

Integration of targeted health interventions into health systems: a conceptual framework for analysis

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The benefits of integrating programmes that emphasize specific interventions into health systems to improve health outcomes have been widely debated. This debate has been driven by narrow binary considerations of integrated (horizontal) versus non-integrated (vertical) programmes, and characterized by polarization of views with protagonists for and against integration arguing the relative merits of each approach. The presence of both integrated and non-integrated programmes in many countries suggests benefits to each approach.

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. However, systematic analysis of the relative merits of integration in various contexts and for different interventions is complicated as there is no commonly accepted definition of ‘integration’—a term loosely used to describe a variety of organizational arrangements for a range of programmes in different settings.

We present an analytical framework which enables deconstruction of the term integration into multiple facets, each corresponding to a critical health system function.

Our conceptual framework builds on theoretical propositions and empirical research in innovation studies, and in particular adoption and diffusion of innovations within health systems, and builds on our own earlier empirical research. It brings together the critical elements that affect adoption, diffusion and assimilation of a health intervention, and in doing so enables systematic and holistic exploration of the extent to which different interventions are integrated in varied settings and the reasons for the variation. The conceptual framework and the analytical approach we propose are intended to facilitate analysis in evaluative and formative studies of—and policies on—integration, for use in systematically comparing and contrasting health interventions in a country or in different settings to generate meaningful evidence to inform policy.

Keywords Health systems, targeted programmes, integration, vertical programmes, horizontal programmes

KEY MESSAGES

- Systematic analysis of the relative merits of integration in various contexts and for different interventions is complicated as there is no commonly accepted definition of 'integration'.
- The analytical framework presented enables the term integration to be deconstructed into multiple facets, each corresponding to a critical health system function.
- The conceptual framework can be used to analyse and map for different health programmes the nature and extent of integration in different settings, along with the factors that influence the integration process.

Introduction

A longstanding debate on health systems organization relates to the benefits of integrating programmes that emphasize specific interventions into health systems to increase access and improve health outcomes. This debate, long characterized by polarization of views with protagonists for and against integration arguing the relative merits of each approach, has been rekindled recently due to substantial rises in externally funded programmes for health interventions and health system strengthening (Walsh and Warren 1979; Warren 1988; Wisner 1988; Cueto 2004; Magnussen *et al.* 2004; World Bank and World Health Organization 2006).

This debate, which has been driven by narrow binary considerations of integrated versus non-integrated programmes, has also developed an ever-expanding lexicon of its own. For example, targeted programmes that emphasize specific interventions are also called 'vertical', 'categorical', 'stand-alone' or 'free-standing' programmes, while programmes whose elements are integrated into health systems are also known as 'horizontal programmes', 'integrated health services' or 'horizontal approaches'. This abundant vocabulary has been further enriched by the addition of terms such as 'diagonal' or 'oblique' to describe approaches that are not considered to be purely vertical or fully integrated (Atun *et al.* 2008).

The presence of both integrated and non-integrated programmes in many countries suggests benefits to each approach. However, the relative merits of integration in various contexts and for different interventions have not been systematically analysed and documented. In practice, such an analysis is complicated as there is no commonly accepted definition of 'integration'—a term loosely used to describe a variety of organizational arrangements for a range of programmes in different settings. Further, as the problem being addressed, the nature and extent of integration of interventions and outcomes measured vary, there are methodological challenges to comparing various interventions in different settings. There is, hence, a need to better define what is meant by integration and deconstruct it in a way that adequately captures various means by which targeted health interventions are integrated into health systems.

In this paper we present an analytical approach that enables us to define integration in relation to critical health system functions. We also describe a conceptual framework that can be used to analyse and map for different health programmes the nature and extent of integration in different settings, along with the factors that influence the integration process.

We developed the proposed framework because of its potential relevance and applicability to real-life problems at the country level. We visualize a health system as a complex adaptive system embedded within a broad context comprising a set of interacting critical functions that include governance, financing, planning, service delivery, monitoring and evaluation, and which are designed to achieve a set of objectives and goals (Atun and Menabde 2008). The reader is encouraged to explore other frameworks (World Health Organization 2000; World Bank 2004) and health system approaches developed by others (Roberts *et al.* 2004) which have informed our framework but which are not appropriate for exploration of how health interventions are integrated into health systems functions. Our framework allows for consistent exploration of integration in a holistic manner for each critical health system function, which we define, and the factors that influence the extent and nature of integration.

In our model, health interventions are defined as complex innovations, and 'integration' is explored using a diffusion of innovation lens. The conceptual framework and the analytical approach presented in this paper are not intended to serve as the only framework or approach applicable to the question stated above. Indeed, the authors recognize limitations of any framework or normative approaches to complex issues in global health that are not fully understood and are influenced by a heterogeneous set of problems and interventions aimed at addressing these in varied contexts.

A conceptual framework for analysing integration of targeted health interventions into health systems

We examine how health interventions are integrated into health systems. Drawing on previous research methodologies and approaches used to assess interventions and health systems (Atun *et al.* 2004; Coker *et al.* 2004b) and perspectives from organizational behaviour, strategy and innovation studies, we consider both the theoretical constructs and empirical evidence of adoption and assimilation of such interventions (Baldrige and Burnham 1975; Downs and Mohr 1976; Tornatzky and Klein 1982; Damanpour 1987; Meyer and Goes 1988; Rogers 1995; van de Ven *et al.* 1999), specifically within health systems (Coleman *et al.* 1966; Kaluzny *et al.* 1974; Kimberly and Evanisko 1981; Greenhalgh *et al.* 2004; Atun *et al.* 2006; Atun *et al.* 2007).

In this framework, we define integration as the extent, pattern, and rate of adoption and eventual assimilation of health interventions into each of the critical functions of a health system (Atun and Menabde 2008), which include, *inter alia*: (i) governance, (ii) financing, (iii) planning, (iv) service delivery, (v) monitoring and evaluation (M&E), and (vi) demand generation. An ‘intervention’ in this context refers to combinations of technologies (e.g. vaccines, drugs), inputs into service delivery, organizational changes and modifications in processes related to decision making, planning, and service delivery.

We view a health intervention as an innovation, comprising new ideas, practices, objects or institutional arrangements perceived as novel by an individual or a unit of adoption (Rogers 2003), while recognizing that in some cases the interventions which have previously been implemented in small scale are scaled up and increased in intensity. In such instances, the ‘newness’ relates less to the technical element of the intervention itself but to the organizational changes, new financing schemes and novel processes that accompany scaling up, intensification, integration and eventual assimilation of the intervention into the health system.

Empirical evidence suggests that adoption and diffusion of innovations in health systems is influenced by the nature and complexity of the innovation (Plsek and Greenhalgh 2001; Denis *et al.* 2002; Coker *et al.* 2004a; Atun *et al.* 2007), how it is perceived by the adopters (Foy *et al.* 2002), contextual circumstances (Pettigrew *et al.* 1992; Coker *et al.* 2003; Atun *et al.* 2006), and health system factors (Atun *et al.* 2005b,c). Further, adoption and diffusion of these innovations are influenced by the prevailing cultural norms, beliefs and values of the key actors and institutions within the adoption system (Atun *et al.* 2005a)—in particular professional groups (Ferlie *et al.* 2005) and opinion leaders (Locock *et al.* 2001; Fitzgerald *et al.* 2002), social networks (West *et al.* 1999), systems and structures that enable learning within an organization (Shortell *et al.* 1998)—and the absorptive capacity for new knowledge within adopting organizations (Barnsley *et al.* 1998; Ferlie *et al.* 2001).

Drawing on relevant empirical evidence and theoretical propositions, we propose that the adoption and diffusion of new health interventions and the extent to which they are integrated into critical health system functions will be influenced by the nature of the problem being addressed, the intervention, the adoption system, the health system characteristics, and the broad context. We build on this proposition to develop a conceptual framework comprising five constituents that interact to collectively influence the extent, pattern and rate of adoption of an intervention within a health system, namely: the nature of the problem, the intervention, the adoption system, the health system characteristics, and the context within which innovation diffusion occurs. Our framework enables analysis of the interactions and interconnections between these elements, allowing a systematic and holistic analysis of adoption and diffusion of health interventions in general. We discuss in more detail below the framework, which is shown in Figure 1.

Health interventions are introduced as innovations to health systems—complex adaptive systems (Plsek and

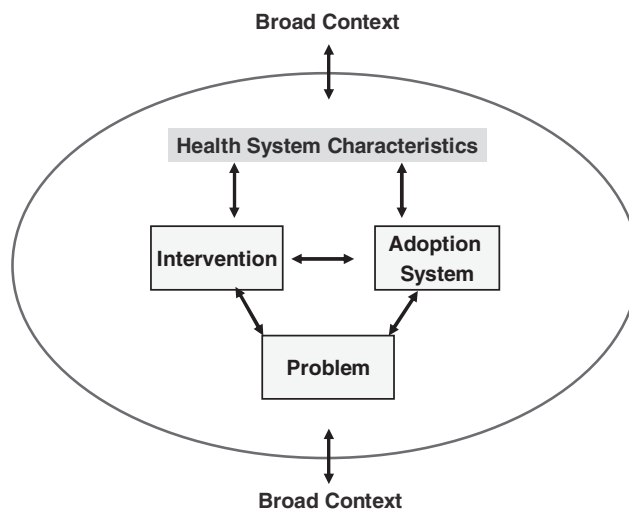


Figure 1 Conceptual framework for analysing integration of targeted health interventions into health systems.

Greenhalgh 2001; Begun *et al.* 2003; Tan *et al.* 2005) that change and adapt in response to endogenous and exogenous actions, disturbances or triggers. As with other dynamic complex systems, health systems comprise interacting feedback loops and non-linear relationships. In such systems the effects of decisions are separated in time and space, hence, the consequences of actions involving one or more elements of the system may not be immediately visible or accurately predictable. These relationships extend beyond the health system and are intricately linked to the context within which the system is embedded. Perturbations in the context influence system elements and changes in system elements affect the context. Further, each intervention is internalized within a distinctive adoption system comprising multiple agents (individuals and organizations that operate within a set of cultural norms and values) that act in ways that are not easily predictable. The actions of these agents are interconnected; action by one agent changes the context for other agents. The interaction of the innovation and the adoption system with the context influences the responsiveness of the context, which, in turn, influences the adoption and assimilation of the innovation in the health system. These dynamic interactions are non-linear, and can lead to unpredictable system responses with unintended consequences (Atun and Menabde 2008).

The problem

The characteristics of the problem will influence the rate at which an intervention designed to address it is integrated into the general health system. For example, the social narrative around the problem, urgency and the scale of the socio-economic burden due to the problem will influence the perceived necessity of a robust response and the speed with which an intervention is integrated into the general health system. At times a rapid response may necessitate speedy introduction of an intervention with limited integration, followed by gradual assimilation as the problem is better controlled.

The intervention

As discussed earlier, we define an ‘intervention’ as combinations of technologies, inputs into service delivery, organizational changes and modifications in processes related to decision making, planning, and service delivery, as well as scaling up of interventions previously implemented in small scale using novel processes. These interventions are introduced into health systems as innovations, comprising new ideas, practices, objects or institutional arrangements.

Perceived attributes of innovations, such as ‘relative advantage’, ‘compatibility’, ‘trialability’, ‘observability’ and ‘complexity’ influence the speed and extent of their integration (Rogers 1995). Less complex interventions more readily lend themselves to standardization and replication than complex interventions. Consequently, they are more readily scaleable than interventions of greater complexity that require greater customization to meet the needs of the specific client groups in different contexts. However, whatever the perceived benefits, trialability, compatibility, observability or the level of complexity, new interventions are viewed with caution or circumspection by multiple potential adopters, affecting the extent, pattern and rate of their adoption.

Health interventions comprise multiple elements and facets—including technological, organizational and processual innovations. Their adoption depends on a range of users and they affect a variety of stakeholders. As such, they range in complexity depending on the number of elements and facets to the intervention, temporal considerations in terms of cause and effect, and the stakeholders involved. In turn, the extent of complexity influences the compatibility of the intervention with the existing system, its trialability, and hence more rapid realization and observation of benefits (or adverse effects). Therefore, health interventions could usefully be grouped using intervention complexity as a dimension.

For example, vaccination for childhood illnesses involves use of a new technology in a selected client group (who can be readily identified). Typically, the intervention is delivered by one or more health professionals at a single occasion or at a limited number of occasions at regular intervals. Hence, it is more readily ‘trialable’, ‘observable’, its compatibility with the existing system more readily apparent, as are the perceived benefits (a child immunized) or adverse effects (reaction to the vaccine). In contrast, integrated maternal and child health programmes involve multiple interrelated and interdependent interventions grouped together, delivered over a period of time at different levels of the health system to a range of stakeholders by a multidisciplinary group of health workers (Figures 2 and 3). As such, an integrated maternal and child health programme is more complex than vaccination.

Intervention complexity is also determined by the number and nature of technologies used to address a problem, and the degree of user engagement needed to achieve improved outcomes or risk reduction. For example, interventions to address onchocerciasis (river blindness) or lymphatic filariasis (elephantiasis) typically use a single drug, ivermectin, administered once annually (and in the case of lymphatic filariasis in combination with albendazole) to infected or at-risk populations in endemic areas, in collaboration with local communities.

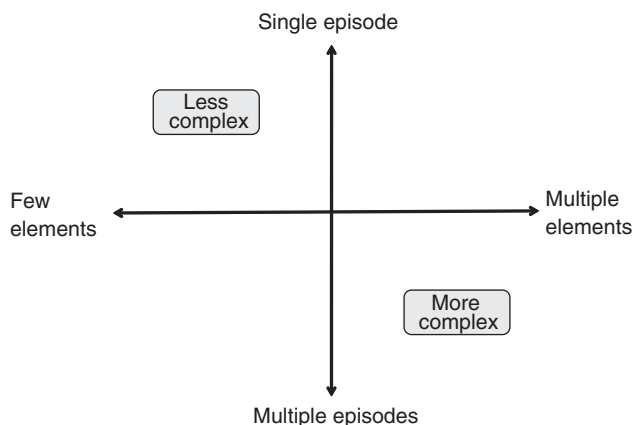


Figure 2 Intervention complexity: episodes of care and number of elements in the Intervention.

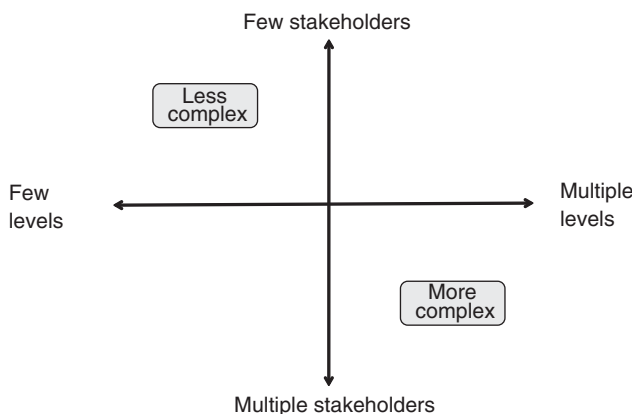


Figure 3 Intervention complexity: levels of care and number of stakeholders involved in delivery of the intervention.

Often, ivermectin is administered as a mass treatment programme.

As compared with onchocerciasis or lymphatic filariasis, interventions for HIV/AIDS are relatively more complex (Figure 4) as they usually involve multiple novel technologies (diagnostic tools to determine infection levels to start treatment and to monitor effect and side effects of drugs used, new antiretroviral treatments for HIV/AIDS and medications for treating co-infections), processes relating to introduction of treatment guidelines, multiple workers (e.g. outreach workers, doctors, nurses, social workers, peers, and families) and groups (civil society, communities affected by HIV/AIDS, media, human rights organizations) working at different levels across several sectors (e.g. health, education, law enforcement and penitentiary systems) for various groups, some of which are difficult to reach (e.g. commercial sex workers and injecting drug users). The scope of interventions for these groups is wide, ranging from harm reduction programmes that combine technological and behavioural interventions, to elaborate care regimes applied over many years often in resource-poor settings. Success of these interventions requires strong stakeholder involvement and user engagement.

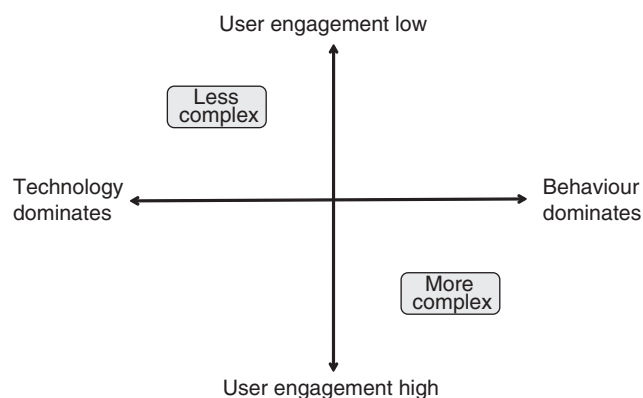


Figure 4

The adoption system

In our framework, the adoption system refers to key actors and institutions in the health system, but also beyond this in the broad context, with varied interests, values and power distribution in relation to the health intervention concerned. These actors include policy makers, managers, health care purchasers, health workers (physicians, nurses, professions allied to medicine), patients, professional associations, patient groups, religious authorities, affected communities, faith-based entities, and civil society organizations.

Each of these stakeholders have differing perceptions of the benefits and risks of an intervention, and consequently occupy disparate positions and roles in the adoption process (Greenwood *et al.* 2002; Atun *et al.* 2005b). The nature of these perceived benefits and the incentives they create vary for each group. Often these are non-monetary or economic incentives such as those relating to health/human rights, equity, power and normative views on a value position (such as libertarian views which stress the individual versus more communitarian approaches that espouse the community). These perceptions are shaped by a number of factors, for example the way by which intervention 'benefits' are communicated and how the intervention 'conforms' to existing institutions, prevailing beliefs and value systems, inherent incentive systems—especially the extent to which the intervention aligns incentives for users, provider and managerial agencies—and the perceived 'legitimacy' of the intervention (in particular cognitive, technical, economic and normative legitimacy) (DiMaggio and Powell 1983; Suchman 1995). Collectively, the perceptions and positions of these actors determine the 'receptivity' of the adoption system to novel interventions.

Health system characteristics

Health innovations are gradually adopted and assimilated into health systems as a result of a cumulative and unpredictable translation process. Often, the adoption involves not just changes in service content but regulatory, organizational, financial, clinical and relational changes involving multiple stakeholders. These interactions shape and transform the innovation to ensure alignment of its elements with critical health system functions in line with stakeholder expectations.

Hence, in practice, the adoption process may not be linear or occur in discrete steps.

Integration can occur at different levels of the health system—local, district, regional or national depending on the prevailing governance arrangements—in relation to critical health system functions, which include, *inter alia*, governance, financing, planning, service delivery, M&E, and demand generation. We briefly discuss below what integration into critical health systems functions means in practice.

Integration of an intervention into broader health system governance functions will involve alignment with existing regulatory mechanisms, creation of unified accountability frameworks, integration of reporting, and establishment of a common performance management system. Integration into financing functions can occur in various ways, for example pooling of finances for the intervention into the existing national/local programme budgets, into health sector funds through a 'sector wide approach' or a 'common basket' or directly into the government/ministry of health budget through 'budget support'. Health interventions can also be integrated into health system planning functions at local and national levels, especially in relation to needs assessment, priority setting, capacity planning, and resource allocation. Integration of monitoring and evaluation often underpins the integration with planning and governance functions, and would include use of shared indicators and establishment of integrated data collection, recording, analysis and reporting systems.

Demand generation is a critically important but frequently overlooked health system function, as many programmes in health systems emphasize the supply-side interventions. Integration of demand generation activities could involve use of joint systems for financial incentives (for example conditional cash transfers, health insurance), or joined-up approaches for individual- and population-level health education and promotion interventions.

The context

In our framework we define the broad context as the interplay of the demographic, economic, political, legal, ecological, socio-cultural (including historical legacies), and technological factors in the environment in which the foregoing considerations (the problem, intervention, health system characteristics and the adoption system) are considered (Atun and Menabde 2008). This context matters as the adoption and assimilation of a health intervention into a health system, and its sustainability, will be dependent on a number of contextual factors.

Critical events (such as regime change or a catastrophe) and technological change (such as a new diagnostic tool, a new and affordable drug, or a new prevention mechanism) provide opportunities for more rapid adoption and assimilation of interventions into health systems. Opportunities are also created when demonstrable synergies and benefits can be achieved by integration (such as nutritional interventions with immunization, joint programmes for neglected tropical diseases, tuberculosis and HIV/AIDS and so on). However, even when evidence on the benefits of an intervention exists (providing technical and economic legitimacy), the prevailing political economy and socio-cultural norms (affecting cognitive and

normative legitimacy) will influence the desirability for adoption and assimilation of the intervention.

In some contexts, integration will be hindered by factors that influence the health system but extend beyond it; for example, fiduciary requirements imposed on donor agencies by their governing structures which require them to 'ring fence' funding streams or be able to attribute results to their investments. Another example is the complexity of fiscal relationships among levels of government, as between central, provincial and local governments in some federal systems. Lower tiers of government might have no incentives to implement centrally funded interventions unless such funds were earmarked by and from the central level. We recognize these context-specific constraints and do not consider them to be inherently bad or good. Finally, the severity of the problem coupled to frailty of the political and economic situation may call for expediency, while fiscal space considerations, which introduce spending ceilings on the health system, may impose constraints on integration as it may not be possible to appoint new staff to be on the regular payroll in the government-financed element of the health sector.

Potential applications of the conceptual framework

To the policy maker and the practitioner, a framework is only as good as the extent to which it is applicable to real-life problems. This framework can be used when undertaking literature reviews, programme reviews, detailed country case studies to explore how novel health interventions and health systems interact, or programme planning at the national or sub-national levels. In relation to case studies, the conceptual framework can be used to develop tools to capture data including a topic guide for in-depth interviews with key informants. The data tools and the topic guide are customized to ensure relevance to the context studied. The framework can be used along two dimensions: (i) diagnostic, which emphasizes the past and current situations, and (ii) formative, focusing on the future.

The diagnostic exercise can be used for detailed mapping of the health intervention, and in particular the *purpose*, *extent* and *nature* of integration of the health intervention(s) under study into critical health system functions, with classification of the *extent* and *nature* of integration of the priority intervention(s) into each health system function as fully integrated, partially integrated, not integrated, or unknown. By examining each critical health system function in this manner, the framework enables both the macro-analysis of integration (for the overall health system) and the micro-analysis of integration (for example, for only one function). While it would help in each context to describe what a fully integrated health system might look like, the framework is agnostic about whether or not a particular system should be fully integrated; that, in our view, is a matter for the policy makers to decide in each context. Instead, the analysis can be used for a detailed exploration of why and how the health intervention is integrated into various health system functions, and how the extent and nature of integration is influenced by factors relating to the intervention, adoption system, health system and the context.

The analysis can provide a detailed account of the purpose of the integration (as perceived by key actors or as stated in key documents), organizations, decisions and choices made, and the policy and programmatic trade-offs considered. The narrative of the analysis summarizes the findings from the interviews with key actors on their perception of the 'relative success', or lack thereof, of integration, and the impacts and unintended consequences on each critical health system function as perceived by them. Depending on data availability, this narrative captures secondary data to triangulate and validate findings from interviews of key actors. The analysis can reveal the reasons for integration or non-integration and enables the policy makers to develop locally identified options and preferences for future action that arose from the case study. For example, the reasons for non-integration of monitoring and evaluation may be due to donor conditionality that requires the country to report on a set of indicators that lie beyond the core set used by the ministry of health. Similarly, financing of the health intervention in question may not be integrated because the existing local systems are not robust enough to capture resource flows (which with appropriate investment could be addressed) or due to requirement of the donor not to pool funds (as is the case with some major donors, and in which case in spite of the obvious benefits in some cases may be difficult to achieve).

We anticipate that the use of this framework at the country level will lead to its refinement over time, and its use to develop a database of health systems that could be compared and contrasted in terms of their adoption of interventions, integration of these interventions into health system functions over time, and the extent to which the external or donor environment played a role, among other factors, in this process. A comparative analysis of decision space in the decentralization of health systems is an example of such multi-country studies (Bossert 2002).

Conclusions

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. We present an analytical framework which enables deconstruction of the term integration into multiple facets, each corresponding to a critical health system function.

The conceptual framework and the analytical approach we propose are intended to facilitate analysis in evaluative and formative studies of—and policies on—integration, but not as a prescription. The framework can be used to systematically compare and contrast health interventions in a country or in different settings to generate meaningful evidence to inform policy.

Adoption, diffusion and eventual assimilation of a health intervention in a health system necessarily involve their translation and transformation to ensure alignment of intervention elements with critical health system functions. The speed and extent of this integration will vary—in part, determined by the intervention complexity, the health system characteristics and the context within which the intervention

is introduced. In practice, the presence of several critical health system functions and multiple levels of intervention means that in different settings the extent and nature of integration of priority interventions at various stages of adoption will diverge from one health system to the next. In any setting, as programmes are more widely adopted, translated to reflect the local health system realities and become more 'mature', the possibilities for greater integration and eventual assimilation will increase.

Our conceptual framework builds on theoretical propositions and empirical research in innovation studies, and in particular adoption and diffusion of innovations within health systems, and builds on our own earlier empirical research. It brings together the critical elements that affect adoption, diffusion and assimilation of a health intervention, and in doing so enables systematic and holistic exploration of the extent to which different interventions are integrated in varied settings and the reasons for this variation.

Our framework will help to shift the boundaries of the debate, which has been stuck in a binary mode, to a new terrain—enabling a new discourse on integration with reference to multiple levels in the health system and in relation to critical health system functions. As with any conceptual or analytical framework, our model will evolve over time. However, it will facilitate a progression beyond the false dichotomy between integrated and vertical approaches, which has so rigidly dominated the debate.

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