

Disease Eradication and Health Systems

From "Disease Eradication in the 21st Century: Implications for Global Health,"
edited by Stephen L. Cochi and Walter R. Dowdle. Strüngmann Forum Reports, vol. 7,
Julia R. Lupp, series editor. Cambridge, MA: MIT Press. ISBN 9780262016735.

From "Disease Eradication in the 21st Century: Implications for Global Health,"
edited by Stephen L. Cochi and Walter R. Dowdle. Strüngmann Forum Reports, vol. 7,
Julia R. Lupp, series editor. Cambridge, MA: MIT Press. ISBN 9780262016735.

Integration of Eradication Initiatives and Health Systems

Alan R. Hinman

Abstract

A wide range of strategies can be used to deliver health interventions, from single interventions to comprehensive preventive and curative services. Increasingly, policy makers, donors, and other development agencies are advocating the integration of interventions to achieve a comprehensive health system. This chapter considers the relative merits and contributions of single interventions and health systems, the opportunities and challenges for categorical programs in a health sector reform environment, the evidence on interactions between elimination/eradication initiatives and health systems, and the global movement toward integration.

The introduction of new vaccines has had many positive impacts on both immunization and health systems. These impacts, however, have not automatically been positive or negative. Characteristics of successful integration of child and maternal health services with immunization programs are (a) program compatibility (i.e., appropriate matching of programs based on staff skill requirements, program objectives, recommended timing of interventions, target populations, and drug/treatment characteristics), (b) existence of a robust immunization service, (c) support from key stakeholders, and (d) decentralization of health services.

At present, approximately 100 global health initiatives address a range of problems, from HIV/AIDS, trachoma, and meningitis, to reproductive health, health policy, and systems. Several of these initiatives feature periodic mass distribution of drugs or vaccines, often reaching people who would otherwise not be served by existing ongoing services. Still, these initiatives may divert health personnel from other duties.

Integrating comprehensive and categorical programs brings advantages as well as challenges. Careful planning is needed to ensure that targeted approaches and the development objectives for health systems are met in ways that maximize positive synergies while minimizing potential conflicts. Specific approaches and indicators are needed to help us achieve the common goal of preventing illness and saving lives.

Introduction

Many interventions (e.g., immunizations, prenatal care, tuberculosis treatment, sexually transmitted disease treatment, and family planning services) have been shown to be effective as well as cost-effective in preventing disease, disability, and death. However, they are not uniformly applied throughout the world; poor countries typically have the lowest rate of implementation due to a lack of human or financial resources and system capacity. As a result, in 2010, approximately 7.7 million children under the age of 5 years died (Rajaratnam et al. 2010). Of the estimated 10 million child deaths in 2000, analysis indicated that 63% of these deaths could have been avoided if proven and cost-effective interventions, which were demonstrated to be feasible to implement in developing countries, had been applied (Black et al. 2003; Jones et al. 2003).

Health interventions can be delivered along a spectrum of strategies:

- single intervention (e.g., smallpox vaccination, malaria treatment),
- integration of similar interventions (e.g., Expanded Program on Immunization, or EPI),
- opportunistic (or “convenience”) integration with interventions that have different goals, but which can be delivered in the same manner (e.g., adding distribution of insecticide-treated bed nets to existing delivery systems for immunization),
- integration of a package of services which may or may not have the same delivery strategy and similar aims (e.g., Integrated Management of Childhood Illnesses, IMCI), and
- full integration of all clinical preventive and curative services (e.g., comprehensive primary care).

Over the past century, programs have been developed at national, regional, and global levels to address individual health problems or interventions (e.g., immunization). The most successful global intervention to date has been the global eradication of smallpox. Since 1974, the EPI, which is coordinated by the World Health Organization (WHO), has provided a basic set of immunizations (BCG, DTP, OPV, and measles) to infants around the world (WHO 2010b). More recently, hepatitis B and *Haemophilus influenzae* type b vaccines have been added, and rotavirus and pneumococcal conjugate vaccines will soon be introduced.

Increasingly, policy makers, donors, and other development agencies have advocated integrating selected interventions or broader integration to achieve a comprehensive health system. WHO describes health systems as containing six building blocks (WHO 2007a): service delivery; health workforce; information; medical products, vaccines, and technologies; financing; and leadership and governance (stewardship).

In this chapter, I discuss the relative merits and contributions of single interventions and health systems, the opportunities and challenges for

categorical programs in a health sector reform environment, the evidence base regarding the interaction between eradication/elimination and health systems, and the global movement toward integration.

Horizontal versus Vertical Programs

Forty-five years ago Gonzalez (1965:9) wrote:

There are two apparently conflicting approaches to which countries should give careful consideration....The first, generally known as the "horizontal approach," seeks to tackle the over-all health problems on a wide front and on a long-term basis through the creation of a system of permanent institutions commonly known as "general health services." The second, or "vertical approach," calls for solution of a given health problem by means of single-purpose machinery. For the latter type of programme the term "mass campaign" has become widely accepted.

Proponents of focused (categorical, vertical, or, as Gonzalez described them, "mass campaign") programs point to the ability to set (and achieve) specific objectives, establish clear lines of supervision, and measure the impact of the interventions. Proponents of more comprehensive health development (horizontal) activities cite the ability to provide a range of services that more comprehensively serve the needs of individuals and which can be more responsive to local situations. However, it may be difficult to set measurable objectives, and they may not provide dramatic or visible impact.

Competition for funds and international recognition pushes health professionals toward vertical initiatives, despite nominal support for an integrative health system approach (Béhague and Storeng 2008). In addition, research practices contribute to the dominance of vertical strategies, because it is easier to measure their impact as compared to horizontal programs.

Atun et al. (2010) have developed a conceptual framework to analyze the integration of targeted health interventions into health systems. They point out that "while the terms 'vertical' and 'integrated' are widely used, they each describe a range of phenomena. In practice the dichotomy between vertical and horizontal is not rigid, and the extent of verticality or integration varies between programmes" (Atun et al. 2010:104). Their approach assesses the complexity (difficulty) of integration based on the number of episodes of care required and the number of elements in the intervention, the levels of care involved and the number of stakeholders involved in delivery of the intervention, and the relative dominance of technology versus behavior and level of user engagement.

Commemorating the 30th anniversary of the Declaration of Alma-Ata on primary health care, Lawn et al. (2008:917) commented that

health has moved from under-investment, to single disease focus, and now to increased funding and multiple new initiatives. For primary health care, the debate of the past two decades focused on selective (or vertical) versus comprehensive (horizontal) delivery, but is now shifting toward combining the strengths of both approaches in health systems. Debates of community versus facility-based health care are starting to shift toward building integrated health systems.

Health Sector Reform and Categorical Programs

Integration of health systems and eradication or elimination initiatives bears some similarity to the efforts at health sector reform in the 1990s, which typically featured decentralization of authority and integration of services, often to the detriment of targeted programs. To advance tuberculosis control in a reforming system, the following recommendations were made (Weil 2000):

- participation in the planning process,
- demonstration of the synergy between reform objectives and TB control,
- articulation of core functions to be protected,
- technical, managerial, and leadership capacity-building,
- documentation of effects and best practices,
- collaboration with those pursuing other public health priorities and reform analysis.

With respect to immunizations, “reforms are likely to involve operational changes in the way that immunization services are to be managed. Integration of services is often perceived to provide a more cost-effective approach than the vertical programs” (Feilden and Nielsen 2001:vi). Feilden and Nielsen recommend that the opportunity offered by reforms to extend the standards developed for immunization to other aspects of primary health care should be taken, as this will reinforce good management practices and build capacity. In addition, new approaches to funding arrangements in support of immunization, especially for the procurement of specialized equipment, need to be considered.

An *ad-hoc* working group of WHO’s Strategic Advisory Group of Experts has reviewed the literature that reports on the impact of new vaccine introduction on immunization and health systems, a form of integration (WHO Strategic Advisory Group of Experts 2010). They looked at the impact of new vaccine introduction on the six components of health systems and concluded that although the introduction of new vaccines has positively impacted both the immunization and health systems, the impacts were not automatically positive or negative. Impacts may vary, depending on the strengths or weakness in the existing health systems. They are also affected by the type and relevance of the service delivery modality under specific socioeconomic, institutional, and cultural circumstances.

Evidence on the Interaction between Eradication Initiatives and Health Systems

Many assertions have been made regarding the positive and negative effects of integration. The evidence base includes projections of what might happen if services were integrated as well as direct measures of what has happened as a result of integration.

Ekman et al. (2008) report on experiences from a variety of countries which show that outcomes in maternal, newborn, and child health can be improved through integrated packages of cost-effective health care interventions that are implemented incrementally in accordance with the capacity of health systems. They assert that maternal, newborn, and child health cannot be effectively improved and sustained by vertical approaches, and identify the following barriers to effective implementation of integrated interventions:

- weak health systems that are seen as unable to cope with integrated approaches,
- desire of donors and governments for evidence of success within short time frames,
- other fields promise immediate results,
- charismatic leadership for single issues to the detriment of broader development of primary health care,
- splits between clinical disciplines, organizations, and clinical and public health management structures,
- financial incentives to allow inefficient international financial and technical support.

In their systematic review of evidence on interventions to improve maternal, newborn, and child health, Bhutta et al. (2008) identified 37 key promotional, preventive, and treatment interventions and strategies for delivery in primary health care. Some (e.g., immunization, vitamin A supplementation, preventive zinc supplementation, insecticide-treated bed net distribution, and intermittent preventive treatment for prevention of malaria) are suitable for integration with eradication/elimination interventions. Others require the existence of functional primary health care delivery systems. Bhutta et al. estimate that full implementation of the evidence-based interventions in Pakistan and Uganda could prevent 20–30% of all maternal deaths, 20–21% of newborn deaths, and 29–40% of post-neonatal deaths in children under 5 years of age.

Wallace et al. (2009) carried out a systematic review of the literature to assess the benefits, challenges, and characteristics of integrating child and maternal health services with immunization programs. Searching through journal databases and gray literature, they evaluated studies based on the quality of methodology: 27 papers met their inclusion criteria describing 19 integration projects, 15 set in Africa. Services integrated with immunization services were vitamin A supplementation (8 projects), bed net distribution (8),

intermittent preventive therapy for infants for malaria (7), deworming tablet distribution (6), and referrals for family planning services (7). Several studies integrated more than two interventions. Of the papers describing changes in vaccine coverage after integration of other services, none reported a negative impact on immunization coverage; all reported increases in coverage of the integrated interventions. A number of benefits were associated with program integration, particularly when compatible interventions were integrated with strong immunization programs. These included rapid increases in the linked intervention to levels comparable to that of the immunization program. Competition between programs that had been competing for the same resources fell after integration. Additionally, communities might prefer integrated services because less effort on the part of individuals is required to receive services.

Some of the challenges to integration included persistently unequal resource allocation to the different interventions, which results in poor uptake of the intervention that does not receive the same level of resources. Other factors mentioned were overburdening of staff (particularly when staff did not receive adequate training in the added intervention), the possibility that nonintegrated activities and objectives might be ignored, and poor integration of data management systems.

The key characteristics of successful integration were program compatibility (appropriate matching of programs based on staff skill requirements, program objectives, recommended timing of interventions, target populations, and drug/treatment characteristics), existence of a robust immunization service, support from key stakeholders, and decentralization of health services.

In a separate study, Wallace (2005) studied integration of lymphatic filariasis elimination with other health interventions in Tanzania. He found that the following key factors and methods contribute to successful integration:

- Program selection is based on similar requirements and criteria.
- Communities are involved in scheduling of frontline workers' multiple tasks.
- A trained frontline worker in the community is present.
- The drug used has been integrated into national drug-delivery system.
- The drug used has been added to essential drug list.
- Program activities have been added to national budget.
- Communities have been sensitized to integration process.
- Decentralization reform to the district level exists.
- Integration is part of the district council health plan.
- The role of the NGO partner has shifted to technical support.
- Multiple partners and government are used.
- Joint training exists.

Not all integration results have a demonstrably positive impact, however. Bryce et al. (2010) evaluated the success of the Accelerated Child Survival

and Development (ACSD) program in three countries in West Africa: Benin, Ghana, and Mali. The ACSD program provided packages of interventions:

- Immunization plus (EPI+) adds vitamin A supplementation and distribution of insecticide-treated bed nets.
- Antenatal care (ANC+) provides intermittent preventive treatment of malaria in pregnant women, tetanus immunization during pregnancy, and supplementation with iron and folic acid during pregnancy and vitamin A postpartum.
- Improved management of pneumonia, malaria, and diarrhea (IMCI+) promotes exclusive breastfeeding up to 6 months, improved and integrated management of children with pneumonia, malaria, and diarrhea, and household consumption of iodized salt.

Although there were decreases in mortality in children <5 years in the ACSD areas, the decreases were not greater than those in comparison areas. Bryce et al. (2010:572) concluded:

The ACSD project did not accelerate child survival in Benin and Mali focus districts relative to comparison areas, probably because coverage for effective treatment interventions for malaria and pneumonia were not accelerated, causes of neonatal deaths and under nutrition were not addressed, and stock shortages of insecticide-treated nets restricted the potential effect of this intervention.

In a study of the interactions between a multi-intervention neglected tropical diseases initiative in Mali (four drugs targeting five diseases) and the country health system at the health center level, Cavalli et al. (2010:2) found at the local level that

campaign effects of care delivery differed across health services. In robust and well staffed health centres, the personnel successfully facilitated mass drug distribution while running routine consultations, an overall service functioning benefitted from programme resources. In more fragile health centres however, additional program workload severely disturbed access to regular care, and [they] observed operational problems affecting the quality of mass drug distribution. Strong health services appeared to be profitable to the NTD control program as well as to general care.

They concluded that “health system strengthening will not result from the sum of selective global interventions but requires a comprehensive approach.”

Global Movement toward Integration

Over the past 20–25 years, several global initiatives have been launched that have attracted large-scale funding from development agencies, multilateral institutions, and foundations. For example, the Polio Eradication Initiative (Polio Eradication Initiative 2010a), which is nearing achievement of its

target, has expended more than USD 6 billion over the period 1985–2010. The Onchocerciasis Control Initiative, which features donations of Mectizan® (ivermectin) from Merck, has provided more than 700 million treatments since 1987 (Mectizan Donation Program 2010). Innovative mechanisms were developed to fund these initiatives, including the Global Fund to fight AIDS, Tuberculosis, and Malaria (GFATM), which has provided USD 19.3 billion since 2002 for more than 572 programs in 144 countries. GFATM provides a quarter of all international financing for global activities against HIV/AIDS, two-thirds for tuberculosis, and three-quarters for malaria (GFATM 2010). As of August 2008, the GAVI Alliance had approved a total of USD 3.7 billion to countries for the period 2000–2015 to support introduction and use of new and underused vaccines as well as to support immunization and health system strengthening in the poorest countries of the world (GAVI Alliance 2010a). Several of these initiatives feature periodic mass distribution of drugs, vaccines, or other modalities, which are often successful in reaching people who do not normally have access to existing health services. At the same time, however, the campaigns may divert health personnel from other duties to participate in the campaign.

At present, there are approximately 100 global health initiatives (GHIs) which address a variety of health issues, ranging from HIV/AIDS, trachoma, and meningitis to reproductive health, health policy, and systems. GHIs represent “a concerted effort by several countries to finance the delivery of specific types of services for priority health problems that arise in many low-income countries” (WHO Maximizing Positive Synergies Collaborative Group 2009:2140). They bring significant levels of funding to target specific health issues. This can have a significant positive effect on the condition being targeted, but it can also distort a country’s ability to set priorities and allocate staff in a planned, rational manner.

Reviewing the patterns of financing for global health activities from 1990–2007, Ravishankar et al. (2009) found a major increase, from USD 5.6 billion to USD 21.8 billion, in overall development assistance during this time. Although GHIs constituted a major part, funding for broader health system development also increased. As development assistance increased, so did the call to make assistance more effective. The 2005 Paris Declaration on Aid Effectiveness set out a series of mutual commitments by donors and partner countries (OECD 2008a) in the following areas:

- Ownership: partner countries exercise effective leadership over their development policies and strategies and coordinate development actions.
- Alignment: donors base their overall support on partner countries’ national development strategies, institutions, and procedures.
- Harmonization: donors’ actions are more harmonized, transparent, and collectively effective.

- Managing for results: aid is managed and implemented in a way that focuses on the desired results, and information is used to improve decision making.
- Mutual accountability: donors and partners are accountable for development results.

Problems may result, however, from the large-scale influx of additional resources to a country brought about by GHIs. These resources can be huge relative to national budgets. They may exceed the absorptive capacity of the country’s health system and create distortions in the allocation of the health workforce (Tangcharoensathien and Patcharanarumol 2010). In addition, GHIs may not adequately address the existing bottlenecks in a country’s health system.

Given the unacceptably high, continuing burden of preventable child deaths, interest has increased in broadening the scope of health initiatives to deliver concurrently a number of interventions, primarily through what was described above as opportunistic integration. For example, in 2008, measles supplemental activities in 17 African countries also included vitamin A in 16 countries (>57 million doses), deworming in 10 countries (23.9 million doses), insecticide-treated bed nets (ITNs) in 6 countries (3.4 million nets), and oral polio vaccine (OPV) in 9 countries.

The WHO Maximizing Positive Synergies Collaborative Group (2009) has developed a conceptual framework of the interaction between GHIs and country health systems (Figure 15.1). They found that the evidence for the effect of GHIs and access and uptake of other health services that are not the specific target of their investments is weak and inconclusive, representing primarily associations rather than cause-and-effect relationships. Positive potential interactions could be that GHI services revitalize health facilities, increase reliability of supplies and availability of qualified personnel, and encourage community demand. In addition, GHIs might be able to free up resources so

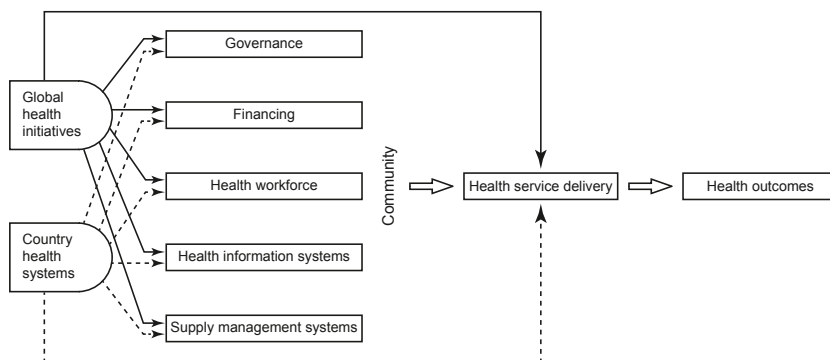


Figure 15.1 Conceptual framework of the interaction between global health initiatives and country health systems (WHO Maximizing Positive Synergies Collaborative Group 2009; reprinted from *The Lancet* with permission from Elsevier).

that other problems can be addressed. Potentially negative interactions include disruption of basic health services as a result of needing to use existing staff for campaigns, insistence on stand-alone information systems that may not be compatible with country health information systems, and use of duplicate supply chains.

The WHO Maximizing Positive Synergies Collaborative Group came to two conclusions. First, GHIs and country health systems are not independent; they are inextricably linked. Second, their interactions are so complex that generalizations may be dangerous. On this basis, the group developed the following recommendations:

1. Infuse the health systems-strengthening agenda with the sense of ambition and speed that has characterized GHIs.
2. Extend the targets of GHIs and agree on indicators for health systems strengthening.
3. Improve alignment of planning processes and resource allocations among GHIs, as well as between GHIs and country health systems.
4. Generate more reliable data for the costs and benefits of strengthening health systems and evidence to inform additional and complementary investments to those of GHIs.
5. Ensure a rise in national and global health financing, and in more predictable financing to support the sustainable and equitable growth of health systems.

In further discussion on maximizing positive synergies between health systems and GHIs, participants from a conference in Venice issued a statement, now known as the Venice statement. It acknowledges “that the impact of global health initiatives on health outcomes and health systems, though variable, has been positive on balance and has helped to draw attention to deficiencies in health systems” (Horton 2009:11) and concludes with two calls to action:

Call on the World Health Organization, drawing on its standards setting and convening roles, to work with partners to enhance alignment and further coordinate technical support to countries for implementation of country-driven and context-specific health systems-strengthening policies and plans.

Call on all national governments and development partners to mobilize required additional resources through existing and innovative means to accelerate and sustain health systems strengthening, inclusive of disease-specific work, to reach the shared goal of saving lives and improving the health of all people.

In a thoughtful review of the issues that surround the vertical and horizontal delivery of services, Oliveira-Cruz et al. (2003:83) concluded:

Vertical and horizontal approaches do not have to be seen as mutually exclusive but rather as complementary strategies, thus pointing to the need to discard the dichotomy of one versus the other. Expanding access to priority health

services requires the concerted use of both vertical and horizontal approaches, in accordance with the capacity of health systems as it changes over time.

One of the four aims of the Global Immunization Vision and Strategy, developed by WHO and UNICEF in 2005, is “to integrate other critical health interventions with immunization” (GIVS 2011).

The International Health Partnership and related initiatives seek “to achieve better health results by mobilizing donor countries and other development partners around a single country-led national health strategy” (IHP+ 2010). Guided by the principles of the Paris Declaration on Aid Effectiveness and the Accra Agenda for Action, IHP+ was launched in September 2007 to better harmonize donor funding commitments and improve the way international agencies, donors, and developing countries work together to develop and implement national health plans.

The GAVI Alliance recently updated its strategic goals. One of them is to “contribute to strengthening the capacity of integrated health systems to deliver immunization” (GAVI Alliance 2010b).

Despite the continuing debate about health systems and GHIs and the growing movement toward harmonization or integration of programs, there continues to be great interest in GHIs. For example, at the 63rd World Health Assembly in May 2010, member States endorsed a series of interim targets set for 2015 as milestones toward the eventual global eradication of measles. Success in achieving the measles 2015 targets is a key issue, if the Millennium Development Goal 4 (to reduce child mortality) is to be reached. In her opening address to the 63rd World Health Assembly, Margaret Chan, Director-General of the WHO, said (Chan 2010):

We need horizontal and we need vertical approaches. We need to scale up the delivery of commodities, and we need to strengthen the fundamental capacities that allow us to do so. We need coherence in policies, within and beyond the health sector, and we need complementarity of efforts....International donors, partners, and governments themselves have failed to rally around national health policies, strategies, and priorities. This contributes to fragmentation, duplication, added demands and costs, and defeats national ownership. We have learned this. How can we scale up interventions or aim for universal coverage when health systems in so many countries are on the verge of collapse? Or when the world faces a shortage of 4 million doctors, nurses, and other health personnel? Weak health systems blunt the power of global health initiatives to reach their goals. Weak health systems are wasteful. They waste money, and dilute the return on investments. They waste money when regulatory systems fail to control the price and quality of medicines or the costs of care in the private sector. They waste training when workers are lured away by better working conditions or better pay. They waste efficiency when needless procedures are performed, or when essential procedures are precluded by interruptions in the supply chain. They waste opportunities for poverty reduction when poor people are driven even deeper into poverty by the costs of care or the failure of preventive services. Above all, weak health systems waste lives. This problem is now recognized

by countries and donors alike, and it is being addressed by a range of new and existing initiatives, including several global health initiatives. Though designed to deliver specific health outcomes, these initiatives now recognize that meeting their goals depends on a well-functioning health system. In my view, this shift of attention is nothing short of revolutionary.

In a presentation at the Harvard School of Public Health on July 16, 2008, Carissa Etienne reported that 11% of GAVI support and 35% of Global Fund support had gone for health systems strengthening. Other indications of the effort to integrate GHI with other activities include the explicit effort to strengthen general immunization services as laid out in the Strategic Plan 2010–2012 of the Polio Eradication Initiative (2010b:42, 44):

A 2001 survey of over 1,000 GPEI staff documented that 100% of national staff and >90% of international staff were already engaged in routine immunization and surveillance for other diseases of public health importance. These staff devoted, on average, 22% and 44% of their time, respectively, to such activities. With >95% of WHO's immunization staff in GAVI-eligible countries funded by the GPEI, this infrastructure has been critical to the rapid scale-up of the work of the GAVI Alliance in sub-Saharan Africa and Asia, especially for the introduction of new and under-used vaccines....It is expected that GPEI staff will on average spend a minimum of 25% of their time on systems strengthening.

Another indication of the move toward integration was provided by the United States, in an announcement by President Obama in May 2009 (Kates 2010). This global health initiative will commit USD 63 billion over six years (2009–2014), with USD 51 billion allocated for HIV, TB, and malaria and USD12 billion designated for other global health priorities, including maternal health, child health, nutrition, family planning/reproductive health, neglected tropical diseases, and health systems strengthening. The four main implementation components of this initiative are:

1. Do more of what works, promote proven approaches.
2. Build on and expand existing platforms.
3. Innovate for results.
4. Collaborate for impact/promote country ownership.

Conclusion

No matter how one views the integration of health systems and eradication/elimination initiatives, integration is happening. Many papers have been written about the relative merits of targeted vs. integrated approaches. Most recognize that there are potentially both advantages and challenges in integrating comprehensive and categorical programs. Many agree that the challenge is to plan carefully so that targeted approaches and health systems development objectives are met in ways that maximize the positive synergies and minimize

potential conflicts. What we now need is to agree on specific approaches and indicators (e.g., along the lines of those of Wallace et al. 2009) and use those to help us achieve our common goals of preventing illness and saving lives.

Acknowledgment

The author is indebted to Uche Amazigo for suggestions in conceptualizing this paper and to Aaron Wallace for important information on his studies of integration of interventions.