

**The Prism: Introducing an Analytical Framework for Understanding
Performance of Routine Health Information Systems in Developing
Countries
(A Work in Progress)**

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The Prism: Introducing an Analytical Framework For Understanding Performance of Routine Health Information Systems in Developing Countries (A Work in Progress)

Health professionals, particularly those engaged in the Routine Health Information Network (RHINO), see great potential in the use of district-level routine health information in developing countries. Better collection and use of health information can improve the provision of health care and enable health services to reach the neediest. Used effectively, routine health information helps managers allocate resources based on sound evidence and real-time needs. Health information is particularly valuable at district level where there are many demands on scarce resources. Despite the potential benefits of health information, in many developing countries, performance of routine health information systems falls consistently short of expectations. Why is that so? What is needed to ensure adequate performance of routine health information systems at district level? In this paper we propose an analytical framework that helps improve our understanding of the performance of routine health information systems in developing countries. Used effectively, this framework can also help us define strategies to address constraints to performance, especially at district level.

Definitions

We begin by **defining routine health information** as “information that is derived at regular intervals of a year or less through mechanisms designed to meet predictable information needs.” (RHINO, 2001). This definition includes systems for collecting and using health services statistics, administrative and financial data, epidemiological and surveillance data, data on community-based health actions, and vital events data.

It is also useful to define what is meant by **performance** of a routine health information system (RHIS). The clearer our expectations of performance, the easier it is to devise strategies for building capacity of these systems. In many cases, performance of a RHIS is narrowly defined as the production of good quality data. But, the ultimate objective of a RHIS is to produce information for *taking action* in the health sector. Performance of a routine health information system should therefore be measured not only on the basis of the quality of data produced but on evidence of the continued *use* of these data for improving health system operations and health status. Improving routine health information systems in terms of data availability, quality and use often requires interventions that address a wide range of possible “determinants of performance.” These determinants are explained in the 3-point framework depicted in Figure 1 below.

The Prism framework

The Prism, or three-point framework, is predicated on the assumption that improving capacity in RHIS (and subsequently performance) requires interventions that address the environmental and behavioral determinants of performance as well as the technical determinants. It broadens analysis of routine health information systems to include the behavior of the collectors and users of data and the context in which these professionals work. We hypothesize that sustainable production and use of good quality



health information is more likely to result from a strategy that focuses on three fronts — improving technical quality of data processes and tools, building individual capacity for understanding and using data, and strengthening the system or organizational context in support of data collection and use — than a strategy focusing on one front alone. The three aspects of the analytical framework can be used to identify opportunities for and constraints to effective (and strategic) data collection, production, and use. Strategies to improve performance in this area can then be built along the same three parameters.

Technical: the classic approach

In practice, information experts and public health professionals develop health information systems or tackle their problems with a technical mindset. In many cases, the chosen path to improving performance at district level focuses mainly on introducing or upgrading technical skills, changing the design of the system, or revamping the technology used to improve the availability and quality of data. Interventions tend to veer toward the nuts and bolts of the system (data collection, transfer, analysis, and presentation), where most health and information professionals are comfortable. While technical rigor is clearly needed in information systems, in practice technical interventions alone do not always result in appropriate action on the ground. There are many examples where indicators are sound, data collection forms are well-designed, and people are well-trained, but neither data tools nor information itself are used routinely to manage health services. Too often data collectors and users are not motivated to use the information system, or the organizational context undermines evidence-based health action. For example, in health systems that use normative rather than strategic planning, decision-makers follow traditional patterns of resource allocation based on set formulas. Even the availability of accurate and timely health data cannot guarantee that evidence becomes the basis of decision making. The entire health system must be geared to the use of information and value it for data to be used consistently.

Environment and behavior

The two other dimensions of the framework – the environment (health system or organizational context) and the actions and behavior of data collectors and users - help us consider strategies to maximize the impact of technical interventions. The external context includes the wider health system that contains the information system as well as the organizations (the ministry, management unit, or health facility) where data collectors and users work. Environmental factors exert pressure and create or limit opportunities for performance of RHIS. At the macro level, structural constraints such as poor roads, lack of telecommunications capacity, and insufficient quantities of appropriate human resources present very real obstacles to timely and complete reporting of information. The internal organization and culture of the health system also matters. A health system structured around vertical disease control programs, for instance, is often at odds with an integrated district-level health information system. On the micro level, field assessments have shown that organizational factors such as lack of clarity about roles and responsibilities for information management at district level; failure to actively distribute or introduce policies, norms, and standards; and ambiguity surrounding the flow of information throughout the system have a direct influence on



performance. Many environmental or organizational factors may appear to be outside the scope of RHIS strengthening. Yet, without an environment that supports and values data collection and use it is nearly impossible to make that critical link between data and health action.

Finally, it is important to consider human behavior in RHIS. Health data are collected by people who play professional and personal roles in the health system. Although building capacity of these people is at the center of RHIS strengthening, it is the behavioral aspects of performance that are often the most difficult to identify and confront in a meaningful way. They involve intangible concepts such as motivation, attitudes, and the values that people hold related to health information, job performance, responsibilities and hierarchy. Influencing many of these behavioral factors will require interventions that go beyond simple training that improves knowledge and skills in data collection and use.

Behavioral factors explain the way in which health workers collect and use data (or fail to do so). For example, the primary job of most data collectors revolves around their tasks as health workers or managers of health services. They see their other duties, such as disease surveillance, stock keeping, and evidence-based planning and budgeting as secondary to providing health care. If expectations with respect to data collection and use are unclear to health professionals, their motivation and commitment to managing data can suffer. Failure to provide feedback on routine reporting is another common disincentive to health worker performance in data management, leading to inadequate recording and reporting, and use. Any intervention to strengthen the health information system that does not address behavioral factors such as attitudes toward the collection and use of health information, motivation and incentives for making decisions based on data will result in poor quality data, underreporting, infrequent data use, and poor decision making.

The technical, environmental, and behavioral determinants of health information system performance rarely stand alone as the single cause of poor performance. They are often connected by a continuum one to the other. For example, on the technical-behavioral continuum, if a trained health worker feels she has not really mastered the necessary skills (self-efficacy as defined by behavioral scientists), then the likelihood that the required actions will be carried out is reduced. On the environmental – behavioral continuum, achieving competency in an action such as collecting and using health information requires not just knowledge and skills but also a supportive environment. In Tanzania, it has become necessary to clarify organizational roles and responsibilities to translate technical guidance on analysis of disease surveillance data into routine behavior on the part of health workers. Job descriptions, responsibilities and consequences for failing to act should be clear to data collectors and they must have the tools necessary for completing their work. Many health systems are not designed to offer such guidance and support to health workers. Hence, in many health information systems there is a low appreciation of the value of health data, particularly on the part of the peripheral health worker who, ultimately, is the source of most health statistics.

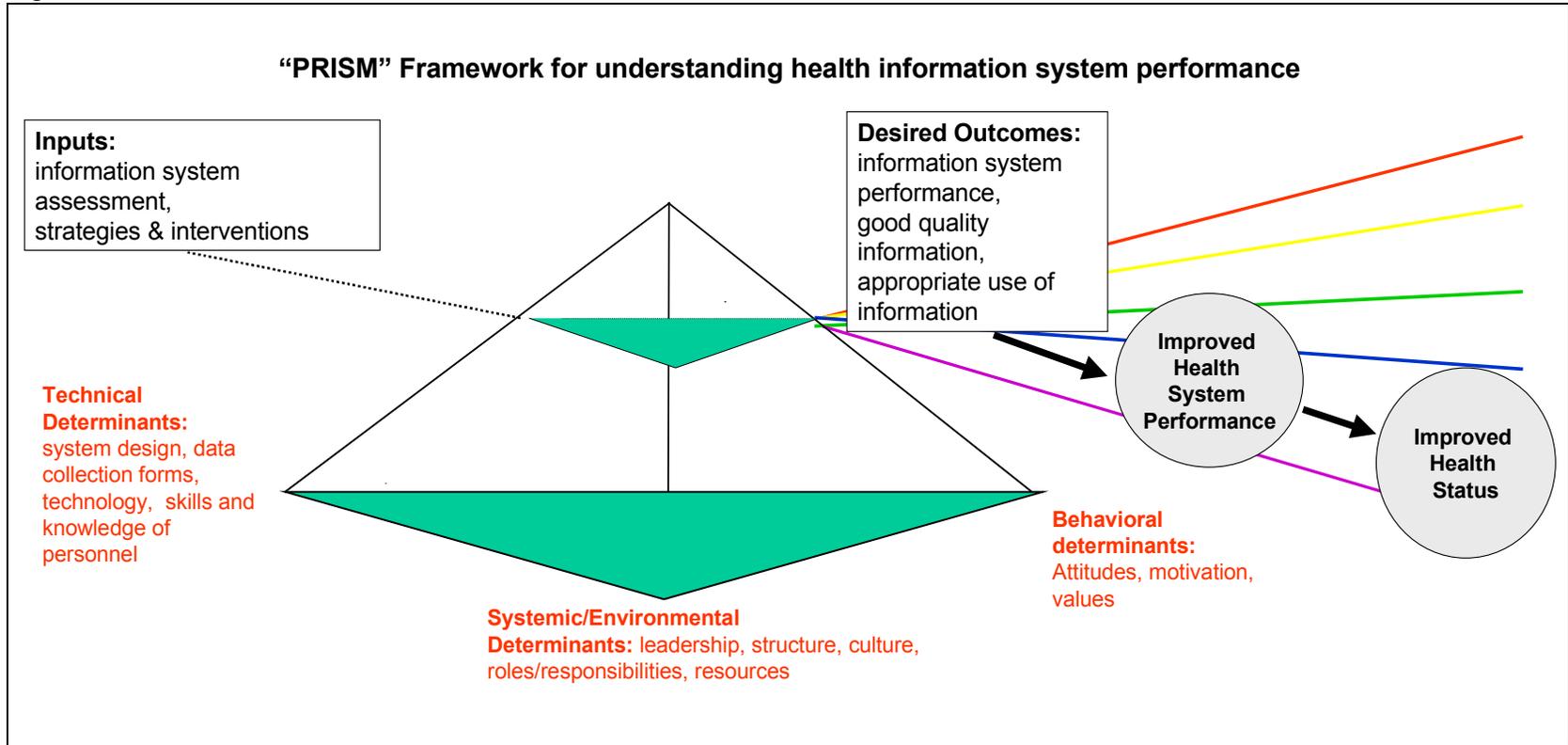


Using the Prism

We present the Prism framework for review and discussion and suggest that it be used as an optic or a lens with which to gain understanding of factors influencing performance of a RHIS. (See Figure 1) Keeping in mind that we seek not only to improve the quality and quantity of routine health information but to increase the perceived and real value and use of health information, the framework also helps us identify how we might move forward on three fronts to eliminate constraints to better performance. Using the Prism we can take our extensive experience in improving the technical content and rigor of health information system design and strengthening, and translate it into action by:

- instilling values that indicate the critical role of health information in system performance, and the need for technical rigor in health information systems among data collectors and users;
- linking health information to roles, responsibilities, duties, job descriptions, job functions, and job performance. Actions related to data collection and use should be linked to consequences – and preferably benefits – to those who are responsible for collecting, reporting, and analyzing data. These requirements are likely to differ at different levels of the health system, within health teams, etc.;
- reducing or eliminating behavioral and environmental obstacles to data collection, analysis and use including aspects of physical infrastructure (roads, telecommunication, paper, pencils, computers) and the political, managerial and human context (hierarchy, communication, rewards and punishments; the overall culture or value attached to information).

Figure 1



Following are examples where the analytical framework can be applied in practical RHIS strengthening. Table 1 illustrates the type of activities that might be included in a country level plan to improve RHIS performance based on the Prism framework.

- To guide a needs assessment. In analyzing a RHIS the Prism guides analysts to examine levels of performance (as defined locally and/or internationally) and its relationship to the technical capacity and rigor of the information system, the health system environment, and behavioral factors. Specifically, it suggests a focus on the contextual and organizational obstacles and opportunities that must be considered if performance is to improve. At the system level both structures, functions, culture, and relationships are important. Among data collectors and users attitudes and values with regard to information-related functions are critical. Such an assessment can comprise tools from a mix of disciplines, including epidemiology, performance improvement and behavior change, and policy analysis. In a district level assessment in Tanzania, tools included a mapping exercise to clarify job responsibilities and performance expectations, in-depth interviews with health workers, district health team members, and district planning officers, and a review of available epidemiological data. This assessment, conducted at the outset of the design of a multi-district project, required a single four-person team about two weeks of data collection per district.
- In defining strategies and solutions to improve RHIS performance both in terms of data quality as well as better use of information. The goal in using the Prism approach for analysis or intervention design is to make the process of improving RHIS less mechanical. The approach places the RHIS in the context of a living health system and all its shortcomings, and links it to the people who are responsible for managing, maintaining and exploiting its power for improving health system performance. Strategies should not simply focus on the perceived obstacles to RHIS performance, but also the ways in which data collectors and users have found data to be useful. These kinds of motivating or enabling factors can serve as a platform for designing interventions. This means employing techniques such as in-depth interviews, focus group discussions, or KAP studies in needs assessments.
- Bringing stakeholders together around a strategy. It is important to secure commitment to improving performance of the health information system at all levels, particularly among those who are responsible for allocating resources or changing system-wide modes of operation. The use of the Prism framework can help establish clear and agreed performance expectations and principles among all stakeholders for ensuring that performance improvements take place.
- The Prism also suggests that we would benefit from engaging a range of professionals with complementary and relevant skills when conducting needs assessments, defining strategies, and implementing interventions to improve performance. Behavioral change experts, professionals with experience in reforming health systems, and management gurus are as important to the equation as



epidemiologists and information specialists. It also suggests that data users will

Box 1

Learning objectives for district HIS training. Participants will be able to:

- Identify the correct forms and reports to use
- Demonstrate correct completion of weekly and monthly forms
- Describe when and how to send information and forms to the district office
- Name the alert thresholds for the 7 epidemic-prone diseases
- Identify 3 ways to communicate ongoing and alert information to the community using existing resources

Training methods

- Presentation of training materials
- Presentation, discussion and exercises on why actions are taken, how to identify and solve problems, and how to overcome common obstacles.

provide critical inputs in the design and implementation of the proposed interventions.

- Training is another area that could benefit from application of the framework. If we consider the three aspects of performance relevant, then training of health professionals for improving information system performance might (depending on the level) focus on developing skills in management, financial planning, information technology, supervision and mentoring, communication, and behavior change, in addition to epidemiology and statistics. Recent training of district level professionals in Pakistan has focused on establishing and organizational culture that values information use and promoting practices that reflect these values (e.g. strategic planning; linking coverage statistics to concrete action). Human Performance Improvement (PI) strategies might also be used to encourage stakeholder analysis and shared commitment to improving performance. Training should reflect the broader approaches advocated by the Prism framework, taking into account the work environment. Examples of possible learning objectives training approaches are found in Box 1.

Table 1. Illustrative Country Level Activities for Improving Performance of Routine Health Information Systems by Framework Elements

Determinants	Activity	Anticipated Information System Outcome (Capacity and Performance)	Anticipated Improvement in Health System Performance and Health Status
System/Environmental (incentives, stakeholder commitment; feedback systems; culture)	<ul style="list-style-type: none"> ● Widespread stakeholder consultation on assessing and improving performance of routine health information system in the health sector ● Facilitate improvement in timely feedback from central to district level on planning and reporting ● Promote adoption of context-appropriate incentive systems for timely and accurate reporting and evidence-based plans and budget proposals ● Coordinate donor reporting requirements 	<ul style="list-style-type: none"> ● Perceived value of data collection and use increases among staff at all levels ● Shared commitment to improving the collection and use of health information ● Reduced duplication of reporting 	<p><u>Health system</u></p> <ul style="list-style-type: none"> ● Improved resource allocation ● Improved coverage of preventive and promotive health services ● Improved quality of care ● Timely and coordinated response to disease outbreaks ● Reduced frequency of stockouts of essential supplies <p><u>Health status</u></p>
Technical (skills, appreciation of M & E methods and use of different types of data)	<ul style="list-style-type: none"> ● Training selected national, regional, and district level health staff in M & E planning, data collection methods, state-of-the art tools, and data use. ● Technical assistance to design regional level facility survey ● Introduce decision-support software to routine health information system at regional level. ● Streamline quarterly report form to reflect key indicators 	<ul style="list-style-type: none"> ● Improved skills and practices in M & E design and execution among regional and district health staff ● Improved quality and frequency of data collection and data use 	<ul style="list-style-type: none"> ● Decline in morbidity and mortality in priority health problems ● Decline in fertility rate
Behavioral (motivation, values, clarity of purpose)	<ul style="list-style-type: none"> ● Mentoring supervisors in in-service training and other techniques that support regional and district level staff in M & E tasks ● Clarify and communicate official expectations for performance of regional and district levels health staff with respect to collection and use of data for planning and health service operations ● Introduce annual dissemination workshops for different levels of health system to provide peer support, share results examples of data use, and identify key focal areas for future programming. 	<ul style="list-style-type: none"> ● Confidence in M & E and data use among health staff increases ● Regional and district health staff link data collection and use with job performance ● Increased motivation to produce good quality health data and its utility to improving policy and practice 	

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