Communities Transforming
To make healthy living easier

CASE STUDY

Working with Primary Care Practices to Improve Care for Cardiovascular Disease

North Carolina's Success Story

National Center for Chronic Disease Prevention and Health Promotion
Division of Community Health

Acknowledgments

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Introduction

This case study describes how the North Carolina Division of Public Health (NCDPH) and its partners used Centers for Disease Control and Prevention (CDC) funding to work with primary care practices to improve clinical and preventive care for patients at risk for cardiovascular disease (CVD)—a broad term for all diseases that affect the heart or blood vessels. It provides examples drawn from real-world practice of methods used with primary care practices to prevent and manage high blood pressure (hypertension), high LDL (bad) cholesterol, and tobacco use, three of the main risk factors for CVD. NCDPH's story demonstrates:

- The value of public health and health care sector partnerships in addressing population health challenges.
- How primary care practices can use quality improvement (QI) tools to better manage CVD risk factors.
- The role primary care practices can play in connecting patients to community resources.
- Key facilitators to working with primary care practices.

This document may be especially helpful to organizations and individuals interested in collaborations between the public health and health care delivery systems, including state and local health departments, primary care practices, and community care organizations. Frequently used terms are defined in the sidebar.

The Issue

CVD is a major cause of death, disability, and health care expenses in North Carolina. Specifically, heart disease and stroke were, respectively, the number one and number four causes of death in North Carolina in 2010, resulting in a combined 21,452 or 27% of all deaths that year.[3] In North Carolina, the proportion of premature CVD deaths (people under age 65) has been rising since the late 1990s, and costs per hospital stay rose more than 60% between 1995 and 2007.[4,5] Total hospital charges for CVD in North Carolina in 2010 exceeded $4.6 billion, not including outpatient care, loss of work, rehabilitation, or home health services.[5]

Key Terms

Quality Improvement: *Systematic and continuous activities that lead to measurable improvement in health care services. A successful health care QI effort incorporates process improvements, a focus on patients, team effectiveness, and use of data.*[1]

QI Coach: *A trained professional who uses systematic steps and tools to facilitate the quality improvement process in a health care practice.*

Driver Diagram: *A visual tool to help identify and map cause-and-effect relationships related to specific improvement goals.*[2]

Change Package: *A set of intervention options available to influence specific drivers associated with a goal.*

CVD disproportionately affects racial and ethnic minorities, people with lower socioeconomic status, and people living in rural areas. Populations with higher rates of CVD also are more likely to reside in areas characterized by a high concentration of establishments that sell tobacco and a low concentration of establishments that sell healthy foods or provide safe venues for physical activity.[6,7,8,9]

Many factors contribute to this problem. This case study addresses three of them. On the clinical side, most medical practices lack adequate systems that support effective tracking and management of CVD risk factors.[10] As a result, health care teams may not be able to easily access information to guide and empower their patients to manage these risk factors. On the community side, programs, services, and resources to promote self-management and prevention of CVD risk factors vary in their effectiveness. Many medical practices lack systems to identify effective programs, and they find it difficult to track and follow up on referrals to these programs. Lastly, because of time constraints and a lack of communication, primary care providers are often unable to be deeply involved with public health efforts to create changes to policy, systems, and environments that make healthy living easier. Similarly, these efforts miss out on the opportunity to benefit from health care providers' expertise and influence.

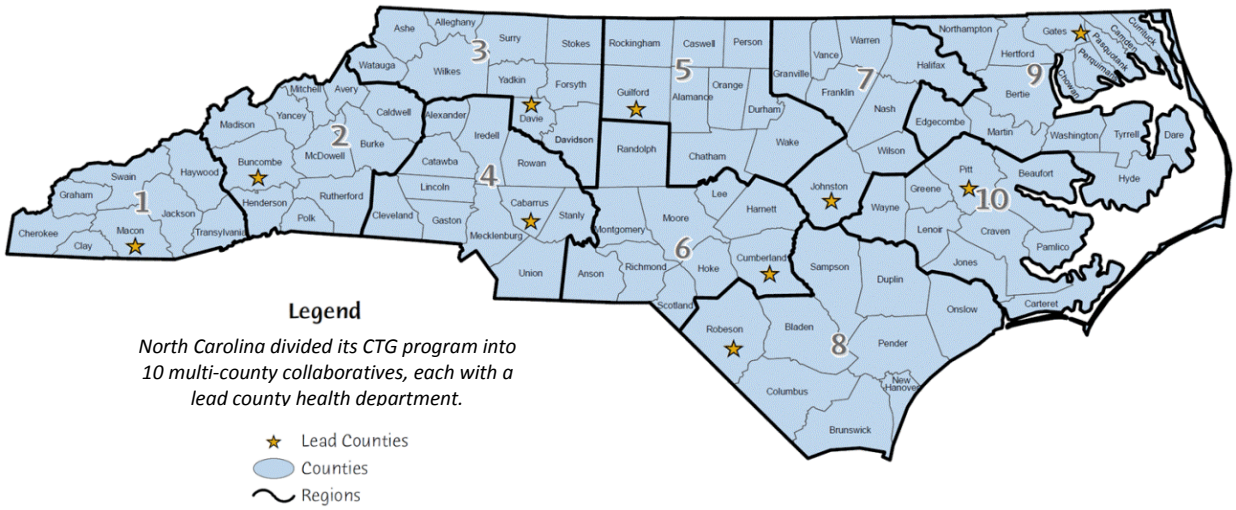
The Intervention

Background

In 2011, CDC awarded NCDPH a cooperative agreement under the Community Transformation Grant (CTG) program. The CTG program focused on active living and healthy eating, tobacco-free living, and clinical and community preventive services to prevent and control high blood pressure and high cholesterol. North Carolina organized its CTG program by region into 10 multi-county collaboratives, each with a lead county health department.

Figure 1

North Carolina's 10 Community Transformation Grant (CTG) Collaboratives



This case study highlights North Carolina's progress on three CTG objectives:

- The clinical objective: To increase the number of primary care practices using QI to prevent and manage three key CVD risk factors: high blood pressure, high cholesterol, and tobacco use.
- The community referral objective: To improve systems for referrals of patients to existing community prevention and self-management programs, services, and resources.
- The policy, systems, and environmental change objective: Begin to increase primary care practices' awareness of and involvement in local efforts to improve policies, systems, and environments that make healthy living easier.

In addition to improving the quality of life for North Carolina residents, meeting these objectives would also decrease health care costs by helping to prevent patients from developing CVD risk factors in the first place. It would ensure that patients who have already developed CVD risk factors would be more effectively monitored and treated before they had a costly and debilitating stroke or heart attack.

The Partnership

NCDPH partnered with two nationally recognized state health care organizations: North Carolina Area Health Education Centers (NC AHEC) and Community Care of North Carolina (CCNC) (see sidebars on page 4 and page 6).

NCDPH enlisted CCNC as a partner to help identify and monitor primary care practices with the greatest potential for improvement in treating and preventing CVD risk factors. CCNC manages an Informatics Center that analyzes Medicaid data to facilitate population-based disease management and provide performance feedback at the patient, practice, and network level.

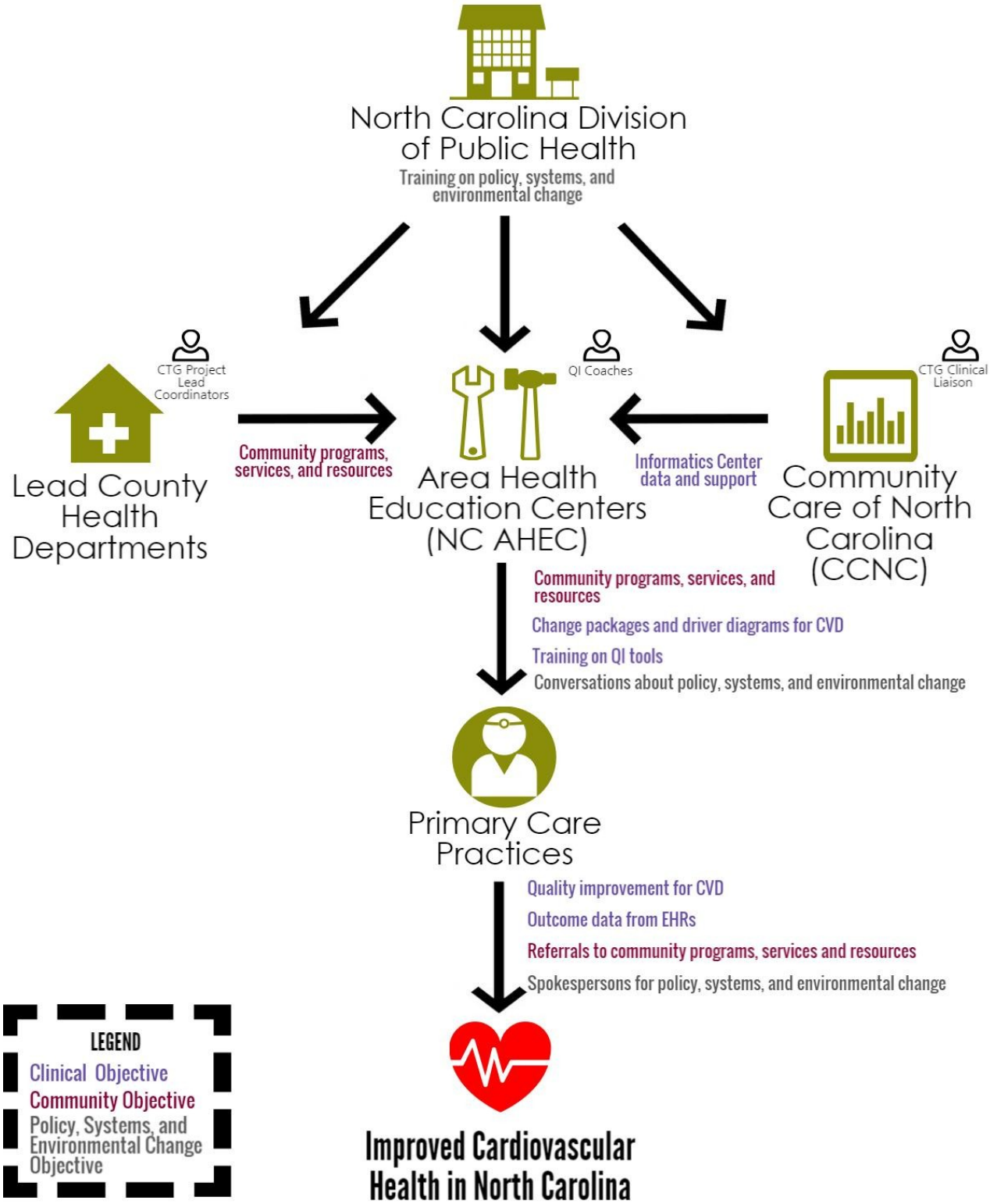
NC AHEC was enlisted for its many years of experience in using QI coaches to work onsite with primary care practices. QI coaches help practices find ways to design and implement targeted improvements at key points in the care cycle.

Community Care of North Carolina (CCNC)

CCNC comprises 14 regional networks where primary care practices, hospitals, health departments, social service agencies, and other community organizations work together to provide population management to 1.3 million Medicaid recipients. CCNC networks support 1,800 practices where comprehensive, team-based, and accessible care is coordinated through a patient's primary care physician following the medical home model. More than 600 care managers support CCNC networks by identifying patients with high-risk conditions or needs, helping primary care practices with disease management education and follow-up, helping patients coordinate their care or access needed services, and collecting data on process and outcome measures.

Figure 2

Working with Primary Care Practices: North Carolina's Partnership to Improve Cardiovascular Health



CTG Project Lead Coordinators at each of the 10 lead county health departments identified community programs, services, and resources that could help prevent and manage high blood pressure and cholesterol, as well as tobacco prevention and cessation. They worked with QI coaches to disseminate this information to primary care practices.

A CTG-funded clinical liaison at CCNC shared Informatics Center data and worked to build closer relationships between health department staff, NC AHEC QI coaches, and CCNC networks and practices.

NCDPH convened yearly Action Institutes that brought partners together and created a shared understanding of the value of collaboration between the public health and health care sectors. They provided technical assistance and training to primary care practices interested in tobacco cessation and to local health department staff through face-to-face meetings or routine Webinar and telephone consultations. They also coordinated the execution of the CTG interventions. Figure 2 on page 4 illustrates the role of each partner.

The Clinical Intervention

The clinical aspect of the CTG partnership focused on making health systems changes to improve the quality of care for patients with CVD risk factors. NC AHEC and CCNC asked adult primary care practices to participate in QI coaching to improve clinical outcomes for the three CVD risk factors.

NC AHEC QI coaches used data generated from electronic health records (EHRs) as a starting point to begin or deepen conversations with practices about how to improve care by using QI methods. QI coaches also used a driver diagram with the goal of improved clinical outcomes to help primary care practices decide what to change. The driver diagram included four categories of primary goals (primary drivers):

- Clinical information systems.
- Team-oriented planned care.
- Standardized care processes.
- Self-management support.

North Carolina Area Health Education Centers (NC AHEC)

NC AHEC is a statewide development initiative for the health care workforce that provides educational programs to enhance quality of care, improve health care outcomes, and meet the health care needs of underserved communities. Before the CTG Project, NC AHEC was providing onsite quality improvement coaching in 130 primary care practices working to improve diabetes and asthma care. NC AHEC is the state's federally funded regional extension center for health information technology, and works with more than 1,000 North Carolina primary care practices to help them implement and meaningfully use electronic health records.

Quality Improvement Examples from Primary Care Practices

An example of a quality improvement (QI) method to improve self-management support comes from one primary care practice that implemented a patient goal sheet to record patients' self-management goals and track their success. In a multiple-choice format, the goal sheet assessed the following with patients:

- Interest in losing weight, exercising more, and quitting smoking.
- Willingness to commit to 30-day goals and take prescribed medications.
- Awareness of barriers to making lifestyle changes.
- Knowledge of educational and community resources.
- Awareness of recommended blood pressure and cholesterol clinical indicators.

The sheet helped the practice routinely raise the subjects of healthy eating, exercise, and smoking. The practice's electronic health records tracked whether each patient had completed a goal sheet and prompted those who had not completed the goal sheet to complete it before the next visit. The combined changes enabled the practice to operationalize and track self-management support.

After looking at its data, a practice in eastern North Carolina decided to use QI to improve team-oriented planned care. The practice's staff members realized they were not doing as well as they thought with tobacco cessation, particularly with medical assistants asking all patients if they were smokers. The practice's QI coach arranged for the NC AHEC nursing director to do a lunch-and-learn for the medical assistants to discuss the harmful effects of smoking and their role in starting this conversation with patients.

CTG funding enabled NC AHEC to create "change packages"—sets of intervention options to influence specific drivers—targeting high blood pressure, ischemic vascular disease (a condition related to high cholesterol), and tobacco use. Primary care practices could select from the change packages or design their own interventions. QI coaches encouraged practices to test their own ideas so that they would be empowered and invested in the process. The interventions consisted of adopting QI tools, clinical best practices (e.g., the Model for Improvement, a type of Plan-Do-Check-Act; rapid-cycle improvement), and small, rapid-cycle changes that would result in improved care. For example, one practice added tobacco use as a vital sign in EHRs, signaling staff members to discuss quitting with patients identified as smokers at every visit. Another practice created a registry of patients with high blood pressure who had not visited the practice in 6 months or more. They contacted patients to encourage them to see a physician in regular 3-month intervals, integrated these reminders into their EHRs, and distributed them through a patient portal.

QI coaches worked with practices and their EHR systems to gather monthly data on patient outcomes and then adjust processes to optimize results. They also helped primary care practices see how system-wide changes could affect their whole patient population.

NC AHEC created a bidirectional feedback system so that if a QI coach identified a promising QI tool or practice, it could be quickly disseminated to other parts of the state. NC AHEC accomplished this task, in part, by engaging a knowledge management librarian at the University of North Carolina-Chapel Hill to create a Wikispace for NC AHEC staff to share resources in real time.

The Community Referrals Intervention

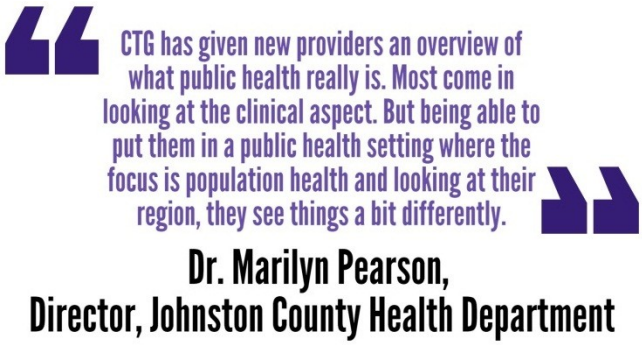
In addition to the QI work, NCDPH and its partners improved referral systems to community services, programs, and resources. CTG project lead coordinators compiled inventories of community health programs, services, and resources that support lifestyle changes for preventing and managing CVD risk factors, and updated these regularly. The CTG clinical liaison organized those resources and facilitated their integration into CCNC's care management information system, which CCNC's care managers use to support Medicaid patients across the state.

QI coaches maintained frequent contact with the CTG Project Lead Coordinators to disseminate these community resources to primary care practices. If primary care practices had ideas for community programs, services, or resources that would help them, QI coaches could share these ideas with the lead health departments and the other partners.

For example, the Region 4 collaborative in central North Carolina added a directory of 31 community services, programs, and resources on its website and worked with NC AHEC to disseminate this information to primary care practices. The collaborative also created mock-up healthy eating "prescription pads" that practices could use to refer patients to community farmers markets and recommend how many servings of fruits and vegetables patients should consume. The collaborative piloted these mock-ups with clinics to test their usability.

Similarly, the Region 7 collaborative created flyers about relevant community events for primary care practices to share with patients. Its farmers market flyer included information on when and where markets are held, as well as options for convenient delivery to residents' workplaces or homes.

The Policy, Systems, and Environmental Change Intervention



In the long term, the CTG partners hoped to go a step beyond improving systems for community referrals. NCDPH started the process of working with CCNC and NC AHEC to engage primary care practices in a conversation about population health and the importance of transforming communities to make healthy

eating, active living, and tobacco-free living easier. Partners spent the first year of the CTG program creating a common understanding around policy, systems, and environmental improvements. They convened annual Action Institutes where partners could contribute ideas and learn to speak the languages of public health and health care. The goal was to encourage health care providers to become spokespersons and active supporters for policy, systems, and environmental improvements in their communities. The CTG program helped lay the foundation for achieving this goal.

> Imagine a typical chronically ill patient who sees his doctor half an hour every 3 months. These four encounters each year—the physician's opportunity to counsel, diagnose, and treat—constitute only 0.02% of this patient's life. For all the rest—the 99.98% of the time that the patient is elsewhere, making decisions about his health in the context of his culture, family, and community—the doctor's impact on the patient's choices is minimal...
>
> **That 99.98% belongs to community medicine, to population health, and to public health.** [11]

Key Outcomes

Because primary care practices were empowered to implement targeted changes, interventions varied from practice to practice, so data collection was focused on practice-level outcomes. NCDPH and its partners set a goal to engage at least 90 primary care practices in using QI to address high blood pressure, high cholesterol, and tobacco use. Before 2011, some of these primary care practices used QI to improve care for patients with asthma and diabetes; however, none of them had done so to address CVD. As a result of NCDPH's and its partners' efforts, by spring 2014, 99 primary care practices (representing approximately 325 physicians) were using QI methods to improve care for patients at risk for CVD.

Aggregated data showing population impact were collected only on the clinical intervention for high blood pressure and tobacco use. The CTG program lasted only 3 years, so evidence of population impact is limited but does show promise in the short term. The following results, as seen in Figures 3 and 4 on page 9, are from primary care practices reporting data to NC AHEC at least six times over a 6-month period during the CTG Project.

High Blood Pressure

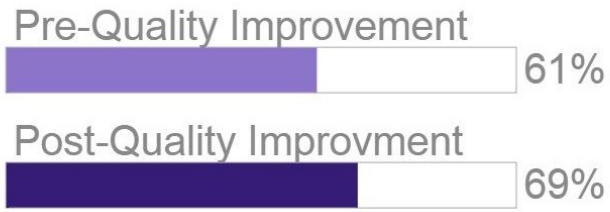
Patients are considered to have their blood pressure controlled when their blood pressure is less than 140 over 90, per the American Heart Association's recommendation. Nineteen of the 99 primary care practices working with NC AHEC to implement QI reported hypertensive patients' blood pressure measures:

- Among 14,502 hypertensive patients seen by these 19 primary care practices, the mean improvement in blood pressure control was 8 percentage points over an average of 12 months. 69% of patients originally diagnosed with hypertension reduced their blood pressure to less than 140 over 90 after QI methods were put into place.
- Of the 19 primary care practices reporting, 14 practices had a greater than 1% increase in patients with blood pressure under control, including 10 practices with a greater than 5% increase.

Figure 3

Blood Pressure Controlled

19 primary care practices in North Carolina reported their patients' blood pressure measures before and after implementing quality improvement (QI) with North Carolina Area Health Education Centers (AHEC), a North Carolina Community Transformation Grant (CTG) partner. Before the QI methods were put into place, 61% of patients diagnosed with hypertension had their blood pressure "controlled" (less than 140 over 90). After the QI methods were put into place, 69% of these patients had their blood pressure controlled.



Tobacco Use

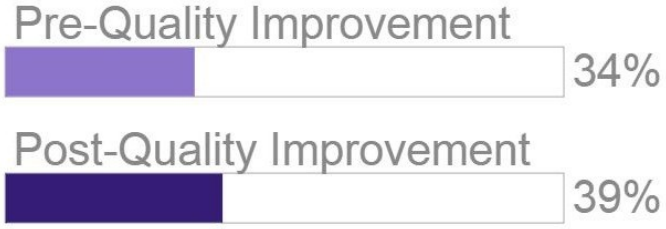
Twenty-seven of the 99 primary care practices reported changes in the proportion of tobacco users that received cessation counseling during the intervention period:

- Among 1,562 tobacco users seen by these primary care practices, the proportion counseled over an average of 10 months increased from 34% to 39%. Of the 27 primary care practices reporting, 20 practices showed some increase in the rate of cessation counseling, and 14 practices improved at least 5 percentage points.

Figure 4

Tobacco Users Counseled in Cessation

27 primary care practices working with North Carolina Area Health Education Centers (NC AHEC), one of the North Carolina Community Transformation Grant partners, reported on the number of tobacco users that were counseled in cessation. Before practices put quality improvement (QI) methods into place, 34% of tobacco users were counseled. After QI was put into place, 39% of tobacco users were counseled.



While modest, these early results represent the beginning of clinical systems changes positively affecting patients at risk for CVD. Although no data were collected on the other interventions, early qualitative findings include a growing understanding among primary care practices of how state and regional partnerships can improve environments and access to care for patients.

Promising Practices

North Carolina's experience offers several lessons:

- Leverage existing partnerships. Trusted partnerships were the most important success factor for North Carolina. NC AHEC and CCNC brought existing infrastructure, data systems, and relationships with primary care practices to the partnership. Regional infrastructures that would have taken decades for NCDPH to develop on its own had been built with the support of past grants and past state funding and were in place at the start of the grant. Another important element was collaboration: staff at multiple levels of each organization were committed to the CTG partnership. Senior-level staff had the necessary decision-making authority, while mid-level staff developed the tools and institutional memory to ensure that work could continue when staff turnover occurred. Many senior leaders had worked together on previous projects, so integrated efforts were part of the culture of participating organizations. This culture made program governance, organization, and distribution of tasks relatively easy.
- Secure a substantial initial investment. CDC awarded NCDPH about $7.5 million annually for its CTG program. This funding allowed NCDPH to allocate enough money to its work with providers to bring effective partners to the table and initiate a statewide discussion about how the health care and public health sectors could work together on policy, systems, and environmental improvements.
- Develop and reinforce a common language and shared understanding. In the first Action Institute, NCDPH introduced concepts and approaches related to policy, systems, and environmental changes to develop a shared understanding about population health among key partner organizations. In addition, the Action Institute allowed staff from all of the partners to meet, interact, and learn to use this common language to discuss their initiatives. During the 3 years of the CTG program, NCDPH continued to work with partners to reinforce this shared understanding and build a system to support statewide efforts to improve community health.
- Use a strategic approach to select primary care practices. North Carolina selected primary care practices with a high burden of disease, as well as the capacity and willingness to implement QI methods. Often, just trying to keep the doors open is a challenge for practices. Corporate offices and concerns about the financial bottom line also might dictate the amount of flexibility practices have to devote resources to QI. North Carolina also identified several other factors that determined how much attention practices could give to QI activities, including:
    - Leadership buy-in.
    - Presence of a physician champion.
    - Organization-wide commitment to working on QI.

- EHRs that can generate data on the target diseases.
- Competing incentive programs or payer initiatives.

- Practices that had the capacity to tie their staff work plans to active participation in QI, had a commitment to examining data monthly, and implemented standardized methods of sharing data internally had more sustained success.

- Empower primary care practices to take ownership of the change process. NC AHEC QI coaches helped primary care practices implement any EHR-data-based activity to address CVD risk factors. QI coaches provided practices with QI tools and support to empower them to make changes and grasp the value of QI. In addition, the partners found that framing QI work as something that could help further the good work practices were already doing, rather than as something new, was invaluable in getting practices to take ownership of the process. Ownership of the process also increased the likelihood that practices would implement QI on their own once coaching ended.

- Use EHRs to capture and analyze timely data. In the absence of current, reliable information about opportunities for improvement, primary care practices could not know where gaps in care existed, nor were they able to make the case for change within their teams. While primary care practices certainly could have conducted QI without automated systems, doing so would have required greater time and effort. Also, for EHRs to be effective in collecting data and complementing care, they must be integrated into the normal workflow of the entire practice team.

- Maintain continuity in the QI coaching staff. Primary care practices whose coaches were stable over time (versus those who experienced turnover) implemented QI more effectively. This work was based on the coach forming a relationship with the primary care practice; if the QI coach changed, it took time to re-engage the practice.

- Manage expectations regarding when change will have an effect. NCDPH and its partners allowed 3 to 6 months from the initial engagement with the primary care practice before expecting to see changes. During this start-up period, process measures helped primary care practices engage and hone their interventions. However, discernible changes in patient behavior and outcomes took far longer.

Conclusion

NCDPH's success in working with partners to reach primary care practices is improving patient care. Although the CTG program ended in the fall of 2014, primary care practices continued to implement QI methods with the training they received from their QI coaches. NC AHEC continued to provide QI coaching using other funding sources, and CCNC continued its work with Medicaid. Primary care practices also have a growing understanding of the importance of community referral systems. In the final months of the CTG program, the CTG clinical liaison worked to build relationships between the CTG partners and other statewide programs like QuitlineNC and Eat Smart. Move More. Weigh Less. Above all, the CTG partnership contributed to a culture of more sustainable efforts to prevent and manage chronic disease.

This example from North Carolina can guide other agencies and organizations interested in forming collaborations between the public health and health care delivery systems to improve patient care. With adequate funding, strong partnerships that avoid silos, solid data, and expertise, working with primary care practices can yield positive results in population health.

Resources

Website addresses of nonfederal organizations are provided solely as a service to readers. Provision of an address does not constitute an endorsement of this organization by CDC or the federal government, and none should be inferred. CDC is not responsible for content contained on the web pages of other organizations.

- North Carolina Division of Public Health (NCDPH)
- North Carolina Area Health Education Centers (NC AHEC)
- Community Care of North Carolina (CCNC)
- Public Health Foundation (PHF) Quality Improvement Tools & Resources
- CDC Office for State, Tribal, Local and Territorial Support Performance Management and Quality Improvement Resources
- Agency for Healthcare Research and Quality Clinical-Community Linkages
- ChangeLab Solutions PSE 101: A Webinar on Building Healthier Communities through Policy, Systems and Environmental (PSE) Change

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