HHS Public Access

Author manuscript

Cancer. Author manuscript; available in PMC 2015 October 24.

Published in final edited form as:

Cancer. 2013 August 1; 119(0 15): 2926–2939. doi:10.1002/cncr.28166.

Developmental Milestones Across the Programmatic Life Cycle:

Implementing the CDC's Colorectal Cancer Screening Demonstration Program

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Abstract

BACKGROUND—In 2005 through 2009, the Centers for Disease Control and Prevention (CDC) funded 5 sites to implement a colorectal cancer screening program for uninsured, low-income populations. These 5 sites composed a demonstration project intended to explore the feasibility of establishing a national colorectal cancer screening program through various service delivery models.

METHODS—A longitudinal, multiple case study was conducted to understand and document program implementation processes. Using metaphor as a qualitative analytic technique, evaluators identified stages of maturation across the programmatic life cycle.

RESULTS—Analysis rendered a working theory of program development during screening implementation. In early stages, program staff built relationships with CDC and local partners around screening readiness, faced real-world challenges putting program policies into practice, revised initial program designs, and developed new professional skills. Midterm implementation was defined by establishing program cohesiveness and expanding programmatic reach. In later stages of implementation, staff focused on sustainability and formal program closeout, which prompted reflection about personal and programmatic accomplishments.

CONCLUSIONS—Demonstration sites evolved through common developmental stages during screening implementation. Findings elucidate ways to target technical assistance to more efficiently move programs along their maturation trajectory. In practical terms, the time and cost

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The articles in this supplement were commissioned based on participation in evaluating the Centers for Disease Control and Prevention-funded Colorectal Cancer Screening Demonstration Program.

CONFLICT OF INTEREST DISCLOSURE

The authors made no disclosure.

associated with guiding a program to maturity may be potentially shortened to maximize return on investment for both organizations and clients receiving service benefits.

Keywords

colorectal cancer screening; program implementation; program evaluation; program development; qualitative methods; multiple case study; technical assistance

INTRODUCTION

Among cancers that affect both men and women, colorectal cancer has the second highest incidence and mortality in the United States with 722,542 cases diagnosed and accounting for 268,783 deaths between 2003 and 2007.[1] Survival rates for colorectal cancer are dramatically improved by early detection and prevention through the removal of precancerous polyps.[2,3] Recent declines in morbidity and mortality are attributed to increases in routine screening among persons aged 50 to 75 years, from 52.3% in 2002 to 65.4% in 2010.[1] The population-based screening rate is one of the leading health indicators for Healthy People 2020.[4] More than one-third of adults aged 50 years and older remains unscreened with the lowest screening prevalence occurring among persons of Hispanic origin and those with lower incomes, less than a high school education, and inadequate health insurance coverage.[5,6]

To address colorectal cancer-related health disparities, the Centers for Disease Control and Prevention (CDC) funded 5 sites during 2005 through 2009 to assess the feasibility of establishing community-based colorectal cancer screening for low-income, uninsured or underinsured adults aged 50 to 64 years.[7] The Colorectal Cancer Screening Demonstration Program (CRCSDP), received nearly $10.5 million in federal funding over the course of the 4-year project.[8] Described in greater detail elsewhere,[7,9–11] the 5 programs provided a prescribed range of high-quality colorectal cancer screening services to the following catchment areas: Baltimore City, Md; Greater Seattle, Wash; the state of Nebraska; St. Louis, Mo; and Suffolk County, NY. Sites had the flexibility of using any one (or a combination) of the US Preventive Services Task Force (USPSTF)-approved screening modalities (as of 2004)[12] and were encouraged to design a service delivery structure tailored to their locale.[10] Collectively, sites implemented the first federally funded organized public health screening program for colorectal cancer based on a common policy-driven framework.[7]

In funding and administering the CRCSDP, CDC emphasized learning about and documenting real-world program effectiveness and implementation. As a potential precursor to a larger, federally funded colorectal cancer screening program, similar to the 22-year-old National Breast and Cervical Cancer Early Detection Program (NBCCEDP) which provided aspects of CRCSDP's foundational infrastructure,[9,13] the demonstration was evaluated comprehensively using a multi-method design, and CDC required sites to participate in certain evaluation components as a condition of funding.[7] Comprising 3 parts, the broader evaluation produced findings on clinical outcomes,[14–16] costs,[8,17] and program implementation, the latter being the focus of this and other articles in this supplement.[18,19]

Although there is literature about the efforts of state and local-level programs,[20,21] little was known about the implementation of organized, federally funded colorectal cancer screening. One purpose of the evaluation was to gain a better understanding of the 5 program models and how staff managed and developed them over time. In addition, CDC aimed to increase CDC's capacity to provide evidence-based technical assistance to state, tribal, territorial, and other organizations initiating similar colorectal cancer screening programs. A team of evaluators with extensive training and experience in qualitative inquiry conducted a longitudinal, multiple case study[22] to document implementation activities and related challenges in-depth at different times from the perspective of those closest to the program,[23] that is, staff charged with implementation, along with their partners and program stakeholders.

This article is a result of the interpretive approach to our inquiry and analysis, wherein we explored an emergent theme related to program development. Below, we describe our evaluation methods including the theoretical framework and present the findings as a progression through various developmental phases, consistent with applications by other scholars.[24–28] We discuss the meaning and practical implications of our evaluation, positioning the work in the context of the extant literature, and make recommendations for future technical assistance to similar programs delivering colorectal cancer screening services.

MATERIALS AND METHODS

The qualitative selection and data collection methods for this study are described more fully in Rohan et al.[19] In brief, this article originated from a multiple case study[22,29] of the 5 CRCSDP sites, which included individual or dyadic interviews with 100 people (program staff and stakeholders), review of 19 documents, participant observation (125 instances), and a final group interview at each site to capture developmental processes and milestones. Our team analyzed case study data for developmental themes and patterns using an interpretivist approach,[30] aiming to represent the collective experience and perspectives of program staff charged with implementing CRCSDP in the 5 sites. Using abduction, also called retroductive inference,[31–36] we applied a metaphor to our analysis, which is a qualitative research technique used to generate insight and represent complexity in an accessible way.[37–44] Specifically, we used Erikson's classic theory of human psychosocial development[45–49] as a framework to facilitate meaning-making, guide analysis, and, organize the results as an interpretive narrative. Analytic procedures followed a sequence of construction, deconstruction, and reconstruction of the metaphor to render a program maturation trajectory for the overall project.

Results from our investigation are organized by CRCSDP's developmental phases, parallel to Erikson's 8 stages of the life span[45–49] (Table 1). Early implementation represents the first 4 stages. Midterm implementation corresponds to Erikson's fifth and sixth stages, and late-term implementation encompasses the final 2 stages. In describing CRCSDP's maturation, we describe developmental milestones and catalysts that advanced program implementation to a higher functional level. Although we observed an overall temporal pattern to the CRCSDP's progression, we recognize that implementation activities were

concurrent and overlapping. For each stage, specific examples grounded in the data serve to empirically illustrate the findings.

RESULTS

Phase 1: Early Implementation

During early implementation, presented below as 4 stages, formalized relationships provided the necessary foundation for program development throughout implementation. In addition, sites faced early implementation challenges, made midcourse corrections, and engaged with one another and CDC to build skills, network, and share what they had learned across CRCSDP sites.

Stage 1: Preparing to Screen—The CDC funded the CRCSDP through cooperative agreements, a funding mechanism that requires substantive CDC staff involvement. Consequently, during CRCSDP's initial "start-up" period,[9,10] CDC and program staff worked closely together to achieve readiness for screening implementation. The data suggest that the nascence of the CRCSDP required time for relationship building, shared attentiveness to structural components of the program, and mutual understanding about the specifics of implementation. One program staff member underscored the nature of the partnership with CDC: "I think implementing anything has everything to do with relationships and trust. You could have a great idea, but unless you have the relationships to put that in place, it's not going to happen." Similarly, another said,

> People think it's going to take off great guns, but the program needs a little bit of development time for everybody to have trust and have processes worked out … [CDC] basically said, "You're expecting too much too soon." So, that was kind of a nice thing to hear.

In guiding the CRCSDP's development, CDC relied on formalized processes to establish implementation readiness. Sites were required to demonstrate their readiness by undergoing formal review and assessment, including undergoing a site visit by a multidisciplinary team. Specifically, the CDC team examined sites' patient algorithms, medical eligibility policies, plans for providing screening and diagnostic follow-up services, quality assurance efforts, Medical Advisory Board (MAB) composition, data collection and patient tracking systems, resources for cancer treatment, and other key elements. Once programs satisfied all criteria in the CRCSDP readiness checklist,[50] CDC sites were granted greater functional autonomy with permission to screen patients.

Formalized procedures were also valuable in preparing sites and their stakeholders at the local level to begin screening. The following quote from a Baltimore City program staff member illustrates the investment in time needed to establish agreements between the site and its providers (ie, hospitals, colonoscopy providers):

> Getting our program coordinated and the hospitals to really understand all the policies and guidelines was a challenge. It was a real challenge initially to get contracts in place that would say how much [provider sites] would pay the doctors and what the doctors' responsibilities were versus what the hospitals' roles were,

> that kind of thing … laying out that whole infrastructure early on was very, very time consuming.

One particular challenge during start-up involved securing treatment resources for individuals diagnosed with colorectal cancer as a result of having been screened through the CRCSDP.[9] Similar to the NBCCEDP,[51] providing direct resources for cancer treatment and medical complications is beyond CDC's authority given program focus on screening. Therefore, programs were required to identify resources for treatment as a precondition of funding and in order to meet screening readiness criteria. Without federal resources allocated for treatment services, providers were initially reluctant to enter contractual relationships with program sites[9]; however, once program staff formalized relationships with partner organizations to ensure the availability of treatment resources for any persons found to have cancer or medical complications following screening, providers' concerns subsided. A St. Louis staff member explained, "I think it's critical that if you have a demonstration project of this nature, you definitely have to have [agreements] in place so that these individuals [patients] don't fall through the cracks once they are diagnosed." As detailed elsewhere,[14,16] every patient who experienced screening complications or received a colorectal cancer diagnosis initiated treatment using locally secured resources.

In sum, the time and attention CDC and the sites devoted to establishing partnerships and ensuring readiness for screening allowed the CRCSDP to successfully move to the next phase.

Stage 2: Implementing Program Policies and Procedures—This stage of early implementation marked a programmatic shift from having developed policies and systems somewhat in the abstract during start-up to actually testing and enforcing them once patients enrolled and screening began. As recruitment and screening commenced, both CDC and the sites began an ascent up a "steep learning curve." One participant noted,

> In my experience with any program, one could say, "Well, we're going to plan what our policy is going to be up-front before we implement it." But, in reality, I think you actually have to start running a program before you understand what many of the issues are going to be.

Essential to program development at this stage was having access to technical support that was routine yet nimble enough to respond to impromptu situations. Support systems existed at multiple levels with assistance provided by CDC to programs and by programs to their clinical service delivery sites. Program staff relied heavily on feedback and support from CDC, senior program directors, and their Medical Advisory Board. For example, program managers at the sites had regular meetings with their contracted screening sites at the local level and provided training and other forms of technical assistance.

> We have a monthly telephone call when we're all together … and we discuss recruitment, how many patients we've managed to get enrolled, how many referrals we've received, how many adverse effects have been experienced, how many patients actually underwent colorectal cancer [screening], and how many cancer-related cases we found at our site.

Site staff working with provider sites embraced their role in building programmatic autonomy. A deliberate management strategy underpinned Greater Seattle's supportive leadership style with local service delivery networks that emphasized openness, optimism, and a focus on programmatic outcomes.

> Our role [requires] really good communication skills, teamwork, team building, listening to people, the ability to take and give constructive feedback to our [screening providers], and staying positive. [We have to] encourage, support, and validate successes, [while] bringing forward problems that are there, but doing it in a way that preserves the integrity of the people that are involved. It just [takes] a lot of patience … [It's important] to keep your eye on the goal, which is all the people that are getting screened. [Recently], we were so happy the first time we had a client report that came through [indicating] that polyps [were found] and taken out. Yeah! We're making a difference.

A challenge during this stage involved implementation of medical eligibility policies. Given the CRCSDP's focus on screening underserved populations at average risk for colorectal cancer, patients presenting with symptoms for colorectal cancer were excluded from participation.[7] During early implementation, varying interpretations of the policy on the part of providers left sites struggling to ensure uniform implementation.

Stage 3: Revising Program Design—As systems were tested and challenges emerged during early implementation, site staff identified areas needing program revisions, such as client recruitment processes and choice of screening modality. Flexibility and openness to learning on both CDC's and programs' parts fostered programmatic growth at this stage. As explained more fully elsewhere,[18] sites revised their recruitment strategies when they were not attracting an adequate number of participants. Similarly, sites switched screening tests to accommodate patients' and providers' preferences and promote screening adherence. As described in Rohan et al,[19] completing colorectal cancer screening is a complex process, regardless of test type. In the words of a program staff member, "The most important test, or the best test for [patients] to do for colorectal cancer, is the one that [they] are actually going to follow through on."

Although CDC had led development of a rigorous and systematic data monitoring system,[16] program managers across CRCSDP sites also took a proactive stance in assessing their own performance and responding to implementation challenges. One staff member described how she assessed early program performance: "I just started [by asking] basic [questions]. How are we attracting people? What population are we trying to attract? How are we doing that? And, are we doing that effectively?" Then, answering her own questions, she added, "Obviously, probably not since we're not getting the numbers we want[ed]." In another site, staff assumed a problem-solving position with their provider sites, described as follows:

> My approach to this stuff is problem solving. When there is a problem that comes up, we look at it and try to figure it out, and sort out what is the best way to fix [it]. Having people feel free enough to admit a failure and admit a problem is really hard … I think it's hard for all of us. We all want to be successful. We all want to feel competent that we know what we're doing. But, the fact of the matter is when

> you start a project like this, … you're going to make mistakes. The best approach in my mind is to expect that and be open to it and, in fact, see that as your job to figure out and identify the problems and mistakes, and … figure out a way to get around [them]. But, it's very uncomfortable for all of us.

Sites generally felt supported by CDC to make needed revisions in program design, and CDC's commitment to learning as much as possible about real-world implementation facilitated their willingness to modify various facets of the program. Although more local flexibility was desired in key areas such as the application of clinical practice,[19] programs noted and appreciated CDC's openness overall. As one staff member reflected, "We've had more flexibility [from CDC] than we really thought we did. That's a good thing." Together, sites' initiative in resolving emerging program issues and CDC's support of sites in making midcourse corrections allowed programs to develop in ways that advanced implementation.

Stage 4: Building Staff Skills—Skill building and comparative assessment produced a sense of competency during this fourth stage of screening implementation. Staff enhanced their colorectal cancer screening program implementation skills, acknowledged their own expertise, and engaged in formal and informal opportunities to network with one another, sharing their programmatic experiences while learning from those of others.

Staff members were pleased with their skill development in several key areas of program implementation including their abilities in negotiating with provider sites, forging new collaborative relationships, managing provider networks, advocating for clinical practice standards, establishing multidisciplinary structures for patient navigation, and completing critical programmatic systems, including data collection and reporting. For clinically trained staff (eg, nurses), skill building in areas outside patient care was especially rewarding. One respondent remarked,

> As a [healthcare] professional, I've gained wonderful knowledge about how to set up a program. I couldn't do it myself, but working with [the program team] has been awesome .. . I work with wonderful, wonderful support, and my administrator and the doctors [are knowledgeable about] how to make a system like this work, and how to provide the service.

Staff from the sites also described situations where providers turned to one another for technical support and advice, often despite disciplinary walls that typically divide them. Here, a program manager expressed pride in bridging communication among provider sites and sharing best practices to troubleshoot a particular problem with bowel preparation before colonoscopy:

> I think a good surprise is how adaptable our sites are to change. [We recently had] a [bowel] prep issue come up 2 or 3 months ago, and [the provider sites] were really good at talking to each other and finding out what worked best … Everybody's like "Oh, I can try that. That's no problem." I think the good thing is, you have one of the world's foremost health care institutions working with a [small] community hospital, and they get along. It's good. I think that's a good surprise on our end.

CDC created 3 opportunities to bring site representatives together with national colorectal cancer experts for networking and sharing, where learning was facilitated for both the sites and CDC through a productive dialogue among all participants. Most sites successfully enhanced program-related competency over the course of the meetings in several areas critical to program implementation such as quality assurance. CDC benefited by gaining significant insight related to real-world program implementation.

Phase 2: Midterm Implementation

After attaining a certain degree of early program mastery, the sites moved into midterm implementation that we characterize as a period of efficiency enabling subsequent programmatic expansion. As revealed in the next 2 stages, a cohesive program identity developed, which, in turn, facilitated program marketing and promotion, supported strategic partnership, and broadened programmatic reach.

Stage 5: Achieving Program Cohesiveness—Across CRCSDP sites, program cohesiveness was fostered through role clarification, team building, and refinement of systems and routines, although observations suggest that it was compromised by staff turnover. Whereas program staff reported that role definition was integral to successfully building “a multidisciplinary team structure” for managing the various components of the CRCSDP, they also described the essential nature of clarifying individual roles in relation to each other. With greater implementation experience, staff improved their ability to see the “integration and overlap” among staff and stakeholders’ responsibilities and better understood how programmatic components functioned together as a system.

To facilitate role clarification and team development during this stage, program managers relied on several techniques. Effective communication, described by different sites as “fluid,” “thorough,” “responsive,” “regular,” and even “clairvoyant,” served as a managerial mainstay. Team building also occurred by assigning staff with “crossover [responsibilities] between the different roles on the demonstration project” (eg, billing and patient tracking). According to staff in Greater Seattle, encouraging staff members to “follow through on everything” also reinforced role clarification and increased teamwork. These management practices facilitated problem solving and built additional trust among stakeholders (ie, providers) in that “if there [was] a problem, there [was] someone they [could] call.”

Creating and fine-tuning functional routines and systems to maximize performance were also essential to establishing a cohesive programmatic identity. Although site staff began systems development during early implementation, it typically required several months of screening implementation experience before staff “[got] the kinks out of the system.” A staff member recalled the need to “[go] from a system on paper to really making it work,” especially as screening volume increased. To reach a certain level of efficiency, staff perfected several types of systems as part of programmatic infrastructure including systems for fecal occult blood test (FOBT) tracking, patient scheduling, patient navigation, and data collection and reporting. Such activities as creating standard correspondence, conducting clinical quality assurance review, and offering provider training to enhance referrals also contributed to a strong sense of program identity.

In describing programmatic development, particularly in relation to the NBCCEDP, program staff acknowledged how much they were still learning about managing and implementing a colorectal cancer screening program. Respondents recalled a period during which they and their program struggled to correct missteps and find solid functional ground. A program staff member from St. Louis noted:

> It's just the experience in the program. It's just like growing up. There's been time put in, there's been mistakes made, there's been mistakes corrected, you know, and everybody's growing into the program. Now there's a whole lot less teaching needing to be done for providers, for clients, and for the referral providers. [We] started operating a little bit on autopilot without having to be constantly hands-on. Sort of like when you can start letting your kids stay home by themselves.

Program staff also found that they could reduce the frequency of performance monitoring once the program's core machinery "hummed along," a testament to staff members' familiarity with programmatic elements and processes. Staff in Suffolk County, NY, discovered they needed to rely less on checklists developed during early screening implementation. Baltimore staff were able to do "less hand-holding" with their providers as program implementation matured, scaling back extensive in-person monitoring, but maintaining other less staff-intensive monitoring efforts. A Greater Seattle staff member referred to this phenomenon as "having momentum, when it doesn't feel like we're pushing the rock up the hill." Both Greater Seattle and Suffolk County personnel described no longer having to create systems, but, rather, focusing energies on "smaller refinements" and "fine-tuning the well-oiled machine," respectively. Staff in Nebraska relied on their data systems in combination with their program management experience to signal readiness to move the program forward.

> It's like when you stop struggling with something, then it's working. It's almost like the system is in the data. You know, you're thinking about it, you're thinking about it, and you're spending tons of time. Then, all of a sudden, one day you're not spending as much time on that. It's working, things are looking the way you expected it to, then it's like, "OK, what is the next thing?"

Stage 6: Expanding Programmatic Reach—In the sixth stage of program development, sites made efforts to expand programmatic reach, often through strategic partnerships. Across sites, staff described the importance of creating and refining systems (eg, data systems, patient protocols) *before* undergoing programmatic expansion.

> When you're confident that systems are working, it does free up some manpower to do other things because you [don't have to] constantly worry about those little things … When we felt that things were stable, it [was] time to do some recruitment … we [knew] exactly what [was] going to happen to [patients] when they [came] into the program.

Systems work was viewed as an ongoing process, especially as expansion activities ensued. One staff member noted, "Once you get the systems figured out … then it's much easier to grow the volume [of patients screened] very, very quickly." A Nebraska staff member emphasized the importance of tailoring systems development and implementing screening

programs on a smaller scale before making the decision to expand to "multiple enrollment sites and multiple distribution points [for FOBT kits]," allowing room for needed programmatic modifications.

> With new states, I think it's really important to start small. Because even if other states have paved the way, even if there are all kinds of systems out there, every state's going to be different. Every program is going to find [some] things [that] are not working quite the way they expected them to. So if you start small, then you don't mess quite as many things up.

Staff from one site described a readiness to formally engage in evaluation processes as a precursor to potential programmatic replication and expansion. Apart from CDC's monitoring and evaluation efforts, staff viewed external evaluation as following their own more informal, internal assessment:

> We do see that evaluation probably in some respects has been our weakest [area] because we're so involved in recruiting, enrolling, and getting systems [in place] that it really is time now to make sure that what we're doing is effective and that it works … We recognize that there is more to evaluation, especially if we want to be able to replicate things and share things with other programs.

To position itself as a pilot for an eventual statewide screening program, the Greater Seattle program concentrated on developing contractual partnerships with primary care providers who could either distribute FOBT kits or refer patients for colonoscopy. Staff deliberately sought contracts with physicians already participating with the NBCCEDP, especially those with experience reaching African American, and Alaska Native and Asian Native population groups. Staff described their emphasis on "nurturing relationships [with gastrointestinal (GI) specialists] in whatever way [they] had to," making necessary accommodations and compromises to make the partnership work.

> When [the provider group] first signed-up, they seemed like they were doing it because it was the right thing to do, but they weren't that excited about it. And we did have problems in the beginning, just typical billing and patient referral stuff. But, then, [once] we got our systems down, it's really been great. The CEO, if I call her, calls me back within a day, and they're excited to participate and to help people … We're giving them exposure to a client [population] that they've never really served before.

Aspects of local culture facilitated expanding programmatic boundaries and reach. In Nebraska, site staff described "neighbors helping neighbors" as a cultural value. In Greater Seattle, emphasis on community, shared decision-making, and grass-roots buy-in allowed site staff to nurture partnerships to fulfill their programmatic vision.

In Suffolk County, NY, programmatic expansion occurred mainly within institutional boundaries. By developing efficient, mutually beneficial relationships with local community-based referral clinics and primary care providers, program staff maximized their institution's capacity for providing screening colonoscopies to under-served persons. Having established a positive reputation in the early stages of the program with a single gastrointestinal specialist (GI) provider, Suffolk County, NY, staff successfully recruited

new GIs within their institution. In reflecting upon their development, staff reminisced lightheartedly about the transition from “going steady” to playing the field: “Those were the teenage years [with a single gastroenterologist]. Now we’re ‘free love,’ swingers.” In sum, engaging strategic partners, being open to external evaluation, pursuing opportunities, and having a compatible cultural context all supported expansion, which, then, increased the likelihood of programmatic sustainability, a focus of late-term implementation.

Phase 3: Late-Term Implementation

Within CRCSDP’s defined funding period, program staff attended to sustainability while preparing for program closeout. In the last 2 stages, together comprising late-term implementation, we describe sites’ efforts to maintain funding stability while also considering other, non-monetary ways of leaving a programmatic legacy and share staff reflections on the meaning of CRCSDP to their lives and communities.

Stage 7: Sustaining the Program—As the CRCSDP moved toward closure, sites initiated sustainability planning, considering whether and how aspects of the program would continue after funding ended rather than program activities simply terminating. Although program sustainability can and did take various forms,[52–54] sites viewed securing new financial resources as the most important means to extend programmatic vitality after CRCSDP funding ended.

Two sites were able to leverage their work on the CRCSDP to secure funding from other sources while also receiving federal funding from CDC’s new Colorectal Cancer Control Program (CRCCP). For one of these sites, assuring the program’s financial stability became a prime focus of its director who described devoting “most of [her] time and energy” to that task. In that site, program stakeholders secured a one-time state appropriation of almost $1 million to screen low-income populations for colorectal cancer. This was accomplished through strong advocacy by key stakeholders, many of whom were participants in the state’s cancer coalition.

In another site, program stakeholders advocated for and received an additional $400,000 a year appropriation from the state legislature. In developing public education initiatives, staff intentionally involved multiple partners to create mutual buy-in for financing colorectal cancer screening awareness. As one staff member explained, “If we weren’t here, they [partners] were still going to be spreading the message that it was important to get screened for colon cancer.”

At another site, several funding streams “fell together” to allow programmatic expansion after the CRCSDP funding period ended. Based on their experience with the demonstration program, some hospitals involved in CRCSDP as provider sites successfully obtained other funding to continue screening low income residents. Program staff acknowledged their unique position and supposed that, without these other sources of state funding, “we’d be shutting down.” Going forward with a variety of funding streams leveraged, at least in part, by the CRCSDP experience, a staff member described building screening capacity for the catchment area:

> This year, the CDC demo had [hundreds of] slots, and next year we're [doubling that] between all these different funding pots. So, that's not only sustainability, it's growth, which is a good thing, especially in [an area] that needs it.

In summary, sites were successful in assuring the sustainability of their programs by building on their CRCSDP experience and competing for new funding opportunities, working with partners who advocated for state legislative dollars and, collaborating with other organizational entities to secure new funding.

Stage 8: Closing Out the Program—Nine to 12 months before the project's end, CDC established a closeout protocol for programs, to support completion of the screening cycle, continuity of care, and receipt of final data submissions (ie, fiscal, clinical, and programmatic). In this stage, program staff also reflected on their experience, expressing pride and satisfaction in their personal and professional accomplishments during final interviews. One staff member in Greater Seattle was especially proud of having developed a program that others now want to replicate within the state. From the same site, another staff person shared her joy in being part of the team receiving a new award: "That has been the biggest blessing of all. To take and develop a successful program and to see it move to the future, I mean, I could resign today and be happy." Staff from Nebraska, similar to staff from other sites, expressed positive sentiments about working collaboratively with CDC, being treated as experts, having been part of a seminal effort to develop a comprehensive program, and seeing their hard work and creative ideas recognized by respected leaders in the field working at the national level. As one respondent said, "It makes me feel good [to be recognized], and I feel like we're part of it—the flagship."

In Suffolk County, NY, where financial sustainability was uncertain, staff praised their role in mentoring and training medical residents exposed to the program. Site staff took pride in plans to disseminate their service model and community outreach approach to other academic medical centers and within their own institution.[55] A staff member who is also a clinician described her experience with the CRCSDP in the following way: "From the bottom of my heart, this program has been the single, best thing I've done in my career."

Regardless of future funding status, staff were grateful to have had the opportunity to "make a real difference" by helping people in their communities directly and in significant ways. Sites considered this outcome of the program their greatest success story. One staff member underscored her appreciation for being able to help under-served persons who, without health insurance, likely would have never received this potentially life-saving screening.

> I think to myself, what an impact! These persons [with precancerous polyps] now aren't going to have cancer. If they never got health insurance, and they never got a colonoscopy, they [might not have] the rest of their lives with their family … and I feel like I was fortunate enough to help those 800 people have better lives, either by the knowledge that they don't have anything wrong with them and they can sleep easily, or [by] not being an ostrich with its head in the sand, they now know what they're up against.

Staff also shared their gratitude for being able to mainstream preventive services for typically underserved and, in some cases, misunderstood, vulnerable populations. In Greater Seattle, for example, staff recalled one African American patient's story of having his trust in the health care system somewhat restored based on his positive experience with the colorectal cancer screening program. According to him as retold by a staff member, memories of the Tuskegee experiments[56] still linger and raise suspicion in some communities. "It [was] sort of a difficult conversation to have, but that was really good [information] for me to hear, and it was really good of him to volunteer it."

In Baltimore City, staff and provider partners described "empowering" patients to be proactive about their health and to have a regular medical home. Through patient support services, staff reported being able to restore "dignity" to persons typically not well-treated, and in fact sometimes "victimized," by healthcare institutions. In particular, provider staff shared "with goose bumps" their program's ability to provide equal service to uninsured persons who are accustomed to being treated differently, as if less entitled to quality and respectful care.

> One gal said, "I really felt like I was treated like a queen." She said, "It's really weird to say, but when you don't have health insurance and you go to get things done, people treat you differently." She says, "Everybody treated me so well, I cannot believe it." And I said, "Well, you know, as far as the staff and I go, we really don't care whether you have health insurance or not because you're our patient. When you walk through that door, they don't know, and it doesn't make any difference to them. You are their patient."

Overall, CRCSDP participants described the demonstration as having enriched the meaningfulness of their careers, expanded their skill set in public health program management, improved communities of practice around colorectal cancer screening, and increased teamwork and partnership. In the view of the program staff, the CRCSDP's most important legacy, however, was improving quality of life for 5233 persons[16,18] by providing potentially life-saving colorectal cancer screening and prevention.

DISCUSSION

In evaluating the implementation of the CRCSDP over time, unique developmental stages were identified through empirical study. Our findings represent a new model of program maturation not yet presented in the literature. Implementation has typically been considered one, discrete phase that is preceded by program planning and followed by sustainability, reinvention, termination, or replication.[24,57–59] Our findings provide evidence that implementation is more complex. A stage-based model of implementation for comprehensive colorectal cancer screening programs has implications for program planning, resource allocation, staffing, technical assistance provision, and evaluation. In the following sections, we discuss the implications of the model for stage-based technical assistance provision, which are summarized in Table 2. In particular, we explicate how technical assistance can serve as a catalyst for programmatic maturation throughout early, midterm, and late-term implementation periods.

Implications for Early Implementation

The 4 stages of early implementation proved to be a dynamic period characterized by a number of milestones. In stage 1, "*preparing to screen*," grantees formalized relationships with partners, secured resources for cancer care, developed data management systems to monitor the quality of clinical services, instituted systems to provide technical support to providers, and demonstrated readiness to initiate screening.

Several areas of technical assistance may facilitate the realization of these milestones. First, supportive frameworks like logic models[60] are useful for program and evaluation planning, helping to explicate an intervention's theory of change and identify outputs and outcomes for monitoring and evaluation. By incorporating evaluative thinking, structures, and processes throughout the life of a program, evaluation can play an important developmental role[61] and create the necessary scaffolding for organizational learning[62] to occur. Support to develop depictions of service delivery structures[10] may also help bound the programmatic purview during this stage, allowing a more focused gaze on understanding the connections between and among inputs, activities, outputs, and intended outcomes. Technical assistance aimed at partnership development may help programs identify critical partners and formalize relationships with them. Programs should be working closely with their comprehensive cancer coalitions[63,64] where valuable partner connections can be brokered. Offering sample templates for documents such as a memorandum of understanding (MOU) that details roles and responsibilities for partnering agencies will help programs solidify these relationships and lay an important foundation for collaboration. Experts in the clinical aspects of colorectal cancer screening are also needed at this stage to assist with the development of program policies, procedures, and patient algorithms. Medical advisory groups were an important source of this expertise for the CRCSDP.[9] Finally, screening readiness criteria like those used in the CRCSDP Checklist to Assess Preparedness for Screening[50] can help guide and assess program development, advancing implementation maturity during early stages.

In stage 2, "*implementing program policies and procedures*," programs initiated colorectal cancer screening and provided individualized support to providers involved in service delivery. Data management systems were used to collect data on patient demographics, clinical outcomes, and program costs.[8,16,17] To achieve these milestones, provider site staff will require responsive technical assistance centered on patient eligibility, colorectal cancer screening guidelines, reimbursement requirements, and other clinical issues. Program staff should be prepared to field queries about data collection requirements and help with data system implementation at provider sites. Any technical support facilitating collection and reporting of high quality data is valuable during this time.

Milestones achieved in stage 3, "*revising program design*," included the identification and resolution of early implementation problems by making needed program modifications. Assistance in establishing systems for regular data review, including tools that facilitate data use, is important at this stage. Performance management systems,[65,66] including the identification of core indicators, may be appropriate and can contribute to enhanced implementation. Such systems provide regular information for ongoing performance

monitoring[58] and quality assurance and permit informed decision-making about midcourse corrections (eg, changed strategies for recruitment).

During the final stage (stage 4) of the early implementation phase, "*building staff skills*," program staff effectively worked with colleagues to share program strategies and lessons learned, conveying program mastery. Assistance in facilitating both formal and informal opportunities for dialogue is important for fostering the learning process at this point. The ability to reflect, actively participate in problem solving around immediately relevant topics, integrate past experience and existing wisdom with knowledge acquisition and application, and engage in context-specific skill development are consistent with effective practices espoused by adult learning theorists.[62,67–70] Funders, program directors, and evaluators should create learning opportunities and an organizational culture that lead to reflective practice.

Implications for Midterm Implementation

In stage 5, *achieving program cohesiveness*, programs clarified staff roles and responsibilities, further refined routines and systems and realized greater team integration. These achievements contributed to *expanding programmatic reach* in stage 6, as having a cohesive program identity engendered staff confidence and allowed for external evaluation.

Although program development and growth are both important milestones during this period, the conceptual distinctions between the 2 have implications for technical assistance provision. Often used synonymously with "growth," "development" more precisely refers to increasing collective competency and capability,[61,71] optimally achieving a state of cohesiveness. Organizational management scholars describe organizations as having reached a state of collectivity once individuals' efforts and teamwork are maximized and organizational commitment, passion, and cohesion coalesce.[72,73] Strategic planning, leadership development, and team building all emerge as important areas for technical assistance.

"Growth," on the other hand, in a programmatic context involves increasing size or programmatic reach[61,71] through expansion or replication as a byproduct of dissemination. In the CRCSDP, partnerships were often leveraged to facilitate growth of the screening program, which suggests that technical assistance related to collaborative partnerships and frameworks for partnership synergy[74] are relevant. As in other programmatic phases of the CRCSDP, resources related to comprehensive cancer coalitions[63,75] offer an essential source of support.

Program fidelity also becomes critical during any expansion phase.[61,76,77] Several scholars note that there is no unitary approach to expansion and that, unlike most commercial franchises, social programs cannot be replicated without regard to context.[61,76–78] Contextual factors that affect the ability to implement a sustainable program include, but are not limited to, organizational capacity, political support, adaptability, and leveraging community assets through strategic planning.[79] With these factors in mind, implementation and dissemination research can inform technical assistance provision related to program expansion.[80] Program staff must identify the elements of a program to be retained intact to

achieve results similar to the original program and those aspects to be adapted to fit a new context.

For demonstration programs like the CRCSDP, evidence of effectiveness may not yet be determined. Consequently, program implementers may benefit from working with evaluators to conduct an evaluability assessment,[81,82] a method used to examine specified criteria (eg, potential impact, reach, feasibility of implementation) and make a determination of evaluation readiness. In temporal sequence, formative (ie, improvement-oriented) evaluation should precede summative judgment about a program's particular merits,[61,83] and widespread dissemination of a program should follow the establishment of evidence about its effectiveness.

Implications for Late-Term Implementation

In late-term implementation, "*sustaining the program*" (stage 7) and "*closing out the program*" (stage 8), site staff engaged in planning activities to sustain the program after the funding period ended, sought and secured new sources of funding, planned for program termination, and reflected on the meaning of their collective efforts to patients, to public health, and to their professional lives. A body of evidence is growing around various conceptualizations of sustainability and its determinants.[52,54,79,84,85] Public health practitioners recognize the importance of sustainability in achieving distal programmatic outcomes for patients (eg, reduced morbidity and mortality), extending the substantial initial investment by funders and funded organizations (eg, time and resources), and preserving community and stakeholder support in the wake of funding (and potentially the program's) termination.[53,84,85] For these reasons, a 1-dimensional approach to sustainability planning, namely, an organization's attempt to implement the exact program in the same way after funding termination, constrains opportunities.

A multidimensional view of programmatic sustainability can help program staff and funders avoid the "all or nothing" pitfall of equating the end of funding with the end of programmatic life. Program staff would benefit from technical assistance about frameworks that consider multiple potential outcomes, including benefits of the program service to new and existing clients, maintenance of collaborative partnerships established during the program, continued implementation of programmatic policies and procedures, sustained public attention on societal needs addressed by the original program, and diffusion or replication of program components in other contexts or settings.[53,54]

Practitioners in late-term implementation may need support in identifying funding opportunities from public or private sources and in developing strong grant applications. Providing specific closeout guidance and requiring a formal, written closeout plan can ensure staff addresses all managerial, financial, and programmatic elements to properly terminate an initiative.

Finally, late-stage implementation also involves reflecting on the program experience. Evaluators can be especially helpful in synthesizing data and evaluation results and developing dissemination plans that consider unique stakeholder audiences. Utilization-

focused evaluation offers a valuable framework for considering how to maximize *use* of evaluation findings through "intended use by intended users."[86]

Limitations

First, in describing program staff members' experiences with CRCSDP's implementation, our analytic findings were shaped by the selection and application of a human psychosocial development metaphor. We acknowledge that other meanings exist in the data and are discoverable beyond our particular metaphoric lens. Second, as a demonstration with finite funding, CDC and program staff developed and implemented colorectal cancer screening for only 4 years. Program development in shorter and longer periods may operate differently, because the time needed for optimal program development may be variable and context dependent. Third, opportunities to directly observe programmatic growth and development over time were limited. With only 3 formal interview phases across the 4-year period, we relied on retrospective reflection to capture details of important milestones. However, notes from CDC's monthly phone calls with site staff provided additional real-time data to support analytic findings.

CONCLUSIONS

By evaluating CRCSDP implementation from its inception to its end, we identified unique developmental stages with corresponding milestones. To date, implementation generally has been described as one discrete phase; therefore, our findings offer an important new model for colorectal cancer screening programs. In particular, we suggest stage-specific areas for technical assistance that may help move programs more efficiently along their maturation trajectory. The time and cost associated with full implementation and program development for future programs may be shortened, thereby maximizing return on investment for both organizations and clients receiving service benefits. Although informed by this particular colorectal cancer screening demonstration, the technical assistance recommendations offered are likely relevant to a variety of other programmatic areas in public health.

Acknowledgments

The authors are grateful to Djenaba Joseph and Thomas J. Chapel for their thoughtful reviews of this manuscript.

FUNDING SOURCES

The Colorectal Cancer Screening Demonstration Program evaluated in this supplement was funded by the Centers for Disease Control and Prevention Funding Opportunity RFA AA030.

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TABLE 1

Erikson's Stages of Human Psychosocial Development[45–49]

Life Stage	Psychosocial Crisis	Developmental Task
Infancy (0–1 y)	Trust vs mistrust	Trust is established through cause and effect patterns of parental care and feeding.
Toddlers (2–3 y)	Autonomy vs doubt	With parental support, independence and self-esteem are built by gaining control over bodily functions and asserting a sense of will.
Preschool (4–6 y)	Initiative vs guilt	Through play, children take initiative and engage in risk-taking to manipulate others and their surroundings.
Childhood (7–12 y)	Industry vs inferiority	School-age children develop skills and learn to be productive, especially in comparison to peers.
Adolescence (13–19 y)	Identity vs role confusion	Adolescents form self-identities by integrating endowments, aptitudes, and social roles, typically after experimentation with various peer groups.
Young adulthood (20–34 y)	Intimacy vs isolation	Individuals search for and develop reciprocal, intimate relationships.
Middle adulthood (35–65 y)	Generativity vs stagnation	Individuals become parents, raise children, and produce a body of work.
Older adulthood (65 + y)	Integrity vs despair	Persons reflect on their lives as either well- or ill-spent.

TABLE 2

Stage-Based Developmental Milestones and Recommendations for Technical Assistance

	Implementation Stages	Developmental Milestones	Areas for Technical Assistance
Early	1. Preparing to screen	Established and formalized relationships among partners	Using logic models to guide program and monitoring/evaluation planning
		Secured cancer treatment resources	Establishing partner relationships with providers, cancer centers, and community organizations
		Developed functional monitoring and support systems	Identifying criteria for program readiness
		Demonstrated readiness through completion of policies and systems	Managing the development of program policies and procedures and fiscal systems
			Developing data management systems for colorectal cancer screening clinical service provision
			Addressing emerging colorectal cancer screening-related clinical issues
	2. Implementing program policies and procedures	Initiated service delivery	Collecting and reporting high-quality clinical data for program monitoring
		Provided individualized support to providers	Building responsive support systems, especially related to clinical issues
	3. Revising program design	Identified early program challenges	Analyzing monitoring data for critical assessment of program implementation
		Made midcourse corrections	Using data, including feedback to providers, for program improvement
	4. Building staff skills	Participated with peers for mutual learning	Facilitating peer exchange
		Developed and conveyed program mastery	Advancing staff skills and expertise
			Building evaluation capacity in the organization
Midterm	5. Achieving program cohesiveness	Clarified roles and responsibilities	Conducting strategic planning based on experiences of early implementation
		Refined systems and routines	Developing program leadership
		Realized team integration	Building team cohesion
	6. Expanding programmatic reach	Expanded program by leveraging partners	Ensuring program fidelity during scale-up
		Invited external evaluation	Leveraging partners to expand provider networks and extend programmatic reach
			Conducting evaluability assessment for outcome and impact evaluation
Late-term	7. Sustaining the program	Planned for sustainability Secured new sources of funding	Conducting sustainability planning Identifying new colorectal cancer-related funding resources Writing funding applications/grants
	8. Closing out the program	Planned for program closeout Made meaning around programmatic legacy	Closing out a colorectal cancer screening program Synthesizing and disseminating evaluation results
			Reflecting on program accomplishments and legacy