

## Measuring infrastructure: A key step in program evaluation and planning



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### ABSTRACT

State tobacco prevention and control programs (TCPs) require a fully functioning infrastructure to respond effectively to the Surgeon General's call for accelerating the national reduction in tobacco use. The literature describes common elements of infrastructure; however, a lack of valid and reliable measures has made it difficult for program planners to monitor relevant infrastructure indicators and address observed deficiencies, or for evaluators to determine the association among infrastructure, program efforts, and program outcomes. The Component Model of Infrastructure (CMI) is a comprehensive, evidence-based framework that facilitates TCP program planning efforts to develop and maintain their infrastructure. Measures of CMI components were needed to evaluate the model's utility and predictive capability for assessing infrastructure. This paper describes the development of CMI measures and results of a pilot test with nine state TCP managers. Pilot test findings indicate that the tool has good face validity and is clear and easy to follow. The CMI tool yields data that can enhance public health efforts in a funding-constrained environment and provides insight into program sustainability. Ultimately, the CMI measurement tool could facilitate better evaluation and program planning across public health programs.

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## 1. Background

A comprehensive approach to tobacco prevention and control—including state and community interventions; mass-reach health communication interventions; cessation interventions, surveillance, and evaluation; and infrastructure, administration, and management—has contributed to a significant decline in U.S. adult smoking rates over the past 50 years (CDC, 2014; U.S. DHHS, 2014a). Despite a considerable drop in U.S. adult cigarette smoking prevalence from 43% in 1965 to 17.8% in 2013 (Jamal et al., 2014), disparities remain in smoking among population subgroups, and many current smokers are using multiple tobacco products (Campaign for Tobacco-Free Kids, 2015; U.S. DHHS, 2014a). Moreover, tobacco use is still the leading cause of premature death in the United States—a fact that undergirds the Surgeon General's recent call for accelerating the national movement to further reduce tobacco use (U.S. DHHS, 2014a). To plan and

implement interventions that respond effectively to the Surgeon General's call, state tobacco prevention and control programs (TCPs) require fully functioning infrastructure (CDC, 2014; Lavinghouze, Snyder, Rieker, & Ottoson, 2013; Lavinghouze, Snyder, & Rieker, 2014).

Broadly speaking, infrastructure provides the foundation for planning, delivering, and evaluating public health programs (U.S. DHHS, 2014b); a strong, functioning infrastructure provides the foundation on which to build policies, systems, and organizational capacities that are optimally responsive to public health threats (Lavinghouze et al., 2013). Given its significance to public health programs, infrastructure needs to be defined in clear, practical, actionable, and evaluable terms so that it can be measured and examined. This is the premise under which Lavinghouze et al. (2014) developed the Component Model of Infrastructure (CMI). The model, shown in Fig. 1, is based on case studies of state TCPs, a literature review of diverse public health program infrastructure articles (e.g., asthma, diabetes, oral health), and theories from other disciplines such as sociology, organizational development, and economics (Lavinghouze et al., 2014). The CMI defines infrastructure as five synergistic core components:

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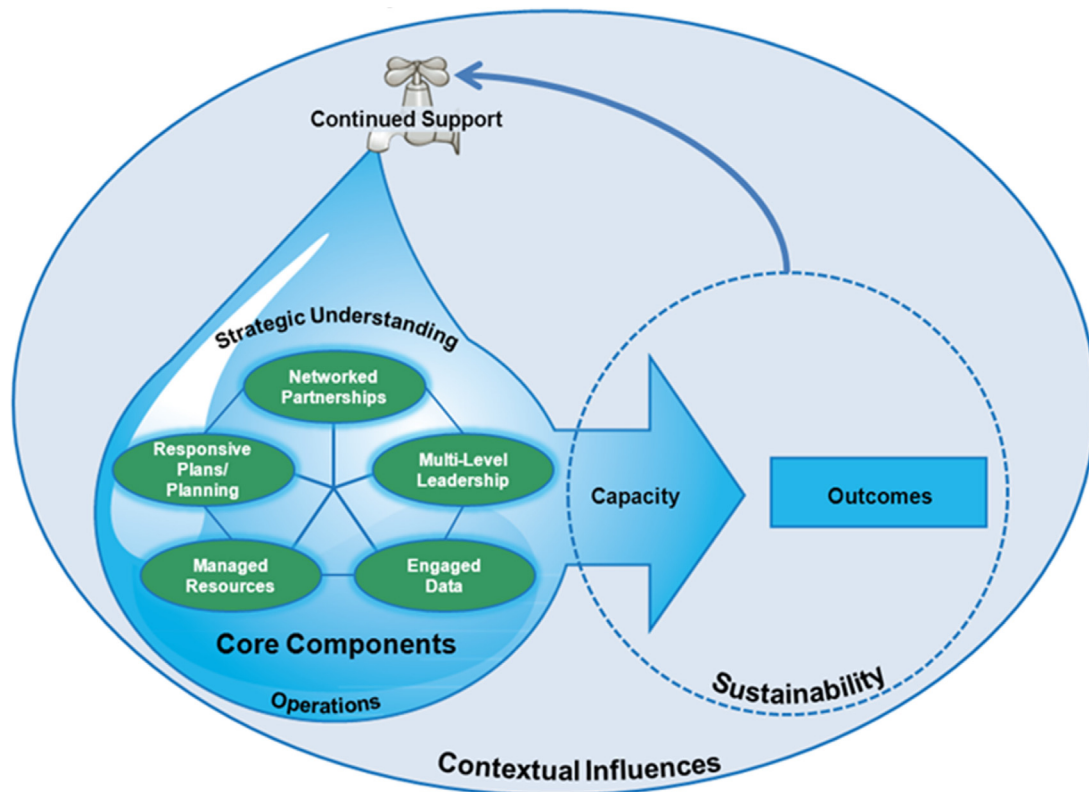


Fig. 1. Component Model of Infrastructure.

- *Networked partnerships* involve strategic collaborations and multilevel relationships among the state TCP and organizational stakeholders at the national, state, and local levels. Although they fill different roles, networked partners work to ensure the accomplishment of all activities necessary to achieve common public health goals.
- *Multilevel leadership* refers to individuals who provide direction for a program or enable resources and processes to support program direction. Leaders and champions can be identified at all levels, including those “above” the program in the health department or other organizational unit where the program is located, within the program in roles other than the program manager or director, among lateral agency partners, and in local programs. Leadership at all levels is necessary to ensure functioning program infrastructure and progress toward health goals.
- *Engaged data* involves identifying, collecting, and employing data to promote action. Data can be used in a manner that engages staff, partners, decision makers, and local programs to act. Data should not merely be collected and summarized, but also used actively to promote public health goals. Training, technical assistance, and follow-through are necessary to ensure the proper use of data.
- *Managed resources* refers to leveraging funds from diverse sources and recruiting and supporting staff with the skills and knowledge to plan and implement best practices. A functional infrastructure requires resources beyond financing; it includes mobilizing an adequate number of staff and partners who reflect the diversity of the communities served and have a variety of technical, program, and administrative skills. Staff, partners, and local programs must also have the necessary training and skills to implement the TCP efficiently and effectively.
- *Responsive strategic plans* are dynamic and evolve in response to contextual influences, such as changes in scientific evidence,

priorities, funding levels, and external support. In addition, the planning process is collaborative and includes viewpoints from multiple stakeholders (Ebbesen, Heath, Naylor, & Anderson, 2004). The process fosters shared ownership and responsibility for the goals and objectives among the state program, partners, and local programs. Responsive plans and planning are developed and implemented collaboratively with diverse stakeholders.

The model also includes three supportive components (strategic understanding, operations, and contextual influences) (CDC, 2014; Lavinghouze et al., 2014). The supportive components are important for program planning and evaluation and are critical to implementing functioning infrastructure (Lavinghouze et al., 2014). However, the core components are the foundation of the CMI and include indicators more readily operationalized for measurement.

Although CMI is an evidence-based framework that can inform TCP efforts to develop and maintain their infrastructure (Lavinghouze et al., 2013, 2014), measures of its constructs are still being developed and tested; this is needed to advance the model's utility for program and evaluation planning and to determine its predictive capability (Lavinghouze et al., 2014). CMI is distinct in that it specifically refers to functioning *program* infrastructure, as opposed to the wider public health system infrastructure (Baker et al., 2005; Handler, Issel, & Turnock, 2001; Lavinghouze et al., 2013; Roper, Baker, Dyal, & Nicola, 1992). Previous attempts to measure program infrastructure have not been based on a comprehensive conceptualization of infrastructure; for example, measures that only address limited aspects, such as partnerships or funding (Farrelly, Pechacek, & Chaloupka, 2003; Granner & Sharpe, 2004). Additionally, previous efforts neither fully considered the dynamic contexts that affect infrastructure measures (e.g., changes in staffing and funding) nor sufficiently took into account

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