



## Strengthening of primary-care delivery in the developing world: IMAI and the need for integrated models of care

September, 2013, marked the 35th Anniversary of the 1978 Declaration of Alma-Ata, an agreement in which WHO member states outlined a comprehensive vision for primary health care that addressed provision of medical services and wider structural and community needs.<sup>1</sup> More than three decades later, effective, high-quality primary care is still an elusive goal for most countries. This status partly shows a failure to develop practical, operational models of primary-care delivery in the developing world in the wake of Alma-Ata. Instead, the global health community turned to programmes smaller in scope and thus deemed more feasible, rapid, and measurable.<sup>2</sup> This choice is partly why primary care and its attendant metrics often refer to targeted initiatives—eg, immunisation campaigns or childhood interventions for children younger than 5 years—rather than more generalised, systems-based interventions.

When *The Lancet* revisited Alma-Ata on its 30th anniversary in 2008, editors and contributors recommended a recommitment to primary care, broader global-health targets, and better integration.<sup>3-6</sup> Similarly to primary care, integration has several layers, including the integration of multiple social and economic sectors that affect primary care, integration of structures and programmes on the health-systems level, and, clinically, integration of services for multiple diseases into essential packages of care.<sup>7</sup> Published studies suggest that concise integrated management guidelines can help to improve quality of comprehensive primary-care delivery,<sup>8</sup> much as standardised protocols have improved quality within disease-specific programmes.<sup>9</sup> Several examples exist of successful integration of services for one disease programme (eg, tuberculosis,<sup>10</sup> sexually transmitted infections,<sup>11</sup> non-communicable diseases,<sup>12</sup> and family planning<sup>13</sup>) with a second programme (commonly HIV<sup>14</sup>), whereas other groups have proposed so-called diagonal approaches<sup>15</sup> to service integration around, for example, women's health. Perhaps most notably, the WHO/UNICEF Integrated Management of Childhood Illness (IMCI) framework has been widely implemented and has proven successful in integrating treatment for multiple specific diseases (eg, acute respiratory infections, anaemia, diarrhoea or dehydration, and

malaria) to improve overall quality of care for children younger than 5 years, when delivered by well-trained and well-supported multipurpose health workers. Despite equivocal findings from long-term effectiveness studies,<sup>16</sup> IMCI leads to reductions in childhood mortality and overall cost-savings to health systems.<sup>17,18</sup>

Also developed by WHO, the Integrated Management of Adult and Adolescent Illness (IMAI)<sup>19</sup> is an analogous guideline that integrates discrete vertical interventions into a single operational model at the point of care. Although IMAI has received little attention or examination, we propose that, with adequate support, research, and iterative improvement, it could have an important role in improvement of primary-care delivery in low-income settings.

Apart from specific programmes for maternal health, HIV, tuberculosis, malaria, and other (mainly infectious) diseases, adult and adolescent ambulatory care in the developing world is neither standardised nor well

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### Panel: Implementation of and research priorities for Integrated Management of Adult and Adolescent Illness (IMAI)

- 1 Needs assessment: Few data exist that define quality of care for adult ambulatory acute care at outpatient departments. A baseline assessment of outpatient department care has recently been done in Rwanda (Vasan, unpublished data), but this must be replicated in multiple settings with varying epidemiology to establish quality gaps and better define the specific role of IMAI in different environments.
- 2 Implementation: IMAI's implementation as a strategy to drive quality improvement for outpatient departments and adult ambulatory acute care must be supported. As with IMCI, IMAI will need strong training programmes, implementation support from Ministries of Health and non-governmental partners, and a robust follow-up involving mentoring, supervision, and quality improvement infrastructure to ensure that post-training increases in quality are sustained.
- 3 Validation: Questions still exist regarding whether the IMAI case-management guidelines provide valid approaches to triage, screening, diagnosis and assessment, and management and referral. IMAI must undergo rigorous validation studies against gold-standard assessment and treatment, and in this way the guidelines can be adjusted and improved to emphasise those protocols that prove most useful in approximating causal diagnosis and management.
- 4 Assessment and effectiveness research: A multicountry assessment of IMAI is needed, in the same way as for Integrated Management of Childhood Illnesses. After sustained implementation we must define and measure IMAI's effect on quality of care, nurse performance, and short-term outcomes for specific illnesses, and its effect on the health system—eg, the triage of severely ill patients, screening for and integration with chronic disease programmes, establishment of a robust referral network from health centres to district hospitals, and generation of efficiencies and cost savings to the health system.

integrated. Especially in low-income countries with tiered health systems, most adult and adolescent primary care is delivered through outpatient departments.<sup>7</sup> These departments deliver general care and some specialty care together while principally addressing acute problems. Apart from disease-specific protocols in national guidelines, however, little reference material exists for use during general patient consultations at outpatient departments. Charting is often minimum, typically in a single-line register format specific to that encounter, which indicates a pattern of acute, episodic, and often suboptimum care. Little is known of whether nurses provide adequate screening or prevention counselling. Perhaps most importantly, attempts at iterative changes or improvements are often not mentioned. Ironically, this paucity of data and literature limits further investment and examination, perpetuating a cycle of ignorance about an important area of health-care delivery.

Building on the success of IMCI and recognising the needs in adult primary care, WHO developed IMAI as a series of simplified, syndromic protocols to diagnose and manage common adult illnesses in low-income settings. Using the universal approach to the patient history and physical examination, each protocol classifies patients according to clinical severity and disease chronicity for a presenting symptom complex—eg, fever, diarrhoea, or cough. The protocols then provide prescriptive algorithms for appropriate treatment, follow-up, and referral, as well as counselling and prevention recommendations. Like IMCI, IMAI integrates proven disease-specific clinical protocols, including for malaria, HIV/AIDS, sexually transmitted infections, pneumonia, and tuberculosis. By targeting nurses and other multipurpose health workers, IMAI is aimed at improvement of care at the front line of the facility-based health system through service integration, and is the first guideline of its kind to do so for adult and adolescent primary care.

Because IMAI was developed in parallel with the movement to expand antiretroviral therapy for HIV/AIDS, WHO also produced the *IMAI Chronic HIV Care with ART handbook*,<sup>20</sup> which has been the focus of most published research on IMAI.<sup>21,22</sup> The small amount of literature on the IMAI Acute Care protocols<sup>23</sup> has shown mixed but generally promising results, suggesting the potential for IMAI to positively affect general adult acute primary care<sup>24</sup> (Simoes E and colleagues, unpublished data; Seung KJ and

colleagues, unpublished data). Certainly, in view of the scarcity of data, further investigation is warranted.

By contrast with the robust implementation and research agenda for IMCI—which has been the subject of more than 200 studies and papers since its inception—the only available research on IMAI is as mentioned. There are several reasons for this paucity of data: first, a syndromic case-management approach—which is particularly useful in children who present with overlapping clinical signs and who often cannot relate detailed histories—is of less value in adults who present with a wide spectrum of symptoms, diseases, and underlying causes. Second, the population affected by adult and adolescent illness is hard to isolate, and without a clear target—eg, children younger than 5 years—rallying the necessary advocacy and funding becomes more challenging. When launched, IMCI effectively integrated the few existing interventions targeting children younger than 5 years—eg, programmes for immunisation, nutrition, and diarrhoeal disease. The myriad vertical programmes broadly targeting adults and adolescents make integration more complex, and thereby make measurement of the effect of IMAI on overall adult survival more difficult than measuring the effect of IMCI on child survival. Finally, IMAI does not address the community health and policy interventions necessary for comprehensive primary health care as outlined at Alma-Ata. Apart from HIV-focused guidelines on community-based palliative care and patient self-management, the present version of IMAI does not deal explicitly with the integration of facility and community-based care.

Despite the challenges and potential limitations, we contend that models such as IMAI can ignite a dialogue about the use of protocols to develop standards and to improve the integrated delivery of primary care. IMAI uses proven clinical approaches for specific illnesses and integrates them into a single guideline. This type of integration streamlines services for the patient and harmonises the monitoring, evaluation, and reporting of these conditions. IMAI also provides a beginning framework of integrating acute care with care for chronic, non-communicable diseases, which have long been recognised as integral to reform of primary care in the face of demographical and epidemiological transitions.<sup>25</sup> Specifically, IMAI does this by incorporating screening for HIV, tuberculosis, cardiovascular disease, and chronic respiratory disease into its standard and

integrated approach to the patient encounter, and gives clear follow-up and referral protocols to help distinguish between an acute event and an acute exacerbation of an underlying chronic illness. In this way, a system of primary-care delivery organised around IMAI provides a clear entry-point for patients with chronic disease who could be missed in the present model designed for acute care and episodic patient contact.

Finally, through its general prophylaxis section, IMAI also makes a first attempt to integrate preventive care in a standardised and operational way by addressing topics such as insecticide-treated mosquito nets, screening for alcohol abuse, and safe-sex practices.

Comprehensive and integrated primary health care encompasses more than the ambulatory services delivered to adults and adolescents and addressed by models such as IMAI, but improvement of primary-care delivery in poor countries will necessitate rigorously tested operational models. A paradigm shift is needed to give health-care providers a more sophisticated and standardised approach to the patient which integrates acute and chronic care, and prevention and treatment. Definition and implementation of a standard of primary-care delivery will serve as the basis for ongoing quality-improvement efforts. To achieve its potential in contributing to a vision of integrated global primary care, IMAI—or any such model—will need support (panel). We recognise that disease-specific health initiatives are, and will continue to be, an integral part of the fabric of global primary care; such initiatives should complement, not compete with, one another. IMAI provides a clearly-defined approach to integrated primary-care delivery in the developing world that can be implemented, tested, analysed, iterated, and improved on. With a robust evidence base, we can deliver on the promise made by Alma-Ata more than 30 years ago.

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- 1 International Conference on Primary Health Care. Declaration of Alma-Ata. USSR, Sept 6–12, 1978. [http://www.phc35.kz/files/Alma-Ata\\_declaration\\_en.pdf](http://www.phc35.kz/files/Alma-Ata_declaration_en.pdf) (accessed June 6, 2013).
- 2 Walsh JA, Warren KS. Selective primary health care: an interim strategy for disease control in developing countries. *N Engl J Med* 1979; **301**: 967–74.
- 3 The Lancet. A renaissance in primary health care. *Lancet* 2008; **372**: 863.
- 4 Chan M. Return to Alma-Ata. *Lancet* 2008; **372**: 865–66.
- 5 Walley J, Lawn JE, Tinker A, et al. Primary health care: making Alma-Ata a reality. *Lancet* 2008; **372**: 1001–07.
- 6 Rohde J, Cousens S, Chopra M, et al. 30 years after Alma-Ata: has primary care worked in countries? *Lancet* 2008; **372**: 950–61.
- 7 Frenk J. Reinventing primary care: the need for systems integration. *Lancet* 2009; **374**: 170–73.
- 8 Lawn JE, Rhode J, Rifkin S, et al. Alma-Ata 30 years on: revolutionary, relevant, and time to revitalise. *Lancet* 2008; **372**: 917–27.
- 9 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.
- 10 Harris JB, Hatwiinda SM, Randels KM, et al. Early lessons from the integration of tuberculosis and HIV services in primary care centers in Lusaka, Zambia. *Int J Tuberc Lung Dis* 2008; **12**: 773–79.
- 11 Sweeney C, Dayo Obure, CB Maier, et al. Costs and efficiency of integrating HIV/AIDS services with other health services: a systematic review of evidence and experience. *Sex Transm Infect* 2012; **88**: 85–99.
- 12 Marais BJ, Lönnroth K, Lawn SD, et al. Tuberculosis comorbidity with communicable and non-communicable diseases: integrating health services and control efforts. *Lancet Infect Dis* 2013; **13**: 436–48.
- 13 Uebel KE, Joubert G, Wouters E, et al. Integrating HIV care into primary care services: quantifying progress of an intervention in South Africa. *PLoS One* 2013; **8**: e54266.
- 14 Walton DA, Farmer PE, Lambert W, Leandre F, Koenig SP, Mukherjee JS. Integrated HIV prevention and care strengthens primary health care: lessons from rural Haiti. *J Pub Health Pol* 2004; **25**: 137–58.
- 15 Gounder CR, Chaisson RE. A diagonal approach to building primary healthcare systems in resource-limited settings: women-centred integration of HIV/AIDS, tuberculosis, malaria, MCH and NCD initiatives. *Trop Med Int Health* published online Nov 1, 2012. DOI:10.1111/j.1365-3156.2012.03100.
- 16 Arifeen SE, Hoque DME, Akter T, et al. Effect of the Integrated Management of Childhood Illness strategy on childhood mortality and nutrition in a rural area in Bangladesh: a cluster randomised trial. *Lancet* 2009; **374**: 393–403.
- 17 Armstrong-Schellenberg JRM, Adam T, Mshinda H, et al. Effectiveness and cost of facility-based Integrated Management of Childhood Illness (IMCI) in Tanzania. *Lancet* 2004; **364**: 1583–94.
- 18 Bryce J, CG Victora, et al. Programmatic pathways to child survival: results of a multi-country evaluation of Integrated Management of Childhood Illness. *Health Policy Plan* 2005; **20** (suppl 1): i5–i17.
- 19 WHO. IMAI/IMCI health centre/primary care guideline modules. <http://www.who.int/hiv/pub/imai/primary/en/> (accessed June 10, 2013).
- 20 WHO. IMAI Chronic HIV Care with ARV therapy and prevention. [http://www.who.int/hiv/pub/imai/primary\\_arv/en/index.html](http://www.who.int/hiv/pub/imai/primary_arv/en/index.html) (accessed April 15, 2013).
- 21 Vasani A, Kenya-Mugisha N, Seung KJ, et al. Agreement between physicians and non-physician clinicians in starting antiretroviral therapy in rural Uganda. *Hum Resour Health* 2009; **7**: 75.
- 22 Clark G, Chapman Y, Francis K. Surveying health professionals' satisfaction with the Integrated Management of Adult and Adolescent Illness Chronic HIV Care training programme: the Papua New Guinea experience. *Int J Nurs Pract* 2009; **15**: 519–24.
- 23 WHO. Acute Care. Jan 7, 2009. [http://www.who.int/hiv/pub/imai/primary\\_acute/en/index.html](http://www.who.int/hiv/pub/imai/primary_acute/en/index.html) (accessed June 10, 2013).
- 24 Woldie M, Enquesselassie F. Assessment of the validity of the guideline for integrated management of adult and adolescent illnesses on HIV patients in Addis Ababa, Ethiopia. *Ethiop Med J* 2009; **47**: 195–203.
- 25 Beaglehole R, Yach D. Globalisation and the prevention and control of non-communicable disease: the neglected chronic diseases of adults. *Lancet* 2003; **362**: 903–08.