
St. Johns Bridge, Portland, Oregon

Building Statewide Infrastructure for Quality Measurement in Healthcare Delivery

Community Engagement Strategies and Emerging Best Practices for States to Reduce Provider Quality Reporting Burden and Improve Population Health Outcomes

April 5, 2018

CEDARBRIDGE GROUP

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Credits and Acknowledgements

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We are grateful to all who took part in the development of this white paper by sharing their expertise and lessons learned in the early days of measuring the quality of the healthcare delivery. Information from the states of Connecticut, Idaho, Maine, Oregon, and Rhode Island contributed to the content of this paper. While there are differences in the approaches being developed for statewide measurement of healthcare quality, each of the states studied are on the forefront of change.

This white paper was commissioned and funded by the New England States Consortium Systems Organization (nescso.org), a private, non-profit organization committed to supporting New England's State Government Health and Human Service agencies.

Recommended citation for this publication: Goderre JL and Robinson C. *Building Statewide Infrastructure for Quality Measurement in Healthcare Delivery: Community Engagement Strategies and Emerging Best Practices for States to Reduce Provider Quality Reporting Burden and Improve Population Health Outcomes*. CedarBridge Group, 2018.

Executive Summary

State governments across the country must manage the cost and quality of healthcare services for a significant portion of the population in complex, diverse healthcare markets. States administer healthcare programs for state employees, beneficiaries of Medicaid and Children's Health Insurance Program (CHIP), and individuals who are dually eligible for both Medicare and Medicaid benefits. State government leaders must also work to assure high quality healthcare services are accessible at an affordable cost for their entire state population, not just state-funded services. However, quality measurement and cost transparency initiatives in healthcare delivery are relatively new for the public sector, even as Medicaid waivers, federal and state transformation programs, and legislative and regulatory mandates have spurred growth of state and local quality improvement strategies.

Pioneers in these initiatives are investing in information technology to control costs, reduce administrative burdens, share information across disparate healthcare and human service settings, and improve population health. Federal quality measurement programs are beginning to ramp up requirements[1] to report electronic clinical quality measures (eCQMs), and many state Medicaid transformation initiatives are setting electronic quality reporting targets. Commercial payers around the country are increasing their quality reporting requirements to inform value-based payment models, and large self-insured employers are beginning to do the same. Certification programs to successfully report electronic data have subsequently followed.[2] With a growing demand to measure healthcare quality through electronic representation of clinical data, the technical infrastructure to support the demand is in a rapid state of remodeling. Other changes are also required for new models of clinical quality measurement to be successful, including establishing new provider workflows to ensure clinical data is accurately captured and the performance benchmark was achieved; developing new data sharing policies to help develop trust among the system users in the operation and governance of the quality measurement system; and shifting healthcare to a culture of active review of quality scores in the context of quality improvement initiatives. This white paper dispatches lessons from some of those pioneers, and documents specific and replicable approaches from state leaders in the field as they have managed planning, procurement, and implementation of health IT systems to assist providers in their quality improvement journeys.

In this white paper, readers will find an overview of several approaches to build statewide health IT quality measurement systems with provider support, and an essential planning checklist to identify key steps in building and procuring these high-profile, high-need technologies. The following findings consistently emerge for implementing successful government projects:

1. Collaboration is essential
2. Plan early and plan often
3. Clarify tangible benefits to each stakeholder with work products that deliver value

Introduction

State governments tasked with reducing healthcare costs while maintaining high quality services are testing new care models for individuals with economic and social disadvantages and significant chronic illnesses. Program administrators in state agencies currently navigate complex regulatory and administrative mandates with ever-changing funding circumstances.

Many states strive to create, test, and drive new care models that deliver on the promise of high-quality care at lower costs—leveraging the state's role as the payer for state employees and retirees, for individuals receiving healthcare through Medicaid or Children's Health Insurance Programs, and for their residents at large. Mandated balanced budgets, combined with declining healthcare budgets, and increasing chronic disease prevalence, contribute to states' efforts to drive delivery system transformation and spur innovation across the entire healthcare delivery ecosystem. This can be accomplished by leveraging federal waivers to administer new rules of Medicaid programs, obtaining federally-funded demonstration grants (focused on healthcare transformation and population health), using regulatory levers where possible and applicable, and using the convening abilities of a state agency or department.

State Medicaid programs apply to the Centers for Medicare and Medicaid Services (CMS) for waivers to the requirements described in the Social Security Act for Medicaid programs, Section 1115A; grants and other funds are then available to test and evaluate care and payment reform described in those waivers. With different requirements from Medicaid-funded waiver programs, the Centers for Medicare and Medicaid Innovation (CMMI) approved funding for two rounds of State Innovation Model (SIM) demonstrations,[3] beginning in 2013. Across the country, the SIM states are implementing a variety of new care delivery and payment models that require, among other things, clinical data for quality measurement. The SIM program also compels states to show engagement of all payers, including Medicaid, in the new models. And, as of the 2017 program year, ten states have received Delivery System Reform Incentive Payment (DSRIP) waivers from CMS to determine successful, innovative approaches to payment and care delivery models. These models and their evaluations depend on the collection of clinical data, extracted from electronic health record (EHR) systems in structured formats to the degree possible, to demonstrate the effectiveness and outcomes of clinical interventions as well as cost of care.

Practice transformation models continue to show promise within individual clinical settings and medical specialties. Scaling these models statewide requires high-touch technical assistance to provider organizations; it also demands streamlined technology infrastructure able to move critical health data across siloed systems and ensure this data supports providers and patients in accurate decision-making. Automation of data exchange and measure calculation to monitor cost and quality of care provided under new payment and delivery system models is key to reducing provider burden.

Introduction

In this brief, we highlight how states are investing in technology infrastructure to support quality measurement initiatives with the promise of improving the health of individuals and populations while lowering the burden of provider participation in quality improvement programs through streamlined reporting of measures, and administrative efficiencies. We highlight emerging best practices in planning for and procuring health IT systems for use by state government officials and their private sector partners as they work to establish a high-impact clinical quality measurement and reporting system that meets the business needs of system users and the data needs for quality improvement programs.

Who Should Read This?

- State government program and procurement officials implementing statewide quality improvement initiatives that will require measurement of:
  - Healthcare processes and interventions
  - Differential care and payment models
  - Improvement of population health outcomes
- Healthcare organizations in states with expanding healthcare payment models seeking to:
  - Harmonize and streamline quality reporting efforts
  - Reduce reporting and analysis burden for providers and payers
  - Incorporate assessments of care quality and health outcomes in innovative, value-based payment models

Key Resources in This Report

- Sample business and functional requirements for statewide eCQM systems
- Key topics to address in strategic communications to stakeholders
- Recommended structure, facilitation models, and work products of health IT committees or work groups tasked with advising the state on design of CQM systems (design groups)
- Checklist to plan statewide CQM infrastructure
- Methods to evaluate a health IT program and ensure state investments are designed to reduce provider burden

Introduction

Methodology

The study team interviewed state officials and nonprofit executives leading quality improvement initiatives, consultants and vendors contracted to assist in health IT planning and deployment, and leaders from organizations tasked with collecting and reporting on eCQMs in five states (Connecticut, Idaho, Maine, Oregon, and Rhode Island) as part of an environmental scan process.

Each of the five states have been engaged in planning, implementing, or operating technology infrastructure to support quality measurement of healthcare delivery using clinical data collected from EHR and other data systems. Additionally, the team observed vendor demonstrations of quality measurement and population health solutions and reviewed documents describing planning processes for quality measurement systems, requests for information (RFIs) and requests for proposals (RFPs), state operational plans, system design and technical reports, and vendor evaluation guidance from governance bodies in the states researched, and guidance from CMS.

Interviewees were serving in key roles in their respective states, such as on design groups for developing functional requirements of a statewide eCQM system, as an ex-officio board member of a health information exchange organization (HIE), or as a member of a procurement review committee. All had experience with Medicaid and public health programs, health insurance commissioner offices, state health information exchange initiatives, and SIM program details. Consultants interviewed for this white paper supported state officials in facilitating design groups, conducting stakeholder engagement activities, and preparing consensus-based requirements for a statewide clinical quality measurement system. Interviewees were asked questions from a standardized script with questions tailored to their projects' implementation stage.

Interviews with state staff and their consultants

Evaluate vendor systems

Document review of RFPs, planning deliverables, design group products, federal guidance, etc.

Summary of Findings

1. Collaboration is Essential

2. Plan Early and Often

3. Clarify Tangible Benefits to Each Stakeholder with Work Products that Deliver Value

1. Collaboration is Essential

To maintain public trust in any technology solution, government leaders must partner across state agencies and engage private sector healthcare leaders in collaborative, inclusive decision-making processes. This is even more important when rolling out technology to measure the quality of patient care being delivered by healthcare providers. Meaningful, early, and ongoing engagement of the end-users of any technology system will increase support for programmatic goals and buy-in for a state's vision of quality improvement. Integrating quality reporting programs where technology is being embedded into provider workflows remains complex; providers have widely varying perspectives on how IT infrastructure can efficiently support the delivery and coordination of care. Technical assistance is key to fostering collaboration and increasing the probability of success of a technology-enabled healthcare transformation program. Planning, procurement, and implementation can take years; state officials should use multiple venues and methods to keep stakeholders engaged and to maintain communication.

2. Plan Early and Often

Project sponsors from the state agency leading a procurement should engage early and often with leadership and staff from every department involved in the project and/or procurement of a quality measurement system and begin by holding a kick-off meeting (or meetings) to explain the project's vision and importance. The project and procurement timelines must take into consideration the time required to garner state and federal approvals for funding requests; approval of procurement documentation; and contracts for vendors and consultants. State staff or contractors may leave during a project or procurement, and progress can be delayed if program managers are unfamiliar with changes to legislation, purchasing approvals, and even document templates. Hence, it is critical to maintain detailed and accurate documentation of each step along the way in a secure, well-organized, shared file system. Program leaders should always be prepared for unexpected situations that can arise during the lengthy planning and procurement process for a large-scale state-sponsored technology initiative, some with the potential to dramatically change the procurement scope and timing. Clear, frequent, and transparent communication throughout the entire process will build trust among state officials as well as with private sector stakeholders.

3. Clarify Tangible Benefits to Each Stakeholder with Work Products that Deliver Value

Government investments must provide tangible value propositions to stakeholders while enabling planners to prepare organization-specific documentation of cost reduction. Design groups deliver requirements and describe conceptual architecture acceptable to a wide range of stakeholders. Stakeholders must be engaged using a variety of methods that result in guide posts for procurement. Tailored Return on Investment (ROI) calculators secure organizational support for shared health IT resources and benefits accrued through efficient shared statewide infrastructure. Describing the benefits of a state platform fostering innovation and entrepreneurs is a high-touch engagement. Community work groups are one key component of the requirements collection and analysis process, and state leaders must set aside travel funds to support in-person meetings about costs and benefits with decision-makers.

Findings: Collaborate

1. Collaboration is Essential

Leaders, Champions, Trusted Conveners

Participation of senior-level leaders in the planning and governing of state-funded health IT initiatives is critical. Senior government leaders (agency and department heads, policy advisors to the executive branch, and legislators or their designated staff) and high-ranking leaders from organizations that span the healthcare ecosystem (healthcare payment, healthcare delivery, and health IT) are critical champions during all planning phases, and in ongoing governance. Senior stakeholders set their organizations' commitment level and must remain involved in evolving decisions on how to measure population health outcomes, provider performance, and cost in relationship to quality. Stakeholders participating in the design of health IT infrastructure for 2018 and beyond must cumulatively deliver broad experience from across the healthcare ecosystem, including domains traditionally left out of prior policy and funding initiatives, such as behavioral health providers and long-term post acute healthcare. State Medicaid programs and purchasers of health benefits for state employees and retirees can drive the direction of the payer market and help sustain alignment necessary for efficient measurement programs and support for statewide health IT investments. Successful projects focus on building the community early, before procurement, and maintaining their involvement on sub-committees or additional work streams unrelated to the specific procurement to sustain enthusiasm when state procurement rules limit communication about vendor selection.

Collaboration is also essential when procuring new or expanded existing health IT services. Including **respected, locally-known champions** with expertise in clinical practice transformation and quality improvement initiatives will add legitimacy to procurement efforts and will help ensure the concepts, value, and vision of the technology initiatives are understood by diverse audiences, including state agencies, local health departments, healthcare delivery and payment stakeholders, community and human service providers, and consumer and patient advocacy groups.

High levels of state leadership strengthen local champions' enthusiasm to participate.

Advisors, designers, implementers, and users of health IT infrastructure benefit from **trusted third-party conveners** to execute their work and establish data sharing environments. Trusted conveners bring stakeholders together by understanding and communicating needs across the healthcare ecosystem. They build stakeholders' confidence by setting aside assumptions of pre-ordained decisions, disassembling, and resolving organizational cultural barriers, and applying deep subject matter expertise to facilitate complex discussions among diverse groups with widely varying business needs. Conveners for these efforts support providers and provider organizations, patient advocates, technologists, and government in design groups to create several types of work products depending on the maturity stage of the statewide health IT infrastructure.

Findings: Collaborate

These work products range from roadmaps, vision statements, and strategic approach statements to business plans, ROI calculations, and business, functional, and technical requirements that form the needs assessment for state procurements.

Our interviews revealed several essential program components of state health IT programs. Most states had some kind of legislated office, board, or reporting requirement. Governing bodies and their design groups followed specific charters, potentially with mandated accountability to the legislative or executive branch. Many work products were completed in short sprints—but as a program evolved, there was an ongoing need to develop work products reflecting continued engagement during later phases of requirements gathering, system selection, and testing and planning for implementation and sustainability. Figure 1 outlines essential program components that:

- build trust,
- support clear procurement requirements,
- sustain engagement
- ensure expectations and plans across many organizations are communicated clearly, and
- convert programmatic and health system needs into actionable recommendations and guides for CQM implementers.

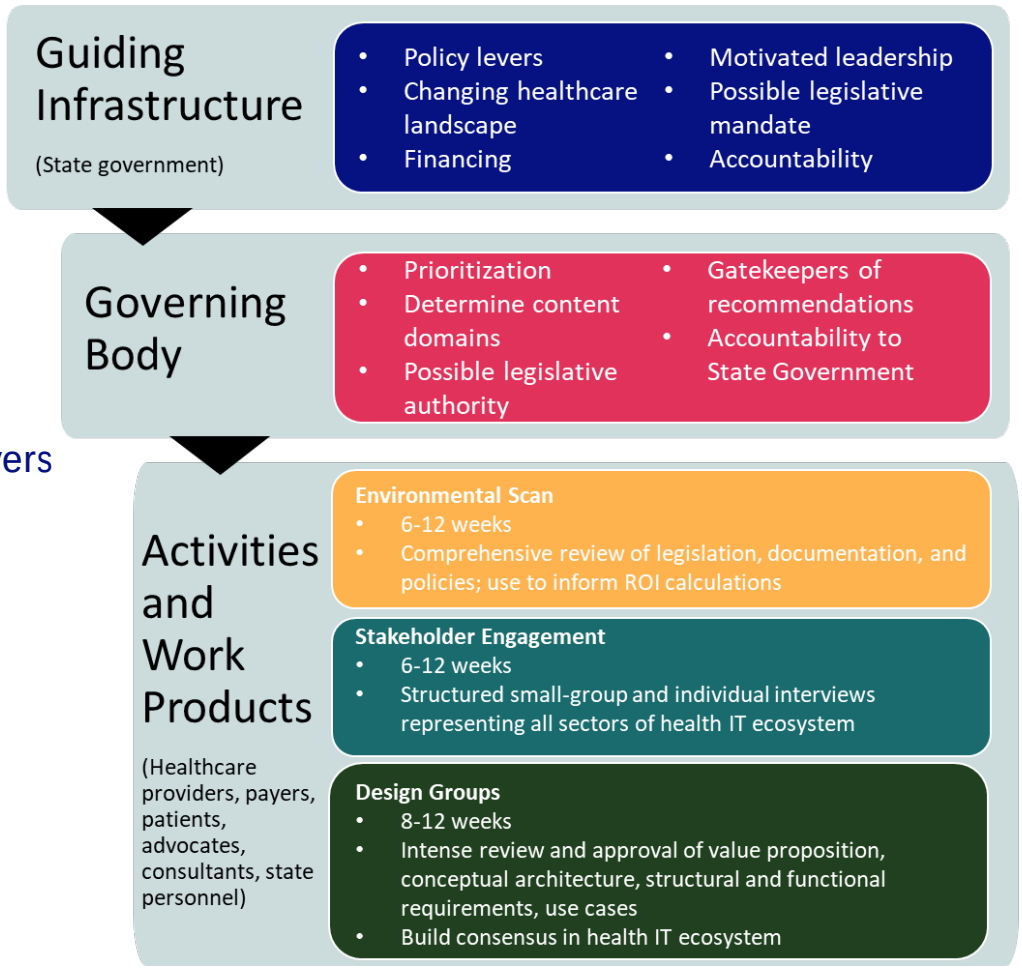


Figure 1. Strong stakeholder engagement delivers work products grounded in community consensus

Findings: Collaborate

Establishing and Maintaining Trust

Clinicians, policy-makers, and funders must be able to rely on data that is credible, auditable, and accessible. Data submitters, end-users, and the public and private payers that support quality measurement programs need to realize the value from governance participation and technology quickly—they must be supported by methods to ensure their trust in the state and vendors who provide these services.

Clinicians, policy makers, and funders must be able to rely on data that is credible, auditable, and accessible.

A key component to ensure high-quality data are modular technology services that allow for federated data governance. These services include maintenance of accurate provider directories, provider-patient attribution, and concept mappings; documentation of common data elements and measures must be shared openly so that other health organizations and payers value the services. State planners must appreciate the interaction between people and technology, legislative barriers or supports, past IT initiatives, and existing investments of providers and payers surrounding state-led initiatives to fund design groups that meet the needs of stakeholders.

A commonly expressed priority of government officials is to find **vendors who accept the role of collaborative partner and data intermediary** in realizing change and value. Few states seek software as the sole method to measure and sustain progress on individual and population health outcomes, and states cannot act alone as a data intermediary, sometimes due to legislative restrictions. The most appreciated vendors have been organizations that understand climate and scope will change. These vendors adjust with state partners once the realities of architecture design, implementation, organizational readiness, and training are placed in the field. In our interviews, states routinely expressed a desire for vendors that are willing to be flexible partners in addressing roadblocks.

In some cases, the vendor cannot serve a community best with the added role of data intermediary but is better positioned to partner with another local organization that provides governance and manages relationships with providers. These intermediaries may also have contracting authority to ensure provider organizations have sufficient technical assistance, workflow integration, and onboarding support and may even be well-suited to serving on RFP evaluation panels, if possible.

Another consistent theme from states implementing solutions that affect day-to-day patient care and policy decisions is an awareness about keeping the program's communications, goals, design, and deliverables local. Successful models of these regional and statewide implementations do not always replicate and scale—but the principle of ensuring local involvement, direction, and leadership is a must.

Findings: Collaborate

Establishing and Maintaining Trust (cont.)

The most successful state infrastructures align with national initiatives in policies and health IT resources, however, state, and federal officials cannot unilaterally mandate specific technologies and projects. Design and implementation of statewide health IT resources should rely on local relationships and networks of trust to ensure adoption and uptake.

Data moves at the speed of trust.[4]

Methods that facilitate **broad community participation to develop shared work products** builds the trust necessary for a state to execute needed and successful CQM services. When trust is present, stakeholders have confidence in the process even in the absence of a known outcome. Trust is also essential among CQM vendors, HIE entities, and data intermediaries that must share data from various provider networks and report to different payers for different reimbursement plans.

Rhode Island built trust among vendors by convening quarterly meetings for all vendors, from technology and services to training and clinical quality improvement, to share information about how they all contribute to a single SIM initiative. This yielded new business relationships and product synergies that better supported state government. These relationships are established in RFP requirements; the state is a good partner when a procurement for a software product or contract with a data intermediary **clearly states expectations for working relationships and roles in the overall scheme of statewide health IT infrastructure**.

The Power of Networks

The creation and cultivation of ongoing governance bodies and design groups establishes a social platform for key personnel at different organizations across the state to collaborate; these social networks are positively associated with successful adoption of technology. The absence of coordinating mechanisms among stakeholders poses a significant risk to adoption of state investments.

2. Plan Early and Often

Discover Community Priorities

The planning phases of all major state-sponsored health IT projects should include **discovery, investigation, and engagement activities** to ensure the needs of future users will be met by the technology solution(s) deployed, to the greatest extent possible. The discovery process includes individual and small group interviews, surveys, and focus groups to gain insight on business needs, key workflows, and critical processes of future users.

The next logical step is for a governance body to validate the findings from the discovery process and work products from diverse domain experts serving on a design group. These activities ensure the appropriate design of the resulting IT solution, where future users will value the effort, benefits, and outcomes related to the services provided by the solution. Planning phases should focus on gathering requirements associated with the complete lifecycle of data and reporting needs, such as understanding:

- types of information available in various data sources, especially from statewide health information exchange entities (HIEs) or regional health information organizations (RHIOs),
- degree of validation and normalization required to make incoming data meaningful to the business and operational needs,
- data standards that are needed or can be supported, and
- calculation of the quality measures and how the data is required to be sent to receiving entities.

All health IT projects spearheaded by state governments should be focused primarily on the **needs of current and future end-users**; the importance of including stakeholders in every step is critical. Many states have engaged stakeholders in evaluating the capabilities of their existing technology and conducting environmental scans to document the baseline status and growth opportunities. Roadmaps and strategic plans follow—stakeholders confirm their agreement around priorities and timelines to implement new health IT services to realize a shared vision for the desired future state of technology capabilities that meet the collective business needs of the ecosystem.

It is often at this point when participating government leaders turn over implementation activities to program staff, typically located in the state's Medicaid or public health divisions. Not coincidentally, the active interest and engagement of private sector leaders who participated in the creation of a health IT plan or roadmap may also wane at this point. This often happens because the state's program staff become consumed by a state's laborious procurement process and have reduced bandwidth to support stakeholder design groups and governance bodies

Discover Community Priorities (cont.)

State staff continue to struggle to sustain external engagement through this phase; one strategy to avoid lagging stakeholder participation is to ensure planning and governing activities unrelated to procurement continue to advance and to shape other needs of the larger initiative.

Lengthy procurement processes also pose a challenge to stay current with rapidly changing technology. By the time the state finalizes a contract, the original RFP requirements and community needs may have changed. Solution delivery after a long procurement period necessitates re-engagement of community partners to re-validate use cases and requirements. States may have different mechanisms to adjust system and implementation requirements to reduce the risk of making a substantial investment that is out of sync with community priorities. States also fund non-technical activities related to engagement and strategy separate from technology procurement and crosswalk services and functionalities across different RFPs to ensure onboarding, technical assistance, facilitation, and design group activities are synced with the technical solution.

Changing Legislative, Regulatory, and Administrative and Policy Levers

State legislatures have recognized the need to ensure that state-funded health IT investments are bound by reporting obligations which describe the progress and operations of health IT programs. In many cases, the legislature will also require advisory councils and describe the specific membership of those councils to include patients, providers, and payers. Another highly-exercised option is the creation of high-level positions within state government that coordinate all health IT activities across different departments.

Funds for state health IT investments may also be contingent upon reporting obligations to the funder and based on achieving program goals. Additionally, certification and accreditation programs for health IT solutions, clinical practice models, and incentive and measurement programs reinforce regulations, and are optimally designed to set the minimum capabilities needed to ensure achievement of the state's programmatic and improvement goals. Even when state officials secure funding to execute on CQM infrastructure, these services are still within the context of quality improvement activities that must be led by the community that will use those CQM resources. Architecture of the solution should support efficient reporting of program metrics to satisfy administrative and legislative reports.

Program design for statewide health IT quality measurement systems and the architecture of the final deployed solution needs to satisfy specific mandates on the reporting obligations of these policy levers. Application of a program evaluation perspective (see Implementor Resource 2) to health IT implementations enables efficient program status reports,

Findings: Plan

Changing Legislative, Regulatory, and Administrative and Policy Levers (cont.)

easily expresses value of the initiative to decision-makers, and transparently reports milestone achievements for complex and coordinated state programs. This public health evaluation approach supports studying and reporting on the efficacy and effectiveness of data exchange services and analytics platforms and their contribution to everyday clinical care and practice improvement.

Health IT is an intervention—it changes how people in a healthcare practice operate, it changes the universe of information available to providers and patients when they make healthcare decisions, and it changes what people know when they make policies.

Funding Sources and Procurement Processes

RHIOs and HIEs have been a case study in the importance of careful planning of phased implementation models for technology systems and services that require substantial change management support for system users. Funding sources are not always available for the entire duration of a long-term project and distinct phases of statewide implementations may require different funding models:

- **early** start-up solutions that solve immediate needs and build confidence and trust,
- reliable **ongoing** maintenance of a core set of stakeholder-supported services,
- **supplemental** addition of sophisticated services.

While the initial creation or subsequent enhancement of infrastructure can be supported through short-term grants, this model can rarely be sustained for the long term. Further, these **tactics create a perception that services do not merit investment.** Subscription services and reporting on the value of services builds enthusiasm for investments from diverse sources.

Funding sources change over time so state agencies must also be alert to new opportunities, such as enhanced federal funding to support costs of data exchange connectivity for Medicaid Eligible providers being expanded to benefit other Medicaid providers—this ultimately evolved to support Immunization Information Systems (IIS) and other infrastructure.[5] Current funding plans should include onboarding providers, training, work flow analysis, and technical assistance. As the solution is developed, it can be **architected to automatically capture and proactively report data needed for its own evaluation**, thus providing ongoing justification for continued investment.

In many cases, public-private partnerships may be better suited to lead health information exchange initiatives and/or statewide quality measurement than state governments—they are governed by a robust steering committee and permitted use policies but can have enhanced relationships to ensure delivery of technical assistance for statewide health IT resources.

Funding Sources and Procurement Processes (cont.)

Regardless of the chosen model, a partnership or state government entity, the contracting group must have staff with the capabilities and expertise necessary to research, and monitor procurements.

Procurements should strive to clearly **describe program goals and define success criteria** at a programmatic and technical level, rather than merely specifying essential tasks. The procurement process routinely involves reference checks, live demonstrations, and documentation of experience with procurements of similar scale and goals. Direct affirmation and demonstrated experience to deliver on the design group's business and functional requirements, in response to a funding opportunity, aids in determining able vendor partners. **Proposal evaluation team members should be knowledgeable in diverse areas**, including familiarity with stakeholder communities, technology and IT data and transport standards, state government rules and regulations, financial assessment of the vendor and their financial stability, cost and sustainability modeling, and public health and healthcare analysis. In many cases, state leaders must hire project management and clinical and technical leaders with expertise from outside government to serve as subject matter experts to assist with the review of proposals and shepherding of projects; this multi-talented state team enables the overall program to be more attentive to risks during each phase of planning, procurement, and implementation. These champions will be critical to maintaining support even as certain phases of procurement become invisible to stakeholders.

3. Clarify Tangible Benefits to Each Stakeholder with Work Products that Deliver Value

Architecture and End-user Design Groups

In the development of a statewide quality measurement and reporting system, clinical and operational domain experts from stakeholder communities, including payers, state agencies, and policy-makers, should be involved in design groups to develop requirements templates related to quality measurement reporting and analytics. If the system must also provide value through consumer-facing functionality, it is important to **create meaningful ways for consumers to inform user design**.

Design groups with a specific charter, and sometimes term- or deliverable-limited existence, help states conduct market research, architecture design, end-user reports, interfaces, and capabilities valued and desired by the community. Sustainable health IT investments rely on design groups' work products as evidence for later financial investments independent of state funds.

Design group members with expertise from a broad spectrum of healthcare and service delivery sectors deliver key insight into

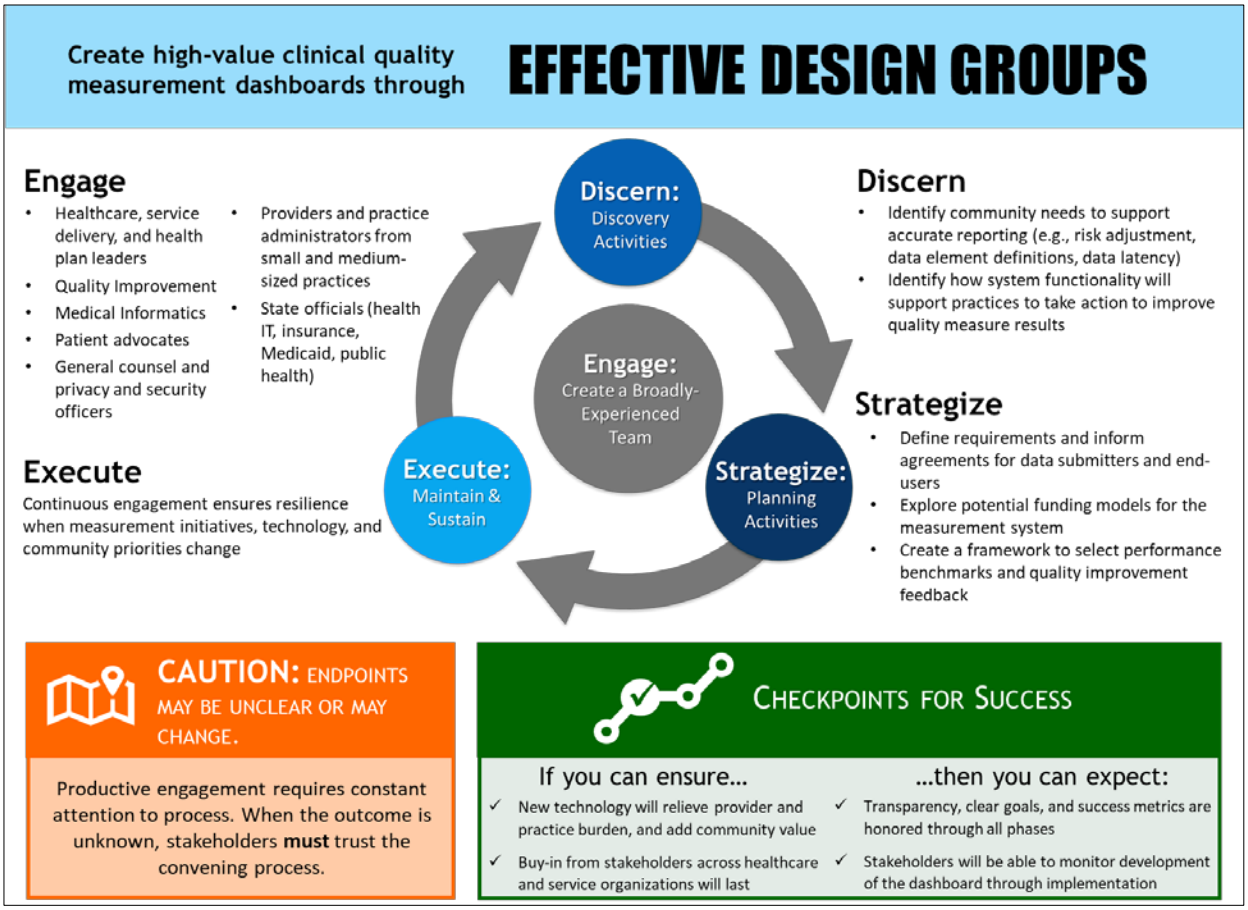
Findings: Clarify

Architecture and End-user Design Groups (cont.)

what value can be delivered by statewide measurement and analytics solutions. They are tasked with working through the details of competing interests to arrive at value propositions for state investments, business and functional requirements, architecture, and program priorities. These groups are successful when facilitated by a third party tasked with successfully reaching agreement. Design groups that influence architecture must have a charter and members capable of understanding the full life cycle of CQM data; the system needs to provide data from across many organizations so that all providers attributed to a patient can appropriately share quality measurement credit when services are provided and limit duplicative testing, even if only one provider delivered the actual service.

Figure 2 captures consistent themes about the facilitation of design groups across all states interviewed.

Figure 2. Design groups are a critical approach to secure support for state health IT investments



Findings: Clarify

Value Proposition and Business Case

Committees are often chartered to investigate and report on potential users of statewide quality measurement IT infrastructure and to develop the final language for value propositions. **The final value proposition should state who derives what value from shared IT resources, and when.** Starter examples that must be tailored to local needs include:

- a coordinated provider directory that serves as a single source of truth reduces administrative burden for each individual provider or payer at different stages of maturity of data exchange, or
- statewide quality measurement infrastructure decreases the burden of determining which populations need specific programs and services.

These value propositions for different stakeholders are a guiding force for technical requirements and strategic communications.

State governments, in contrast to individual payers or provider systems, are uniquely positioned to ensure that all data from providers who work with the same patient can be included in quality measurement programs and this comprehensive, longitudinal view of a patient enables all providers to better identify which patients truly have gaps in care.

The business value of a shared service is generally derived from the ability to do something that couldn't otherwise be done by an individual or single organization, or the ability to improve performance and operations—potentially through economies of scale. A business case should describe the details of how the proposed services will fit into the existing market and justify financial benefits to stakeholders. Tools to calculate ROI help convert the value proposition into real dollars and document savings to each organization; they must consider current costs for health IT infrastructures and how their costs will change under a new business model designed to relieve some of their internal health IT investments.

ROI calculation involves tailored discussion of the costs associated with capturing data for quality measures, validation and normalization steps, measure calculation, and actionable intelligence pushed to practices to improve data completeness and appropriate follow-up visits. Provider organizations determine their own estimates for staff time, software, and supplies to report quality measures, including the effects of network leakage when a patient secures the necessary follow-up care outside an organization's data exchange network. Payers can also be supported to determine the value of efficiently managing quality measure submissions and plan attribution. Ideally, an ROI calculator helps decision makers determine if shared statewide services satisfy the same needs at a cheaper price.

Findings: Clarify

Business and Functional Requirements

Once design groups have a clear purpose and value for their design activities, they can advance to clarifying business and functional requirements for procurement details and program evaluation. Requirements characterize **what** various organizations could do, or hope to do, with enhanced data and information from a statewide quality measurement system. Functional requirements further define **how** the technology must function to meet the business requirements and ultimately drive the technical requirements for the system. Vendors will be able to build systems that serve the needs of stakeholders when these requirements, and the known customer base, have clearly stated the desired end goal. Sample business requirements and their associated functional requirements (Table 1) can be requested from states with more mature health IT infrastructure and may be found in public documents delivered to states for use during state procurement research efforts and deliberations of design groups:

Table 1. Examples of business requirements for statewide clinical quality measurement systems that drive functional requirements to support vendors and end-users

Business Requirements	Functional Requirements
Efficiently share clinical data related to quality measures with a statewide entity and report measures on behalf of providers to quality programs, payers, and/or purchasers Reduce provider burden by harmonizing measures across diverse payer programs	• Interfaces between the statewide HIT-enabled CQM system and provider EHRs, local or national HIEs, provider organization data warehouses, selected commercial labs, state Public Health Laboratory, prescription vendors • A Master Patient Index to link patient data across data sources to support correct calculation of measures, identification of true care gaps, and reduction in unnecessary care • Send quality measures to those that need to receive it – collect once, calculate and send on behalf of providers

Findings: Clarify

Table 1. (cont.)

Business Requirements	Functional Requirements
Conduct clinical quality improvement activities	• Identify patient cohorts using flexible parameters • Identify gaps in care or poor outcomes for cohorts and individuals • Evaluate effectiveness of program and achievement of goals and objectives • Provide benchmarked feedback at practice and provider level to providers • Identify compliance with clinical guidelines and best practices • Integrate point-of-care prompts to support QI and compliance with best practice
Maximize incentive payments (clinicians and other providers)	• Access to integrated payer claims data and clinical data from provider EHRs • Patient-Provider-Plan attribution logic • Identify patient healthcare utilization events outside plan network • Access to care outcomes data, including out-of-network providers • Clearly apply exclusion criteria for populations diagnoses or other components of measure calculation
Transparency of data normalization and transformation and measure calculation Support transparent interrogation of data to solve questions about measure calculation and data quality Transparently report select information to the public	• Attribution logic across patients, providers, and value-based programs • Risk adjustment methods for measure calculation and reimbursement • Computation and visualization of descriptive and inferential statistics • Methods for how incentives are calculated • Public reporting in response to community priorities or legislative mandates

Findings: Clarify

Use Case Library and Prioritization

Stakeholders should then work in design groups to **develop specific use cases that describe the needs of end-users and how the solution relieves pressure for current problems and reduces provider burden**. Use cases are a methodology used in systems analysis to identify, clarify, and organize system requirements.[6] The use case includes a set of possible sequences of interactions between systems and users in an environment and related to a specified goal. A use case can be thought of as a collection of possible scenarios related to a goal; the use case and goal are sometimes considered to be synonymous. The use case should, at a minimum, include the following sections:

- Executive summary,
- Function and purpose,
- Value proposition(s),
- Persona – fictional narrative detailing real-world example of each use case,
- Process diagram, and
- Identification of key actors.

Additional sections with further technical precision will support vendor development more efficiently and are more thoroughly described in the literature.[7] **Building a library of use cases and prioritizing implementation of which use cases are executed first helps to ensure that stakeholders define the types and features of services delivered by statewide health IT infrastructure.** This secures buy-in for the product and communicates to vendors how end-users will act on the technology delivered. RFPs should provide a framework for technology vendors to understand what uses cases have been developed and prioritized, if use cases are ready for implementation or require additional development to be useful for developers, and how use cases will be re-validated over time as the solution expands functionalities to meet the needs of the community.

Strategic Communications

State officials may be required to report to a variety of advisory councils, legislators, and executive officials on the progress of the health IT infrastructure development programs. Additionally, state officials must be prepared to address the concerns of stakeholders, end-users, and patients and to monitor onboarding and technical assistance programs with outreach and education communication strategies.

Presentations, memos, conversations, and other communication deliverables must address a consistent set of concepts related to health IT technology adoption first identified in 2014 (Figure 3) that continue to resonate today.[8, 9] Stakeholders across many health IT projects have consistent concerns that affect their adoption of new technology. State planners should be prepared to demonstrate leadership by **addressing these concerns before stakeholders raise them**. Many other factors influence adoption of novel health IT solutions and changing workflows are more personal and require an alertness to tone and context when expressing ideas that resolve these concerns.

Findings: Clarify

Figure 3. Several key concepts consistently influence end-user acceptance and adoption of new health IT solutions and must be addressed in strategic communications

1

Information System or Technology

- System usability
- System performance
- System evaluation

2

Organizational-level

- Time to complete tasks
- Disruption to workflow
- Resource availability and capacity for change
- Education, training, or knowledge
- Implementation support from technical advisors
- Leadership champion
- Complexity of guidelines or documentation

3

Personal-level

- Efficacy based on skill, familiarity with technology, and confidence
- Attitude: level of motivation and optimism
- Inertia to change
- Relationships: influence of professional and patient relationships

4

Perceived Benefits

- General benefits: communication, care quality, time saving
- Benefits to patients
- Benefits to user of technology

5

Other Factors

- Emotions: apprehension, frustration, uncertainty
- Trust in system; credibility of system
- Social pressure
- Professionalism: sense of being in control, user's responsibility
- Relevance: Fitness and importance of task

Adapted from Khong, 2015 and Wisdom, 2014

Conclusion

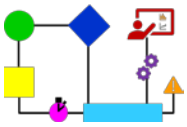
Adding state-funded resources to clinical and service delivery and practice improvement activities requires culture change, coordination, communication, and training. Appropriate planning based on evidence, monitored proactively using multi-level evaluation and engagement frameworks, can help state officials peer around the corner to unintended consequences. Proper planning can also help reduce gaps in implementation and result in an overall program that has the right data to analyze and report on program success. This approach helps states make the business case to partners in population health improvement and describe why technology adoption works, how it will be implemented and monitored, and who derives value from different outputs the state health IT program.

Effective program and procurement officials must take time to write thorough, well-researched procurement documentation, clearly describing the goods and services the state seeks to purchase. A good solicitation should allow its review panel to effectively assess respondents' skills and capabilities against a set of clearly defined functional requirements, fully-vetted by the future end-users of the technology being purchased. A solicitation must describe how vendors can successfully achieve the business goals of the system's users; these goals and business needs should be developed in advance of a procurement by an inclusive stakeholder process. Any chosen solution will need to grow over time as more users derive value from expanded capabilities, and the state should create continuous feedback opportunities for early adopters and future users of the system. The original architecture should support flexibility to respond changes in quality measurement programs, additional types of data exchange, and an ever-growing number of data sources and data elements to be included in measures. States need vendors who can adjust and succeed in a dynamic environment. Once selected, vendors should participate in stakeholder engagement activities, gathering business, functional, and technical requirements, and incorporating end-user feedback into system design and agile development cycles.

State governments have had mixed results over the years with large-scale technology implementations, and it is inevitable that a high degree of scrutiny will be applied to a state-led technology system rollout. The experiences of current leaders in statewide quality measurement, their vendor partners and stakeholder communities offer several key findings for replication by other states as they work to drive quality improvement and value in healthcare delivery.

Implementor Resource 1

Checklist to develop a statewide clinical quality measurement program



Planning and Procurements

- ❑ **Assess and address barriers:** Assess policy, regulatory, and market barriers to data sharing; design approaches to overcome those barriers.
- ❑ **Develop legal framework:** Assess current data sharing and use agreements and develop the legal framework to allow prompt execution of legal agreements and BAAs (Business Associate Agreements) among all parties, once a vendor is selected.
- ❑ **Convene stakeholders:** Build an initial mechanism to ensure broad stakeholder participation and design procurements and agile development cycles with contracted vendors to align with the iterative work of public and private stakeholder work groups.
- ❑ **Involve champions and decision-makers:** Identify and engage clinical, technical, governmental, and payer champions to serve in key leadership roles.
- ❑ **Establish value propositions:** Establish value propositions for key stakeholders and financial models to monetize quality improvement, reduce cost, improve safety, and report on stakeholder satisfaction.
- ❑ **Align with other programs:** Align quality measurement programs with existing technical standards (e.g., Value Set Authority Center(VSAC)), policy initiatives (e.g., State Health Improvement Plan), quality improvement programs (e.g., Medical Home model), and incentive programs (e.g., CPC+, Meaningful Use, Quality Payment Program (QPP), payer programs), even as these programs change.
- ❑ **Develop sustainable funding strategies:** Design start-up and ongoing funding models for technology, technical assistance, and governance; adoption and implementation are phased processes.
- ❑ **Be a good contracting partner:** Attract knowledgeable vendors during procurements by writing clearly-worded RFPs and funding opportunity announcements; be specific when there are preferred approaches for vendors to include in RFP responses. Examples would be when there is a preference for vendor proposals to include one or more data organizations in intermediary roles, or when a vendor is expected to engage with other hardware and/or software suppliers in modular or federated technology environments.
- ❑ **Prepare evaluation panels:** When establishing evaluation panels for procurements, recruit subject matter experts from within and outside of government with expertise in state agency and private sector stakeholder needs; secure non-disclosure agreements with procurement evaluators; require all evaluators and advisors to declare potential conflicts of interest in advance; ensure evaluators understand expected time commitments for a procurement and where applicable, secure management support for their participation.

Implementor Resource 1

Checklist to develop a statewide clinical quality measurement program (cont.)

Implementation and Use

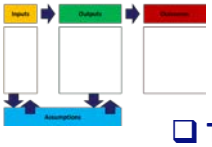
- ❑ **Iterative testing:** Design a pilot implementation with a few key sites and different types of organizations (providers, HIEs, etc.) that hold patient data to test the accuracy of data capture, measure calculation, and reporting in phased approaches with real data and real partners as you scale up the program.
- ❑ **Parsimonious measure set:** Deploy a small menu of proven measures that are evaluable and have rich data sources to address the most pressing health, cost, and quality concerns in your region.
- ❑ **Trusted convener:** Recognize that state government may not be the best convener on all topics; establish mechanisms to build trust, execute agreements, and ensure continuous feedback through multiple channels.
- ❑ **User-centered:** Design the technology behind measurement infrastructure, reporting, and analysis in collaboration with end-users from the very beginning.
- ❑ **Communicate value:** Communicate tailored value propositions to each stakeholder community and recognize that value accrues differentially over time in a complex and changing healthcare environment; align incentives with existing priorities of different communities.

Evaluation and Feedback

- ❑ **Evaluate:** Design IT platforms that proactively support the overall program evaluation so that data about IT development, onboarding providers, and end-user access of data, measures, and reports in the platform drives the performance measures of your program and shows achievement of milestones.
- ❑ **Stakeholder engagement:** Build infrastructure to ensure community participation in requirements and use case development and prioritization, including mechanisms for continuous feedback, methods to remove or revise measures, and formal channels to share knowledge throughout the life of statewide health IT innovations.
- ❑ **Stay local:** Prepare to adjust for highly localized needs in all areas at all times—provider organizations may come to data sharing with different levels of capacity, may have unique populations, and may require programs and technologies to flexibly examine measures according to health risks; different areas of the state may have different measurement needs.

Implementor Resource 1

Checklist to develop a statewide clinical quality measurement program (cont.)



Evaluation and Feedback (cont.)

- ❑ **Transparency:** Create an objective and transparent reporting process that meets the needs of stakeholders; transparency should include easy-to-access written processes for regular evaluation and continuous improvements of technology, operations and governance, technical assistance and training, and program management.
- ❑ **Training:** Build in methods and resources to onboard management and frontline staff and supportive structures that ensure competencies remain high, even as organizations routinize the innovative technology and staff turn over.
- ❑ **Workflow:** Continuously assess workflow impact of the measurement program at multiple levels.

Implementor Resource 2

Advanced skill-building activity for program evaluation

Health IT as an Intervention and Change-Agent

The first step in evaluating a program, in this case defined as statewide HIE, CQM, and analytics services, is to clearly map the causal and logic models associated with changing the use of healthcare information and adoption of those technologies. Consider the causes of successful health IT adoption with a stakeholder group and describe the local factors associated with improving adoption and the use of new health IT resources. Describe the entire effect theory of the health IT program to evaluate its ability to support population health improvements and technology innovation.

Step 1: Create an effect theory of the health IT program

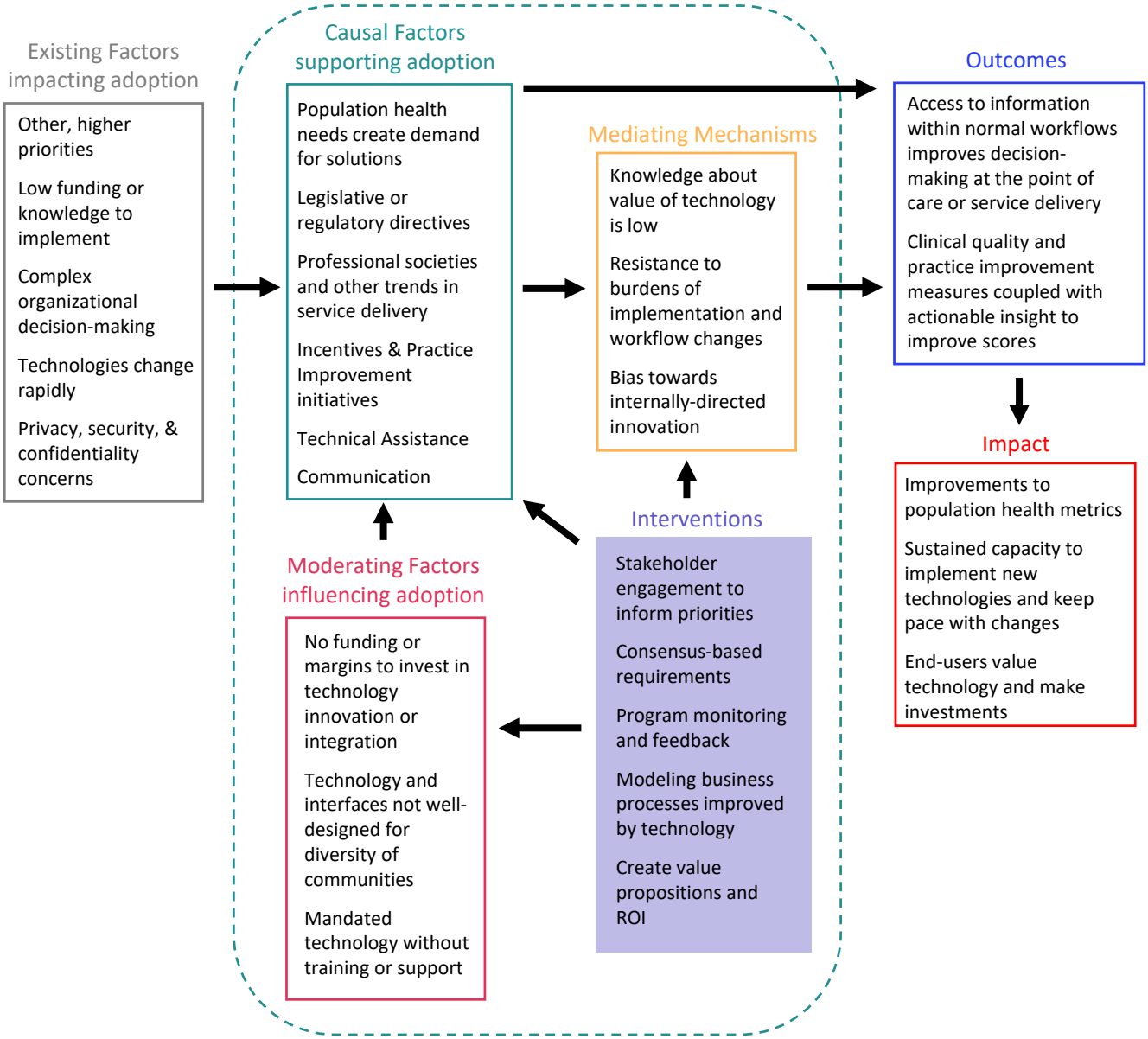
Describe moderating factors and mediating mechanisms, how the intervention of health IT tools can be designed to influence health outcomes, and the intended impacts of the overall program with existing statewide health improvement goals. Develop this model collaboratively with stakeholders to elicit the causes of factors that inhibit technology adoption and identify unique interventional approaches. This examination increases the likelihood of success[10] and aids planners in creating measurable and evaluable goals and data systems that flow from logic and causal models.

Advanced skill-building activity for program evaluation

Step 1: Create an effect theory of the health IT program (cont.)

The process of diagramming this model (Figure 4) to implement statewide health IT solutions helps define the readiness of the program in the state's larger healthcare environment. It also helps to identify non-IT resources that might be necessary to support design and adoption of health IT solutions and shows how to describe the benefits of the program through visual means.

Figure 4. Example of an Effect Theory diagram for new statewide health information technologies to support value-based payment frameworks and population health improvements



Advanced skill-building activity for program evaluation

Step 2: Select an evaluation framework

Evaluation frameworks, such as RE-AIM (Reach Effectiveness Adoption Implementation Maintenance) or MAPP (Mobilizing for Action through Planning and Partnerships) guide stakeholder engagement, requirements development, and technology procurements. This public health evaluation approach helps state planners causally attribute improvement in care and health to the use of health IT tools.

Step 3: Select a theory of change

With an evaluable program model in hand, develop a theory of change about how the health IT platform will change practice improvement activities in clinical or service delivery settings. This theoretical model should show how intended use of state health IT investments will ultimately change behaviors and decision-making, and subsequently workflows of practices and population health outcomes.

Industry approaches to describing theories of change include process modeling and incorporating that process modeling into the architecture of health IT platforms. Theories of change that describe how IT innovations are adopted, including in healthcare settings,[11, 12, 13] commonly explain behavior and influencers at the individual-level only. Implementation and diffusion literature contribute a thorough understanding of how organizations and systems recognize a need for adoption of technology in the context of implementing evidence-based practices that improve care and service delivery, including the crucial period where organizational leaders have decided on a plan to adopt new technology and then transition to securing buy-in from staff-level implementers who must incorporate new technology into their normal routines.

There is a recognized need to combine individual-level theories (Diffusion of Innovation) with organization- and system-level theories (Information Technology Adoption Model, Technology Acceptance Model, and the Theory of Planned Behavior and of Reasoned Action) to determine how organizations uptake innovative new technologies (for example, a new IT standard developed by the government or a new patient-facing application). Critical to a successful implementation, these models help organizations routinize practices and ensure that technology is used every day. Using theoretical models that frame how to change human behavior and use a new technology is a bold and unique challenge. It is critical to answer the questions and concerns of implementers and patients in a way that will ensure uptake, and ultimately impact the infrastructure supporting everyday clinical service delivery.

Finally, clinicians and administrators will adopt technology if it is designed to be part their routine workflows and decision-making processes. State officials can use models like Normalization Process Theory (NPT) to ensure their technology reduce the burden of care and payment activities.

Advanced skill-building activity for program evaluation

Step 4: Develop a logic model and set program goals

Once these change models have been used to describe how a new statewide technology raises the capacity of practice improvements and population health outcomes, write a logic model with measurable goals and necessary inputs, activities, and outputs that will create the desired impact. This performance-monitoring framework can support making the uptake and routinization of state technology investments part of the goal and evaluation plan.

Outputs may include reporting measures for value-based programs, providing reports for actionable practice improvement strategies, and providing a higher-level view of all the interactions of healthcare and services in a state. The architecture of a technology platform can be designed from the start to evaluate technology uptake and to passively report on techniques used to improve adoption, such as push notifications, access of information during the point of care or when planning clinical visits, or other measures[14] that show usage of technology and data resources, before, during, and after implementation.

Figure 5. Example of a health IT program goal and possible metrics aimed at measuring progress toward the goal of reducing provider burden

GOAL: Health IT investments made by the state will reduce provider burden by X% in the first year, Y% in the second year, and Z% in the third year.

The system reports progress on users' time to complete patient safety reports
% of data elements for PSR
Number of user changes to pre-filled data made to complete a PSR
The system reports progress on users' time spent validating data quality
2-question trust survey about data quality shown to users periodically when completing data quality tasks
% measure data elements in structured fields % measure data elements in open text fields
% data elements require modifications to be used for quality reporting (before and after implementation, system changes)
The CQM system supports providers in taking action to improve patient health
% of patients below benchmark contacted in last 30, 60, 90 days
% of measure feedback tied to QI or CDS recommendations

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