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Group Report: Developing an Eradication Investment Case

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Abstract

Eradication initiatives offer important opportunities to provide global as well as inter-generational health benefits. Humankind should aspire to the eradication of diseases; however, the decision to commit to an eradication goal should derive from careful consideration of the evidence base and a thorough discussion of the benefits, risks, and costs of eradication compared to the status quo. This chapter discusses the need to develop an eradication investment case (EIC) as a tool to support the decision-making process involved in launching an eradication initiative.

Eradication initiatives, like other major societal investments (e.g., capital and infrastructure investments), require careful and deliberate conception and management. Benefits from eradication may include the public good of intergenerational health and associated productivity gains and/or economic savings. However, like other major projects, eradication initiatives represent resource-intensive efforts with associated opportunity costs.

Proponents of future eradication initiatives should develop an investment case prior to launch. Critical elements of an EIC are discussed, and the need to standardize the methodology to the greatest extent possible is identified. Since no single overarching decision-making body currently exists to demand and review EICs, an analytic-deliberative process must be developed.

The EIC should support and inform deliberations and decisions made by national health leaders at the World Health Assembly and elsewhere, as they consider a global commitment to an eradication goal. An EIC will also stimulate the development of a financial plan, which will provide details about financing the initiative, as stakeholders evaluate the choice to commit to an eradication goal. The EIC will not, however, include the financial or fundraising plan. Innovation should lead to the creation of additional mechanisms to finance eradication initiatives, perhaps including the use of an “eradication bond.” Issues of phasing and timing of multiple eradication initiatives are discussed, as is the need to consider potential synergies of eradication initiatives and opportunities to diversify the disease eradication portfolio.

Introduction

The eradication of a disease offers important opportunities for society, and humankind should aspire to this goal. The eradication of smallpox and the interruption of SARS virus transmission that emerged in 2002, represent significant accomplishments, from which humankind continues to benefit. Eradication initiatives require significant commitments, including major investments of economic and sociopolitical capital. Thus, the decision to commit to an eradication goal should derive from careful consideration of the evidence base and a thorough discussion of the benefits, risks, and costs of eradication compared to the status quo.¹ This chapter discusses the need to develop an eradication investment case (EIC) as a tool to support the decision-making process involved in launching an eradication initiative.

Although decisions to launch past and ongoing eradication initiatives occurred without the benefit of an EIC, we learned from these experiences about the importance of managing expectations better throughout the process. We believe that the EIC will enable this to occur by establishing clear expectations at the outset.

The EIC will serve as a tool that facilitates rigorous evaluation by stakeholders during the decision-making process as they evaluate the choice to move from the base case comparator (i.e., some form of control) to eradication of a specific disease, with full consideration of what this global commitment entails. The EIC provides the context and information needed to support the deliberations of international health leaders and other key stakeholders; it synthesizes all of the information relevant to the choice, taking as a starting point that eradication represents a biologically and technically feasible option (see Strebel et al., this volume). We propose that the EIC include discussion of the global burden of disease; expected benefits, risks, and costs of the eradication and comparator options; social, political, and economic challenges; ethical considerations; and operational and other research needs. An EIC will apply to a specific disease, and for that disease it will address the question: What are the current options related to eradication and control, based on complete characterization and quantification of the risks, costs, benefits, and discussion of qualitative considerations of eradication and control options at the global level? Ideally, when eradication emerges as the best option for multiple diseases, the collection of EICs developed for each disease would inform decisions about phasing coordinated eradication activities to optimize efforts in the context of resource constraints (e.g., financial, political will, capacity), and encourage discussion of the impact on the overall eradicable disease portfolio. We anticipate the ongoing management of multiple eradicable diseases

¹ Status quo represents baseline expectations of the current situation and path, whereas when projecting future trajectories, analysts need to consider more than one possibility (e.g., the current situation could remain unchanged, improve, or worsen).

at the same time, and we refer to the set of all potentially eradicable diseases as the eradicable disease portfolio. Managing the eradicable disease portfolio could lead to discussions about the need to challenge any constraints that drive suboptimal management. However, before we can combine and explore EICs for multiple diseases, we need to create an expectation for their development, standardization (to the extent possible), and use.

Stakeholders

Numerous stakeholders would benefit from an EIC. For example, when evaluating the possible adoption of an eradication goal, national health ministers responsible for considering potential commitments for their individual countries could use the evidence-based EIC to inform their decisions. Once eradication represents the preferred international choice (i.e., when it appears that sufficient global motivation exists for national health leaders and other key stakeholders to make the commitment and cooperate to achieve an eradication goal), the EIC would provide the necessary context to support global health diplomacy. It would facilitate consensus about strategies and targets to achieve eradication by informing other stakeholders involved: global health leaders, potential funding partners and national finance ministers, intervention producers (e.g., pharmaceutical and biotechnology companies that produce vaccines, therapeutic agents, and delivery devices), partners in health systems at multiple levels, community leaders, individual consumers, and opinion leaders from low- and middle-income countries and representatives of affected populations.

The development of an EIC should occur as part of an analytic-deliberative process that involves active consultation with all stakeholders. We suggest that the process itself will ultimately prove as valuable as the final EIC document, because it will characterize demand for eradication in the context of the complex geopolitical environment and result in a concrete plan, which can then form the basis for developing a financial plan.

The responsibility for synthesizing the solid evidence base and developing the EIC will most likely fall on the stakeholders who step forward to propose detailed plans for an eradication effort (i.e., the proponents). The EIC should rely on a standardized methodology (to the extent possible) and undergo extensive review and iteration, as part of the analytic-deliberative process. Developers of the EIC should strive for objectivity and critical evaluation of the evidence base.

Examples of Investment Cases from Other Contexts

Business plans represent a well-established, generic example of an investment case. Typically, a business plan includes a formal statement of goals, a plan of

action, an estimate of the costs of the plan, information about the result of the action, and a discussion of challenges. In general, business plans help organizations look ahead and create expectations for future performance, allocate resources, focus on key issues, and identify and prepare for threats and opportunities. The term “business plan” may suggest a for-profit enterprise. Thus, we chose instead the term “investment case,” building on Webster’s definition, “to make use of for future benefits or advantages,” as this reflects the goals inherent in an eradication initiative. This term is widely recognized by global immunization partners as a result of its regular use by the Global Alliance for Vaccines and Immunization (GAVI).

With respect to specific examples of investment cases that might be of relevance to eradication efforts, we discussed the investment cases that the GAVI Alliance currently uses to support decisions related to expanding its eligible vaccine portfolio (GAVI Alliance 2006). Specifically, GAVI requires the development of an investment case that follows guidelines to support its decision about whether or not to include a specific vaccine in its list of vaccines eligible for GAVI funding. At the highest level, the GAVI investment cases focus on disease burden and potential impact, cost-effectiveness, and demand forecasting and supply strategies. The cases recognize that:

1. Accurately characterizing disease burden requires the establishment and maintenance of surveillance systems,
2. Rigorous and accurate demand forecasts are required to send appropriate signals to multinational and emerging vaccine suppliers, and
3. Stakeholders need high-quality estimates of the value of vaccination to address the national, regional, and global burden of disease.

Each GAVI investment case specifically addresses whether the proposed activity aligns with an existing GAVI goal and/or enables achievement of part of its long-term strategy. For example, in the context of recently evaluating and adding rotavirus vaccine to its portfolio, the investment case suggested that adding rotavirus aligned with GAVI’s goal to “accelerate the uptake and use of underused and new vaccines and associated technologies and improve vaccine supply security” (GAVI Alliance 2006).

We identified opportunities to adopt some of the GAVI investment case concepts directly into our discussion, but highlighted the need to develop a specific EIC for eradication initiatives to address the unique attributes of the decisions to pursue eradication and to encompass interventions other than vaccines.

Demand for an Eradication Investment Case

In contrast to the GAVI investment case, no single overarching decision-making body currently exists to demand the creation of EICs or to ensure quality and consistency in the evidence that they would provide. The World Health

Assembly (WHA) might serve as the primary source of demand for an EIC in the context of its consideration of a future WHA resolution for an eradication goal. Notably, the WHA offers the most likely forum for discussion by national health leaders about the desirability to cooperate to achieve an eradication goal, and a WHA commitment most likely represents a necessary requirement for the implementation of coordinated eradication initiatives. Thus, the WHA could demand an EIC as it engages in a process to consider an eradication goal, which requires international cooperation, in contrast to an existing control strategy. We do not believe, however, that only the WHA could demand the development of an EIC. Other stakeholders may request initial development of an EIC for a specific disease.

We suggest the potential need to create a new decision-making process tasked with managing the eradication disease portfolio, in partnership with national health leaders, the World Health Organization, and other stakeholders. Although we discussed the desirability of maintaining independence from advocates, we recognize that eradication efforts need leaders, champions, and underwriters, and that without active advocates, progress toward eradication may not occur optimally (i.e., with timing and resource investments made and managed in a way that maximizes the public good). This implies likely involvement of some advocates in the creation of an EIC and the need for a review process as noted above. Potential reviewers could include the International Task Force for Disease Eradication, a consultation panel convened by the WHO or the InterAcademy Medical Panel, open and/or invited commentary, and peer review.

We discussed the challenges of engaging stakeholders at all levels, and identified community engagement as critical to both characterizing demand and ultimately achieving eradication. We also discussed many issues about how and when to best engage communities, which remain unresolved. The EIC should serve as a tool to provide the context for essential communications about why eradication may or may not represent a goal worth pursuing. We expect that cooperation will likely require negotiation with stakeholders at multiple levels. The EIC should serve to help highlight the reasons why countries set out with different perspectives about the value of eradication as it relates to their national concerns, and provide a perspective about whether or not eradication might lead to a better future. While the EIC will present evidence on the global argument for eradicating a disease, we note that it will not focus on evaluating national cases, so countries will need to develop these separately if necessary to support their decision making process.

Recognizing the importance of providing context to ensure that stakeholders use the available evidence as they assess their demand for eradication, we discussed the comparator for any EIC, and noted that the base case (i.e., presumably some form or forms of control) would represent the relevant starting point for an EIC. This could mean starting in relatively different places for different diseases, since nations and regions may vary with respect to the progress

made prior to consideration of the EIC for any individual disease and their use of the intervention. Consider, for example, the starting point for smallpox eradication in 1958 with under 1 billion people living in endemic countries versus polio eradication in 1988 with approximately 4.5 billion people living in endemic countries (Thompson and Duintjer Tebbens 2007). In this regard, the EIC should include a discussion about the disease context at the time of the analysis (i.e., description of the status quo and the path leading to it, the current costs of control, and the current burden of disease). The base case should represent the baseline expectations about the current situation and path, but in projecting the future or reconstructing a counterfactual scenario, analysts may need to consider more than one possibility: the current situation could remain unchanged, improve, or worsen, and the past could have been different. A study of the economics of the Global Polio Eradication Initiative (Duintjer Tebbens et al. 2011) provides an example of an analysis that dealt with uncertainty about the past and future when considering the base case comparator and eradication with different potential future post-eradication policies. While we do not expect the EIC to necessarily assess every possible scenario, the analysis should consider the wide range of possibilities; then, if an eradication initiative is launched, those managing the effort should periodically revisit the assumptions in the EIC to update and manage expectations (see Stoeber et al., this volume). Analysts may need to consider explicitly the reality that the status quo may not represent the economically optimal level, which could occur in either direction (i.e., currently over- or under-investing from a purely economic perspective). We emphasize that the dynamics, situation, and system require careful consideration, because economic analyses often depend on unrealistic assumptions of equilibrium and/or ignore time, and such analyses will not capture the real time delays that exist in the system. For example, some period of high control will most likely represent a prerequisite to actually achieving an elimination or eradication goal, and a period of low control may reflect real system constraints that exist in producing, procuring, and/or implementing interventions.

Critical Elements of the Eradication Investment Case

Using the GAVI investment case as a model, we derived an initial list of critical elements specific to disease eradication and development of an EIC. We emphasize that several critical elements of the EIC differ from the GAVI model, because the EIC focuses on an analysis related to the cooperation necessary to achieve eradication, and this may involve a large spectrum of vaccine and/or nonvaccine interventions.

The Proposed Investment

- Description of the disease and its global health significance.
- Transparent characterization of the status quo (i.e., the base case), based on historical context and projections for the future path (may involve consideration of multiple possibilities allowing analysts to identify other options and distinguish comparators from potential interventions).
- Articulation of a specific plan for achieving eradication; includes a proposed timeline, projections about how the world will look after eradication is achieved, and discussion of expected post-eradication activities.
- Assessment of the current burden of disease, in terms of relevant morbidity and mortality metrics, using disability-adjusted life years (DALYs) to capture both in the context of a single health metric; discussion of historical trends related to the burden of disease.
- Articulation of the role of ongoing research in achieving eradication.
- Discussion of the current methods and challenges for disease and infection control, including vaccination with various delivery strategies, if applicable, and other interventions used in practice.
- Discussion of the public good obtained by eradication and how this differs from the status quo.
- Discussion of the need for cooperation at the global level to obtain the public good.

Rationale for Investing

- Documentation of sufficient evidence of biological and technical feasibility and review of any relevant evidence related to proof of concept.
- Presentation of evidence of demand for eradication and willingness to cooperate at the global level.
- Projection of burden of disease expected over the time horizon for analysis for the status quo and the eradication effort (based on the specific plan).
- Discussion of anticipated challenges and constraints (ethical, geopolitical, social, economic, epidemiologic, technical and institutional) for the status quo and eradication plan, and strategies to address these.
- Assessment of why existing health systems, stratified by relevant categories or types, have/have not achieved elimination, and discussion of how the global plan integrates and strengthens health systems, with particular emphasis on how planned activities will be achieved in countries with the weakest, most fragile health systems.
- Discussion of anticipated global and national resource requirements for the status quo and eradication plan over the same time horizon for different scenarios.

- Discussion of critical risks associated with attempting to move from control to eradication, including the ethical and social risks.
- Assessment of total costs (including programmatic resources) associated with the status quo and eradication plan (aggregated to the global level and also appropriately disaggregated as needed to address heterogeneity issues), with consideration of the impact of time delays and contingency plans included that explore the potential for cost overruns if the eradication plan does not perform as expected.
- Assessment of health outcomes associated with the status quo and eradication plan (aggregated to the global level and also appropriately disaggregated as needed to address heterogeneity issues).
- Transparent discussion of broader social impacts, including intergenerational benefits, equity (e.g., reaching marginalized populations), and the social value of eradication of disease; that is, lives rescued and worry avoided (e.g., nonexistence value), community morale (the sense “warm glow” of accomplishment).
- Assessments of cost-effectiveness and benefit-cost estimates, including efforts to demonstrate the impacts of explicit choices regarding valuation of health outcomes and nonmonetary benefits and appropriate sensitivity analyses.
- Discussion of projected impacts on demand and supply of the interventions and the effect on prices and availability, considering bottlenecks in the development, distribution, procurement, and/or manufacturing of key materials, at all appropriate and required levels (i.e., global, national, community).
- Discussion of capacity of qualified staff and technical resources.
- Discussion of assumptions about post-eradication plans, including discussion of expected needs for continued intervention, surveillance, commodity stockpiles, and/or outbreak response.

Management and Governance

- Discussion of proposed eradication initiative partnerships and plan for governance.
- Establishment of critical milestones, including any critical decision and action points, and the plan for monitoring, oversight, and evaluation of milestones.
- Assessment of diagnostic tools for monitoring.
- Discussion of the risk management plan for critical ethical, geopolitical, social and other risks.
- Discussion of the operational research plan and the proposed strategy for how operational research would be supported.
- Discussion of the proposed process for active evaluation of any impacts on health systems.

Critical Issues and Standardization of Methods

To promote objectivity and comparability of results, people preparing an EIC should use standardized methods and reporting of information to the extent possible. Key issues for standardization include choices related to managing time preferences in the framing of the analysis and key inputs, such as the discount rate. We raised the issue of using consistent time horizons for post-eradication activities while noting the difficulties associated with forecasting decades into the future. We also discussed the need to characterize different options for the pre- and post-eradication timelines and the importance of developing some standards related to the conduct and presentation of the economic analysis performed to quantify the benefits and costs of eradication and the base case scenarios.

Considerations of ethical issues during the development of an EIC will clarify the potential ethical challenges (Emerson, this volume). Thus we included the requirement of a narrative of the moral value of launching an eradication program with respect to the lives rescued, benefits accrued to future generations, and contribution to the broader public good. The narrative should capture the value of intangible benefits and ensure consideration of benefits that are difficult to quantify. In addition, an EIC must make explicit the anticipated ethical and social risks, and outline a plan to address these, because unattended ethical and social barriers can derail the critical path to success of an eradication program. For example, the 2003 polio vaccination boycott in northern Nigeria occurred, at least in part, as a result of ethical, social, and cultural issues (Kaufmann and Feldbaum 2009); inadequate attention to trust, communication, community ownership, and community engagement emerged as major contributing factors (Obadare 2005). Such experiences teach us that we must seek to anticipate some of the challenges and create early interventions. Thus, as an ethical requirement and an ingredient for success, the EIC should present potential strategies to engage relevant communities and key opinion leaders, as a means of identifying the critical barriers early on and as part of the effort to gain and sustain public support. Public support and willingness to endorse future eradication initiatives may depend on the success of current initiatives. The success of polio eradication may be important with respect to the pursuit of future eradication initiatives and global health efforts more broadly.

In terms of projections, the EIC should clearly articulate critical barriers and the end game. In addition, the EIC should anticipate that the costs of eradication may increase during the final stages, due to the need to access harder-to-reach populations as well as the impact of sustaining high levels of activity globally while coping with delays in achieving milestones. The EIC should create realistic expectations, provide contingency plans, and explore “what-if” scenarios. Once launched, an eradication effort will require ongoing operational research, which the EIC should characterize explicitly.

For issues related to health systems, we determined that eradication programs should not be expected to fix health systems, but that they should create strategies that seek to provide overall net benefits to the extent possible. Thus, an EIC should clearly delineate linkages to the health systems and should seek opportunities to create positive externalities.

In our discussions, a critical issue arose as to whether an eradication plan should prioritize easiest and lowest cost activities first, or address more challenging targets first to demonstrate the possibility of eradication in these places. Tackling relatively easier areas first would help to build momentum, test approaches, and eliminate the disease in geopolitical settings likely to maintain elimination. Waiting to start in the difficult areas, however, will inevitably lead to delays. We suggest that the EIC should explore the impacts of timing decisions and trade-offs by modeling the impacts of various scenarios, which would be used in the context of discussions to develop the implementation and financing plan.

We identified the need for a separate effort to focus specifically on developing a guidance document—one that would develop standards for preparing an EIC. This document would build on the standardized guidelines for economic analyses of vaccine interventions (WHO 2008a) and add to that framework to account specifically for eradication-related issues. With respect to the specific terms of reference for this effort, we discussed the need to standardize EIC methods and presentation of results with respect to the following:

1. The assumptions about time related to the characterization of the ethics and economics of benefit to future generations, prior to and after eradication, and the development of recommendations for the analytical time horizon and discount rate for use in the base case and sensitivity analyses.
2. The precise format for the ethical framework for the analysis and development of a standard set of questions that must be answered in the narrative and any recommended set of key ethical criteria for consideration. This framework could be based on broader considerations, such as the ethical significance of rescue, obligations to future generations, and creation of public goods (Emerson and Singer 2010).
3. The process and dynamics of decision making, and assumptions about how to address barriers.
4. The review process and development of a specific checklist for review.

Process

The EIC will serve as a tool to *facilitate* discussions, but it does not and cannot *make* the decision to commit to an eradication initiative. Development of an EIC will require iteration as part of an analytic-deliberative process.

Stakeholders should actively engage in reviewing drafts and challenging assumptions, prior to finalization of the EIC and its use by global partners and WHO leaders (e.g., in support of a global resolution) or other stakeholders (e.g., to develop a financial plan). We identified potential strategies (e.g., focus groups, surveys) to solicit public opinion and to encourage stakeholder engagement early and often in the process. Stakeholder involvement needs to include a wide range of individuals and voices, preferably at multiple levels; however, early engagement of key national opinion leaders may facilitate more rapid implementation. Implementing a systematic process to engage stakeholders should improve the process, but exactly how to accomplish this remains an area for further research.

Standardized guidelines will ensure that EICs present evidence-based information, and we discussed the need for a rigorous review process involving a broad array of voices and technical experts (e.g., health, economic, programmatic, ethics, policy, implementation). We did not address the issues related to how diseases get selected for development of an EIC in detail, although we expect that the initial list would consider diseases already identified as eradicable (ITFDE 2008).

Financing

The EIC document would make the economic case for eradication or continuance of the status quo. It should identify the expected financial needs, should decision makers choose to pursue eradication, but it would not include the actual financial plan. The EIC would support efforts to prepare a financial plan and seek financing.

The financial needs analysis should anticipate and estimate the expected resources required for national efforts and address the need to identify potential nongovernmental sources of financial support. In this regard, we explored existing and potential strategies for apportioning contributions and discussed the challenges of dealing with free riders that occurs with many public goods. For example, if the financial resources of an initiative depend on grants, then the eradication initiative will need to engage grant-making early in the process. This, in turn, requires a clear delineation of the incentives to contribute to the eradication effort and may pose a challenge if the initiative does not appear to provide direct benefits to the donor(s) and if fundraising activities will consequently need to appeal to altruistic ideals.

In the past, financing of global and regional public goods occurred primarily through four channels: public sources, private sources, payments by users and beneficiaries, and partnerships (Ferroni and Modi 2002). Principal sources of public financing include developing country governments, donor countries, and multilateral development banks through grants or loans. The opportunity to pursue alternative financing, which may result from developing an EIC that

financial leaders can evaluate, represents an important innovation for eradication initiatives. Recognizing that current eradication efforts depend on a pay-as-you-go financial model and that this may lead to resource constraints and nonoptimal operational decisions that ultimately delay eradication and increase overall costs (Duintjer Tebbens and Thompson 2009), we discussed the concept of exploring alternative financing mechanisms for eradication.

In contrast with the current view, we need to conceptualize eradication initiatives as major public health projects (Thompson and Duintjer Tebbens 2008b) that yield public goods with intergenerational benefits. Thus, we should consider eradication in the same manner as major capital investments, and finance them using similar models. Take, for example, the potential issuance of “eradication bonds,” which would serve to finance eradication initiatives. Such bonds provide time-limited support and allow sharing the benefits and costs of eradication initiatives with future generations, similar to the concept of the GAVI International Finance Facility for Immunization (IFFIm) (GAVI Alliance 2010c). Eradication bonds may offer the opportunity to front-load funds and provide a steady stream of resources for program implementation, to be repaid with funds intended for similar future development projects. From an ethical standpoint, the eradication bond concept provides a just and fair distribution of benefits and burdens; since future generations will benefit from the eradication of disease, they can in fairness contribute to repayment of the debt.

Special Drawing Rights and the sale of International Monetary Fund gold reserves could provide additional sources of innovative financing opportunities (IMF 2010). Since eradication initiatives may wish to create flexible mechanisms to raise funds quickly, we also discussed the concept of establishing a special-purpose global lottery with tax-free earnings. This could potentially play an important role in financing the end stage of eradication, but might also prove useful in meeting unanticipated funding needs earlier in the program. For eradication initiatives with limited geographical areas, the eradication initiative should engage relevant regional, international financial institutions (e.g., the Asian Development Bank, African Development Bank) to explore strategies to meet funding needs. Finally, we discussed the need to develop potential strategies to engage high net worth individuals, NGOs, and private foundations who might play an important role by providing voluntary contributions.

We emphasize that many opportunities exist to learn from the experiences of prior eradication initiatives, with respect to estimating required financial needs and to including the provision of finances to address unexpected issues. Operational research must be funded and conducted to inform programmatic decisions and make appropriate course corrections, so as to permit identification and solution of unexpected issues. In addition, eradication initiative costs may balloon during the final stages of eradication, due to the very high global control and aggressive efforts needed to reach every infected individual.

A financial concept should potentially allow for a smoothing of costs (e.g., conversion of the balloon payment mortgage to a fixed-rate mortgage), greater

ability to fund forward (i.e., make funds available when needed), and expectations for financial management and accountability associated with managing borrowed funds. Such an approach differs significantly from the mode currently used for public health effort, and the partnership responsible for future eradication initiatives would need to be empowered to borrow on the behalf of future generations.

Phasing and the Overall Disease Eradication Portfolio

Discussions about eradication may occur for any individual disease at various points in the life cycle of the disease. Thus, the disease life cycle constitutes an integral part of the discussion (Thompson and Duintjer Tebbens, this volume). Efforts to stop an emerging disease prior to allowing it to become established (e.g., SARS) should proceed based on the available and evolving data about the emerging disease. The EIC should consider the determinants of virulence and host tropism as well as the wide uncertainty bounds in any modeling used to assess the threat. For malaria, some countries (e.g., those on the edges of endemic areas) continue to make significant progress toward achieving national elimination. The achievements led to discussions about the tools needed to achieve malaria eradication, given the challenges associated with sustaining the current high levels of control, and highlighted the need to develop an EIC for each individual disease.

In the context of discussing multiple diseases, we noted that the current disease eradication portfolio includes two initiatives (i.e., dracunculiasis and polio), which operate on very different geographic scales and require distinct types of interventions. Specifically, as a vaccine-preventable viral disease that can rapidly spread globally, polio differs from the parasitic disease guinea worm, which spreads locally and regionally through contaminated water. Coupling these two existing initiatives provides diversity, which portfolio managers generally seek. Essentially, they exist in parallel, with little to no overlap or synergy between them. In addition, combining disease eradication programs might effectively share resources. Potential candidates include measles, onchocerciasis (river blindness), lymphatic filariasis, or other diseases currently targeted for elimination.

Could potential synergies present cost-sharing opportunities to pursue additional eradication initiatives? Figure 10.1 depicts a timeline for multiple eradication initiatives, where t_0 represents the current point in time. At t_0 , eradication initiatives *A* and *B* are underway (solid arrows represent the current projected, but uncertain end times). Assuming that the EIC for eradication of disease *C* supports an eradication goal and financing exists to support this goal, the decision to commit to the eradication of *C* may occur. Up until that point, *C* will continue with control, and we emphasize that Figure 10.1 does not include the portfolio of controlled infectious diseases. With respect to evaluating *C* and

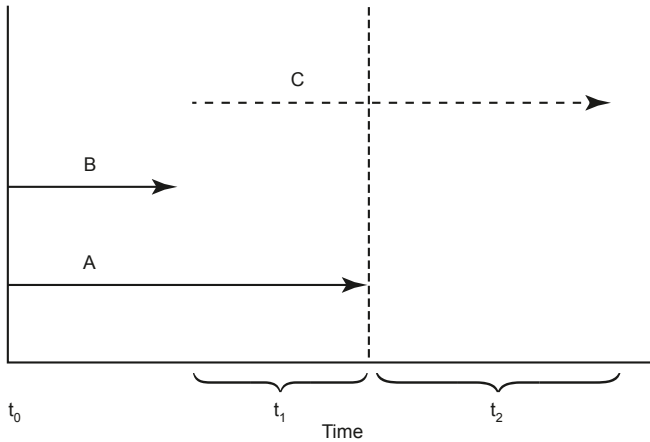


Figure 10.1 Managing the eradication portfolio.

potential synergies with *A* and *B*, the development of a specific analysis that will explicitly consider the synergies may make the combined costs of working on *A* and *C* lower if implemented simultaneously than the costs of completing *A* and *C* independently. With full acknowledgment that *A* and *C* may involve different stakeholders, partnerships, and champions, we suggest the need for explicit characterization of the investment case for disease *C* jointly with *A*, to explore whether opportunities for synergy exist. In this regard, the timing of the launch of *C* could begin anywhere. Figure 10.1 shows the possibility that success of eradication of *B* occurs and launch of the eradication of *C* begins such that *A* and *C* occur simultaneously during the time period t_1 , and *C* continues on its own during t_2 .

Managing a disease eradication portfolio warrants careful consideration to ensure that resources get used optimally and to avoid eradication efforts “competing” with each other, thus leading to less-than-optimal outcomes (Duintjer Tebbens and Thompson 2009). To counteract the possibility of antagonistic effects (e.g., impacts on existing health systems; see Pate et al., this volume) requires careful consideration of potential antagonistic effects as well as synergies.

In the overall eradication portfolio, numerous criteria related to the decision-making process on the phasing and timing of multiple eradication initiatives should be considered: the nature of interventions, surveillance, scope, staff, costs, social motivation, social and political will, operational issues, and the potential impact on health systems due to codependency on key factors (e.g., two groups potentially competing for resources). A phased approach could make the most sense, because different countries operate on different geographical scales, and phasing efforts may promote continued use and leverage of existing eradication resources or infrastructure, including social and

intellectual capital. Bundled activities may permit risks to be shared—a potential that should be carefully scrutinized. If programs link tightly, then issues and challenges that impact one program may spill over to the other program.

In the analysis of the overall eradication portfolio, the process should consider explicitly public perception of eradication efforts and manage public support. Perceptions about one eradication initiative might impact others, such that public perception can act as a significant enabler or barrier for stakeholder engagement and cooperation.

What the Eradication Investment Case Is Not

Clearly, this chapter reflects our aspirations and the promise of an EIC, but it also needs to present what the EIC will not include or achieve. The EIC does not include a financing plan or an implementation plan, focus on country-specific costs and benefits, or make the decision for the world. An EIC should help inform future eradication decisions. However, the actual decision-making process requires weighing multiple attributes, and this depends on values.

We intend that the EIC should provide comprehensive information relevant to the attributes that concern decision makers as they engage in the decision-making process to implement an eradication program. Decision makers are in the best position to make a choice based on their values.

Recommendations

We offer the following recommendations with respect to further development and use of an EIC to support future eradication initiatives:

1. Future eradication initiatives should develop an EIC, which we believe will serve to manage expectations more effectively, create opportunities to seek financing and develop better financing plans, and encourage the consideration of eradication initiatives as major projects that provide public goods.
2. All stakeholders should feel empowered to engage in the iterative process used to develop and use EICs. We identified the importance of creating an analytic-deliberative process and recommend the conduct of research that might further define the actual process and the roles of various stakeholders.
3. Recognizing the challenges inherent in integrating large amounts of information into an EIC, efforts should be undertaken to develop specific guidelines for EICs that may help to standardize the process, assist analysts with respect to methodological challenges, and ensure completeness.

4. Additional research should explore the timing, phasing, and portfolio of all eradication efforts and address the joint effects and synergies.
5. Policy makers should identify and research potential options for innovative financing for eradication initiatives, such as eradication bonds.
6. Public health leaders should recognize the challenges associated with managing major projects and learn lessons that may help with respect to managing eradication initiatives.