A framework and toolkit for capturing the communicable disease programmes within health systems

Tuberculosis control as an illustrative example

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The frameworks and methods used for analysis, monitoring and evaluation of communicable disease control vary greatly. Although a number of manuals exist for a detailed analysis of wider health system context are lacking. This is surprising given that the success of vertical programmes is often determined by the constraints of health systems. The importance of the context and the health system in determining the successful implementation of national tuberculosis programmes is well recognized by the WHO, which recommends analysis of national tuberculosis programmes within the context of the health care system, health reform and the economic status of the country. However, current approaches inadequately capture intelligence on the health systems variables impacting on programme efficacy, limiting the ability of policy makers to draw lessons for wider use. A recent WHO report highlights the major systemic constraints to DOTS implementation and recommends a comprehensive and multi-sectoral approach to tuberculosis control. This obviates the need for tools that take into account health systems issues as well as focusing on a particular vertical programme. But no such comprehensive tool exists. This paper outlines the conceptual basis for a model and a toolkit for rapid assessment, monitoring, and evaluation of the context, the elements of the health system and vertical communicable disease programme. It describes the framework, the potential strengths and weaknesses, approach and piloting of the toolkit and its two elements: first for ‘horizontal assessment’ of the health system within which the programme is embedded and second for ‘vertical assessment’ of the infectious disease-specific programme.

Keywords: health systems, rapid appraisal, systems analysis, toolkit

Although a number of guidelines and manuals exist for baseline, assessment, monitoring and evaluation of infectious disease programmes, these lack well developed tools that enable an assessor to take account of the wider health system context. This is surprising given that often the health systems factors constrain the success of such programmes. For instance, the WHO tuberculosis strategy is based on five elements considered essential for global tuberculosis control: political commitment; case detection using sputum microscopy; standardized short course chemotherapy; regular drug supply and; a standardized recording and reporting system. Assessment based on these elements fails adequately to capture intelligence on the health systems context impacting on programme efficacy. Consequently, assessments of the success or failure of programmes are done with a limited analysis of the context and hence tend to be narrow in focus, limiting the ability of policy makers to draw lessons for wide use. The WHO ‘Guidelines for conducting a review of a national tuberculosis programme’ identifies that one of the purposes of reviewing a tuberculosis programme is to describe the national tuberculosis programme resources and structure within the context of the general health care system, health sector reform, and the economic status of the country. The document highlights that one of the objectives of reviewing a tuberculosis programme is to analyse the ‘current structure of health service management and financing, and potential changes over the next five years which will affect the national tuberculosis programme’. However, despite WHO recommendation highlighting the importance of such a review no formally validated tool exists to undertake a detailed assessment of the health system and the broader context. A recent WHO report highlights the major systemic constraints to Directly Observed Therapy-Short Course (DOTS) implementation and recommends a comprehensive and multi-sectoral approach to tuberculosis control. This obviates the need for tools that take into account health systems issues as well as focusing on a particular vertical programme. Vertical programmes tend to focus on a disease, such as tuberculosis, and hence the programme goals and objectives are often highly specific and tend to be more easily measurable and achievable. The WHO and the International Union Against TB and Lung Disease (IUATLD) recommend and strongly support a closer integration of vertical programmes into the health system through ‘a pragmatic approach combining a specialisation, well defined management system with a fully integrated service delivery’. However, in many countries integration is not achieved and programmes are set up in parallel with existing health systems. At worst, the objectives of vertical programmes are not fully aligned with countries’ governmental health priorities and are ‘owned’ by international development agencies or local NGOs that have different lines of management and accountability, resulting in fragmentation and duplication of services. When such discordance exists the likelihood of effectively integrating the vertical programme into the health system declines, increasing the risk of governments diverting resources away from areas covered by externally supported vertical programmes, reducing the ‘added value’ these programmes may bring and the chances of long-term programme sustainability. Successful vertical programmes can, however, be ‘rolled-out’ nationally and become part of the existing health system. Notions of sustainability are of critical importance.
Many constraints faced by vertical programmes have their roots less in the technical content of the programme but rather in health system policy, structure and organisation. Addressing health systems issues and strengthening the health system rather than the vertical programme alone increases the chances of sustainability for the vertical programme. To fully capture the complexities of a vertical programme embedded within, or running parallel to (but still influenced by), the health system, a more comprehensive joint assessment of the health system and the vertical programme is necessary. This paper outlines the conceptual basis for a proposed toolkit that can be used for rapid assessment, monitoring and evaluation of the elements of the health system and a vertical programme. It describes the way the toolkit has been developed, the framework, the potential strengths and weaknesses, and the approach taken to pilot and validate the toolkit. Tuberculosis is used as an illustrative example but the toolkit has wide application for infectious disease programmes.

CONCEPTUAL FRAMEWORK

The toolkit comprises two elements: the first element, the ‘horizontal assessment’, is for analysis of the health system within which the infectious disease programme is embedded from a variety of perspectives. The second element, the ‘vertical assessment’, is used to assess the infectious disease-specific component.

The over-arching conceptual framework on which this toolkit is based bears similarities to the approaches to evaluations proposed by Atun, Hsiao for health systems and Pawson and Tilley generally, but goes beyond these. The first two approaches are strongly analytical and focus on the ‘inputs’ or ‘control knobs’, the inputs and processes that can be modified to achieve health system objectives whereas third extends the analysis to underlying factors that influence change. The approach adopted in the development of the toolkit aims to find a middle ground between the meta-analysis, with roots in evidence based medicine, and narrative review which is a more inductive approach examining and comparing the features of different programmes and drawing conclusions about what makes them more or less successful. For the realist, it is not programmes that work but ‘rather it is the underlying reasons or resources that they offer subjects that generate change.’ Pawson and Tilley propose that the mechanism (M) by which a programme aims to influence the subject’s actions is triggered (or not) depending on the context (C) or characteristics of both the subjects and the programme locality. Consequently, programmes will have varying outcomes (O) if implemented in different situations and/or at different times. The mechanism broadly corresponds to the horizontal element of the toolkit proposed in this paper and the context to the vertical element. This theoretical framework is represented in figure 1 with examples from the DOTS strategy inserted to illustrate. The regularity factors in the case of DOTS are the five essential components or gold standards against which the success or failure of programmes is judged. Outputs are a function of regularity and outcome and using the proposed toolkit, analysis of each of the five components and specified outputs will be carried out. In order to quantify and measure success or failure, inputs and outputs should be determined deductively.

The emphasis here is on the application of the same mechanism in different contexts with a detailed analysis of successes and failures in an attempt to imitate successes and avoid failures in future applications thus building up what Pawson calls ‘programme theories.’

FEATURES OF THE TOOLKIT

The existing tools used to review the baseline situation, feasibility, monitoring and evaluation of vertical infectious disease programmes are effective assessing in detail the programme per se, offering a profound epidemiological understanding, but need to be coupled with tools for a detailed assessment of the health system within which the vertical programme is embedded. While a number of tools exist to assess health system elements or political economy within which the system operates these tend to be narrow in scope. The tools and methodologies used in health system and programme assessment are time-consuming and resource-intensive. An exception includes the Rapid Assessment and Response (RAR) toolkits, used in the areas of substance abuse and HIV/AIDS. For instance, the Rapid Assessment and Response Guide on Substance Use and Sexual Risk Behaviour (SEX–RAR), produced jointly by the WHO and UNAIDS, uses rapid appraisal techniques and links the assessment process directly to response and interventions. RAR toolkits have particular features that make them useful including:

- Speed of application

Critical in a fast changing public health environment such as increases in incidence of tuberculosis and MDR–TB in the Russian Federation and increases in tuberculosis consequent upon the epidemic of HIV/AIDS in Sub-Saharan Africa.

- More economically acquired data

Preferable in resource-poor settings.

- Practical relevance

The tools within the toolkit are selected on the basis of their contextual sensitivity to the particular setting and the interventions that follow rather than scientific rigour alone.

- Use of multiple methodologies for data collection

The information obtained is triangulated and verified to ensure validity. Sampling techniques are explicitly identified. The use of multiple methods, especially ethnographic approaches, enables investigation of politically or culturally sensitive information from a cross-section of societal groups enabling a more comprehensive and holistic picture to emerge, especially valuable where vulnerable groups such as prison inmates and the homeless are targeted populations, for example in tuberculosis in the Russian Federation.

- Working collaboratively with local teams

Ensuring that the responses identified are relevant and sensitive to local needs.

- Use of routinely collected data sets and only supplements these with additional information if specific gaps are identified.

- Inductive reasoning: the team avoids making assumptions about the outcome of the assessment and allows the conclusions to emerge inductively.

While such rapid assessment toolkits can provide accurate information relatively cost-effectively, there are drawbacks.

![Figure 1 Conceptual framework for the toolkit](image-url)
Much depends on the quality of the planning of the rapid assessment process and the skills of the assessment team especially in the ability to conduct interviews. The process is often externally driven and ignores the long-term importance of community involvement and ownership of infectious disease programmes. The use of key informants alone in a rapid assessment can provide a biased and unrepresentative picture, especially when vulnerable and ‘hard to reach’ groups are a particular focus of a programme, as in the case of tuberculosis in the Russian Federation, where the homeless and ex-prisoners are important groups.

The key shortcoming of the RAR toolkits is their vertical focus on a particular disease, condition or therapeutic area and the failure to capture key contextual and health systems issues at institutional and macro levels necessary when introducing intervention programmes to address HIV/AIDS, tuberculosis and other infectious diseases epidemics that are a result of the interaction of a number of different factors creating a dynamic and complex environment within which the epidemic exists and develops. Narrow technical interventions therefore are unlikely to succeed. Multifaceted and multi-methods intervention strategies need to be pursued to address the epidemics influenced by complex socio-economic and political factors. However, multifaceted interventions require a thorough understanding of the broad context and the health system within which the interventions are placed. Currently, no unified or integrated instruments exist to enable decision-makers to gather appropriate and timely information for such contextual analysis.

We have developed an integrated toolkit that can be used to simultaneously assess the broad context, health system, and programme specific areas. The Systemic Rapid Assessment and Monitoring toolkit (SRAM) combines the advantages of rapid assessment approaches and provides an opportunity for more in-depth longitudinal assessment of specific areas such as political commitment, societal attitudes, beliefs and values as well as organizational responses to change. The richness of qualitative data required for a comprehensive analysis in such areas is difficult to obtain during a single rapid assessment. An in-depth longitudinal assessment provides a better understanding of these contextual issues, building on the results of the rapid analysis.

The toolkit differs from existing guidelines in that it has a predefined structure including a set of modules covering all the contextual and programme-specific areas and a key set of questions/datasets to undertake comparative or longitudinal assessments or benchmark the findings (comparatively or longitudinally). This feature of the toolkit makes it an ideal instrument not just for initial assessment but also for monitoring and evaluation. The modular structure and the flexibility of questions means that they can be adapted to ensure context sensitivity and questions can be added to ensure that the instrument captures answers to not just ‘what?’ questions but also those of ‘why?’ and ‘how?’

**TOOLKIT FRAMEWORK**

The toolkit has two elements: The ‘horizontal element’ assesses the macro context and the health system within which the tuberculosis programme is embedded from a variety of perspectives: political, legal, social, demographic, economic, technological, financing, organisational arrangements, resource allocation, and provision. The ‘vertical element’ assesses the infectious disease, for instance tuberculosis-specific, components of the programme such as epidemiology, service delivery, diagnostics laboratory networks, and treatment. The toolkit is modular in structure allowing flexibility according to the area in question, context and resource availability. Each module addresses a specific area (legal, political, financing, epidemiology, etc.). The instrument has a predefined set of key generic questions or headings in each module to enable the user to capture necessary information rapidly. A multi-methods approach by a multidisciplinary team enables cross-referencing and triangulation of data. Where possible, toolkit utilizes routine datasets.

The toolkit that has been designed is based loosely on a T model (figure 2). The horizontal elements comprise the health system analysis, and the vertical elements the infectious disease programme components. In cases where parallel vertical systems exist, for example Ministry of Health tuberculosis control programme and a prison-based Ministry of Justice tuberculosis control system, these are explored both individually and in terms of their linkages to each other.

As with any figurative representation, the model gives a simplistic view of a highly complex system with a multitude of linkages and interdependencies that are difficult to reflect diagrammatically.

The toolkit has three stages of analysis (figure 3). The first, ‘screening’ stage, comprises application of series of predefined questions for each module to a cohort of identified key informants. This stage enables a multidisciplinary assessment team comprising external consultants, local professionals, and programme managers to elicit key qualitative and quantitative information, through an iterative process of information gathering and discussion that triangulates the findings. The aim of this stage is to provide rapidly comprehensive information on the context, current processes and mechanism for the programme in question. Many questions identified at this stage are often posed during programme feasibility studies but have rarely been structured in a way presented in the toolkit. The questions seek information on past patterns, trends, responses to changes and other historical information to help the assessment team begin a process of scenario building and modelling possible future system and programme responses.

Box 1 illustrates examples of questions included for the financing module at systemic level.

The questions included at this stage are wide ranging and, through validation, are being refined, expanded or reduced to a core set of questions that yield valid and reliable information. These questions should be applicable in a variety of settings with supplementary questions used context-sensitively as necessary.

The aim of the second stage is to elucidate information obtained at stage one and provide more detail on the health system and vertical programme based on gaps identified by the screening questions. At this stage the team can include a wider range of key informants in order to capture a more representative group. The tools and questions recommended at stage two are frequently used in rapid assessment and appraisal and can be carried out in a short time frame. Key informants and sentinel sites are used extensively at this stage. Qualitative data predominates as it is relatively easy to obtain but routine quantitative data, where it exists, is also collated, especially in the areas of financing and epidemiology: much of it from routinely collected data at national and local level. At this stage there could be some areas for which the qualitative data is insufficient or biased. These problems can partly be resolved by ensuring that key informants are chosen from as wide a circle as possible and that appropriate sampling techniques are used when gathering information at sentinel sites. Sampling methodologies such as capture-recapture techniques have been used successfully, particularly where the social groups targeted are vulnerable and ‘hard to reach’, as is the case with many tuberculosis sufferers.

As in stage one the project team meets daily to analyse and triangulate the data collected and identify areas for further in-depth longitudinal analysis at stage three.

The aim of stage three is to provide detailed information on areas identified as critical to the success of the programme and not
easily collated during rapid assessment stages one and two. This new information is collected over a longer time frame and may well coincide with programme implementation and could be a programme output as well as being used to inform programme implementation. Such analyses will need to be carried out by the external team in concert with local collaborators and the balance will depend on the outcome of the rapid appraisal stages as well as the skills and knowledge of the experts carrying out the detailed assessment. A set of suggested tools are identified in the model for use at this level and require more resources and expertise than the tools suggested at stage two.

The toolkit has been designed to be used for programme monitoring and evaluation and could be used on an annual or biannual basis depending on the local and programme requirements.

**LIMITATIONS**

As with any of the toolkits available in the area of infectious diseases there is always a possibility that if the vertical arm of the assessment is too narrow the potential links with emerging opportunistic infections such as HIV/AIDS (in the case of tuberculosis, for example) could be undetected or underestimated unless there is existing knowledge about a possible relationship.

The flexibility of the model, while a strength in ensuring that the toolkit can be adapted to local needs and initiative, may leave the team with insufficient information in a number of important areas, for example, in the case of tuberculosis, the available diagnostic and treatment procedures on which the information is based may fail to identify potential sources of multidrug resistant tuberculosis (MDR–TB) and chronic cases. In order to
guard against this, it is essential that information from a variety of sources is triangulated at every stage and the programme team is involved in regular discussions and analysis of the findings. The examination of past socio-demographic trends and epidemiology and the use of this information to build scenarios should be approached with caution. This approach is an integral part of public health work but the quality of the information from which such projections are made should be verified where possible. The use of key informant interviews in examining information systems and data quality in this toolkit is a potential strength.

**TOOLKIT VALIDATION**

In order to validate this model the toolkit is being applied to a number of different settings with varied contextual features. The toolkit has been successfully piloted initially in the Russian Federation for tuberculosis programmes in a Russian region where the nature of the tuberculosis epidemic is changing rapidly, and the health system environment is complex and varied. The pilot yielded rich information on both the tuberculosis programme and the health system in the Russian region concerned. The information captured on the context and the health system would not have been possible if existing ‘Guidelines for conducting a review of a national tuberculosis programme’ were used alone. The information generated through the use of the toolkit in the pilot phase on the context, health system and the tuberculosis control programme is more extensive than the results of previously reported reviews of tuberculosis control programmes. The findings have been used to design interventions to implement WHO recommended
tuberculosis control strategy in the region concerned and inform regional and federal policy makers. The results of the pilot are reported elsewhere.17

The toolkit has been subsequently refined for validation and used for analysis of HIV prevention and control programmes in two Russian regions. The validation and refinement programme includes further application in the Russian Federation, in Georgia, South Africa and Tanzania, where well-developed programmes are struggling under the pressure of the HIV epidemic. Finally, the toolkit will be modified to use in resource-rich settings to shed light on why some local approaches, for example in some boroughs in London, appear to respond effectively to patient needs while other services appear to struggle.

CONCLUSIONS

The importance of a systemic as well as programmatic approach to the analysis of tuberculosis programmes has been outlined in this paper. This is especially important in the light of the expanding epidemic of HIV and the need for a coordinated and integrated approach to control diseases that emphasizes the importance of a coherent holistic health systems response.18–20

Empirical evidence, drawing on health systems development and tuberculosis control projects, identifies the complex legal, social, cultural, and economic constraints to change.17,21 Application of the toolkit has helped to expand significantly the understanding of the complex and dynamic interactions within the health system, within the vertical programme, and between these. This knowledge base has contributed to a better understanding of the motors and barriers to change in the region concerned and findings used to design context sensitive interventions to implement WHO recommended tuberculosis control strategies.

The toolkit is being validated in settings with a high burden of tuberculosis on the basis that these countries have been prioritized by the WHO for implementation of the DOTS programme and are likely to experience a wide range of constraints to the implementation of the programme. Indeed, many of these countries have already experienced mixed fortunes in relation to the impact of DOTS.22 Settings with high and/or increasing co-incidence of tuberculosis and HIV/AIDS are included in the validation process to ensure that the toolkit is sufficiently sensitive to the context of converging epidemics. This is critical as even in those countries such as Tanzania, where DOTS is well established and has achieved relatively good treatment outcome rates in the past, the burden of tuberculosis is growing.

REFERENCES


Box 1 Examples of questions for the financing module at systemic level

Box 1

Financing issues: Supply side
What is the absolute annual expenditure on health?
What is the expenditure on health as a proportion of GDP?
What is the expenditure on health as a proportion of total public expenditure?
What have been the trends in expenditure over the last 5 years?
What is the projected expenditure level on health?
What is the proportion of public versus private financing in the health system?
What are the pooling arrangements?
If insurance companies exists what is their ownership status?
What market share do the insurance companies have?
How do users choose insurance companies?
How are the premia for insurance companies paid?
How is the health budget distributed geographically?
How is the health budget distributed among tertiary, secondary and primary care providers?
How is the health budget distributed among different socio-economic groups?
Is there a resource allocation formula that determines budget allocations?

How are providers paid?
Are there any incentive payments to providers?
Is there any performance related pay for providers?
Are budget lines to providers fixed?
Is it possible to shift funds between different budget lines?

Financing issues: Demand side
What are the financing constraints faced by the users?
How do these constraints impact on access to the communicable disease programme?
How do these constraints impact on continued programme utilization?
How do these constraints impact on user-service relationships?


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