronic diseases could allow midwifery programmes to seek funding from HIV infection or tuberculosis programmes, for instance, says Dr Luc de Bernis, senior maternal health adviser at UNFPA, who is coordinating the development of the *State of the world's midwifery 2014* report.

Another reason why midwifery has been sidelined, says ten Hoope-Bender, is the focus on emergency obstetric

UNFPA





A midwife in India advises a young mother on breastfeeding techniques

care and facility-based childbirth, which have been at the heart of efforts to achieve the MDGs. But "when midwifery is in place, there is much less need for emergency interventions because problems requiring prompt attention are managed or referred before they become a life-threatening complication," she says.

Training is now a major focus in midwifery, and - for women in poor countries - the new generation of midwives can't come soon enough. This is essential in Somalia, where a woman has a 1 in 16 chance of survival beyond her reproductive years. According to Achu Lordfred, senior reproductive and maternal health adviser with UNFPA in the east African country, "the severe shortage of skilled health personnel with obstetric and midwiferv skills means that most women have their babies delivered by traditional birth attendants. But when complications arise, these women either die or develop debilitating conditions, such as obstetric fistula, or lose their babies." Since 2007, UNFPA has set up seven midwifery schools in Somalia that have trained 125 midwives to date, while two more schools are to be opened by the end of the year.

Ethiopia is making progress with training too. Since 2008, the number of midwives there has increased by 3000 to 4700, says Dorothy Lazaro, a midwifery specialist at UNFPA Ethiopia. The increase is due to government efforts to establish more midwifery training institutions, but ensuring quality control remains a challenge.

Ethiopia is currently testing mentorship schemes so that more experienced midwives can make sure that recent graduates have the right practical skills, Lazaro says.

Globally only 30% of practising midwives have completed a full threeyear training course; only 25% of those who are fully trained meet International Confederation of Midwives (ICM) competencies; and only 15% of nurses who undertake midwifery duties meet the ICM core competencies, according to *The state of the world's midwifery 2011* report.

> There is an important distinction between a sick person receiving treatment and a healthy woman giving birth.

Frances McConville

"These data show that while we are seeing significant increases in the coverage of skilled birth attendants, the existing cadre of midwives cannot possibly be providing the quality of care that women need," says McConville.

Increasing training is an important first step, but ensuring that midwives stay in the profession, especially in remote areas, is difficult. In the United Republic of Tanzania, for instance, says ten Hoope-Bender, a year after graduation, about 50% of women are no longer working as midwives. Incentives do not need to be monetary, says Mwansa Nkowane, nursing and midwifery technical officer at WHO. Among the top factors that count when it comes to retaining midwives are: decent housing, transport, career development and access to schools.

More research on the benefit that midwives provide will also be critical to improving midwifery, says ten Hoope-Bender, one of a group of researchers working on an upcoming midwifery series in *The Lancet*, the first time the journal devotes a series to this subject.

Little quantitative research on the impact of the care delivered by midwives has been conducted because much of this impact is qualitative in nature (i.e. gauged by the woman's experience of childbirth), says de Bernis.

In many resource-poor settings, childbirth is often assisted solely by traditional birth attendants. When midwives are hired in an attempt to make childbirth safer and reduce the risk of complications, traditional birth attendants may feel excluded and develop antagonism towards midwives, he says.

Increasingly, however, evidence shows that traditional birth attendants can play a vital role in improving maternal health if they work in harmony with midwives. In Indonesia, for instance, traditional birth attendants are offered financial incentives to refer pregnant women to midwives.

In a community-based midwifeled unit, for instance, traditional birth attendants could undertake basic tasks under the supervision of a midwife. "This ensures that hospitals only see the women who need treatment for a pregnancy or childbirth complication," says ten Hoope-Bender. Understanding that pregnancy is not an illness is vital, says McConville. "Midwifery is often conflated with nursing because most midwives begin their training as nurses, but there is an important distinction between a sick person receiving treatment and a healthy woman giving birth."

Midwives are a pillar of reproductive health programmes and it is crucial to understand their role in the health system and support them, says McConville. "These workers are proud to be midwives; you don't go into midwifery if you don't want to help other women. There is an element of love here. We are clinicians, but this is about loving and caring for other women, their babies and their families at a very special time in their lives."

Funding, flexible management needed for Brazil's health worker gaps

Last month the first Cuban physicians arrived in Brazil under a new government programme to work in underserved parts of the country, both rural and urban. Francisco Eduardo de Campos tells Claudia Jurberg why the *Mais Médicos* (More Physicians) programme is necessary.

Q: Brazil has a relatively high physician to population ratio (1.8 per 1000), but recently the government decided to bring in foreign professionals to work in your country. Can you explain this paradox?

A: The current labour market for physicians in Brazil is buoyant. Studies show that we do not have enough physicians to meet increasing demand in the public and private sectors. That inability to meet demand in these sectors makes it even harder for the government to deploy physicians in rural and poor urban areas. But this failure is incompatible with a health system mandated by the constitution to provide universal and equitable health care to all citizens. That is why the Brazilian government has decided to act decisively in this matter by training more physicians and importing others on short-term contracts to fill current gaps. In Brazil, fewer than 2% of physicians are educated abroad. In some countries, this proportion is as high as one third. That's why it's perfectly reasonable for Brazil to open its market to foreign physicians.

Q: The government provides incentives to encourage Brazilian physicians to work in poor urban areas and remote parts of the country? Why are they still reluctant to go?

A: Brazil not only faces a shortage of physicians; these professionals are also maldistributed. This is not only a problem in Brazil, but in many countries, as shown by the World Health Organization (WHO). Physicians are reluctant to work in these parts of the country for several reasons. Most of Brazil's medical students belong to Brazil's economic and social elite and prefer to live in affluent urban areas. Poor urban and rural areas are not attractive to them or any other professionals with similar backgrounds. But while a lack of qualified teachers, architects, engineers, artists, journalists, singers or musicians in small towns does not result in life-threatening situations, a shortage of physicians does and, therefore, deserves more attention. There are many barriers to attracting health professionals to work in those areas, including poor infrastructure, fear of violence, few career



Francisco Eduardo de Campos has dedicated much of his career to the development of human resources for health, in particular for Brazil's vast public health sector. He is a professor in the department of preventive medicine at the Federal University of Minas Gerais, where he obtained his medical qualification (1974), Master's degree (1977) and PhD in public health in (1985). He is the executive secretary of UNASUS, the Brazilian Open University of the *Sistema Único de Saúde* (Unified Health System) and a board member

Francisco Eduardo de Campos

of both the Global Health Workforce Alliance and the Ministerial Leadership Initiative from the Harvard School of Public Health. From 2005 to 2011, he was the Secretary of Education and Health Labour Management at the Ministry of Health and coordinator of the Interministerial Committee for Education and Health Labour Management.

development prospects and unreliable remuneration (due to precarious hiring practices). In addition, there are few job opportunities for spouses or good schools for their children. Moreover, they may fear professional isolation – having no one to consult on a difficult case – although this problem could in part be addressed by ehealth programmes, such as those offered by the Open University of the SUS.

Q: The government wants to create a mandatory contract for newly qualified physicians from public institutions to work for two years in the Sistema Único de Saúde (Unified Health System). What do you think of this plan?

A: Whether in the form of civil service or post-graduation employment, several countries link the attainment of professional medical qualifications to an effort to address public needs. On the one hand, the plan can generate a return on the public investment made in the education of physicians, and, on the other hand, it can be a way to change the image of rural areas - which are often seen as undesirable places to work - and to counter the view that primary health care is somehow "second rate." The public interest must always prevail over the interests of individuals or associations representing health professionals. That's why I agree with the solution proposed by the Federal Government. But I fear

that extending from six to eight years the length of time it takes for a physician to graduate in Brazil might not be the best approach, especially given the additional four years on average that it takes to complete medical residencies. Our resources are limited and may not cover all the salaries of physicians who may charge more than before to compensate for the years of foregone salaries due to additional training. The alternative, which has just been approved by Congress, is to require that the first year of all medical residencies is done in a family health-care setting, starting in 2019. Either way, there is no doubt that a large proportion of physicians must be well qualified in primary health care.

Q: The Mais Médicos programme allows for the limited importation of foreign physicians to work in underserved areas. Some people say that their work could be substandard or that they will compete with Brazilian physicians. Are these fears justified?

A: Foreign professionals can only join the *Mais Médicos* programme if they are licensed to work in their own countries. I don't think that the countries from which we are likely to attract foreign graduate physicians have poor educational systems, so I am not concerned about their qualifications. Furthermore, they won't compete with Brazilian-trained physicians because they will only be granted temporary (three-year) licences restricting their practice to the facilities where they will be placed. Only if they were to pass the national revalidation exam could they apply for a full physician's licence and compete with Brazilian professionals.

Q: During the World Health Assembly (WHA66) in May, Brazil impressed other countries with its high physician-to-population ratio. Which government bodies in Brazil are responsible for building and maintaining the health workforce?

A: Under the Brazilian Constitution, the Ministry of Education is responsible for the education sector. However, when it comes to health workers, this responsibility is shared with the SUS. In recent years, these two bodies have strengthened their collaboration in several ways. For example, they have been working together through the Interministerial Committee for Education and Health Labour Management, established in 2007. Together, the ministries are responsible for several initiatives aimed at improving mid-level technical education, as well as undergraduate courses, medical residencies and other graduate training programmes for all kinds of health workers. They also provide continuing medical education to keep physicians' skills up to date.

Q: What were the main challenges for developing the health workforce in recent years?

A: Since the 1970s, with the establishment of an interministerial programme for human resources, there has been a consensus on what the main problems are. At that time, the programme involved four ministries: education, health, social security and labour. Since then, we have managed to address some problems with the help of the Pan American Health Organization. For example, we developed a strategy for training nursing assistants (who are being phased out) to become mid-level nurses. The discussions between these four ministries were not always easy, as each sector had its own priorities. However, this dialogue continues today. The Conselho Nacional de Saúde (CNS) (National Health Council, the supreme health decision-making body in Brazil) has a very active human resource committee that examines all proposed policies before they are submitted to

the full council. Similarly, the Tripartite Commission (of federal, state and municipal health secretaries) has a strong human resource committee. Every policy approved by ministerial decree must first be examined by these two committees, in which civil society, including patients and health workers, are well represented.

> The public interest must always prevail over the interests of individuals or associations representing health professionals.

Q: Could you compare Brazil's health workforce to those in other emerging economies?

A: It's difficult to make comparisons because, as I mentioned, Brazil has unique structures governing health workforce issues. Yet Brazil has been praised at several international events as a country that understands the core function of the health workforce as an essential building block of a complex health system. The Brazilian health system encourages discussion between all players – including civil society, health workers and health authorities – to improve the health system through subsidies, regulations, incentives and other mechanisms.

Q: For example?

A: The reform of the medical school curricula. Currently, there is a tremendous gap between the needs of the SUS and the dominant model of the curative, hospital-centred approach that forms the basis of our medical courses. About 400 academic institutions that are regulated and financed by the Ministry of Education are now receiving financial incentives from the Ministry of Health to shift the emphasis of their curricula from tertiary to primary health care by providing grants to teachers, students, professors and health professionals. In addition, the Ministry of Health recently became an important funder of medical residencies. Between 2010 and 2013, it doubled the number of these scholarships to increase the number of qualified physicians training in priority specialties and achieve more equity in the public

system, as required by law. No other country has taken such a wide range of health workforce measures with such strong political will.

Q: Brazil has come a long way in terms of building a public health system based on universal health access. But health care was a key theme during demonstrations across the country earlier this year. Why is the public dissatisfied with the SUS?

A: The system is underfunded and overstretched. Brazil used to impose a financial transaction tax from 1997 to 2007 (0.25% between 1997 to 2002 and 0.38% from 2002 to 2007). The revenue raised by this levy made a substantial contribution towards the public health budget. However, in 2007, the government lost a vote in parliament to continue it and the levy was dropped. As a result, the SUS lost about a quarter of its income. Although it is hugely underfunded, the system continues to perform miracles in both primary and tertiary care. The waiting times for secondary care are often too long and some hospitals are in a precarious state. Nevertheless, these problems will not be solved by privatizing the health system, as some have suggested. What we need is a review of the management model, giving it more flexibility, and an adjustment of its funding. These are the key factors for improving the quality of the care and services provided by the SUS.

Q: What is Brazil's legal basis for universal health care?

A: The Brazilian Constitution has five chapters dedicated to health. It states that access to health care in the country should be public, free, universal and equitable to all Brazilian citizens, rich or poor. It is one of the most generous and socially inclusive health programmes in the world. But, while the legal basis of this 1988 constitution and other laws are important, what matters most is the health awareness of the population. The Brazilian public health movement, which resulted in the creation of the SUS in 1988, grew alongside calls for redemocratization of the country, to end the dictatorship. Thus, it was part of the general call for better public services and directly influenced by major segments of the population. This is particularly true of the urban poor and unionized workers. With all its difficulties, the SUS is not just a technical project: it is the product of the political will of the people.

Health worker remuneration in WHO Member States

P Hernandez-Peña,^a JP Poullier,^b CJM Van Mosseveld,^c N Van de Maele,^a V Cherilova,^a C Indikadahena,^a G Lie,^a T Tan-Torres^a & David B Evans^a

Objective To present the available data on the money spent by Member States of the World Health Organization (WHO) on remunerating health workers in the public and private sectors.

Methods Data on government and total expenditure on health worker remuneration were obtained through a review of official documents in WHO's Global Health Expenditure Database and directly from country officials and country official web sites. Such data are presented in this paper, by World Bank country income groups, in millions of national currency units per calendar year for salaried and non-salaried health workers. They are presented as a share of gross domestic product (GDP), total health expenditure and general government health expenditure. The average yearly change in remuneration (i.e. compound annual growth rate) between 2000 and 2012 as a function of these parameters was also assessed.

Findings On average, payments to health workers of all types accounted for more than one third of total health expenditure across countries. Such payments have grown faster than countries' GDPs but less rapidly than total health expenditure and general government health expenditure. Remuneration of health workers, on the other hand, has grown faster than that of other types of workers.

Conclusion As they seek to attain universal health coverage (UHC), countries will need to devote an increasing proportion of their GDPs to health and health worker remuneration. However, the fraction of total health expenditure devoted to paying health workers seems to be declining, partly because the pursuit of UHC calls for strengthening the health system as a whole.

Abstracts in عربى, 中文, Français, Русский and Español at the end of each article.

Introduction

A sufficient number of motivated health workers of different types is a precondition for achieving universal health coverage (UHC).¹ The world health report 2006 refocused the world's attention on the acute shortage of health workers in many countries - a persistent problem - but it also made clear that governments need information on the costs of training, hiring, deploying and remunerating health workers when developing plans to improve the availability, distribution, capacity and performance of their health workforces.¹⁻⁷ Unfortunately, data of this sort are only available for selected countries.^{8,9} According to a report from 48 African countries developed in the mid-1990s, the proportion of total health expenditure spent on health workers ranged from 17% to 74% and was 46% on average.¹⁰ The World Health Organization (WHO) subsequently estimated the share of government expenditure devoted to paying health workers in 64 countries as ranging from 10 to 90% and being 42% on average.⁷ This variability reflects differences across countries in accounting procedures, wages and the price of other health inputs, such as medicines.11

Despite the shortage of data, the information that exists has been used to estimate resource gaps and implement policies affecting the health workforce. For example, in the 64 countries identified as having the greatest health worker shortages, the yearly cost of training and employing an additional 3.5 million doctors, nurses and midwives and 2.8 million other workers was estimated at 17 800 million United States dollars (US\$) in 2006.^{3,4} If salaries were increased to try to retain the newly trained health workers, the costs would be substantially higher. The data supporting the estimates just described pertain to a limited number of countries and only to medical and paramedical workers, since remuneration data for other types of health workers are not available.¹² Even for these categories, comparisons across studies and countries are made difficult by variations in payment modalities, statistical practices and in the definition of the different types of workers and their respective roles.¹³ To obtain a complete picture, it makes sense to first identify and assess the data available from as many countries as possible using standardized definitions and accounting practices to facilitate comparisons.¹⁴ This paper, based on the data available for 2000 and 2010, reports on the first attempt to do so for all 194 WHO Member States.

Methods

We searched for data on payments made to different types of health workers by conducting a documentary review and directly contacting officials from all WHO Member States. These officials included WHO focal points in charge of health accounts – appointed by health ministries – and staff in statistics offices responsible for national accounts reports. The data reported here follow the international standards developed for the entire health workforce,¹⁴ which is defined as "all people engaged in actions whose primary intent is to enhance health".⁷ This definition embraces anyone working towards promoting, restoring or maintaining health, including people in management and support jobs that are essential for health systems to function (e.g. health insurance personnel). We also report on the remuneration of government health workers.

General government health expenditure comprises all current and capital spending earmarked for the maintenance,

^a World Health Organization, avenue Appia 20, 1211 Geneva 27, Switzerland.

^b Geneva, Switzerland.

^c Statistics Netherlands, The Hague, Netherlands.

Correspondence to P Hernandez-Peña (e-mail: hernandezp@who.int).

⁽Submitted: 10 March 2013 – Revised version received: 5 July 2013 – Accepted: 8 July 2013)

restoration or enhancement of the health status of the population. Total health expenditure comprises all expenditure earmarked for the maintenance, restoration or enhancement of the health status of the population, regardless of the outcome of the goods and services consumed, and including public and private spending.¹⁵ We used general government expenditure on health and total health expenditure as the denominators for our calculations.

Health worker remuneration is frequently reported as the following two variables or indicators, though not by all countries:

- Total remuneration of all salaried workers in the health system, which refers to wages and salaries (including benefits and allowances) and to social contributions paid on behalf of workers involved in providing health services. A subcomponent is the remuneration paid by government to its employees.
- ii) Remuneration of independent practitioners (e.g. self-employed health workers such as physicians and physiotherapists), which comprises their business income net of operating costs, taxes and capital consumption. In national accounts this is called "mixed income".¹⁶

We break down these broad categories into:

- total remuneration of salaried health workers, as a share of total health expenditure and gross domestic product (GDP);
- ii) remuneration of salaried health workers paid by the government, as a share of general government health expenditure, total health expenditure and GDP;
- iii) total remuneration of independent health practitioners, as a share of total health expenditure and GDP.

Data were collated in millions of national currency units per calendar year and are reported by World Bank country income groups for 2013.¹⁷

We also assessed changes in remuneration over time and compared data for health workers with data for workers in the whole economy. Only 62 countries had data available for 2000 and 2010 for both health workers and workers in the total economy, so we supplemented this with data from 43 countries having one data point close to 2000 (up to 2003) and another close to 2010 (2008–2011). To allow for differences in the number of years between data points, we report the average yearly change for the case of health workers (i.e. the compound annual growth rate) and we report the number of countries covered in the analysis in each table.

Data sources

General government health expenditure and total health expenditure are published annually by WHO in its Global Health Expenditure Database (GHED) for all its Member States after country data searches and consultations. This was our main source of data for denominators and remunerations.18 We obtained the remuneration given to salaried health workers in each sector (in total and by governments) and to all salaried workers in the economy, including all industries combined (in total and by governments), from reports on government finance, budget records and national accounts, labour and general government accounts and health accounts. These data are published by ministries of finance and health, statistical offices, central banks, health insurance entities and international organizations such as the International Monetary Fund (government finance statistics and country reports), the United Nations, the Organisation for Economic Co-operation and Development, the Statistical Office of the European Union and the World Bank (public expenditure reviews). Statistical yearbooks, institutional annual reports and national web sites were supplementary sources of information. The specific data on health worker remuneration and the source from which we obtained each data point are available on the GHED, as are the figures for each country separately.

Data caveats

Most of the data on the remuneration of salaried health workers pertains to direct health care provision. Payments to other types of health workers – e.g. to people who dispense medicines and lenses in pharmacies and other retail units or who work in the administration of health insurance – are not routinely reported. In addition, outsourced services are reported as service purchases without any breakdown of how much is paid to health workers.

Government health workers can also be paid through external funds or

through special budgetary arrangements that are not systematically accessed, such as through the armed forces. Some public hospitals are reported as corporations and aggregated with private entities, which reduces the amount reported as having been paid by the government. The available metadata are not always clear about what they comprise but, if anything, our numbers probably underestimate the payments made to health workers.

Results

Remuneration of salaried health workers

The remuneration of all salaried health workers – in the public and private sectors combined – is available for only 136 countries and averages 33.6% of total health expenditure (Table 1). The average remuneration increases the higher the country income group: it is 38.1% and 28.7% of total health expenditure in the highest and lowest country income groups, respectively.

Data for independent practitioner remuneration are even more scarce (n = 89). The average remuneration is 9% of total health expenditure. It varies enormously across countries – from negligible to around 50% of total health expenditure – and this is one reason that the differences observed by country income group are not statistically significant.

More countries report the remuneration paid by government to salaried health workers (n = 179). Such remuneration accounts for almost 20% of total health expenditure and for 33.2% of total government health expenditure, on average (Table 2). The shares in lowincome countries are significantly lower than in the higher-income countries combined.

Remuneration of all health workers

Total remuneration of all health workers is the sum of the remuneration of salaried and independent health workers. The 33.6% of total health expenditure comprised by remuneration of salaried health workers cannot strictly be added to the 8.9% pertaining to independent practitioners (Table 1) because the data are not available for the same countries. If we include only those countries for which data for the two components are available (n = 75), the total remuneration

Table 1. Remuneration of salaried health workers as a share of total health expenditure (THE) in 194 Member States of the World Health Organization, 2010 (or closest available year)

Country income	Total no. of Average ^b remuneration as share of THE								
group ^a	countries	Of salaried he	alth workers	No. of	Of independent h	No. of			
	-	%	SD	countries with data	%	SD	countries with data		
High	50	38.1	13.8	44	9.6	12.0	40		
Upper middle	56	33.2	11.2	43	7.5	7.9	31		
Lower middle	52	30.5	12.0	33	10.7	15.4	13		
Low	36	28.7	14.7	16	7.6	7.5	5		
All	194	33.6	13.0	136	8.9	11.0	89		

SD, standard deviation.

^a According to the 2013 World Bank classification, based on per capita income.

^b The figures are arithmetic averages of the shares in each country group. This unweighted average represents the typical proportion of countries in a particular income group rather than the population-weighted average of all countries in the group.

Note: The data for the different variables in the table are not necessarily for the same countries.

Source: WHO Global Health Expenditure Database.¹⁸

Table 2. Remuneration of salaried health workers by governments as share of total health expenditure (THE) and general government health expenditure (GGHE) in Member States of the World Health Organization, 2010 (or closest available year)

Country income group ^a	Averag	No. of countries			
	Share of THE		Share	with data	
	%	SD	%	SD	
High	18.0	17.4	31.2	20.2	48
Upper middle	23.4	10.8	38.2	15.8	51
Lower middle	18.7	10.9	34.7	15.8	48
Low	9.9	6.5	26.2	14.3	32
All	18.1	15.3	33.2	17.2	179

SD, standard deviation.

^a According to the 2013 World Bank classification, based on per capita income.

^b The figures are arithmetic averages of the shares in each country group. This unweighted average represents the typical proportion of countries in a particular income group rather than the population-weighted average of all countries in the group.

Note: The data for the different variables in the table are not necessarily for the same countries.

Source: WHO Global Health Expenditure Database.¹⁸

Table 3. Average^a yearly change in the remuneration of salaried health workers and independent health practitioners, compared with that of total salaried workers and independent workers in the total economy, in 75 selected Member States of the World Health Organization, 2000–2010

Country income	No. of countries Average yearly change in remuneration as share (%) of GDP						
group⁵	with data	with data Salaried health All salaried workers workers		Independent health practitioners	All independent workers		
High	39	1.34	-0.12	3.16	-1.06		
Upper middle	25	0.12	-0.43	-3.14	-0.71		
Lower middle	8	3.90	1.04	-1.18	-1.68		
Low	3	1.34	-2.98	10.84	-0.24		
All	75	1.24	-0.20	0.90	-0.98		

GDP, gross domestic product.

^a The figures are arithmetic averages of the shares in each country group. This unweighted average represents the typical proportion of countries in a particular income group rather than the population-weighted average of all countries in the group.

^b According to the 2013 World Bank classification, based on per capita income.

Note: The data for the different variables in the table are not necessarily for the same countries.

Source: WHO Global Health Expenditure Database.¹⁸

Table 4. Average^a yearly change in the remuneration of all salaried workers and of salaried health workers in 106 Member States of the World Health Organization, 2000–2010

Country income	No. of	Average yearly change						
group ^b	countries with data	In remuneration of salaried health workers, as share (%) of THE	In expenditure on health, as share (%) of GDP	In remuneration of salaried health workers, as share (%) of GDP	In remuneration of salaried workers, as share (%) of GDP			
High	44	-0.56	1.90	1.05	-0.08			
Upper middle	36	-0.64	1.14	0.32	0.25			
Lower middle	20	-0.27	1.34	1.62	0.30			
Low	б	-0.09	1.45	1.44	-1.41			
All	106	-0.51	1.51	0.93	0.03			

GDP, gross domestic product; THE, total health expenditure.

^a The figures are arithmetic averages of the shares in each country group. This unweighted average represents the typical proportion of countries in a particular income group rather than the population-weighted average of all countries in the group.

^b According to the 2013 World Bank classification, based on per capita income.

Note: The data for the different variables in the table are not necessarily for the same countries.

Source: WHO Global Health Expenditure Database.¹⁸

Table 5. Average^a yearly change in government remuneration of health workers, including salaried health workers, in 106 Member States of the World Health Organization, 2000–2010

Country income	No. of	Average yearly change						
group ^b	countries with data	In government remuneration of health workers, as share (%) of GGHE	In government expenditure on health, as share (%) of GDP	In government remuneration of salaried health workers, as share (%) of GDP	In government remuneration of all types of workers, as share (%) of GDP			
High	44	-1.19	1.98	0.69	0.00			
Upper middle	36	-2.13	1.96	-0.57	0.84			
Lower middle	20	-0.07	1.90	0.47	0.54			
Low	6	-1.66	2.92	0.63	2.35			
All	106	-1.33	2.01	0.22	0.52			

GDP, gross domestic product; GGHE, general government health expenditure.

^a The figures are arithmetic averages of the shares in each country group. This unweighted average represents the typical proportion of countries in a particular income group rather than the population-weighted average of all countries in the group.

^b According to the 2013 World Bank classification, based on per capita income.

Note: The data for the different variables in the table are not necessarily for the same countries.

Source: WHO Global Health Expenditure Database.¹⁸

of all health workers accounts for 34.5% of total health expenditure, on average (Table 3).

Changes over time

We first focused on the 106 countries for which data on payments to salaried health workers were available for the period (Table 4). From 2000 to 2010, total health expenditure grew faster than the GDP; it increased as a share of GDP at an annual rate of 1.5%. Total payments to salaried health workers also grew but at a slower rate than total health expenditure, so the share of total health expenditure paid to these health workers decreased in country income groups (at an average rate of 0.5% annually). However, because total health expenditure was increasing as a share of GDP, expenditure on salaried health workers also increased as a share of GDP at an average annual rate of almost 1%, despite a more modest increase in upper-middle-income countries.

Salaried worker remuneration

The period analysed includes the first years of the recent financial crisis. The health wage bill for salaried workers continued growing more rapidly than the total economy (Table 4). On the other hand, the remuneration of all types of salaried workers did not change substantially over the period as a share of GDP (the average annual growth rate was 0.03%, i.e. not significantly different from zero).

Government expenditure on health workers

Government health expenditures grew more rapidly than both GDP and total health expenditure over the period, at an average annual rate of 2% (Table 5). Government expenditure on salaried health workers also increased as a share of GDP, but less rapidly than total expenditure on salaried workers, as shown in Table 4. In fact, payments to salaried health workers fell as a share of government health expenditure by over 1.3% annually and did so more rapidly in upper-middle-income countries.

Government payments to all types of salaried workers, however, increased at a faster rate than payments to health workers in all but the high-income countries.

Table 6. Average^a annual remuneration of salaried health workers in 92 Member States of the World Health Organization, 2010 (or closest available year)

Country income	No. of countries	Average remuneration per worker				
group ^b	with data	In US\$, 2010	In PPP, 2010			
High	39	28 298	28 063			
Upper middle	32	8037	14 667			
Lower middle	16	3079	5927			
Low	5	473	1347			
All	92	15 352	18 102			

PPP, purchasing power parity; US\$, United States dollars.

^a The figures are arithmetic averages of the shares in each country group. This unweighted ratio represents the typical proportion of countries in a particular income group rather than the population-weighted average of all countries in the group.

^b According to the 2013 World Bank classification, based on per capita income.

Note: The data for the different variables in the table are not necessarily for the same countries. Source: WHO Global Health Expenditure Database.¹⁸

Payments to independent practitioners versus salaried workers

Data on payments to both salaried and independent workers, both in the health sector and in the entire economy, were available for only 75 countries for 2000 and 2010. Payments to both types of health workers increased as a share of GDP: for salaried health workers at over 1.2% annually and for independent health workers at just below 1% (Table 3). The growth rate of payments to independent health workers showed more variability across country income groups, but the small number of countries in some of the groups resulted in differences that are not statistically significant. Total remuneration to independent health workers increased faster than remuneration to other types of non-salaried workers. In fact, the share of GDP comprised by the remuneration of independent workers in all sectors fell between 2000 and 2010.

Average level of remuneration

Total expenditure on health worker remuneration is a function of the number of workers and how much each worker gets paid. To get an idea of the average payment made to each worker, we divided total expenditure on remunerations by the reported number of salaried workers for the 92 countries with available data. The global average in 2010 is US\$ 15 352 (18 102 in purchasing power parities) per employee. We recognize the limitations of this estimate. For example, the incomes of different types of health workers vary considerably, so the differences across country groups in Table 6 also reflect differences in the mix

of health workers. However, the variations across country income groups are as expected – health worker payments increase with country income group – and this gives face validity to the data presented earlier.

Discussion

Appropriate health financing schemes are needed for progress towards UHC. Also essential are systems capable of delivering high-quality health services covering health promotion, disease prevention and treatment, and rehabilitation and palliation. These services need to be accessible and affordable,¹⁹ but this is not possible without sufficient health workers possessing the right skills and located close to the people who need them.

Health workers need to be paid and questions of how much remuneration will motivate them to provide good services, stay in rural areas and not emigrate, for example, have long exercised the attention of policy-makers.² At a higher level, the critical questions are how much money has been raised to pay the health workforce and at what rate this amount has changed over time. These are the main questions addressed in this paper, which provides critical information not previously available but crucially important for planning the changes needed to attain UHC.

The data herein presented, which resulted from a laborious effort to obtain all the information available from WHO Member States on health worker remuneration, point to several important findings. First, payments to health workers comprise an important component of total health expenditure and GDP. Payments to salaried and self-employed health workers combined accounted, on average, for over 34% of total health expenditure and around 2.5% of GDP in the 75 countries for which both sources of data were available in 2010. In the 136 countries with information on salaried health workers, their remuneration alone accounted for 33.6% of total health expenditure. This suggests that for all health workers combined, including those who are self-employed, the share of total health expenditure surpasses 34%. Only pharmaceuticals account for a higher share of total health expenditure.²⁰ On the other hand, our estimates are lower than those from earlier studies based on smaller samples of countries. For instance, Peters reported a share of 46% of total health expenditure, but those estimates were made more than 15 years ago, when health systems were less complex than now.10

Second, these expenditures can be expected to increase over time and as a share of GDP. This has occurred over the past 10 years, largely because the overall number of health workers has increased everywhere. Interestingly, payments to health workers have increased more slowly than other types of health expenditure, which suggests that the health sector is becoming more reliant on technology or more capital-intensive everywhere.

Our findings have major implications with regard to the type of strategies that would accelerate progress towards UHC. In most low-income countries, funding for health is simply not enough to allow all people to access even a minimum set of needed health services.²¹ Considerably more will need to be spent on the health workforce for this to change, but the path to UHC also requires investment in other components of the health system, including medicines, infrastructure and information systems. The dilemma for governments is how much of the funding, which is currently insufficient, should be devoted to its health workforce.

Third, payments to salaried health workers have increased more rapidly than payments to other salaried workers. Although the data do not allow us to determine if this is the result of changes in the number of workers or in their average remuneration, expenditure on the health workforce seems to have been protected despite the recent financial crisis.

P Hernandez-Peña et al.

These findings are important, but complete and accurate data are not yet available for all countries. Although expenditure on the total health workforce is frequently found as a line item in government budgets and national accounts reports, coverage is incomplete and more effort is required to build lowincome countries' capacity to track and report the remuneration of various types of health workers.

In addition, identifying the flows linked to financial incentives, delivered sometimes as cash payments and sometimes in kind, is fraught with difficulty. This means that the data reported here might be underestimating true expenditures. Other possible causes of underestimation include the inability to identify the component of outsourced services paid to health workers from existing accounts, and the exclusion of retail sellers of medical supplies and health insurance administrators from health expenditure records.^{4,22}

The remuneration of independent health practitioners, especially in countries with large private sectors, warrants particular attention. How much is paid to independently employed workers relative to salaried workers reflects the way labour markets are organized in different settings. In many countries independent practitioners are selfemployed but receive the bulk of their income from social health insurance or government payments, in much the same way that salaried workers do. Fortunately, the new system of health accounts, published in 2011, includes a component for monitoring factors of provision, and this could be expanded to ensure uniform reporting of expenditure on various types of health workers over time and across countries.¹⁵

In summary, this study confirms, on the basis of data from many more countries than previously available, that payments to health workers account for a substantial share of total health expenditure. However, this share has been decreasing over time. It also shows that payments to salaried health workers have increased as a share of GDP, while those to other types of workers have remained stable or fallen.

Competing interests: None declared.

المركب) بين عامي 2000 و2102 كدالة لهذه المعاملات. النتائج في المتوسط، مثلت المدفوعات إلى العاملين الصحيين من جميع الأنواع أكثر من ثلث إجمالي الإنفاق الصحي عبر البلدان. وزادت هذه الدفعات أسرع من إجمالي الناتج المحلي للبلدان ولكن بسرعة أقل من إجمالي الإنفاق الصحي والإنفاق الصحي الحكومي العام. وفي الجانب الآخر، زادت أجور العاملين الصحيين أسرع من الأنواع الأخرى من العاملين. وصحية شاملة (UHC) إلى تخصيص نسبة متزايدة من إجمالي ناتجها المحلي للصحة ومرتبات العاملين الصحيين. ومع ذلك، يبدو جزء إجمالي الإنفاق الصحي المخصص للدفع للعاملين الصحيين في يتاقص، ويرجع ذلك جزئياً إلى أن السعي نحو التغطية الصحية الشاملة يتطلب تدعيم النظام الصحي بكامله.

ملخص مرتبات العاملين الصحيين في الدول الأعضاء في منظمة الصحة العالمية الغرض عرض البيانات المتوفرة حول الأموال التي تُنفقها الدول الأُعْضاء في منظمة الصحة العالمية (WHO) على مرَّ تبات العاملين الصحيين في القطاعين العام والخاص. الطريقة تم الحصول على بيانات حول الإنفاق الحكومي والإجمالي على مرتبات العاملين الصحيين من خلال مراجعة المستندات الرسمية في قاعدة بيانات الإنفاق الصحي العالمي الخاصة بمنظمة الصحة العالمية، وتم الحصول عليها مبآشرة منَّ مسئولي البلدان والمواقع الإلكترونية الرسمية للبلدان. ويتم عرض هذه البيانات في هذا البحث، حسب مجموعات دخل البلدان وفق البنك الدولي، بالمليون من وحدات العملة الوطنية لكل سنة ميلادية للعاملين الصحيين الذين يحصلون على راتب والذين لا يحصلون على راتب. ويتم عرضها كحصة من إجمالي الناتج المحلي (GDP)، وإجمالي الإنفاق الصحى والإنفاق الصَّحي آلحكومتي العام. وتم كذلكَ تقييم متوسط التّغيير السنوي في المرّتبات (أي معدل النمو السنوي

摘要

世卫组织成员国卫生工作者报酬

目的介绍有关世界卫生组织(WHO)成员国公共和私营部门卫生工作者开支的可用数据。

方法 通过审阅世界卫生组织全球卫生支出数据库的官 方文档以及直接从国家官方和国家官方网站获取有关 卫生工作者报酬的政府和合计开支的数据。本文按照 世界银行国家收入群组介绍带薪和非带薪卫生工作者 的这些数据,并以每日历年各国百万货币为单位。这 些数据按占国内生产总值(GDP)、卫生总开支和一般 政府卫生支出的份额进行表示。本文也评估了2000年 至2012年间报酬年平均变化(即复合年增长率)与这 些参数的函数关系。 结果 平均而言,各类卫生工作者的报酬占据各国卫生 总开支三分之一以上。这些开支增长比各国的 GDP 增 长速度快,但是比卫生总开支和一般政府卫生支出增 长速度慢。另一方面,卫生工作者的报酬增长比其他 类型工作者的报酬增长快。

结论 各国都在努力实现全民医疗保障制度(UHC), 因此需要增加卫生和卫生工作者报酬的 GDP 比例。但 是,专用于支付卫生工作者报酬的卫生总开支的比例 似乎有所下降,部分原因是 UHC 的实现需要从整体 上强化卫生系统。

Résumé

La rémunération des travailleurs de la santé dans les États membres de l'OMS

Objectif Présenter les données disponibles sur les sommes dépensées par les États membres de l'Organisation mondiale de la Santé (OMS), liées à la rémunération des travailleurs de la santé dans les secteurs public et privé.

Méthodes Les données sur les dépenses gouvernementales et totales liées à la rémunération des travailleurs de la santé ont été obtenues en examinant les documents officiels de la base de données des dépenses mondiales liées à la santé de l'OMS et directement à partir des représentants et des sites Web officiels des pays. Ces données sont présentées dans ce document, par groupes de revenu de pays de la Banque mondiale, en millions d'unités monétaires nationales par année civile pour les travailleurs de la santé salariés et non salariés. Elles sont présentées comme part du produit intérieur brut (PIB), du total des dépenses de santé et des dépenses générales de santé du gouvernement. La moyenne annuelle du changement de la rémunération (c'est-à-dire le taux de croissance annuel composé) a également été évaluée entre 2000 et 2012 en fonction de ces paramètres.

Résultats En moyenne, le coût des rémunérations pour tous les types de travailleurs de la santé représentait plus du tiers du total des dépenses de santé dans les différents pays. Ce coût a augmenté plus rapidement que le PIB des pays, mais moins rapidement que le total des dépenses de santé et des dépenses générales de santé du gouvernement. La rémunération des travailleurs de santé a d'autre part augmenté plus rapidement que celle des autres types de travailleurs.

Conclusion Alors qu'ils cherchent à atteindre une couverture maladie universelle (CMU), les pays devront consacrer une proportion croissante de leur PIB à la santé et à la rémunération des travailleurs. Toutefois, la portion du total des dépenses de santé consacrée à payer les travailleurs de santé semble diminuer, en partie parce que la mise en place de la CMU exige un renforcement de l'ensemble du système de santé.

Резюме

Оплата труда работников здравоохранения в государствах-членах ВОЗ

Цель Представить имеющиеся данные о средствах, потраченных государствами-членами Всемирной организации здравоохранения (ВОЗ) на оплату труда работников здравоохранения в государственном и частном секторах.

Методы Данные о государственных расходах и общей сумме расходов на оплату труда работников здравоохранения были получены на основе анализа официальных документов из Глобальной базы данных ВОЗ по расходам в области здравоохранения, а также непосредственно от должностных лиц и с официальных веб-сайтов стран. Эти данные, упорядоченные по группам стран, выделяемым Всемирным банком в зависимости от их дохода, были указаны в настоящей статье в миллионах национальных денежных единиц, выплачиваемых за календарный год штатным и внештатным работникам здравоохранения. Они представлены в виде доли от валового внутреннего продукта (ВВП), общей суммы расходов на здравоохранение. В качестве функциональной зависимости этих параметров также были проанализированы среднегодовые изменения в оплате труда (т.е. совокупные темпы годового прироста) в 2000-2012 гг. Результаты В среднем на выплаты работникам здравоохранения всех категорий приходится более трети всех расходов на здравоохранение в разных странах. Суммы таких выплат росли быстрее, чем ВВП стран, но менее быстрыми темпами, чем общие суммы расходов на здравоохранение и общие суммы государственных расходов на здравоохранение. С другой стороны, уровень оплаты труда работников здравоохранения растет быстрее, чем уровень оплаты труда других категорий работников.

Вывод Поскольку страны стремятся достичь всеобщего охвата населения медико-санитарными услугами, им придется направить большую долю своего ВВП на здравоохранение и оплату труда работников здравоохранения. Однако, похоже, доля оплаты труда работников здравоохранения в общих расходах на здравоохранение сокращается. Это происходит отчасти потому, что стремление выполнить рекомендации по всеобщему охвату населения медико-санитарными услугами требует укрепления системы здравоохранения в целом.

Resumen

El salario del personal sanitario en los Estados miembros de la OMS

Objetivo Mostrar los datos disponibles sobre el capital que los Estados miembros de la Organización Mundial de la Salud (OMS) destinaron a remunerar al personal sanitario en los sectores público y privado. **Métodos** Se extrajeron datos sobre el gobierno y el coste salarial total del personal sanitario mediante una revisión de los documentos oficiales de la base de datos Global Health Expenditure Database de la OMS, y directamente de los funcionarios del país y los sitios web oficiales de los países. Este informe presenta los datos en millones de unidades monetarias nacionales por año natural destinados al personal sanitario, asalariado y no asalariado, a través de la clasificación de países por los grupos salariales que emplea el Banco Mundial. Se presentan como un porcentaje del producto interior bruto (PIB), el coste sanitario total y el coste sanitario general de los gobiernos. También se evaluó el cambio salarial anual promedio (es decir, la tasa del crecimiento anual compuesto) entre los años 2000 y 2012 como una función de estos parámetros.

Resultados En general, los pagos al personal sanitario de cualquier tipo representaron más de un tercio del coste total en salud entre los países. Estos pagos han aumentado a mayor velocidad que los PIB de los países, pero a menor velocidad que el coste sanitario total y el coste sanitario general de los gobiernos. El salario del personal sanitario, por su parte, ha aumentado a mayor velocidad que el de los trabajadores de otros sectores.

Conclusión En su esfuerzo por alcanzar la cobertura sanitaria universal (UHC), los países tendrán que destinar una mayor proporción de su PIB a la sanidad y al salario de los trabajadores sanitarios. Sin embargo, la fracción del coste sanitario total derivado del pago del personal sanitario parece reducirse, en parte porque para alcanzar la cobertura sanitaria universal es necesario fortalecer el sistema sanitario en su conjunto.

References

- The Global Health Workforce Alliance 2012 annual report: making health workers count. Geneva: World Health Organization; 2012. Available from http://www.who.int/workforcealliance/knowledge/resources/ annualreport2012/en/index.html [accessed 7 August 2013].
- Resolution WHA57.19. International migration of health personnel: a challenge for health systems in developing countries. In: *Fifty-seventh World Health Assembly: resolutions and decisions*. Geneva: World Health Organization; 2004. Available from: http://www.who.int/hrh/resolutions/ en/ [accessed 7 August 2013].
- The health workforce: current challenges. Geneva: World Health Organization; 2004 (WHO/EIP/HRH/2004). Available from: http://apps.who.int/iris/ handle/10665/68609 [accessed 7 August 2013].
- Human resources for health: overcoming the crisis. Cambridge: The President and Fellows of Harvard College; 2004. Available from: www.who.int/hrh/ documents/JLi_hrh_report.pdf [accessed 7 August 2013].
- Hongoro C, McPake B. How to bridge the gap in human resources for health. *Lancet* 2004;364:1451–6. doi: http://dx.doi.org/10.1016/S0140-6736(04)17229-2 PMID:15488222
- Travis P, Bennett S, Haines A, Pang T, Bhutta Z, Hyder AA et al. Overcoming health-systems constraints to achieve the Millennium Development Goals. *Lancet* 2004;364:900–6. doi: http://dx.doi.org/10.1016/S0140-6736(04)16987-0 PMID:15351199
- The world health report 2006: working together for health. Geneva: World Health Organization; 2006. Available from: http://www.who.int/whr/2006/ en/ [accessed 7 August 2013].
- Chopra M, Munro S, Lavis JN, Vist G, Bennett S. Effects of policy options for human resources for health: an analysis of systematic reviews. *Lancet* 2008;371:629-30. doi: http://dx.doi.org/10.1016/S0140-6736(08)60305-0 PMID:18295024
- 9. Pick W. Lack of evidence hampers human-resources policy making. *Lancet* 2008;371:629–30. PMID:18295008
- Peters DH, Kandola K, Elmendorf AE, Chellaraj G. Health expenditures, services, and outcomes in Africa: basic data and cross-national comparisons, 1990–1996. Washington: The World Bank; 1999. Available from: http:// econ.worldbank.org/external/default/main?pagePK=64165259& theSitePK=477872&piPK=64165421&menuPK=64166093&entity ID=000094946_99093005584165 [accessed 7 August 2013].
- Vujicic M, Ohiri K, Sparkes S. Working in health: financing and managing the public sector health workforce. Washington: The World Bank; 2009.
- 12. Anell A, Willis M. International comparison of health care systems using resource profiles. *Bull World Health Organ* 2000;78:770–8. PMID:10916914

- Bennetts R. Remuneration of doctors and nurses: progress and next steps in data collection. Paris: Organisation for Economic Co-operation and Development; 2005. Available from: www.oecd.org/health/healthsystems/48832370.pdf [accessed 7 August 2013].
- 14. Hernández P, Tan Torres T, Evans D. Chapter 6. Measuring expenditure on the health workforce: concepts, data sources and methods. In: Dal Poz MR, Gupta N, Quai E, Soucat ALB, editors. *Handbook on monitoring and evaluation of human resources for health, with special applications for lowand middle-income countries*. Geneva: World Health Organization; 2009. pp 63–78. Available from: http://www.who.int/hrh/resources/handbook/en/ index.html [accessed 7 August 2013].
- A system of health accounts, 2011 edition. Geneva: Organisation for Economic Co-operation and Development, Eurostat & World Health Organization; 2011. Available from: http://www.oecd-ilibrary.org/social-issues-migrationhealth/a-system-of-health-accounts_9789264116016-en [accessed 30 August 2013].
- System of national accounts 2008. New York: European Communities, International Monetary Fund, Organisation for Economic Co-operation and Development, United Nations & The World Bank; 2009. Available from: http://unstats.un.org/unsd/nationalaccount/sna2008.asp [accessed 30 August 2013].
- The World Bank [Internet]. How we classify countries. Washington: WB; 2013. Available from: http://data.worldbank.org/about/countryclassifications [accessed 7 August 2013].
- WHO Global Health Expenditure Database [Internet]. Geneva: World Health Organization; 2013. Available from: http://apps.who.int/nha/database/ DataExplorerRegime.aspx [accessed 7 August 2013].
- The world health report health systems financing: the path to universal coverage. Geneva: World Health Organization; 2010. Available from: http:// www.who.int/whr/2010/en/index.html [accessed 7 August 2013].
- Ye L, Hernandez P, Abegunde D, Edejer T. *The world medicines situation 2011:* medicine expenditures. Geneva: World Health Organization; 2011 (WHO/ EMP/MIE/2011.2.6). Available from: http://apps.who.int/medicinedocs/ en/m/abstract/Js18767en/ [accessed 7 August 2013].
- 21. Taskforce on Innovative International Financing for Health Systems. *Raising and channelling funds: working group 2 report.* Geneva: International Health Partnership; 2009.
- 22. Szende A, Culyer AJ. The inequity of informal payments for health care: the case of Hungary. *Health Policy* 2006;75:262–71. doi: http://dx.doi. org/10.1016/j.healthpol.2005.04.001 PMID:15913832

Monitoring the implementation of the WHO Global Code of Practice on the International Recruitment of Health Personnel

Amani Siyam,^a Pascal Zurn,^b Otto Christian Rø,^c Gulin Gedik,^d Kenneth Ronquillo,^e Christine Joan Co,^f Catherine Vaillancourt-Laflamme,^g Jennifer dela Rosa,^g Galina Perfilieva^h & Mario Roberto Dal Pozⁱ

Objective To present the findings of the first round of monitoring of the global implementation of the WHO Global Code of Practice on the International Recruitment of Health Personnel ("the Code"), a voluntary code adopted in 2010 by all 193 Member States of the World Health Organization (WHO).

Methods WHO requested that its Member States designate a national authority for facilitating information exchange on health personnel migration and the implementation of the Code. Each designated authority was then sent a cross-sectional survey with 15 questions on a range of topics pertaining to the 10 articles included in the Code.

Findings A national authority was designated by 85 countries. Only 56 countries reported on the status of Code implementation. Of these, 37 had taken steps towards implementing the Code, primarily by engaging relevant stakeholders. In 90% of countries, migrant health professionals reportedly enjoy the same legal rights and responsibilities as domestically trained health personnel. In the context of the Code, cooperation in the area of health workforce development goes beyond migration-related issues. An international comparative information base on health workforce mobility is needed but can only be developed through a collaborative, multi-partnered approach. **Conclusion** Reporting on the implementation of the Code has been suboptimal in all but one WHO region. Greater collaboration among state and non-state actors is needed to raise awareness of the Code and reinforce its relevance as a potent framework for policy dialogue

on ways to address the health workforce crisis.

Abstracts in عربى, 中文, Français, Русский and Español at the end of each article.

Introduction

The health workforce is at the core of a health system. Global health targets and universal health coverage (UHC) are not likely to be attained unless health systems employ a sufficient number of health workers who are appropriately skilled and motivated, equitably distributed and well supported.^{1,2} In any setting currently facing a critical shortage of health workers, extending health-care coverage and offering a broader health service package will not be possible.² Staff shortages are exacerbated by the international migration of health workers who seek better employment opportunities, wages and working conditions abroad. This unplanned or uncontrolled outflow of health workers can weaken a health system, undermine planning projections and erode its current and future skills base.³

In May 2004, the World Health Assembly (WHA) petitioned the World Health Organization (WHO) to develop – in consultation with its Member States and all relevant partners – a code of practice on the international recruitment of health personnel as a global framework for dialogue and cooperation on matters concerning health personnel migration and health systems strengthening. In drafting the code, inputs were received during several global fora and in response to calls within the Kampala Declaration adopted at the First Global Forum on Human Resources for Health.⁴ The adoption in 2010 of the WHO Global Code of Practice on the International Recruitment of Health Personnel ("the Code") furnished a guide to international cooperation and facilitated a platform for continuing dialogue on the critical problem of health worker migration.⁵ The Code negotiation process was a vigorous one in which maturity and a favourable evolution in global health diplomacy were displayed.^{5,6}

The Code was developed around the principle that everyone has a right to the highest attainable standard of health and that all individuals, including health workers, have the right to migrate from one country to another in search of employment.^{4,7} The Code contains 10 articles covering the following: objectives; nature and scope; guiding principles; responsibilities, rights and recruitment practices; health workforce development and health systems sustainability; data gathering and research; information exchange; implementation of the Code; monitoring and institutional arrangements; and partnerships, technical collaboration and financial support.⁷ As a voluntary, non-legal instrument with no impact on state practice, the Code incorporates potent but flexible procedural mechanisms to advance implementation.⁵ Article 9.1 of the Code calls upon Member States to report to the Secretariat every three years on measures taken, accomplishments and difficulties encountered in implementing the Code to illustrate how the objectives of the Code are being achieved.⁷ The objective of this paper is to

^a Human Resources for Health, Health Systems Policies and Workforce, World Health Organization, avenue Appia 20, 1211 Geneva 27, Switzerland.

^b Department of Country Focus, World Health Organization, Geneva, Switzerland.

^c Department of Global Health, Directorate of Health, Oslo, Norway.

^d Human Resources for Health, World Health Organization, Manila, Philippines.

^e Health Human Resources Development Bureau, Department of Health, Manila, Philippines.

^f Policy and Network, Planning and Standards Division, Department of Health, Manila, Philippines.

⁹ Promoting Decent Work Across Borders: A Project for Migrant Health Professionals and Skilled Workers, International Labour Organization, Philippines.

^h Regional Office for Europe, World Health Organization, Copenhagen, Denmark.

¹ Social Medicine Institute, University of the State of Rio de Janeiro, Rio de Janeiro, Brazil.

Correspondence to Amani Siyam (e-mail: siyama@who.int).

⁽Submitted: 15 March 2013 – Revised version received: 15 August 2013 – Accepted: 15 August 2013)

Table 1. Countries that designated national authorities and that completed and returned the National Reporting Instrument on the implementation of the Global Code of Practice on the International Recruitment of Health Personnel, by WHO region

Region		Countries that designated a national authority
	No. (%)ª	Name
AFR (n = 46)	13 (28)	Angola, Cameroon, ^b Congo, Democratic Republic of the Congo, Ghana, Kenya, Mauritania, Mauritius, Namibia, Rwanda, ^b Seychelles, Swaziland, Uganda
AMR (n = 35)	11 (31)	Canada, Chile, Colombia, El Salvador, ^b Guatemala, Mexico, ^b Nicaragua, Panama, Paraguay, Saint Vincent and the Grenadines, United States of America ^b
EMR (n = 21)	8 (38)	Lebanon, ^b Oman, Pakistan, ^b Qatar, Saudi Arabia, Sudan, ^b Syrian Arab Republic, Yemen
EUR (n = 53)	43 (81)	Albania, ^b Armenia, ^b Austria, ^b Azerbaijan, ^b Belarus, ^b Belgium, ^b Bosnia and Herzegovina, ^b Croatia, ^b Cyprus, ^b Czech Republic, ^b Denmark, ^b Estonia, ^b Finland, ^b France, Georgia, ^b Germany, ^b Hungary, ^b Ireland, ^b Israel, Italy, ^b Kazakhstan, ^b Kyrgyzstan, ^b Latvia, ^b Lithuania, ^b Monaco, ^b Montenegro, ^b Netherlands, ^b Norway, ^b Poland, ^b Portugal, ^b Republic of Moldova, ^b Romania, Russian Federation, ^b Slovakia, ^b Slovenia, ^b Spain, ^b Sweden, ^b Switzerland, ^b Tajikistan, ^b Turkey, ^b Turkmenistan, ^b United Kingdom of Great Britain and Northern Ireland, ^b Uzbekistan ^b
SEAR (n = 11)	4 (36)	Indonesia, ^b Maldives, ^b Myanmar, Thailand ^b
WPR (n = 27)	6 (22)	Brunei Darussalam, Federated States of Micronesia, ^b Japan, ^b Philippines, ^b Republic of Korea, Singapore ^b
Total (N = 193)	85 (44)	-

AFR, African Region; AMR, Region of the Americas; EMR, Eastern Mediterranean Region; EUR, European Region; SEAR, South-East Asia Region; WHO, World Health Organization; WPR, Western Pacific Region.

^a Percentage of all countries in the region.

^b Completed and returned the National Reporting Instrument.

present the findings from the first round of reporting on the Code implementation process. The paper concludes with several key messages aimed at national and global health development partners.

Methods

Two elements were central in monitoring the implementation of the Code: the designation of national authorities and the development of a survey tool. As a first step, WHO called on each Member States to designate a national authority who could take charge of the exchange of information regarding the migration of health and the implementation of the Code. At the time of writing, 85 (44%) of the 193 Member States (Table 1) have complied. Of the designated national authorities, 79% are in ministries of health, 11% are in public health institutes and the rest are spread among health authorities, health boards and human resources for health (HRH) observatories. In a second step WHO developed the National Reporting Instrument (NRI),8 a 15-question tool created for use in crosssectional country-based self-assessment surveys. Delegated national authorities were contacted between March and June 2012 and asked to complete and return information on the Code implementation process using the NRI. They entered the information securely via a web-based interface that linked to a databank

hosted by WHO. At the time of writing, 56 countries, mainly in the European Region, have completed and returned the NRIs (Table 1). The reporting countries represent more than 80% of the population living in destination countries and comprise a small fraction of the known source countries.

Results

Of the 56 countries that completed and sent NRIs, 37 (66%) had taken steps to implement the Code. Table 2 describes the range of actions and measures undertaken to communicate with multiple stakeholders and involve them in matters concerning health workforce migration and international recruitment. Countries adopted different approaches to raise awareness about and promote dialogue concerning the Code. For example, the Government of Canada is disseminating materials to raise awareness of the Code among foreign workers entering the country at embassies and high commissions abroad. Many countries had translated the Code into their national languages for dissemination among state and non-state actors. In El Salvador, the Ministry of Labour conducted an analysis of the correspondence between the Code and the country's labour laws and legal framework. During Belgium's presidency of the European Union (EU), a ministerial conference was organized

for the purpose of discussing the articles contained in the Code in light of the European Region's health workforce priorities. In addition, Be-cause health, a Belgian international health platform, developed a charter designed to better harmonize health worker recruitment practices - and to improve their equity and effectiveness - among Belgian cooperation stakeholders providing support to health workers from partner countries.9 Finland's ministries of social affairs and health, in collaboration with national stakeholders, are developing recommendations and taking other measures to ensure that the international recruitment of social service and health personnel is conducted in conformity with the Code. Following the Code's adoption in Thailand, the country's human resource committee appointed a national multisectoral subcommittee to oversee implementation of the Code by all relevant international partners.

Recruitment practices, rights and responsibilities

Table 3 summarizes the responses given by countries in the different WHO regions to NRI questions concerning recruitment practices and the rights and responsibilities of migrant health professionals. Migrant health professionals are those whose current practice is outside their country of origin and/or outside the country where they were first

Table 2. Measures taken or being considered by countries in support of the Global Code of Practice on the International Recruitment of Health Personnel, by WHO region

Measure	Countries that reported on Code implementation status						
	AFR (<i>n</i> = 2)	AMR (<i>n</i> = 4)	EMR (<i>n</i> = 3)	EUR (<i>n</i> = 40)	SEAR (<i>n</i> = 3)	WPR (<i>n</i> = 4)	Total (<i>n</i> = 56)
Countries that responded "yes" to "Has the country taken steps to implement the Code?"	1	4	2	26	2	2	37
Information is shared across sectors on matters pertaining to health worker recruitment and migration, as well as on the Code.	1	4	2	21	2	3	33
All stakeholders have been involved in decision-making processes involving the migration and international recruitment of health personnel.	1	2	1	9	1	3	17
Changes to laws or policies pertaining to the international recruitment of health personnel are under consideration.	1	0	0	10	2	2	15
Records are maintained of all recruiters authorized by competent authorities to operate within their jurisdictions.	1	1	0	4	2	2	10
Good practices are encouraged and promoted among recruitment	1	1	0	4	2	1	9

AFR, African Region; AMR, Region of the Americas; EMR, Eastern Mediterranean Region; EUR, European Region; SEAR, South-East Asia Region; WHO, World Health Organization; WPR, Western Pacific Region.

trained.¹⁰ Remarkably, 51 (91%) countries confirmed that migrant health professionals enjoy the same legal rights and responsibilities as health workers who are domestically trained. Broadly speaking, recruitment is based on qualifications, particularly in the case of physicians, dentists, nurses and midwives. Generally speaking, in all countries health personnel are required to take a national certifying examination and those who pass must apply to a national certifying authority, such as a medical board or a council of registered nurses, to obtain a licence to practise.

Data gathering and research

As shown in Table 4, countries varied widely in their capacity to gather data and conduct research on matters re-

lating to health personnel migration. Marked regional disparities were noted in this respect. In addition, evidence of the existence of technical cooperation agreements related to the recruitment, management and migration of international health personnel was found in only 13 countries (23%). Thirty-four (61%) countries keep statistical records of health personnel whose initial qualification was obtained in a foreign country. Comparably, thirty-six (64%) countries have mechanisms for granting internationally recruited health personnel authorization to practice and keep statistical records of all such authorizations. In contrast, only 11 (20%) countries have a database of laws and regulations pertaining to the recruitment and migration of international health personnel.

Health workforce development and health system sustainability

According to NRI reports, several countries have in place bilateral, multilateral and regional agreements in connection with the recruitment of international health personnel. Most of these agreements preceded the Code; others were developed or refined after the Code was adopted. Some of the agreements are between neighbouring countries - e.g. Cyprus and Greece; Egypt and Sudan; Monaco and France; Denmark, Finland, Iceland, Norway and Sweden; Kazakhstan, Kyrgyzstan, the Russian Federation, Tajikistan and Uzbekistan. Some are between countries having different income levels - e.g. Armenia and Qatar; Croatia and Germany; Finland and the

Table 3. National recruitment practices and rights and responsibilities of migrant health professionals,^a by WHO region

Practices/rights and responsibilities		Countries that reported on Code implementation status							
	AFR	AMR	EMR	EUR	SEAR	WPR	Total		
	(n = 2)	(n = 4)	(n = 3)	(n = 40)	(n = 3)	(n = 4)	(n = 50)		
Migrant health professionals enjoy the same legal rights and responsibilities as domestically-trained health personnel.	2	4	1	38	3	3	51		
Migrant health professionals are hired, promoted and remunerated on the basis of criteria that are as objective as those that apply to domestically-trained health personnel.	2	4	1	33	2	1	43		
Migrant health professionals enjoy the same education, qualifications and career progression opportunities as domestically-trained health personnel.	2	4	1	28	0	2	37		
Recruitment mechanisms allow migrant health professionals to assess the benefits and risks associated with their employment.	1	2	1	15	1	1	21		

AFR, African Region; AMR, Region of the Americas; EMR, Eastern Mediterranean Region; EUR, European Region; SEAR, South-East Asia Region; WHO, World Health Organization; WPR, Western Pacific Region.

^a Migrant health professionals are those whose current practice is outside their country of origin and/or outside the country where they were first trained.

Table 4. Country capacity for gathering data and conducting research on matters relating to health personnel migration, by WHO region

Canacity	Countries that reported on Code implementation status							
capacity		countries	tilat Tepol		mplemen		13	
	AFR	AMR	EMR	EUR	SEAR	WPR	Total	
	(<i>n</i> = 2)	(<i>n</i> = 4)	(<i>n</i> = 3)	(<i>n</i> = 40)	(<i>n</i> = 3)	(<i>n</i> = 4)	(<i>n</i> = 56)	
Has at least one entity or mechanism for the professional certification of internationally recruited health personnel and for statistical record keeping.	1	0	1	28	3	3	36	
Has at least one entity or mechanism for maintaining statistical records on health personnel whose first training was overseas.	1	4	3	22	3	1	34	
Has government or non-government programmes or institutions that conduct research on the migration of health personnel.	0	4	1	19	2	1	27	
Has a technical cooperation agreement related to international health personnel recruitment or to the management and migration of such personnel, or provides or receives financial assistance for these activities.	1	2	0	9	1	0	13	
Has a database of laws and regulations pertaining to international health personnel recruitment and migration.	0	2	0	7	1	1	11	

AFR, African Region; AMR, Region of the Americas; EMR, Eastern Mediterranean Region; EUR, European Region; SEAR, South-East Asia Region; WHO, World Health Organization; WPR, Western Pacific Region.

Philippines; Ireland and Pakistan; Italy and Tunisia; the Philippines and Bahrain. Transatlantic bilateral agreements exist between Cuba and Portugal, Portugal and Uruguay and Portugal and Costa Rica. Multilateral agreements include "mobility partnerships". These consist of non-legally-binding frameworks for the proper management and monitoring of health personnel movements between the EU and individual countries. Prominent regional agreements include those between Brunei Darussalam, Cambodia, Indonesia, the Lao People's Democratic Republic, Malaysia, Myanmar, the Philippines, Thailand and Viet Nam as part of the Association of Southeast Asian Nations network. Agreements cover doctors and nurses and, in a few cases, midwives. Many agreements were concluded at the national level and others at the subnational level. The agreements between Canada and the Philippines and between Egypt and Rwanda were concluded at the subnational level.

Countries also reported on a range of broader financial and technical cooperation agreements. Some examples are certain agreements between members of the Ibero-American Network on Migration of Health Professionals (headed by the Ministry of Public Health of Uruguay and supported by the European Commission); the Triple Win pilot project involving Albania, Bosnia and Herzegovina, Germany and Viet Nam; and the Indonesia-Japan collaboration on the enhancement of nursing competency through in-service training. Support of the principles espoused by the Code was demonstrated in the form of several global health initiatives, particularly health systems strengthening and HRH development initiatives spearheaded by the Government of the United States of America. As a member of the European ESTHER Alliance, Ireland supports a similar initiative in which health institutions in the EU are matched with institutions in less developed countries to strengthen the latters' health workforce.

Several countries reporting on the Code indicated being involved in the EU Joint Action on Health Workforce Planning, a collaborative platform for countries striving to prepare a sustainable health workforce in keeping with their economies and population-based needs.¹¹

The challenges of implementation

As part of the reporting, countries were asked to name the three main impediments to the implementation of the Code. The one most often reported was the difficulty in engaging multiple stakeholders - at the national and subnational levels and in the public and private sectors in efforts concerning health personnel migration and international recruitment. The second most commonly reported factor was the lack of coordinated and comprehensive data on health personnel migration of the type normally shared between agencies and entities within and among developed countries. The third most common factor was the lack of a shared understanding of the interrelatedness, at the country level, of workforce migration, current and future health workforce needs, and short- and longterm planning of the workforce.

Country-specific experiences

As a destination country, Norway reported using a multisectoral approach - under the Ministry of Health and Care Services and the Ministry of Foreign Affairs - to address its health workforce challenges and follow the implementation of the Code.¹² It described three strategic directives, all coherent with the Code. One directive is geared towards developing sufficient domestic educational capacity to meet the country's needs in health-care provision, which would reduce the pull on foreign health workers and the country's dependency on foreign-trained personnel. Norway is also adapting regulations to attract more people to the health workforce. For instance, it is converting part-time contracts into full-time contracts and trying to improve working conditions for better worker retention. Internationally, Norway supports several technical cooperation agreements aimed at strengthening the performance of foreign health systems to reduce the push effect in less developed, source countries. Forecasts of health personnel needs reveal a substantial shortage of workers requiring shortterm training, such as nurse assistants, a situation that attracts foreign migrant health workers into Norway.¹³ On the other hand, the country seems to have enough health workers requiring longterm training. The interplay of supply and demand affects the sustainability of UHC in Norway and the country's selfsufficiency in terms of the health sector labour market.

The Department of Health of the Philippines, an important source country, conducted an assessment of the implementation of the Code with the participation of multiple stakeholders.¹⁴ It did so at the initiative of the International Labour Organization, in partnership with the Department of Labour and Employment and with support from WHO's Western Pacific Regional Office.¹⁵ Five groups were identified as key stakeholders in the Code implementation process: the government, trade unions, employers' organizations, recruitment agencies and professional organizations. Philippines policies and programmes pursue the promotion and protection of the rights and welfare of Filipino migrant health personnel to raise awareness with respect to migrant workers' rights and welfare through pre-employment and pre-departure orientation seminars for migrants. They are also intended to facilitate the monitoring of personnel agency international recruitment practices. The five groups of stakeholders pointed out two important challenges: (i) a lack of awareness of the Code domestically among migrant health workers, trade unions and personnel recruiters; and (ii) pressure to migrate abroad owing to unemployment in the national health sector. Furthermore, no dialogue on the subject of the Code takes place between receiving countries and migrant health personnel and no sanctions are in place for penalizing recruiters and employers who violate the Code. A final recommendation, intended to promote ethical recruitment, was to create a system of awards for proper implementation of the Code based on the quality rather than the quantity of processed transactions for foreign recruitment.

Discussion

The fact that 85 WHO Member States have designated a national authority, most often in the health ministry, in charge of reporting on the implementation of the Code may be a positive lead for countries who have not yet taken this step. About one fourth of WHO's 193 Member States responded to the NRI, and this limits the generalizability of the conclusions. The NRI performed adequately in terms of the completeness and comprehensiveness of the answers to the questions addressed, but it will be developed further to enable it to capture subtle differences in the extent to which source and destination countries implement the Code. The information gathered with the NRI formed the basis for a progress report on the Code implementation process that was presented and discussed by the WHA in 2013.¹⁶

The implementation of the Code has triggered domestic and international policy-making processes that could mark the beginning of a move from principle to action. Several key messages should be considered:

- Countries have used promising approaches to engage multiple stakeholders in efforts to make the principles articulated in the Code internally coherent and to have them properly implemented. Given the Code's non-binding nature, more potent and flexible ways of advancing the Code implementation process should follow.
- The choice of the Code as a nonbinding instrument for addressing dynamic, complex and highly sensitive HRH issues testifies to a more nuanced understanding by Member States of the nature and utility of binding and non-binding international legal instruments for furthering global health.⁵ Yet countries in all WHO regions but one - particularly source countries - have failed to report on the status of its implementation. The reasons may be that: (i) information about the Code and its utility has not reached all actors involved in HRH development; (ii) actions to promote implementation of the Code, whose observance is voluntary, have not been taken; or (iii) source countries struggling to strengthen their HRH information systems are deterred by requests for information on HRH mobility and migration. A strategic approach to promoting implementation of the Code must be adopted. Regional and national observatories and similar mechanisms can be used to build capacity and encourage policy dialogue so that the principles articulated in the Code can guide health workforce production, recruitment, deployment, retention and mobility.

• There is a need for global action and consensus on the building of an international database for health personnel migration statistics. Data on health workforce mobility appear to be available, especially in destination countries. However, in countries where such data exist, there needs to be consensus on which key indicators to collect.¹⁷ The feedback from reporting countries suggests a need for technical cooperation to improve existing health information systems, including those pertaining to laws and regulations on health personnel recruitment. Existing populationbased data sources, such as censuses and household surveys, could perhaps be extended to include items on migration.18

Health workforce migration is an important problem, especially in countries with fragile health systems and scarce resources, yet migration alone is not the root of the health workforce crisis. According to WHO estimates, the need for health workers in developing countries is far greater than the number of immigrant health workers in countries of the OECD.¹⁰ On the other hand, health worker mobility can help to alleviate unemployment or under-employment in the health sector and can lead to gains in knowledge and skills transfer.¹⁹ The effects of health worker mobility will depend on how a country stands in terms of workforce shortages, unbalanced skill mix, geographical maldistribution of workers, workforce and population ageing and attrition, and/or underproduction of health professionals.^{20,21}

To conclude, renewed political and technical commitment at the national, regional and global levels is crucial to invigorate observance of the Code and fulfil its aspirational objectives, which were unanimously adopted by WHO Member States in 2010. The WHA periodically reviews the progress made by countries in implementing the Code and Member States should seize the opportunity they are given to report on their actions and share their concerns. The political imperative of moving towards UHC serves as a driver of greater integration between the planning of the health workforce and policy-making and of overall efforts to strengthen health systems.

Competing interests: None declared.

* 1	
لحصر	ما

رصد تنفيذ مدونة منظمة الصحة العالمية لقواعد المارسة بشأن توظيف العاملين الصحيين على المستوى الدولي الغرض عرض نتائج الجولة الأولى لرصد التنفيذ العالمي لمدونة منظمة الصحة العالمية لقواعد المارسة بشأن توظيف آلعاملين الصحيين على المستوى الدولي ("مدونة القواعد")، وهي مدونة قواعد طوعية تم إقرارها في عام 2010 بواسطة جميع الدول الأعضاء في منظمة الصحة العالمية (WHO) البالغ عددها 193 دولة.

الطريقة طلبت منظمة الصحة العالمة أن تعبن الدول الأعضاء فيها هيئة وطنية لتيسير تبادل المعلو مات حول هجرة العاملين الصحيين وتنفيذ مدونة القواعد. وتم فيها بعد إرسال استقصاء مقطعي يتضمن 15 سؤالا حول عدد من المواضيع المتعلقة بالمواد العشرة الواردة في مدونة القِواعد إلى كل هيئة معينة.

النتائج قام 55 بلداً بتعيين هيئة وطنية. وقام 56 بلداً فقط بالإبلاغ عن حالة تنفيذ مدونة القواعد. وقام 37 منها باتخاذ خطوات نحو تنفيذ مدونة القواعد، وتمَّ ذلك بشكل أساسي من خلال إشراكٌ

摘要

监控世卫组织卫生人员国际招聘方面全球行为守则的实施

目的 描述对世界卫生组织 (WHO) 在全球实施卫生 人员国际招聘全球行为守则("守则")进行第一轮监 控的调查结果,守则是2010年由世卫组织所有193个 成员国采纳的自律守则。

الجهات المعنية ذات الصلَّة. وفي 90 ٪ من البلدان، أظهر ت

التقارير أن العاملين الصحيين المهاجرين يتمتعون بنفس الحقوق القانونية والمسئوليات مثلهم مثل العاملين الصحيين المدربين محلياً.

وفي سياق مدونة القواعد، يتجاوز التعاون في مجال تطوير قوة

العمل الصحية المسائل المرتبطة بالهجرة. وتوجد حاجة إلى قاعدة معلومات مقارنة دولية حول تنقل قوة العمل الصحية ولكن لا

الاستنتاج كان الإبلاغ عن تنفيذ مدونة القواعد دون المستوى

الأمثل في جميع أقاليم منظمة الصحة العالمية باستثناء إقليم واحد.

وتوجد حاجة إلى تعاون أكبر بين الجهات الفاعلة للدول وغير

الدول لزيادة الوعى بمدونة القواعد وتدعيم ملاءمتها كإطار عمل

فعال من أجل حوار سياسي حول سبل التعامل مع أزمة قوة العمل

يمكن تطويرها إلا عبر نهج تعاوني متعدد الأطراف.

方法 WHO 要求其成员国指定一个促进卫生人员移民 信息交流和守则实施的全国性主管机关。然后, 向每 个指定的主管机关发出一份包含15个问题的横断面 调查,这些问题与守则中10项条款的一系列主题相关。 结果 有 85 个国家指定了全国性主管机关。仅有 56 个 国家报告了守则实施的状态。在这些国家中,有37 个采取措施实施守则,其主要手段是让有关的利益相 关者参与进来。在 90% 的国家中,移民卫生专业人士 据报告与在本国培养的卫生专业人士享有同样的法律 权利和责任。在守则的背景下,卫生劳动力发展领域 的合作超越了移民相关问题。需要建立一个有关卫生 劳动力流动性的国际比较信息库,而这只能通过协作、 多方参与的方法实现。

结论 除了一个 WHO 区域外, 其他所有地区中报告的 守则实施都未达到最为理想的状态。国家和非国家参 与者之间需要加强协作,唤起对守则的意识,强化其 在解决卫生劳动力危机过程中作为政策对话有效框架 的相关性。

Résumé

Suivi de la mise en œuvre du Code de pratique mondial de l'OMS pour le recrutement international du personnel de santé

الصحية.

Objectif Présenter les résultats du premier tour de suivi de la mise en œuvre mondiale du Code de pratique mondial de l'OMS pour le recrutement du personnel de santé («le Code»), un code de conduite volontaire adopté en 2010 par l'ensemble des 193 États membres de l'Organisation mondiale de la Santé (OMS).

Méthodes L'OMS a demandé à ses États membres de désigner une autorité nationale pour faciliter l'échange d'informations sur la migration du personnel de santé et la mise en œuvre du Code. Chaque autorité désignée a ensuite reçu une enquête transversale comportant 15 questions sur une gamme de sujets concernant les 10 articles inclus dans le Code.

Résultats Une autorité nationale a été désignée par 85 pays. Seuls 56 pays ont signalé l'état de la mise en œuvre du Code. Parmi eux, 37 ont pris des mesures pour appliquer le Code, principalement par le biais des parties concernées. Dans 90% des pays, les professionnels de santé migrants disposeraient des mêmes droits et des mêmes responsabilités que le personnel de santé formé localement. Dans le contexte du Code, la coopération dans le domaine du développement des travailleurs de la santé va au-delà des guestions liées à la migration. Une base de données comparative internationale sur la mobilité du personnel de santé est nécessaire, mais elle ne peut être développée que par une approche collaborative et multipartite.

Conclusion Les rapports sur la mise en œuvre du Code de pratique mondial ont été insuffisants en général, sauf dans une région de l'OMS. Une meilleure collaboration entre les acteurs étatiques et non étatiques est nécessaire pour sensibiliser au Code et renforcer sa pertinence en tant que structure efficace pour le dialogue politique sur les moyens de remédier à la crise des effectifs du personnel de santé.

Резюме

Мониторинг процесса внедрения Глобального кодекса ВОЗ по практике международного найма персонала здравоохранения

Цель Представить выводы, сделанные в результате первого этапа мониторинга процесса внедрения на глобальном уровне Глобального кодекса BO3 по практике международного найма персонала здравоохранения (далее в тексте «Кодекс»). Данный Кодекс является добровольным и был принят в 2010 году всеми 193 государствами-членами Всемирной организации здравоохранения (ВОЗ).

Методы В соответствии с рекомендациями ВОЗ, государства-члены должны были назначить национальный орган, ответственный за соблюдение Кодекса и содействие обмену информацией по вопросам миграции персонала здравоохранения. Всем назначенным органам была направлена анкета, включающая в себя 15 вопросов по различным темам, относящимся к 10 включенным в Кодекс статьям.

Результаты Национальные органы были назначены в 85 странах. Отчет о текущем состоянии процесса внедрения Кодекса предоставили только 56 стран, из которых 37 предприняли определенные шаги по внедрению Кодекса, заключающиеся в основном в определении обязательств для вовлеченных сторон. По имеющимся данным, в 90% стран мигрировавшие работники здравоохранения обладают теми же законными правами и несут такую же ответственность, что и персонал здравоохранения, подготовленный внутри страны. Согласно Кодексу, сотрудничество в области подготовки трудовых ресурсов здравоохранения выходит за рамки вопросов, относящихся к миграции. Требуется создание международной сравнительной информационной базы данных по мобильности трудовых ресурсов здравоохранения, чего можно достигнуть только в результате совместной работы множества партнеров. Вывод Предоставленные отчеты по внедрению Кодекса не содержали достаточных данных для всех регионов BO3, кроме одного. Чтобы повысить информированность о Кодексе и его значимость как потенциальной основы для проведения диалога по вопросам поиска путей для выхода из кризиса в сфере трудовых ресурсов здравоохранения требуется более высокий уровень взаимодействия между государственными и негосударственными учреждениями.

Resumen

Seguimiento de la aplicación del Código de prácticas mundial de la OMS sobre la contratación internacional de personal sanitario

Objetivo Presentar los resultados de la primera ronda de seguimiento de la aplicación global del Código de prácticas mundial de la OMS sobre la contratación internacional de personal sanitario («el Código»), un código voluntario adoptado en 2010 por los 193 Estados miembros de la Organización Mundial de la Salud (OMS).

Métodos La OMS pidió a los Estados miembros que designaran a una autoridad nacional para facilitar el intercambio de información sobre la migración del personal y la aplicación del Código. Se envió una encuesta transversal con 15 preguntas sobre una variedad de temas relacionados con los 10 artículos incluidos en el Código a las autoridades designadas. **Resultados** Un total de 85 países designaron a una autoridad nacional. Solo 56 informaron sobre el estado de aplicación del Código, de los

cuales 37 tomaron medidas para la aplicación del mismo, principalmente a través de la participación de las partes interesadas. En el 90 % de los

países, los profesionales sanitarios migrantes disfrutan supuestamente de los mismos derechos y responsabilidades legales que el personal sanitario formado en el país. En el marco del Código, la cooperación en el ámbito del desarrollo del personal sanitario transciende las cuestiones sobre migración. Se necesita una base internacional de datos comparativos sobre la movilidad del personal sanitario, la cual solo puede desarrollarse mediante un enfoque de asociación múltiple colaborativo.

Conclusión La elaboración de informes sobre la aplicación del Código ha sido insuficiente en todas las regiones de la OMS, excepto en una. Se requiere una mayor colaboración entre los actores estatales y no estatales a fin de dar a conocer el Código y reforzar su importancia como un marco eficaz para el diálogo político sobre las diversas formas de abordar la crisis del personal sanitario.

References

- The world health report: working together for health. Geneva: World Health 1. Organization; 2006. Available from: http://www.who.int/whr/2006/en/ [accessed 23 August 2013].
- 2. The world health report – health systems financing: the path to universal coverage. Geneva: World Health Organization; 2010. Available from: http:// www.who.int/whr/2010/en [accessed 23 August 2013].
- Buchan J. Health worker migration in Europe: policy issues and options. London: HLSP Institute; 2007. Available from: http://www.hlsp.org/LinkClick. aspx?fileticket=SM55vQDY0bA%3D&tabid=1702&mid=3361 [accessed 23 August 2013].
- 4. User's guide to the WHO Global Code of Practice on the International Recruitment of Health Personnel. Geneva: World Health Organization; 2010 (WHO/HSS/ HRH/HMR/2010.2). Available from: http://whqlibdoc.who.int/hq/2010/ WHO_HSS_HRH_HMR_2010.2_eng.pdf [accessed 23 August 2013].
- Taylor AL, Dhillon IS. The WHO Global Code of Practice on the International Recruitment of Health Personnel: the evolution of global health diplomacy. Glob Health Gov 2011;V. Available from: http://scholarship.law.georgetown. edu/facpub/733/ [accessed 23 August 2013].

- Robinson M, Clark P. Forging solutions to health worker migration. Lancet 6. 2008;371:691-3. doi: http://dx.doi.org/10.1016/S0140-6736(08)60310-4 PMID:18295029
- WHA63.16. WHO Global Code of Practice on the International Recruitment 7. of Health Personnel. In: World Health Organization [Internet]. Sixty-sixth World Health Assembly, Geneva, 20-28 May 2013: main documents. Geneva: WHO; 2013. Available from: http://www.who.int/hrh/migration/ code/code en.pdf [accessed 23 August 2013].
- WHO Global Code of Practice on the International Recruitment of Health 8. Personnel: National Reporting Instrument. Geneva: World Health Organization; 2012. Available from: http://www.who.int/hrh/migration/ code/WHO_CODE_NationalReportingInstEn.pdf [accessed 29 August 2013].
- The Belgian development cooperation stakeholders' charter on the recruitment and support to the development of human resources for health in partner countries. Be-cause health matters 2012;5:1-7. Available from: http://www.be-causehealth.be/media/33192/be_cause_health_ matters_n_5.pdf [accessed 29 August 2013].

Amani Siyam et al.

- Part III. Immigrant health workers in OECD countries in the broader context of highly skilled migration. In: *International migration outlook: SOPEMI 2007 edition*. Paris: Organisation for Economic Co-operation and Development; 2007. Available from: http://www.oecd.org/els/mig/41515701.pdf [accessed 23 August 2013].
- Dussault G, Perfilieva G, Pethick J. Implementing the WHO Global Code of Practice on International Recruitment of Health Personnel in the European Region. Geneva: World Health Organization; 2012. Available from: http:// www.euro.who.int/__data/assets/pdf_file/0013/173020/BRIEF_NRI_ annex_060912VeryFinal.pdf [accessed 23 August 2013].
- Rø OC. The health workforce crisis What are the future challenges? Does the WHO Code work? In: *World Health Summit; 21–24 October 2012: Berlin, Germany:* speaker presentations [Internet]; 2012. Available from: http:// www.worldhealthsummit.org/member/whs-2012/presentations-2012. html?L=0 [accessed 23 August 2013].
- Arbeidstilbudet fra sykepleiere og leger ved endret studie- og arbeidsmønster. Oslo: Statistisk sentralbyrå; 1997. Norwegian. Available from: http://www. ssb.no/a/histstat/rapp/rapp_199708.pdf [accessed 29 August 2013].
- 14. Department of Health, Department of Labor and Employment, International Labour Organization. (Philippines) & World Health Organization (Philippines and Western Pacific Regional Office). Monitoring of the WHO Global Code of Practice on the International Recruitment of Health Personnel: the Philippines multi-stakeholders approach. Manila: DOH, DOLE, ILO & WHO; 2012. Available from: http://www.wpro.who.int/philippines/publications/ phil_multistakeholders_approach/en/index.html [accessed 23 August 2013].
- International Labour Organization. Promoting decent work across borders: a project for migrant health professionals and skilled workers funded by the European Union. Geneva: ILO; 2013. Available from: http://www.ilo.org/ manila/whatwedo/projects/lang--en/index.htm [accessed 29 August 2013].

- Document A66.25. The health workforce: advances in responding to shortages and migration, and in preparing for emerging needs. In: World Health Organization [Internet]. Sixty-sixth World Health Assembly, Geneva, 20–28 May 2013: main documents. Geneva: WHO; 2013. Available from: http://apps.who.int/gb/ebwha/pdf_files/WHA66/A66_25-en.pdf [accessed 23 August 2013].
- International migration of health workers: improving international cooperation to address the global health workforce crisis. Paris: Organisation for Economic Co-operation and Development; 2010 (OECD/WHO Policy Brief). Available from: http://www.who.int/hrh/resources/oecd-who_policy_ brief_en.pdf [accessed 23 August 2013].
- Migrants count: five steps toward better migration data report of the Commission on International Migration Data for Development Research and Policy. Washington: Center for Global Development; 2009. Available from: http://www.cgdev.org/files/1422146_file_CGD_migration_FINAL_web.pdf [accessed 23 August 2013].
- Dussault G, Fronteira I, Cabral J. Migration of health personnel in the WHO European Region. Geneva: World Health Organization; 2009. Available from: http://www.euro.who.int/__data/assets/pdf_file/0010/95689/E93039.pdf [accessed 23 August 2013].
- Glinos IA, Wismar M, Maier CB, Palm W, Figueras J. Health professional mobility and health systems in Europe: conclusions from the case-studies. In: Wismar M, Maier CB, Glinos IA, Dussault G, Figueras J, editors. *Health* professional mobility and health systems: evidence from 17 European countries. Geneva: World Health Organization; 2011 (Observatory Study Series No. 23). Available from: http://www.euro.who.int/__data/assets/ pdf_file/0017/152324/e95812.pdf [accessed 23 August 2013].
- The looming crisis in the health workforce, how can OECD countries respond? Paris: Organisation for Economic Co-operation and Development; 2008 (OECD Health Policy Studies). Available from: http://www.oecd.org/els/ health-systems/41509461.pdf [accessed 23 August 2013].

Quality of care provided by mid-level health workers: systematic review and meta-analysis

Zohra S Lassi,^a Giorgio Cometto,^b Luis Huicho^c & Zulfiqar A Bhutta^a

Objective To assess the effectiveness of care provided by mid-level health workers.

Methods Experimental and observational studies comparing mid-level health workers and higher level health workers were identified by a systematic review of the scientific literature. The quality of the evidence was assessed using Grading of Recommendations Assessment, Development and Evaluation criteria and data were analysed using Review Manager.

Findings Fifty-three studies, mostly from high-income countries and conducted at tertiary care facilities, were identified. In general, there was no difference between the effectiveness of care provided by mid-level health workers in the areas of maternal and child health and communicable and noncommunicable diseases and that provided by higher level health workers. However, the rates of episiotomy and analgesia use were significantly lower in women giving birth who received care from midwives alone than in those who received care from doctors working in teams with midwives, and women were significantly more satisfied with care from midwives. Overall, the quality of the evidence was low or very low. The search also identified six observational studies, all from Africa, that compared care from clinical officers, surgical technicians or non-physician clinicians with care from doctors. Outcomes were generally similar.

Conclusion No difference between the effectiveness of care provided by mid-level health workers and that provided by higher level health workers was found. However, the quality of the evidence was low. There is a need for studies with a high methodological quality, particularly in Africa – the region with the greatest shortage of health workers.

Abstracts in عربى, 中文, Français, Русский and Español at the end of each article.

Introduction

In 2000, 189 countries adopted the United Nation's Millennium Declaration and its eight Millennium Development Goals, including Goals 4, 5 and 6, which are directly related to health. However, progress towards achieving the associated health targets falls far below expectations, especially in developing countries. Recent reviews have clearly identified interventions that can have a positive effect on maternal and child health and neonatal survival but implementing them throughout the general population has been hampered by a lack of trained and motivated health workers.¹⁻⁶ Moreover, the poor performance of health systems in delivering effective, evidence-based interventions for priority health conditions has been linked to the poor retention, inadequate performance and poor motivation of health workers, as well as to shortages of personnel and their maldistribution. As health systems around the world and the international health community increasingly embrace the goal of universal health coverage, which will inevitably result in greater demands on health systems and existing health workers, the need to address these shortcoming is becoming imperative.⁷ In parallel, there is growing recognition that skilled and semi-skilled mid-level health workers, who are sometimes referred to as "outreach and facility health workers", can play a major role in community mobilization and in delivering a range of health-care services.

Although mid-level health workers have been defined in a variety of ways (Table 1), the definitions commonly agree that they will have received shorter training than physicians but

will perform some of the same tasks.¹⁰ Typically, these workers follow certified training courses and receive accreditation for their work.¹⁰ Many, such as nurse auxiliaries and medical assistants, undergo shorter training than physicians and the scope of their practice is narrower, but this is not necessarily the case for all. For example, sometimes nurses and nurse practitioners spend more than 5 years in training and perform some of the same tasks as doctors. Similarly, non-physician clinicians may have, in total, spent an equal amount of time in training as medical doctors and may perform a comparable range of tasks, including surgery. Despite differences in the roles and training of mid-level health workers and despite a continuing struggle for their acceptance, today many countries rely ever more heavily on these workers to improve the coverage and equity of health care.11 Although mid-level health workers have played a vital role in many countries' health-care systems for over 100 years, interest in them has been renewed only in the past 10 years, principally because of the serious shortage of health workers in many developing countries, the burden of diseases such as human immunodeficiency virus (HIV) infection and the emerging importance of other conditions, such as noncommunicable diseases. Many African and Asian countries have successfully invested in these workers.¹²⁻¹⁵

Our aim was to test the hypothesis that mid-level health workers are as effective as higher level health workers at providing good quality care in priority areas of the health service. We also hoped to increase understanding of their effectiveness and of how they can best be integrated into national healthcare systems.

^a Division of Women and Child Health, Aga Khan University, PO Box 3500, Karachi 74550, Pakistan.

^b Global Health Workforce Alliance Secretariat, World Health Organization, Geneva, Switzerland.

^c Universidad Peruana Cayetano Heredia, Lima, Peru.

Correspondence to Zulfiqar A Bhutta (e-mail: zulfiqar.bhutta@aku.edu).

⁽Submitted: 10 March 2013 – Revised version received: 28 May 2013 – Accepted: 30 May 2013)

Table 1. Definitions of mid-level health workers

Source of definition	Definition of mid-level health workers
WHO Regional Office for the Western Pacific, 2001 ⁸	"Front-line health workers in the community who are not doctors but who have been trained to diagnose and treat common health problems, to manage emergencies, to refer appropriately and to transfer the seriously ill or injured for further care."
Dovlo, 2004º	"Health cadres who have been trained for shorter periods and required lower entry educational qualifications, to whom are delegated functions and tasks normally performed by more established health professionals with higher qualifications."
Lehman, 2008 ¹⁰	"Mid-level workers are health-care providers who are not professionals but who render health care in communities and hospitals. They have received less (shorter) training and have a more restricted scope of practice than professionals. In contrast to community or lay health workers, they have a formal certificate and accreditation through their countries' licensing bodies. Some may work under the direct or indirect supervision of professionals, while others work independently and indeed lead health care teams, particularly in primary and community care."

WHO, World Health Organization.

Methods

We performed a systematic review of studies on the role of mid-level health workers in delivering to the general population health-care services that are associated with the achievement of Millennium Development Goals on health and nutrition or with the management of noncommunicable diseases. We included all randomized and nonrandomized controlled trials, controlled before-andafter trials and interrupted time-series studies. Less rigorously designed studies, such as observational (cohort and case-control) and descriptive studies, were also examined to understand the context within which mid-level health worker programmes are implemented, the types of health-care providers involved, the types of interventions delivered and the outcomes obtained. We aimed to compare the effectiveness of: (i) different kinds of mid-level health workers; (ii) mid-level health workers and doctors or community health workers; and (iii) mid-level health workers working alone or in a team.

For the purpose of this study, a mid-level health worker was defined as a health-care provider who is not a medical doctor or physician but who provides clinical care in the community or at a primary care facility or hospital. He or she may be authorized and regulated to work autonomously, to diagnose, manage and treat illness, disease and impairments, or to engage in preventive care and health promotion at the primary- or secondary-health-care level. The definition includes midwives, nurses, auxiliary nurses, nurse assistants, non-physician clinicians and surgical technicians (Table 2). Workers who specialize in health administration or who perform only administrative tasks and those who provide rehabilitative or dentistry services were excluded. However, no type of patients or recipient of health services was excluded.

A systematic search of the Cochrane Library, Medline, Embase and Cinahl databases, the Latin America and the Caribbean database LILACS and the Social Sciences Citation Index was performed, without language restrictions. Articles in both peer-reviewed and grey literature were included and the authors of relevant papers were contacted to help identify additional published or unpublished works.

The main health-care outcomes we considered were morbidity, mortality, outcomes associated with care delivery, health status, quality of life, service utilization and the patient's satisfaction with care. Two review authors independently extracted all outcome information. Data were collected on all health workers and care recipients involved, on health-care settings and on each study's design and outcomes.

The statistical analysis was performed using Review Manager (Nordic Cochrane Centre, Copenhagen, Denmark). Risk ratios (RRs) and mean differences, with 95% confidence intervals (CIs), were calculated for dichotomous and continuous variables, respectively. Study heterogeneity was assessed using I^2 and χ^2 statistics. Two review authors independently assessed the risk of bias in each study using a form describing standard criteria, which was obtained from the Cochrane Effective Practice and Organisation of Care Group.¹⁸ We analysed the quality of the evidence supporting study findings using the approach developed by the Grading of Recommendations Assessment, Development and Evaluation (GRADE) working group.^{19,20} The quality of the evidence for each outcome was rated high, moderate, low or very low.

Results

The search identified 24 246 database records, which led to the retrieval of documentation on 327 studies for a full text review (Fig. 1). Of the 327, 53 met the eligibility criteria and were included in the review (Table 3, available at: http://www.who.int/bulletin/ volumes/91/11/13-118786). Most stud1 ies compared either care provided by midwives with that provided by doctors working in a team along with midwives or care provided by nurses with that provided by doctors. Moreover, most were conducted in high-income countries and at tertiary care facilities. The studies were experimental in design and their results were pooled for the metaanalysis (Table 4). Since the evidence in all studies was found to be of low or very low quality, as assessed using GRADE criteria, the findings of the meta-analysis should be interpreted with caution.

Thirteen of the 53 studies²¹⁻³³ compared the care provided by midwives with that provided by doctors working in a team with midwives. On meta-analysis, no significant difference in the antenatal hospitalization rate was found between care provided by midwives alone and that provided by doctors working with midwives (RR: 0.95; 95% CI: 0.79-1.13). However, the absence of intrapartum analgesia was more likely with care from midwives alone (RR: 1.13; 95% CI: 0.96-1.33), but not significantly so, and the use of opiate or regional anaesthesia was significantly less likely (Table 4). Episiotomy was also significantly less likely with care from midwives alone (Fig. 2). However, there was no significant difference in rates for the induction of labour, instrumental delivery or caesarean section (Table 4). The postpartum

Table 2. Categories of mid-level health workers

Broad category	Definition ^{16,17}	Titles
Nurse	A graduate nurse who has been legally authorized (i.e. registered) to practise after examination by a state board of nurse examiners or similar regulatory authority. Their education typically includes 3, 4 or more years in a nursing school and leads to a university or postgraduate university degree or equivalent.	Registered nurse, nurse practitioner, clinical nurse specialist, advanced practice nurse, clinical practice nurse, practice nurse, licenced nurse, diploma nurse, nurse with a Bachelor of Science degree
Midwife	A person who has been assessed and registered by a state midwifery regulatory authority or similar regulatory authority. Midwives offer care to childbearing women during pregnancy, labour, birth and the postpartum period. They also care for neonates and assist the mother with breastfeeding. Their education lasts 3, 4 or more years in a nursing school and leads to a university or postgraduate university degree or equivalent. A registered midwife has the full range of midwifery skills.	Registered midwife, midwife, community midwife
Auxiliary nurse or auxiliary nurse midwife	Auxiliary nurses and auxiliary nurse midwives undergo some training in secondary school. A period of on-the-job training may be included and sometimes formalized in apprenticeships. An auxiliary nurse has basic nursing skills but no training in nursing decision-making. Auxiliary nurse midwives provide care to women during the prenatal, intrapartum and postpartum periods and to neonates.	Auxiliary nurse, auxiliary nurse midwife, auxiliary midwife, nurse assistant
Non-physician clinician	A non-physician clinician is a health worker who is not trained as a physician but who is able to perform many of the diagnostic and clinical functions of a medical doctor and who has more clinical skills than a nurse. He or she usually provides advanced advisory, diagnostic, curative (including minor surgery but not, according to the definition adopted in this report, caesarean section, except in Mozambique) and preventive medical services. The requisites and training vary from country to country but often include 3 or 4 years of education after secondary school in clinical medicine, surgery and community health.	Clinical officer, medical assistant, physician assistant
Surgical technician	Surgical technicians perform all the functions of non-physician clinicians. However, they are predominantly responsible for performing caesarean sections.	Medical and surgical technician

haemorrhage rate was not significantly lower with care from midwives alone and there was no significant difference between the groups in the rate of fetal or neonatal death, preterm birth or admission to the neonatal intensive care unit (Table 4). In one study, women were significantly more satisfied with antenatal care provided by midwives alone but there was no significant difference between the groups in satisfaction with intrapartum or postpartum care.³¹ Turnball et al.³⁰ also reported that women were

Fig. 1. Database search for experimental studies of mid-level health workers' effectiveness, 1973–2012



more satisfied with care from midwives alone than care from doctors working with midwives in a team. Wolke et al.³³ compared the level of satisfaction with health workers in general between groups of patients managed by midwives and those managed by junior paediatricians: the care provided by midwives was perceived as being significantly better than that provided by physicians (RR: 1.23; 95% CI: 1.10–1.37).

Four of the 53 studies³⁴⁻³⁷ compared auxiliary nurse midwives with doctors. There was no significant difference in the likelihood of an incomplete abortion between groups of patients managed by auxiliary nurse midwives and those managed by doctors (RR: 0.93; 95% CI: 0.45-1.90). Nor was the likelihood of a complication during (RR: 3.07; 95% CI: 0.16-59.1) - or an adverse event after (RR: 1.36; 95% CI: 0.54-3.40) - manual vacuum aspiration significantly greater with auxiliary nurse midwives. Similarly, there was no difference between the groups in postoperative complications in women who underwent tubal ligation or in those who were referred to a specialist after insertion of an intrauterine device (Table 4).

Table 4. Meta-analysis of the effectiveness of mid-level health workers, 1973–2012

Clinical area and outcome measure	RR (95% CI)	Meta-analysis		Study heterogeneity	
		No. of studies	No. of participants	² (%)	P for χ^2
Midwife vs obstetrician or doctor in team with midwives					
Antenatal hospitalization	0.95 (0.79–1.13)	2	1 794	47	0.17
Antepartum haemorrhage	1.02 (0.54–1.92)	3	2 460	48	0.14
No intrapartum analgesia	1.13 (0.96–1.33)	3	7419	0	0.94
Use of intrapartum opiate analgesia	0.85 (0.71-1.00)	6	9411	89	< 0.0001
Use of intrapartum regional analgesia	0.87 (0.81-0.93)	8	9415	0	0.56
Augmentation or artificial oxytocin during labour	0.85 (0.71-1.00)	8	12 143	89	< 0.0001
Induction of labour	0.90 (0.79-1.02)	7	9 4 4 0	59	0.02
Spontaneous vaginal delivery	1.05 (1.01–1.09)	8	13616	62	0.01
Instrumental vaginal birth	1.10 (0.81–1.50)	8	13 388	88	< 0.0001
Episiotomy	0.85 (0.78–0.92)	8	13 205	25	0.23
Caesarean section	0.94 (0.83-1.06)	8	12 144	11	0.34
Intact perineum	1.08 (0.95–1.23)	6	10 105	70	0.005
Postpartum haemorrhage	0.53 (0.25-1.14)	6	8 604	90	< 0.001
Fetal or neonatal death	0.94 (0.56–1.58)	6	11 562	13	0.33
Preterm birth	0.87 (0.73–1.04)	5	9210	0	0.58
Admission to neonatal intensive care	0.97 (0.77–1.23)	8	13 980	62	0.01
Auxiliary nurse midwife vs doctor					
Incomplete abortion	0.93 (0.45–1.90)	1	1 032	NA	NA
Complication during manual vacuum aspiration	3.07 (0.16–59.1)	1	2 789	NA	NA
Adverse event after manual vacuum aspiration	1.36 (0.54–3.40)	1	2 761	NA	NA
Complication after tubal ligation	2.43 (0.64–9.22)	1	292	NA	NA
Referral to a specialist after intrauterine device insertion	0.81 (0.31–2.09)	1	996	NA	NA
Nurses vs doctors					
Communicable diseases					
ART failure	1.08 (0.39–2.14)	1	812	NA	NA
Noncommunicable diseases					
Management of depression	1.28 (0.83–1.98)	1	139	NA	NA
Repeat consultation for a noncommunicable disease	0.90 (0.35-2.32)	3	2 394	93	< 0.0001
Improved physical functioning	1.06 (0.97–1.15)	4	3 603	78	0.004
Attendance at a follow-up visit for a chronic condition	1.26 (0.95–1.67)	3	4022	84	0.002
Attendance at an emergency department after receiving care	1.02 (0.87-1.14)	2	2 648	0	0.91
Satisfaction with noncommunicable disease care	0.20 (0.14-0.26)	4	4 903	90	< 0.0001
Compliance with drug treatment	1.24 (1.03-1.48)	1	62	NA	NA
Death by 12-month follow-up	0.36 (0.17–0.79)	1	106	NA	NA

ART, antiretroviral therapy; CI, confidence interval; NA, not applicable; RR, risk ratio.

One study³⁸ compared the effects of antiretroviral therapy (ART) in patients managed by nurses and those managed by doctors. There was no significant difference in the likelihood of ART failure between groups of patients managed by nurses and those managed by doctors (RR: 1.08; 95% CI: 0.39–2.14). Nor was there any difference in mortality, failure of viral suppression or immune recovery between the groups.

The search also identified one study³⁹ that compared nursing care of depression in the general population with standard care. There was no significant difference

in measures of depression between patients managed by nurses compared with those managed by physicians (RR: 1.28; 95% CI: 0.83–1.98).

Twenty-eight studies^{40–45,47–51,53–69} compared the effectiveness of care provided by nurses and care provided by doctors in patients with chronic diseases, such as heart disease and diabetes. Most concerned secondary and tertiary care in developed countries. The metaanalysis showed that care provided by nurses was as effective as care provided by nurses was as effective as care provided by doctors: no significant difference between the groups was found in the need for a repeat consultation, improved physical functioning, attendance at follow-up visits or attendance at an emergency department after receiving care (Table 4). However, dissatisfaction was significantly lower with care received from nurses than with that received from doctors (RR: 0.20; 95% CI: 0.14–0.26). The likelihood of death at 12-month follow-up was also lower with care from nurses and the likelihood of compliance with drug treatment was higher (Table 4). However, these last two findings are based on the results of only one study.

Fig. 2. Forest plot showing the risk of episiotomy when pregnancy care is provided only by midwives versus when it is provided by obstetricians or other types of doctors as part of a team including midwives, 1993–2012



CI, confidence interval; RR, risk ratio.

Note: The values to the left of the 1 indicate a lower risk of episiotomy when pregnancy care is provided only by midwives and those to the right of 1 indicate a higher risk when the care is administered by obstetricians or other types of doctors as part of a team including midwives.

Observational studies

All of the lower quality, prospective observational studies identified came from Africa and compared care delivered by clinical officers, surgical technicians or non-physician clinicians with that delivered by doctors.

Six observational studies compared the effectiveness of care provided by clinical officers and surgical technicians with that of care provided by doctors.70-75 Detailed descriptions of the interventions and types of midlevel health workers involved in these studies are provided in Table 5 (available at: http://www.who.int/bulletin/ volumes/91/11/13-118786). Since the studies were not experimental in design, data could not be pooled for analysis. Two studies from Malawi compared the outcomes of surgical procedures carried out by clinical officers and medical officers (i.e. doctors).^{70,71} In the prospective cohort study from Malawi, there was no significant difference in postoperative maternal health outcomes, such as fever, wound infection, the need for re-operation and maternal death, after emergency obstetric procedures performed by clinical officers or by medical officers (RR: 0.99; 95% CI: 0.95-1.03). In particular, there was no significant difference in the likelihood of a stillbirth with procedures performed by clinical officers (RR: 0.75; 95% CI: 0.52-1.09) or in the likelihood of early neonatal death (RR: 1.40; 95% CI: 0.51-3.87). Although 22 maternal deaths occurred in 1875 procedures performed by

clinical officers compared with 1 in 256 procedures performed by medical officers, the difference was not significant. In a prospective cohort study from Mozambique,⁷² haematomas occurred significantly more often after surgery performed by a surgical technician than after surgery performed by an obstetrician (odds ratio: 2.2; 95% CI: 1.3–3.9). Finally, a retrospective cohort study from the United Republic of Tanzania⁷³ found no difference in maternal mortality or perinatal mortality between care provided by an assistant medical officer and that provided by a medical officer.

Discussion

The meta-analysis showed that the outcomes of numerous interventions in the areas of maternal and child health and communicable and noncommunicable diseases were similar when the interventions were performed by mid-level health workers or higher level health workers. However, this finding must be interpreted with caution as the evidence obtained in the systematic review was generally of low or very low quality.

Mid-level health workers play an important role in maternal and child health since midwives are the primary health-care providers in many settings. The results of our meta-analysis indicate that antenatal care provided by midwives alone gave comparable results on most outcome measures to care provided by doctors working in a team with midwives. In addition, mothers were more satisfied with neonatal examinations performed by midwives alone. Midwives can provide continuity of care after childbirth and can advise mothers on other health-care issues concerning neonates, such as breastfeeding.

Mid-level health workers often care for patients with chronic conditions such as diabetes mellitus and hypertension. Our meta-analysis indicated that patients were significantly more satisfied with care received from nurses than from doctors, though the evidence available was of low quality. Moreover, care provided by nurses was as effective as that provided by doctors. Another consideration is that consultations with mid-level health workers are less expensive for patients.

If health-related Millennium Development Goals are to be achieved, health systems will have to be strengthened so that more countries can deliver a wider range of health services on a much larger scale. It has been claimed that better quality health services could be achieved using the existing workforce, but there is compelling evidence that the number of people with access to health-care services is directly correlated with the number of health service providers.⁷⁶ Furthermore, there is also a correlation between the health of the population and the density of qualified health-care workers.77 Thus, the number of healthcare workers has a positive effect not only on access to health care but also on health outcomes. Clearly, any strategy that aims to increase the scope or reach of the health-care services must consider long-, medium- and short-term initiatives for increasing the skills and retention of health-care workers.

Although the use of mid-level health workers instead of medical doctors has proved successful in various contexts, such as in performing surgery, providing health-care services, health promotion and education and providing ART, the quality of care can be poor when mid-level health workers are not properly supervised or are inadequately trained.⁷⁸ Moreover, these factors can also have a negative effect on staff retention. Once it has been accepted that less-qualified health-care workers can provide as good a service as more qualified workers, attention should shift to optimizing the skills mix of the workforce. This would mitigate the effect of personnel shortages and help countries achieve the Millennium Development Goals.

This meta-analysis provides evidence supporting the concept of tasksharing, which is defined as the situation in which health-care tasks are shared, as part of a team-based approach to the delivery of care, with either existing or new health workers who have been trained for only a limited period or within only a narrow field. Task-sharing can help achieve the new paradigm of universal health coverage as well as health-related Millennium Development Goals. In addition, mid-level health workers are less costly to train and employ than doctors and they are easier to retain in rural areas. However, it must be remembered that task-sharing alone cannot produce large-scale changes where there is a shortage of personnel. Any task-sharing strategy should be implemented alongside other strategies designed to increase the total number of health-care workers.79-82

The main obstacle to ensuring that mid-level health workers can help improve health outcomes is that they are often ignored by government policies, health workforce strategies and health system support measures, despite their widespread use. Until these workers are more comprehensively taken into account and supported, their potential contribution will not be fully realized.

This review has several limitations. First, most studies reviewed did not fully describe the characteristics of the mid-level health workers involved; in particular, the level and amount of training and supervision provided were not reported. Second, the meta-analysis included few studies of the role of midlevel health workers in HIV prevention and care, mental health or nutrition. Third, the quality of the evidence in the studies we identified was low or very low and, in particular, the majority of studies from Africa on non-physician clinicians and clinical officers were not experimental. Therefore, the results of these studies could not be pooled to generate evidence on the effectiveness of mid-level health workers.

There is a need for more studies of a high methodological quality, particularly experimental studies in primary health care and developing countries. In addition, further research is required on the effectiveness of mid-level health workers in low- and middle- income settings, where the challenge of accessing essential health services is greatest. There is also a remarkable dearth of information on the cost-effectiveness of programmes involving these health workers and on whether these programmes help ensure that care can be

accessed on an equitable basis. Finally, there is a need for a systematic review to identify factors that determine whether interventions involving mid-level health workers are sustainable when scaled-up.

In conclusion, we found no difference between the effectiveness of care provided by mid-level health workers and that provided by higher level health workers. However, the quality of the evidence was low or very low. Better quality trials with longer follow-ups are needed, particularly in Africa. Countries in danger of missing health-related Millennium Development Goals should continue to scale up health-care interventions involving community health workers and mid-level health workers. Both national and subnational policies are needed to reduce the shortfall in human resources for health: the skills required by mid-level health workers and their roles should be clearly defined with reference to the level of demand from the local community and changing disease patterns in the country.

Funding: The review was supported financially by the Global Health Workforce Alliance.

ملخص

Competing interests: None declared.

الصحيين.

تلقين الرعاية من الأطباء العاملين في فرق مع القابلات، وازداد مستوى رضا النساء عن الرعاية المقدمة من القابلات بشكل كبر. وبشكل عام، كانت جودة البيانات منخفضة أو شديدة الانخفاض. وحدد البحث كذلك ست دراسات قائمة على الملاحظة، جمعها من أفريقيا، قارنت الرعاية المقدمة من العاملين السريريين أو الاختصاصيين الجراحيين أو الخبراء السريريين غير الأطباء بالرعاية المقدمة من الأطباء. وكانت الحصائل متشابهة بشكل عام. الاستنتاج لم يتم العثور على اختلاف بين فعالية الرعاية المقدمة من العاملين الصحيين على المستوى المتوسط وتلك المقدمة من العاملين الصحيين على المستوى الأعلى. ومع ذلك، كانت جودة البينَّات منخفضة. وثمة حاجة لإجراء دراسات ذات جودة منهجبة عالبة، لاسيما في أفريقيا - المنطقة التي تعانى من أعلى نقص في العاملين

جودة الرعاية المقدمة بواسطة العاملين الصحيين على المستوى المتوسط: استعراض منهجي وتحليل وصفي الغرض تقييم فعالية الرعاية المقدمة من العاملين الصحيين على اللاتي يلدن وتلقين الرعاية من القابلات فقط، عنها لدى اللاتي الغرض تقييم فعالية الرعاية المقدمة من العاملين الصحيين على المستوى المتو سط. الطريقة تم تحديد الدراسات التجريبية والقائمة على الملاحظة التي تقارن العاملين الصحيين على المستوى المتوسط والعاملين الصحيين على المستوى الأعلى عن طريق استعراض منهجي للأبحاث العلمية. وتم تقييم جودة البينّات باستخدام معايير تقدير وتطوير وتقييم التوصيات، وتم تحليل البيانات باستخدام مدير المراجعة. النتائج تم تحديد ثلاث وخمسين دراسة، معظمها من البلدان المرتفعة الدخلُّ وتم إجراؤها في منشآت الرعاية المتخصصة. وبشكل عام، لم يتم العثور على أي اختلاف بين فعالية الرعاية المقدمة من العاملين الصحيين على المستوى المتوسط في مجالات صحة الأم والطفل والأمراض السارية وغير السارية وتلك المقدمة من العاملين الصحيين على المستوى الأعلى. ومع ذلك، انخفضت معدلات بضع الفرج واستخدام المسكنات بشكل كبير لدى النساء

摘要

中级卫生工作者提供的护理质量:系统回顾和元分析

目的 评估中级卫生工作者所提供护理的效果。 方法 通过系统回顾科学文献,对比较中级卫生工作者 和高级卫生工作者的实验和观察性研究进行确认。使 用推荐等级的评估、制定与评价评估、制定和评价标 准分级来评估证据的质量,并使用 Review Manager 分 析数据。

结果确认了53项研究,这些研究大多数来自高收入 国家,并且是在三级医院中执行的。一般而言,在孕产 妇和儿童卫生以及传染病和非传染性疾病方面,中级 卫生工作者和高级卫生工作者所提供护理的效果没有 差别。但是,较之由医生与助产士合作提供护理的产 妇,其会阴侧切率和镇痛使用率显著低于只接受助产 士护理的产妇,并且产妇对助产士的护理明显更加满 意。整体而言,证据的质量较低或非常低。此次研究 还确定了六项观察性研究,这些研究都来自非洲,它 们对临床人员、外科工作人员和非医师临床人员提供 的护理与医生提供的护理进行比较。结局大致相似。 结论在中级卫生工作者和高级卫生工作者提供的护理 效果之间没有发现区别。但是,证据的质量很低。需 要进行方法质量较高的研究,尤其是在非洲——该地 区卫生工作者最为短缺。

Résumé

Qualité des soins prodigués par les agents de santé de niveau intermédiaire: revue systématique et méta-analyse

Objectif Évaluer l'efficacité des soins fournis par les agents de santé de niveau intermédiaire.

Méthodes Des études expérimentales et observationnelles comparant des agents de santé de niveaux intermédiaire et de niveau supérieur ont été identifiées à l'aide d'une revue systématique de la documentation scientifique. La qualité des éléments de preuve a été évaluée à l'aide des critères GRADE (Grading of Recommendations Assissment, Development and Evaluation – Méthode d'évaluation des recommandations, de détermination, d'élaboration et d'évaluation), et les données ont été analysées à l'aide d'un gestionnaire d'examen.

Résultats Cinquante-trois études ont été identifiées, la plupart provenant de pays à revenu élevé, et menées dans des établissements de soins tertiaires. En général, il n'y avait pas de différence entre l'efficacité des soins prodigués par des agents de santé de niveau intermédiaire dans les domaines de la santé maternelle et infantile et des maladies contagieuses et non contagieuses et ceux prodigués par des agents de santé de niveau supérieur. Cependant, les taux de recours à l'épisiotomie et aux analgésiques étaient significativement moins élevés chez les femmes accouchant avec la seule aide d'une sage-femme que chez les femmes prises en charge par des docteurs secondés par des sagesfemmes, et les femmes étaient significativement plus satisfaites des soins prodigués par les sages-femmes. Dans l'ensemble, la qualité des éléments de preuve était basse, voire très basse. La recherche a également identifié six études observationnelles, provenant toutes d'Afrique, qui comparaient les soins de praticiens cliniques, de techniciens chirurgicaux ou de cliniciens non-médecins avec les soins prodigués par des médecins. Les résultats étaient généralement similaires.

Conclusion Aucune différence n'a été constatée entre l'efficacité des soins prodigués par des agents de santé de niveau intermédiaire et ceux fournis par des agents de santé de niveau supérieur. Cependant, la qualité des éléments de preuve était basse. Il est nécessaire d'effectuer des études basées sur une méthodologie de haute qualité, en particulier en Afrique, la région qui manque le plus d'agents de santé.

Резюме

Качество медицинской помощи, предоставляемой средним медицинским персоналом: систематический обзор и метаанализ

Цель Оценить качество медицинской помощи, предоставляемой средним медицинским персоналом.

Методы На основе систематического обзора научной литературы были отобраны экспериментальные и обсервационные исследования, в которых сравнивается качество услуг, получаемых от медицинского персонала среднего и более высокого уровня. Качество собранных данных оценивалось на основе методологии GRADE (система градации и оценки качества рекомендаций), собранные данные были проанализированы с помощью программы Review Manager.

Результаты Было отобрано 53 исследования, главным образом из стран с высокими доходами, проведенных в учреждениях специализированной медицинской помощи. В целом не было выявлено разницы между эффективностью медицинской помощи, оказываемой медперсоналом среднего уровня в области материнского и детского здоровья и инфекционных и неинфекционных заболеваний, и помощью, оказываемой медицинскими работниками более высокого уровня. Однако показатели использования эпизиотомии и анальгезии были значительно ниже при родах женщин, получавших помощь только от акушерок, по сравнению с теми родами, которые вели врачи, работающие в группах с акушерками; и женщины были значительно более удовлетворены уходом акушерок. Но качество этих данных было низким или очень низким. В процессе поиска также было выявлено шесть обсервационных исследований, все из Африки, в которых проводилось сравнение медицинского ухода, получаемого от сотрудников клиник, хирургических техников и медицинских работников, не являющихся врачами. Результаты в целом были сходными.

Вывод Не обнаружено никаких отличий между эффективностью медицинской помощи, оказываемой медперсоналом среднего уровня, и помощью, оказываемой медицинскими работниками более высокого уровня. Однако качество этих доказательств являлось низким. Существует потребность в изучении данного вопроса с более высоким методологическим качеством, особенно в Африке, регионе с наиболее острой нехваткой работников здравоохранения.

Resumen

La calidad de la atención proporcionada por trabajadores sanitarios de nivel intermedio: examen sistemático y meta-análisis

Objetivo Evaluar la eficacia de la atención proporcionada por los trabajadores sanitarios de nivel intermedio.

Métodos A través de un examen sistemático de la literatura científica se identificaron diversos estudios experimentales y observacionales que comparaban a los trabajadores sanitarios de nivel intermedio con los de nivel superior. Se evaluó la calidad de las pruebas científicas con ayuda de los criterios GRADE y se empleó el programa Review Manager para el análisis de los datos.

Resultados Se identificaron 53 estudios, la mayoría de ellos de países de ingresos elevados y que se habían efectuado en centros de atención sanitaria terciaria. En general, no se observaron diferencias entre la eficacia de la atención prestada por los trabajadores de salud de nivel intermedio y la proporcionada por los trabajadores de salud de nivel superior en las áreas de salud materno-infantil y en relación a las enfermedades transmisibles y no transmisibles. Sin embargo, los índices de episiotomía y el uso de analgésicos fueron significativamente

inferiores en las mujeres que dieron a luz únicamente con la ayuda de una matrona en comparación con aquellas cuya atención corrió a cargo de médicos que trabajaron conjuntamente con matronas. Las mujeres estuvieron mucho más satisfechas con el trabajo de las matronas. En general, la calidad de las pruebas científicas fue baja o muy baja. La búsqueda también identificó seis estudios observacionales, todos ellos realizados en África, que comparaban la atención de los encargados clínicos y la de los instrumentadores quirúrgicos o clínicos sin licencia para practicar medicina con la de los médicos. Los resultados fueron, en su mayoría, similares.

Conclusión No se encontró diferencia alguna entre la eficacia de la atención proporcionada por trabajadores sanitarios de nivel intermedio o de nivel superior. No obstante, la calidad de las pruebas científicas era baja. Es necesario realizar estudios con una calidad metodológica alta, especialmente en África, la región con la mayor escasez de personal sanitario.

References

- Bhutta ZA, Ahmed T, Black RE, Cousens S, Dewey K, Giugliani E et al.; Maternal and Child Undernutrition Study Group. What works? Interventions for maternal and child undernutrition and survival. *Lancet* 2008;371:417–40. doi: http://dx.doi.org/10.1016/S0140-6736(07)61693-6 PMID:18206226
- Bhutta ZA, Ali S, Cousens S, Ali TM, Haider BA, Rizvi A et al. Interventions to address maternal, newborn, and child survival: what difference can integrated primary health care strategies make? *Lancet* 2008;372:972–89. doi: http://dx.doi.org/10.1016/S0140-6736(08)61407-5 PMID:18790320
- Bhutta ZA, Darmstadt GL, Haws RA, Yakoob MY, Lawn JE. Delivering interventions to reduce the global burden of stillbirths: improving service supply and community demand. *BMC Pregnancy Childbirth* 2009;9(Suppl 1):S7. doi: http://dx.doi.org/10.1186/1471-2393-9-S1-S7 PMID:19426470
- Campbell OMR, Graham WJ. Lancet Maternal Survival Series steering group. Strategies for reducing maternal mortality: getting on with what works. *Lancet* 2006;368:1284–99. doi: http://dx.doi.org/10.1016/S0140-6736(06)69381-1 PMID:17027735
- Kerber KJ, de Graft-Johnson JE, Bhutta ZA, Okong P, Starrs A, Lawn JE. Continuum of care for maternal, newborn, and child health: from slogan to service delivery. *Lancet* 2007;370:1358–69. doi: http://dx.doi.org/10.1016/ S0140-6736(07)61578-5 PMID:17933651
- Haws RA, Thomas AL, Bhutta ZA, Darmstadt GL. Impact of packaged interventions on neonatal health: a review of the evidence. *Health Policy Plan* 2007;22:193–215. doi: http://dx.doi.org/10.1093/heapol/czm009 PMID:17526641
- Resolution A/RES.33/63. Global health and foreign policy. In: General Assembly of the United Nations [Internet]. Resolutions. New York: WHO; 2013 (A/RES/33/63). Available from: http://www.who.int/trade/ foreignpolicy/en/ [accessed 26 August 2013].
- Mid-level and nurse practitioners in the Pacific: models and issues. Manila: World Health Organization, Western Pacific Regional Office; 2001. Available from: http://whqlibdoc.who.int/wpro/2001/a76187.pdf [accessed 26 August 2013].
- Dovlo D. Using mid-level cadres as substitutes for internationally mobile health professionals in Africa: a desk review. *Hum Resour Health* 2004;2:7.
- Lehman U. Mid-level health workers. The state of the evidence on programmes, activities, costs and impact on health outcomes: a literature review. Geneva: World Health Organization; 2008. Available from: http://www.who.int/hrh/ MLHW_review_2008.pdf [accessed 26 August 2013].
- 11. Task shifting to tackle health worker shortages. Geneva: World Health Organization; 2007. Available from: www.who.int/healthsystems/ task_shifting_booklet.pdf [accessed 26 August 2013].
- Zulu I. Clinical officers (CO) and health care delivery in Zambia: a response to physician shortage. Lusaka: CDC Global AIDS Program. Available from: http:// csis.org/files/media/csis/events/080324_zulu.pdf [accessed 4 July 2013].
- Hounton SH, Newlands D, Meda N, De Brouwere V. A cost-effectiveness study of caesarean-section deliveries by clinical officers, general practitioners and obstetricians in Burkina Faso. *Hum Resour Health* 2009;7:34. doi: http://dx.doi.org/10.1186/1478-4491-7-34 PMID:19371433

- Kruk ME, Pereira C, Vaz F, Bergström S, Galea S. Economic evaluation of surgically trained assistant medical officers in performing major obstetric surgery in Mozambique. *BJOG* 2007;114:1253–60. doi: http://dx.doi. org/10.1111/j.1471-0528.2007.01443.x PMID:17877677
- Pereira C, Cumbi A, Malalane R, Vaz F, McCord C, Bacci A et al. Meeting the need for emergency obstetric care in Mozambique: work performance and histories of medical doctors and assistant medical officers trained for surgery. *BJOG* 2007;114:1530–3. doi: http://dx.doi.org/10.1111/j.1471-0528.2007.01489.x PMID:17877775
- 16. Optimizing the delivery of key interventions to attain MDGs 4 and 5: background document for the first expert 'scoping' meeting to develop WHO recommendations to optimize health workers' roles to improve maternal and newborn health. Geneva: World Health Organization; 2010.
- 17. Mullan F, Frehywot S. Non-physician clinicians in 47 sub-Saharan African countries. *Lancet* 2007;370:2158–63.
- Ottawa Hospital Research Institute [Internet]. EPOC resources. Suggested risk of bias criteria for EPOC reviews. Ottawa: OHRI; 2013. Available from: http://epoc.cochrane.org/search/google-appliance/Suggested%20risk%20 of%20bias%20criteria [accessed 26 August 2013].
- Guyatt GH, Oxman AD, Kunz R, Vist GE, Falck-Ytter Y, Schünemann HJ; GRADE Working Group. What is "quality of evidence" and why is it important to clinicians? *BMJ* 2008;336:995–8. doi: http://dx.doi.org/10.1136/ bmj.39490.551019.BE PMID:18456631
- Higgins JPT, Green S, editors. Cochrane handbook for systematic reviews of interventions version 5.1.0 [updated March 2011]. Oxford: The Cochrane Collaboration; 2011. Available from: www.cochrane-handbook.org [accessed 26 August 2013].
- Begley C, Devane D, Clarke M, McCann C, Hughes P, Reilly M et al. Comparison of midwife-led and consultant-led care of healthy women at low risk of childbirth complications in the Republic of Ireland: a randomised trial. *BMC Pregnancy Childbirth* 2011;11:85. doi: http://dx.doi. org/10.1186/1471-2393-11-85 PMID:22035427
- Harvey S, Jarrell J, Brant R, Stainton C, Rach DA. A randomized, controlled trial of nurse-midwifery care. *Birth* 1996;23:128–35. doi: http://dx.doi. org/10.1111/j.1523-536X.1996.tb00473.x PMID:8924098
- Hundley VA, Cruickshank FM, Lang GD, Glazener CMA, Milne JM, Turner M et al. Midwife managed delivery unit: a randomised controlled comparison with consultant led care. *BMJ* 1994;309:1400–4. doi: http://dx.doi. org/10.1136/bmj.309.6966.1400 PMID:7819846
- MacVicar J, Dobbie G, Owen-Johnstone L, Jagger C, Hopkins M, Kennedy J. Simulated home delivery in hospital: a randomised controlled trial. *Br J Obstet Gynaecol* 1993;100:316–23. doi: http://dx.doi. org/10.1111/j.1471-0528.1993.tb12972.x PMID:8494832
- Marks MN, Siddle K, Warwick C. Can we prevent postnatal depression? A randomized controlled trial to assess the effect of continuity of midwifery care on rates of postnatal depression in high-risk women. *J Matern Fetal Neonatal Med* 2003;13:119–27. doi: http://dx.doi.org/10.1080/ jmf.13.2.119.127 PMID:12735413

Systematic reviews Effectiveness of mid-level health workers

Zohra S Lassi et al.

- 26. McLachlan HL, Forster DA, Davey M-A, Lumley J, Farrell T, Oats J et al. COSMOS: Comparing standard maternity care with one-to-one midwifery support: a randomised controlled trial. *BMC Pregnancy Childbirth* 2008;8:35. doi: http://dx.doi.org/10.1186/1471-2393-8-35 PMID:18680606
- Di Napoli A, Di Lallo D, Fortes C, Franceschelli C, Armeni E, Guasticchi G. Home breastfeeding support by health professionals: findings of a randomized controlled trial in a population of Italian women. *Acta Paediatr* 2004;93:1108–14. doi: http://dx.doi.org/10.1111/j.1651-2227.2004. tb02725.x PMID:15456204
- Rowley MJ, Hensley MJ, Brinsmead MW, Wlodarczyk JH. Continuity of care by a midwife team versus routine care during pregnancy and birth: a randomised trial. *Med J Aust* 1995;163:289–93. PMID:7565233
- Small R, Lumley J, Donohue L, Potter A, Waldenström U. Randomised controlled trial of midwife led debriefing to reduce maternal depression after operative childbirth. *BMJ* 2000;321:1043–7. doi: http://dx.doi. org/10.1136/bmj.321.7268.1043 PMID:11053173
- Turnbull D, Holmes A, Shields N, Cheyne H, Twaddle S, Gilmour WH et al. Randomised, controlled trial of efficacy of midwife-managed care. *Lancet* 1996;348:213–8. doi: http://dx.doi.org/10.1016/S0140-6736(95)11207-3 PMID:8684197
- Waldenström U, McLachlan H, Forster D, Brennecke S, Brown S. Team midwife care: maternal and infant outcomes. *Aust N Z J Obstet Gynaecol* 2001;41:257–64. doi: http://dx.doi.org/10.1111/j.1479-828X.2001.tb01225.x PMID:11592538
- 32. Law YYH, Lam KY. A randomized controlled trial comparing midwifemanaged care and obstetrician-managed care for women assessed to be at low risk in the initial intrapartum period. *J Obstet Gynaecol Res* 1999;25:107–12. doi: http://dx.doi.org/10.1111/j.1447-0756.1999.tb01131.x PMID:10379125
- Wolke D, Dave S, Hayes J, Townsend J, Tomlin M. Routine examination of the newborn and maternal satisfaction: a randomised controlled trial. *Arch Dis Child Fetal Neonatal Ed* 2002;86:F155–60. doi: http://dx.doi.org/10.1136/ fn.86.3.F155 PMID:11978744
- Eren N, Ramos R, Gray RH. Physicians vs. auxiliary nurse-midwives as providers of IUD services: a study in Turkey and the Philippines. *Stud Fam Plann* 1983;14:43–7. doi: http://dx.doi.org/10.2307/1965401 PMID:68366665
- Dusitsin N, Chalapati S, Varakamin S, Boonsiri B, Ningsanon P, Gray RH. Post-partum tubal ligation by nurse-midwives and doctors in Thailand. *Lancet* 1980;1:638–9. doi: http://dx.doi.org/10.1016/S0140-6736(80)91129-0 PMID:6102637
- 36. Warriner IK, Meirik O, Hoffman M, Morroni C, Harries J, My Huong NT et al. Rates of complication in first-trimester manual vacuum aspiration abortion done by doctors and mid-level providers in South Africa and Vietnam: a randomised controlled equivalence trial. *Lancet* 2006;368:1965–72. doi: http://dx.doi.org/10.1016/S0140-6736(06)69742-0 PMID:17141703
- Warriner IK, Wang D, Huong NT, Thapa K, Tamang A, Shah I et al. Can midlevel health-care providers administer early medical abortion as safely and effectively as doctors? A randomised controlled equivalence trial in Nepal. *Lancet* 2011;377:1155–61. doi: http://dx.doi.org/10.1016/S0140-6736(10)62229-5 PMID:21458058
- Sanne I, Orrell C, Fox M, Conradie F, Ive P, Zeinecker J et al. Nurse versus doctor management of HIV-infected patients receiving antiretroviral therapy (CIPRA-SA): a randomised non-inferiority trial. *Lancet* 2010;376:33– 40. doi: http://dx.doi.org/10.1016/S0140-6736(10)60894-X PMID:20557927
- Mann AH, Blizard R, Murray J, Smith JA, Botega N, MacDonald E et al. An evaluation of practice nurses working with general practitioners to treat people with depression. *Br J Gen Pract* 1998;48:875–9. PMID:9604408
- Du Moulin MF, Hamers JPH, Paulus A, Berendsen CL, Halfens R. Effects of introducing a specialized nurse in the care of community-dwelling women suffering from urinary incontinence: a randomized controlled trial. *J Wound Ostomy Continence Nurs* 2007;34:631–40. doi: http://dx.doi.org/10.1097/01. WON.0000299814.98230.13 PMID:18030102
- Gordon DW. Health maintenance service: ambulatory patient care in the general medical clinic. *Med Care* 1974;12:648–58. doi: http://dx.doi. org/10.1097/00005650-197408000-00003 PMID:4852229
- Hemani A, Rastegar DA, Hill C, al-Ibrahim MS. A comparison of resource utilization in nurse practitioners and physicians. *Eff Clin Pract* 1999;2:258–65. PMID:10788023
- Katz DA, Brown RB, Muehlenbruch DR, Fiore MC, Baker TB; AHRQ Smoking Cessation Guideline Study Group. Implementing guidelines for smoking cessation: comparing the efforts of nurses and medical assistants. *Am J Prev Med* 2004;27:411–6. PMID:15556742

- Kinnersley P, Anderson E, Parry K, Clement J, Archard L, Turton P et al. Randomised controlled trial of nurse practitioner versus general practitioner care for patients requesting "same day" consultations in primary care. *BMJ* 2000;320:1043–8. doi: http://dx.doi.org/10.1136/bmj.320.7241.1043 PMID:10764366
- 45. Strömberg A, Mårtensson J, Fridlund B, Levin LÄ, Karlsson J-E, Dahlström U. Nurse-led heart failure clinics improve survival and self-care behaviour in patients with heart failure: results from a prospective, randomised trial. *Eur Heart J* 2003;24:1014–23. doi: http://dx.doi.org/10.1016/S0195-668X(03)00112-X PMID:12788301
- 46. Mårtensson J, Strömberg A, Dahlström U, Karlsson JE, Fridlund B. Patients with heart failure in primary health care: effects of a nurse-led intervention on health-related quality of life and depression. *Eur J Heart Fail* 2005;7:393– 403. doi: http://dx.doi.org/10.1016/j.ejheart.2004.01.016 PMID:15718180
- Moher M, Yudkin P, Wright L, Turner R, Fuller A, Schofield T et al. Cluster randomised controlled trial to compare three methods of promoting secondary prevention of coronary heart disease in primary care. *BMJ* 2001;322:1338. doi: http://dx.doi.org/10.1136/bmj.322.7298.1338 PMID:11387182
- Sakr M, Angus J, Perrin J, Nixon C, Nicholl J, Wardrope J. Care of minor injuries by emergency nurse practitioners or junior doctors: a randomised controlled trial. *Lancet* 1999;354:1321–6. doi: http://dx.doi.org/10.1016/ S0140-6736(99)02447-2 PMID:10533859
- 49. Smith JR, Mildenhall S, Noble MJ, Shepstone L, Koutantji M, Mugford M et al. The Coping with Asthma Study: a randomised controlled trial of a home based, nurse led psychoeducational intervention for adults at risk of adverse asthma outcomes. *Thorax* 2005;60:1003–11. doi: http://dx.doi. org/10.1136/thx.2005.043877 PMID:16055616
- 50. Stein GH. The use of a nurse practitioner in the management of patients with diabetes mellitus. *Med Care* 1974;12:885–90. doi: http://dx.doi. org/10.1097/00005650-197410000-00008 PMID:4437220
- Chambers LW, Bruce-Lockhart P, Black DP, Sampson E, Burke M. A controlled trial of the impact of the family practice nurse on volume, quality, and cost of rural health services. *Med Care* 1977;15:971–81. doi: http://dx.doi. org/10.1097/00005650-197712000-00001 PMID:592915
- Black DP, Riddle RJ, Sampson E. Pilot project: the family practice nurse in a Newfoundland rural area. *Can Med Assoc J* 1976;114:945–7. PMID:1268779
- Caine N, Sharples LD, Hollingworth W, French J, Keogan M, Exley A et al. A randomised controlled crossover trial of nurse practitioner versus doctor-led outpatient care in a bronchiectasis clinic. *Health Technol Assess* 2002;6:1–71. PMID:12433318
- Chambers LW, West AE. The St John's randomized trial of the family practice nurse: health outcomes of patients. *Int J Epidemiol* 1978;7:153–61. doi: http://dx.doi.org/10.1093/ije/7.2.153 PMID:681061
- 55. Chinn DJ, Poyner T, Sibley G. Randomized controlled trial of a single dermatology nurse consultation in primary care on the quality of life of children with atopic eczema. *Br J Dermatol* 2002;146:432–9. doi: http:// dx.doi.org/10.1046/j.1365-2133.2002.04603.x PMID:11952543
- Cox C, Jones M. An evaluation of the management of patients with sore throats by practice nurses and GPs. Br J Gen Pract 2000;50:872–6. PMID:11141872
- 57. D'Eramo-Melkus G, Spollett G, Jefferson V, Chyun D, Tuohy B, Robinson T et al. A culturally competent intervention of education and care for black women with type 2 diabetes. *Appl Nurs Res* 2004;17:10–20. doi: http:// dx.doi.org/10.1016/j.apnr.2003.10.009 PMID:14991551
- Dierick-van Daele ATM, Metsemakers JFM, Derckx EWCC, Spreeuwenberg C, Vrijhoef HJM. Nurse practitioners substituting for general practitioners: randomized controlled trial. J Adv Nurs 2009;65:391–401. doi: http://dx.doi. org/10.1111/j.1365-2648.2008.04888.x PMID:19191937
- 59. Federman DG, Krishnamurthy R, Kancir S, Goulet J, Justice A. Relationship between provider type and the attainment of treatment goals in primary care. *Am J Manag Care* 2005;11:561–6. PMID:16159046
- 60. Houweling ST, Kleefstra N, van Hateren KJ, Kooy A, Groenier KH, Ten Vergert E et al.; Langerhans Medical Research Group. Diabetes specialist nurse as main care provider for patients with type 2 diabetes. *Neth J Med* 2009;67:279–84. PMID:19687522
- Mundinger MO, Kane RL, Lenz ER, Totten AM, Tsai W-Y, Cleary PD et al. Primary care outcomes in patients treated by nurse practitioners or physicians: a randomized trial. *JAMA* 2000;283:59–68. doi: http://dx.doi. org/10.1001/jama.283.1.59 PMID:10632281
- Myers PC, Lenci B, Sheldon MG. A nurse practitioner as the first point of contact for urgent medical problems in a general practice setting. *Fam Pract* 1997;14:492–7. doi: http://dx.doi.org/10.1093/fampra/14.6.492 PMID:9476082
- Rushforth H, Burge D, Mullee M, Jones S, McDonald H, Glasper EA. Nurseled paediatric preoperative assessment: an equivalence study. *Paediatr Nurs* 2006;18:23–9. PMID:16634381
- 64. Sharples LD, Edmunds J, Bilton D, Hollingworth W, Caine N, Keogan M et al. A randomised controlled crossover trial of nurse practitioner versus doctor led outpatient care in a bronchiectasis clinic. *Thorax* 2002;57:661–6. doi: http://dx.doi.org/10.1136/thorax.57.8.661 PMID:12149523
- Shum C, Humphreys A, Wheeler D, Cochrane M-A, Skoda S, Clement S. Nurse management of patients with minor illnesses in general practice: multicentre, randomised controlled trial. *BMJ* 2000;320:1038–43. doi: http:// dx.doi.org/10.1136/bmj.320.7241.1038 PMID:10764365
- 66. Venning P, Durie A, Roland M, Roberts C, Leese B. Randomised controlled trial comparing cost effectiveness of general practitioners and nurse practitioners in primary care. *BMJ* 2000;320:1048–53. doi: http://dx.doi.org/10.1136/bmj.320.7241.1048 PMID:10764367
- 67. Sackett DL, Spitzer WO, Gent M, Roberts RS. The Burlington randomized trial of the nurse practitioner: health outcomes of patients. *Ann Intern Med* 1974;80:137–42.
- Babor TE, Higgins-Biddle J, Dauser D, Higgins P, Burleson JA. Alcohol screening and brief intervention in primary care settings: implementation models and predictors. J Stud Alcohol 2005;66:361–8. PMID:16047525
- 69. McIntosh MC, Leigh G, Baldwin NJ, Marmulak J. Reducing alcohol consumption. Comparing three brief methods in family practice. *Can Fam Physician* 1997;43:1959–62. PMID:9386883
- Chilopora G, Pereira C, Kamwendo F, Chimbiri A, Malunga E, Bergström S. Postoperative outcome of caesarean sections and other major emergency obstetric surgery by clinical officers and medical officers in Malawi. *Hum Resour Health* 2007;5:17. doi: http://dx.doi.org/10.1186/1478-4491-5-17 PMID:17570847
- 71. McGuire M, Goossens S, Kukasha W, Ahoua L, Pujades M, Le Paih M, et al. Nurses and medical assistants taking charge: task-shifting HIV care and HAART initiation in resource-constrained and rural Malawi. In: XVII International AIDS Conference, 3–8 August 2008 Mexico City, Mexico [Internet]. Available from: http://www.doctorswithoutborders.org/events/ symposiums/2008-aids-iac/assets/files/Nurses-and-medical-assistantstaking-charge.pdf [accessed 26 August 2013].
- Pereira C, Bugalho A, Bergström S, Vaz F, Cotiro M. A comparative study of caesarean deliveries by assistant medical officers and obstetricians in Mozambique. *Br J Obstet Gynaecol* 1996;103:508–12. doi: http://dx.doi. org/10.1111/j.1471-0528.1996.tb09797.x PMID:8645640

- McCord C, Mbaruku G, Pereira C, Nzabuhakwa C, Bergstrom S. The quality of emergency obstetrical surgery by assistant medical officers in Tanzanian district hospitals. *Health Aff (Millwood)* 2009;28:w876–85. doi: http://dx.doi. org/10.1377/hlthaff.28.5.w876 PMID:19661113
- 74. Gimbel-Sherr K, Augusto O, Micek M, Gimbel-Sherr S, Tomo MI, Pfeiffer J, et al. Task shifting to mid-level clinical health providers: an evaluation of quality of ART provided by tecnicos de medicina and physicians in Mozambique. In: XVII International AIDS Conference, 3–8 August 2008, Mexico City, Mexico [Internet]. Available from: http://www.aids2008.org/pag/PSession.aspx?s=321 [accessed 26 August 2013].
- 75. Labhardt ND, Balo JR, Ndam M, Grimm JJ, Manga E. Task shifting to non-physician clinicians for integrated management of hypertension and diabetes in rural Cameroon: a programme assessment at two years. *BMC Health Serv Res* 2010;10:339. doi: http://dx.doi.org/10.1186/1472-6963-10-339 PMID:21144064
- Anand S, Bärnighausen T. Health workers and vaccination coverage in developing countries: an econometric analysis. *Lancet* 2007;369:1277–85. doi: http://dx.doi.org/10.1016/S0140-6736(07)60599-6 PMID:17434403
- Anand S, Bärnighausen T. Human resources and health outcomes: crosscountry econometric study. *Lancet* 2004;364:1603–9. doi: http://dx.doi. org/10.1016/S0140-6736(04)17313-3 PMID:15519630
- Munga MA, Kilima SP, Mutalemwa PP, Kisoka WJ, Malecela MN. Experiences, opportunities and challenges of implementing task shifting in underserved remote settings: the case of Kongwa district, central Tanzania. *BMC Int Health Hum Rights* 2012;12:27. doi: http://dx.doi.org/10.1186/1472-698X-12-27 PMID:23122296
- Task shifting: rational redistribution of tasks among health workforce teams; global recommendations and guidelines. Geneva: World Health Organization; 2008. Available from: http://chwcentral.org/sites/default/files/Task%20 Shifting-%20Global%20Recommendations%20and%20Guidelines.pdf [accessed 26 August 2013].
- Huicho L, Miranda JJ, Diez-Canseco F, Lema C, Lescano AG, Lagarde M et al. Job preferences of nurses and midwives for taking up a rural job in Peru: a discrete choice experiment. *PLoS ONE* 2012;7:e50315. doi: http://dx.doi. org/10.1371/journal.pone.0050315 PMID:23284636
- Miranda JJ, Diez-Canseco F, Lema C, Lescano AG, Lagarde M, Blaauw D et al. Stated preferences of doctors for choosing a job in rural areas of Peru: a discrete choice experiment. *PLoS ONE* 2012;7:e50567. doi: http://dx.doi. org/10.1371/journal.pone.0050567 PMID:23272065
- Lagarde M, Pagaiya N, Tangcharoensathian V, Blaauw D. One size does not fit all: investigating doctors' stated preference heterogeneity for job incentives to inform policy in Thailand. *Health Econ* 2013:Epub 24 January 2013. doi: http://dx.doi.org/10.1002/hec.2897 PMID:23349119

Early implementation of WHO recommendations for the retention of health workers in remote and rural areas

James Buchan,^a Ian D Couper,^b Viroj Tangcharoensathien,^c Khampasong Thepannya,^d Wanda Jaskiewicz,^e Galina Perfilieva^f & Carmen Dolea^g

Abstract The maldistribution of health workers between urban and rural areas is a policy concern in virtually all countries. It prevents equitable access to health services, can contribute to increased health-care costs and underutilization of health professional skills in urban areas, and is a barrier to universal health coverage. To address this long-standing concern, the World Health Organization (WHO) has issued global recommendations to improve the rural recruitment and retention of the health workforce. This paper presents experiences with local and regional adaptation and adoption of WHO recommendations. It highlights challenges and lessons learnt in implementation in two countries – the Lao People's Democratic Republic and South Africa – and provides a broader perspective in two regions – Asia and Europe. At country level, the use of the recommendations facilitated a more structured and focused policy dialogue, which resulted in the development and adoption of more relevant and evidence-based policies. At regional level, the recommendations sparked a more sustained effort for cross-country policy assessment and joint learning. There is a need for impact assessment and evaluation that focus on the links between the rural availability of health workers and universal health coverage. The effects of any health-financing reforms on incentive structures for health workers will also have to be assessed if the central role of more equitably distributed health workers in achieving universal health coverage is to be supported.

Abstracts in عربى, 中文, Français, Русский and Español at the end of each article.

Introduction

Any shortage of health workers can prevent good access to health services and is a barrier to universal coverage. When such shortages are accompanied by an unequal distribution of the workers, their impact can be even more dramatic.

The maldistribution of health workers between urban and rural or remote areas is a concern in virtually all countries. In Senegal, for example, the Dakar region, which is mostly urban, has more than 60% of the country's physicians but only 23% of the total population.¹ In Canada – where 99.8% of the territory is rural – 24% of the population but only 9.3% of the physicians lived in rural areas in 2006.² About one half of the world's population lives in rural and remote areas, but this half is served by only one quarter of the world's doctors and by less than one third of the world's nurses.³

Lack of access to health workers in rural and remote areas often leads to relatively high mortality rates in such areas. It also leads to rural residents seeking care at urban health facilities and thus to overcrowding – and increased costs – at urban hospitals. The relatively higher levels of staff in urban areas and facilities may lead to the underutilization of skilled personnel, who may then consider emigration.⁴

In 2010, the World Health Organization (WHO) addressed the long-standing problem of the maldistribution of health workers. First, it facilitated intergovernmental negotiations that led to the adoption – by all of WHO's Member States – of a code of practice for the international recruitment of health personnel.⁵ Second, it established a global task force to examine the adverse effects of the intra-country relocation of health workers – mainly from rural to urban areas – which then developed 16 evidence-based recommendations for the improved retention of health workers in remote and rural areas (Table 1).³ Although no systematic approach to collect in-depth information about the implementation of these recommendations has yet been made, this paper provides broad details of progress across two regions, and more specific details of the lessons learnt in using these recommendations in two countries.

Implementing the recommendations

Adaptation to country context

Lao People's Democratic Republic

Health workers in the Lao People's Democratic Republic are concentrated in cities, although more than 70% of the country's population lives in rural areas.⁶ In an attempt to correct this maldistribution, the Laotian health ministry began to develop a strategy for the retention of health workers in those areas. This strategy was built, in part, on the national "2020 Health Personnel Development Strategy" and on a governmental decree that established guidelines for implementing financial incentives for rural civil servants.7 To assess which of WHO's 16 recommendations would be most effective in the Laotian context, the Ministry of Health - in partnership with CapacityPlus and WHO⁸ - used a retention survey tool that had been developed from the recommendations9 to conduct a discrete choice experiment.¹⁰ The results of surveys involving 970 students who were training to become professional health workers and 483 people who were already health workers, indicated that salary levels became less of an issue when a set of other, highly valued incentives, such as promotion and study opportunities, was offered.

^a Queen Margaret University, Edinburgh, Scotland.

^b Centre for Rural Health, University of Witwatersrand, Johannesburg, South Africa.

^c International Health Policy Programme, Ministry of Health, Bangkok, Thailand.

^d Department of Health Personnel, Ministry of Health, Vientiane, Lao People's Democratic Republic.

^e IntraHealth International, Chapel Hill, North Carolina, United States of America.

^f Europe Regional Office, World Health Organization, Copenhagen, Denmark.

⁹ Health Systems Policies and Workforce, World Health Organization, 20 avenue Appia, 1211 Geneva, Switzerland.

Correspondence to Carmen Dolea (e-mail: doleac@who.int).

⁽Submitted: 10 March 2013 – Revised version received: 31 May 2013 – Accepted: 6 June 2013)

Category of interven- tion	Examples
Education	Target admission policies to enrol students with a rural background in education programmes for health disciplines
	Locate health professional schools and family medicine residency programmes outside major cities
	During studies, arrange clinical rotations in remote and rural areas
	Revise curricula to reflect the main issues in rural health
	Develop programmes of continuous professional development for rural health workers
Regulation	Introduce enhanced scopes of practice in remote and rural areas
	Introduce different types of health workers in remote and rural areas
	Implement compulsory service in remote and rural areas
	Subsidize education for return of service in remote and rural areas
Financial incentives for health workers in remote and rural areas	Provide appropriate financial incentives
Professional and	Improve living conditions
personal support for health workers in	Develop a safe and supportive working environment
	Provide outreach support
Terriole and fulat aleas	Provide career development programmes
	Support the development of professional networks
	Adopt public recognition measures

Table 1. World Health Organization recommendations to improve the recruitment and retention of health workers in remote and rural areas

Source: Adapted from World Health Organization.³

Table 2. Top priorities for rural health care in South Africa, as identified by an expert panel

Rank	Area of health sector strategy	Priority
1	Human resources for health	There is a need to focus on how to recruit, retain and support senior health-care professionals in rural hospitals for the long term.
2	Governance and leadership	The employment of hospital and medical managers in rural areas should be based on appropriate skills and experience.
3	Human resources for health	There is a need to develop and implement a national "human resource plan" that is relevant in the context of rural health care.
4	Finance	Equitable funding formulae need to be designed for the financing of hospitals, based on the local burden of disease, staffing needs, the costing of services and equity principles.
5	Governance and leadership	The employment of district managers in rural areas should be based on appropriate skills and experience.

Source: adapted from Versteeg et al.¹⁵

The Laotian health ministry subsequently used a costing tool¹¹ to gauge the financial feasibility of implementing the preferred sets of incentives and to assist the relevant policy-makers in their decision-making.

The results of the surveys and costing were used to develop a new, national policy for the recruitment and retention of health workers. This policy – which was announced by the Laotian government in October 2012 – stipulates that all graduates in medicine, nursing, midwifery, pharmacy and dentistry and all postgraduates in family medicine must complete three years of service as a health worker in a rural area before they can receive their licences to practise in their field of study.¹² The policy also stipulates the provision of incentives to encourage new health workers both to provide high-quality services while they work in rural areas and to continue working in a rural area after they have completed their three years of compulsory service. The provided incentives include permanent civil service positions, transportation and eligibility for continued education. The first phase of the implementation of the policy began in early 2013 and focused on 400 newly qualified doctors, pharmacists and dentists who were assigned to health centres and district hospitals serving 142 rural districts.

South Africa

WHO policy guidelines for health worker retention were launched at an event hosted by the University of the Witwatersrand's Centre for Rural Health, in South Africa. At this event, there was a clear call for countries with large rural populations to adapt the global recommendations to their local contexts. The launch event in South Africa, the call for local adaptation and the fact that South Africa faces a severe crisis in its health workforce provided the impetus for a contextualization of WHO guidelines to local - South African - conditions and needs. Thus, in early 2011, a group of national academic and civil society institutions - the University of the Witwatersrand's Centre for Rural Health, the Rural Doctors Association of Southern Africa, the University of KwaZulu-Natal Centre for Rural Health and the University of Cape Town Primary Health Care Directorate - under the leadership of South Africa's Rural Health Advocacy Project developed a document that adapted WHO's recommendations for use in South Africa. The document was distributed for stakeholder review in June 2011 and further inputs were subsequently obtained from Rural Rehabilitation South Africa and the South African Committee of Health Sciences Deans. The "final" contextualization document that was released publicly is a "living document" that is intended to be the basis for continuous discussion and ongoing development.13 Inputs from all categories of health workers in South Africa and other stakeholders are still being sought.

The contextualization document describes WHO guidelines as long-term strategies, illustrates four categories of interventions with specific examples for South Africa, and makes recommendations for the scaling up of these interventions or for adding to them. The recommendations formulated in this document were submitted to South Africa's national Department of Health, as part of an engagement around the development of a new "human resources for health plan" for South Africa. Many of them were subse-

Type of policy	China	Lao People's Democratic Republic	Sri Lanka	Thailand	Viet Nam
Education Students from rural backgrounds	Recruits students from townships for medical education; waives tuition fees and offers subsidies on condition that students serve	Reserves 10% of places in medical schools for students from the poorest districts	Selects certain categories of health workers on the basis of place of residence	Recruits rural students for medical and nursing education and home-town placement	Recruits medical students from hardship areas for medical education; offers 4 years of "upgrade training" to MD level
Site schools for health professionals outside major cities		Three colleges of health sciences and five public health schools located outside major cities	Some training schools for nurses and midwives located outside Colombo	Of 19 medical schools, 12 located outside Bangkok, of 79 nursing schools, 67 located outside Bangkok	Secondary schools and colleges for health professionals run by provincial governments or houth doors
Clinical rotations in rural areas during studies	I	I	I	Mandatory clinical rotation to district hospitals for students of all medical and	-
Curricula that reflect rural health issues	1	Rural health issues included in curricula for PHC workers and community midwives	Rural health issues included in curricula for all health professionals	numing serious Rural health issues included in curricula for all health professionals	1
Continuous professional development	Capacity building for mid-level rural health professionals at county hospitals	1		Non-mandatory CPD for doctors and mandatory CPD for nurses, associated with relicensing every 5 years	CPD for all physicians, for a mean of 24 hours per year
Enhanced scopes of practice	I	Decrees to enhance scopes for nurses and midwives	1	Scopes expanded for nurse practitioners and nurses in fields such as anaesthesiology, dialysis, intensive care and psychiatric services	1
Producing new types of health workers	I	Production of 1500 community midwives in response to MDG commitments	I	-	I
Compulsory service in a rural area	Short-term compulsory rural service for health professionals before they can be promoted	Decrees requiring all new health graduates to serve rural communities for at least 2 years within 5 years of graduation	Compulsory service in a rural area part of national policy but only implemented snoradically.	Since 1970s, compulsory service of at least 3 years in rural areas for all health professionals; those failing to comply fined for heach of contract	Compulsory service in a rural area not part of national policy since 1990
Subsidized education for return of service	Medical students recruited from rural townships receive subsidies on condition that they serve in rural areas after they have graduated	I			1
Appropriate financial incentives	I	Decree on the provision of bonuses – of 30%, 40% or 50% of basic salary – to all civil servants, including health workers in "hardship" areas	I	Additional incentives provided, such as hardship allowance, non-private- practice incentive	Decree on the provision of a bonus – of 70% of basic salary – to health workers in most "hardship" areas. Allowance approved for village health workers

Table 3. Policies for improving the recruitment and retention of health workers in five Asian countries



quently included in the new plan, which was launched in October 2011.14 As a result of the contextualization document, the plan included a priority area entitled: "Access in rural and remote areas" - as well as seven other priority areas in which issues relating to access to health care in rural areas were also embedded. The partnership being led by the Rural Health Advocacy Project is continuing to engage with the South African Department of Health on the establishment of a taskforce to develop an implementation plan for improving "access in rural and remote areas". A detailed implementation plan has already been drafted by the partnership. More recently, the partnership has been in discussion with the various groups that have been working on the development of human resource norms and indicators for all levels of the health service in South Africa.

The continued importance of WHO's recommendations in the South African context was confirmed by a recent consensus statement made by a panel of rural health experts.¹⁵ This statement listed the top five challenges for health care in rural South Africa (Table 2) and these challenges were mostly workforce issues like those identified in WHO's guidelines.

Policy analysis and mutual learning

Asia perspective

The Asia-Pacific Action Alliance on Human Resources for Health took a joint learning approach to assessing WHO's 16 recommendations. In 2012-2013, the Alliance convened a study to assess policies to improve the retention of health workers in the rural areas of five countries, with reference to WHO recommendations.¹⁶ A policy analysis tool was used to map existing and potential retention strategies - from formulation to implementation - and to assess or predict outcomes. The aims were to scale up the policies that worked well and either scale down the other policies or minimize the barriers to their effective implementation. Initially, only existing policies were investigated (Table 3). Although different sets of relevant interventions were applied in the five study countries, the recruitment of students from rural backgrounds, mandatory rural service by new graduates and the use of financial or non-financial incentives were common. There appears to have been little attempt to evaluate the success of any of these interventions. In a

systematic review of retention strategies, the interventions that had been evaluated had multiple effects, at different points on a continuum that ran from the attraction of health workers to their recruitment, retention and impact.17 For example, the building of schools in rural areas seems to improve the attraction of students at the schools to rural work but appears to have no impact on long-term retention. In contrast, outreach interventions appear to improve the retention and performance of health workers in rural areas but have no significant effect on recruitment.¹⁷ It can be difficult to isolate the impact of any one intervention when several are being implemented at the same time and in the same place. There may be many confounding factors and there may also be a lack of specific "intervention logic" that clarifies the expectations of each intervention's designers.^{17,18} Recent theoretical frameworks may help to identify the interplay of the different factors involved by providing a systematic and comprehensive approach for the design, implementation, monitoring, evaluation and review of such interventions.^{19,20} Such frameworks make use of a systems approach that differentiates between "impact" - for example, in terms of the attraction and retention of health workers in underserved areas - and "inputs", "outputs" and "outcomes". They provide a set of indicators to measure progress in implementing various strategies and allow their users not only to determine what does or does not work but also to explore the contextual factors that influence success or failure. The frameworks also help to address "heads-on" challenges - such as the absence of baseline indicators - and the need for a multi-stakeholder approach in the design, implementation and impact evaluation of interventions.

The investigations in five Asian countries involved policy-makers from the beginning. It is hoped that the findings will empower policy-makers to take steps to overcome any identified weaknesses and to scale up the workable strategies. The results of the second phase of these investigations – to be published in late 2013 – should help to provide revised, evidence-based, policy options for improving retention strategies in the five study countries.

Europe perspective

In Europe, WHO recommendations have sparked a sustained effort to document existing, related practices in the region, and to facilitate joint learning through

Category of in- tervention	Bulgaria	Republic of Moldova	Tajikistan	The former Yugoslav Republic of Macedonia	Ukraine
Education	Training of mediators to provide ethnic minorities with access to health care	Special admission quotas for students from rural areas	Medical colleges for nurses and midwives in eight rural areas	Special admission quotas for students from minority ethnic groups	A training centre for family physicians in each oblast
Regulation	Introduction of the "health assistant" as a new profession and change in the scope of practice	Bonding contract for 3 years of public health service	3-year bonding contract for scholarship students	Dual practice allowed	Pilot scheme with 3-year bonding contracts after graduation
Financial	Financial compensation through national health insurance, and fund for GPs working in remote areas	Financial incentives for general practitioners, specialists and nurses working in rural areas	Increased salaries for health workers in rural areas	Physicians salaries based on performance, with added compensation for rural work	Salary increase and differential payment based on catchment population
Professional and personal support	Improved access for nurses to medical universities	Housing benefits and electricity for health workers in rural areas, provided by local authorities	Land plots for housing for medical specialists in rural areas	Increased investment of Ministry of Health in public-health facilities and equipment	Transportation, housing support and Internet access for doctors in rural areas

Table 4. Interventions for improving the recruitment and retention of health workers in five European countries

GP, general practitioner.

Source: Adapted from World Health Organization.²¹

a series of subregional workshops organized by WHO and the Royal Tropical Institute in Amsterdam.²¹ These workshops have allowed for a detailed mapping of current policies - and an informed exchange on the challenges in implementing them - in 20 countries, notably in the south and east of the region. Initial findings from these countries (Table 4) indicate that the recruitment of health workers to remote and rural areas and their retention in such areas have been promoted by a range of policies covering education, regulation and financial, professional and personal support. However, the success of these systems is often difficult to evaluate. There is a need for situation analysis and impact assessment, which are both identified as important aspects of the successful implementation of WHO guidelines. As the recommended interventions should be "bundled" and can be costly, any mismatch between what is proposed and what may be effective can lead to a substantial waste of resources.

Conclusion

WHO recommendations for the retention of health workers in remote and rural areas have been a useful guide in many countries, particularly for initiating a more structured and focused policy dialogue, strengthening the collection of evidence and supporting policy development. However, more effective mechanisms to share the lessons learnt, to assess impact and to explore the links between the rural availability of health workers and universal health coverage are needed. Such mechanisms should help answer several critical policy questions, including: "How do different types of retention interventions really work?" and "What are the contextual factors that most influence intervention success?" We also need to know how comprehensive situation analysis can be conducted so that policy responses can be aligned with the expectations and needs of health workers, and so that the most effective mix or "bundle"19 of interventions in any given context can be identified.

At a ministerial level meeting held in February 2013, effective distribution of health workers was identified as a key component in achieving universal health coverage.²² Such coverage is also predicated on reforms in health financing. If the central role to be played by equitably distributed health workers in achieving universal health coverage is to be supported, the effects of these finance-related reforms on incentive systems for health workers will also have to be assessed.^{23,24}

Competing interests: None declared.

والاحتفاظ بقوة العمل الصحية. ويعرض هذا البحث الخبرات الخاصة بالتكييف المحلى والإقليمي وتبنى توصيات منظمة الصحة العالمية. وهو يسلط الضوء على التحديات والدروس المستفادة من التنفيذ في بلدين – جمهورية لاوس الديمقراطية الشعبية وجنوب أفريقيا – ويقدم منظوراً أوسع في إقليمين – آسيا وأوروبا. وقد ساعد استخدام التوصيات، على مستوى البلدان، على الوصول إلى حوار سياسي أكثر تنظيماً وتركيزاً، وهو ما نتج عنه وضع وتبنى

التنفيذ المبكر لتوصيات منظمة الصحة العالمية للاحتفاظ بالعاملين الصحيين في المناطق النائية والريفية يعتبر سوء توزيع العاملين الصحيين بين المناطق الحضرية والريفية أحد شواغل السياسة في كل البلدان تقريباً. وهو يحول دون الوصولُ العادل إلى الخدمات الصحية، ويمكن أن يسهم في زيادة تكالبف الرعاية الصحية وقصور استغلال المهارات المهنية الصحية في المناطق الحضرية، كمَّا يمثل عائقاً أمام التغطية الصحية الشاملة. ولمعالجة هذا الشاغل طويل الأمد، أصدرت منظمة الصحة العالمية (WHO) توصيات عالمية لتحسين التوظيف في المناطق الريفية الصحية الشاملة. وسينبغي أيضاً تقييم تأثيرات أية إصلاحات للتمويل الصحي على هياكل الحوافز للعاملين الصحيين، إذا كانت هناك حاجة لدعم الدور المركزي الذي يؤديه التوزيع الأكثر عدلاً للعاملين الصحيين في تحقيق التغطية الصحية الشاملة.

سياسات أكثر صلة وتستند إلى الأدلة. أما على المستوى الإقليمي، فقد أسهمت التوصيات في بدء جهود أكثر استدامة لتقييم السياسة عبر البلدان والتعلم المشترك. وهناك حاجة لتقييم وتقدير التأثير الذي يركز على الروابط بين التوفر الريفي للعاملين الصحيين والتغطية

摘要

世卫组织留住偏远和农村地区卫生工作者建议的早期实施

城市和农村地区卫生工作者配置不合理的问题在几乎 所有国家都是一个政策考虑。这种不均衡妨碍了人们 公平获取卫生服务,可能增加造成更高卫生保健成本, 使城市地区卫生专业人员的技能得不到充分利用,成 为实现全民医疗保障制度的拦路虎。为解决这一长期 存在的问题,世界卫生组织(WHO)发出了聘用和 留住更多农村卫生工作者的全球建议。本文介绍了因 地制宜采纳WHO建议的经验。文中重点介绍两个国 家(老挝和南非)在实施中的挑战和经验教训,并展 望了亚洲和欧洲这两个区域的大形势。在国家层次上, 这些建议的采纳促进了更结构化、更有针对性的政策 对话,从而促成更加中肯并以证据为基础的政策的制 定和实施。在区域层次上,这些建议激发了人们投入 更加持久的努力进行各国间政策的评估和共同学习。 文中指出针对农村卫生工作者可及性和全民医保制度 之间的关系,需要进行效果的评估和评价。在实现全 民医保的过程中,如果能够发挥卫生工作者更合理配 置的核心作用,则还必须对卫生工作者激励结构的所 有卫生筹资改革效果进行评估。

Résumé

Mise en œuvre anticipée des recommandations de l'OMS pour la rétention des travailleurs de la santé dans les régions rurales et excentrées

La mauvaise répartition des travailleurs de la santé entre les zones urbaines et rurales demeure une préoccupation politique dans pratiquement tous les pays. Elle empêche l'accès équitable aux services de santé, elle peut contribuer à une augmentation du coût des soins de santé et de sous-utilisation des compétences des professionnels de la santé dans les zones urbaines, et elle représente un obstacle à la mise en place d'une couverture maladie universelle. Pour répondre à cette préoccupation qui existe depuis longtemps, l'Organisation mondiale de la Santé (OMS) a émis des recommandations visant à améliorer le recrutement et la rétention des travailleurs du secteur de la santé en milieu rural. Ce document présente différentes expériences locales et régionales concernant l'adaptation et l'adoption des recommandations de l'OMS. Il souligne les défis et les leçons tirées de mises en œuvre dans deux pays - en République démocratique populaire lao et en Afrique du Sud - et il offre une perspective plus vaste dans deux régions - en Asie et en Europe. Au niveau des pays, l'application des recommandations a permis un dialogue plus structuré et plus ciblé sur les règlementations, qui a abouti à l'élaboration et à l'adoption de politiques plus pertinentes basées sur les faits. Au niveau régional, les recommandations ont suscité un effort plus soutenu en ce qui concerne l'évaluation des politiques entre les pays et leur apprentissage commun. Il faut évaluer l'impact des liens qui existent entre la disponibilité des travailleurs de la santé dans les zones rurales et la couverture maladie universelle. Les effets de toutes les réformes financières sur les structures d'incitation des travailleurs de la santé devront également être évalués si le but principal est de répartir plus équitablement les travailleurs de la santé et d'atteindre une couverture maladie universelle.

Резюме

Первые итоги реализации рекомендаций ВОЗ по удержанию работников здравоохранения на рабочих местах в отдаленных и сельских районах

Неравномерное распределение работников здравоохранения между городскими и сельскими районами представляет собой проблему для политики здравоохранения практически во всех странах. Данная проблема не позволяет обеспечить равный доступ к медицинским услугам, может способствовать увеличению расходов на здравоохранение и недостаточно эффективному использованию профессиональных навыков работников здравоохранения в городских районах, а также является препятствием для всеобщего охвата населения медико-санитарными услугами. Для решения этой давней проблемы Всемирная организация здравоохранения (BO3) опубликовала глобальные рекомендации по совершенствованию найма и удержания трудовых ресурсов здравоохранения в сельских районах. В этой статье описывается опыт адаптации и внедрения рекомендаций ВОЗ на местном и региональном уровнях. В ней освещаются проблемы и извлеченные уроки при применении рекомендаций в двух странах — в Лаосской Народно-Демократической Республике и Южной Африке, а также дается более широкий обзор для двух регионов — Азии и Европы. На уровне стран использование рекомендаций способствовало более структурированному и целенаправленному диалогу по вопросам выработки политики, что привело к разработке и принятию более обоснованной политики, основанной на фактах. На региональном уровне рекомендации стимулировали более последовательные усилия по сравнительным оценкам политик в различных странах региона и их совместному осмыслению. Существует необходимость проведения оценки последствий политик и анализа, в ходе которого основное внимание должно уделяться связям между наличием работников здравоохранения в сельских районах и всеобщим охватом населения медикосанитарными услугами. Кроме того, необходимо также оценить влияние всех реформ финансирования здравоохранения на структуры стимулирования работников здравоохранения, если придерживаться точки зрения, что более справедливое распределение работников здравоохранения является ключевым фактором для обеспечения всеобщего охвата населения медикосанитарными услугами.

Resumen

La aplicación temprana de las recomendaciones de la OMS para la conservación del personal sanitario en zonas rurales y remotas

La distribución ineficaz del personal sanitario entre las zonas urbanas y rurales constituye una preocupación política en casi todos los países, pues impide el acceso equitativo a los servicios sanitarios, puede contribuir al aumento de los costes de atención sanitaria y la infrautilización de las capacidades profesionales sanitarias en las zonas urbanas, y obstaculiza la cobertura sanitaria universal. Para solucionar este problema de larga data, la Organización Mundial de la Salud (OMS) ha publicado una serie de recomendaciones generales para mejorar la contratación a nivel rural y la conservación del personal sanitario. Este informe presenta las experiencias en relación con la adaptación local y regional, y la adopción de las recomendaciones de la OMS. Además, subraya los desafíos y las lecciones aprendidas de la aplicación en dos países, la República Democrática Popular Lao y Sudáfrica, y proporciona una perspectiva más amplia en dos regiones, en concreto, Asia y Europa. A nivel nacional, el uso de las recomendaciones facilitó un diálogo político más organizado y específico, lo que permitió el desarrollo y la adopción de políticas más relevantes con base empírica. A nivel regional, las recomendaciones motivaron un esfuerzo más firme para evaluar las políticas entre los países y el aprendizaje conjunto. Es necesario realizar una evaluación y una valoración del impacto que se centren en la relación entre la disponibilidad de personal sanitario en zonas rurales y la cobertura sanitaria universal. Asimismo, deben evaluarse los efectos de las reformas financieras en asistencia sanitaria sobre las estructuras de incentivos para el personal sanitario con miras a promover el papel central del mismo, distribuido de forma más equitativa, en la consecución de la cobertura sanitaria universal.

References

- Zurn P, Codjia L, Sall FL, Braichet JM. How to recruit and retain health workers in underserved areas: the Senegalese experience. *Bull World Health Organ* 2010;88:386–9. doi: http://dx.doi.org/10.2471/BLT.09.070730 PMID:20461134
- Dumont J-C, Zurn P, Church J, Le Thi C. International mobility of health professionals and health workforce management in Canada: myths and realities. Paris: Organization for Economic Co-operation and Development; 2008. Available from: http://www.oecd.org/canada/41590427.pdf [accessed 25 July 2013].
- Increasing access to health workers in remote and rural areas through improved retention: global policy recommendations. Geneva: World Health Organization; 2010. Available from: http://whqlibdoc.who.int/ publications/2010/9789241564014_eng.pdf [accessed 25 July 2013].
- Dussault G, Franceschini MC. Not enough there, too many here: understanding geographical imbalances in the distribution of the health workforce. *Hum Resour Health* 2006;4:1–12. doi: http://dx.doi. org/10.1186/1478-4491-4-12 PMID:16438710
- The WHO global code of practice on the international recruitment of health personnel. Geneva: World Health Organization; 2010. Available from: http:// www.who.int/hrh/migration/code/code_en.pdf [accessed 25 July 2013].
- 6. Annual report of the Department of Organization and Personnel. Vientiane: Ministry of Health; 2011.
- 7. Buchan J, Weller B. *Health worker incentives, Lao People's Democratic Republic; final report.* Manila: World Health Organization; 2013. Forthcoming.
- Jaskiewicz W, Phathammavong O, Vangkonevilay P, Paphassarang C, Phachanh IT, Wurts L. *Toward development of a rural retention strategy in Lao People's Democratic Republic: understanding health worker preferences*. Washington: CapacityPlus; 2012. Available from: http://www.capacityplus. org/files/resources/Toward-Development-of-a-Rural-Retention-Strategy-in-Lao-PDR.pdf [accessed 8 June 2013].
- Jaskiewicz W, Deussom R, Wurts L, Mgomella G. Rapid retention survey toolkit: designing evidence-based incentives for health workers. Washington: CapacityPlus; 2012. Available from: http://www.capacityplus.org/files/ resources/Rapid_Retention_Survey_Toolkit.pdf [accessed 8 June 2013].
- Lagarde M, Blaauw D. A review of the application and contribution of discrete choice experiments to inform human resources policy interventions. *Hum Resour Health* 2009;7:62. doi: http://dx.doi. org/10.1186/1478-4491-7-62 PMID:19630965
- *iHRIS retain. Cost health worker retention interventions.* Washington: Capacity*Plus;* 2013. Available from: http://retain.ihris.org/retain/ [accessed 8 June 2013].
- CapacityPlus [Internet]. Laotian health workforce recruitment and retention policy informed by use of CapacityPlus tools. Washington: CapacityPlus; 2012. Available from: http://www.capacityplus.org/laotian-healthworkforce-recruitment-retention-policy [accessed 25 July 2013].

- 13. The WHO global policy recommendations on increasing access to health care workers in remote and rural areasthrough improved recruitment and retention: the South African context. Braamfontein: Rural Health Advocacy Project; 2011.
- 14. *Human resources for health South Africa 2030.* Pretoria: National Department of Health; 2011.
- Versteeg M, du Toit L, Couper I. Building consensus on key priorities for rural health care in South Africa using the Delphi technique. *Glob Health Action* 2013;6:1–8. doi: http://dx.doi.org/10.1186/1478-4491-4-12 PMID:16438710
- Asia-Pacific Action Alliance on Human Resources for Health Newsletter [Internet]. AAAH Research Workshop, 18-19th April 2012 at Siam City Hotel, Bangkok. Mueang Nonthaburi: AAAH; 2012. Available from: http://www. aaahrh.org/pdf/Newsletter_Year_6_Issue2_Mar_Apr_2012%20(1).pdf [accessed 25 July 2013].
- Huicho L, Dieleman M, Campbell J, Codjia L, Balabanova D, Dussault G et al. Increasing access to health workers in underserved areas: a conceptual framework for measuring results. *Bull World Health Organ* 2010;88:357–63. doi: http://dx.doi.org/10.2471/BLT.09.070920 PMID:20461135
- Dieleman M, Kane S, Zwanikken P, Gerretsen B. Realist review and synthesis of retention studies for health workers in rural and remote areas. Geneva: World Health Organization; 2011. Available from: http://whqlibdoc.who.int/ publications/2011/9789241501262_eng.pdf [accessed 25 July 2013].
- Dolea C, Stormont L, Braichet JM. Evaluated strategies to increase attraction and retention of health workers in remote and rural areas. *Bull World Health Organ* 2010;88:379–85. doi: http://dx.doi.org/10.2471/BLT.09.070607 PMID:20461133
- Monitoring, evaluation and review of national health strategies: a country-led platform for information and accountability. Geneva: World Health Organization; 2011. Available from: http://www. internationalhealthpartnership.net/en/tools/monitoring-evaluationplatform/ [accessed 25 July 2013].
- Attracting and retaining health workers in the Member States of the Southeastern Europe Health Network: a policy brief. Copenhagen: World Health Organization; 2012. Available from: http://www.euro.who.int/__data/ assets/pdf_file/0013/152203/e95774.pdf [accessed 8 June 2013].
- WHO/World Bank Ministerial-level Meeting on Universal Health Coverage 18–19 February 2013, WHO headquarters, Geneva, Switzerland. Geneva: World Health Organization; 2013. Available from: http://www.who.int/ health_financing/ministerial_meeting_report20130328.pdf [accessed 25 July 2013].
- 23. Buchan J. What difference does ("good") HRM make? *Hum Resour Health* 2004;2:6. doi: http://dx.doi.org/10.1186/1478-4491-2-6 PMID:15182378
- Hoffman L. *Right time, right place*. London: BioMed Central; 2013. Available from: http://blogs.biomedcentral.com/bmcblog/2013/03/21/right-timeright-place/ [accessed 25 July 2013].

Why do health labour market forces matter?

Barbara McPake,^a Akiko Maeda,^b Edson Correia Araújo,^b Christophe Lemiere,^b Atef El Maghraby^c & Giorgio Cometto^d

Abstract Human resources for health have been recognized as essential to the development of responsive and effective health systems. Low- and middle-income countries seeking to achieve universal health coverage face human resource constraints – whether in the form of health worker shortages, maldistribution of workers or poor worker performance – that seriously undermine their ability to achieve well-functioning health systems. Although much has been written about the human resource crisis in the health sector, labour economic frameworks have seldom been applied to analyse the situation and little is known or understood about the operation of labour markets in low- and middle-income countries. Traditional approaches to addressing human resource constraints have focused on workforce planning: estimating health workforce requirements based on a country's epidemiological and demographic profile and scaling up education and training capacities to narrow the gap between the "needed" number of health workers and the existing number. However, this approach neglects other important factors that influence human resource capacity, including labour market dynamics and the behavioural responses and preferences of the health workers themselves. This paper describes how labour market analysis can contribute to a better understanding of the factors behind human resource constraints in the health sector and to a more effective design of policies and interventions to address them. The premise is that a better understanding of the impact of health policies on health labour markets, and subsequently on the employment conditions of health workers, would be helpful in identifying an effective strategy towards the progressive attainment of universal health coverage.

Abstracts in عربى, 中文, Français, Русский and Español at the end of each article.

Health workforce challenges

Human resources for health are central to any health system insofar as health workers perform or mediate most health system functions. They make treatment decisions at the point of service and their actions determine how efficiently other resources are used.¹ Health-care delivery is highly labour intensive. To be effective, a health-care system must have the right number and mix of health-care workers and it must ensure that they possess the means and motivation to skilfully perform the functions they are assigned. Many countries are facing a "crisis in human resources for health" that involves three dimensions: availability, which relates to the supply of qualified health workers; distribution, which relates to the recruitment and retention of health workers where their presence is most needed; and performance, which relates to health worker productivity and to the quality of the care that health workers provide.

Traditional approaches to resolving human resource constraints in the health sector have relied primarily on workforce planning, i.e. the practice of estimating health workforce requirements based on a country's epidemiological and demographic profile and of scaling up education and training capacities to narrow the gap between the existing number of health workers and the number required. However, focusing narrowly on the production of health workers results in the neglect of other important factors that influence human resource capacity, such as labour market dynamics and the behaviour and preferences of the health workers themselves. Thus, despite the extensive published literature on the human resource crisis in the health sector, few analyses have been conducted using labour economic frameworks and the dynamics of labour markets remain little known or understood, especially in low- and middle-income countries.

The health status of a population, its health-care needs and its requirements in the area of human resources for health are linked in complex ways.² For example, the employment opportunities available to health workers and the type of employment conditions that health workers prefer are not always aligned with priority health-care needs. Health workers may be attracted to positions that do not respond to such needs or may choose to migrate in search of alternative employment opportunities. Sometimes a paradoxical situation arises: vacancies in high-priority positions in the public sector coexist with high unemployment rates among health workers. This paradox is explained by the labour market failure to match the supply and demand for health workers. For instance, several African countries (e.g. Kenya, Mali and Senegal) are experiencing acute under-employment among doctors and nurses, yet they are simultaneously investing substantial public funds in producing more health workers. This worsens underemployment and reduces the efficiency of government expenditures. The system of posting health workers to rural areas further illustrates the limitations of traditional workforce planning. When health workers are officially assigned to a remote rural area, they often find unofficial ways to evade the assignment and find employment in an urban area. These examples highlight the inadequacy of a human resource strategy focused exclusively on the needs-based production of health workers.³

Labour market conditions such as low salaries and a lack of other economic benefits are known to influence employment processes, but their influence on the planned allocation of resources is less widely recognized. Thus, an analysis of the labour market is essential to achieve a better understanding of the forces that drive health worker shortage, maldistribution and suboptimal performance and to develop policies and

^a Institute for International Health and Development, Queen Margaret University, Edinburgh, Scotland.

^b The World Bank, 1818 H Street, NW, Washington, DC, 20433, United States of America.

^c African Development Bank, Tunis, Tunisia

^d Global Health Workforce Alliance, World Health Organization, Geneva, Switzerland.

Correspondence to Akiko Maeda (e-mail: amaeda@worldbank.org).

⁽Submitted: 10 March 2013 – Revised version received: 12 June 2013 – Accepted: 13 June 2013)

What is a labour market?

A market is any structure that allows buyers and sellers to exchange goods, ser-

vices or information of any type. A labour market is the structure that allows labour services to be bought and sold.⁴ In a labour market, those who seek to employ staff are the "buyers" and those who seek employment are the "sellers". A labour market can be delineated according to dif-

ferent criteria: geographical (national or international); occupational (specialized

Fig. 1. Possible labour market scenarios



Note: The supply curve (S) slopes upward because higher levels of P (price or, in this case, the wage rate) result in a higher quantity (Q) of supply: more health workers ready to offer their services or health workers willing to work more hours. The demand (D) curve slopes downward because, at higher levels of price, those that demand health workers' services reduce the quantity they demand as the wage rate rises.

or unspecialized); and sectoral (formal or informal). A special feature of labour markets is that labour cannot be sold but only rented. Furthermore, conditions of employment (e.g. adequate infrastructure, supportive management, opportunities for professional development and career progression) are as important as prices (wages) in determining labour market outcomes. Thus, these outcomes are driven by the behaviour of employers and workers in response to changes in the terms of employment (wages, compensation levels and working conditions).

In a well-functioning labour market, wages or "compensation" - which can be understood as the overall return received for employment in a particular post and not only the financial component of that return - act as the mechanism whereby the intentions of buyers and sellers are reconciled. The demand and the supply of labour tend towards equilibrium. A point is reached in which the amount of labour supplied equals the amount demanded at the going level of compensation. Labour markets are said to "clear" when the supply of labour matches the demand for workers. However, labour markets do not always "clear" in this way. When they fail to do so, they exhibit either labour surplus or unemployment (i.e. people seek jobs at the going rate of pay but cannot find them), or labour shortage (i.e. employers seek to fill posts at the going rate of pay but cannot find people to fill them). These possible scenarios are illustrated in Fig. 1.

A health labour market is a dynamic system comprising two distinct but closely related economic forces: the supply of health workers and the demand for such workers, whose actions are shaped by a country's institutions and regulations. Traditionally, analyses of human resources for health have been framed as a supply crisis, with demand-side factors receiving scant attention. The demand for health workers in a country is determined by what government, private sector and international actors, such as donors and multinational corporations, are willing to pay to hire them. "Willingness to pay" is dependent on the level of health-care financing and the willingness to hire health workers depends on the money available for doing so. "Willingness to pay" marks a distinction between demand and "need". A mismatch commonly exists between the financial resources available - and hence, willingness to pay - for employing health workers and the number of workers needed to cover the health-care needs of the population.² The supply of health workers is influenced by the level of remuneration and by many other factors that are economic, social, technological, legal, demographic and political. Fig. 2 illustrates the dynamics of the health labour market.

Markets fail to "clear" for two reasons. Either prices are not flexible (e.g. wages may be fixed by legislative or bureaucratic process or tied to civil service schedules that are insensitive to health market conditions), or demand or supply does not adjust to price signals. This may be because "demand" is predominantly defined by government and driven by legislative or bureaucratic process rather than by market forces, or because supply is regulated. An example of such regulation is offered by graduates who are "bonded" and constrained from exiting the labour market on their own volition. In health labour markets both types of rigidities are common. The market clearing position may be politically unacceptable. It may, for example, result in unaffordable health services and, in this respect, failure to "clear" may be a foreseeable result of price control. In such cases, health labour market analysis will allow a forecast of the resulting difficulty in filling available posts.

To overcome these constraints, health labour markets may require regulatory or institutional intervention to achieve socially desirable and economically efficient outcomes. Health labour markets can be regulated through a wide range of interventions: licensing professional occupations, accrediting universities and institutions that offer professional degrees, subsidizing medical education, restricting entry to the market and creating coercive measures (e.g. bonding and compulsory service) to direct health workers to rural and underserved areas.6 The selection of the appropriate balance of regulations and policies requires a solid understanding of the dynamics of the health labour market.

When conducting health labour market analysis, it is also crucial to take into account market structures – i.e. the degree of concentration on the demand and supply sides. The organization of health professionals through institutions such as labour unions or professional associations creates a degree of monopoly in the supply of health labour through collective bargaining. Medical professional associations may play a role beyond that of a union and often take on



Fig. 2. Framework for analysis of health workers labour market dynamics

internal regulation of health workers by setting the requirements for obtaining a licence, defining minimum quality standards and determining the number of workers entering the profession.⁶ Restricting supply in this way results in higher wages and introduces inflexibilities in the labour market. On the demand side, where potential employers are well organized, for example, in the form of a single or dominant public sector employer, a health worker may have to accept the terms on offer or leave the sector altogether. These conditions can explain why markets fail to "clear", as the dominant roles of unions, professional associations and public sector employers or single payer employers set conditions that are often driven by political goals rather than market conditions.

Health labour market analysis and better policies

Despite the limited number of studies on the health labour market dynamics in low- and middle-income countries, recent analyses of underlying market scenarios are beginning to reveal the importance of understanding such dynamics and of tailoring policy responses to the unique conditions of each country. To illustrate this point, we now turn to some examples of analyses that provide useful insights into the dynamics of the health labour market.

In a comparative study, Vujicic et al. (2009)⁷ analysed the implications of government wage bill policies in the Dominican Republic, Kenya, Rwanda and Zambia for the health workforce. All four countries were implementing general government wage bill restriction policies and the study's purpose was to explore the effects of those policies on the strategy for maintaining or expanding the health workforce. Their research suggests that in Rwanda the health sector wage bill was maintained despite the general wage bill restriction and that the health workforce was successfully expanded in line with the country's health strategy. In Kenya, on the other hand, the wage bill for the health sector was reduced in line with the general restrictions and this limited expansion of the workforce. In Zambia, the main obstacle to the expansion of the workforce was not deemed to be the wage bill restrictions, but the difficulties in filling budgeted posts. In the Dominican Republic, wage bill restrictions constrained growth in salaries but not in the number of health

workers, which resulted in a contraction of the hours worked in the public sector and an increase in the prevalence of dual practice. Health workers responded to their reduced pay by allocating more time to other occupations. These differential responses illustrate how four countries that introduced similar wage bill policies faced different health worker responses because of their very different market situations. Supply responded flexibly to labour market conditions in the Dominican Republic and Rwanda. In the Dominican Republic, the supply of health workers fell in response to declining pay, whereas in Rwanda the supply increased in response to non-wage measures that supported expansion. Despite having a shortage of health workers relative to need, Kenya has a pool of long-term surplus in human resources for health (i.e. unemployed health professionals). The "shortage" is thus generated by inadequate demand - employment opportunities with adequate working conditions. By contrast, in Zambia the health labour market faces a long-term shortage, such that an increase in the demand for health workers did not increase employment, since there was an insufficient pool of unemployed or under-employed workers wanting to take advantage of better conditions.

Another example is that of Malawi, which faced a dire shortage, maldistribution and outmigration of health workers in the early 2000s. Malawi has subsequently succeeded in reversing a negative trend through a combination of demand- and supply-side interventions. A 50% increase in training output for priority cadres was accompanied by a 52% salary top-up to enhance deployment and retention. This led to a significant improvement in health workforce availability, as health worker density rose from 0.87 to 1.44 per 1000 population between 2004 and 2009.⁸

A widely promoted solution for increasing the availability of human resources for health is to expand training and increase funding for public sector employment. But this requires funds, largely from the public purse. Countries such as Ethiopia and Niger, whose macroeconomic conditions prevented them from implementing this approach, chose to invest in community-based health workers, who undergo shorter training and require less pay. In early experiences, these cadres have played a significant role in improving service coverage and

ATP, ability to pay; HRH, human resources for health; HW, health workers; WTP, willingness to pay. Source: adapted from Soucat et al. $^{\rm S}$

health outcomes in underserved communities.^{9,10} Similarly, experiences in Mozambique¹¹ and elsewhere show that mid-level cadres respond differently to health labour market conditions and are more easily retained in rural areas than physicians.

These examples highlight why it is important to understand underlying market conditions when introducing human resource policies in the health sector, as summarized below:

- where constraints to supply are most important, policies such as expanding training opportunities may be appropriate;
- where constraints on demand are most important, policies such as increasing the funding available for the health workforce are likely to be appropriate;
- an effective strategy will more often address both supply and demand constraints simultaneously; and
- in some cases, solutions may require structural changes to the labour market, such as the reorganization of the service delivery system and changes in the skills required of health workers (e.g. greater use of mid-level health workers), which in turn will change the labour market dynamics.

Knowledge and research gaps

One reason that labour market analysis has received little attention in the debate surrounding human resources for health is that data in this domain are scarce in low- and middle-income countries. Some critical areas in terms of data and research are highlighted below:

• Central to any labour market analysis is an understanding of the absolute and relative levels of health worker remuneration from all sources. This is a very difficult variable to measure in the health sector and doing so requires considerable effort. Pay of health professionals, especially in low- and middle-income countries, consists of multiple components including salaries, informal payments and bonuses and allowances that can vary considerably among individual health workers. Furthermore, health professionals often hold multiple jobs or generate income outside their primary employment. Availability of

more comprehensive data on their pay levels will be essential for understanding the dynamics of the health labour market.

- Technological changes require transformation in the health system and are important determinants of labour market evolution, although little research is available to guide government policies and investments. One important implication for labour markets of the growth of medical technologies over the last decade is the growing demand for highly skilled workers that cost more to produce and employ.^{12,13}
- Few studies have been conducted in low- and middle-income countries to measure the "elasticity" (responsiveness) of the supply of health workers to changes in the wage rate. One study conducted in China suggests that the elasticity of supply may be considerably higher in that country than in high-income countries, and the authors conclude that increasing health worker pay may be a more cost-effective strategy to expand the health workforce than expanding training programmes.14 More empirical studies will be needed to establish whether this is equally applicable to low- and middle-income countries other than China
- Little research has been conducted on the responsiveness of health worker quality to economic variables. Among the well-known human resource problems in the health sector are low productivity, effort and morale. There is a need to evaluate the impact of changes in salaries, training availability and other working conditions on health worker performance. Some work in this area has already begun.¹⁵⁻¹⁸ Such studies will help to generate hypotheses about the impact of pay and institutional variables on health worker effort and will inform the effectiveness and sustainability of pay for performance and other financial and non-financial incentives to elicit more effort and greater productivity from health workers.
- Health worker preferences and responses to market conditions are also beginning to attract some research in the context of health worker recruitment and retention in rural and remote areas. Discrete choice experiments have been conducted in sever-

al low- and middle-income countries to elucidate workers' preferences in terms of job characteristics and assess their willingness to be deployed to remote and rural areas.^{19,20}

Conclusion

We have described how labour market analysis can enhance our understanding of the factors that constrain human resources for health and result in more effective policies and interventions to address these. We have also described the health labour force analytical framework and explained that labour markets are eminently shaped by supply and demand and only indirectly by need. Although any policy conclusions derived from labour market analysis are tentative at this stage because of gaps in data and research, several country experiences point to important challenges in the health labour market and, depending on the country context, such challenges should be tackled by considering market forces from both a supply- and demandside perspective. The identification of appropriate policy options will require further research and evaluation of effective strategies, as well as a deeper understanding of the underlying labour market conditions affecting the health worker situation in a specific country.

A better understanding of the impact of health policies on health labour markets and, subsequently, on the employment conditions of health workers would be helpful in identifying an effective strategy for the progressive attainment of universal health coverage. The human resource challenges faced by the health sector should therefore be addressed within a country's broader development framework, where the factors affecting the dynamics of the health labour workforce - from education to regulation, incentives and the fiscal space for the wage bill - can be addressed in a holistic, integrated manner.

Acknowledgements

The authors are grateful to Christiane Wiskow (International Labour Organization) and the participants of the African Regional Workshop on Health Labour Market Analysis held in Hammamat, Tunisia, in March 2013.

Competing interests: None declared.

في نطاق القدرات التعليمية والتدريبية لتضييق الفجوة بين العدد "المطلوب" من العاملين الصحيين والعدد الموجود. ومع ذلك، يهمل هذا الأسلوب عوامل أخرى هامة تؤثر على قدرة الموارد البشرية، بها في ذلك القوى المحركة لسوق العمالة والاستجابات السلوكية وتفضيلات العاملين الصحيين أنفسهم. ويصف هذا المحث كيفية إسهام تحليل سوق العمالة في التوصل إلى فهم أفضل للعوامل التي تقف وراء قيود الموارد البشرية في القطاع الصحي وإلى تصميم أكثر فعالية للسياسات والتدخلات للتعامل معها. وتقوم الفرضية على أن الفهم الأفضل لتأثير السياسات الصحية على أسواق العمالة الصحية، ومن ثم على ظروف توظيف العاملين التدرج للتغطية الصحية الشاملة. ملخص ما سبب أهمية قوى سوق العمالة الصحية؟

تم الاعتراف بضرورة الموارد البشرية الصحية لتطوير أنظمة تم الاعتراف بضرورة الموارد البشرية الصحية لتطوير أنظمة صحية فعالة وسريعة الاستجابة. وتواجه البلدان المنخفضة قيوداً تتعلق بالموارد البشرية – سواء أكانت في شكل نقص في العاملين الصحيين أو سوء توزيع للعاملين أو الأداء الضعيف لهم – والتي تضعف بشكل خطير من القدرة على إنشاء أنظمة صحية تعمل بشكل جيد. ورغم وجود أبحاث كثيرة حول أزمة أطر العمل الاقتصادية للعمالة لتحليل الموقف، ولا يوجد سوى القليل من المعرفة والفهم حول تشغيل أسواق العمالة في البلدان معرود المشرية على تخطيط قوة العمل: تقدير متطلبات قوة قيود الموارد البشرية على تخطيط قوة العمل: تقدير متطلبات قوة العمل الصحية استناداً إلى الحالة الوبائية والسكانية للبلد والتوسع العمل الصحية استناداً إلى الحالة الوبائية والسكانية للبلد والتوسع

摘要

为什么卫生劳动力市场力量很关键?

卫生人力资源被公认为发展灵敏有效的卫生系统不可 或缺的一环。努力实现全民医疗保障制度的中低收入 国家面临着人力资源限制的问题——或是卫生工作者 就是卫生工作者配置不合理,或是卫生工作者 绩效差——这些问题不合理,或是卫生系统的 能力。尽管有关卫生部门人力资源危机的论述为数众 多,却很少有研究应用劳动经济框架分析这种状况, 人们对中低收入国家劳动力市题的传统方法将重点放 在劳动力规划上:基于国家的流行病学和人口统计学 特征估计卫生工作人员需求,升级教育培训实力来缩 短"需要"卫生工作者数量和现有数量之间的差距。 但是,这种方法忽略了影响人力资源容量的其他重要 因素,包括劳动力市场动力和卫生工作者自身的行为 反应和偏好。本文描述了劳动力市场分析对更好理解 卫生部门人力资源限制因素的作用,以及对制定更有 效应对政策和干预措施的作用。其论述的前提是:更 好地理解卫生政策对卫生劳动力市场的影响,继而对 卫生工作者就业状况的影响,将有助于识别出逐步实 现全民医保的有效战略。

Résumé

Pourquoi les effectifs du marché du travail de la santé sont-ils importants?

Les ressources humaines du secteur de la santé sont essentielles au développement de systèmes médicaux efficaces et réactifs. Les pays à revenu faible et moyen qui cherchent à obtenir une couverture maladie universelle souffrent de restrictions en matière de ressources humaines - que ce soit sous forme de pénurie d'agents de santé, de mauvaise répartition ou de faibles performances des travailleurs - qui compromettent sérieusement leur capacité à créer un système de santé optimal. Même si on a beaucoup écrit au sujet de la crise des ressources humaines dans le secteur de la santé, des cadres économiques de travail ont rarement été appliqués pour analyser la situation, et on connaît ou on comprend peu de choses sur le fonctionnement des marchés du travail dans les pays à revenu faible et moyen. Les approches traditionnelles dans le but de répondre aux restrictions en matière de ressources humaines accordent de l'importance à la planification des effectifs : estimer les besoins en matière de travailleurs de la santé par rapport

au profil démographique et épidémiologique d'un pays, et intensifier les capacités de formation et d'enseignement pour réduire l'écart entre le nombre de travailleurs "nécessaire" et le nombre réel. Toutefois, cette approche néglige d'autres facteurs importants qui influent sur la capacité des ressources humaines, notamment les dynamiques du marché du travail et les réponses et préférences comportementales des travailleurs de la santé. Ce document explique comment l'analyse du marché du travail peut aider à mieux comprendre les facteurs qui sont à l'origine des restrictions en matière de ressources humaines dans le secteur de la santé, mais aussi à mettre en oeuvre des politiques et des interventions plus efficaces pour y remédier. L'hypothèse initiale est qu'une meilleure compréhension de l'impact des politiques de santé sur les marchés du travail de la santé et, par ailleurs, sur les conditions d'emploi des travailleurs de la santé, serait utile pour pouvoir identifier une stratégie efficace et progressivement mettre en place une couverture maladie universelle.

Резюме

Почему столь важны движущие силы рынка труда в сфере здравоохранения?

Человеческие ресурсы в сфере здравоохранения были признаны необходимымфакторомдля развития оперативной и эффективной системы здравоохранения. Страны с низким и средним уровнем доходов, стремящиеся обеспечить всеобщий охват населения медико-санитарными услугами, сталкиваются с нехваткой человеческих ресурсов в виде либо нехватки работников здравоохранения, либо неравномерного распределения работников, либо низкой эффективности труда работников, что серьезно подрывает способность данных стран обеспечить хорошее функционирование систем здравоохранения. Хотя уже много написано на тему кризиса человеческих ресурсов в секторе здравоохранения, для анализа ситуации редко применялись экономические концепции, касающиеся труда, и о функционировании рынков труда в странах с низким и средним уровнем дохода мало что известно или мало кто понимает, как они функционируют. Традиционные подходы к решению проблем нехватки человеческих ресурсов были направлены на планирование трудовых ресурсов, то есть на оценку потребности в трудовых ресурсах в сфере здравоохранения на основе эпидемиологического и демографического профиля страны и пропорциональном наращивании возможностей образования и подготовки с целью сократить разрыв между «необходимым» и имеющимся количеством работников здравоохранения. Однако такой подход не учитывает других важных факторов, которые влияют на человеческие ресурсы, в том числе динамику рынка труда и поведенческие реакции и предпочтения самих работников здравоохранения. В этой статье описывается то, как анализ рынка труда может способствовать лучшему пониманию факторов, обуславливающих нехватку человеческих ресурсов в секторе здравоохранения, и разработке более эффективной политики и мероприятий по устранению данных факторов. Исходной посылкой является то, что лучшее понимание влияния политики в области здравоохранения на рынки труда в данной сфере и, соответственно, на условия труда работников здравоохранения может оказаться полезным при выборе эффективной стратегии по постепенному достижению всеобщего охвата населения медико-санитарными услугами.

Resumen

Por qué son importantes las fuerzas del mercado laboral sanitario

El papel de los recursos humanos en el sector sanitario se considera esencial para el desarrollo de sistemas sanitarios eficaces y con capacidad de respuesta. Los países de ingresos bajos y medianos que aspiran a alcanzar la cobertura sanitaria universal se enfrentan a las limitaciones en materia de recursos humanos, sea por escasez de personal sanitario, la distribución ineficaz del personal o el desempeño ineficiente del mismo, factores que socavan gravemente la capacidad para lograr sistemas sanitarios con un funcionamiento adecuado. Aunque se ha vertido mucha tinta acerca de la crisis de recursos humanos en el sector sanitario, rara vez se han aplicado los marcos económicos laborales para analizar la situación y poco se sabe o entiende sobre el funcionamiento de los mercados laborales en los países de ingresos bajos y medianos. Los enfoques tradicionales para hacer frente a las limitaciones en materia de recursos humanos se han centrado en la planificación del personal, mediante el cálculo de las necesidades de personal sanitario basada en el perfil epidemiológico y demográfico del país y la ampliación de los recursos educativos y formativos para reducir la brecha entre el número «necesario» de personal sanitario y el número real. Sin embargo, este enfoque deja de lado otros factores importantes que influyen en la capacidad de los recursos humanos, como la dinámica del mercado de trabajo, las respuestas de comportamiento y las preferencias del personal sanitario. Este informe describe cómo el análisis del mercado laboral pretende mejorar la comprensión de los factores que explican la escasez en materia de recursos humanos en el sector sanitario y ofrecer un diseño más eficaz de las políticas e intervenciones para abordarlos. La premisa para ello es que una mejor comprensión del impacto de las políticas sanitarias en el mercado laboral sanitario, y por consiguiente, en las condiciones laborales del personal sanitario, sería de gran ayuda en la identificación de una estrategia eficaz para alcanzar la cobertura sanitaria universal de forma progresiva.

References

- Anand S, Bärnighausen T. Health workers at the core of the health system: framework and research issues. *Health Policy* 2012;105:185–91. doi: http:// dx.doi.org/10.1016/j.healthpol.2011.10.012
- Vujicic M, Zurn P. The dynamics of the health labour market. Int J Health Plann Manage 2006;21:101–15. doi: http://dx.doi.org/10.1002/hpm.834
- Hongoro C, McPake B. How to bridge the gap in human resources for health. Lancet 2004;364:1451–6. doi: http://dx.doi.org/10.1016/S0140-6736(04)17229-2
- Fields G, Andalón M. A toolkit for analyzing labor markets in the health care sector in Africa: health, nutrition and population, AFTHD Africa Region. Washington: The World Bank; 2008.
- Soucat A, Scheffler R, Ghebreyesus TA, editors. The labor market for health workers in Africa: a new look at the crisis. Washington: The World Bank; 2013.
- Nicholson S, Propper C. Medical workforce. In: Pauly MV, McGuire TG and Barros PP, eds. Handbook of Health Economics 2. Elsevier; 2012. pp. 873-925.
- 7. Vujicic M, Ohiri K, Sparkes S. *Working in health: financing and managing the public sector health workforce*. Washington: The World Bank; 2009.
- Management Sciences for Health. Evaluation of Malawi's emergency human resources programme. 2010. Available from: http://www.msh.org/news-bureau/ msh-publishes-evaluation-of-malawi-human-resource-program.cfm [accessed 7 July 2013].
- Wakabi W. Extension workers drive Ethiopia's primary health care. Lancet 2008;372:880. doi: http://dx.doi.org/10.1016/S0140-6736(08)61381-1
- Amouzou A, Habi O, Bensaïd K; Niger Countdown Case Study Working Group. Reduction in child mortality in Niger: a Countdown to 2015 country case study. *Lancet* 2012;380:1169–78. doi: http://dx.doi.org/10.1016/S0140-6736(12)61376-2
- Pereira C, Cumbi A, Malalane R, Vaz F, McCord C, Bacci A et al. Meeting the need for emergency obstetric care in Mozambique: work performance and histories of medical doctors and assistant medical officers trained for surgery. *BJOG* 2007;114:1530–3. doi: http://dx.doi.org/10.1111/j.1471-0528.2007.01489.x

- 12. Denton FT, Gafni A, Spencer BG. The SHARP way to plan health care services: a description of the system and some illustrative applications in nursing human resource planning. *Socioecon Plann Sci* 1995;29:125–37. doi: http://dx.doi. org/10.1016/0038-0121(95)00004-6
- Sales CS, Schlaff AL. Reforming medical education: a review and synthesis of five critiques of medical practice. *Soc Sci Med* 2010;70:1665–8. doi: http://dx.doi. org/10.1016/j.socscimed.2010.02.018
- 14. Qin X, Li L, Hsieh CR. Too few doctors or too low wages? Labor supply of health care professionals in China. *China Econ Rev* 2013;24:150–64. doi: http://dx.doi. org/10.1016/j.chieco.2012.12.002
- Das J, Hammer J. Money for nothing: the dire straits of medical practice in Delhi, India. Washington: The World Bank; 2005 (World Bank Policy Research Working Paper 3669).
- 16. Das J, Sohnesen TP. Variations in doctor effort: evidence from Paraguay. *Health Aff* 2007;26:324–37. doi: http://dx.doi.org/10.1377/hlthaff.26.3.w324
- 17. Leonard KL, Masatu MC. Using the Hawthorne effect to examine the gap between a doctor's best possible practice and actual performance. *J Dev Econ* 2010;93:226–34. doi: http://dx.doi.org/10.1016/j.jdeveco.2009.11.001
- Maestad O, Torsvik G, Aakvik A. Overworked? On the relationship between workload and health worker performance. J Health Econ 2010;29:686–98. doi: http://dx.doi.org/10.1016/j.jhealeco.2010.05.006
- Ryan M, Kolstad J, Rockers P. How to conduct a discrete choice experiment for health workforce recruitment and retention in remote and rural areas: a user guide with case studies. Geneva: World Health Organization; 2012. Available from: www.who.int/entity/hrh/resources/DCE_UserGuide_WEB.pdf [accessed 2 July 2013].
- Araújo E, Maeda A. How to recruit and retain health workers in rural and remote areas in developing countries. Washington: The World Bank (World Bank Health, Nutrition and Population Discussion Paper). Forthcoming.

Community health workers for universal health-care coverage: from fragmentation to synergy

Kate Tulenko,^a Sigrun Møgedal,^b Muhammad Mahmood Afzal,^c Diana Frymus,^d Adetokunbo Oshin,^e Muhammad Pate,^e Estelle Quain,^d Arletty Pinel,^f Shona Wynd^g & Sanjay Zodpey^h

Abstract To achieve universal health coverage, health systems will have to reach into every community, including the poorest and hardest to access. Since Alma-Ata, inconsistent support of community health workers (CHWs) and failure to integrate them into the health system have impeded full realization of their potential contribution in the context of primary health care. Scaling up and maintaining CHW programmes is fraught with a host of challenges: poor planning; multiple competing actors with little coordination; fragmented, disease-specific training; donor-driven management and funding; tenuous linkage with the health system; poor coordination, supervision and support, and underrecognition of CHWs' contribution.

The current drive towards universal health coverage (UHC) presents an opportunity to enhance people's access to health services and their trust, demand and use of such services through CHWs. For their potential to be fully realized, however, CHWs will need to be better integrated into national health-care systems in terms of employment, supervision, support and career development. Partners at the global, national and district levels will have to harmonize and synchronize their engagement in CHW support while maintaining enough flexibility for programmes to innovate and respond to local needs. Strong leadership from the public sector will be needed to facilitate alignment with national policy frameworks and country-led coordination and to achieve synergies and accountability, universal coverage and sustainability. In moving towards UHC, much can be gained by investing in building CHWs' skills and supporting them as valued members of the health team. Stand-alone investments in CHWs are no shortcut to progress.

Abstracts in عربی, 中文, Français, Русский and Español at the end of each article.

From Alma-Ata to universal health coverage

From the early years of primary health care, community-based health workers and volunteers (henceforth referred to as community health workers [CHWs]) have played a key role in satisfying the need and demand for essential health services. The Alma-Ata Declaration states that primary health care "relies, at local and referral levels, on health workers, including physicians, nurses, midwives, auxiliaries and community workers as applicable, as well as traditional practitioners as needed, suitably trained socially and technically to work as a health team and to respond to the expressed health needs of the community."

The values and principles set down at Alma-Ata continue to be relevant today, even though the primary-health-care movement has encountered difficulties in many countries and at many levels when seeking to put them into practice. With the growing momentum for making universal health coverage (UHC) a core strategy for shaping the post-2015 global health agenda, known barriers to coverage and access must be overcome.² This also applies to factors that undermine the role of CHWs in the health system.

The path-finding pilots for community-based primary health care and CHW models took place in nongovernmental settings in the beginning of the 1970s. The Christian Medical Commission of the World Council of Churches, in proactive engagement with the World Health Organization (WHO),³ was instrumental in making the case for this paradigm shift in health care by joining efforts with lead projects in Guatemala, India, Indonesia and elsewhere, among them the Comprehensive Rural Health Programme in Jamkhed, India, established in 1970,⁴ which continues today. After the Commission's pioneering work, hundreds of other faith-based groups and nongovernmental organizations (NGOs) have continued to refine community-based health-care models and CHW programmes.

After Alma-Ata, the eagerness of public health authorities to produce national blueprints for the rapid scale-up of primary health care did, however, generally miss out on creating ample space for community participation. The comprehensiveness and continuity of care - so basic to the model - were soon replaced by selective interventions for focused results, including selected maternal and child health interventions and family planning. Well-intended, top down national planning and external support created wave after wave of CHWs in the making and reshaping, under different names and with different roles. Many countries and many communities can recall a history of training, deployment and failure of several repeating initiatives, such as that in the United Republic of Tanzania in the 1980s.⁵ Caught between the formal health system and the community and often in a "grey zone" between public, nongovernmental and private health systems, CHWs were for a long time seen as a stopgap measure and did not

^a CapacityPlus, IntraHealth, 1776 I St, NW, Washington, DC 20006, United States of America (USA).

^b Norwegian Knowledge Center for the Health Services, Oslo, Norway.

^c Global Health Workforce Alliance, Geneva, Switzerland.

^d United States Agency for International Development, Washington, USA.

^e Federal Ministry of Health, Abuja, Nigeria.

^f Genos Global, Panama City, Panama.

^g Joint United Nations Programme on HIV/AIDS, Geneva, Switzerland.

^h Public Health Foundation of India, New Delhi, India.

Correspondence to Kate Tulenko (e-mail: ktulenko@capacityplus.org).

⁽Submitted: 10 March 2013 - Revised version received: 24 May 2013 - Accepted: 1 July 2013)

receive the adequate support needed for sustainability.

When the epidemic of HIV infection set in, community-based care models found new expressions. The need to act grew organically out of the affected communities in the early days of the epidemic. People living with HIV infection had no choice but to help one another. What evolved was a system rooted in the local context and born out of friendship and a shared experience: mothers supported mothers, gay men supported gay men and grandmothers helped grandmothers. When the early antiretrovirals became available, projects and programmes funded by governments, donors and NGOs spotted the opportunity to utilize existing community HIV support networks and began funding training and development for CHW programmes specific to the needs of HIV programmes, yet largely without being part of the local health services and clinics. What started out as community-based responses began to evolve into multiple, stand-alone CHW programmes focused on HIV care with varying degrees of formality, sustainability, success, support and reporting.⁶

The use of CHWs for childhood development and maternal, neonatal and child health care has a long history, as illustrated in India. The Accredited Social Health Activists (ASHA) model for the follow-up of women during pregnancy, delivery and the postnatal period has been relatively successful in overcoming barriers to service delivery and increasing institutional deliveries.⁷ The ASHA programme has attained roughly 70% coverage of both mothers and neonates in participating areas.⁸

Lady health workers in Pakistan, behvarz in the Islamic Republic of Iran, agentes communitários de saúde in Brazil, BRAC community health workers in Bangladesh, village health volunteers in Thailand, and health extension workers in Ethiopia all represent different successful CHW models.9 Zambia agreed on a national CHW strategy in 2010 and implemented a community health assistant programme in 2012. In August 2011 Nigeria held its very first national meeting on human resources for health, which brought together various partners and representatives of all levels of government. Similar national meetings have taken place in Kenya in 2011 and in 2013 the United Republic of Tanzania. These programmes and processes have, in dif-

Box 1. Commonly noted contributions of community health workers (CHWs)

- CHWs who are properly trained, equipped and supported can take on a range of tasks that
 otherwise depend on mid-level health workers.
- CHWs extend care to underserved communities, where they enhance access to health
 services and promote people's trust, demand and use of such services.
- CHWs who speak the local language and identify with the local community convey health
 messages more effectively.
- CHW training and service contribute to capacity for community leadership.
- CHWs recruited from the communities they serve are less likely to go elsewhere because
 of difficult living conditions.
- CHWs can help service users avoid trips to health facilities, which translates into saved transportation costs and time.
- CHWs can meet some of the needs of homebound patients.

ferent ways, brought in the voices of the CHWs and their communities and seek to optimize the potential contribution of skilled and supported CHWs to primary health care (Box 1).

Scale-up and sustainability

Although some sustainable national CHW programmes exist, such programmes have not achieved the scaleup and sustainability envisioned at Alma-Ata. CHWs have traditionally been recruited, trained, employed and supervised at the periphery of health ministry structures. Donors have generally supported CHW programmes to achieve goals linked to disease-specific vertical programmes or for the performance of specific tasks such as family planning, nutrition and immunization. Moreover, CHWs often lack a career ladder or professional associations. Although such vertical approaches may have resulted in short-term gains, programme fragmentation, ownership and sustainability have been major concerns.

The impact of CHWs can no longer be taken on faith; rigorous effectiveness and cost-effectiveness data are needed. Systematic reviews of studies comparing CHWs with usual practices have shown the effectiveness of CHWs in promoting immunization and breastfeeding, improving tuberculosis treatment outcomes and reducing child morbidity and mortality. The importance of integrating CHWs into the health system on the basis of a core set of skills defined at the national level and with appropriate supervision and support cannot be sufficiently underscored. In this process, due attention must be paid to the need for diverse training in keeping with the various roles and tasks performed by CHWs on the ground.^{10,11}

In 2012, several initiatives were implemented to engage the services of CHWs and other health workers at the front line in providing improved access to life-saving care. Together, these initiatives brought to light a dearth of operational research and a need for better synergies in knowledge management and operations. They also revealed that CHW programmes are still fragmented, with many different programmes of different origins having evolved over time, and that this fragmentation can be linked in part to the way programmes and initiatives are funded by external partners and coordinated at the country level.^{12,13} The Global Health Workforce Alliance synthesized the findings from these consultations and has initiated work to improve synergies across initiatives and partners.

The experience with CHW programmes points to six key challenges in terms of policy and practice, with implications for scale-up and sustainability. These are discussed in the following sections.

Neglect of CHWs in health workforce planning

In most countries' health workforce strategies, district and local authorities are responsible for hiring, managing and supporting CHWs at the front-line facility and community levels without strong guidance from the national level. The creation of CHW programmes in multiple "waves" throughout the past 30 years has contributed to severe fragmentation on the ground. There is a need for explicit principles and guidance from the national level on ways of integrating and aligning these efforts to optimize synergies and build sustainable platforms for the scale-up of CHW programmes towards achieving UHC.

Multiple actors without coordination

United Nations partners working in the sphere of health have direct or indirect engagement with CHW programmes and other community-based health initiatives - often in diverging ways within the same country. Partners engaged in supporting CHW and communitybased programmes are seldom present at the district or lower level but work through contractors and implementers without national or local mechanisms for coordination. Faith-based and NGOrelated private or community-based CHW programmes have their own contracts and arrangements for health workers and barriers to communication between public and NGO providers are not uncommon.

Fragmented, disease-specific focus

Differences in the way interventions - in family planning, nutrition, malaria, immunization, HIV-related care and maternal and child health - are structured and supported add to the complexity of the situation. Training, management and incentive structures differ widely. Results and accountability frameworks for these programmes are not structured to drive synergies across initiatives. Be they local and free-standing or part of nationwide efforts, programmes and initiatives often stimulate piloting and innovation. Yet because resulting innovations are not coordinated, they do not spread and programmes are not scaled up.

Unclear link to the health system

There is an urgent need for supervision and support for CHWs at the level of programme implementation. The role of the district and subdistrict levels in facilitating coordination and ensuring synergy among multiple stakeholders and initiatives is often unclear. This is also true of the accountability of CHW programmes to the district and community governance structures for health and development. This lack of clarity in the link of CHW programmes to the health system undermines overall commitment to and capacity for supervision and support.

Competing nongovernmental organizations

The "NGO challenge" acts as a further barrier to synergy across CHW initia-

tives and partners. Although competition for funding among international, regional and national NGOs fosters creativity and momentum, it makes competing NGOs disinterested in cooperating with one another. When NGOs bid for contracts they feel compelled to offer a product that is different from what other NGOs offer. It therefore behoves donors to incentivize cooperation among NGOs or to make it mandatory.

Unclear identity

CHWs often operate in an environment in which it is not clear whether they represent the community, an NGO, the health system or a combination of these. This can lead to confused responsibilities and accountabilities among the various actors and deprives CHWs of the support they need. CHWs interface between their communities and formal health systems and their roles and expectations must therefore be clarified and understood by all parties. CHWs also face opposition from more established health professionals, such as physicians and nurses, who may see them as a potential threat to their job security and salaries. In most countries, CHWs have never been integrated into the established, salaried team of health system workers, have never been professionalized and have never been given a voice in the affairs of the health system or the non-state health sector.14

Synergy, integration and sustainability

The challenges identified in this paper stem from the "going it alone" approach applied by most funders and implementers of CHW programmes, which has left us with a legacy of parallel initiatives funded separately, delivering separately and reporting separately. If the isolated health gains that have been achieved through CHW programmes are to be sustained and scaled up to meet UHC targets, a clear strategy for optimizing synergies and integration is needed.

Major steps have been taken at the national level, through a variety of collaborative frameworks, plans and strategies, to harmonize and coordinate the actions of multiple entities in support of health system development and service delivery. Examples include sector-wide support platforms, the International Health Partnership and the Global Health Workforce Alliance's programme of Country Coordination and Facilitation for Human Resources for Health. However, these coordination mechanisms seldom cover programmes implemented under district-level authority at the health facility and community levels, including CHW programmes.

With the growing focus on scaling up CHW programmes of differing scope and fit within the formal health system, decisive steps to ensure operational synergies are essential. Such steps must be taken through agreed national policies and with guidance and alignment by all partners and they must allow for flexibility and innovation. The aim must be to optimize a health team approach at the front line of the health system, fit for the local context, with facility-based and community-based health workers working together. This approach may result in slower progress at the outset but will ensure long-term results and sustainability.

It is the responsibility of every national government to establish guidelines for scaling up CHW programmes that respond to local needs and realities. A national inventory of ongoing programmes and community-based CHW initiatives is key to alignment among different programmes. The policy framework for integration and alignment of the tasks performed by different types of CHWs across different vertical initiatives must be agreed on by both funders and implementers. Specifically, the question of incorporating CHWs into the formal health system and the greater health workforce must be addressed, together with the mechanisms for regulating their performance - i.e. setting standards for training, licencing, scope of work, career ladders and supervision.

District health management teams and local governments need to be given the authority to bring together the implementing partners to enhance synergies and programme alignment in accordance with national guidance, make full use of the space for innovation, and facilitate mutual learning. District health managers will need to work with their community counterparts as appropriate to track and act on CHW-related service data, keep coverage maps, ensure the necessary supervision and guidance, and track performance.

Key to engaging CHWs to attain UHC is the readiness of global and

national partners and implementers to (i) value collaboration; (ii) comply with national- and district-level guidance on synergies and integration; (iii) share information; (iv) ensure sufficient local flexibility and (v) monitor established indicators. As an alliance of key stakeholders, the Global Health Workforce Alliance is well placed to promote a health system approach, with coordination across CHW initiatives, when seeking programme scale-up at the global, national and district levels. In this context, new initiatives such as the One Million Community Health Workers Campaign, hosted by the United Nations Sustainable Development Solutions Network and the Earth Institute, represent important opportunities for aligned action. Multilateral partners,

global initiatives, donors and international NGOs need to closely examine programming, funding and reporting to minimize fragmentation and duplication and ensure the scale-up of CHW programmes in the context of a trained, equipped and supported health team.

Conclusion

As was made clear in the Alma-Ata Declaration and as is valid today, CHWs, whether hired by the formal health system or selected and supported by communities, cannot be left to serve on their own.¹⁵ CHW programmes need be comprehensive rather than vertical and they should rely on both the community and the formal health system for supplies, communications and referrals.

Isolated investment in CHWs is no shortcut to progress.

CHWs can be effective, integral members of the health team. They can go beyond the provision of care and foster community-based action. As the MDG era comes to an end and a new era focused on UHC begins, the global health community has a unique opportunity to work with CHWs to create lasting health improvements everywhere.

Funding: The views expressed in this publication are solely the authors'; they do not necessarily reflect the views of the United States Agency for International Development or the Government of the United States.

Competing interests: None declared.

للجتمعية. ومع ذلك، لتحقيق إمكانياتهم بشكل كامل، سوف يتعين دمج العاملين في مجال الصحة المجتمعية بشكل أفضل في نظم الرعاية الصحية الوطنية فيما يتعلق بالتوظيف والإشراف والدعم والتطوير المهني. وسوف يتعين على الشركاء على المستويات العالمة والوطنية ومستويات المناطق تنسيق ومزامنة مشاركتهم في دعم العاملين في مجال الصحة المجتمعية مع الحفاظ على مرونة كافية للبرامج من أجل الابتكار والاستجابة للاحتياجات المحلية. وسوف توجد حاجة إلى قيادة قوية من القطاع العام لتسهيل المواءمة مع أطر السياسة الوطنية والتنسيق بقيادة الدولة ولتحقيق أوجه التآزر والمساءلة والتغطية الشاملة والاستدامة. وعند التحرك صوب التغطية الصحية الشاملة، يمكن تحقيق المزيد عن طريق الاستثمار في بناء مهارات العاملين في مجال الصحة المجتمعية ودعمهم كأفراد ذوي قيمة في الفريق الصحي. وليست الاستثمارات القائمة بذاتها في العاملين في مجال الصحة المجتمعية مسار أمختصم أإلى التقدم.

ملخص العاملون في مجال الصحة المجتمعية من أجل التغطية الشاملة في الرعاية الصحية: من التجزئة إلى التآزر لكي تتحقق التغطية الصحية الشاملة، سيتعين على النظم الصحية الوصول إلى كل مجتمع، بيا في ذلك المجتمعات الأكثر فقراً وصعوبة في الوصول إليها. ومنذ إعلان ألما - آتا، أدى الدعم المتضارب من جانب العاملين في مجال الصحة المجتمعية والفشل في دمجهم في النظام الصحى إلى عرقلة الإدراك الكامل لمساهمتهم المحتملة في سياق الرعاية الصحية الأولية. ويشتمل تُعزيز برامج العاملين في مجال الصّحة المجتمعية والحفاظ عليها على مجموعة من التحديات، هي: سوء التخطيط؛ وتعدد الأطراف المتنافسة مع قلة التنسيق فيها بينها؛ وتشتت التدريب المحدد لكل مرض؛ والإدارة والتمويل عن طريق الجهة المانحة؛ وهشاشة الربط بالنظام الصحي؛ وسوء التنسيق والإشراف والدعم، ونقص الاعتراف بمساهمة العاملين في مجال الصحة المجتمعية.

يقدم الاتجاه الراهن صوب التغطية الصحية الشاملة فرصة لتعزيز وصول الأشخاص إلى الخدمات الصحية وثقتهم وطلبهم واستخدامهم لهذه الخدمات من خلال العاملين في مجال الصحة

摘要

全民医疗保障的社区卫生工作者:从零散到协同

为实现全民医疗保障,卫生系统必须深入每个社区,包 括最贫穷和最偏远的地方。阿拉木图对社区卫生工作 者 (CHW) 的支持不一致,无法将其融入卫生系统,因 而阻碍了卫生工作者在初级卫生保健中充分发挥自身 的潜力。扩大和维护 CHW 计划充满各种挑战:规划 不周;多个行动者相互竞争、缺乏协调;培训零散且 针对特定疾病;管理和融资由捐赠者驱动;卫生系统 联动薄弱;协调、监督和支持不力以及对社区卫生工 作者的贡献没有充分的认识。

当前实现全民医保 (UHC) 的动力带来了这样的 机会:改善人们使用卫生服务的状况,并增强人们对 CHW 服务的信任、需求和使用。然而, 要充分发挥潜 力,CHW 需要在就业、监督、支持和职业发展方面更 好地融入国家卫生保健系统。全球、国家以及区域级 别的合作者必须协调和同步对 CHW 的支持,同时保 持足够的计划灵活性以便创新和响应地方需求。需要 来自公共部门的强有力领导,以便更好地向国家政策 框架和国家主导的协作看齐,从而实现协同效应和问 责制、全民覆盖和可持续性。在实现 UHC 过程中, 在 培养 CHW 的技能并支持其成为卫生团队宝贵成员方 面加大投入力度,会有不少收获。对 CHW 的孤立投 入不是发展的捷径。

Résumé

Les agents sanitaires des collectivités pour la couverture sanitaire universelle: de la fragmentation à la synergie

Pour parvenir à une couverture sanitaire universelle, les systèmes de santé devront étendre leur portée à toutes les communautés, y compris celles qui sont les plus pauvres et les plus difficiles d'accès. Depuis la Déclaration de Alma-Ata, le soutien inégal des agents sanitaires des collectivités et l'échec de leur intégration dans les systèmes de santé ont empêché la pleine réalisation de leur contribution potentielle dans le contexte des soins de santé primaires. Le développement et le maintien des programmes des agents sanitaires des collectivités se heurtent à une multitude de défis à relever: mauvaise planification; multitude d'acteurs concurrents avec peu de coordination; formation fragmentée et spécifique aux maladies; gestion et financement à l'initiative des donateurs; lien ténu avec le système de santé; coordination, supervision et soutien de mauvaise qualité, et sous-reconnaissance de la contribution des agents sanitaires des collectivités.

La campagne actuelle vers une couverture sanitaire universelle offre une opportunité d'améliorer l'accès des personnes à des services de santé, ainsi que leur confiance, demande et utilisation de tels services par le biais des agents sanitaires des collectivités. Pour que leur potentiel puisse être pleinement réalisé, les agents sanitaires des collectivités devront toutefois être mieux intégrés dans les systèmes nationaux de soins de santé en termes d'embauche, de supervision, de soutien et d'évolution de carrière. Les partenaires au niveau du monde, du pays et du district devront harmoniser et synchroniser leurs engagements dans le soutien aux agents sanitaires des collectivités tout en maintenant suffisamment de flexibilité pour permettre aux programmes d'innover et de répondre aux besoins locaux. Un leadership fort du secteur public sera nécessaire pour faciliter l'alignement avec les cadres politiques nationaux et la coordination dirigée par le pays et pour réaliser des synergies et des responsabilités, la couverture universelle et la durabilité. En avançant vers la couverture sanitaire universelle, il y a beaucoup à gagner en investissant dans l'acquisition de compétences des agents sanitaires des collectivités et en les soutenant en tant que membres à part entière des équipes de santé. Les investissements autonomes au bénéfice des agents sanitaires des collectivités ne sont pas des raccourcis vers le progrès.

Резюме

Роль местных медработников в деле обеспечения всеобщего охвата медико-санитарной помощью: от отдельных инициатив к взаимодействию

Для обеспечения всеобщего охвата медико-санитарной помощью системы здравоохранения должны быть внедрены во всех сообществах, включая самые бедные слои населения и жителей, проживающих в труднодоступных регионах. Кроме Алматы, отсутствует стабильная поддержка местных медицинских работников (MMP), как и их полная интеграция в систему здравоохранения, что препятствует полноценной реализации их полноценного вклада в оказание первичной медико-санитарной помощи. Расширение охвата и программ поддержки MMP усложняется значительным количеством проблем: несовершенное планирование; множество конкурирующих участников, практически не координирующих между собой свою деятельность; фрагментированная подготовка, специализирующаяся только на определенных заболеваниях; значительная зависимость управления и финансирования от спонсоров; непрочные связи с системой здравоохранения; недостаточный уровень координации, надзора и поддержки, а также недооценка вклада ММР.

Текущая тенденция к внедрению всеобщего охвата медикосанитарной помощью предоставляет возможности улучшить доступ населения к службам здравоохранения, а также повысить доверие, уровень спроса и использование таких служб через ММР. Тем не менее, чтобы в полной мере реализовать свой потенциал, местные медработники должны быть в большей степени интегрированы в национальные системы здравоохранения в вопросах трудоустройства, надзора, поддержки и карьерного роста. Организации-партнеры на глобальном, национальном и региональном уровнях должны гармонизировать и синхронизировать свою деятельность по поддержке ММР, сохраняя при этом достаточную гибкость для программ по внедрению инициатив и реагирования на локальные потребности. Понадобится проявление руководящей воли со стороны государственных служб, чтобы обеспечить согласованность данных усилий с положениями национальной политики и координацию в масштабах страны для достижения взаимодействия и контролируемости, всеобщего охвата и устойчивого развития. На пути внедрения всеобщего охвата медико-санитарной помощью много можно достигнуть путем инвестиций в развитие профессиональных навыков у ММР и поддержки их как ценных членов системы здравоохранения. Отдельные инвестиции в ММР не так перспективны для ускорения прогресса в данном направлении.

Resumen

Los trabajadores comunitarios de salud en la cobertura universal de la salud: de la fragmentación a la sinergia

A fin de lograr la cobertura universal de la salud, los sistemas sanitarios deben llegar a todas las comunidades, incluidas las más pobres y de difícil acceso. Desde la conferencia de Alma-Ata, el apoyo inconstante de los trabajadores comunitarios de salud (TCS) y la falta de integración de estos en el sistema sanitario han impedido la plena realización de su contribución potencial en el contexto de la atención primaria de la salud. La ampliación y el mantenimiento de los programas de trabajadores comunitarios de salud suponen muchos desafíos: la mala planificación, los agentes múltiples que compiten con insuficiente coordinación, la fragmentación en los programas de capacitación orientados a combatir

enfermedades específicas, la gestión y la financiación impulsadas por los donantes, la escasa unión con el sistema sanitario, la falta de coordinación, supervisión y apoyo, y la infravaloración de la contribución de los trabajadores comunitarios de la salud.

El avance actual hacia la cobertura universal de la salud (CUS) ofrece una oportunidad para mejorar el acceso de la población a los servicios de salud, así como para aumentar la confianza, la demanda y el uso de dichos servicios a través de los trabajadores comunitarios de salud. Sin embargo, es necesario integrar mejor a los trabajadores comunitarios de salud, en términos de empleo, supervisión, apoyo y desarrollo profesional, en los sistemas nacionales sanitarios para aprovechar plenamente su potencial. Los socios a nivel mundial, nacional y local deben armonizar y sincronizar su compromiso a favor de los trabajadores comunitarios de salud, manteniendo la flexibilidad suficiente para que los programas tengan capacidad de innovación y respuesta frente a las necesidades locales. Se requiere un fuerte liderazgo por parte del sector público para facilitar la alineación con los marcos de las políticas nacionales y la coordinación dirigida por el país, y para lograr sinergias y la rendición de cuentas, la cobertura universal y la sostenibilidad. En la consecución de la cobertura universal de la salud, pueden obtenerse grandes beneficios si se invierte en el desarrollo de competencias de los trabajadores comunitarios de salud, y se les apoya como miembros valiosos del equipo sanitario. Por el contrario, las inversiones aisladas en trabajadores comunitarios de salud no son atajos hacia el progreso.

References

- World Health Organization. *Declaration of Alma-Ata*. Geneva: WHO; 1978. Available from: http://www.who.int/publications/almaata_declaration_ en.pdf [accessed 19 July 2013].
- World Health Organization [Internet]. Universal health coverage: five questions. Geneva: WHO; 2013. Available from: http://www.who.int/ health_financing/universal_health_coverage_5_questions.pdf [accessed 15 July 2013].
- Litsios S. The Christian Medical Commission and the development of the World Health Organization's primary health care approach. *Am J Public Health* 2004;94:1884–93. doi: http://dx.doi.org/10.2105/AJPH.94.11.1884 PMID:15514223
- Mann V, Eble A, Frost C, Premkumar R, Boone P. Retrospective comparative evaluation of the lasting impact of a community-based primary health care programme on under-5 mortality in villages around Jamkhed, India. *Bull World Health Organ* 2010;88:727–36. doi: http://dx.doi.org/10.2471/ BLT.09.064469 PMID:20931057
- Heggenhougen KV, Muhondwa E, Rutabanzibwa-ngaiza J. Community health workers: the Tanzanian experience. Oxford: Oxford Medical Publications; 1987. pp. 154-71.
- Hermann K, Van Damme W, Pariyo GW, Schouten E, Assefa Y, Cirera A et al. Community health workers for ART in sub-Saharan Africa: learning from experience–capitalizing on new opportunities. *Hum Resour Health* 2009;7:31. doi: http://dx.doi.org/10.1186/1478-4491-7-31 PMID:19358701
- Gopalan SS, Mohanty S, Das A. Assessing community health workers' performance motivation: a mixed-methods approach on India's Accredited Social Health Activists (ASHA) programme. *BMJ Open* 2012;2:e001557. doi: http://dx.doi.org/10.1136/bmjopen-2012-001557 PMID:23019208
- Sundararaman T, Ved R, Gupta G. Determinants of functionality and effectiveness of community health workers: results from evaluation of ASHA programme in eight Indian states. *BMC Proc* 2012;6(Suppl 5):O30.
- Global Health Workforce Alliance [Internet]. Global experience of community health workers for delivery of health related Millennium Development Goals: a systematic review, country case studies, and recommendations for integration into national health systems. Geneva: World Health Organization; 2010. Available from: http://www.who. int/workforcealliance/knowledge/themes/community/en/index.html [accessed 14 July 2013].

- Lewin S, Munabi-Babigumira S, Glenton C, Daniels K, Bosch-Capblanch X, van Wyk BE et al. Lay health workers in primary and community health care for maternal and child health and the management of infectious diseases. *Cochrane Database Syst Rev* 2010;3:CD004015. PMID:20238326
- Corluka A, Walker DG, Lewin S, Glenton C, Scheel IB. Are vaccination programmes delivered by lay health workers cost-effective? A systematic review. *Hum Resour Health* 2009;7:81. doi: http://dx.doi.org/10.1186/1478-4491-7-81 PMID:19887002
- Naimoli JF, Frymus DE, Quain EE, Roseman EL. Community and formal health system support for enhanced community health worker performance: a US Government evidence summit, final report. Washington: United States Agency for International Development; 2012.
- Regional Network on Equity in Health in Southern Africa [Internet]. Consultation on improving access to health worker at the frontline for better maternal and child survival: report. South Africa: EQUINET; 2012. Available from: http://www.equinetafrica.org/bibl/docs/Consultation%20 FrontlineHW%20Rep%20June%202012.pdf [accessed 15 June 2013].
- Capacity*Plus* [Internet]. Professionalization of under-recognized health worker cadres. Washington: United States Agency for International Development & Capacity*Plus*; 2010. Available from: http://www. capacityplus.org/files/resources/under-recognized-cadres-overview.pdf [accessed 15 June 2013].
- Jaskiewicz W, Tulenko K. Increasing community health worker productivity and effectiveness: a review of the influence of the work environment. *Hum Resour Health* 2012;10:38. doi: http://dx.doi.org/10.1186/1478-4491-10-38 PMID:23017131

Human resources for health and universal health coverage: fostering equity and effective coverage

James Campbell,^a James Buchan,^b Giorgio Cometto,^c Benedict David,^d Gilles Dussault,^e Helga Fogstad,^f Inês Fronteira,^e Rafael Lozano,^g Frank Nyonator,^h Ariel Pablos-Méndez,ⁱ Estelle E Quain,ⁱ Ann Starrs^j & Viroj Tangcharoensathien^k

Abstract Achieving universal health coverage (UHC) involves distributing resources, especially human resources for health (HRH), to match population needs. This paper explores the policy lessons on HRH from four countries that have achieved sustained improvements in UHC: Brazil, Ghana, Mexico and Thailand. Its purpose is to inform global policy and financial commitments on HRH in support of UHC.

The paper reports on country experiences using an analytical framework that examines effective coverage in relation to the availability, accessibility, acceptability and quality (AAAQ) of HRH. The AAAQ dimensions make it possible to perform tracing analysis on HRH policy actions since 1990 in the four countries of interest in relation to national trends in workforce numbers and population mortality rates.

The findings inform key principles for evidence-based decision-making on HRH in support of UHC. First, HRH are critical to the expansion of health service coverage and the package of benefits; second, HRH strategies in each of the AAAQ dimensions collectively support achievements in effective coverage; and third, success is achieved through partnerships involving health and non-health actors.

Facing the unprecedented health and development challenges that affect all countries and transforming HRH evidence into policy and practice must be at the heart of UHC and the post-2015 development agenda. It is a political imperative requiring national commitment and leadership to maximize the impact of available financial and human resources, and improve healthy life expectancy, with the recognition that improvements in health care are enabled by a health workforce that is fit for purpose.

Abstracts in عربی, 中文, Français, Русский and Español at the end of each article.

Introduction

In December 2012, the United Nations General Assembly called upon all governments to "urgently and significantly scale up efforts to accelerate the transition towards universal access to affordable and quality healthcare services".¹ The evolving momentum for universal health coverage (UHC), with its principles of equity and social justice, aims to ensure that all members of a society can access the health-care services they need without incurring financial hardship.^{2,3} UHC encompasses the three dimensions of *who* is covered (population coverage), *what* is covered (health-care benefits) and *how much* of the cost is covered (financial protection), all of which may expand over time.⁴

Addressing these three dimensions of UHC⁵⁻⁷ within the boundaries of fiscal space⁸ is challenging for all countries. It requires continuing political commitment and leadership to distribute available resources, especially human resources for health (HRH),⁹ in an efficient, equitable and sustainable manner to match population needs. Overcoming the inequitable distribution of services is particularly critical.¹⁰

High-, middle- and low-income countries alike are facing fundamental health challenges stemming from demographic changes, ageing populations, the growing burden of noncommunicable diseases and emerging public health threats such as drug-resistant malaria, tuberculosis and pandemics. Several countries of the Organisation for Economic Co-operation and Development (OECD), hit by the global financial crisis, are revisiting health benefits, coverage and protection - either to reaffirm commitments or cut services.¹¹ In low- and middleincome countries, other evolving dynamics will shape efforts to achieve UHC, including epidemiological transitions,¹² economic growth, increased health expenditure and diminishing international health aid – or its reprioritization.¹³⁻¹⁵ In the next decade, an increasing number of African and Asian countries will become able to finance essential health services from domestic resources and will then face critical decisions on how to invest these funds most effectively to accelerate progress towards UHC.¹⁶

The health workforce is central to a country's response to these challenges. Reaching a greater percentage of the population, extending the benefit package and improving the qual-

^a Instituto de Cooperación Social Integrare, Calle Balmes 30, 3°-1, 08007 Barcelona, Spain.

^b Queen Margaret University, Edinburgh, Scotland.

^c Global Health Workforce Alliance, World Health Organization, Geneva, Switzerland.

^d Australian Agency for International Development, Canberra, Australia.

^e Universidade Nova de Lisboa, Lisbon, Portugal.

^f Norwegian Agency for Development Cooperation, Oslo, Norway.

⁹ National Institute of Public Health, Cuernavaca, Mexico.

^h Ministry of Health, Accra, Ghana.

¹ United States Agency for International Development, Washington, United States of America (USA).

^j Family Care International, New York, USA.

^k International Health Policy Programme, Ministry of Public Health, Nonthaburi, Thailand.

Correspondence to Jim Campbell (e-mail: jim.campbell@integrare.es).

⁽Submitted: 12 March 2013 – Revised version received: 25 August 2013 – Accepted: 26 August 2013)

ity of the care provided requires commensurate attention to the governance and management of the health-care workforce, including its stock, skill mix, distribution, productivity and quality. Matching population health needs with a supply of competent and motivated health workers that are both *fit for purpose* and *fit to practise* in the country context is therefore the foundation for accelerating the attainment of UHC.

Case studies: methods and findings

This paper explores the HRH policy lessons from four countries - Brazil, Ghana, Mexico and Thailand (Table 1) - purposefully selected for having achieved sustained improvements in accelerating progress towards UHC since 1990.7 Part of their success lies in the policy focus on the health workforce to expand population coverage and the health benefits package. The paper reviews the available literature on the impact of HRH policy to identify the key actions and lessons that support accelerated progress towards UHC, with special attention to "effective coverage" and equity. By effective coverage we mean the proportion of people who have received satisfactory health services relative to the number needing such services.^{19,20} We focus on maternal and neonatal health - areas in which comparative data are widely available, given that measuring effective coverage of UHC within and across countries is feasible by establishing "tracers" or a subset of activities indicative of overall service quality and quantity.²¹

We use an analytical framework (Fig. 1) specifically adapted from the UHC "cube"⁴ – integrating Tanahashi's health coverage model and the right to health ^{2,19,22} – to characterize the dimensions of effective coverage: availability, accessibility, acceptability, utilization and quality. The paper focuses on these four dimensions as they apply specifically to the health workforce: availability (e.g. stock and production); accessibility (e.g. spatial, temporal and financial dimensions); acceptability (e.g. gender and sociocultural); and quality (e.g. competencies and regulation).

The framework shifts the focus beyond the current monitoring of access to and contact with a health worker – i.e. skilled attendance at birth, or density of

Table 1. Selected demographic, economic and health sector indicators, by country, 2011

Country	Population (thousands)	GNI per capitaª	THE as a fraction of GDP (%)	UHC
Brazil	196.935	11 420	89	191 million (100%) in 2009
Ghana	24821	1810	4.8	12 million (61%) in 2008
Mexico	119361	15 390	6.2	104 million (98%) in 2011
Thailand	66 576	8360	4.1	65 million (98%) in 2007

GDP, gross domestic product; GNI, gross national income; PPP, purchasing power parity; THE, total health expenditure; UHC, universal health coverage.

^a In PPP international dollars.

^b Population with health-care coverage and extent to which each country had attained UHC by the year indicated.

Sources: Population, GNI per capita, health expenditure: *World health statistics* (2012)¹⁷ and Joint Learning Network for Universal Health Coverage (2013).¹⁸

Fig. 1. Dimensions of universal health coverage (UHC) pertaining to human resources for health (HRH): effective coverage



X axis represents the population, specifically the percentage of the population covered by health services.

Adapted from *The world health report* (2010),⁴ UN Economic and Social Council (2000)²² and Tanahashi (1978).¹⁹

health professionals per 1000 population – and turns the AAAQ dimensions of the workforce into the key determining factors of the quality of care,²³ represented in Fig. 1 as the "effective coverage gap".

We apply the four workforce dimensions to guide a process-tracing analysis of HRH policy actions since 1990. Process tracing is an analytical tool for exploring causal mechanisms and contributory steps in the chain of events that collectively support a desired outcome.²⁴⁻²⁶ We collated historical data (Fig. 2, Fig. 3, Fig. 4 and Fig. 5) on national trends in the number of skilled birth attendants (midwives, nurses and physicians) employed in the public sector. Subject to data availability, the figures also show the rates for maternal mortality, under-five mortality and either infant or neonatal mortality. We have disaggregated the national policy and governance steps on HRH by their respective AAAQ dimensions

(Table 2).²⁷ The respective policies are captured chronologically to explore their linkages to national trends in the health workforce and maternal, neonatal and child health outcomes.

We recognize the limitations inherent in an ex post analysis such as this. The complexity of decision-making and the confounders influencing improved health outcomes are not discussed here. Hence, while the paper explores causal mechanisms, it is beyond its scope to express causal conclusions. Instead, we use the case studies and wider published literature to identify what appears to have worked and where and draw examples of good practice from this evidence base.

Brazil

Since the adoption of its current constitution in 1988, Brazil has worked progressively to achieve UHC by setting up the *Sistema Único de Saúde* (SUS) [Unified Health System], an integrated health







CADHRU, Capacitação e Desenvolvimento de Recursos Humanos em Saúde; HRH, human resources for health; MMR, maternal mortality rate; NMR, neonatal mortality rate; PET-Saúde, Programa de Educação pelo Trabalho para a Saúde; PROFAE, Projeto de Profissionalização dos Trabalhadores da Area de Enfermagem; PROFAPS, Programa de Formação de Profissionais de Nível Médio para a Saúde; ProgeSUS, Programa de Qualificação e Estruturação da Gestão do Trabalho e da Educação no SUS; PROMED, Programa de Incentivo a Mudanças Curriculares nos Cursos de Medicina; PRO-SAÚDE, Programa Nacional de Reorientação da Formação Profissional em Saúde; SUS, Sistema Único de Saúde; TELESSAÛDE, telehealth; USMR, under-five mortality rate; UNA-SUS, Universidade Aberta do SUS.

Note: Data sources available from the corresponding author upon request.

service system based on the provision of community care and improved access for underserved populations. The SUS revealed the need to expand the health workforce, both in terms of adding staff and rationalizing roles and responsibilities, especially in relation to developing new skills and building management capacity at the municipal level – the locus of health service delivery.

The government implemented several steps to produce more staff, improve their training, enhance working conditions and strengthen management capacity. The first major effort in the 1980s was the Programa Larga Escala [Long-term Programme], designed to qualify staff who had not received formal training. In 1987, before the SUS was created, the Capacitação em Desenvolvimento de Recursos Humanos initiative was launched to build capacity in HRH training and management. This was followed in 2006 by the establishment of the Programa de Qualificação e Estruturação da Gestão do Trabalho e da Educação no SUS (Proge-SUS) [Programme of Qualification and Structuring of the Management of Work and Education in the Unified Health System], a programme for strengthening HRH and, more generally, health service management.²⁸ Other programmes, such as the 2003 Programa de Incentivo a Mudanças Curriculares nos Cursos de Medicina (PROMED) and the 2009 Programa de Educação pelo Trabalho para a Saúde (PET-Saúde) [Programme of Incentives for Curricular Changes in Medical Schools], have sought to improve service acceptability and quality and to bridge the gaps between HRH availability and need in the area of primary care. The family health team model, based on a multidisciplinary team of health workers oriented towards primary care, entails a re-orientation of the values and practices of health professionals towards the community²⁹ and improvements in population health and, indirectly, in labour supply.³⁰ The successes of these HRH policies have been made possible by strong political commitment and a sustained policy focus.

Through the implementation of these policies and programmes, between 1990 and 2009 Brazil managed to increase the number of health workers – nurses by 500% and physicians by 66% – well above the 31% in population growth. Between 2002 and 2012 the number of family health teams doubled – from 15 000 to 30 000 – and in 2013 access to basic health units reached 57% of the population (i.e. 108 million people).³¹ Over the same period neonatal mortality decreased from 26.8 to 9.7 per 1000 live births and under-five mortality from 58 to 15.6 per 1000 live births, respectively.

Ghana

A 1992 constitutional amendment to ensure the right to health enhanced the political and financial commitment to a supply-driven expansion of the health

Fig. 3. Process-tracing of human resources for health policy in relation to the number of employed health professionals and health outcomes (1990–2009): Ghana



HRH, human resources for health; MMR, maternal mortality rate; NMR, neonatal mortality rate: U5MR, under-five mortality rate.

Note: Data sources available from the corresponding author upon request.

workforce in Ghana. In 1996 new regulation, accompanied by administrative decentralization and the definition of HRH staffing norms, paved the way for Ghana's Patient's Rights Charter of 2002. The improved availability and accessibility of health workers since the turn of the millennium enabled the development of the High-Impact Rapid Delivery strategy (2005), aimed at expanding the package of essential interventions for maternal and child health and extending population coverage. The Human Resources for Health Strategic Plan (2007-2011), which integrated the accessibility, acceptability and quality dimensions, was instituted to improve deployment and retention strategies, accreditation, regulation and licensing and continuous professional development for staff.

In 1990-2009, Ghana witnessed a rapid increase in its supply of professional health workers: 185% more midwives, 260% more nurses and 1300% more physicians. Approximately 14000 additional professional health workers were trained and employed, a number representing four times the increase in population growth (240% versus 59%) over the same period. In the case of physicians, the growth in each 5-year period is fairly uniform, but in the case of midwives and nurses such growth dropped sharply towards the end of the period (2005-2009). The reduction has since been corrected, however, with the addition of more workers in 2010-12.

Achieving equity in access to and use of essential services continues to be challenging.³² A large share of national health expenditure – approximately 85% – is committed to health workforce salaries and incentives, but the steps taken in 1990–2009 have reduced workforce attrition, increased the capacity of health training institutions – Ghana is now one of the largest producers of physicians in sub-Saharan Africa – and improved the number and distribution of health workers.

Mexico

Policies and programmes have generated large increases in the health workforce,³³ beginning with the 1995 Health Sector Reform (1995–2000), which established agreements with educational institutions for the training of human resources and increased the number of health workers nationwide.³⁴ The coverage expansion programme (PAC) initiated in 1996 to







IMR, infant mortality rate; MMR, maternal mortality rate; U5MR, under-five mortality rate. Note: Data sources available from the corresponding author upon request.

address accessibility employed thousands of workers to support health activities in underserved areas. Staff remuneration was initially covered by loans from the Inter-American Development Bank, but the health ministry committed to paying wages in subsequent phases of the programme. In 2002 the PAC was integrated into the new Programa de Calidad, Equidad y Desarrollo en Salud (PROCEDES) [Programme for Quality, Equity and Development in Health].^{35,36}

The Sistema de Protección Social en Salud (SPSS) [System for Social Protection in Health] and the Seguro Popular de Salud (SPS) [Popular Health Insurance] were created in 2003 to pursue the goal of UHC, with encouraging results across all AAAQ domains.³⁷

The number of nurses and physicians increased over 1990-2009. More than 250000 additional professionals were trained and the 80% increase in nurses and the 170% increase in physicians outstripped the population growth of 30%. In the same period, infant mortality and under-five mortality more than halved: from 32.6 to 14.6 per 1000 live births and from 41 to 17.8 per 1000 live births, respectively.³⁸⁻⁴¹ Maternal mortality fluctuated over the period but was reduced by more than 50% overall, according to data from 2011.42

Attrition between education and employment is an important workforce problem that remains to be addressed. According to an analysis of the 2008 Encuesta Nacional de Ocupación y Empleo (ENOE) [National Survey of Occupation and Employment], 87% of physicians are employed, but of those who are, approximately 10% work outside the health sector. Thus, nearly one in every five physicians is not participating in the health labour market, a rate that requires further scrutiny in light of the growing private sector for medical education. In 1990, only 7% of medical students were in private schools, but by 2010 the proportion had risen to 20%. Of the 27 new medical schools established during this period, five are publicly funded and the other 22 are funded by private investments.43-45

Thailand

Although the HRH policy and governance milestones of 1990-2009 were clearly influential in Thailand's success, critical decisions were also made in the 1970s. Such decisions continue to exert an influence 40 years later.46,47 Policies on the provision and financing of health services are pro-poor.48 Primary health care at the district level was made possible through a comprehensive health workforce policy developed in 1995 that centred on retention and professional satisfaction to encourage rural deployment,⁴⁹ as well as through policy revisions introduced in 1997 and 2005. Several policies adopted from 1994 to 2009, emphasizing continuous reflection and improvement, have aimed to improve quality: development and strengthening of professional councils, regulation over curriculum standards and quality of training institutes, worker licensing and re-licensing. The establishment of the Healthcare Accreditation Institute in 2009 has consolidated these quality efforts. Post-service training in advanced practice for nursing cadres, such as nurse practitioners, intensive care unit nurses and anaesthesiology nurses, plays a significant task shifting

Fig. 5. Process-tracing of human resources for health policy in relation to the number of employed health professionals and health outcomes (1990–2009): Thailand



CNE, continuing nursing education; IMR, infant mortality rate: MMR, maternal mortality rate; U5MR, under-five mortality rate; UHC, universal health coverage.

Note: Data sources available from the corresponding author upon request.

role. Policy has centred on strengthening local and district health systems as a strategy to translate policy into practice and improve equity. The attention to equity is particularly important. Although in 1991–2009 the overall increase in nurses (210%) and physicians (186%) outstripped James Campbell et al.

population growth (13%), the accessibility dimension improved even more. For example, the ratio of nurses to people increased from 1:7.2 to 1:3.4 in 1991–2009. Regional variations in workforce deployment between the least affluent north-eastern region and affluent areas such as Bangkok have also been substantially reduced.

Case study overview

All governments have an obligation to support the highest attainable standard of health for their citizens, and many are expressing this through a commitment to the progressive realization of UHC. Our analysis provides several messages that can inform evidence-based decisionmaking on HRH in support of UHC.

First, success in awarding adequate priority to HRH depends on political leadership and commitment that is multisectoral, legislated and regulated through governance instruments and that remains coherent and consistent over electoral cycles. Second, strategies and actions in each of the AAAQ dimensions of HRH have brought about improvements in quality of care and effective coverage and these have resulted in better health outcomes. The focus on HRH goes beyond merely expanding the supply of workers. Each country aims for a workforce that is fit for purpose and fit to practise - made possible by wholeof-government approaches prioritizing equitable, efficient and effective health services. Third, the successes seen in the four countries examined in this paper reflect achievements made possible through partnerships in and outside the health sector: public and private entities; education, labour and finance; government and development partners; federal, state and district governments; health workers and consumers; providers, professional associations and health workers.

Discussion

In the past 10 years there has been increasing recognition that HRH are central to improving health.^{50,51} However, in the initial years of the "decade of action on HRH", the policy discourse tended to focus on two issues: the "crisis" in the availability of health workers in low- and middle-income countries and the international migration of health workers. While these were critical issues then and

Table 2. Role of governments, partners and the health workforce in enhancing the availability, accessibility, acceptability and quality of human resources for health

Availability	Accessibility	Acceptability	Quality
 Strengthen, plan, finance, manage, monitor and report on the health workforce to equitably meet population needs in health based on strategic intelligence and evidence; create and/or strengthen the policy, regulatory and fiscal environments to match health workforce supply, demand, affordability and sustainability in health labour markets; ensure the health workforce is educated, trained and continuously supported – in sufficient numbers and across their working lifespan to achieve and maintain competencies and deliver essential health services; strive towards domestic security of supply (in primary, secondary and tertiary education) for qualified entrants and nationally trained health workers, with predictable, sustainable financing and adequate remuneration; strengthen bilateral, multinational and regional partnerships of clear mutual benefit. 	 Identify and implement solutions that remove financial, geographical and other barriers that impede access to a health worker when care is required; actively steward, manage and deploy the health workforce to equitably meet population needs across urban, rural and remote areas; promote population access to a quality health workforce across the continuum of care with effective referral across community, primary, secondary and tertiary services; identify and implement health workforce solutions that provide equity-focused approaches to increase access for vulnerable groups, including selecting trainees from disadvantaged communities and implementing educational strategies and incentives to enhance and sustain deployment in rural areas; design and implement effective policies and strategies to train and retain health workers in an enabling and productive environment. 	 Actively steward, manage and support the domestic health workforce to increase population demand for and use of high-quality services; explore and implement evidence-based guidance on workforce sex balance, skill mix, competencies and sociocultural needs to increase the uptake and coverage of essential services in communities and health facilities; develop a workforce that is responsive to the needs of people of both sexes and all ages, ethnicities and languages, and to context- specific requirements; review and strengthen health workforce education pathways and oversight mechanisms to enhance health workers' accountability to consumers; identify and remove any perverse financial incentives and information asymmetries that affect health workers' treatment of consumers. 	 Prioritize patients' interests and the clinical appropriateness of the care they receive; review, revise and implement education and career pathways and standards, accreditation and regulatory systems, to promote and attain a quality workforce that is fit for purpose and fit to practise in relation to population- specific needs; link and support professional, community and consumer organizations to accelerate and sustain a quality workforce; strengthen patient pathways and human resource management to identify, manage and remove patient risk and improve the efficiency, effectiveness and quality of essential health services; design and implement country- specific workforce management, performance and monitoring systems to monitor, acknowledge and sustain high-quality services, using appropriate incentive schemes if relevant.
Note: Covernments provide the political	loadarchin, racalus and racourcas to offacti	ively staward the adjustion deployment	t management financing and performance

Note: Governments provide the political leadership, resolve and resources to effectively steward the education, deployment, management, financing and performance of a health workforce that equitably serves population needs, promotes the right to health and accelerates progress towards population-specific, comprehensive universal coverage.

Partners, including consumers, civil society, the private sector, professional organizations, academia, and – in those countries where it is applicable – multilateral and bilateral agencies, support and facilitate the strengthening of the health workforce through mutual respect, participation, accountability, solidarity and financial subsidy, aligned with national needs and mechanisms.

Health workers, in all cadres and sectors, should be responsive to population needs and enhance the quality of health systems and services.

Governments, partners and health workers collectively and individually support a transnational, coordinated effort to strengthen the health workforce. They do so by ensuring the effective implementation of applicable international and regional conventions and resolutions on the right to health, the social determinants of health, universal coverage and the health workforce, using evidence, innovation and technologies to do so.

Adapted from Global Health Workforce Alliance (2013).27

remain so today, there is now a growing recognition of the multifaceted nature of HRH-related challenges and of the need for HRH governance and management within dynamic, local health systems.⁵²

Since 2006, several United Nations agencies, the Global Health Workforce Alliance, regional HRH networks, development agencies, academic institutions, civil society groups and HRH observatories⁵³ have greatly expanded the HRH evidence base and analysis, planning and management tools and have led to policy recommendations.^{52,53} This strategic workforce intelligence now needs to inform contemporary commitments, policy and actions beyond 2015. The key messages can be synthesized as follows:

First, training more staff is necessary in many countries, given that more than 100 countries lack enough professional health workers if the ILO's access deficit indicator⁵ is used to set the threshold for density per 1000 population. However, increasing the numbers is not in itself sufficient to provide culturally appropriate, acceptable care to communities and to address the effective coverage gap. Expanding the supply, participation and availability of health workers also involves making informed decisions about the selection of trainees, the location, content and mode of training, and the development of appropriate skills for individual staff and effective skill mix across multidisciplinary teams. "More staff" only becomes "better staff" when there is sufficient and targeted funding to secure the correct investment in competencies and skills' development over the longer term.^{54,55}

Second, employing more staff is often necessary but not sufficient to improve access for underserved communities. Ensuring availability also requires planning to improve the accessibility, acceptability and quality dimensions – ensuring appropriate geographic and sector distribution combined with the right bundle of financial and non-financial incentives to direct and retain staff where they are most required and to motivate them to be responsive and productive.56 "More staff" only becomes "better care" when effective local management and an enabling, "positive practice" environment⁵⁷ are supported by context specific, evidence-based, responsive and fully funded HRH policies that are informed by labour market analysis and relate to defined community needs.

Third, only by addressing deepseated health system bottlenecks - health workforce constraints being prominent among them - will countries be able to achieve their health objectives.⁵⁸ Doing so will require sustained investments, including consideration of recurrent cost budgets for staffing, education, and incentives, and a policy focus over a longer period. There is a risk, however, that systemic HRH challenges will take second place to "quick wins" or "vertical" programmes (e.g. immunization or single-disease control initiatives). This is a governance issue for global health; it requires international solidarity to recognize and act on the available evidence.⁵⁹ There are no effective shortcuts for decision-makers: without adequate policies and funding to achieve a skilled and motivated workforce, other investments in the health system will not yield the expected returns or may even be wasted. Investment in other key elements of the health system will also be necessary, as even the most motivated and skilled health worker needs essential supplies, equipment, infrastructure and financing mechanisms to provide quality care.

Conclusion

The key messages from the processtracing analysis are consistent with the wider evidence.⁶⁰⁻⁶³ There is therefore a body of knowledge that can guide HRH policy, actions and commitments in relation to UHC. But evidence is not always transformed into policy and practice. A short-term horizon or wavering policy attention at the national or international level can hinder progress. Sustained improvements in HRH that enable the delivery of acceptable, quality care require consistent policies and long-term predictable funding, fully aligned with national needs, strategies and accountability mechanisms.

This debate should not be confined to HRH; it lays out the logic of how to maximize the accountability, transparency and impact of financial and human resources to keep global promises, measure results and improve health. It is a political imperative to face the unprecedented health and development challenges that transcend all country income groups and to shape discussion on the post-2015 development agenda for health and on the central role of HRH. Political commitment by national and global leaders is needed to build a global health workforce that is responsive to the challenges of the 21st century: one that is fit for purpose and fit to practise. While some argue that health care is labour intensive, it is worth remembering that UHC and improvements in health care are workforce enabled.

Acknowledgements

The co-authors extend their thanks and appreciation to Maria Guerra-Arias, Research Associate, ICS Integrare, for her valuable support.

Competing interests: None declared.

للتغطية الصحية الشاملة. أولاً، الموارد البشرية الصحية بالغة الأهمية في توسيع تغطية الخدمات الصحية وحزمة المزايا؛ ثانياً، تدعم استراتيجيات الموارد البشرية الصحية في كل بعد من أبعاد التوافر والإتاحة والمقبولية والجودة في مجموعها الإنجازات في التغطية الفعالة؛ ثالثاً، يتحقق النجاح من خلال الشراكات التي تضم جهات فاعلة في المجال الصحي وغير الصحي. يجب أن تكون مواجهة التحديات الصحية والإنهائية غير

المسبوقة التي تؤثر على كل البلدان وتحويل بينّات الموارد البشرية الصحية إلى سياسة وممارسة محور التغطية الصحية الشاملة وجدول أعمال التنمية بعد عام 2015. وتمثل زيادة أثر الموارد المالية والبشرية المتاحة إلى أقصى قدر ممكن، وتحسين متوسط العمر المأمول لدى الأصحاء مع الإقرار بتمكين القوى العاملة الصحية المناسبةِ للغرض من إدخال تحسينات في الرعاية الصحية واجباً سياسياً يتطلب التزاماً وقيادة على الصعيد الوطني.

ملخص الموارد البشرية الصحية والتغطية الصحية الشاملة: تعزيز الإنصاف والتغطية الفعالة يتضمن تحقيق التغطية الصحية الشاملة توزيع الموارد، لاسيما الموارد السه بة الصحبة، لتلبية احتياجات السكان. وتستكشف هذه الورقة الدروس السياسية المعنية بالموارد البشرية الصحية المستفادة من أربعة بلدان حققت تحسينات مستدامة في التغطية الصحية الشاملة، هي: البرازيل وغانا والمكسيك وتايلند. وتهدف هذه الورقة إلى توفير المعلومات اللازمة للسياسة العالمية والالتزامات المالية للموارد البشرية الصحية دعماً للتغطية الصحية الشاملة.

> تقدم هذه الورقة تقارير عن خبرات البلدان باستخدام إطار تحليلي يدرس التغطية الفعالة فيما يتصل بتوافر وإتاحة ومقبولية وجوَّدة الموارد البشرية الصحية. وتتيح أبعاد التوافر والإتاحة وبودن الموارد البسرية الصحية. وسيح ببعاد الموالو والرعامة والمقبولية والجودة تنفيذ تتبع التحليل المعني بإجراءات سياسة الموارد البشرية الصحية منذ عام 1990 في البلدان الأربع محل الاهتهام فيها يتصل بالاتجاهات الوطنية في أعداد القوى العاملة ومعدلات وفيات السكان.

> توفر النتائج المعلومات اللازمة حول المبادئ الرئيسية لاتخاذ القرار المستند على البيّنات المعنى بالموارد البشرية الصحية دعماً

摘要

卫生人力资源和全民医疗保障:促进公平和有效覆盖 实现全民医保(UHC)涉及满足人们需求的资源分配, 尤其是卫生人力资源(HRH)的分配。文本探讨了巴西、 加纳、墨西哥和泰国四国 HRH 相关政策的经验教训, 这四个国家在 UHC 方面取得了持续改进。本文旨在 为 HRH 的相关全球政策和财务规划提供信息,用以 支持 UHC。

本文使用考查 HRH 可用性、可及性、可接受性和 质量(AAAQ)相关有效覆盖的分析框架来报告国家 经验。采用 AAAQ 维度可以对四个受关注国家执行 1990年以来有关劳动力数量和人口死亡率国家趋势的 HRH 政策行为跟踪分析。

研究结果可以为基于证据的相关 HRH 决策的基本

原则提供参考信息,对 UHC 加以支持。首先,HRH 对于扩大卫生服务覆盖和福利制度非常关键;其次, 每个 AAAQ 维度中的 HRH 战略对实现有效覆盖共同 起支持作用;第三,成功通过合作关系实现,这种合 作关系涉及卫生工作者,也牵涉到非卫生行动者。

面对影响所有国家的前所未有的卫生和发展挑战, 将 HRH 证据转化为政策和实践必须居于 UHC 和 2015 年后发展议程的核心。一个需要国家承诺和领导的政 治要务就是,通过认识到专业对口的卫生劳动力能实 现医疗卫生事业的改善,将可用财政和人力资源的效 力最大化,并改善健康预期寿命。

Résumé

Ressources humaines pour la santé et la couverture sanitaire universelle: promouvoir l'équité et une couverture efficace

Parvenir à la couverture sanitaire universelle (CSU) implique la répartition des ressources, et en particulier des ressources humaines pour la santé (RHS), afin de répondre aux besoins de la population. Cet article étudie les leçons politiques sur les RHS de quatre pays ayant accompli des progrès durables en matière de CSU: le Brésil, le Ghana, le Mexique et la Thaïlande. Son but est d'informer sur les politiques globales et les engagements financiers dans les RHS visant à promouvoir la CSU.

L'article décrit les expériences des pays à l'aide d'un cadre analytique examinant la couverture efficace par rapport à la disponibilité, l'accessibilité, l'acceptabilité et la qualité (DAAQ) des RHS. Les dimensions DAAQ permettent de réaliser une analyse de traçage des actions politiques en RHS depuis 1990 dans les quatre pays étudiés, par rapport aux tendances nationales des statistiques de main-d'oeuvre et des taux de mortalité de la population.

Les résultats indiquent quels sont les principes clés pour la prise de décisions basées sur les faits sur les RHS visant à promouvoir la CSU. Premièrement, les RHS sont essentielles à l'expansion de la couverture des services de santé et de l'ensemble des avantages; deuxièmement, des stratégies RHS pour chacune des dimensions DAAQ favorisent collectivement les progrès vers une couverture efficace; et troisièmement, le succès est atteint à travers des partenariats impliquant des acteurs tant médicaux que non médicaux.

Répondre aux défis sans précédent dans les domaines de la santé et du développement, qui concernent tous les pays, et transformer les faits RHS en politiques et en pratiques doivent être à la base du programme de CSU et de l'agenda de développement post-2015. C'est un impératif politique qui exige un engagement et un leadership nationaux pour optimiser l'impact des ressources financières et humaines disponibles et accroître l'espérance de vie en bonne santé, avec la reconnaissance que les progrès dans le domaine des soins de santé ne sont possibles qu'avec une main-d'oeuvre de santé adéquate.

Резюме

Роль кадровых ресурсов здравоохранения в вопросе всеобщего охвата медико-санитарной помощью: обеспечение справедливого доступа и эффективного охвата

Достижение всеобщего охвата медико-санитарной помощью (ВОМСП) подразумевает распределение ресурсов, особенно кадровых ресурсов здравоохранения (КРЗ), в соответствии с потребностями населения. В данной статье исследуются результаты проведения политики в области КРЗ в четырех странах, добившихся устойчивых улучшений в области ВОМСП: Бразилии, Ганы, Мексики и Таиланда. Целью статьи является информирование о глобальной политике и финансовых обязательствах по КРЗ в целях обеспечения ВОМСП.

В статье сообщается об опыте стран с применением аналитической основы, когда эффективность охвата медицинскими услугами рассматривается на основе таких параметров КРЗ, как наличие, доступность, приемлемость и качество (НДПК). Использование параметров НДПК дало возможность выполнить исторический анализ политики КРЗ в этих четырех странах с 1990 года с учетом национальных тенденций численности рабочей силы и смертности населения.

В результате были выделены основные принципы научно обоснованных решений по КРЗ для поддержки ВОМСП. Вопервых, КРЗ имеет решающее значение для расширения охвата медицинским обслуживанием и связанных с ним комплексных улучшений; во-вторых, стратегии КРЗ по каждому параметру НДПК совместно обеспечивают более эффективный охват услугами; и в-третьих, успех достигается благодаря партнерским отношениям с организациями, как связанными со здравоохранением, так и работающими вне этой области.

Эффективное преодоление беспрецедентных трудностей в области здравоохранения и развития, затрагивающих все страны, и воплощение результатов, полученных в ходе исследования КРЗ, в политику и практику, должно стать основой стратегии ВОМСП и сформировать повестку дня в целях развития после 2015 года. Политическим императивом сегодня является национальная заинтересованность и обеспечение руководства развитием здравоохранения, что позволит оптимально использовать имеющиеся финансовые и людские ресурсы и увеличить ожидаемую продолжительность здоровой жизни. При этом необходимо признание того, что улучшения в области медицинского обслуживания возможны только при наличии кадров работников здравоохранения, соответствующих данным целям.

Resumen

Los recursos humanos para la salud y la cobertura sanitaria universal: cómo fomentar una cobertura eficaz y justa

Lograr una cobertura sanitaria universal implica una distribución de los recursos, en particular, de los recursos humanos para la salud (RHS), a fin de satisfacer las necesidades de la población. Este documento examina las lecciones sobre políticas relacionadas con los RHS de cuatro países que han conseguido avances ininterrumpidos en materia de cobertura sanitaria universal: Brasil, Ghana, México y Tailandia. Su objetivo consiste en exponer la política mundial y los compromisos financieros sobre RHS como ayuda para una cobertura sanitaria universal.

El documento explica las experiencias de los países mencionados por medio de un marco de trabajo analítico que examina la eficacia de una cobertura en función de la disponibilidad, accesibilidad, aceptabilidad y calidad (DAAC) de los RHS. Los aspectos DAAC permiten llevar a cabo análisis de seguimiento sobre las acciones políticas relativas a los RHS desde 1990 en los cuatro países de interés en relación con las tendencias nacionales en el número de trabajadores y las tasas de mortalidad de la población.

Los resultados muestran los principios fundamentales para la toma

References

- A/67/L.36. Agenda item 123: global health and foreign policy. In: General Assembly of the United Nations [Internet]. Sixty-seventh United Nations General Assembly, New York, 3–11 September 2012, official documents. Geneva: UNGA; 2013. Available from: http://daccess-dds-ny.un.org/doc/ UNDOC/LTD/N12/630/51/PDF/N1263051.pdf?OpenElement [accessed 10 September 2013].
- Ooms G, Brolan C, Eggermont N, Eide A, Flores W, Forman L et al. Universal health coverage anchored in the right to health. *Bull World Health Organ* 2013;91:2–2A. doi: http://dx.doi.org/10.2471/BLT.12.115808 PMID:23397341
- Savedoff WD, de Ferranti D, Smith ÅL, Fan V. Political and economic aspects of the transition to universal health coverage. *Lancet* 2012;380:924–32. doi: http://dx.doi.org/10.1016/S0140-6736(12)61083-6 PMID:22959389
- The world health report: health systems financing: the path to universal coverage. Geneva: World Health Organization; 2010. Available from: http:// whqlibdoc.who.int/whr/2010/9789241564021_eng.pdf [accessed 10 September 2013].
- Social health protection: an ILO strategy towards universal access to health care. Geneva: International Labour Office; 2008 (Social Security Policy Briefings). Available from: http://www.ilo.org/secsoc/informationresources/publications-and-tools/policy-briefings/WCMS_SECSOC_5956/ lang--en/index.htm [accessed 10 September 2013].
- 6. Glassman A, Chalkidou K. *Priority-setting in health: building institutions for smarter public spending*. Washington: Center for Global Development; 2012.
- Giedion U, Alfonso EA, Díaz Y. The impact of universal coverage schemes in the developing world: a review of the existing evidence. Washington: The World Bank; 2013. Available from: http://siteresources.worldbank.org/ HEALTHNUTRITIONANDPOPULATION/Images/IMPACTofUHCSchemesinDevelo pingCountries-AReviewofExistingEvidence.pdf [accessed 20 September 2013].
- Tandon A, Cashin C. Assessing public expenditure on health from a fiscal space perspective. Washington: The World Bank; 2010 (HNP Discussion Paper).
- Jimba M, Cometto G, Yamamoto T, Shiao L, Huicho L, Sheikh M. Health workforce: the critical pathway to universal health coverage. Montreux: First Global Symposium on Health Systems Research; 2010. Available from: http:// www.hrhresourcecenter.org/node/3459 [accessed 10 September 2013].
- Victora CG, Hanson K, Bryce J, Vaughan JP. Achieving universal coverage with health interventions. *Lancet* 2004;364:1541–8. doi: http://dx.doi. org/10.1016/S0140-6736(04)17279-6 PMID:15500901
- Mladovsky P, Srivastava D, Cylus J, Karanikolos M, Evetovits T, Thomson S, et al. *Health policy responses to the financial crisis in Europe*. Geneva: World Health Organization, European Observatory on Health Systems and Policies; 2012 (Policy Summary 5). Available from: http://www.euro.who.int/__data/ assets/pdf_file/0009/170865/e96643.pdf [accessed 10 September 2013].
- 12. Lozano R, Naghavi M, Foreman K, Lim S, Shibuya K, Aboyans V et al. Global and regional mortality from 235 causes of death for 20 age groups in 1990 and 2010: a systematic analysis for the Global Burden of Disease Study 2010. *Lancet* 2012;380:2095–128. doi: http://dx.doi.org/10.1016/S0140-6736(12)61728-0 PMID:23245604

de decisiones basadas en pruebas científicas sobre los RHS como apoyo a una cobertura sanitaria universal. En primer lugar, los RHS son esenciales para expandir la cobertura de los servicios sanitarios y el conjunto de prestaciones. En segundo lugar, las estrategias RHS en cada uno de los aspectos DAAC respaldan de forma colectiva los logros en la eficacia de la cobertura y, en tercer lugar, los buenos resultados solo pueden conseguirse a través de la asociación de actores sanitarios y no sanitarios.

Hacer frente a los desafíos sanitarios y de desarrollo sin precedentes que afectan a todos los países y traducir las pruebas científicas sobre RHS en políticas y prácticas deben convertirse en los puntos centrales de la cobertura sanitaria universal y de la agenda de desarrollo a partir del año 2015. Se trata de un imperativo político que requiere un compromiso y liderazgo nacionales para potenciar el impacto de los recursos financieros y humanos disponibles, y así mejorar la esperanza de vida saludable, sin olvidar que las mejoras en materia de asistencia sanitaria son posibles gracias a un personal sanitario apto para tal propósito.

- Pitt C, Lawn JE, Ranganathan M, Mills A, Hanson K. Donor funding for newborn survival: an analysis of donor-reported data, 2002–2010. *PLoS Med* 2012;9:e1001332. doi: http://dx.doi.org/10.1371/journal.pmed.1001332 PMID:23118619
- Hsu J, Pitt C, Greco G, Berman P, Mills A. Countdown to 2015: changes in official development assistance to maternal, newborn and child health in 2009–10, and assessment of progress since 2003. *Lancet* 2012;380:1157–68. doi: http://dx.doi.org/10.1016/S0140-6736(12)61415-9 PMID:23000291
- Ravishankar N, Gubbins P, Cooley RJ, Leach-Kemon K, Michaud CM, Jamison DT et al. Financing of global health: tracking development assistance for health from 1990 to 2007. *Lancet* 2009;373:2113–24. doi: http://dx.doi. org/10.1016/S0140-6736(09)60881-3 PMID:19541038
- Brandford DeLong J. Contours of the world economy 1–2030 AD: essays in macro-economic history. New York: Oxford University Press; 2007.
- 17. World health statistics. Geneva: World Health Organization; 2012.
- Joint Learning Network for Universal Health Coverage [Internet]. Compare: population covered. UHC Forward; 2013. Available from: http://uhcforward. org/reforms/compare/population [accessed 10 September 2013].
- 19. Tanahashi T. Health service coverage and its evaluation. *Bull World Health Organ* 1978;56:295–303. PMID:96953
- Shengelia B, Tandon A, Adams OB, Murray CJL. Access, utilization, quality, and effective coverage: an integrated conceptual framework and measurement strategy. *Soc Sci Med* 2005;61:97–109. doi: http://dx.doi. org/10.1016/j.socscimed.2004.11.055 PMID:15847965
- The world health report 2013: research for universal health coverage. Geneva: World Health Organization; 2013. Available from: http://apps.who.int/ iris/bitstream/10665/85761/2/9789240690837_eng.pdf [accessed 10 September 2013].
- UN Economic and Social Council. General comment no. 14: the right to the highest attainable standard of health (Art. 12 of the Covenant). Geneva: UN Committee on Economic, Social and Cultural Rights; 2000 (Document E/C.12/2000/4). Available from: http://www.unhcr.org/refworld/ pdfid/4538838d0.pdf [accessed 10 September 2013].
- Graham WJ, McCaw-Binns A, Munjanja S. Translating coverage gains into health gains for all women and children: the quality care opportunity. *PLoS Med* 2013;10:e1001368. doi: http://dx.doi.org/10.1371/journal. pmed.1001368 PMID:23335862
- 24. Van Evera S. *Guide to methods for students of political science*. Cornell University; 1997.
- Reilly RC. Process tracing: In: Mills AJ, Eurepos G, Wiebc E, editors. *Encyclopedia of case study research*. London: Sage Publications Ltd; 2009. Available from: http://spectrum.library.concordia.ca/6421/1/ Process_tracing.pdf [accessed 10 September 2013].
- Collier D. Understanding process tracing. PS: Political Science & Politics 2011;44:823–30. doi: http://dx.doi.org/10.1017/S1049096511001429

James Campbell et al.

- The Kampala declaration and agenda for global action. Geneva: World Health Organization, Global Health workforce Alliance; 2008. Available from: http:// www.who.int/workforcealliance/Kampala%20Declaration%20and%20 Agenda%20web%20file.%20FINAL.pdf [accessed 10 September 2013].
- Buchan J, Fronteira I, Dussault G. Continuity and change in human resources policies for health: lessons from Brazil. *Hum Resour Health* 2011;9:17. doi: http://dx.doi.org/10.1186/1478-4491-9-17 PMID:21729318
- 29. Peres EM, Andrade AM, Dal Poz MR, Grande NR. The practice of physicians and nurses in the Brazilian Family Health Programme evidences of change in the delivery health care model. *Hum Resour Health* 2006;4:25. doi: http://dx.doi.org/10.1186/1478-4491-4-25 PMID:17107622
- Rocha R, Soares RR. Evaluating the impact of community based health interventions: evidence from Brazil's Family Health Program. New Delhi: Global Development Network; 2009 (GDN Working Paper No. 1). Available from: http://depot.gdnet.org/newkb/submissions/Health project_Brazil_Rocha & Soares_1.pdf [accessed 10 September 2013].
- Sala de Apoio á Gestão Estrategica [Internet]. Indicadores de saúde a um clique. Brasilia: Ministério de Saúde; 2013. Portugese. Available from: http://189.28.128.178/sage/ [accessed 10 September 2013].
- Countdown to 2015: building a future for women and children the 2012 report. Geneva: World Health Organization & United Nations Children's Fund; 2012. Available from: http://www.countdown2015mnch.org/ documents/2012Report/2012-Complete.pdf [accessed 10 September 2013].
- Frenk J, Gómez-Dantés O, Knaul FM. The democratization of heath in Mexico financial innovations for universal coverage. *Bull World Health Organ* 2009;87:542–8.
- Nigenda G, Ruiz JA. El caso de México: factores restrictivos para la descentralización en recursos humanos. Washington: Pan American Health Organization; 1999 (Serie Desarrollo de Recursos Humanos 16). Spanish.
- Secretaría de Salud, Programa de Ampliación de Cobertura 1996-2000: recuento y testimonio de un esfuerzo de equidad y extensión de servicios de salud en México. Mexico City: 2000. Spanish.
- Nigenda G, Ruiz-Larios JA, Aguilar-Martínez ME, Bejarano-Arias R. Regularización laboral de trabajadores de la salud pagados con recursos del Seguro Popular en México. *Salud Publica Mex* 2012;54:616–23. Spanish doi: http://dx.doi.org/10.1590/S0036-36342012000600010 PMID:23318898
- Frenk J. Bridging the divide: global lessons from evidence-based health policy in Mexico. *Lancet* 2006;368:954–61. doi: http://dx.doi.org/10.1016/ S0140-6736(06)69376-8 PMID:16962886
- Secretaría de Salud. Vol. I. Recursos físicos, materiales y humanos 2000 al 2011. In: *Boletín de Información Estadística*. Mexico City: Sistema Nacional de Información en Salud. Spanish. Available from: http://www.sinais.salud.gob. mx/publicaciones/index.html [accessed 15 September 2013].
- Nigenda G, Machado M, Ruiz F, Carrasco V, Moliné P, Giraldi S. Towards the construction of Health workforce Metrics for Latin America and the Caribbean. *Hum Resour Health* 2011;9:24.
- González-Robledo LM, González-Robledo MC, Nigenda G. Dentist education and labour market in Mexico: elements for policy definition. *Hum Resour Health* 2011;10:31.
- Alcalde-Rabanal JE, Barnighausen T, Nigenda-Lopez G, Velazco–Mondragón HE, Sosa-Rubi SG. Human resources needed to after health prevention and promotion to adults in primary care. *Salud Publica Mex* 2013;55:301–9.
- Observatorio de Mortalidad Materna en México [Internet]. Indicadores 2011: Objetivo de Desarrollo del Milenio 5: avances en México. Mexico City: OMMM; 2013. Spanish. Available from: http://omm.org.mx/images/stories/ Documentos%20grandes/Indicadores%202011%20%2829%20de%20 julio%29.pdf [accessed 15 September 2013].
- Anuario estadístico 2004: población escolar de posgrado. Mexico City: Asociación Nacional de Universidades e Instituciones de Educación Superior; 2004. Spanish.
- 44. Anuario estadístico 2005–2007: población escolar y personal docente en la educación media superior y superior. Mexico City: Asociación Nacional de Universidades e Instituciones de Educación Superior; 2008. Spanish.

- 45. Anuario estadístico 2010: población escolar y personal docente en la educacion media superior y superior, ciclo escolar 2009–2010. Mexico City: Asociación Nacional de Universidades e Instituciones de Educación Superior; 2011. Spanish.
- Rohde J, Cousens S, Chopra M, Tangcharoensathien V, Black R, Bhutta ZA et al. 30 years after Alma-Ata: has primary health care worked in countries? *Lancet* 2008;372:950–61. doi: http://dx.doi.org/10.1016/S0140-6736(08)61405-1 PMID:18790318
- 47. Patcharanarumol W, Tangcharoensathien V, Limwattananon S, Panichkriangkrai W, Pachanee K, Poungkantha W, et al. Chapter 7: Why and how did Thailand achieve good health at low cost? In: Balabanova D, McKee M, Mills A, editors. 'Good health at low cost' 25 years on: what makes a successful health system? London: London School of Hygiene and Tropical Medicine; 2011. pp. 193-223.
- 48. Evans TG, Chowdhury AM, Evans DB, Fidler AH, Lindelow M, Mills A, et al. Thailand's universal coverage scheme: achievements and challenges: an independent assessment of the first 10 years (2001–2010). Nonthaburi: Health Insurance System Research Office; 2012.
- 49. Tangcharoensathien V, Prakongsai P, Limwattananon S. Achieving universal coverage in Thailand: what lessons do we learn? A case study commissioned by the Health Systems Knowledge Network of the WHO Commission on Social Determinants of Health. Geneva: World Health Organization; 2007.
- Joint Learning Initiative. Human resources for health: overcoming the crisis. Cambridge: The President and Fellows of Harvard College; 2004.
- 51. *The world health report 2006: working together for health*. Geneva: World Health Organization; 2006.
- 52. van Olmen J, Criel B, Van Damme W, Marchal B, Van Belle S, Van Dormael M, et al. *Analysing health system dynamics: a framework*. Antwerp: ITG Press; 2012.
- Evidence-informed human resources for health policies: the contribution of HRH observatories. Geneva: World Health Organization; 2011. Available from: http://www.who.int/hrh/resources/observatories_meeting_report.pdf [accessed 10 September 2013].
- Task Force for Scaling Up Education and Training for Health Workers [Internet]. Scaling up, saving lives. Geneva: World Health Organization; 2008. Available from: http://www.who.int/workforcealliance/documents/ Global_Health FINAL REPORT.pdf [accessed 11 September 2013].
- 55. Frenk J, Chen L, Bhutta ZA, Cohen J, Crisp N, Evans T et al. Health professionals for a new century: transforming education to strengthen health systems in an interdependent world. *Lancet* 2010;376:1923–58. doi: http://dx.doi.org/10.1016/S0140-6736(10)61854-5 PMID:21112623
- Huicho L, Dieleman M, Campbell J, Codjia L, Balabanova D, Dussault G et al. Increasing access to health workers in underserved areas: a conceptual framework for measuring results. *Bull World Health Organ* 2010;88:357–63. doi: http://dx.doi.org/10.2471/BLT.09.070920 PMID:20461135
- 57. Bhutta ZA, Lassi ZS, Mansoor N. Systematic review on human resources for health interventions to improve maternal health outcomes: evidence from developing countries. Karachi: The Aga Khan University; 2010.
- Travis P, Bennett S, Haines A, Pang T, Bhutta Z, Hyder AA et al. Overcoming health-systems constraints to achieve the Millennium Development Goals. *Lancet* 2004;364:900–6. doi: http://dx.doi.org/10.1016/S0140-6736(04)16987-0 PMID:15351199
- Ministers of Foreign Affairs of Brazil, France, Indonesia, Norway, Senegal and Thailand. Why we need a commission on global governance for health. *Lancet* 2012;379:1470–1. PMID:22169106
- Kaplan AD, Dominis S, Palen JG, Quain EE. Human resource governance: what does governance mean for the health workforce in low- and middle-income countries? *Hum Resour Health* 2013;11:6. doi: http://dx.doi. org/10.1186/1478-4491-11-6 PMID:23414237
- 61. Dussault G, Buchan J, Sermeus W, Padaiga Z. *Assessing future health workforce needs*. Copenhagen: World Health Organization; 2010.
- 62. Vujicic M. Macroeconomic and fiscal issues in scaling up human resources for health in low-income countries. Washington: The World Bank; 2005.
- 63. Witter S, Cometto G, Zaman RU, Sheikh MR, Wibulpolprasert S. Implementing the Agenda for Global Action on human resources for health: analysis from an international tracking survey. *J Hosp Admin* 2012;2:77–87. doi: http://dx.doi.org/10.5430/jha.v2n1p77

Strengthening human resources for health through multisectoral approaches and leadership: the case of Cameroon

S Kingue,^a E Rosskam,^b AC Bela,^a A Adjidja^a & L Codjia^c

Problem Cameroon has a severe shortage of human resources for health (HRH) and those that are available are concentrated in urban areas. **Approach** As the result of a national emergency plan for the years 2006–2008, innovative strategies and a multisectoral partnership – led by the Ministry of Public Health and supported by diverse national and international organizations – were developed to address the shortages and maldistribution of HRH in Cameroon.

Local setting At the time that the emergency plan was developed, Cameroon had health services of poor quality, an imbalance between HRH training and employment, a maldistribution of HRH between urban and rural areas and a poor allocation of financial resources for HRH. It also lacked an accreditation system for use in the training of health workers.

Relevant changes Between 2007 and 2009, the number of active health workers in Cameroon increased by 36%, several new institutions for higher education in health care and training schools for paramedical staff and midwives were opened, and a national strategy for universal health coverage was developed.

Lessons learnt In the improvement of HRH, strong leadership is needed to ensure effective coordination and communication between the many different stakeholders. A national process of coordination and facilitation can produce a consensus-based view of the main HRH challenges. Once these challenges have been identified, the stakeholders can plan appropriate interventions that are coordinated, evidence-based and coherent.

Abstracts in عربى, 中文, Français, Русский and Español at the end of each article.

Background

Although Cameroon has an acute shortage of human resources for health (HRH), it lacks the economic resources to support the mass recruitment of new health workers. Only 27% of the individuals who completed their training at nursing schools in Cameroon between 1990 and 2009 were recruited by the Ministry of Public Service.¹ The training in health care that does take place in Cameroon is also seldom matched with employment needs. In 2011, for example, severe staff shortages in the fields of mental health, ophthalmology and anaesthesia-resuscitation were known to exist, but almost all health science students at training schools in Cameroon were intending to work as nursing aids, state registered nurses or laboratory technicians in other fields of medicine. Approximately 66% of the health workers in Cameroon are employed in the public sector but more heath workers are needed in both the public and the private sectors (Table 1). 2

Context

Much of the current HRH crisis in Cameroon can be attributed to low government spending on health – a mere 4.6% and 5.1% of the gross domestic product in 2000 and 2012, respectively³ – and a lack of effective coordination between the key stakeholders. Poor coordination has led to the duplication of interventions, the use of conflicting procedures and a general waste of resources.

Substantial increases in the Cameroonian health budget are not likely to occur in the near future. The main strategy for reducing HRH problems in Cameroon is therefore to capitalize on the existing potential – primarily by improving the coordination and effectiveness of the key stakeholders' current efforts to improve the health system. In response to the HRH crisis, the Cameroonian government developed an HRH emergency plan for the years 2006 to 2008. Implementation of this plan led to the recruitment of 5400 health workers, the opening of new training schools for health workers, the revision of the training curricula for paramedical staff, and a simplification of the process that contract or temporary workers need to follow to become permanent employees in the public sector. Between 2007 and 2010, Cameroonian HRH received increased financial support from external sponsors. Over this period, the International Monetary Fund and the World Bank – via the Heavily Indebted Poor Country initiative – and the French government – via the *Contrat de Désendettement et de Développement* – together contributed about 7359 million African Financial Community (CFA) francs towards the salaries of health workers in Cameroon.

The HRH emergency plan for 2006-2008 did not solve the maldistribution of HRH in Cameroon, where health care is concentrated in urban areas; the low allocation of financial resources for HRH, or the absence of an accreditation system for HRH training. External resources were therefore mobilized to develop new approaches to address these challenges. The mobilization process started in 2007, with a 2-day conference on HRH organized by the Global Health Workforce Alliance. This conference resulted in the Douala Plan of Action.⁴ In 2010 - with financial support from the World Health Organization (WHO), the Global Health Workforce Alliance, the French Development Agency and the European Union - Cameroon's Ministry of Public Health formally adopted and implemented a "country coordination and facilitation" process. The aims were to clarify the main challenges to effective HRH in Cameroon and to subsequently create an integrated, participatory and comprehensive HRH-development strategy - for the years 2011–2015 – that would address these challenges.

^a Ministry of Public Health, Yaoundé, Cameroon.

^b Webster University, Geneva, Switzerland.

^c Global Health Workforce Alliance, World Health Organization, avenue Appia 20, 1211 Geneva 27, Switzerland.

Correspondence to L Codjia (e-mail: codjial@who.int).

⁽Submitted: 11 March 2013 – Revised version received: 24 July 2013 – Accepted: 2 August 2013)

Table 1. Supply and shortfall of human resources for health in Cameroon, 2011

Sector	No. of individuals ^a				
	Needed	Registered	Shortfall		
Public					
Health-care providers	36728	17 334	19 394		
Other workers ^b	12 388	7 849	3 894		
Total	49116	25 183	23 933		
Private					
All workers	16743	13 024	23 933		
Entire health sector	65 859	38 207	27 652		

^a Estimates from an external evaluation (S Kingue and F Nissack, unpublished data, 2012).

^b Health sector workers not involved directly in health care. This includes, for example, managers, statisticians and analysts.

statisticialis and analysts.

The country coordination and facilitation process for HRH development was a catalytic force that ensured the mobilization and coordination of the key stakeholders. The stakeholders became jointly responsible for reviewing national HRH problems, setting strategic priorities and developing a national, strategic HRH plan. As part of the process undertaken to address the problem of HRH maldistribution, financial resources were mobilized, the extent of the maldistribution was evaluated and a retention policy for health workers was developed.5 The main aim of the retention policy was to ensure the presence of health workers in rural areas of Cameroon that are difficult to access.6

To address the problem of poor stakeholder coordination, a meeting with over 200 participants was convened.7 This meeting led to several recommendations, including the development of a multisectoral coordinating committee and a multisectoral technical working group for HRH in Cameroon. In 2010, these recommendations led the Cameroonian Ministry of Public Health to mobilize a national coordinating committee composed of representatives of all the key stakeholders. This committee currently acts as the umbrella organization for developing HRH, raising awareness of issues surrounding HRH and high-level HRH advocacy. It also manages an HRH technical working group, an HRH national observatory and a multidisciplinary HRH research group.8 The members of the committee include 11 ministerial administrators and representatives of development partners (n=2), the private sector (n = 1), decentralized local and regional authorities (n = 1), civil society organizations (n = 1), chambers of commerce (n = 1), professional associations (n = 4), trade unions (n = 2), medical and nursing schools (n=2) and

patient associations (n = 1), plus other experts on an as-needed basis. The committee meets twice a year routinely and ad hoc at other times. Before the country coordination and facilitation strategy was implemented, the committee responsible for HRH in Cameroon met relatively rarely and only on an as-needed basis.

The HRH technical working group in Cameroon is responsible for the development of HRH policies and strategic plans and the subsequent monitoring of their implementation. It meets four times per year to respond to the central HRH issues. Meetings of both the coordinating committee and the technical working group follow established agendas and focus on specific needs. For example, the committee's agenda includes creating synergy among the various ministries involved in health sector improvement; ensuring coherence among health sector activities, resources and actors; coordinating and informing the key HRH stakeholders; and seeking sustainable funding solutions with interested partners. The agenda of the technical working group includes creating synergy among the different activities aimed at health sector improvement by ensuring coherence in activities, resources and operators; harmonizing the various health sector interventions; coordinating and informing the actors responsible for implementing the interventions; following up on Cameroon's commitments to developing its health sector; encouraging multisectoral participation; ensuring coherence in the implementation of health sector strategies and other strategies, such as those to stimulate growth and employment; finding sustainable solutions to the problem of health financing in dialogue with all interested partners; following up the key indicators of the evolution of the health

system; and coordinating and supervising health sector reviews.

Results

Since 2006, strong leadership has facilitated the process of moving to an evidence-based approach to HRH development in Cameroon. It has encouraged collaboration between the ministries involved in the Cameroonian health sector, fostered relevant discussion and dialogue, increased trust between the various stakeholders, and promoted a consensus view and approach. The nongovernmental organizations and national societies involved in health care in Cameroon have been able to expand their role, increase their visibility and improve their credibility with the national government and other stakeholders. Even health workers in remote areas have been able to contribute to the HRH planning process.

Implementation of the HRH emergency plan resulted in the recruitment of 6417 additional health workers in Cameroon between 2007 and 2009. Such recruitment increased the number of active health workers in the country from 11 528 in 2005 to 15 720 in 2009 - a 36% increase.9 Over the same period the number of Cameroonian institutions for higher education in health sciences was increased from five to seven in a further attempt to address the shortfall in health workers in general and of specialist physicians and midwives in particular. Training at degree level has been expanded to cover an additional 14 medical specialties, bringing the total to 26, with the aim of more than doubling the number of specialist physicians active in Cameroon - to 130 - by 2014. The number of training schools for paramedical staff in Cameroon increased by 54% between 2007 and 2013 with the creation of 37 new schools, including 10 for the training of midwives. Over the same period, the number of paramedical workers active in Cameroon increased from 4000 to about 9000. The aim is to have 81 training schools for paramedical staff and at least 250 midwives trained per year by 2014.

Payment to health workers increased considerably too. Between 2007 and 2010, the monthly gross salaries of governmentrecruited assistant nurses, nurses and physicians had risen by a mean of 8.75% – to 102 540, 147 352 and 217 578 CFA francs, respectively.¹

As a result of the implementation of the country coordination and facilitation

ملخص

process, all HRH stakeholders are now involved in all strategic planning that relates to the national health system. The Cameroonian government is currently developing a strategy for universal health coverage that will include the development or expansion of social insurance for public sector workers and their families, private health insurance schemes and community-based health insurance schemes. The aim is to have at least 40% of the population of Cameroon covered by health insurance by 2015.⁵

An external evaluation of the country coordination and facilitation process was conducted in 2012 with funding from the European Union. The data collected in this evaluation indicated that the process had been successfully implemented in Cameroon. This success was largely attributed to precise methods that permitted – and still permit – stakeholders

Box 1. Summary of main lessons learnt

- In the improvement of human resources for health, strong leadership is needed to ensure effective coordination and communication between the many different stakeholders.
- A national process of coordination and facilitation can produce a consensus-based view of the main challenges involved in the area of human resources for health.
- Once the main challenges have been identified, the stakeholders can plan appropriate interventions that are coordinated, evidence-based and coherent.

to be identified and then engaged on the basis of their specific interests and their potential contributions to solving the HRH crisis.¹⁰ Several lessons can be learnt from the results of the external evaluation (Box 1). Investing in the country coordination and facilitation process and applying it appear to be cost-effective and sustainable ways to build stakeholder consensus on the actions needed to address HRH challenges. A return on investment can be demonstrated. Policies and legal frameworks to promote the retention of health workers and, in particular, to develop and scale up effective strategies for the retention of health workers in rural areas should help developing countries such as Cameroon to achieve universal health coverage and the health-related Millennium Development Goals by 2015. The education of potential health workers should follow competency-based curricula that are responsive to – and respectful of – population needs.

Competing interests: None declared.

تعزيز الموارد البشرية الصحية من خلال القيادة والأساليب متعددة القطاعات: حالة الكامرون

التغيّرات ذات الصلة ازداد عدد العاملين الصحيين الفعالين في الكاميرون في الفترة من 2007 إلى 2009 بنسبة 36 ٪، وتم افتتاح عدة مؤسسات جديدة للتعليم العالي في مجال الرعاية الصحية ومدارس تدريب للمساعدين الطبيين والقابلات، وتم وضع استراتيجية وطنية من أجل التغطية الصحية الشاملة. الدروس المستفادة ثمة حاجة إلى قيادة قوية في تحسين الموارد البشرية الصحية لضمان فعالية التنسيق والاتصال بين العديد من أصحاب الصحية المختلفين. ومن المكن أن تسفر عملية للتنسيق والتيسير على الصعيد الوطني عن رؤية تستند على توافق في الآراء حول تحديات الموارد البشرية الصحية الرئيسية. وبمجرد تحديد هذه التحديات، يستطيع أصحاب المصلحة تخطيط تدخلات ملائمة ومنسقة ومستندة على بيّنات ومتسقة. تعزيز الموارد البشرية الصحية من خلال القيادة والأساليب م المشكلة تعاني الكاميرون من نقص حاد في الموارد البشرية الصحية وتتركز الموارد البشرية الصحية المتاحة في المناطق الحضرية. الأسلوب نتيجة لخطة طوارئ وطنية للسنوات من 2006 إلى 2008، تم وضع استراتيجيات مبتكرة وشراكة متعددة القطاعات - بقيادة وزارة الصحة العمومية وبدعم من منظات وطنية ودولية عديدة – للتعامل مع أوجه النقص وسوء التوزيع في الموارد البشرية الصحية في الكاميرون.

المواقع المحلية في الوقت الذي وضعت فيه خطة الطوارئ، كانت الخدمات الصحية في الكاميرون تعاني من سوء الجودة وعدم التوازن بين تدريب الموارد البشرية الصحية والتوظيف، وسوء توزيع الموارد البشرية الصحية بين المناطق الحضرية والريفية، وسوء تخصيص الموارد المالية للموارد البشرية الصحية. كما افتقرت كذلك إلى نظام اعتهاد لاستخدامه في تدريب العاملين الصحيين.

摘要

通过多部门方法和领导强化卫生人力资源:喀麦隆的案例

问题 喀麦隆严重缺乏卫生人力资源(HRH)并且可用的资源都集中在城市地区。

方法 随着 2006-2008 年国家应急计划的推出, 喀麦 隆制定了创新战略和发展了多部门合作关系(由卫生 部领导并得到不同国家和国际组织的支持)以解决该 国 HRH 短缺和分配不合理的问题。

当地状况 在制定应急计划时, 喀麦隆存在卫生服务质 量差、HRH 培训和就业不均衡、城乡地区 HRH 分配 不合理以及 HRH 财政资源配置不到位等问题。此外, 它还缺乏供卫生工作者培训中采用的认可体系。 相关变化 在 2007 至 2009 年间, 喀麦隆在岗卫生工作 者数量增加 36%, 新开办了数家卫生保健高等教育机 构和辅助医疗人员和助产士培训学校,并制定了全民 医保的国家战略。

经验教训 在 HRH 改进过程中,需要强有力的领导以确保多个不同利益相关者之间的有效协作和沟通。国家协调和推动进程可形成对主要 HRH 挑战的共识。 在确认了这些挑战之后,利益相关者就可以规划出协调一致、基于证据并且连贯的适当干预措施。

Résumé

Renforcer les ressources humaines pour la santé à travers un leadership et des approches multisectorielles: le cas du Cameroun

dans les zones urbaines.

Problème Le Cameroun souffre d'une grave pénurie de ressources humaines pour la santé (RHS) et le peu de personnel disponible se concentre

Approche Suite à un plan d'urgence national pour la période 2006–2008,

des stratégies novatrices et un partenariat multisectoriel – dirigé par le ministre de la Santé publique et soutenu par diverses organisations nationales et internationales – ont été développés pour faire face à la pénurie et à la mauvaise répartition des RHS au Cameroun.

Environnement local À l'époque où le plan d'urgence a été développé, le Cameroun souffrait de services de santé de mauvaise qualité, d'un déséquilibre entre la formation et l'emploi des RHS, d'une mauvaise répartition des RHS entre les zones urbaines et rurales et d'une affectation inadéquate des ressources financières des RHS. On manquait également d'un système d'homologation pouvant être utilisé dans la formation des agents de santé. **Changements significatifs** Entre 2007 et 2009, le nombre d'agents de santé actifs au Cameroun a augmenté de 36%, plusieurs instituts supérieurs de formation en soins de santé et écoles de formation paramédicale et de sages-femmes ont vu le jour et une nouvelle stratégie a été développée pour la couverture sanitaire universelle.

Leçons tirées Dans l'amélioration des RSH, un leadership fort est nécessaire pour assurer une coordination et une communication efficaces entre les nombreux acteurs en place. Un processus national de coordination et de facilitation peut produire une approche consensuelle des principaux défis des RHS. Une fois ces défis identifiés, les acteurs clés peuvent planifier des interventions appropriées, coordonnées, cohérentes et fondées sur les faits.

Резюме

Укрепление кадровых ресурсов здравоохранения посредством многосекторальных подходов и руководства: на примере Камеруна

Проблема В Камеруне отмечается острая нехватка кадровых ресурсов здравоохранения (КРЗ), а существующие ресурсы в основном сосредоточены в городских районах.

Подход В результате принятия национального плана по борьбе с чрезвычайными ситуациями на 2006-2008 годы были разработаны новаторские стратегии и установлено межсекторальное партнерство под руководством министерства здравоохранения и при поддержке различных национальных и международных организаций с целью решения проблем нехватки и неравномерного распределения КРЗ в Камеруне.

Местные условия Когда разрабатывался данный план по борьбе с чрезвычайными ситуациями, качество услуг здравоохранения в Камеруне было низким, отмечался дисбаланс между профессиональной подготовкой и занятостью КРЗ, неравномерное распределение КРЗ между городскими и сельскими районами и плохое распределение финансовых ресурсов для КРЗ. Также отсутствовала система аккредитации в области профессиональной подготовки работников здравоохранения.

Осуществленные перемены С 2007 по 2009 год количество активных медицинских работников в Камеруне возросло на 36%, было открыто несколько новых институтов для получения высшего образования в сфере здравоохранения и учебных заведений для младшего медицинского персонала и акушерок, разработана национальная стратегия всеобщего охвата медико-санитарной помощью.

Выводы Для улучшения ситуации в КРЗ необходимо сильное руководство, способное обеспечить эффективную координацию и связь между множеством различных заинтересованных сторон. Национальный процесс координации и содействия может привести к консенсусу при решении основных проблем в области КРЗ. После выявления основных проблем заинтересованные стороны могут спланировать соответствующие мероприятия, которые будут являться скоординированными, научно обоснованными и последовательными.

Resumen

Reforzar los recursos humanos para la salud a través de enfoques multisectoriales y liderazgo: el caso de Camerún

Situación Camerún padece una escasez grave de recursos humanos para la salud (RHS) y los recursos disponibles se concentran en las zonas urbanas. Enfoque Como resultado de un plan de emergencia nacional para los años 2006–2008, se desarrollaron estrategias novedosas y una asociación multisectorial, dirigida por el Ministerio de sanidad pública y respaldada por diversas organizaciones nacionales e internacionales a fin de hacer frente a la escasez y la mala distribución de los RHS en Camerún.

Marco regional La situación de Camerún cuando se desarrolló el plan de emergencia era la siguiente: servicios sanitarios de muy poca calidad, desequilibrio entre la formación y el empleo de los RHS, mala distribución de los RHS entre las zonas urbanas y rurales y una asignación irregular de los recursos financieros para los RHS. También carecía de un sistema de acreditación en la formación de personal sanitario. **Cambios importantes** Entre 2007 y 2009, el número de trabajadores sanitarios activos en Camerún aumentó un 36%, se inauguraron numerosos centros de formación superior en el ámbito de la salud y de formación de personal paramédico y matronas y se desarrolló una estrategia nacional para una cobertura sanitaria universal.

Lecciones aprendidas Para conseguir mejorar los RHS es necesario un liderazgo fuerte que garantice una coordinación y comunicación eficaces entre las distintas partes interesadas. Un proceso de coordinación y asesoramiento nacional puede dar lugar a una visión de los principales desafíos de los RHS basada en el consenso. Una vez que se han identificado dichos desafíos, las partes interesadas pueden planificar intervenciones adecuadas, coordinadas, coherentes y basadas en las pruebas científicas.

References

- 1. Situational analysis of HRH in Cameroon. Yaoundé: Ministry of Public Health; 2010.
- 2. General census of health personnel. Yaoundé: Ministry of Public Health; 2011.
- 3. Health expenditure, total (% of GDP). Washington: World Bank; 2013.
- Conference "Human Resources for Health in Africa: experiences, challenges and realities", Douala, Cameroun, 6–8 June 2007: Douala Plan of Action – adopted. Geneva: Global Health Workforce Alliance; 2007.
- Plan de développement des ressources humaines du système de santé du Cameroun, 2013–2017: plan d'actions et plan d'actions prioritaires. Yaoundé: Ministry of Public Health; 2012. French.
- 6. Situational analysis of health human resources in Cameroon. Yaoundé: Ministry of Public Health; 2010.
- Report of the meeting with stakeholders in the health sector, 16–21 April 2011, Yaoundé. Yaoundé: Ministry of Public Health; 2011.
- 8. External evaluation of CCF countries. Geneva: Global Health Workforce Alliance; 2011.
- 9. General census report of staff in the health sector. Yaoundé: Ministry of Public Health; 2011.
- 10. Martins J. Report of the end of program evaluation: strengthening health workforce development and tackling the critical shortage of health workers. Geneva: World Health Organization; 2012.

Strengthening human resources for health through information, coordination and accountability mechanisms: the case of the Sudan

Elsheikh Badr,^a Nazar A Mohamed,^b Muhammad Mahmood Afzal^c & Khalif Mohamud Bile^d

Problem Human resources for health (HRH) in the Sudan were limited by shortages and the maldistribution of health workers, poor management, service fragmentation, poor retention of health workers in rural areas, and a weak health information system.

Approach A "country coordination and facilitation" process was implemented to strengthen the national HRH observatory, provide a coordination platform for key stakeholders, catalyse policy support and HRH planning, harmonize the mobilization of resources, strengthen HRH managerial structures, establish new training institutions and scale up the training of community health workers.

Local setting The national government of the Sudan sanctioned state-level governance of the health system but many states lacked coherent HRH plans and policies. A paucity of training institutions constrained HRH production and the adequate and equitable deployment of health workers in rural areas.

Relevant changes The country coordination and facilitation process prompted the establishment of a robust HRH information system and the development of the technical capacities and tools necessary for data analysis and evidence-based participatory decision-making and action. **Lessons learnt** The success of the country coordination and facilitation process was substantiated by the stakeholders' coordinated support, which was built on solid evidence of the challenges in HRH and shared accountability in the planning and implementation of responses to those challenges. The support led to political commitment and the mobilization of resources for HRH. The leadership that was promoted and the educational institutions that were opened should facilitate the training, deployment and retention of the health workers needed to achieve universal health coverage.

Abstracts in عربى, 中文, Français, Русский and Español at the end of each article.

Introduction

For many years, the Sudan - once the largest country in Africa by area – has faced political unrest, civil war and economic hardships. In 2011, the country was divided into two independent nations: the Sudan and South Sudan. As a result of the secession of South Sudan, the government of the Sudan lost oil revenue and donor support. These losses exacerbated the Sudan's slow development and health-system challenges, which included health worker shortages, a frequent mismatch between the skills that health workers had and those that were needed, and the maldistribution, migration and poor productivity and retention of health workers.1 These weaknesses not only constrained the delivery of health care but also limited the potential for the Sudan to attain any of the health-related Millennium Development Goals (MDGs) or universal health coverage.^{2,3} The country lacked effective systems for the collection and analysis of the data on HRH that are needed for evidence-based policy-making and the planning of health services. The governance of the Sudan's HRH was also constrained by a general lack of coordination between the main stakeholders in the health system and beyond. The national leadership - assisted by the World Health Organization (WHO) and the Global Health Workforce Alliance - therefore initiated several interventions that catalysed the involvement of many partners in the improvement of HRH.^{4,5} A new national HRH observatory became a hub for the collation of information that would be used in evidence-based policy reform and action. The launch of the "country coordination and facilitation" process

in the Sudan further enhanced the role of the observatory in engaging the diverse HRH stakeholders.⁶ This paper aims both to describe the Sudan's experience with the establishment of a national HRH observatory, the country coordination and facilitation process and the related accountability, and to outline the main lessons learnt.

Local setting and context

The health system of the Sudan follows a devolved mode of governance with three levels: national or federal, state and local government. Health expenditure is generally low and the health financing that does exist is skewed towards cure rather than prevention. There are about 100 000 health workers in the Sudan - 80% employed by the public sector - but approximately 70% of this workforce serves just 30% of the population, and 36% of outreach health facilities were not functioning in 2006 because of HRH shortages.^{7,8} Most health care relates to communicable diseases but the prevalence of many noncommunicable diseases is increasing. In a study conducted in 2010, only one third of the Sudan's facilities for primary health care was found to be providing the full package of primary-health-care services and 14% of the rural population had no access to any health facilities.⁹ At the same time, the national health information system was weak in terms of coverage, data quality and capacity for data analysis. With infant and maternal mortality rates of 57 deaths per 1000 live births and 216 deaths per 100 000 live births, respectively, the Sudan is currently not on track to achieve any of the health-

^a Academy of Health Sciences, Baladiya Street, PO Box 978, Khartoum, Sudan.

^b Federal Ministry of Health, Khartoum, Sudan.

^c Global Health Workforce Alliance, World Health Organization, Geneva, Switzerland.

^d Somali Swedish Research Association, Stockholm, Sweden.

Correspondence to Elsheikh Badr (e-mail: elsheikh941@gmail.com).

⁽Submitted: 17 March 2013 – Revised version received: 1 August 2013 – Accepted: 6 August 2013)
related MDGs by 2015.⁸ The density of physicians, nurses and midwives in the Sudan – 1.23 per 1000 population – falls well short of the minimum threshold – 2.3 per 1000 – recommended by WHO.⁴

Interventions and progress

A national observatory and information system

The solid vision of the national leadership prompted a paradigm shift that was characterized by a sharp focus on human resource development as a key health system priority. Financial and technical support from the Global Health Workforce Alliance spurred the national leadership and facilitated the design of an HRH information system. In 2006, the new information system enabled a newly established national HRH observatory to conduct its first ever nationwide HRH census. This exercise generated comprehensive HRH data, unveiled the challenges facing the health workforce and provided useful evidence for policy- and decision-making.¹⁰ The observatory became the hub for HRH stakeholder coordination and advocacy, developed capacity for data analysis and management and created an HRH research agenda that should produce a knowledge base for guiding future HRH development.11 To institutionalize the HRH information system, the national observatory introduced a conceptual framework that is based on the WHO workforce lifespan model for HRH (Fig. 1).

Coordination mechanisms

As a result of the Sudan's country coordination and facilitation process - which was introduced by the Global Health Workforce Alliance - the national HRH observatory was able to strengthen and expand its "umbrella" over HRH stakeholders and develop a stakeholder forum.^{2,6} The stakeholder forum has enabled the formation of collaborative partnerships across sectors, eliminated duplication and fragmentation and encouraged coordinated implementation. It has brought representatives of the Federal Ministry of Health, other ministries and governmental institutions, health worker registration councils, professional associations and nongovernmental and international organizations around the same table. Although representatives of some private-sector institutions have joined the forum, the wider involve-

Fig. 1. Conceptual framework based on WHO's workforce lifespan model for human resources for health and governing stakeholders in each stage of workforce dynamics, Sudan



MOH, Ministry of Health; MOHE, Ministry of Higher Education; NGO, nongovernmental organization; WHO, World Health Organization.

ment of this expanding sector remains a challenge; further encouragement and regulatory measures may be necessary.

The forum meets once a quarter to discuss HRH issues, with the aim of setting strategic directions, devising solutions, building partnerships for implementation, consolidating the coalition between the federal- and state-level ministries of health, and building a culture of good ethics and accountability.12 This has resulted in a coherent integrated response to each major HRH issue and in beneficial effects on the production, equitable distribution and retention of health workers.² The forum has also successfully promoted evidence-based policy dialogue and resource mobilization for an HRH action plan.² Some stakeholders initially appeared reluctant to join the forum and share the data that they had collected. An effective communication strategy for stakeholder engagement

was therefore implemented, the support of data sharing and use by stakeholder institutions was improved, and the equitable participation of all stakeholders in the governance of the national HRH observatory was promoted through the pursuit of collective decision-making processes.

The coordination and "buy-in" of the stakeholders were achieved and strengthened through an acknowledgement of institutional interests, the offering of capacity-building opportunities, the provision of free and timely access to HRH data, and the granting of greater recognition and visibility to the stakeholders. Table 1 summarizes the major achievements and specific results achieved through the introduction of the national HRH observatory and the country coordination and facilitation process in the Sudan. Improvements in the Sudan's HRH situation were achieved through the collective actions

Challenge	2005°	2012 ^b		
Data collection and use	- Deficient HRH information	– A comprehensive electronic HRH database built		
	 Weak capacity for data analysis and use 	- Improved capacity for data analysis and knowledge translation		
	– Lack of studies on HRH	 – HRH operational research on key workforce issues commissioned – several studies accomplished 		
Partnerships	 No mechanism to bring HRH stakeholders together 	 Stakeholder forum established and operational 		
	 Poorly coordinated HRH actions – leading to duplication and conflicts 	 HRH analysis, decisions and actions are coordinated, coherent and jointly conducted 		
Policy and planning	 Lack of documented and coherent HRH policies 	 Institution of an inclusive policy process in the domains of pre- service education, the scaling up of CPD and health-worker deployment and distribution 		
	– Absence of a national strategic plan for HRH	 Development of a costed national HRH strategic plan for 2012–2016 		
Institutional strengthening and leadership	 Modest capacity for HRH leadership and advocacy 	 Emergence of HRH champions – leading to the strategic positioning of HRH issues in higher government forums and, subsequently, supportive deliberations by the Federal Cabinet 		
development	 Lack of a critical mass of HRH technical staff at the Federal MOH and inadequate HRH-focused training 	 Number of HRH technical staff at the Federal MOH raised from 20 to 115 		
	 Limited capacity of training institutions for mid- level and community health workers 	 More than 340 individuals in MOH exposed to HRH training opportunities 		
		 More training institutions for mid-level and community health workers at national and state level – and greater enrolment at older institutions 		
Coverage and skill mix to revitalize PHC	 Critical shortage of health workers and a distorted skill mix 	 Number of training institutions for nurses and midwives increased from 18 to 55 		
services		 More than 5500 nurses and midwives produced in a year, with majority enrolled in the rural health network 		
		 More than 3400 individuals enrolled in a new programme for the training of community health workers 		
		 Number of medical schools increased from 27 to 33, with 3000 doctors produced per year 		
		 Mechanisms introduced for predicting future HRH needs and levels 		
CPD coverage	– Lack of CPD institutional structures and norms	 Establishment of a national CPD programme and a CPD centre with 15 state-level branches 		
	 Sporadic in-service training covering only 24% of the workforce 	 Mobilization of additional resources and extension of coordinated and harmonized CPD activities to 67% of the health workforce 		
Geographical distribution of health	 Seventy per cent of health workers serving 30% of the population 	 Over 10 000 new employment positions sanctioned, many of them in rural and other provincial areas 		
workforce	 Limited job creation at state and rural level and poor workforce retention 	 Improved bonding schemes to strengthen the implementation of training policies 		
		 Introduction of a major "discrete choice experiment" to help in the design of an appropriate and effective incentive package for rural retention 		
		 Improved staff retention through decentralized education and improved enrolment of students from rural areas 		
Emigration of health workers	– Few data on emigration of health workers	 Establishment of migration database – leading to several studies on health-worker migration 		
	- Lack of policy attention despite increasing levels	 Establishment of national Migration Studies Centre 		
	oi emigration	 Emigration issues raised in the political agenda – the problem being discussed by the Federal Cabinet to support a national policy on the subject 		
		 Movement to sign bilateral agreements with three destination countries – Ireland, Libya and Saudi Arabia – initiated 		

Table 1. Status of human resources for health, Sudan, 2005 and 2012

CPD, continuing professional development; HRH, human resources for health; MOH, Ministry of Health; PHC, primary health care.

^a The situation in 2005 applies to the Sudan before the secession of what is now South Sudan.
 ^b Six years after the establishment of a national observatory and the introduction of the country coordination and facilitation process in the Sudan.

Box 1. Summary of main lessons learnt

- The government's commitment and the creation of a stakeholder forum as a coordination mechanism supported by a powerful information system and a solid accountability framework – have helped resolve many of the problems surrounding human resources for health in the Sudan.
- The decentralization of training institutions and recruitment of students from rural backgrounds can increase the production, deployment and retention of health workers in remote rural settings.
- If the growing private health sector is to be adequately involved in the pursuit of strategic
 policies for human resources for health, the sector's active participation in the stakeholder
 coordination process must be encouraged and regulatory measures may have to be
 introduced.

of the well-coordinated stakeholders – supported by the technical contributions of the observatory's secretariat, which rendered the procedures for engagement simple, practical and transparent. The HRH information system and the results of related HRH studies provided solid evidence of the main issues affecting HRH in the Sudan, including the numerical shortages, the skill-mix imbalances, the lack of programmes for the continuing professional development of health workers, and the geographical maldistribution and substantial emigration of health workers.

Government commitment and leadership

To substantiate its commitment, the Sudan's national government upgraded the HRH unit in the Federal Ministry of Health to a general directorate, increased the number of institutions providing health worker training and increased enrolment at all such institutions. These changes resulted in a substantial increase in the production and deployment of health workers. The national government also promoted the stakeholder forum and supported the collective pursuit of HRH-related activities. The President of the Sudan set up a special task force charged with reporting to a meeting of the Federal Cabinet on any bottlenecks in the creation and use of HRH. Presidential directives were issued to make HRH a main priority for the National Council for Health Care Coordination. Much of the progress recently made in HRH in the Sudan can be attributed to such high-level attention.

Accountability of stakeholder forum members

For the development of HRH, members of the stakeholder forum followed an evidence-based approach and assumed specific roles and responsibilities that matched their mandates. They also established accountability norms within the forum to promote the transparent involvement of each stakeholder institution in HRH issues and the pursuit of cooperation and joint action.¹³ All members of the forum agreed to report periodically on their contributions to HRH in the Sudan. The accountability process enabled the state and local authorities to demand solutions to any HRH challenges that they encountered.

Lessons learnt

The main lesson learnt from recent Sudanese experience in HRH development (Box 1) is that a great deal of power can be created by combining an evidencebased HRH information system with the promotion and implementation of the country coordination and facilitation process and the institutionalization of a framework for shared accountability. Effective governance was critical for developing an HRH-related strategic policy and designing, funding and implementing a national HRH plan. Effective coordination spearheaded a public-sector commitment to HRH reform that was characterized by highlevel involvement and the strategic positioning of HRH issues. The revitalization and decentralization of a large number of training institutions - particularly those for nurses, midwives and allied health professionals - reduced the workforce shortages in underserved rural areas.

Competing interests: None declared.

ملخص تعزيز الموارد البشرية الصحية من خلال المعلومات والتنسيق وآليات المساءلة: حالة السودان معريز الموارد البشرية الصحية في السودان محدودة بسبب موارد بشرية صحية ونشر العاملين الصحيين في المناطق الريفية على نحو كاف ومنصف. أوجه النقص وسوء التوزيع في العاملين الصحيين وسوء الإدارة التغترات ذات الصلة تطلبت عملية التيسير والتنسيق عبر البلد وتشتت الخدمات وضعف استبقاء العاملين الصحيين في المناطق تأسيس نظام معلومات قوى للموارد البشرية الصحية وتطوير الريفية وضعف نظام المعلومات الصحية. الأسلوب تم تنفيذ عملية ّ "التيسير والتنسيق عبر البلد" لتعزيز القدرات التقنية والأدوات الضرورية لتحليل البيانات واتخاذ الرصد ألوطني للموارد البشرية الصحية، وتقديم برنامج تنسيق القرارات التشاركية المستندة على البيّنات واتخاذ الإجراءات. الدروس المستفادة تم إثبات نجاح عملية التيسير والتنسيق عبر البلد من أجل أصحاب المصلحة الرئيسيين وتسريع الدعم آلسياسي عن طريق الدعم المنسق لأصحاب المصلحة، والذي اعتمد على وتخطيط الموارد البشرية الصحية، وتنسيق تعبئة الموارد، وتعزيز الهياكل الإدارية للموارد البشرية الصحية، وإقامة مؤسسات بيَّنات دامغة للتحديات في مجال الموارد البشرية الصحية والمساءلة تدريب جديدة وزيادة تدريب العاملين الصحيين المجتمعيين. المشتركة في تخطيط الاستجابات لهذه التحديات وتنفيذها. وأدى الدعم إلى الالتزام السياسي وتعبئة الموارد من أجل الموارد البشرية المواقع المحلية صدقت الحكومة الوطنية السودانية على تصريف شؤون النظام الصحى على صعيد الولايات، ولكن العديد من الصحية. وينبغي على القيادة، التي تم تعزيزها والمؤسسات التعليمية التى تم افتتاحها، تيسير تدريب العاملين الصحيين الولايات افتقرت إلى الخطط والسياسات المتسقة في مجال الموارد البشرية الصحية. وحالت ندرة مؤسسات التدريب دون إنتاج المطلوبين لتحقيق التغطية الصحية الشاملة، ونشر هم واستبقائهم.

通过信息、协调和问责机制强化卫生人力资源:苏丹的案例

问题 苏丹的卫生人力资源(HRH)受到卫生工作者 短缺且分配不合理、管理不善、服务零散、农村地区 留不住卫生工作者以及卫生信息系统薄弱等方面的限 制。

方法 苏丹实施"国家协调和促进"进程,以便强化全国 HRH 观察,为关键利益相关者提供协调平台,促成政策支持和 HRH 规划,协调资源调动,加强 HRH 管理结构,建立新的培训机构,扩大社区卫生工作者培训规模。

当地状况 苏丹国家政府鼓励州一级的卫生系统管理, 但是许多州缺乏一致的 HRH 规划和政策。培训机构 的缺乏限制了HRH培养以及农村地区卫生工作者充 分均衡的部署。

相关变化 国家协调和推动进程促进了强大 HRH 信息 系统的建立、数据分析及基于证据的参与式决策和行 动所需技术实力以及工具的发展。

经验教训 利益相关者的协调支持证明了国家协调和推动进程的成功,它建立在 HRH 挑战的确凿证据之上,并分担应对这些挑战的规划和实施方面的责任。这种支持促成了对 HRH 的政府承诺和资源调度。提升的领导力和开办的教育机构会促进实现全民医疗保障所需的卫生工作者培养、部署和留系。

Résumé

Renforcer les ressources humaines pour la santé par la mise en place de dispositifs d'information, de coordination et de responsabilisation: le cas du Soudan

Problème Les ressources humaines pour la santé (RHS) au Soudan étaient limitées à cause des pénuries et de la mauvaise répartition des agents de santé, d'une mauvaise gestion, de la fragmentation du service, d'une fidélisation médiocre des agents de santé dans les régions rurales et d'un système d'information sur la santé peu efficace.

Approche Un processus de «coordination et facilitation national» a été mis en place afin de: renforcer l'observatoire RHS national, fournir une plateforme de coopération pour les acteurs clés, catalyser le soutien des politiques et la planification des RHS, harmoniser la mobilisation des ressources, renforcer les structures de gestion des RHS, créer de nouvelles institutions de formation et élever le niveau de formation des agents de santé communautaires.

Environnement local Le gouvernement national du Soudan a sanctionné la gouvernance étatique du système de santé, mais de nombreux États manquaient de programmes et de politiques RHS cohérents. La rareté des institutions de formation a limité la production

de RHS et le déploiement adéquat et équitable des agents de santé dans les zones rurales.

Changements significatifs Le processus de coordination et de facilitation du pays a favorisé la création d'un système d'information RHS solide, ainsi que le développement de moyens techniques et d'outils nécessaires à l'analyse des données et à une action et une prise de décisions participatives et fondées sur les faits.

Leçons tirées Le succès du processus de coordination et facilitation a été confirmé par le soutien coordonné des acteurs clés, basé sur des preuves solides des défis en RHS et sur la responsabilité partagée dans la planification et la mise en œuvre de réponses à ces défis. Le soutien a entraîné un engagement politique et une mobilisation des ressources pour les RHS. Le fait de promouvoir le leadership et l'ouverture d'institutions de formation devrait faciliter la formation, le déploiement et la fidélisation des agents de santé, qui sont nécessaires pour parvenir à la couverture de santé universelle.

Резюме

Укрепление кадровых ресурсов здравоохранения посредством механизмов информирования, координации и подотчетности: на примере Судана

Проблема Состояние кадровых ресурсов здравоохранения (КРЗ) в Судане характеризовалось нехваткой и неравномерным распределением работников здравоохранения, плохим управлением, фрагментированным оказанием услуг, слабым удержанием работников здравоохранения в сельских районах и неразвитой информационной системой.

Подход На уровне страны была реализована программа «координации и содействия», которая ставила целью усилить контроль КРЗ на национальном уровне, обеспечить платформу координации действий ключевых заинтересованных сторон, активизировать поддержку политики и планирования КРЗ, согласовать мобилизацию ресурсов, укрепить управленческие структуры КРЗ, создать новые институты подготовки кадров и расширить масштабы подготовки работников здравоохранения на местах.

Местные условия Национальное правительство Судана санкционировало управление системой здравоохранения на государственном уровне, однако у многих регионов отсутствовали последовательные планы и политика в области КРЗ. Нехватка учебных заведений ограничивала воспроизводство КРЗ, а также адекватное и справедливое распределение медицинских работников в сельских районах.

Осуществленные перемены Программа координации и содействия, реализованная на уровне страны, инициировала создание надежной информационной системы КРЗ, а также развитие технических возможностей и инструментов, необходимых для анализа данных и совместного принятия решений и проведения мероприятий на доказательной основе. Выводы Успех программы координации и содействия в стране был подкреплен скоординированной поддержкой заинтересованных сторон, основанной на надежных доказательствах по сути проблем в КРЗ и общей ответственности при планировании и осуществлении ответных мер, позволяющих решить эти проблемы. Данная поддержка обеспечила политическую заинтересованность и мобилизацию ресурсов для развития КРЗ. Инициированная программой заинтересованность руководства и созданные учебные заведения должны способствовать профессиональной подготовке, развертыванию на местах и удержанию работников здравоохранения, что необходимо для достижения всеобщего охвата медико-санитарной помощью.

Resumen

Reforzar los recursos humanos para la salud a través de mecanismos informativos, de coordinación y responsabilidad: el caso de Sudán

Situación Los recursos humanos para la salud (RHS) en Sudán presentaban limitaciones debido a la escasez y mala distribución del personal sanitario, una gestión incompetente, la fragmentación de los servicios, la pérdida del personal sanitario en las zonas rurales y un sistema insuficiente de información sanitaria.

Enfoque Se puso en marcha un proceso de «asesoramiento y coordinación nacional» a fin de reforzar el observatorio nacional de RHS, proporcionar una plataforma coordinadora para las partes interesadas, catalizar el apoyo de las políticas y la planificación de los RHS, armonizar la movilización de los recursos, reforzar las estructuras administrativas de los RHS, establecer centros de formación nuevos y mejorar la formación del personal sanitario de la comunidad.

Marco regional El gobierno nacional de Sudán aprobó la autoridad estatal del sistema sanitario, pero muchos estados carecían de unos planes y estrategias de RHS coherentes. La escasez de instituciones de formación limitó en gran medida la creación de RHS y el despliegue adecuado y equitativo del personal sanitario en las zonas rurales.

Cambios importantes El proceso de coordinación y asesoramiento nacional impulsó el establecimiento de un sistema de información de RHS sólido y el desarrollo de las capacidades y herramientas técnicas necesarias para el análisis de datos y la toma de decisiones y acciones basadas en pruebas científicas.

Lecciones aprendidas El éxito del proceso de coordinación y asesoramiento nacional se consolidó gracias al apoyo coordinado de las partes interesadas, asentado sobre las pruebas sólidas de los desafíos en el ámbito de RHS y la responsabilidad compartida en la planificación y puesta en marcha de las respuestas para hacer frente a dichos desafíos. El apoyo tuvo como consecuencias el compromiso político y la movilización de recursos para los RHS. La promoción del liderazgo y la apertura de centros educativos deberían facilitar la formación, el despliegue y conservación del personal sanitario necesario para lograr una cobertura sanitaria universal.

References

- Human resources for health country profile Sudan. Geneva: World Health Organization; 2009. Available from: http://www.who.int/workforcealliance/ knowledge/resources/hrh_profile_sudan/en/index.html [accessed 16 September 2013].
- Rapid assessment on the effectiveness of the country coordination and facilitation (CCF) process in Sudan, Zimbabwe and Zambia, consolidated report. Geneva: Global Health Workforce Alliance; 2012. Available from: http://www.who.int/workforcealliance/knowledge/resources/ccfresources/ en/ [accessed 16 September 2013].
- Health workers for all and all for health workers: the Kampala Declaration and Agenda for Global Action. Geneva: World Health Organization; 2008. Available from: http://www.who.int/workforcealliance/forum/2_ declaration_final.pdf [accessed 11 September 2013].
- The world health report 2006: working together for health. Geneva: World Health Organization; 2006. Available from: http://www.who.int/whr/2006/ en/ [accessed 16 September 2013].
- Report on the Prince Mahidol Award Conference 2011, 2nd Global Forum on Human Resources for Health: reviewing progress, renewing commitments to health workers towards MDGs and beyond. Geneva: Global Health Workforce Alliance; 2011. Available from: http://www.who.int/workforcealliance/ forum/2011/en/ [accessed 16 September 2013].
- Country coordination and facilitation (CCF): principles and process. Geneva: Global Health Workforce Alliance; 2010. Available from: http://www. worldcat.org/title/country-coordination-and-facilitation-ccf-principles-andprocess/oclc/710999815 [accessed 16 September 2013].

- National human resources for health strategic plan for Sudan, 2012–16. Khartoum: Ministry of Health; 2012. Available from: http://www.who.int/ entity/workforcealliance/countries/Sudan_HRHPlan_2012-16.pdf [accessed 16 September 2013].
- 8. Health sector strategic plan 2012–16. Khartoum: Ministry of Health; 2012.
- 9. Primary health care facility survey. Khartoum: Ministry of Health; 2010.
- 10. Badr E. Human resources for health in Sudan: opportunity for revival. *Sudanese J Public Health* 2007;2:137.
- Establishing an observatory on human resources for health in Sudan: a report for the World Health Organization (WHO) and the Federal Ministry of Health (FMOH). Khartoum: National HRH Observatory; 2007.
- Travis P, Egger D, Davies P, Mechbal A. Towards better stewardship: concepts and critical issues: evidence and information for policy. Geneva: World Health Organization; 2002. Available from: http://www.who.int/healthinfo/ paper48.pdf [accessed 16 September 2013].
- Siddiqi S, Masud TI, Nishtar S, Peters DH, Sabri B, Bile KM et al. Framework for assessing governance of the health system in developing countries: gateway to good governance. *Health Policy* 2009;90:13–25. doi: http:// dx.doi.org/10.1016/j.healthpol.2008.08.005 PMID:18838188

Health workforce contributions to health system development: a platform for universal health coverage

Viroj Tangcharoensathien,^a Supon Limwattananon,^b Rapeepong Suphanchaimat,^a Walaiporn Patcharanarumol,^a Krisada Sawaengdee^a & Weerasak Putthasri^a

Problem In the 1970s, Thailand was a low-income country with poor health indicators and low health service coverage. The local health infrastructure was especially weak.

Approach In the 1980s, measures were initiated to reduce geographical barriers to health service access, improve the health infrastructure at the district level, make essential medicines more widely available and develop a competent, committed health workforce willing to service rural areas. To ensure service accessibility, financial risk protection schemes were expanded.

Local setting In Thailand, district hospitals were practically non-existent in the 1960s. Expansion of primary health care (PHC), especially in poor rural areas, was considered essential for attaining universal health coverage (UHC). Nationwide reforms led to important changes in a few decades.

Relevant changes Over the past 30 years, the availability and distribution of health workers, as well as their skills and competencies, have greatly improved, along with national health indicators. Between 1980 and 2000 coverage with maternal and child health services increased substantially. By 2002, Thailand had attained UHC. Overall health system development, particularly an expanded health workforce, resulted in a functioning PHC system.

Lessons learnt A competent, committed health workforce helped strengthen the PHC system at the district level. Keeping the policy focus on the development of human resources for health (HRH) for an extended period was essential, together with a holistic approach to the development of HRH, characterized by the integration of different kinds of HRH interventions and the linking of these interventions with broader efforts to strengthen other health system domains.

Abstracts in عربى, 中文, Français, Русский and Español at the end of each article.

Introduction

Thailand has made impressive achievements in health in recent decades. The country, once characterized by poor health indicators and a very weak health infrastructure, especially at the local level, had achieved universal health coverage (UHC) by 2002. Over the years health service utilization increased, financial risk protection mechanisms improved and greater equity in health outcomes was attained.¹ How did these changes come about?

Several factors have contributed to Thailand's improved health outcomes in recent decades. Among them are overall economic growth and improved literacy. The launching of the Expanded Programme on Immunization in 1977, prompted by low immunization coverage and the lack of an effective primary health-care (PHC) system, is another.² Most importantly, a functioning PHC system was developed at the district level to achieve equitable access to health services by all.^{3,4} Simultaneously, financial risk protection mechanisms were improved to keep people from experiencing financial hardship and prevent households from becoming impoverished on account of the use of health services.⁵ Two synergistic policies designed to improve access to health services were at the heart of efforts to develop the Thai health system: one was to increase the availability of functional services and the second was to reduce financial barriers to health service access. In this paper we examine the key actions undertaken in these areas and the main lessons learnt from the Thai experience. We review Thailand's socioeconomic development and its health achievements and progress in

health service coverage, with a focus on how the health system and the health workforce were developed and how both have contributed to a functioning PHC system – a critical element in attaining UHC and equitable access to health services.

Approach

Minimizing geographical barriers

Health facility coverage

In the 1960s, Thailand had no district hospitals. A few health centres were providing primary care services in certain large districts. Districts that lacked health centres relied on mobile health teams that usually provided services for a few months out of the year.

In the period from 1960 to 1975, health, education and infrastructure development were the focus of key rural government programmes.³ District health system development began in 1977 for the purpose of attaining, over the next 20 years, full geographical coverage with domestically funded district hospitals and health centres. During the decade from 1982 to 1991, the number of district hospitals, especially those with 10 to 60 beds, grew enormously. A 10-year programme of health centre development was simultaneously launched to attain full health facility coverage at the subdistrict level. By the late 1990s, the targeted coverage had been attained in districts and subdistricts.

A district health system – defined as a close-to-client service provider 6 consisting of a district hospital and 10 to

^b Faculty of Pharmaceutical Sciences, Khon Kaen University, Thailand.

^a International Health Policy Program, Ministry of Public Health, Tiwanond Road, Nonthaburi, Thailand 11000.

Correspondence to Viroj Tangcharoensathien (e-mail: viroj@ihpp.thaigov.net).

⁽Submitted: 8 March 2013 – Revised version received: 3 September 2013 – Accepted: 19 September 2013)

12 subdistrict health centres serving a typical catchment area of approximately 50 000 population – serves as a platform for scaling up public health interventions.^{7,8} Despite the fact that in the 1980s Thailand was a low-income country with a gross national income per capita of only 710 United States dollars (US\$), fiscal space for investment in the district health system was made possible by a temporary decline in investment in infrastructure at the provincial level.

Health workforce expansion

To create a functioning PHC system, it is essential for diagnostics and medicines to be available. However, the most critical resource is the health workforce. In Thailand, the rapid expansion of the PHC infrastructure called not just for an expanded health workforce, but also for strategies to ensure health workforce distribution to rural communities.

Since 1974, Thailand has had special tracks for recruiting rural students to medical and nursing careers in return for allowing them to work in their home communities. The system was the first national programme of mandatory rural service - for a three-year period - for new medical and nursing graduates. In later years, this rural bonding policy was extended to dentistry and pharmacy graduates. In addition, the Collaborative Project to Increase the Production of Rural Doctors (CPIRD) in phase one (1995-2004) was approved by the Thai Cabinet. Twelfth-grade students who were residents of a given province were eligible to sit for an examination under the CPIRD track. Those who passed went on to spend one year studying basic sciences, two years pursuing premedical studies in a university and three years doing clinical practice in teaching hospitals affiliated with the Ministry of Public Health (34 in total in 2013). These were all accredited regional and provincial teaching hospitals where the teaching was conducted by medical staff.

While the CPIRD continued to phases two and three (2005–2014), a programme known as One District, One Doctor (ODOD, 2005–2015) was approved by the Cabinet to further strengthen the recruitment of rural students into medical schools.⁹ Students eligible for the ODOD programme have to be residents of a given district, unlike CPIRD students, who have to reside within a given province. A system of government bonding is in place. All graduates recruited through the normal track – the national entrance examination – and the CPIRD have to render mandatory service in a district hospital for three years or risk a penalty of US\$ 13 000. ODOD programme graduates have to serve for 12 years in their home towns or face a penalty of US\$ 65 000 if they fail to comply.

The mandatory rural service was accompanied by financial incentives, in addition to the basic salary and per diem while on duty. A monthly hardship allowance for doctors, amounting to US\$ 60–88, was introduced in 1975 and substantially revised in 1997. In response to an internal brain drain from the public to the private sector, a monthly allowance of US\$ 250 was introduced in 1995 for those who chose not to engage in private practice.

Medical schools outside Bangkok – 11 out of a total of 19 – played a critical role in producing doctors for service in rural areas. Their production capacity increased from less than 35% of the country's medical graduates in 2002 to nearly 44% in 2012.^{10,11}

A temporary laddered nursing programme was introduced in 1982 in response to the rapid expansion of district health systems. Students received a diploma as technical nurses after a two-year course of study. At the end of the four-year mandatory rural service, these technical nurses received two more years of training to obtain a Bachelor in Nursing. The laddered curriculum was well planned and was approved by the Thai Nursing and Midwifery Council. To fulfil the growing demand for nursing care, since 1990 all stand-alone midwifery courses leading to a diploma have been integrated into the four-year Bachelor in Nursing degree. Competency in midwifery is required of all registered nurses. To reinforce their commitment to rural health service, dedicated health workers are given social recognition by being granted an annual award from a renowned organization or foundation. Professional career advancement is another key incentive. Since 2007, district hospital directors can be promoted to a level 9 position - equivalent to deputy director general - on a scale in which the highest-ranking position is 11. In 1991 the maximum promotion was to level 8.

One of the strengths of the Thai health system has been the presence of a high ratio of nurses to physicians. Nurses' contributions to the success of maternal and child health-care programmes have been traditionally acknowledged and recognized. In the family planning campaigns conducted in the 1980s, nurses not only provided pills and condoms, but were trained to insert intrauterine devices.¹² Task shifting was introduced in Thailand in the 1980s through programmes such as a 12-month, in-service training in anaesthesiology and psychiatry for nurse practitioners.

Minimizing financial barriers

Along with the implementation of reforms to strengthen the health-care infrastructure and the health workforce, efforts were made to reduce the constraints on health service demand and, more specifically, to minimize the financial barriers that kept the poorest segments of society from using health services. A two-pronged approach was adopted: (i) a tax-financed scheme, established in 1975, that provided free outpatient and inpatient care for the poor (known as the Low-Income Card Scheme); and (ii) a social health insurance scheme established in 1991, financed from payroll taxes, for formal private sector employees.13 Providing health insurance coverage for workers in the informal sector and for people who were not economically active was especially difficult because around three quarters of the total population had incomes too irregular to allow for the payment of premiums, and the enforcement and collection of such premiums were prohibitively expensive.14 Nonetheless, by early 2002 - 27 years after the launching of the Low-Income Card Scheme - Thailand had at last achieved UHC.

Relevant changes

Improvements in health infrastructure

Investment in health infrastructure resulted in substantial expansion of public health facilities to rural areas, where full geographical coverage with such facilities was reached well before UHC was achieved. In 2010 there were 9758 health centres in the 7255 subdistricts; 731 district hospitals in the 801 districts; and 68 provincial and 25 regional hospitals in the 76 provinces outside Bangkok. Some provincial hospitals were located in large districts. Fig. 1.

Infrastructural improvement was followed by securement of a larger health workforce. The number of physicians increased from 8000 in 1985 to 35 000 in 2009 – a fourfold increase in 24 years. A 3.3-fold increase in nurses was noted during the same period.

Medical schools outside Bangkok have increased their production capacity over the last decade.^{15,16} In addition, nursing schools have increased in number from 39 in 1976 to 80 in 2009. Notably, private nursing colleges increased from 3 to 21 over this period and all of them were accredited by the Thai Nursing and Midwifery Council.

In addition to an increase in the number of graduates, there has also been improvement in worker distribution. In 1979 there was one doctor for every 1210 residents of Bangkok, while in the north-eastern part of Thailand, there was one doctor for every 25713 residents. This 21-fold difference was reduced to a 5-fold difference in 2009. Over the same period, the gap in the number of nurses between Bangkok and the north-eastern part of the country was reduced from 18-fold to 3-fold.

According to survey data, graduates recruited through special tracks (the CPIRD and the ODOD programme) had 10 to 15% higher chances of complying with their three-year mandatory service than those recruited through the normal track.¹⁷ They also showed longer retention in rural district hospitals. It was noted that 80% and 16% of CPIRD graduates were still serving in such hospitals after three and 10 years, respectively, compared with 70% and 10% of graduates who had been recruited through the normal channel.¹⁸ Graduates from the CPIRD and from regional medical schools were more confident of surgical skills and had better medical knowledge than graduates of medical schools in greater Bangkok and those recruited through the normal track.¹⁹ Although the knowledge gap is decreasing, it is still large and efforts are being made to reduce it further.

Clearly the CPIRD and the ODOD programme had persistent shortcomings. Most CPIRD graduates did not stay in district hospitals longer than required of them; after three years, about three quarters had left to undertake specialist training. The fraction was similar among graduates recruited through the normal track. District health systems continue to receive new graduates owing



Mortality among children younger than 5 years as a function of the density of

Source: Data on nurses and physicians: Ministry of Public Health of Thailand, health resource surveys for various years; child mortality rates: Global Health Data Exchange (2013).²⁵

to the mandatory service requirement, but only a small percentage is retained beyond. Also, financial incentives did not always improve retention beyond the mandatory period. To remain in service in rural areas is a decision made by health workers based on a complex set of factors; recruitment of graduates from rural areas for rural service, government bonding and financial and non-financial incentives are only a few.

Improved financial risk protection

According to the evidence, UHC has improved financial risk protection in Thailand. Since the accessible district health system is the main service provider, health services are pro-poor, as is government health spending.8,20 Out-of-pocket payments for health care have dropped substantially, from 33% of total health expenditure in 2001 - before UHC - to 14% in 2010. This fraction puts Thailand on a par with countries belonging to the Organisation for Economic Co-operation and Development (OECD). The high level of financial risk protection is reflected in the low rates of catastrophic household health expenditure and health-related impoverishment.²¹ Recently, an independent external assessment of the first 10 years of UHC found positive results, both in terms of equity and efficiency.¹ If the OECD definition is applied, in 2010 the unmet need for outpatient and inpatient services was as low as 1.4% and 0.4%, respectively, and on a par with the fraction observed in selected OECD countries.²²

Service coverage and health outcomes

Vaccination coverage of more than 90% of children less than one year of age has been achieved and sustained since 1990. The coverage of the newly-introduced hepatitis B vaccine increased from 10% in 1992 to 90% in 1996, a reflection of the high capacity and resilience of PHC systems in Thailand.

The number of pregnant women who attended at least four antenatal care visits increased from 62% in 1988 to 82% in 2006.²³ Government health services accounted for 80.3% of all prenatal care. Births delivered by skilled birth attendants increased from 66% in 1986 to nearly 100% in 1995 and beyond. Physicians and professional nurses – those with a bachelor's degree in nursing – have been the most common delivery attendants since 1990.

In 1970, the child mortality rate in Thailand was 87.9 per 1000 live births.²⁴ Between 1990 and 2006 this rate decreased by an average annual rate of 8.5%, in proportion with an increase in the density of the health workforce, other contributing socioeconomic factors notwithstanding (Fig. 1). This put Thailand among the 30 low- and middle-income countries that registered the highest decreases in child mortality over that period.²⁶

In 1970, a high total fertility rate of 5.1 was recorded and the prevalence of contraceptive use was very low (14.7%) owing to insufficient access to essential maternal and child health services.²⁷ Between 1965 and 1994, Thailand's total fertility rate dropped from 6.3 to below the replacement rate of 2.1.²⁸ By 2003 it had decreased to 1.7 – below the replacement rate. The prevalence of contraceptive use increased from 14.7% in 1970 to 81.1% in 2006 and a gap in this prevalence no longer exists between urban and rural areas.

Life expectancy at birth increased more among women than among men. In women it increased from 63.8 years in 1975 to 77.6 years in 2005. The epidemic of human immunodeficiency virus infection triggered active prevention and control measures as early as the late 1980s and, as a result, by the late 1990s the epidemic had reversed.^{15,29} Furthermore, the recent introduction of universal antiretroviral therapy has greatly reduced mortality from acquired immunodeficiency syndrome.^{30,31}

Lessons learnt

Expanding the health system infrastructure at the district level to achieve full geographical coverage is feasible with continued political commitment and a favourable fiscal space. However, doing so is not easy. Thailand's experience over the past 30 years has been the source of several critical lessons (Box 1):

The development of a functioning primary health-care system at the district level and the extension of financial risk protection lie at the heart

Box 1. Summary of main lessons learnt

- Two synergistic policies have contributed to the development of the Thai health system:

 (i) the development of a functioning primary health-care system based on an adequate number of competent and committed health workers;
 (ii) the extension of financial risk protection to minimize financial barriers to health care.
- The development of a functioning health-care system at the district level served as a platform for achieving universal health coverage and more equitable health outcomes by facilitating people's access to health services.
- Pivotal in making services available where needed was the adoption of educational strategies to retain health workers in rural areas: rural recruitment, training close to home and placement in workers' home towns, together with government bonding and financial and non-financial incentives.

of Thailand's success in increasing access to health care and achieving more equitable health outcomes. To create such a system, the country had to adopt policies not just to produce more health workers, but also to attract them to rural areas and encourage them to remain there. This latter goal was achieved through regulatory policies and incentive systems based on government bonding of new medical graduates for public services and on actively recruiting students from rural areas, offering them training in provincial institutions close to home, and enabling them to work in their own home towns together with financial and non-financial incentives.32

It takes comprehensive policy interventions to develop the health workforce. To carry out their work effectively, workers require an adequate health infrastructure and enough equipment, medicines and supplies. Policies designed to improve working conditions and ensure a sufficient supply of medicines and equipment are consequently necessary.³³

Producing a competent, committed health workforce can only be achieved by keeping the policy focus on the development of human resources for health (HRH) over an extended period. The development of such a workforce should be part of a holistic approach characterized by different types of HRH interventions embedded in broader efforts to strengthen the health system as a whole.

Thailand still faces important challenges in the area of HRH. Above all, it must build a workforce capable of fulfilling the health-care needs created by the epidemiologic transition and an ageing population and of working with non-health sectors in addressing the social determinants of health.

Competing interests: None declared.

ملخص إسهامات القوى العاملة الصحية في تطوير النظام الصحي: منهاج عمل للتغطية الصحية الشاملة بِالْإِضِافَةُ إلى مهاراتِهم وكفاءاتهم، على مدار الثلاثين سنة الماضية، المشكلة في سبعينيات القرن العشرين، كانت تايلند بلداً منخفض تَحْسَناً كبيراً، فضلًا عن تحسن المؤشرات الصحية على الصعيد الدخل مع ضعف المؤشرات الصحية وانخفاض تغطية الخدمات الوطني. وفي الفترة من عام 1980 إلى 2000، ازدادت تغطية الصحية. وكانت البنية التحتية الصحية المحلية بالأخص ضعيفة. الخدمات الصحية للأم والطفل بشكل كَبير. وبحلول عام 2002، الأسلوب في ثمانينيات القرن العشرين، تم البدء في أتخاذ تدابير لتقلبل الحواجز الجغرافية أمام الوصول إلى الخدمات الصحية، حققت تايلند التغطية الصحية الشاملة. وأسفر التطوير الشامل للنظام الصحي، ولاسيما توسيع نطاق القوى العاملة الصحية، عنَّ وتحسين البنية التحتية الصحية على مستوى المنطقة وإتاحة الأدوية الأساسية على نطاق أوسع وتطوير قوى عاملة صحية مؤهلة نظام رعاية صحية أولية يعمل على نحو جيد. وملتزمة مستعدة لخدمة المناطق الريفية. ولضهان إتاحة الخدمة، تم الدروس المستفادة ساعدت القوى العاملة الصحية التي تتمتع بالكفاءة والالتزام في تعزيز نظام الرعاية الصحية الأولّية على توسيع مخططات الحماية من المخاطر المالية. المواقع المحلية لم تكن مستشفيات المناطق موجودة من الناحية مستوى المناطق. وكتان للحفاظ على تركيز السياسة على تنمية الموارد البشرية الصحية لفترة ممتدة أمراً ضرورياً، فضلاً عن اتباع العملية في تايلند في ستينيات القرن العشرين. واعتبر توسيع نطاقٍ الرعاية الصحية الأولية، ولاسيا في المناطق الريفية الفقيرة، أمراً نهج شامل لتنمية الموارد البشرية الصحية، يتسم بدمج الأنواع المختلفة لتدخلات الموارد البشرية الصحية وربط هذه التدخلات

ضرورياً لبلوغ التغطية الصحية الشاملة. وأدت الإصلاحات على الصعيد الوطني إلى تغيرات هامة خلال بضعة عقود. التغيّرات ذات الصلة شهد توافر العاملين الصحيين وتوزيعهم،

بالجهود الأوسع نطاقاً لتعزيز مجالات النظام الصحي الأخرى.

摘要

卫生劳动力对卫生系统发展的贡献:全民医疗保障的平台

问题 在二十世纪七十年代,作为低收入国家,泰国的 卫生指标差,医疗服务覆盖率低,地方卫生基础设施 尤其薄弱。

方法 在二十世纪八十年代,泰国开始实施各种措施, 减少卫生服务可及性的地理障碍,改善地区级卫生基 础设施,更广泛地提供基本药物,培养愿意在农村地 区服务的胜任并全身心投入的卫生工作者。为确保服 务的可及性,扩大了财务风险保护计划。

当地状况 二十世纪六十年代, 泰国几乎没有地区医院。扩大初级卫生保健(PHC) 被认为是实现全民医保(UHC) 的关键, 在穷苦的农村地区尤其如此。几 十年间全国范围的改革带来了重大的改变。 相关变化 在过去的 30 年间,卫生工作者的可及性和 分布及其技能和能力与国民健康指标一道得到很大提 高。在 1980 年至 2000 年,孕产妇和儿童卫生服务覆 盖率大幅增加。到 2002 年,泰国已经实现 UHC。整 个卫生系统的发展,尤其是扩大的卫生劳动力,形成 了有效运作的 PHC 系统。

经验教训 胜任并全身心投入的卫生工作者有助于强化 地区级别的 PHC 系统。在更长时期保持政策关注卫生 人力资源(HRH)发展至关重要,同时要采用整体方 法发展 HRH,其特点在于融合各种 HRH 干预并将这 些干预与更广泛的努力相关联,以加强其他卫生系统 域。

Résumé

Contributions des effectifs de santé au développement du système de santé: une plate-forme pour réaliser la couverture sanitaire universelle

Problème Dans les années 70, la Thaïlande était un pays à faible revenu avec de mauvais indicateurs de santé et une faible couverture des services de santé. L'infrastructure sanitaire locale était particulièrement faible.

Approche Dans les années 80, des mesures ont été entreprises pour réduire les obstacles géographiques à l'accès aux services de santé, améliorer les infrastructures sanitaires au niveau des districts, rendre les médicaments essentiels plus largement disponibles et développer des effectifs de santé compétents et dévoués, prêts à desservir les zones rurales. Pour assurer l'accessibilité à ces services, les systèmes de protection contre les risques financiers ont été étendus.

Environnement local En Thaïlande, les hôpitaux de districts étaient pratiquement inexistants dans les années 60. L'expansion des soins de santé primaires, en particulier dans les zones rurales pauvres, était considérée comme essentielle pour réaliser la couverture sanitaire universelle. Des réformes nationales ont conduit à d'importants changements en quelques décennies.

Changements significatifs Au cours des 30 dernières années, la

disponibilité et la distribution des effectifs de santé, ainsi que leurs qualifications et leurs compétences, se sont grandement améliorées, tout comme les indicateurs de santé nationaux. Entre 1980 et 2000, la couverture des services de santé maternelle et de santé infantile a considérablement augmenté. En 2002, la Thaïlande a atteint la couverture sanitaire universelle. Le développement de l'ensemble du système de santé, en particulier un effectif de santé élargi, a abouti à un système de soins de santé primaires qui fonctionne.

Leçons tirées Un effectif de santé compétent et dévoué a permis de renforcer le système de soins de santé primaires au niveau des districts. Maintenir les politiques concentrés sur le développement des ressources humaines de la santé pendant une période prolongée fut essentiel, conjointement avec une approche globale pour le développement des ressources humaines de la santé, qui fut caractérisée par l'intégration de différents types d'intervention des ressources humaines de la santé et l'association de ces interventions avec des efforts plus larges visant à renforcer les autres domaines de systèmes de santé.

Резюме

Вклад кадровых ресурсов здравоохранения в развитие системы здравоохранения: платформа для всеобщего охвата медико-санитарной помощью

Проблема В 1970-х годах Таиланд был страной с низким уровнем дохода, слабыми показателями системы здравоохранения и низкимуровнемохвата медико-санитарными службами. Локальная инфраструктура здравоохранения была исключительно слабой. Подход В 1980-х годах были приняты меры по устранению географических барьеров, ограничивающих доступность служб здравоохранения, улучшению инфраструктуры здравоохранения на региональном уровне, повышению доступности основных лекарственных средств и формированию компетентных, целеустремленных кадровых ресурсов здравоохранения, желающих оказывать услуги в сельской местности. Для обеспечения доступности служб были расширены схемы защиты от финансовых рисков.

Местные условия В 1960 годах в Таиланде практически не существовало региональных больниц. Распространение первичной медико-санитарной помощи, особенно в бедных и сельских регионах, считалось важнейшей задачей для обеспечения всеобщего охвата медико-санитарной помощью.

Реформы национального масштаба привели к важным изменениям на протяжении нескольких десятилетий.

Осуществленные перемены На протяжении последних 30 лет значительно улучшилась доступность и распределение работников здравоохранения, а также повысился их профессионализм и компетентность, что привело к улучшению национальных показателей здоровья. В период с 1980-го по 2000-ый годы значительно увеличился охват службами по уходу за беременными женщинами и новорожденными. К 2002 году Таиланд достиг всеобщего охвата медико-санитарными службами. Общее развитие системы здравоохранения, позволило сформировать действующую систему первичной медикосанитарной помощи.

Выводы Компетентные, целеустремленные работники здравоохранения помогли усилить систему первичной медико-санитарной помощи на региональном уровне. Важную роль сыграла поддержка политики развития кадровых ресурсов для здравоохранения на протяжении длительного периода, в сочетании с комплексным подходом к развитию кадровых ресурсов для здравоохранения, включающем интеграцию усилий работников здравоохранения различных специализаций и дополнение этих интеграционных шагов более широкомасштабными действиями по развитию других областей системы здравоохранения.

Resumen

Las contribuciones del personal sanitario al desarrollo del sistema sanitario: una plataforma para la cobertura sanitaria universal

Situación En la década de 1970, Tailandia era un país de bajos ingresos con indicadores de salud deficientes y cobertura de servicios sanitarios insuficiente. Además, la infraestructura sanitaria local era particularmente precaria.

Enfoque En la década de 1980, se comenzaron a aplicar las medidas para reducir las barreras geográficas al acceso a los servicios sanitarios, mejorar la infraestructura sanitaria a nivel local, aumentar en gran medida la disponibilidad de los medicamentos esenciales y formar a un personal sanitario competente, comprometido y dispuesto a prestar atención en las áreas rurales. Los sistemas de protección contra los riesgos financieros se expandieron para garantizar la accesibilidad a los servicios.

Marco regional En Tailandia, los hospitales locales eran casi inexistentes en la década de 1960, por lo que se consideraba esencial ampliar la atención primaria de salud (APS), sobre todo en las zonas rurales pobres, para alcanzar la cobertura sanitaria universal (UHC). Las reformas a nivel nacional llevaron a cambios importantes en solo unas décadas. Cambios importantes En los últimos 30 años, la disponibilidad y la distribución del personal sanitario, así como sus capacidades y competencias, han mejorado en gran medida, junto con los indicadores nacionales de salud. Entre 1980 y 2000 aumentó considerablemente la cobertura que incluía servicios de salud maternoinfantiles. En 2002, Tailandia alcanzó la cobertura sanitaria universal. El desarrollo del sistema sanitario general, especialmente la ampliación del personal sanitario, dio como fruto un sistema de atención primaria de la salud operativo. Lecciones aprendidas Disponer de un personal sanitario competente y comprometido ayudó a fortalecer el sistema de atención primaria de salud a nivel local. Fue vital mantener el enfoque de las políticas en el desarrollo de los recursos humanos en sanidad (RHS) por un mayor periodo, junto con un enfoque integral para el desarrollo de los recursos humanos en sanidad, basado en la integración de las diferentes intervenciones del sector de los recursos humanos en sanidad, y la unión de dichas intervenciones con otros esfuerzos más amplios para fortalecer otros dominios de los sistemas sanitarios.

References

- 1. Evans TG, Chowdhury MR, Evans DB, Fidler AH, Lindelow M, Mills A, et al. *Thailand's Universal Coverage Scheme: achievements and challenges. an independent assessment of the first 10 years (2001-2010).* Nonthaburi: Health Insurance System Research Office; 2012.
- Bhunbhu T. Expanded Programme on Immunization in Thailand. *Rev Infect Dis* 1989;11(Suppl 3):S514–7. doi: http://dx.doi.org/10.1093/clinids/11. Supplement_3.S514 PMID:2762697
- Patcharanarumol W, Tangcharoensathien V, Limwattananon S, Panichkriangkrai W, Pachanee K, Poungkantha W, et al. Why and how did Thailand achieve good health at low cost? In: Balabanova D, McKee M, Mills A, editors. 'Good health at low cost' 25 years on: What makes a successful health system? First ed. London: London School of Hygiene and Tropical Medicine; 2011. pp. 193–223.
- Balabanova D, Mills A, Conteh L, Akkazieva B, Banteyerga H, Dash U et al. Good health at low cost 25 years on: lessons for the future of health systems strengthening. *Lancet* 2013;381:2118–33. doi: http://dx.doi.org/10.1016/ S0140-6736(12)62000-5 PMID:23574803
- The world health report 2010 health systems financing: the path to universal coverage. Geneva: World Health Organization; 2010. Available from: http:// www.who.int/whr/2010/en [accessed 19 September 2013].
- 6. Everybody's business: strengthening health systems to improve health outcomes: WHO's framework for action. Geneva: World Health Organization; 2007.
- Lee K, Lush L, Walt G, Cleland J. Family planning policies and programmes in eight low-income countries: a comparative policy analysis. *Soc Sci Med* 1998;47:949–59. doi: http://dx.doi.org/10.1016/S0277-9536(98)00168-3 PMID:9722114
- Prakongsai P, Limwattananon S, Tangcharoensathien V. The equity impact of the universal coverage policy: lessons from Thailand. In: Chernichovsky D, Hanson K, editors. *Innovations in health system finance in developing and transitional economies*. London: Emerald Group Publishing Limited; 2009. pp. 57-81.
- Collaborative Project to Increase Production of Rural Doctors (CPIRD) [Internet]. List of affiliated teaching centers. Nonthaburi: Ministry of Public Health; 2013. Thai. Available from: http://cpird.in.th/main/node/10 [accessed 19 September 2013].
- Suwannakij T, Sirikanokwilai N, Wibulpolprasert S. Supply projection for physician in Thailand over the next 25 years (1996-2020 AD). *Human Res Health* 1998;2:117–28.

- Suphanchaimat R, Wisaijohn T, Thammathacharee N, Tangcharoensathien V. Projecting Thailand physician supplies between 2012 and 2030: application of cohort approaches. *Hum Resour Health* 2013;11:3. doi: http://dx.doi. org/10.1186/1478-4491-11-3 PMID:23374250
- Tangcharoensathien V, Suthivisessak P, Siripornpanich P, Seriratanakorn J. Intrauterine contraceptive devices: comparing health centre and district hospital costs in Thailand. *Health Policy Plan* 1990;5:177–81. doi: http:// dx.doi.org/10.1093/heapol/5.2.177
- Tangcharoensathien V, Prakongsai P, Limwattananon S, Patcharanarumol W, Jongudomsuk P. Chapter 16. From targeting to universality: lessons from the health system in Thailand. In: Townsend P, editor. *Building decent societies: rethinking the role of social security in development*: Houndmills: Palgrave Macmillan; 2009. pp. 310-22.
- Tangcharoensathien V, Patcharanarumol W, Ir P, Aljunid SM, Mukti AG, Akkhavong K et al. Health-financing reforms in southeast Asia: challenges in achieving universal coverage. *Lancet* 2011;377:863–73. doi: http://dx.doi. org/10.1016/S0140-6736(10)61890-9 PMID:21269682
- Stover J, Walker N, Garnett GP, Salomon JA, Stanecki KA, Ghys PD et al. Can we reverse the HIV/AIDS pandemic with an expanded response? *Lancet* 2002;360:73–7. doi: http://dx.doi.org/10.1016/S0140-6736(02)09339-X PMID:12114060
- The Medical Council of Thailand [Internet]. Physician statistics. Bangkok: MCT; 2013. Thai. Available from: http://www.tmc.or.th/pdf/Summary2555_ Graph_forTMCWebsite.pdf [accessed 19 September 2013].
- 17. Putthasri W, Suphanchaimat R, Topothai T, Wisaijohn T, Thammatacharee N, Tangcharoensathien V. Thailand special recruitment track of medical students: a series of annual cross-sectional surveys on the new graduates between 2010 and 2012. *BMC Public Health* 2013. Forthcoming
- Pagaiya N, Kongkam L, Worarat W, Sriratana S, Wongwinyou K. Rural retention of medical graduates trained by the collaborative project to increase rural doctors (CPIRD). *J Health Syst Res* 2012;6:219–27.
- Suphanchaimat R, Topothai T, Thaichinda C, Pagaiya N, Wisaijohn T, Thammathacharee N et al. Newly medical graduates' confidence in medical and public-health competency: exploratory factor analysis and multiple regression. J Health Syst Res 2012;6:455–66.

Lessons from the field The health workforce and health system development

Viroj Tangcharoensathien et al.

- Limwattananon S, Tangcharoensathien V, Tisayaticom K, Boonyapaisarncharoen T, Prakongsai P. Why has the Universal Coverage Scheme in Thailand achieved a pro-poor public subsidy for health care? *BMC Public Health* 2012;12(Suppl 1):S6. doi: http://dx.doi.org/10.1186/1471-2458-12-S1-S6 PMID:22992431
- Limwattananon S, Tangcharoensathien V, Prakongsai P. Catastrophic and poverty impacts of health payments: results from national household surveys in Thailand. *Bull World Health Organ* 2007;85:600–6. doi: http:// dx.doi.org/10.2471/BLT.06.033720 PMID:17768518
- 22. Thammatacharee N, Tisayaticom K, Suphanchaimat R, Limwattananon S, Putthasri W, Netsaengtip R et al. Prevalence and profiles of unmet healthcare need in Thailand. *BMC Public Health* 2012;12:923. doi: http://dx.doi.org/10.1186/1471-2458-12-923 PMID:23110321
- National Statistical Office [Internet]. National reproductive health surveys, various years. Nonthaburi: Ministry of Information and Communication Technology; 2013.
- 24. Rajaratnam JK, Marcus JR, Flaxman AD, Wang H, Levin-Rector A, Dwyer L et al. Neonatal, postneonatal, childhood, and under-5 mortality for 187 countries, 1970-2010: a systematic analysis of progress towards Millennium Development Goal 4. *Lancet* 2010;375:1988–2008.
- Global Health Data Exchange [Internet]. Infant and child mortality estimates by country 1970-2010. Seattle: Institute for Health Metrics and Evaluation; 2013. Available from: http://ghdx.healthmetricsandevaluation.org/record/ infant-and-child-mortality-estimates-country-1970-2010 [accessed 25 September 2013].
- Rohde J, Cousens S, Chopra M, Tangcharoensathien V, Black R, Bhutta ZA et al. 30 years after Alma-Ata: has primary health care worked in countries? *Lancet* 2008;372:950–61. doi: http://dx.doi.org/10.1016/S0140-6736(08)61405-1 PMID:18790318

- Ekachampaka P, Wattanamano N. Chapter 5: Health status and health problems of Thai people. In: Wibulpolprasert S, editor. *Thailand health profile report 2008–2010*. Nonthaburi: WVO Office of Printing Mill, War Veterans Organization of Thailand; 2013. pp. 239-315.
- Prachuabmoh V, Mithranon P. Below-replacement fertility in Thailand and its policy implications. *J Popul Res (Canberra)* 2003;20:35–50. doi: http://dx.doi. org/10.1007/BF03031794
- 29. Morison L. The global epidemiology of HIV/AIDS. *Br Med Bull* 2001;58:7–18. doi: http://dx.doi.org/10.1093/bmb/58.1.7 PMID:11714621
- Aungkulanon S, McCarron M, Lertiendumrong J, Olsen SJ, Bundhamcharoen K. Infectious disease mortality rates, Thailand, 1958-2009. *Emerg Infect Dis* 2012;18:1794–801. doi: http://dx.doi.org/10.3201/eid1811.120637 PMID:23092558
- Bundhamcharoen K, Odton P, Phulkerd S, Tangcharoensathien V. Burden of disease in Thailand: changes in health gap between 1999 and 2004. *BMC Public Health* 2011;11:53. doi: http://dx.doi.org/10.1186/1471-2458-11-53 PMID:21266087
- 32. Pagaiya N, Tangcharoensathien V, Kasemsup V, Chantanisr A, Sriratana S, Wongwinyou K. Attitude and rural job of choices of newly graduated doctors. *J Health Syst Res* 2012;6:30–9.
- 33. Tangcharoensathien V, Prakongsai P, Limwattananon S, Patcharanarumol W, Jongudomsuk P. Achieving universal coverage in Thailand: what lessons do we learn? A case study commissioned by the health systems knowledge network of the WHO Commission on Social Determinants of Health. Geneva: World Health Organization; 2007.

Tackling health workforce challenges to universal health coverage: setting targets and measuring progress

Giorgio Cometto^a & Sophie Witter^b

Abstract Human resources for health (HRH) will have to be strengthened if universal health coverage (UHC) is to be achieved. Existing health workforce benchmarks focus exclusively on the density of physicians, nurses and midwives and were developed with the objective of attaining relatively high coverage of skilled birth attendance and other essential health services of relevance to the health Millennium Development Goals (MDGs). However, the attainment of UHC will depend not only on the availability of adequate numbers of health workers, but also on the distribution, quality and performance of the available health workforce. In addition, as noncommunicable diseases grow in relative importance, the inputs required from health workers are changing. New, broader health-workforce benchmarks – and a corresponding monitoring framework – therefore need to be developed and included in the agenda for UHC to catalyse attention and investment in this critical area of health systems. The new benchmarks need to reflect the more diverse composition of the health workforce and the participation of community health workers and mid-level health workers, and they must capture the multifaceted nature and complexities of HRH development, including equity in accessibility, sex composition and quality.

Abstracts in عربى, 中文, Français, Русский and Español at the end of each article.

Introduction

The eight Millennium Development Goals (MDGs)¹ have been credited with catalysing a greater focus on the development priorities they targeted – poverty reduction, gender equality, primary education, maternal and child health, control of major diseases, environmental issues, and partnerships for development – and with mobilizing the relevant resources. With three of the MDGs being health-related, health is awarded a high priority in the current framework. The progress being made towards achieving these three goals is inequitable within and across countries, but despite this, many countries are recording improvements in health outcomes.²

However, limitations in the MDG framework - and particularly in the health-related MDGs - are being recognized: a lack of attention to equity,³ the neglect of health issues that were not explicitly included in any of the MDGs, and the fragmentation of efforts targeted at the different health priorities (the latter might have contributed to a narrowly selective focus on development assistance for health).⁴ The targets and indicators currently used for the health-related MDGs focus on increasing the coverage of some priority health services - such as skilled birth attendance - and on improving health outcomes in relation to maternal health, child health and infectious diseases. However, none of the MDG targets refers explicitly to the health system actions required to attain such objectives. Yet it has been evident for over a decade that only by overcoming the structural deficiencies of health systems - including those related to governance, the health workforce, information systems, health financing and supply chains - will it be possible to improve specific outcomes for individual diseases or population subgroups.⁵

Although econometric analyses have confirmed that an adequate health workforce is necessary for the delivery of essential health services and improvement in health outcomes,^{6,7} there have been systemic failures in the planning, forecasting, development and management of human resources for

health (HRH).^{8,9} This has led to unacceptable variations in the availability, distribution, capacity and performance of health workers, and these have resulted, in turn, in uneven quality and coverage of health services. In many low-income countries, acute shortages in the health workforce have been compounded by the emigration of health workers to highincome countries that offer better working conditions. The situation has heightened a sense of injustice that culminated in the adoption, in 2010, of the WHO Global Code of Practice on the International Recruitment of Health Personnel.¹⁰

Health workforce benchmarks

The world health report 2006 included an estimate of the minimum density threshold of physicians, nurses and midwives deemed generally necessary to attain a high coverage of skilled birth attendance: 2.28 per 1000 population.⁹ According to the statistics available when the report was published, 57 countries fell below this benchmark and an additional 4.3 million health workers would be required to achieve the minimum density globally.

Thanks to its grounding in evidence, its relative simplicity and the fact that it could be easily standardized, the minimum density of physicians, nurses or midwives suggested in *The world health report 2006* – 2.28 per 1000 population – has become the most widely used health workforce "target". It was adopted in the commitments of the Group of Eight (G8) in 2008¹¹ and has served as a basis for several monitoring and accountability processes that were either focused on the health workforce¹² or had a different and broader focus.¹³ However, this benchmark focuses exclusively on physicians, nurses and midwives and was developed with the objective of attaining relatively high coverage of selected essential health services of relevance to the health MDGs. In today's world, it is no longer adequate in the health workforce discourse for at least four reasons:

^b ReBUILD, Queen Margaret University, Edinburgh, Scotland.

^a Global Health Workforce Alliance, World Health Organization, avenue Appia 20, 1211 Geneva 27, Switzerland.

Correspondence to Giorgio Cometto (e-mail: giorgiocometto@hotmail.com).

⁽Submitted: 7 March 2013 – Revised version received: 25 June 2013 – Accepted: 26 June 2013)

- i) The evidence underpinning the threshold value was based on data on immunization coverage and skilled birth attendance. No consideration was given to health workforce requirements with respect to a wider range of health services, including the control and treatment of noncommunicable diseases.
- ii) The benchmark only allows the identification of inadequacies in the numbers of health workers. In the attainment of universal health coverage (UHC), many other challenges of equal – if not greater – importance exist, such as issues relating to access to, and the quality and performance of, the health workforce that were not captured by the simple density-based benchmark. Aspects such as distribution, responsiveness, affordability and productivity were crucially missing.
- iii) The macroeconomic implications of attaining the density benchmark have not been examined. It has been estimated that some lowincome countries would have to allocate 50% of their gross domestic product to health to be able to reach the benchmark.¹⁴
- iv) The benchmark only relates to physicians, nurses and midwives. However, community health workers^{15,16} and mid-level health workers¹⁷ can also improve the availability and accessibility of health services while maintaining - when appropriately trained and managed - quality standards that are similar to those of cadres undergoing longer training. Despite a growing evidence base and a significant political momentum in support of their role, including through the global One Million Community Health Workers Campaign and similar initiatives,^{18,19} these cadres are often operating at the margins of health systems and are largely excluded from HRH information systems and benchmarks.

A few other benchmarks have been used, such as the Sphere standards.²⁰ However, these benchmarks – which call for at least one physician and 50 community health workers for every 50 000 population – are only of primary relevance to humanitarian operations in refugee settings.

Fig. 1. Human resources for health actions required to achieve universal health coverage

	[Popula	tion without	access to weil-performing nealth workers	7
Performing health Productivity g adequate ince		ductivity gap equate incent	y gaps: require systems support, enabling management, ncentives		
Quality health workforce		Quality gaps: require enhanced pre-service and in-service training, effective regulation, supportive supervision			
Equitably distributed Distributed und		Distributio underserve	n gaps: require incentives for retention in d areas		
Available health workforce				Numbers and skills mix gaps: require adequate planning and investment	1

Population access to health workforce

Source: Jim Campbell and Giorgio Cometto (2012), adapted from Tanahashi (1978).

Evolving health workforce needs

The renewed focus on UHC in the health policy discourse – which culminated in December 2012 in the adoption of a United Nations General Assembly resolution on global health and foreign policy – has contributed to a wider recognition of the need for an "adequate skilled, well-trained and motivated [health] workforce".²¹

The progressive realization of the right to health for all people - and of UHC - will entail a wide array of actions to address the specific needs of each country. As national health systems in low- and middle-income countries try to broaden the services they provide to cover noncommunicable diseases as well, new demands will be made on their health workers. Population demands for more equitable access to health care of good quality will also have to be reflected in efforts at securing greater accessibility of health workers - especially in rural and other underserved areas²² - and improving their competence and performance. There will also be an increasing demand for greater efficiency: in general, the countries that are facing the greatest obstacles to the attainment of UHC are also the most fiscally constrained. Affordable approaches to boost the performance of health workers are urgently required. There may be tradeoffs between the broader HRH needs entailed in the UHC paradigm and the financial constraints faced by many countries. It may be possible to increase the cost-effectiveness of an expanding health system by awarding more prominent roles to community health workers and mid-level health workers. Similarly, the adoption of appropriate management systems and incentive structures could help to optimize the performance of existing health workers and reduce wasteful spending.²³

Guaranteeing UHC is a multifaceted endeavour. To approach the issue through the health workforce lens, it is necessary to go beyond mere numbers and address gaps in equitable distribution, competency, quality, motivation, productivity and performance. Improving access to effective coverage will not be possible otherwise (Fig. 1).

On the path towards UHC, fundamental changes will have to be adopted by countries and by the global health community in relation to how health workers are trained, deployed, managed and supported.²⁴ The role of the public sector in shaping health labour market forces will also have to be strengthened. A critical element in this endeavour is the inclusion of HRH benchmarks and of a corresponding monitoring framework in the UHC agenda.

Aiming for universal health coverage

HRH are not an end in themselves but the indispensable means to achieving

improved health outcomes. Aware of the importance of measurable targets and linked accountability mechanisms in stimulating action, countries and the international community should include a health-workforce-specific benchmark in the framework for UHC and the post-2015 development agenda. The inclusion of HRH benchmarks in the post-2015 agenda could help to foster collaboration between countries and global partners and to focus policy actions and investments where they are most required.

The development of new benchmarks in the field of HRH should take into account several interrelated factors, including:

- i) population growth and the demographic transition;
- ii) the growing burden of noncommunicable diseases and the corresponding changes in demand for health services by citizens;
- iii) the need to adapt the skills and competencies of health workers to match these changed demands;
- iv) an appreciation of health workforce challenges other than numerical shortages, and of the potential contributions of cadres other than physicians, nurses and midwives in improving health service availability and accessibility - especially in

face the most acute challenges; v) the role of non-state actors, which has never been adequately captured in previous benchmarks or in the corresponding monitoring frameworks.

New benchmarks are required that give a better reflection of the diverse composition of the health workforce. They should take account of the contributions that are made by social workers who are involved in long-term care and by community health workers and mid-level health workers. The inclusion of these other cadres could result in targets that are realistically attainable even by low-income countries. Recent costing studies suggest that providing care through community health workers is affordable.²⁵ However, any additions to the roles and expectations of health workers are likely to increase resource requirements.

Even adopting a more affordable skills mix and increasing efficiency in HRH spending through a renewed emphasis on performance and quality of care, the financial path towards UHC for some low-income countries and fragile states will inevitably involve, at least in the short-term, a role for official development assistance. Feng Zhao et al. discuss in an editorial in this theme issue how to maximize the returns of external financing for HRH.26

HRH benchmarks should influence the planning, management, support and monitoring of health systems. They should also be reflected in the setting of the targets used - at the national and global level - to track progress towards UHC and the health priorities of the post-2015 development agenda.

It would also be helpful, besides setting quantitative targets, to introduce an equity lens and explore needs in other dimensions, including the geographical distribution and sex composition of the health workforce. Minimum standards need to be established for all aspects of health worker performance - including responsiveness and competency and the associated management, financing and information systems. This round table base paper is complemented by four discussants,27-30 on how to strike the right balance between benchmarks that are sharp, actionable and measurable while simultaneously capturing the multifaceted nature and complexities of health workforce development.

Competing interests: None declared.

ملخص

العاملين الصحيين تتغبر . ولذلك، ثمة حاجة لوضع أسس مرجعية جديدة أوسع نطاقاً للقوى العاملة الصحية - وإطار رصد مقابل -وإدراجها في جدول الأعمال للتغطية الصحية الشاملة بغية تسريع الاهتمام والاستثمار في هذا الجانب الهام من النظم الصحية. ويتعين أن تعكس الأسس المرجعية الجديدة التركيبة الأكثر تنوعاً للقوى العاملة الصحية ومشاركة العاملين في مجال الصحة المجتمعية والعاملين الصحيين من المستوى المتوسط، ويجب أن تستوعب الطبيعة متعددة الأوجه لتطوير الموارد البشرية الصحية وتعقيداتها، بيا في ذلك الإنصاف في الإتاحة والتركيبة من الجنسين والجودة.

التصدي لتحديات القوى العاملة الصحية للتغطية الصحية الشاملة: وضع الأهداف وقياس التقدم سوف يتعين تعزيز الموارد البشرية الصحية إذا كانت هناك رغبة الأمراض غير السارية بأهمية نسبية، فإن الإسهامات المطلوبة من في تحقيق التغطية الصحية الشاملة. وتركز الأسس المرجعية الْقائمة للقوى العاملة الصحية بشكل حصري على كثافة الأطباء والمم ضات والقابلات، وتم تطويرها بهدف بلوغ التغطية المرتفعة نسبياً لخدمات التوليد التي يقدمها أشخاص مهرة وغيرها من الخدمات الصحبة الأساسية ذات الصلة بالأهداف الإنبائية للألفية في مجال الصحة. وعلى الرغم من ذلك، لن يعتمد بلوغ التغطية الصحية الشاملة على إتاحة الأعداد الكافية من العاملين الصحيين فحسب، ولكنه سيعتمد كذلك على توزيع القوى العاملة الصحية المتاحة ونوعيتها وأداءها. بالإضافة إلى ذلك، نتيجة لنمو

摘要

应对全民医疗保障的卫生劳动力挑战:设定目标,衡量发展

要实现全民医保 (UHC), 就必须强化卫生人力资源 (HRH)。现有卫生人力基准仅仅关注医生、护士和助 产士的密度,其发展目标在于实现熟练助产和其他卫 生千年发展目标 (MDG) 相关基本卫生服务的较高覆 盖率。但是,实现 UHC 不仅依赖于足够数量卫生工 作者的可及性, 还在于可用卫生劳动力的分布、质量 和绩效。此外,随着非传染性疾病相对重要性的提高,

对卫生工作者所提供服务的要求也在变化。因此,需 要制定更广泛的卫生劳动力基准以及相应的监控框架, 并将其纳入 UHC 日程中,以便促成对卫生系统这一关 键领域的关注和投入。新的基准需要反映更加多样的 卫生劳动力组合以及社区卫生工作者和中级卫生工作 者的参与,并且必须把握 HRH 发展的多样化和复杂性, 包括可及性、性别组成和质量方面的公平性。

Résumé

Relever les défis des effectifs de santé pour réaliser la couverture sanitaire universelle: établir les objectifs et mesurer les progrès

Les ressources humaines de la santé devront être renforcées pour pouvoir réaliser la couverture sanitaire universelle. Les points de référence existants des effectifs de santé se concentrent exclusivement sur la densité des médecins, infirmiers et sages-femmes, et ils ont été développés avec l'objectif d'atteindre une couverture relativement élevée des accouchements médicalisés et des autres services de santé essentiels qui sont importants pour la réalisation des objectifs du Millénaire pour le développement (OMD) de la santé. Cependant, la réalisation de la couverture sanitaire universelle ne dépendra pas seulement de la disponibilité d'un nombre approprié de professionnels de la santé, mais également de la distribution, de la qualité et de la performance des effectifs de santé disponibles. En outre, comme le nombre des maladies non transmissibles ne cesse de croître, les contributions requises de la part des professionnels de la santé sont en train de changer. Des points de référence nouveaux et plus larges des effectifs de santé – et un cadre de suivi correspondant – doivent donc être développés et inclus dans l'agenda pour la couverture sanitaire universelle afin de catalyser l'attention et les investissements dans ce domaine critique des systèmes de santé. Les nouveaux points de référence doivent refléter la composition plus diverse des effectifs de santé et la participation des agents sanitaires des collectivités et des agents sanitaires de niveau intermédiaire, et ils doivent saisir la nature polymorphe et la complexité du développement des ressources humaines de la santé, y compris en ce qui concerne l'équité dans l'accessibilité, la composition sexospécifique et la qualité.

Резюме

Устранение проблем, связанных с кадровыми ресурсами здравоохранения при внедрении всеобщего охвата медико-санитарной помощью: постановка целей и отслеживание выполнения

Для достижения всеобщего охвата медико-санитарной помощью (ВОМСП), необходимо усилить кадровые ресурсы здравоохранения (КРЗ). Существующие в настоящее время методы оценки достаточности кадров здравоохранения сосредоточены исключительно на обеспеченности населения врачами, медсестрами и акушерками и были разработаны с целью достигнуть относительно высоких показателей по количеству профессиональных акушеров и других важных медицинских служб в соответствии с Целями тысячелетия в области развития здравоохранения. Тем не менее, достижение всеобщего охвата зависит не только от адекватного количества работников здравоохранения, но также от распределения, качества и профессиональных показателей доступных кадровых ресурсов здравоохранения. Кроме того, с ростом относительной важности лечения неинфекционных заболеваний меняются требования к работникам здравоохранения. Поэтому должны быть разработаны и включены в программу действий по ВОМСП новые, более широкие методы оценки кадровых ресурсов здравоохранения, а также соответствующая система наблюдения. Это поможет активизировать привлечение внимания и инвестиций к этой исключительно важной области системы здравоохранения. Новые методы оценки должны отражать многообразный состав кадровых ресурсов здравоохранения и задействование местных медработников, а также работников здравоохранения среднего звена. Кроме того, эти оценки должны отражать многопрофильность и сложность развития КРЗ, включая равенство при обеспечении доступности, половой состав и качество подготовки.

Resumen

Abordar los desafíos del personal sanitario para alcanzar la cobertura universal de la salud: fijación de objetivos y evaluación del progreso

Es fundamental fortalecer la acción de los recursos humanos en sanidad (RHS) para alcanzar la cobertura universal de la salud (CUS). Los parámetros de referencia actuales sobre el personal sanitario se centran exclusivamente en la densidad de médicos, enfermeros y comadronas, y se desarrollaron con el fin de alcanzar una cobertura relativamente alta de asistencia especializada durante el parto y otros servicios de salud esenciales, que fueran para lograr los Objetivos de Desarrollo del Milenio (ODM). Sin embargo, la consecución de la cobertura universal de la salud no solo depende de la disponibilidad de un número adecuado de personal sanitario, sino también de la distribución, la calidad y el desempeño del personal sanitario disponible. Además, la contribución necesaria por parte del personal sanitario cambia a medida que la

importancia de las enfermedades no transmisibles crece relativamente. Por lo tanto, es necesario desarrollar e incluir en el programa otros parámetros de referencia más amplios y actuales, así como su marco de seguimiento correspondiente, de modo que los trabajadores comunitarios de salud puedan catalizar la atención y la inversión en esta área clave del sistema sanitario. Los nuevos puntos de referencia deben reflejar la composición más plural del personal sanitario y la participación de los trabajadores comunitarios de salud, así como de los trabajadores sanitarios de nivel medio. De esta manera, deben captar las múltiples facetas y complejidades del desarrollo de los recursos humanos para sanidad, incluyendo la equidad en la accesibilidad, la composición por sexo y la calidad.

References

- Waage J, Banerji R, Campbell O, Chirwa E, Collender G, Dieltiens V et al. The Millennium Development Goals: a cross-sectoral analysis and principles for goal setting after 2015: Lancet and London International Development Centre Commission. Lancet 2010;376:991–1023. doi: http://dx.doi.org/10.1016/ S0140-6736(10)61196-8 PMID:20833426
- United Nations Regional Information Centre for Western Europe [Internet]. UN MDG report, 2012, stresses need for a true global partnership. Brussels: UNRICWE; 2012. Available from: http://www.unric.org/en/ latest-un-buzz/27661-un-mdg-report-2012-stresses-need-for-a-true-globalpartnership [accessed 25 July 2013].

Giorgio Cometto & Sophie Witter

- Reidpath DD, Morel CM, Mecaskey JW, Allotey P. The Millennium Development Goals fail poor children: the case for equity-adjusted measures. *PLoS Med* 2009;6:e1000062. doi: http://dx.doi.org/10.1371/journal. pmed.1000062 PMID:19399155
- Samb B, Evans T, Dybul M, Atun R, Moatti JP, Nishtar S et al.; World Health Organization Maximizing Positive Synergies Collaborative Group. An assessment of interactions between global health initiatives and country health systems. *Lancet* 2009;373:2137–69. doi: http://dx.doi.org/10.1016/ S0140-6736(09)60919-3 PMID:19541040
- Travis P, Bennett S, Haines A, Pang T, Bhutta Z, Hyder AA et al. Overcoming health-systems constraints to achieve the Millennium Development Goals. *Lancet* 2004;364:900–6. doi: http://dx.doi.org/10.1016/S0140-6736(04)16987-0 PMID:15351199
- Anand S, Bärnighausen T. Health workers and vaccination coverage in developing countries: an econometric analysis. *Lancet* 2007;369:1277–85. doi: http://dx.doi.org/10.1016/S0140-6736(07)60599-6 PMID:17434403
- Anand S, Bärnighausen T. Human resources and health outcomes: crosscountry econometric study. *Lancet* 2004;364:1603–9. doi: http://dx.doi. org/10.1016/S0140-6736(04)17313-3 PMID:15519630
- Human resources for health overcoming the crisis. Cambridge: Joint Learning Initiative; 2004. Available from: www.who.int/hrh/documents/JLi_hrh_report. pdf [accessed 25 July 2013].
- The world health report 2006 working together for health. Geneva: WHO; 2006. Available from: http://www.who.int/whr/2006 [accessed 25 July 2013].
- Resolution WHA63.16. WHO Global Code of Practice on the International Recruitment of Health Personnel. In: Sixty-third World Health Assembly, Geneva, 21 May 2010. Resolutions and decisions. Geneva: World Health Organization; 2010. Available from: http://apps.who.int/gb/ebwha/pdf_files/WHA63/ A63_R16-en.pdf [accessed 25 July 2013].
- G8 Hokkaido Toyako Summit Leaders Declaration. Toyako: Group of Eight; 2008. Available from: http://www.mofa.go.jp/policy/economy/summit/2008/doc/ doc080714__en.html [accessed 25 July 2013].
- Global Health Workforce Alliance [Internet]. Reviewing progress, renewing commitment: launch of the progress report on the Kampala Declaration and Agenda for Global Action. Geneva: World Health Organization; 2011. Available from: http://www.who.int/workforcealliance/forum/2011/ progressreportlaunch [accessed 25 July 2013].
- Building a future for women and children: the 2012 report. Geneva: World Health Organization; 2012. Available from: http://www.countdown2015mnch.org/ reports-and-articles/2012-report [accessed 25 July 2013].
- Bossert TJ, Ono T. Finding affordable health workforce targets in lowincome nations. *Health Aff (Millwood)* 2010;29:1376–82. doi: http://dx.doi. org/10.1377/hlthaff.2009.0443 PMID:20606191
- Lewin S, Munabi-Babigumira S, Glenton C, Daniels K, Bosch-Capblanch X, van Wyk BE et al. Lay health workers in primary and community health care for maternal and child health and the management of infectious diseases. *Cochrane Database Syst Rev* 2010;3:CD004015. PMID:20238326
- Global Health Workforce Alliance [Internet]. Community health workers. Geneva: GHWA; 2010. Available from: http://www.who.int/workforcealliance/ knowledge/themes/community [accessed 25 July 2013].
- Lassi ZS, Cometto G, Huicho L, Bhutta ZA. Quality of care provided by midlevel health workers: systematic review and meta-analysis. *Bull World Health Organ* 2013;91:824–33.

- One million community health workers [Internet]. Grant to help coordinate campaign to train one million community health workers in sub-Saharan Africa. New York: One Million Community Health Workers Campaign; 2013. Available from: http://www.1millionhealthworkers.org [accessed 25 July 2013].
- Singh P, Sachs JD. 1 million community health workers in sub-Saharan Africa by 2015. *Lancet* 2013;382:363–5. doi: http://dx.doi.org/10.1016/S0140-6736(12)62002-9 PMID:23541538
- Humanitarian charter and minimum standards in humanitarian response. Geneva: The Sphere Project; 2011. Available from: http://www.sphereproject. org/resources/download-publications/?search=1&keywords=&language=En glish&category=22 [accessed 25 July 2013].
- Resolution A. 67/L.36. Resolution on global health and foreign policy. In: Sixtyseventh session of the United Nations General Assembly, New York, 6 December 2012. New York: United Nations; 2012. Available from: http://www.un.org/ga/ search/view_doc.asp?symbol=A/67/L.36 [accessed 25 July 2013].
- Dolea C, Stormont L, Braichet JM. Evaluated strategies to increase attraction and retention of health workers in remote and rural areas. *Bull World Health Organ* 2010;88:379–85. doi: http://dx.doi.org/10.2471/BLT.09.070607 PMID:20461133
- The world health report 2010 health systems financing: the path to universal coverage. Geneva: World Health Organization; 2010. Available from: http:// www.who.int/whr/2010 [accessed 25 July 2013].
- Bhutta ZA, Chen L, Cohen J, Crisp N, Evans T, Fineberg H et al. Education of health professionals for the 21st century: a global independent commission. *Lancet* 2010;375:1137–8. doi: http://dx.doi.org/10.1016/S0140-6736(10)60450-3 PMID:20362799
- McCord GC, Liu A, Singh P. Deployment of community health workers across rural sub-Saharan Africa: financial considerations and operational assumptions. *Bull World Health Organ* 2013;91:244–53B. doi: http://dx.doi. org/10.2471/BLT.12.109660 PMID:23599547
- Zhao F, Squires N, Weakliam D, Van Lerberghe W, Soucat A, Toure K et al. Investing in human resources for health: the need for a paradigm shift for the global health community over the next decade. *Bull World Health Organ* 2013;91:799–9A.
- 27. Boerma T, Siyam A. Health workforce indicators: let's get real. *Bull World Health Organ* 2013;91:886.
- Campbell J. Towards universal health coverage: a health workforce fit for purpose and practice. Bull World Health Organ 2013;91:886–7.
- 29. Scheil-Adlung X. Health workforce benchmarks for universal health coverage and sustainable development. *Bull World Health Organ* 2013;91:888.
- Baker BK. Empowering patients and strengthening communities for real health workforce and funding targets. Bull World Health Organ 2013;91:889.

Round table discussion

Health workforce indicators: let's get real

Ties Boerma^a & Amani Siyam^a

Health workforce indicators?¹ Those should be easy. We just need to count the numbers entering from training institutions or through re-entry, the numbers working, and the numbers exiting. If we know where these people work, we have the distribution of health workers within a country, and if we also have information on their competencies, responsiveness and productivity, we can know about their performance.

Sound health workforce statistics enable countries to develop policies that ensure the equitable and effective distribution of the workforce. They can be used to forecast needs by making projections and to plan accordingly. They can also be the basis for implementing policies to improve performance and the regulation of the public and private sectors. These statistics would also allow for reliable global monitoring of progress, including progress towards achieving benchmark targets,² and for monitoring the implementation of the WHO Global Code of Practice on the International Recruitment of Health Personnel.³

And yet, health workforce statistics are fraught with measurement problems. This is not for lack of agreement on core indicators or because we do not know what needs to be monitored. And it is not because measuring indicators is complicated or costly, as is true in other areas of health. For some indicators, such as those that capture productivity, more work is needed, but many indicators are well established.^{4,5}

Health workforce information systems fail to deliver comprehensive, reliable and timely data in many countries. As a consequence, planning and policy-making are often based on very limited evidence and global monitoring in areas such as the implementation of the Global Code and the setting of benchmarks is conducted with inadequate country statistics.

The challenges begin at the very basis: with the definition and classification of health workers. Indicators are intended for tracking progress over time, so country-specific definitions make it difficult to assess trends and conduct comparative analyses. The International Standard Classification of Occupations of the International Labour Organization facilitates the mapping of country health labour data, but it does little to take the statistical dimension into account, as is done, for example, for the International Classification of Diseases (ICD).⁶ Some solvable issues are not well addressed, among them the classification of non-physician clinicians and community health workers.⁷

Measuring the size and distribution of the health workforce involves drawing data from several sources, including sources outside the health sector.⁴ Currently too little is done to make use of these multiple, imperfect sources, reconcile the numbers and develop a best estimate. Human resources for health observatories aim to improve the information base,⁸ yet to date they have had little impact on the quality of health workforce data and statistics.

It's time to get real. Reliable and comparable health workforce statistics are essential and global partners and countries simply have not invested enough. It is necessary to invest in health workforce registries. Carefully designed, these become timely and consistent sources of data on the health workforce. Creating such registries will take time. In addition, a census of health facilities should be conducted to update a database of the public and private sector workforce and lay the groundwork for a continuous health workforce registry. Such a census could also be used to collect information on characteristics such as infrastructure, medicines, diagnostic readiness and the observance of universal precautions for the prevention of nosocomial infections, and could therefore provide a comprehensive picture of service availability and readiness.9 Finally, investments in strengthening country analytical capacity are crucial for improving the quality of health workforce statistics.

Competing interests: None declared.

References

- Cometto G, Witter S. Tackling health workforce challenges to universal health coverage: setting targets and measuring progress. *Bull World Health Organ* 2013;91:881–5.
- The world health report 2006: working together for health. Geneva: World Health Organization; 2006. Available from: http://www.who.int/whr/2006. [accessed 16 August 2013].
- WHO Global Code of Practice on the International Recruitment of Health Personnel. Geneva: World Health Organization; 2010. Available from: http:// www.who.int/hrh/migration/code/code_en.pdf [accessed 16 August 2013].
- 4. Dal Poz MR, Gupta N, Quain E, Soucat ALB, editors. Handbook on monitoring and evaluation of human resources for health with special applications for low- and middle-income countries. Geneva: World Health Organization; 2009. Available from: http://www.who.int/hrh/resources/handbook/en/index.html [accessed 16 August 2013].
- Pacqué-Margolis S, Ng C, Kauffman S. Human resources for health (HRH) indicator compendium. Washington: United States Agency for International Development; 2011. Available from: http://capacityplus.org/files/resources/ HRH_Indicator_Compendium.pdf [accessed 16 August 2013].
- International classification of diseases and related health problems, 10th revision. Geneva: World Health Organization; 2010. Available from: http://apps. who.int/classifications/icd10/browse/2010/en [accessed 16 August 2013].
- Mullan F, Frehywoth S. Non-physician clinicians in 47 sub-Saharan African countries. *Lancet* 2007;370:2158–63. doi: http://dx.doi.org/10.1016/S0140-6736(07)60785-5 PMID:17574662
- Gedik G, Dal Poz M. Human Resources for Health Observatories: contributing to evidence-based policy decisions. *Hum Res Health Obs* 2012;10.
- O'Neill K, Takane M, Sheffel A, Abouzahr C, Boerma T. Monitoring service delivery for universal health coverage: service availability and readiness assessment (SARA). *Bull World Health Organ* 2013. Forthcoming.

Towards universal health coverage: a health workforce fit for purpose and practice

James Campbell^a

The finality of universal health coverage (UHC) is to ensure that *all* people are able to access the *quality* health services they *need* without suffering undue financial hardship. Margaret Chan describes it as the ultimate expression of *fairness*.¹ The italicized words above should therefore frame the starting point for a contemporary discourse on human resources for health

^a World Health Organization, avenue Appia 20, 1211 Geneva 27, Switzerland. Correspondence to Ties Boerma (e-mail: boermat@who.int).

in the post-2015 development agenda for health (2015-2030).

UHC is an aspirational concept. It establishes what is to be achieved but says little on how to get there.² However, the first step in accelerating progress towards UHC - building a health workforce that is both fit for purpose and fit to practice - is relatively simple. How does one go about it? By developing the competencies and regulatory frameworks needed to deliver quality care in accordance with the burden of disease and health priorities. The planning and implementation lens is ex ante: What health workforce do we need by 2030 to attain "effective coverage"3-7 of an agreed package of care that meets the needs of all people, be they rich or poor? This line of questioning, which is increasingly evident,⁸ generates the strategic intelligence to inform evidence-based decisions on human resources for health. Once need is quantified, a secondary but important policy consideration is pragmatism surrounding the available human and capital resources and fiscal space within national settings. Such pragmatism can inform the pace of acceleration towards UHC but should not undermine the initial workforce visioning process or the obligation of governments to deliver on the right to health.9

Existing thresholds for the required number of professional health workers (midwives, nurses and physicians) per 1000 population - 2.28 and 3.45 according to the World Health Organization (WHO) and the International Labour Organization, respectively¹⁰⁻¹² – provide valuable references for translating need into indicative workforce requirements, but they should be considered part of the process of planning the workforce to meet the needs of the population rather than an absolute target in countries currently below these thresholds. To promote effective coverage and deliver services closer to the client, it is essential to further analyse the availability or supply of the workforce; its accessibility in spatial, temporal and financial terms; its acceptability to clients; and its quality, in terms of performance. This entails using internationally recognized standards to classify the different occupations in the health workforce; gaining a better understanding of the health labour market within a country; moving beyond counting health workers to assessing their fulltime equivalent and available working time; and being more cognisant of the skill mix - and educational pathways - required for the workforce to become fit for purpose.

To an extent, *The Kampala declaration and agenda for global action* and the *WHO Global Code of Practice on the International Recruitment of Health Personnel* offer existing global benchmarks.^{13,14} The accountability report from the meeting of the G8 held in June 2013 in Lough Erne, Northern Ireland, provides evidence that some countries are monitoring their recommended actions.¹⁵ However, the international community has yet to fully grasp the inherent value of these documents in fostering accountability. The 2013 progress report on the Global Code of Practice, for example, is a sober reminder that existing health workforce recommendations are not being implemented at scale in all WHO regions.¹⁶

A contemporary strategy on human resources for health, embedded within the post-2015 development agenda for health, is needed to accelerate progress towards UHC. Such a strategy should promote effective coverage with health services staffed by a workforce that is both fit for purpose and fit to practice. This requires an accompanying accountability and reporting mechanism not only for tracking the stock or density of the health workforce or the coverage of health interventions, but for collating disaggregated data on the availability, accessibility, acceptability and quality of the workforce to meet population needs, ensure the delivery of quality care and achieve fairness for all.

Competing interests: None declared.

References

- World Health Organization [Internet]. Chan M. Universal coverage is the ultimate expression of fairness. Geneva: WHO; 2012. Available from: http://www.who.int/ dg/speeches/2012/wha_20120523/en/index.html# [accessed 16 August 2013].
- Giedion U, Alfonso EA, Díaz Y. The impact of universal coverage schemes in the developing world: a review of the existing evidence. Washington: The World Bank; 2013 (UNICO Studies Series No. 25). Available from: http://siteresources. worldbank.org/HEALTHNUTRITIONANDPOPULATION/Images/IMPACTofUHCS chemesinDevelopingCountries-AReviewofExistingEvidence.pdf [accessed 20 August 2013].
- Shengelia B, Tandon A, Adams OB, Murray CJL. Access, utilization, quality, and effective coverage: an integrated conceptual framework and measurement strategy. Soc Sci Med 2005;61:97–109. doi: http://dx.doi.org/10.1016/j. socscimed.2004.11.055 PMID:15847965
- Tanahashi T. Health service coverage and its evaluation. Bull World Health Organ 1978;56:295–303. PMID:96953
- Campbell J. The route to effective coverage is through the health worker: there are no shortcuts. *Lancet* 2013;381:725. doi: http://dx.doi.org/10.1016/S0140-6736(13)60579-6 PMID:23472917
- Background paper for the Technical Consultation on Effective Coverage of Health Systems. Geneva: World Health Organization; 2001. Available from: http://www.who.int/health-systems-performance/technical_consultations/ effcov_background.pdf [accessed 16 August 2013].
- Graham WJ, McCaw-Binns A, Munjanja S. Translating coverage gains into health gains for all women and children: the quality care opportunity. *PLoS Med* 2013;10:e1001368. doi: http://dx.doi.org/10.1371/journal.pmed.1001368 PMID:23335862
- Ono T, Lafortune G, Schoenstein M. Health workforce planning in OECD countries: a review of 26 projection models from 18 countries. Ferney-Voltaire: OECD; 2013. Available from: http://www.oecd-ilibrary.org/content/ workingpaper/5k44t787zcwb-en [accessed 16 August 2013].
- Ooms G, Brolan C, Eggermont N, Eide A, Flores W, Forman L et al. Universal health coverage anchored in the right to health. *Bull World Health Organ* 2013;91:2–2A. doi: http://dx.doi.org/10.2471/BLT.12.115808 PMID:23397341
- The world health report 2006: working together for health. Geneva: World Health Organization; 2006. Available from: http://www.who.int/whr/2006/en/ [accessed 24 August 2013].
- Scheil-Adlung X. Health workforce benchmarks for universal health coverage and sustainable development. *Bull World Health Organ* 2013;91:888–9.
- Cometto G, Witter S. Tackling health workforce challenges to universal health coverage: setting targets and measuring progress. *Bull World Health Organ* 2013;91:881–885..
- Global Health Workforce Alliance. *The Kampala declaration and agenda for global action*. Geneva: World Health Organization; 2008. Available from: http://www.who.int/workforcealliance/knowledge/resources/kampala_declaration/en/ [accessed 16 August 2013].
- Resolution WHA63.16. WHO Global Code of Practice on the International Recruitment of Health Personnel. In: Sixty-third World Health Assembly, Geneva, 17–21 May 2010. Resolutions and decisions. Geneva: World Health Organization; 2013. Available from: http://apps.who.int/gb/ebwha/pdf_files/WHA63-REC1/ WHA63_REC1-P2-en.pdf [accessed 16 August 2013].
- Gov.UK [Internet]. Lough Erne accountability report: keeping our promises. London: G8 UK; 2013. Available from: https://www.gov.uk/government/ publications/lough-erne-accountability-report [accessed 16 August 2013].
- A 66/25. The health workforce: advances in responding to shortages and migration, and in preparing for emerging needs: report by the Secretariat. In: Sixty-sixth World Health Assembly, Geneva, 20–28 May 2013. Geneva: World Health Organization; 2013. Available from: http://apps.who.int/gb/ebwha/pdf_files/ WHA66/A66_25-en.pdf [accessed 16 August 2013].

^a Instituto de Cooperación Social Integrare, Calle Balmes 30, 3°-1, 08007 Barcelona, Spain. Correspondence to James Campbell (e-mail: jim.campbell@integrare.es).

Health workforce benchmarks for universal health coverage and sustainable development

Xenia Scheil-Adlung^a

Universal health coverage (UHC) includes the guarantee that everyone will be protected over the entire life-cycle by a defined set of essential health services fulfilling four interrelated criteria, as set out in Social Protection Floors Recommendation, 2012 (202) of the International Labour Organization (ILO): availability, accessibility, acceptability and quality.¹ Insofar as it furthers health, which is essential to human productivity and economic progress, UHC – and the health workforce needed to attain it – serves as a foundation to sustainable development.

Gaps in the health workforce – in number, distribution and skills – undermine service availability, acceptability, accessibility and quality. Such gaps can also create financial barriers and impoverish people when they have to seek care without being covered by a social health protection system or scheme. Access to quality services is vitally dependent on the existence of a health workforce that is able to meet needs and enjoys decent working conditions, characterized by training opportunities, attractive employment, good career prospects, fair remuneration, adequate social protection, a safe work environment and access to dispute settlement mechanisms, as described in the ILO Nursing Personnel Convention No. 149.²

Service accessibility is further compromised by factors external to the health sector that influence the financing of health and of the health workforce. Of particular relevance are the socioeconomic contexts in which people live and work. Poverty, unemployment and low wages affect a household's ability to pay for needed health care, be it through taxes, employee contributions, premiums or out-of-pocket expenditure. At the national level, high poverty rates and the existence of large informal economies often result in tax revenues that are insufficient for adequate funding of health care and that challenge governments' technical capacity to supply services in areas where unregistered workers and their families live. In highly vulnerable countries, defined by the ILO³ as those where most people work in the informal economy and most of the population is poor, health care is accessible to much fewer people than in countries with low poverty rates and small informal economies.⁴ Furthermore, in such countries most health care is financed by out-of-pocket payments that can reach catastrophic levels and plunge families into dire poverty or bar their access to needed care. According to the ILO, over 1.5 billion people in the world are living and working in socioeconomic contexts that challenge adequate financing of UHC and the attainment of sustainable development, so critically dependent on the presence of a healthy population.

Any health workforce benchmark for measuring sustainable progress towards UHC must reflect the above-mentioned aspects, including the basic socioeconomic causes of UHC gaps beyond the health sector.⁵ One such benchmark is the ILO's staff-related access deficit indicator (SAD).^{3,6} The SAD measures the relative difference between a particular country's health workforce density and the population-weighted median health workforce density in a group of countries defined by the ILO as having low vulnerability (and hence used as the global standard). These are countries with low poverty levels and small informal economies and therefore with the potential to successfully tackle the root causes of health workforce gaps and access-related deficits in UHC and, ultimately, to achieve sustainable development.

The SAD - currently 34.5 health workers per 10000 population⁷ - suggests that one third of the world's population lacks access to health care because of gaps in the health workforce. Globally, more than 90 countries are challenged by health workforce deficits. Burundi, for example, has a deficit of 33 health workers per 10 000 population, which leaves 95% of the population without access to health care. These and other countries with high levels of poverty and large informal economies should strive towards the achievement of the SAD benchmark by adopting coherent socioeconomic and health policies that foster sustainable development by prioritizing adequate labour market policies, poverty alleviation and decent working conditions. This relative benchmark has the flexibility to respond to health developments such as the growing burden of noncommunicable diseases and the demographic transition. It is useful for planning and investment purposes at the national level. Countries must, however, make internal decisions to achieve an equitable health workforce distribution and adopt socioeconomic policies embedded in national development strategies to create synergy between increased wealth and improved health.

Competing interests: None declared.

References

- International Labour Organization [Internet]. R 202 Social Protection Floors Recommendation, 2012 (No. 202). Geneva: ILO; 2012. Available from: http:// www.ilo.org/dyn/normlex/en/f?p=1000:12100:0::NO::P12100_INSTRUMENT_ ID:3065524 [accessed 25 July 2013].
- International Labour Organization [Internet]. C149 Nursing Personnel Convention, 1977 (No. 149). Geneva: ILO; 2012. Available from: http:// www.ilo.org/dyn/normlex/en/f?p=NORMLEXPUB:12100:0::NO:12100 :P12100_ILO_CODE:C149 [accessed 25 July 2013].
- World social security report 2010/11: providing coverage in times of crisis and beyond. Geneva: International Labour Office; 2010. Available from: http:// www.ilo.org/global/publications/ilo-bookstore/order-online/books/ WCMS_146566/lang--en/index.htm [accessed 25 July 2013].
- Scheil-Adlung X. Revisiting policies to achieve progress towards UHC in lowincome countries: realizing the payoffs of national social protection floors. Int Soc Secur Rev 2013. Forthcoming
- Cometto G, Witter S. Tackling health workforce challenges to universal health coverage: setting targets and measuring progress. *Bull World Health Organ* 2013;91:881–5.
- Scheil-Adlung X, Bonnet F, Wiechers T, Ayangbayi T. New approaches to measuring deficits in social health protection coverage in vulnerable countries. Geneva: World Health Organization; 2010 (World Health Report 2010 Background Paper 56).
- Global Extension of Social Security. Geneva: International Labour Organization; 2013. Available from: http://www.ilo.org/global/topics/socialsecurity/lang--en/index.htm [accessed 26 July 2013].

^a Social Protection Department, International Labour Organization, 4 rte des Morillons, CH-1211 Geneva 22, Switzerland. Correspondence to Xenia Scheil-Adlung (e-mail: scheil@ilo.org).

Empowering patients and strengthening communities for real health workforce and funding targets

Brook K Baker^a

The setting of ambitious targets for expanding the health workforce and improving its quality, efficiency and equitable service delivery is a task long overdue. It has been nearly one decade since the minimum needed density of physicians, nurses and skilled midwives - 2.28 workers per 1000 inhabitants - was established, but without attention to other health worker cadres. Furthermore, the estimate was based on only two areas of health worker activity - skilled birth attendance and measles immunization - that represent a minuscule fraction of people's health-care needs.¹ As a result, it grossly underestimated the health workforce needed in low- and middle-income countries to respond effectively to the pandemics of human immunodeficiency virus infection (HIV), tuberculosis and malaria; the burden of neglected tropical diseases; unmet needs in child, maternal and sexual and reproductive health; and the growing prevalence of noncommunicable diseases. In addition to being unsuitable for responding to epidemiological trends and other contextual variables, the established worker density target was minimalistic and non-dynamic, for it conveyed the impression that meeting only the most rudimentary needs of health systems would suffice to alleviate the crisis in the area of human resources for health. No aspirational goals were set for progressively expanding and strengthening a health workforce to meet a population's broad-spectrum health needs.

Cometto & Witter² are correct in asserting that much has been learnt about the value of properly trained mid-level³ and community health workers⁴ in improving health service coverage and efficiency. Work is still being conducted to determine the best skill mixes and workforce ratios for different countries and to establish good practice models for health workforce training, task sharing and teamwork. Although simplification, combined with equity and quality, is the overall goal, the path is laborious given the headwinds of bureaucratic intransigence, chronic underfunding and persistent brain drain. To overcome these headwinds, it is crucial that health workers be paid living wages and given incentives to work in neglected areas.⁵

Despite the above, the framework described by the authors is not inclusive enough because it omits the transformation taking place in the delivery of robust, affordable and operable point-of-care diagnostics by health workers with less training.^{6,7} The possibility of making a diagnosis at the periphery of health services rather than in tertiary facilities is made even more attractive by growing evidence that dispersed community-based care is often as good as concentrated facility-based care or even better.⁸ More importantly, we have learned from HIV activists and people living with HIV that patients can and must be empowered to prevent ill health and manage their own care – in short, to be partners in their own well-being – through health literacy and communal support systems. Similarly, communities and community systems must be strengthened if they are to support patients and their caretakers in their efforts to seek care and preserve health. Only by placing patients at the centre of human resource strategies and strengthening the interface between health and community systems will we attain the efficiency and quality in health care that we seek.

Empowered patients and strengthened communities will be in a position to hold health systems and their leaders accountable.⁹ They will demand of both domestic funders and foreign donors the resources needed to recruit, train and retain health workers capable of delivering good, equitable care. They will also demand dynamic targets for strengthening the health workforce, matched with enforceable targets for adequate and sustained funding.

Competing interests: None declared.

References

- 1. Joint Learning Initiative. Overcoming the crisis: report of the Joint Learning Initiative. Boston: Harvard University Press; 2004. Available from: http://www. who.int/hrh/documents/JLi_hrh_report.pdf [accessed 24 July 2013].
- Cometto G, Witter S. Tackling health workforce challenges to universal health coverage: setting targets and measuring progress. *Bull World Health Organ* 2013;91:881–5.
- Global Health Workforce Alliance. Mid-level health providers: a promising resource to achieve the health Millennium Development Goals. Geneva: World Health Organization; 2010. Available from: http://www.who.int/ workforcealliance/knowledge/resources/Final_MLP_web_2.pdf [accessed 24 July 2013].
- 4. Global Health Workforce Alliance. Global experience of community health workers for delivery of health related Millennium Development Goals: a systematic review, country case studies, and recommendations for integration into national health systems. Geneva: World Health Organization; 2010. Available from: http://www.who.int/workforcealliance/knowledge/ publications/CHW_FullReport_2010.pdf [accessed 24 July 2013].
- Global Health Workforce Alliance. Guidelines: incentives for health professionals. Geneva: World Health Organization; 2008. Available from: http://www. who.int/workforcealliance/documents/Incentives_Guidelines%20EN.pdf [accessed 24 July 2013].
- Chan CPY, Mak WC, Cheung KY, Sin KK, Yu CM, Rainer TH et al. Evidence based point-of-care diagnostics: current status and emerging technologies. *Annu Rev Anal Chem (Palo Alto Calif)* 2013;6:191–211. doi: http://dx.doi. org/10.1146/annurev-anchem-062012-092641 PMID:23527548
- UNITAID. HIV/AIDS diagnostic technology landscape. 3rd ed. Geneva: World Health Organization; 2013. Available from: http://www.unitaid.eu/images/ marketdynamics/publications/UNITAID-HIV_Diagnostic_Landscape-3rd_edition.pdf [accessed 24 July 2013].
- Rich ML, Miller AC, Niyigena P, Franke MF, Niyonzima JF, Socci A et al. Clinical outcomes and high retention in care among adults in a community-based HIV treatment program in rural Rwanda. J Acquir Immune Defic Syndr 2012;59:e35–42. doi: http://dx.doi.org/10.1097/QAI.0b013e31824476c4 PMID:22156912
- Hodel D. Meeting report: advancing country ownership: civil society's role in sustaining public health. Washington: The Foundation for AIDS Research; 2013. Available from: http://www.amfar.org/uploadedFiles/_amfarorg/ On_the_Hill/Country-Ownership-Meeting-Report-June-2013.pdf [accessed 24 July 2013].

^a Northeastern University School of Law, 400 Huntington Ave, Boston, MA 02115, United States of America. Correspondence to Brook K Baker (e-mail: b.baker@neu.edu).

Leveraging information technology to bridge the health workforce gap

Robert Bollinger,^a Larry Chang,^a Reza Jafari,^b Thomas O'Callaghan,^c Peter Ngatia,^d Dykki Settle,^e Jane McKenzie-White,^a Kunal Patel,^c Amir Dossal^f & Najeeb Al Shorbaji^g

According to some estimates, the world needs more than 4 million additional physicians, nurses, pharmacists, laboratory technicians, midwives, community health workers (CHWs) and other front-line health workers.¹ However, there is also a shortage of faculty that can provide high-quality training and mentorship for current training programmes² and continuing education opportunities for health workers. The use of new information and communication technologies (ICTs) can help to overcome these challenges.^{3,4}

Recent global investments in fibre and wireless infrastructure, as well as innovations in e-learning, electronic health (eHealth) and mobile health (mHealth) and in the social media, can be leveraged to train, deploy, support and empower health workers.4-8 The International Telecommunication Union estimates that, in only four vears (2007-2011), mobile broadband subscriptions in the developing world increased by more than tenfold: from 43 million to 458 million. Mobile devices and internet access are becoming increasingly necessary professional tools for health-care workers at all levels in developing countries. New fibre and wireless infrastructure, as well as the rapid growth of computer processing power, provide an unprecedented opportunity to scale up health worker training and improve its quality, as well as to optimize health service delivery and strengthen health systems.

Over the past 20 years, learning management systems have contributed greatly to the tremendous expansion of e-learning. The past five years have also seen an increase in massive open online courses. eHealth technologies, including electronic medical records, laboratory and pharmacy information systems, along with disease surveillance and supply chain information systems, are transforming health care. Mobile health (mHealth), which is the practice of medicine and public health supported by mobile devices, extends these systems to the most remote and inaccessible parts of the developing world. In addition, the same mobile devices used to optimize communication and support front-line health-care workers can be used to deploy multimedia training programmes and clinical decision support tools. The social media and the development of communities of practice have yet to be fully mobilized to support health workforce capacity building. The use of the social media by health workers has several potential benefits. Some examples are crowdsourcing of educational content, translations and localization (i.e. adaptation of the content to a particular region), peer-to-peer learning, joint problem solving and reflective practice. In addition, ICTs can strengthen communication between providers and patients, increase community support for health worker capacity building and heighten the demand for high-quality clinical services.

E-learning tools can support curriculum development and course scheduling and management in ways that are conducive to blended learning approaches and that take advantage of multiple learning environments. Such tools can also be linked with national health professional registration and licensure systems, as well as with health workforce planning, management and in-service training systems, to provide information and support to the health workforce throughout the health worker lifecycle. Following pre-service training, ICTs can be used to optimize the work of a health-care provider – the use of electronic health records, clinical decision-making, supply chain management and service quality control are examples – and to facilitate mHealth communications, continuing education and the establishment of professional social networks.

Training methods based on video conferencing, webcasting, recording, localization and playback of training can enable global access to the very best educators and are more cost-effective than standard face-to-face educational programmes. Interactive content programmes that incorporate gaming and adaptive learning tools can also be used.9 By enabling the development of virtual networks of learners, e-learning makes learning a community effort and facilitates the sharing of training content. Furthermore, since e-learning can take place in the community, at the point of care or at other convenient points, training costs are reduced and health-care providers can remain in their clinics and communities, where they are most needed, without disruption of healthcare delivery.10

E-learning is not a second-rate alternative to traditional health worker education. It adds value and makes it possible to overcome the limitations of existing educational strategies. The goal of any health education strategy or curriculum should be to present the educational content and conduct the training in a manner that will enable all learners to acquire the clinical competencies they need. A blended learning strategy based on the use of ICTs, e-learning and other educational methods can achieve this objective.

^a Johns Hopkins University School of Medicine, Phipps 540, 600 N. Wolfe St, Baltimore, Maryland 21287, United States of America (USA).

^b E-Development International, Baltimore, USA.

^c iHeed Institute, Mitcheltown, Ireland.

^d African Medical and Research Foundation, Nairobi, Kenya.

^e Capacity*Plus*, Intrahealth International, Chapel Hill, USA.

f Global Partnerships Forum, New York, USA.

⁹ World Health Organization, Geneva, Switzerland.

Correspondence to Robert Bollinger (e-mail: rcb@jhmi.edu).

⁽Submitted: 15 April 2013 – Revised version received: 4 August 2013 – Accepted: 6 August 2013)

Despite the potential and opportunities described herein, several challenges must be addressed before ITCs and e-learning can be fully employed to build health-care worker capacity globally. Some of them have to do with the limitations of the ICT infrastructure and of the ICT and e-learning technologies themselves; others are cultural, societal and regulatory barriers.

Despite recent investments in fibre and wireless network infrastructure, two thirds of the world's population still lacks internet access and, even in communities with new network architecture, the cost of connectivity remains prohibitively high.¹¹ The number of highly trained ICT experts is also insufficient for health programmes and institutions to adequately staff their own network support teams. In addition, in many communities a lack of electric power is the main obstacle to the use of ICTs and mHealth tools. The use and scale up of ICTs in health programmes are also hindered by the absence of appropriate and enabling strategies, policies and standards, the lack of harmonization across communication systems and the poor interoperability of technologies and platforms.

Many medical faculty members and health programme staff are reluctant to modify or abandon traditional teaching and learning methods that have been essentially unchanged for decades. Incentives may be required to promote the uptake of e-learning strategies among these professionals, in addition to training in computers and e-learning tools. Furthermore, since women represent the majority of health-care providers, efforts to leverage ICTs to train health workers will have little impact unless computer literacy and access to ICTs are promoted among women.¹² Various ministries, especially the ministries of information technologies, education, finance and health, will need to better coordinate and synergize their missions in connection with the use of ICTs among health workers. In addition, several issues need to be addressed with respect to regulation on content sharing and the use of e-learning platforms for the certification and accreditation of health professionals. Use of the internet to share content, faculty members, lessons and best practices, as well as to build social networks of learners, could bring down the regulatory silos that limit cross-border collaboration in health education.

Box 1. Recommendations for training, empowering and supporting health workers in resource-limited settings through the use of information and communication technologies (ICTs)

- Ministries of health, education, finance and information technologies and communications must coordinate efforts to improve ICT infrastructure, expand broadband access and support e-learning initiatives in health professional institutions and health programmes.
- Ministries of health and health professional organizations must fully embrace e-learning through the establishment of standards and accreditation procedures that facilitate the certification and sharing of training programmes for students and of continuing education initiatives for health-care providers.
- Health professional institutions and health programmes should fully embrace e-learning and ICT innovations in training, supporting and empowering health workers at all levels.
- Computer literacy, particularly for women, should be a high-priority competency in all training programmes for health-care workers.
- Specific training of faculty and students in the use of e-learning platforms should be a priority for health professional schools.
- E-learning tools should be blended with other educational approaches designed to help all students achieve the necessary competencies.
- The full range of e-learning tools learning management systems, massive open online courses, mHealth, the social media, webcasts, decision support tools, simulation training, adaptive learning platforms, etc. – should be utilized in the training of health professionals.
- All health training programmes should include self-evaluation and regular curricular updates to ensure that all students achieve the necessary clinical competencies, regardless of the educational strategies used.
- Support for innovative and sustainable e-learning programmes for health workers should be established through new public-private partnership models that engage the full range of stakeholders.
- The ICT workforce available in resource-limited communities needs to be greatly expanded to provide health programmes with highly qualified, affordable and innovative ICT support.

Governments and donors will need to be shown evidence that investments in ICTs and e-learning for health workers lead to programmatic cost savings, increased productivity and improved health outcomes. New models of public-private partnership are needed to ensure the scalability and sustainability of investments in ICTs for the support of health-care workers. Governments and donors will need to recognize that corporate partners expect public-private partnerships to lead to new business and new markets. Similarly, private sector partners will need to recognize that governments, donors, health programmes, institutions and communities will expect public-private partnerships to lead to sustainable improvements in programmatic efficiency, productivity and improved health outcomes.

We recommend several measures to train, empower and support health workers in resource-limited settings in Africa, Asia and Latin America through the use of ICTs (Box 1). ICTs are a global transformative force. E-learning and other ICT tools offer ways of bridging the global health workforce gap, but several challenges must be overcome. The ICT "train" has left the station. It remains to be seen whether the global health workforce will ride along or remain behind.

Acknowledgements

The authors gratefully acknowledge the participants, speakers and moderators of the 2013 GETHealth Summit and particularly thank Kate Tulenko, Director of Capacity*Plus* IntraHealth International, for her suggestions. The opinions expressed in this paper are those of the authors alone and do not necessarily reflect the opinions of Kate Tulenko or of GETHealth participants, speakers or moderators.

Funding: Robert Bollinger and Amir Dossal were co-leaders of the 2013 GETHealth Summit that took place at the United Nations on 6–7 February 2013. They received no direct financial support for their role in the Summit. However, the GETHealth Summit was supported by The US National Institutes of Health Office of AIDS Research, the Norwegian Agency for Development Cooperation, Hewlett-Packard, My Two Sons Fund, The Verizon Foundation, InPractice, Intel and the Gilead Foundation.

Competing interests: None declared.

References

- The world health report 2006: working together for health. Geneva: World Health Organization; 2006. Available from: http://www.who.int/whr/2006/ en/index.html. [accessed 11 September 2013].
- Mullan F, Frehywot S, Omaswa F, Buch E, Chen C, Greysen SR et al. Medical schools in sub-Saharan Africa. *Lancet* 2011;377:1113–21. doi: http://dx.doi. org/10.1016/S0140-6736(10)61961-7 PMID:21074256
- GETHealth [Internet]. New York: Global Education and Technology for Health Summit; 2011 [updated 2013]. Available from: http://www. gethealthsummit.org/ [accessed 11 September 2013].
- Frehywot S, Vovides Y, Talib Z, Mikhail N, Ross H, Wohltjen H et al. E-learning in medical education in resource constrained low- and middle-income countries. *Hum Resour Health* 2013;11:4–11. doi: http://dx.doi. org/10.1186/1478-4491-11-4 PMID:23379467
- Resolution WHA58.28. eHealth. In: World Health Organization [Internet]. Fifty-eighth World Health Assembly, Geneva, 16–25 May 2005. Resolutions and decisions. Geneva: WHO; 2005. Available from: http://apps.who.int/ gb/ebwha/pdf_files/WHA58-REC1/english/Resolutions.pdf [accessed 11 September 2013].
- Broadband Commission for Digital Development Working Group on Education. *Technology, broadband and education: advancing the education for all agenda*. Paris: United Nations Educational, Scientific and Cultural Organization; 2013. Available from: http://www.broadbandcommission. org/work/working-groups/education/BD_bbcomm-education_2013.pdf [accessed 11 September 2013].

- Key global telecom indicators for the world telecommunication service sector. Geneva: International Telecommunication Union; 2013. Available from: http://www.itu.int/net/itu_search/index.aspx [accessed 11 September 2013].
- Kaplan WA. Can the ubiquitous power of mobile phones be used to improve health outcomes in developing countries? *Global Health* 2006;2:9–14. doi: http://dx.doi.org/10.1186/1744-8603-2-9 PMID:16719925
- Erhel S, Jamet E. Digital game-based learning: impact of instructions and feedback on motivation and learning effectiveness. *Comput Educ* 2013;67:156–67. doi: http://dx.doi.org/10.1016/j.compedu.2013.02.019
- Funes R, Hausman V, Rastegar A. Preparing the next generation of community health workers: the power of technology for training. New York: Dalberg Global Development Advisors; 2012. Available from: http://hetv.org/pdf/ power-of-technology-for-training.pdf [accessed 11 September 2013].
- Farhan H, D'Agostino D, Worthington H. WebIndex 2012. Geneva: World Wide Web Foundation & Oxford Economics; 2012. Available from: http:// thewebindex.org/2012/10/2012-Web-Index-Key-Findings.pdf [accessed 11 September 2013].
- 12. Tella A, Mutula SM. Gender differences in computer literacy among undergraduate students at the University of Botswana: implications for library use. *Malays J Libr Inf Sci* 2008;13:59–76.

A comprehensive health labour market framework for universal health coverage

Angelica Sousa,^a Richard M Scheffler,^b Jennifer Nyoni^c & Ties Boerma^d

In many developed and developing countries, progress towards attaining UHC is hindered by the lack of a health workforce large enough and with the proper skills to deliver quality services to the entire population. Several factors accentuate the problems associated with health worker shortages, especially in low- and middleincome countries: maldistribution and migration of the workforce, inappropriate training, poor supervision, unregulated dual practice, imbalances in skill-mix composition, and reduced productivity and performance.1 Such problems are, however, not limited to low- and middleincome countries; many high-income countries are likely to face severe shortages of health workers because of budget cuts for social services resulting from the global economic downturn. The ageing of the population puts further pressure on health systems by increasing the demand

for health care. Moreover, the changing dynamics of workforce migration, such as the increased exodus of workers from one developing country to another, pose a challenge for global health labour markets.²

Comprehensive health workforce policies

To address the challenges described and attain UHC, countries will have to develop effective policies to optimize the supply of health workers. This can only be accomplished through comprehensive planning of the health workforce based on an in-depth analysis of the health labour market to understand the driving forces affecting workforce supply and demand, both within countries and at the global level.

Partial health workforce policies designed on the basis of needs-based estimates and focused on training more health workers are not sufficient in addressing health worker shortages. The needs-based approach consists of estimating the number of health workers required to meet the needs of the population. Although these estimates are useful to inform the demand of health workers, they are not enough to formulate effective health workforce policies because they ignore the dynamics of the health labour market.³ Workforce shortages cannot be resolved by simply training more health workers; the health labour market conditions also have to be such that the newly-trained health workers can be absorbed into the health workforce. Otherwise, a fraction of them will migrate, work in another sector or remain unemployed and the resources

^a Department for Health Systems Policies and Workforce, World Health Organization, avenue Appia 20, 1211 Geneva 27, Switzerland.

^b School of Public Health and the Goldman School of Public Policy, University of California, Berkeley, United States of America.

^c Health Systems and Services, World Health Organization Regional Office for Africa, Brazzaville, Congo.

^d Department for Health Statistics and Informatics, World Health Organization, Geneva, Switzerland.

Correspondence to Angelica Sousa (e-mail: sousaa@who.int).

⁽Submitted: 9 April 2013 – Revised version received: 5 August 2013 – Accepted: 6 August 2013)

Fig. 1. Health labour market framework and policy levers for attaining universal health coverage (UHC)



Note: The supply of health workers is made up of the pool of qualified health workers willing to work in the health-care sector. The demand for health workers is represented by the public and private institutions that constitute the health-care sector.

Source: Adapted from Vujicic 2006 and 2012.⁶⁷

spent on training them will have gone to waste.⁴

Health labour market dynamics are the main determinant of the level of employment in a country – not the health needs of the population or the education sector alone. The health labour market is influenced by the health needs of the population, the demand for health services and the supply and governance of health workers. Together these factors determine workers' wages and allowances, the number of health workers employed, the number of hours they work, their geographical distribution, their employment settings, and their productivity and performance.⁵

The health labour market framework

The framework presented in Fig. 1 provides a comprehensive picture of health labour market dynamics and of the contributions of four groups of health workforce policies to the attainment of equitable access to quality health services and UHC.

The training of health workers as defined by the education market is a key determinant of a country's supply of new graduates - and hence of the supply of health labour. Production policies are those that pertain to the opening of new training institutions, the provision of scholarships, the offer of financial incentives for teaching staff, the alignment of health worker education with the health needs of the population, and the training of new cadres of health workers. These polices will succeed in producing enough health workers to fulfil the needs of the population only if they are designed in parallel with policies to ensure the absorption of new graduates into the labour market and to correct workforce maldistribution and inefficiencies.

The available supply of health workers – i.e. the number of qualified health workers willing to work for the health sector – is determined by wages, working conditions, safety and career opportunities. The demand for healthcare workers is determined by the needs of the population and the demand for health services. Health worker demand is represented by those private and public institutions that are willing and able to pay for health workers to staff clinics, hospitals or other parts of the health system. These institutions compete with the each other by having different wage rates, budgets, provider payment practices, labour regulations and hiring rules that compete favourably with working conditions in other labour markets in attracting health professionals, including new graduates.⁸

The available supply of health workers is undermined by migration and by the attrition of those who choose to work outside the health sector. In Kenya, for example, 61% of physicians are not willing to work in their home country under current working conditions and wages and prefer to migrate to Australia, Namibia or the United States of America.9 Between 1990 and 2004, Zambia experienced a large exodus of physicians. To discourage physicians from leaving the country, the government increased their wages by 16% between 2007 and 2011 - to an amount 15 times the per capita income and in excess of the average pay received by other professionals with similar education, such as lawyers. Yet despite this increase, a physician's average annual wage is only 21780 United States dollars.¹⁰ Policies to attract health workers back to the health-care sector, discourage their migration and mobilize the unemployed, range from increasing wages and providing extra allowances to improving working conditions, revising recruitment strategies and offering training opportunities. If we are to draw closer to attaining equitable access to quality health services for the entire population, these policies will need to be designed with several factors in mind, including the geographical distribution of the current health workforce, worker productivity and performance, the skillmix composition, and the allocation of health workers to the public and private sectors.

Although the shortage of health workers constrains service delivery, worker maldistribution, inappropriate training, poor supervision, low productivity and poor performance undermine the capacity of the existing supply of health workers to deliver quality services that are acceptable and accessible to the entire population. For example, Cameroon's capital city of Yaoundé has 4.5 times as many health workers per inhabitant as the country's poorest province.¹¹ Such large health workforce inequalities stem from the low retention of health workers in poorer areas, which results in less access to health services and worse health outcomes in those areas than in more prosperous ones. Several policies are designed to redress worker maldistribution and inefficiencies. They include the training of local health workers; the opening of new vacancies; the adoption of recruitment strategies to increase the supply of health workers in underserved or rural areas; the provision of allowances; the granting of scholarships; and the matching of workers' skills and tasks. UHC cannot be attained unless health workforce inefficiencies and resource wastage are eliminated by improving health worker productivity and performance.12

Virtually all countries have growing private health labour markets. Poli-

cies specifically designed to regulate the private sector need to be developed to ensure equitable access to quality health services for the entire population. In Sudan, for example, 90% of health workers engage in dual practice - i.e. they work in both the private and the public sector - but they do so informally, with little regulation. This jeopardizes the availability of health workers in the public sector and the quality of public health services.13 Staff training, service quality and dual practice are some of the areas in which regulatory policies are needed in the private health labour market.

Finally, the precise combination of health workforce policies intended to address worker shortages and maldistribution should be tailored to each country's particular context and to its population's health needs. In addition, innovative approaches such as task shifting and deployment of community health workers are needed to address inefficiencies and enhance equity in the delivery of services.

Conclusion

Health workforce policies that are partial rather than comprehensive, such as those that focus on education, are not effective in addressing health workforce shortages and ensuring equitable access to health services for a country's entire population. A health labour market framework can provide the comprehensive approach needed to fully understand the forces behind health workforce supply and demand and make it possible to develop effective health workforce polices for the attainment of UHC.

Competing interests: None declared.

References

- The world health report 2006: working together for health. Geneva: World Health Organization; 2006. Available from: http://www.who.int/whr/2006/ en/ [accessed 11 September 2013].
- WHO Global Code of Practice on the International Recruitment of Health Personnel. Geneva: World Health Organization; 2010. Available from: http:// www.who.int/hrh/migration/code/WHO_global_code_of_practice_EN.pdf [accessed 11 September 2013].
- Scheffler RM, Liu JX, Kinfu Y, Dal Poz MR. Forecasting the global shortage of physicians: an economic- and needs-based approach. *Bull World Health Organ* 2008;86:516–23B. doi: http://dx.doi.org/10.2471/BLT.07.046474 PMID:18670663
- Sousa A, Flores G. Transforming and scaling up health professional education: policy brief on financing education of health professionals. Geneva: Department for Health Systems Policies and Workforce, World Health Organization; 2013. Forthcoming.
- Scheffler R, Bruckner T, Spetz J. The labour market for human resources for health in low and middle income countries. Geneva: Department for Health Systems Policies and Workforce, World Health Organization; 2012. Available from: http://www.who.int/hrh/resources/observer11/en/index.html [accessed 11 September 2013].
- Vujicic M, Zurn P. The dynamics of the health labour market. Int J Health Plann Manage 2006;21:101–15. doi: http://dx.doi.org/10.1002/hpm.834 PMID:16846103
- Vujicic M. Shedding light on the invisible hand a labor market approach to health workforce policy. Presented at the: Annual Session of the American Dental Association, San Francisco, 18–21 October 2012. Chicago: American Dental Association; 2012.
- Glassman A, Becker L, Makinen M, De Ferranti D. Planning and costing human resources for health. *Lancet* 2008;371:693–5. doi: http://dx.doi. org/10.1016/S0140-6736(08)60311-6 PMID:18295030

- Kiambati H, Kiio CK, Toweett J. Understanding the labour market and productivity of human resources for health: country report Kenya. Geneva: Department for Health Systems Policies and Workforce, World Health Organization; 2013. Available from: http://www.who.int/hrh/tools/ labour_market/en
- Kamwanga J, Koyi G, Mwila J, Musonda M, Bwalya R. Understanding the labour market and productivity of human resources for health: country report Zambia. Geneva: Department for Health Systems Policies and Workforce, World Health Organization; 2013. Available from: http://www. who.int/hrh/tools/labour_market/en
- Ngah-Ngah S, Kingue S, Peyou MN, Bela AC. Understanding the labour market and productivity of human resources for health: country report Cameroon. Geneva: Department for Health Systems Policies and Workforce, World Health Organization; 2013. Available from: http://www.who.int/hrh/ tools/labour_market/en
- The world health report 2010 health systems financing: the path to universal coverage. Geneva: World Health Organization; 2010. Available from: http://www.who.int/healthsystems/topics/financing/healthreport/ whr_background/en/ [accessed 11 September 2013].
- Abu-Agla A, Ahmed N, Ahmed N, Badr E. Understanding the labour market and productivity of human resources for health: country report Sudan. Geneva: Department for Health Systems Policies and Workforce, World Health Organization; 2013. Available from: http://www.who.int/hrh/tools/ labour_market/en

Can human resources for health in the context of noncommunicable disease control be a lever for health system changes?

Sania Nishtar^a & Johanna Ralston^b

Major global shifts are shaping health priorities in the wake of new challenges and emerging opportunities. While reaffirming a commitment to accelerate progress on the Millennium Development Goals, discussions on the post-2015 agenda have also focused on the importance of noncommunicable diseases (NCDs).¹ Efforts are also under way to enhance countries' commitment to universal health coverage (UHC) and to overcome the system constraints that are hampering progress towards achieving disease-specific targets. Despite auspicious directions, the journey is fraught with obstacles. A focus on human resources for health (HRH) in the context of NCD control could be a lever for health system change after 2015 by leading to measures designed to improve health systems more broadly.

This view is supported by several trends. First, the required shift from the care of acute infectious diseases to chronic conditions entails a reorientation of health systems for which human resources can be an important lever. This effect has been shown in programmes for the control of human immunodeficiency virus (HIV) infection that have relied heavily on changes in the terms and conditions of employment: task sharing and task shifting strategies were designed; information systems, supply chains and service delivery norms were tailored towards chronic disease care; new referral systems and appointment and defaulter tracking methods were introduced; and worker training was focused on the use of new instruments, such as appointment books, patient counselling guidelines, medical records and standardized treatment protocols.² Besides these measures, HIV programmes have also employed

non-traditional human resource strategies in the form of engagement with nongovernmental organizations, service recipients, peer educators, treatment partners and expert clients.³ In the context of NCD management, human resources can be strategically leveraged in similar fashion to reorient systems towards chronic care more broadly.

Second, the "health in all policies" approach is gaining appeal with the growing recognition that many paths towards improving health lie outside the health-care system.⁴ New stewardship capacities are required to ensure appropriate institutional mechanisms and partisan agreements, a collaborative division of labour, a commitment to shared goals and accountability for results. Change is possible only if the right human resource competencies are present at the starting point. The prevention and control of NCDs provide a platform for intersectoral engagement, both through "health in all policies" and through a more issue-centric approach, such as tobacco control.⁵

Third, NCDs are the focus of most of the information and communication technology-based solutions designed to overcome human resource shortages and geographic access constraints to health care. Among them are health education to promote patient screening for NCDs and cell-phone-enabled medication adherence tools for the management of asthma and diabetes, some of which have shown clinical benefits in trials.^{6,7} Now that 95% of the world's population has access to mobile signals, these approaches could help to overcome critical health worker shortages, to the benefit of the one billion people in the world who would otherwise never have access to a health professional. Sim card applications, which can be powered by any type of phone, can provide health service access to patients and communities in settings where health worker shortages are not amenable to quick fixes. These emerging tools for NCD control create opportunities for revising health worker roles and maximizing the effectiveness of health systems.

HRH are also an important lever in post-2015 efforts to attain UHC. Of all the resources that factor into the health system - financial, physical, technological and human - human resources are the most strategic. Individually or collectively, they can generate change within the system.8 For example, decentralization of authority from a higher government level to the subnational level can enhance accountability. Outsourcing of health service management and new service delivery arrangements can lead to improved performance. Definition of new rules of engagement between public and private entities in the health system and new recruitment and retention mechanisms, together with empowerment of facilities by granting them increased autonomy, can affect staff incentives and, consequently, morale and performance. As health systems are reoriented towards the control of NCDs, these measures become potential pathways towards health system reform.

In summary, human resources for health are vital for mainstreaming changes in health systems and in the broader social system that affects the health of the population. Emerging agendas in the post-2015 landscape offer an opportunity to tap to the fullest the potential of human resources for health.

^b World Heart Federation, Geneva, Switzerland.

Correspondence to Sania Nishtar (e-mail: sania@heartfile.org).

(Submitted: 23 April 2013 – Revised version received: 4 September 2013 – Accepted: 5 September 2013)

^a Heartfile, 1 Park Road, Chak Shahzad, Islamabad, Pakistan.

References

- The World We Want [Internet]. Health thematic consultation. New York: United Nations; 2013. Available from: http://www.worldwewant2015.org/ health [accessed 8 September 2013].
- Rabkin M, Kruk ME, El-Sadr WM. HIV, aging and continuity care: strengthening health systems to support services for noncommunicable diseases in low-income countries. *AIDS* 2012;26(Suppl 1):S77–83. doi: http://dx.doi.org/10.1097/QAD.0b013e3283558430 PMID:22781180
- Porter ME, Lee S, Rhatigan J, Kim JY. Partners in health: HIV care in Rwanda. Cambridge: Global Health Delivery Project at Harvard University; 2009 (Case Study N9-709-474). Available from: http://cb.hbsp.harvard. edu/cb/web/product_detail.seam?E=630151&R=709474-PDF-ENG&conversationId=153494 [accessed 8 September 2013].
- Adelaide Statement on Health In all Policies. Geneva: World Health Organization & Government of South Australia; 2010. Available from: http:// www.who.int/social_determinants/hiap_statement_who_sa_final.pdf [accessed 8 September 2013].
- United Nations General Assembly. Political Declaration of the High Level Meeting of the General Assembly on the prevention and control of Non-Communicable diseases. New York: UNGA; 2011. Available from: http:// www.un.org/en/ga/ncdmeeting2011/pdf/NCD_draft_political_declaration. pdf [accessed 8 September 2013].
- Sankaranarayanan R, Nene BM, Shastri SS, Jayant K, Muwonge R, Budukh AM et al. HPV screening for cervical cancer in rural India. *N Engl J Med* 2009;360:1385–94. doi: http://dx.doi.org/10.1056/NEJMoa0808516 PMID:19339719
- Bartolini E, McNeill E. Getting to value: eleven chronic disease technologies to watch. Cambridge: NEHI; 2012. Available from: http://www.nehi.net/ publications/72/getting_to_value_eleven_chronic_disease_technologies_ to_watch [accessed 8 September 2013].
- 8. Nishtar S. *Choked pipes: reforming Pakistan's health system*. Oxford: Oxford University Press; 2010.

Corrigendum

In Volume 91, Issue 6, June 2013, page 420, the x-axis of Fig. 3 should read "Global burden of disease in million DALYs".



In Volume 91, Issue 9, September 2013, on page 704: the 10th author's name should read "Jennifer Kidwell Drake".

In Volume 91, Issue 10, October 2013, on page 722, paragraph 6, the 2nd sentence should read: "Cardiovascular disease, including heart disease and stroke, accounts for 62% of those deaths – higher than the global average of 48% – while cancer causes almost 13% of them."