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Group Report: Designing Elimination or Eradication Initiatives that Interface Effectively with Health Systems

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Abstract

At the outset, disease eradication programs need to define short-, medium- and long-term goals and how these relate to and interact with the existing health system. Potential system synergies need to be evaluated on a country-by-country basis so that eradication efforts can be effectively integrated into existing government systems and processes. Critical to the success of any eradication program is the sense of “country ownership.” Developing countries must be empowered and supported to take ownership and lead in the design and implementation of an eradication program. Consensus is necessary at the global level, but countries must have a voice in structuring eradication initiatives in their national contexts.

The global expectations that accompany a World Health Assembly (WHA) resolution must be understood by countries, particularly the need to strengthen health systems to achieve the goals inherent in an eradication program. Opportunities to bundle interventions should be explored and reporting mechanisms developed that derive from in-country reporting mechanisms. Objective metrics are needed along with explicit evaluations of health systems impacts. All programs should routinely undergo independent evaluation and corrective actions taken when necessary.

How Will the Health and Development Landscape Look over the Next 15 Years, and How Will This Influence Future Disease Eradication Programs?

Since the launch of the guinea worm and polio disease eradication programs in 1980 and 1988, respectively, the health and development landscape has

changed dramatically. The architecture of global health aid has evolved into a complex entity involving the efforts of multiple donors and various stakeholders in an ever-increasing number of health initiatives. Low-income countries face many challenges: a double disease burden with the unfinished agenda of high levels of preventable and treatable infectious diseases is compounded by a mounting burden of noncommunicable diseases. Institutional capacity is often minimal and resources are limited. In the poorest countries, health systems are unable to deliver even the most basic services to its population. Overseeing and interacting with a large number of health partners and initiatives—some of whom work through parallel systems which may not be aligned with the country's national health plan nor reflected in a country's national budget—poses a formidable challenge to low-income countries (Schieber et al. 2006; Piva and Dodd 2009).

We expect that the global health situation will continue to evolve over the foreseeable future such that new disease eradication initiatives will operate in a very different environment than is currently in existence. Success of future disease eradication programs will depend on an understanding of how health systems are organized, financed, managed, and held accountable in low-income countries. In addition, we must be aware of the challenges that governments face when dealing with the increasingly complex development aid architecture and multiple aid delivery models. A multitude of parallel finance and delivery systems can easily overwhelm the already weak capacities in some countries (Hecht and Shah 2006).

Long-standing debates continue on the merits of targeted (vertical), health systems (horizontal), or combination (diagonal) approaches to improve health outcomes, and there is a growing appreciation of a combination (diagonal) approach, which optimizes the synergies between the two. Coexistence of future disease eradication programs and health systems-strengthening efforts will need to assure implementation of the most effective and efficient strategies to deliver maximum health gains, both in relation to eradication targets and in delivering a basic package of services that meet the health needs of the population (Mills 2005; Gyapong et al. 2010; Kabatereine et al. 2010). In our discussions, we explored a range of possible scenarios, based on the rapid pace of change since the WHA polio resolution in 1988. Broadly, we came to conclusions built around two possible scenarios.

The more optimistic scenario is that a growing global economy will create enabling opportunities for future disease eradication, subject to a robust investment case being made. There will be increasing global resources for health system development, with close alignment of national and global health interests through improved national coordination and leadership. Under this scenario, child mortality will continue to fall, and there will be no emerging pandemics. As the health of the population improves, global citizens will not tolerate continuing infectious diseases and will demand that governments eradicate specific diseases. Polio and guinea worm will be eradicated; however, polio

will continue to incur ongoing costs in many countries due to national security concerns. Advances in technology will lead to price reductions of vaccines and other key commodities, enabling rapid expansion in the use of currently expensive vaccines and health-improving products.

The more pessimistic scenario is that there will be further fragmentation of the global health aid architecture, decreased health aid, and reduced effectiveness of much development assistance. Country capacities will be overwhelmed by many well-meaning but uncoordinated health initiatives that operate outside the national health plan and budget and incur high transaction costs. The minimal or absent health systems in the most challenged countries will lead donors to bypass struggling government systems and create parallel but unsustainable systems to deliver services. Government health budgets will increase slowly but will not keep pace with mounting disease burdens, due to both communicable and noncommunicable diseases. There will be increasing competition for health development assistance of new and old targeted health initiatives. Support for infectious diseases, immunization, or neglected tropical diseases (NTDs) will be squeezed by rising demands related to noncommunicable diseases, cancer, and health impacts from urbanization. New and uncertain agendas related to climate change will further constrain the fiscal space for health development. The tensions between national and globally defined health priorities will be exacerbated, leading some countries to reject disease eradication programs.

In either scenario, future disease eradication initiatives will need to present a robust investment case or business plan to address, at the very least, the following issues: the full estimated program costs; realistic time frames; potential impacts on the health system, both positive and negative (particularly impacts on human resources, finance, and service delivery); and clear ideas on how these impacts can be maximized or minimized. Disease eradication programs will also be required to optimize opportunities to deliver disease eradication packages in an integrated manner and to link with other priority programs and health system initiatives. They will need to define the criteria for success at different stages of the eradication pathway as well as the criteria for abandoning the goal of eradication. We anticipate that greater attention will be given to the strengthening of health systems. Imperative for the necessary agenda building are ongoing discussions between GAVI, GFATM, and the World Bank, the International Health Partnership Plus (IHP+), the US Global Health Initiative, and an increasing focus on results-based financing.

What Is the Optimal Interface (Best Fit) between Disease Eradication Programs and Health Systems?

Country health systems are heterogeneous in terms of their size, capacities, financing, structure, and ways of thinking about the world. There are different

health system challenges in low- and middle-income countries and fragile states (Cavalli et al. 2010; Patel et al. 2010). Some countries with highly decentralized government systems face unique challenges (Oliveira Cruz and McPake 2010). Therefore, it is unlikely that one type of disease eradication program will fit all health systems. Thus, from the outset disease eradication programs will need to be flexible and adaptable to optimize how they interact with a particular health system context, within which they will operate and collaborate with health systems strengthening to find ways to work effectively to deliver short-, medium-, and long-term gains.

There is wide recognition that weak and failing health systems can undermine the success of an eradication program. Although disease eradication programs cannot be responsible to fix dysfunctional health systems, how they choose to operate can contribute to or undermine the long-term development of health systems.

Country ownership of disease eradication programs and health systems-strengthening initiatives are central to enabling lower-income countries to optimize the synergies between the two. The tensions between global partnerships and governments around issues of ownership and accountability need to be considered and openly addressed. An effective coordinating mechanism at the country level could play an important role in program success. Disease eradication programs should support the strengthening of government systems for planning and management, finance and accountability, monitoring, and evaluation. In the most challenging settings, this will need to be done in incremental steps. When government is in control, it is more likely that disease eradication programs will be “on plan and on budget,” reflecting the priority within the national plan and national budget. Future disease eradication programs should seek to maximize the effectiveness of aid by providing resources through government finance channels, where these channels are robust. Where they are weak, the channels for providing resources will need to be addressed with other development partners.

Eventually, all disease eradication programs will end and the health system will need to absorb any ongoing long-term responsibilities. For example, after eradication, polio vaccines will need to be delivered through routine immunization systems for an undetermined time. Thus disease eradication programs need to build linkages and capacity with the health system early on in the program, with the end point and post-eradication periods in mind.

A major challenge is to balance the medium-term, results-driven disease eradication program agenda with the longer-term health system agenda to deliver comprehensive and sustainable services. The time frame of current disease eradication programs (e.g., in the case of polio, more than twenty years) highlights the importance of engaging closely with the health system from the planning phase.

Given the current fragmentation of the global health aid architecture, future disease eradication programs need to avoid developing “quick fix” parallel

systems whenever possible. If parallel systems are absolutely necessary in the short term, plans must be in place to move rapidly to a medium- and longer-term model through engaging with a wider range of development partners.

Where a country's primary health care system is functioning well, disease eradication programs should use the existing system and hold governments accountable for results. Where a health system has broken down, disease eradication programs need to help rebuild it. There is evidence that fragile health systems are impacted disproportionately from global health initiatives. Positive synergies between disease-specific interventions and nontargeted health services are most likely to occur in robust health systems (Cavalli et al. 2010). Different models are needed according to the level of functionality of the primary health care system. The high transaction costs for disease eradication programs in under-resourced health systems can be reduced through greater integration or a bundling of services across multiple programs targeting the same populations.

The presence of private sector providers within country health systems is growing, both in the not-for-profit sector (e.g., faith-based health organizations) and the for-profit sector. The former group has collaborated with many disease eradication programs. While there has been less interaction with the private sector, for-profit organizations are increasingly playing important roles in providing preventive and curative health services, especially for urban and peri-urban populations in low- and middle-income countries. Because the government's regulatory oversight capacity is often inadequate, future disease eradication programs need to be aware of roles played by the for-profit providers and devise collaborative strategies to avoid creating pockets of unreached populations.

The following provide examples of good practice, where disease eradication programs have contributed to the strengthening of health services:

- The mass training of health workers (e.g., in conjunction with the polio initiative in India) demonstrates capacity building and demonstrates how an eradication program can strengthen the health system. However, the impact of all capacity-building efforts needs to be evaluated.
- Laboratory and surveillance systems developed in the polio eradication initiative can be transformed and used for broader infectious disease surveillance. In Nigeria, for example, polio laboratories can be used for measles and other disease surveillance.
- Procurement and logistics systems for disease eradication programs and vertical programs can be used for other health commodities, although experience in Senegal shows that this is difficult to achieve.
- Disease eradication programs provide an opportunity to integrate with other initiatives, such as expanded programs on immunization and vitamin A or the bundling of products in mass drug administrations. However, the integration of disease eradication programs with other

initiatives can also carry serious credibility risks, particularly if the promised additional items cannot be delivered in time or fall short in numbers.

Questions of the impact of targeted global health initiatives on efforts to strengthen national health systems led the WHO Positive Synergies Group and the IHP+ to establish indicators against each of the six core health system building blocks. The investment case for any future disease eradication program will need to delineate the potential interactions with each core system, including how the potential benefits could be maximized and the potential negative effects minimized or eliminated.

Do Current Disease Eradication Program Models Offer Lessons for the Design of Future Programs to Ensure an Effective Interface with Health Systems?

Formal health systems in developing countries often reach and stop at the district level. New models are needed to use existing community structures (e.g., as demonstrated by the African program for onchocerciasis control, polio, and guinea worm) in the context of health systems strengthening.

Disease eradication programs can increase financial and human resource flows at the community level and improve the effectiveness of the health system. Similarly, the evolution of global health initiatives in recent years offers lessons to the onchocerciasis, lymphatic filariasis, and polio eradication efforts in terms of how health systems can be strengthened (e.g., the GAVI, GFATM, World Bank common platform for health systems strengthening). A future disease eradication initiative must actively look at potential system synergies at the stage when they articulate the investment case.

Onchocerciasis

The history and development of the onchocerciasis program and the lessons that have been learned throughout are described by Hopkins (this volume). Here we wish to emphasize the remarkable advancement in efficiency and effectiveness that was achieved as the mass ivermectin treatment program evolved from reliance on unsustainable mobile teams to community-directed treatment. Communities became empowered to organize their own distribution in their own way at a time that suited the communities. Primary health care staff members at the periphery are now very much involved. Attitudes have changed from one of resistance, as they were often not included in the decision-making process, to one of full support, as they realize the usefulness of the community in the delivery of health care.

Sustainability plans for mass drug administration of ivermectin are now anchored at the health district level. Plans cover not only funding but also the roles of the various actors in the health district, including the community, and demonstrate health systems strengthening “from the bottom up.”

As the vital link with the periphery, community ownership not only ensures implementation of the necessary high-coverage strategies to achieve elimination (Amazigo 2008), it remains the key to any changes in strategy that may be required to develop the elimination program. Community ownership and the associated strengthening of the health system has led to a whole series of health delivery strategies (called community-directed interventions) and will be central to efforts to control neglected tropical diseases, including the planned elimination of lymphatic filariasis.

Lymphatic Filariasis

The lymphatic filariasis model is based on the onchocerciasis model, which highlights the importance of mapping and baseline data from the very start, giving a much stronger base for monitoring. The model is more top-down than the onchocerciasis program and is tightly structured with time limits.

The Global Alliance to Eliminate Lymphatic Filariasis was established as the result of the World Health Assembly Resolution No. 52 of 1997, which targeted the elimination of lymphatic filariasis as a public health problem by the year 2020. All member states agreed to the resolution. The program employed mass drug administration of (a) Mectizan® and albendazole in Africa and (b) diethylcarbamizind in areas not endemic for onchocerciasis, based on research showing these to be effective microfilaricides capable of interrupting transmission when used for a period of not less than five years. The other mainstay of the program involves disease alleviation for those who already have the debilitating manifestations of the disease. This includes care of affected limbs through washing and elevation as well as surgery for those with hydroceles. To date, the program has delivered over 1 billion treatments in endemic countries. It has been described as the fastest growing program in public health (Molyneux 2009). However, although the program has been successful, some countries, particularly in Africa, have yet to start elimination programs (Gyapong and Twum-Danso 2006).

Mass drug administration has been implemented differently in the various countries but has remained a grassroots program. It involves villages, communes, and shehias where drugs are distributed house to house or at specific booths. The workforce used to distribute the drugs is named differently in the various countries, but it is basically comprised of community-based resource persons who are identified by the community to distribute the drugs. Studies in Nigeria, Cameroon, Ghana, Tanzania, and Kenya have shown (CDI Study Group 2010) that adding other responsibilities to the community health worker (i.e., distribution of nets) did not adversely affect delivery of ivermectin. To the

contrary, this actually enhanced performance of the mass drug administration and any other interventions.

From a health systems perspective, efficient utilization of this workforce could and has, to a great extent, been shown to strengthen subdistrict-level health systems. The community workforce involved in mass drug administration offers an example of an effective framework to deliver interventions at the community level. In Tanzania, community volunteers (also referred to as “community own resource persons” or CORPs) have been able to act as support for patients following hydrocelectomy (Malecela et al. 2009), thus reducing the number of complications following surgery. CORPs have shown the ability to deliver several interventions such as long-lasting insecticide treated nets, vitamin A supplements, and mass drug administration, and this increased overall efficiency (WHO/TDR 2008). In Tanzania, the same CORPs are distributing drugs for five diseases as part of an integrated neglected tropical disease program (Malecela et al. 2009; Michael et al. 2008). The health system is broad, and this community health workforce is a crucial component, in particular for those systems that are already weak and fragmented. These examples clearly demonstrate where possibilities exist to find convergence with the health system.

Throughout the lymphatic filariasis program, there is strong country ownership. Countries decide how the program is implemented. Districts own their own aspects of the program and participate in the planning of the program. Data requirements are rigid, and national coordinating mechanisms are used to gather data. There are now moves to add anti-schistosomiasis and trachoma drugs, and use common systems for implementation.

Polio

Lessons learned throughout the polio eradication initiative have been summarized by Aylward (this volume) and are a valuable resource for any future eradication initiative. The global polio eradication initiative is anchored at the WHO in Geneva and has regional technical advisory groups (TAGs) and interagency coordination structures. At the country level, the program is built around the WHO expanded program on immunization, with replication of the regional TAG and interagency coordination committees at the national level. The strategy of the polio eradication initiative explicitly recognizes the importance of strengthening routine immunization and surveillance systems.

The polio eradication model has manifested synergy in areas such as its surveillance platform, which has been used for other infectious diseases (including measles, Japanese encephalitis, neonatal tetanus) as well as for early disaster warning systems (such as floods in Pakistan). However, results are mixed in the bundling of other interventions, such as bed nets and vitamin A.

The polio eradication initiative created a pilot program of results-based financing in Pakistan and Nigeria, through an innovative credit buy-down

arrangement for polio vaccines. This allows partners, such as the Bill & Melinda Gates Foundation and Rotary International, to leverage their funds for purchasing vaccines and permit governments to receive the funds as in-kind grants, if results are achieved.

The polio eradication initiative could make a valuable contribution to the delineation of future disease eradication programs; however, additional independent evaluations are needed. We strongly recommend that documentation of the initiative be made available of the lessons that have been learned over the years.

What Are the Optimal Arrangements for Disease Eradication Programs in Relation to Health Systems Governance?

Key attributes of an optimal arrangement include issues related to governance, finance, management, and health human resources. To summarize our extensive discussions on the crucial elements necessary to achieve, when positioning a disease eradication program within the larger context of a health system, the components necessary to ensure optimal engagement are listed below.

1. Stewardship and Governance
 - Highest-level political commitment and ownership through a WHA resolution.
 - Informed by a robust evidence and investment case, based on broad consultation and consensus.
 - High-level technical leadership (usually WHO) with adequate capacity.
 - Active management following a WHA resolution, including building a wide national constituency for action.
 - An effective mechanism to engage global nongovernment partners (e.g., Rotary Club for polio, pharmaceutical industry for lymphatic filariasis).
 - Continued active reinforcement of national commitment to global eradication goals in the face of changes of governments.
 - Regional resolutions, committees, and TAGs important; regional operational forum can address cross-border issues; global and regional governance structures will need to be “light touch.”
 - Clear, transparent mechanisms for flow of funds; role of ICCs at national and regional levels.
 - Optimize synergies across program and sectors, and with flexible and adaptable response in line with evolving global aid architecture.

- Need to examine what worked and did not work optimally in polio; mapping the governance structures involved in GPEI would be a useful exercise.
2. Planning and Management
 - Link global action plan to country priorities and national action plan.
 - Agreed realistic time frame at outset.
 - Establish criteria for exit point.
 - Map stakeholders, relations, and potential interactions with the health system.
 - Focus on management coordination and capacity development.
 3. Service Delivery, Drugs, Commodities and Logistics
 - Improve access through functional infrastructure.
 - Align drug, vaccines, and commodities procurement and logistics systems where possible.
 - Integration of packages (e.g., mass drug administration) based on evidence within minimum service packages.
 4. Finance
 - Resource mobilization for disease eradication programs should be additional so as not to distort ongoing programs at the global level (e.g., HIV vs. health systems).
 - Allocation decisions in-country should prioritize basic primary health services and support delivery of basic health care package.
 - Composition of spending should not undermine the functioning of health systems (e.g., salary bonuses, training workshops, per diems or large infrastructure without recurrent budget).
 - Structure financing in multi-year, predictable fashion and integrate within government budget cycle to ensure sustainability.
 - Include all local costs in national budget from the outset.
 - Improve government oversight on program spending to ensure efficiency and accountability.
 - Dedicated government counterpart contribution to support critical areas such as human resources.
 5. Human Resources
 - Shift from single issue to multipurpose community-based workers.
 - Develop realistic incentive systems that do not compete with overall health system goals.
 - Plan transition strategy for workforce when end is in sight (e.g., how to redirect polio health workers in India).
 6. Monitoring and Evaluation System
 - Maximize use of disease eradication program surveillance system and laboratory capacity for broader disease surveillance.
 - Link disease eradication program surveillance into national health information systems.

- Exact independent international technical evaluation of programs.
- Use common data systems where feasible.

Governance

The “optimal” governance arrangement for disease eradication programs will look differently from the perspective of disease eradication program funders or implementers at the various levels; that is, from global to country to local levels. Negotiating through the inherent tensions between global, regional, and national priorities as well as governance, finance, and human resources will be the key determinants of the success of future disease eradication programs (see also Stoever, this volume).

Governance and management of disease eradication programs must recognize the importance of government oversight, optimizing synergies, strengthening accountability, and the impact on country health systems. Within recipient countries, the Ministries of Health and disease eradication programs will need to jointly assess and determine which structures and systems must be strengthened to ensure implementation of the disease eradication program, so that parallel systems are not created specifically for the disease eradication program (see also Stoever et al., this volume). The disease eradication program should identify their investments in those systems. Ideally the systems strengthened will be ones that will remain after the disease eradication program has been completed. Given that fragile health systems suffer the most from global health initiatives, a sliding scale approach is needed when allocating disease eradication program and health systems-strengthening resources, so that the low-income countries receive the highest proportion of funding devoted to systems strengthening. Higher-income countries can then be allocated with less funding toward health systems strengthening.

Finance

Resource mobilization for a disease eradication program at the global level needs to be additional; that is, it should not displace funding intended for basic services and health systems. Further, the implication of dedicated disease eradication program funding at the national level needs to be considered. Countries should drive the resource allocation decision in their domains so that local priorities are not neglected in an attempt to support the global initiatives (Kirigia and Barry 2008).

The structure and composition of spending for global efforts need to be monitored to ensure that unnecessary distortions are not created. Governments need the flexibility to fill critical gaps related to implementation of the disease eradication program while simultaneously attending to other priorities (see also Jacobsen, this volume).

Funding large parallel initiatives through off-plan, off-budget mechanisms can make it very difficult for a country to predict its future resource expectations. Assuring stated commitments of governments to eradication programs may require additional counterpart funding dedicated to critical areas such as the health workforce.

Management

All global health initiatives, including eradication programs, need to be aligned with and embedded within national health plans so that they reflect country priorities. Disease eradication programs need to pursue specific goals and contribute to wider efforts to strengthen health systems (see also Tyson and Biellik, this volume).

Where regular health information systems may not satisfy the requirements of a disease eradication program, adjustments in reporting arrangements may have to be made. If parallel systems have to be created in the short term, inter-operability of the data systems and linkages need to be secured (see also Hinman, this volume).

Health Human Resources

By definition, disease eradication programs require extra effort in addition to ongoing routine work, which may mean hiring temporary workers to operate at the community level. Even when these workers are volunteers, there is often the need to remunerate as well as manage and supervise this group of community workers. The disease eradication program may need to mobilize and provide for the additional funds in consultation with the Ministries of Health (Rowden 2010).

To strengthen the workforce within the health system, the ideal community worker will be multi-skilled rather than a “single-disease” worker (see also Bates et al., this volume). This implies the need for adequate training curricula, materials, and resources (Vujicic 2010; Fulton et al. 2011).

Salary benefits and differential rates across different initiatives distort the management of the health system and can be counterproductive unless managed carefully (see also Hanvoravongchai et al., this volume). When incentives need to be provided, monetary as well as nonmonetary incentives should be considered. Professional performance bonuses granted as lump sum amounts to subdistrict-level workers were, for example, found to be acceptable in Tanzania. In the Congo, however, when graduated lump sums were allocated to the health workforce, the outcome was highly inequitable.

Over the course of implementing a disease eradication program, a transition strategy must be developed to secure the engaged workforce after the completion of a disease eradication program. For example, in the case of the polio program in India, which currently engages more than half a million health

workers, what happens after the program is over has serious implications for those involved. Without a good transition strategy, the possibility of negative incentives developing among the workers cannot be excluded.

Recommendations

In addressing the question of how a future eradication program can be designed to interface most effectively with the health system in which it is operating, we offer the following recommendations:

1. Disease eradication programs should evaluate potential system synergies in each country with the goal of strengthening and integrating with existing government systems and processes wherever feasible. Disease eradication programs should be flexible to adapt to country situations without losing focus of their primary objective.
2. Developing countries should be empowered and aided to own and lead the design and implementation of the disease eradication programs in their own contexts. While consensus is reached at the global level, countries must have a say as to how the initiatives are structured in their own contexts. Country ownership is a critical factor for success.
3. Disease eradication programs should be adapted to each country's circumstances. There is no "one size fits all" approach. A sliding scale approach should be implemented, where the most fragile health systems are allocated more resources for health systems strengthening.
4. Countries should understand global expectations, and vice versa, when supporting a WHA resolution on disease eradication, particularly in regard to the need to strengthen health systems to achieve disease eradication program goals.
5. Disease eradication programs should explore opportunities to deliver disease eradication packages in an integrated manner and bundle interventions without losing focus of their own objectives and interventions, as with mass drug administration for NTDs.
6. Reporting mechanisms used in eradication programs should be developed and derived from in-country reporting mechanisms (e.g., the case of the Ghana SWAp). In doing so, the decentralization context should be taken into account.
7. Disease eradication programs should develop objective metrics and include explicit evaluations of health systems impacts. All programs should be independently evaluated for lessons learned and corrective actions taken when necessary.
8. From the outset, disease eradication programs should define short-, medium-, and long-term goals and their relationship to the health system. For example, when building laboratory capacity, a short-term focus

could be human resource technical assistance and training. On the medium term, this could include logistics support and equipment, whereas on the longer term, this may consist of infrastructure development such as improved laboratories for wider use in other diseases, institutionalizing human resources, and funding into government budget.