

Design of a Multilevel Tobacco Cessation Intervention in Public Housing Neighborhoods

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ABSTRACT CATEGORY: Research design

PURPOSE: African American (AA) women in public housing neighborhoods have high smoking rates, difficulties with cessation, and minimal access to culturally sensitive interventions. To address this need, academic researchers, neighborhood residents, and housing officials partnered to develop a community-preferred intervention. The purpose of this presentation is to describe the multilevel approach and study design of this NIH-funded protocol.

METHODS: The partnership utilized town hall forums, focus groups, and household surveys to identify the community's preferred strategies and overall design for the study. Community preferences informed the following multilevel approach: (1) 1:1 coaching/support from indigenous AA female former smokers, (2) professional-led group meetings to provide behavioral counseling/peer support, (3) involvement of neighborhood leaders to implement social and environmental change.

RESULTS: A cluster-randomized design is being used. Specifically, we pair match 14 public housing neighborhoods from two metropolitan areas and randomly assign one neighborhood in each pair (7 per condition) to a bundled, multilevel intervention or a control condition. Women who smoke (29 from each neighborhood) receive: (1) 24-week, bundled multilevel treatment intervention that includes: (a) individual level strategies with 1:1 community health worker (i.e., coach) contact to enhance smoking cessation self-efficacy; (b) interpersonal-level strategies with behavioral counseling in small peer groups to enhance social support; (c) neighborhood-level strategies with policy and counter-marketing campaigns led by a neighborhood advisory board; and, (d) 8-week supply of nicotine patches and study-specific written cessation materials; OR, (2) control condition consisting of written cessation materials at 4 time points. The control participants are offered a delayed intervention. Primary outcome measures are biochemically validated smoking cessation (point prevalence quit rates and 6- and 12-month prolonged abstinence).

CONCLUSIONS: The study partners recommended a multilevel approach to combat tobacco use in their neighborhoods. This ongoing trial will test the effectiveness of this strategy on cessation outcomes.

An Investigation of the Association Between Glioma and Socioeconomic Status: Effects of Controlling for Group-Level Spatial Autocorrelation

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ABSTRACT CATEGORY: Analytic approaches

The etiology of glioma is largely unknown, with ionizing radiation and family history being the only recognized risk factors. Glioma rates vary by demographic factors (race, sex) and geo-political boundaries, and this variation suggests higher glioma rates in groups with higher socioeconomic status (SES). The primary goal of this analysis is to investigate the glioma-SES relationship within a hierarchical framework using Surveillance Epidemiology and End Results (SEER) data. Cases were defined as individuals age 25 years diagnosed with glioma between 2000 and 2006 and residing within the SEER 17 catchment area. County-, sex-, race-, age-specific sub-groupings were created in order to investigate individual-level associations. Principal component analysis was used to create two distinct county-level socioeconomic variables. A Bayesian spatial conditionally autoregressive (CAR) hierarchical Poisson model was used to simultaneously estimate individual- and county-level effects while controlling for possible county spatial dependence. Those residing in counties of the 4th, 3rd, and 2nd quartiles of SES have glioma incidence rates that are 1.10 (95% CI: 1.02 - 1.18), 1.12 (95% CI: 1.02 - 1.19), 1.15 (95% CI: 1.07 - 1.23) times that of the 1st quartile, respectively. The assumption of error spatial independence was questionable for both random intercept-only and random-intercept SES covariates models (Moran's I and p : 0.0676 and 0.0010.0366 and 0.06, respectively). A random-intercept SES CAR model properly controlled for the spatial dependence (Moran $I=0.0258$, $p = 0.166$) yielding less biased estimates. Absence of data on individual SES precludes any conclusions that may attribute the increased glioma rates to individual SES as opposed to possible contextual effects due to county SES. Subsequent studies should strive to collect analogous SES data at each level to fully address the glioma-SES relationship. Proper consideration of model assumptions is critical for yielding unbiased estimates.

Involvement of Caregivers in the Assistance with Management of Patients' Symptoms: Symptom-, Patient-, and Caregiver-Level Analyses

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ABSTRACT CATEGORY: Analytic approaches

PURPOSE: To determine whether, in patients with solid tumors, a nurse-delivered symptom management intervention was more effective than a coach-led intervention in increasing caregiver involvement in symptom management and improving caregivers' emotional health.

METHODS: Both caregivers and patients were recruited for the study. Inclusion criteria for patients were 21 years of age and undergoing chemotherapy for solid tumors. Dyads were randomized to a nurse-delivered symptom management intervention ($N=88$) versus coach-led group ($N=81$). In the nurse arm, strategies for assistance with symptoms were delivered to patients and their caregivers. Symptom-level data were used to assess caregiver involvement. Caregiver assistances with each symptom were treated as multiple events nested within a dyad and analyzed using Generalized Estimating Equations (GEE) models. Data were collected via telephone interviews at baseline, 10, and 16 weeks. Caregiver symptom involvement, depressive symptoms, caregiver-care recipient communication, and symptom experience for patients were analyzed using linear mixed effects models to determine the effect of caregiver involvement with patient symptom management on caregiver outcomes.

FINDINGS: Caregivers with lower depressive symptoms were more likely ($OR=2.0$; 95% CI = 2.00 - 1.45) to provide assistance at 10 weeks if they received the nurse-delivered intervention. Compared with non-spouses, spousal caregivers who provided assistance at baseline were less likely to provide assistance at 10 weeks ($OR=0.58$; 95% CI: 0.36 - 0.94). Greater involvement with symptoms was significantly associated with worse caregiver emotional health.

CONCLUSIONS: Findings suggest nurse-delivered problemsolving intervention increases family caregivers' level of assistance in symptom management for caregivers with lower levels of depressive symptoms. Data also suggest interventions focused solely on patient symptom management may not be effective in improving caregivers' emotional health.

Feasibility of a Multilevel Supermarket Intervention to Increase Purchases of Healthy Foods

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ABSTRACT CATEGORY: Multilevel interventions in an era of healthcare reform and personalized medicine

INTRODUCTION: Interventions to change health behaviors may be most effective when environments support the behavior change. Individual programs can be expensive and labor-intensive. Therefore interventions to improve the food environment should combine individual (one-to-one delivery), interpersonal (social support enhancement), and community factors (physical environment). Multilevel supermarket interventions aimed at promoting healthier food purchasing represent a promising approach to improve population nutrition.

PURPOSE: The purpose is to describe the methodology and perceived usefulness of a multilevel supermarket pilot study that used a randomized design to determine the feasibility of a novel point-of-purchase (POP) food shopping intervention, including a packaged EatSmart® program developed by the supermarket registered dietitian.

METHODS: The individual component of the intervention included a brief one-on-one educational session introducing shoppers to the EatSmart® POP program and giving tips for healthy shopping. The interpersonal component was expressed through increasing shopper awareness of supermarket dietitian services. The environmental component, EatSmart®, included nutrition shelf tags placed below food items, healthy shopping lists, newsletters, and store displays. Participant demographic data and intervention usefulness were collected through exit surveys.

FINDINGS: 69% of the participants randomized to the intervention ($n=70$) reported the program very or extremely useful; 26% reported it somewhat useful. 65% reported they would be more likely to shop in a supermarket that offered a healthy shopping program. Purchases of fruits and vegetables were higher among those randomized to the intervention group (findings described elsewhere).

CONCLUSIONS: Findings of this study suggest that a multilevel supermarket intervention to increase healthy food purchases is feasible and highlights the important role of the registered dietitian in the supermarket environment. Multilevel supermarket-based interventions encourage healthy shopping through individual education, environmental modifications to make choosing the healthy choice easy, and improvements in social support by promoting the role of the store-registered dietitian and staff.

System Dynamics Modeling as a Tool for Multilevel Program Planning and Evaluation

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ABSTRACT CATEGORY: Analytic approaches

System Dynamics Modeling (SDM) and other contemporary systems methodologies (e.g., social networking and complex adaptive systems analysis) constitute novel approaches to studying and resolving important public health problems). We posit that quantitative simulation models — informed by social and behavioral theory, published scientific findings, and community-based participatory research — can be used to guide community decisionmaking and action needed to bring about effective systems change.

PURPOSE: With a focus on community-based breast cancer education and screening, we are applying SDM to better assess and understand the dynamic complexity and contextual reality that surrounds effective program dissemination and implementation. Our system dynamics modeling will explore how and why different strategies to promote adherence to screening guidelines work for particular women, served by particular health systems, living in particular contexts, over time.

METHOD: As preliminary research to inform a planned community-based intervention for The Bronx, New York City, we used established SDM building methods to develop and validate a prototype that examines processes of effective dissemination and implementation of stepped breast cancer education and screening interventions.

SIMULATION OUTPUT: Dynamic behavior-over-time graphs and trend analyses generated with our prototype model are presented. Three problem levels were assessed, namely: (1) Individual — What is the effect or impact of evidence-based interventions on targeted populations, across participating communities; (2) Community — What facilitates adaptation and improvement of various evidence-based practices via community partnerships; and (3) Organizational — What dimensions of readiness and capacity among participating agencies facilitates or dampens the effectiveness of outreach strategies?

CONCLUSION: Simulated output from our prototype model constituted a practical, virtual test of key preliminary assumptions about how to launch our community-based program. Specifically, modeling data proved useful for assessing the feasibility of preliminary planned activities within and across intervention levels (individual, community, organization).

Learning from a Model of Multilevel Interactions and Interventions in an Implementation Study

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ABSTRACT CATEGORY: Multilevel interventions in an era of healthcare reform and personalized medicine

PURPOSE: During a 2-year implementation study, we sought to identify, classify, model, and interpret interactions between our research team (RT) and organizational entities (OE) located at several levels of a seven-level ecological model (Figure 2, Conference Background Document) and to define relevant governmental policy influences. The study aims at implementing and institutionalizing a centralized screening mammography mail/phone reminder/counseling system (MRCS) serving about 34,000 patients of all primary care practices ($n=26$) in an integrated healthcare network (IHN). Our goals in this analysis are to articulate lessons learned from planned and unplanned implementation interventions at multiple levels and to show how these lessons and conceptual modeling may guide our institutionalization interventions.

METHODS: During implementation we collected and summarized our observations on the RT's interactions with OEs and interviewed key stakeholders at several levels. We created a conceptual model of the relevant OEs. We located each entity at one of seven levels and identified key actors, operational factors, and key relationships between an OE and the RT and between an OE and other OEs within and across levels.

RESULTS: We identified eight interventions of the RT with OEs at local community, practice setting, provider, family, and patient levels. We enumerated the related actors (e.g., health plan administrators, practice leaders) and operational factors (e.g., provider incentives, quality targets) and recorded the outcomes of interventions. We also identified four relevant federal and state policy influences (e.g., incentives and mandates to reorganize primary care delivery). Based on our analysis of the implementation model, we propose multilevel interventions to support institutionalization of the MRCS.

CONCLUSIONS: This implementation study, like many implementation studies, involved planned and unplanned interventions with OEs at multiple levels. Conceptual modeling of implementation processes may assist investigators in developing multilevel intervention strategies for implementing and institutionalizing centralized support systems in IHNs.

Systems Framework for Understanding Multilevel Impacts of an Integrative Survivorship Clinic in a Cancer Center

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ABSTRACT CATEGORIES: Multi-disciplinary theory and models; Research design; Multilevel interventions in an era of healthcare reform and personalized medicine

PURPOSE: A cancer center is a complex system of patients and their families, oncology providers, support services of various types, and administrators. This presentation provides a research model to evaluate the multilevel interactions and impacts associated with implementing a family physician-led Integrative Survivorship Consult Clinic within a comprehensive cancer center.

CONTEXT: Patient populations and consultation: Cancer patients of all types at all stages of treatment are eligible to attend the survivorship consulting service, which includes: in-depth pre-visit questionnaire, 90-minute intake with physician, follow-up visit including written survivorship plan, and additional visits as requested. Family members' participation is welcomed during visits. The goal is a patient-centered multilevel cancer survivorship plan. Referral networks to the clinic through oncology teams (oncologists, nurses, NPs), supportive services (social work, psychiatry), and self-referral.

MEASURES: Patients: quality of life (Functional assessment (FACT) and depression scales, qualitative interviews), utilization of services, cancer progression (EHR).

FAMILIES: patients' and family members' own well-being (interviews, survey).

CANCER CENTER SYSTEM: oncology providers and staff attitudes toward survivorship clinic (survey, interviews) relationships of referral sources to receivers' survivorship information flow among units via staff, patients, families (EHR, interviews), external key events affecting system interactions (researcher observation).

ANALYSIS: Utilize systems modeling to identify emergent behaviors, non-linear responses to inputs, and component functioning.

CONCLUSIONS: An integrative survivorship clinic within a cancer center offers consideration and care of patients as whole persons within the context of their families and the cancer experience and bridges conventional oncological care to the broader services available to patients and families. This bridging is welcomed by patients but is challenging to some professional staff. Evaluation of the setting from a complex systems perspective that recognizes flows of patients, relationships, and information provides insights into overall function and suggests directions and methodologies for future research to enhance patient outcomes and provide system feedback.

Effects of Family Economic Status and School Neighboring Environments on Alcohol Purchase Among School-Attending Children: A Longitudinal Study

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ABSTRACT CATEGORIES: Multi-disciplinary theory and models

Analytic approaches: Important roles of neighborhood contexts related to alcohol availability have been identified; however, little has been known about the extent to which multilevel contextual characteristics influence alcohol availability in underage populations. This study sought to probe the relationship of family and the school neighboring environment with alcohol purchase among elementary school-attending children.

Over 800 4th graders were ascertained from 16 elementary schools in northern Taiwan in 2006 (T0, mean age = 10 years), followed up annually for two waves (T2-T3) during 2006–2008. Information pertaining to family and individual background was collected via paper-and-pencil self-administered questionnaires, and school environment was assessed via archived administrative data and a geographic information system. A generalized estimating equation was used for repeated measurements of alcohol purchase and time-varying characteristics. The association of school-level characteristics at T0 with alcohol purchase at T3 was evaluated via multilevel analyses.

Incidence of alcohol purchase is 2.03% at T2 and 3.15% at T3. Over one-third of children continue to obtain alcohol in the subsequent wave. Alcohol users are more likely to purchase alcohol (Adjusted odds ratio [aOR]=3.10; 95% confidence interval [95% CI] = 1.82 - 5.26); in addition, children who drank at T2 are two times more likely to buy alcohol at T3 (95% CI = 1.54 - 3.78). Family characteristics are associated with two- to three-fold risks for alcohol purchase in the past year (aOR=1.73-2.25) at grades 5 and 6 in cross-sectional analyses, yet the association seems less salient between family factors at T0/T2 and alcohol purchase at T3. School neighboring environment has little effect on children's alcohol purchase after taking into account family characteristics.

Family characteristics have crucial effects on alcohol purchase in late childhood. This study may provide policy implications in reducing children's alcohol involvements and alcohol availability and accessibility.

Development and Utilization of Colorectal Cancer Care Quality Measures in an Integrated Delivery System

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ABSTRACT CATEGORY: Measurement, including operational definitions, validity, and reliability

PURPOSE: Beginning in 2005, the Veterans Affairs (VA) healthcare system developed the colorectal cancer (CRC) care collaborative (C4) partnership between operations and research to improve the quality of CRC diagnosis and treatment. Central to this effort was the development of quality-of-care indicators that were used in a quality improvement (QI) collaborative, VA-wide evaluation of CRC care, and ongoing quality monitor.

METHODS: As part of a 28-facility QI collaborative, C4 partners developed a Cancer Care Quality Measurement System (CCQMS) to measure quality across the care continuum. Two types of indicators were created (1) percentage of patients receiving guideline-concordant care based on National Comprehensive Cancer Network guidelines and (2) timeliness of care. The CCQMS computer software allows for abstraction of data from the VA electronic health record and production of real-time quality reports. CCQMS measures were analyzed for the collaborative facilities and then adapted for a special study by the External Peer Review Program (EPRP), VA's official quality-monitoring system. Results were distributed VA-wide to help administrators consider potential areas of improvement. Subsequently, the VA has conducted two additional collaborative improvement projects focused on multiple cancers prevalent among veterans. A toolkit to help medical centers improve quality and timeliness of care will be published in early 2011. Additionally, the VA and NCI partnered to pilot a survey of patient-reported feedback on quality of CRC care.

FINDINGS: The CCQMS was used by 27 facilities over a 1-year period to enter data on 1,375 incident CRC patients. For both this effort and the EPRP special study, the greatest opportunity for improvement was found in the area of survivorship follow-up.

CONCLUSIONS: Multilevel interventions require clear, accepted measures of the goal to provide timely, evidence-based care. The experience of the VA with CRC quality measurement demonstrates the process of piloting and then broadly using measures.

Multilevel Barriers and Facilitators at the Patient, Provider, and Organizational Levels Upon Guideline-Concordant Surveillance Colonoscopy Among Veterans

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ABSTRACT CATEGORIES: Multi-disciplinary theory and models; Measurement, including operational definitions, validity, and reliability; Analytic approaches

PURPOSE: To study multilevel influences upon cancer survivorship care, we adapted a conceptual framework by Zapka that emphasizes concentric, multilevel relationships. Our specific goal was to determine whether physician specialty or organizational factors are associated with the quality of surveillance colonoscopy among colorectal cancer (CRC) survivors.

METHODS: We measured receipt of surveillance colonoscopy among a national cohort of 7,135 veterans diagnosed with CRC between 1998 and 2006, using VA administrative data. The VA Program Evaluation of Oncology Programs survey was administered to 138 VA medical centers in 2005. Survey content included the organizational domains of resources and complexity. Resource measurements included the types of physician and non-physician providers participating in cancer care and whether imaging, procedures, and chemotherapy were administered onsite or elsewhere. Complexity measurements included cancer volume, comprehensive cancer status, and number of tumor boards. The effects of patient, provider, and organizational factors upon guideline-concordant colorectal cancer surveillance care were modeled using generalized estimating equations to account for the clustering of patients within organizations.

FINDINGS: Overall 50% of eligible patients received surveillance colonoscopy. CRC patients with higher Charlson-Deyo comorbidity were less likely to underuse colonoscopy. Patients who had a greater proportion of follow-up visits with specialty physicians (oncologists, surgeons, or gastroenterologists) were less likely to underuse colonoscopy. VA medical centers with PET scans and general surgeons practicing on-site were both more likely to underuse surveillance colonoscopy.

CONCLUSIONS: Sicker patients received higher quality care, likely due to frequent contact with the healthcare system. Simple provider-level interventions may facilitate cancer-specific surveillance among primary care providers. Our findings that more organizational oncology resources were associated with more underuse were counterintuitive, but suggest a lack of organizational resources may not be a dominant barrier to survivorship care. These findings inform potential barriers and facilitators to target in future multilevel interventions.

Building the Foundation for Future Multilevel Interventions on Social Networks Sites: An Examination of Uses and an Interdisciplinary Model of Dissemination

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ABSTRACT CATEGORY: Multi-disciplinary theory and models

PURPOSE: Social networks have documented effects on individuals' health and well being and are essential for communication at all levels of the healthcare system. New communication technologies and particularly Social Network Sites (SNS) created unprecedented opportunities for multilevel interventions as they allow for communication and for dissemination of messages to different audiences. Examinations of the ways in which messages are diffused at different levels through SNS require interdisciplinary approaches to research and advanced computational strategies. The goals of this article are to describe an interdisciplinary, translational model of analysis of the use of SNS in cancer control communication from communication and computational biology perspectives and to describe multilevel dissemination of messages and networks' structures of advocacy-related organizations with other organizations, patients, providers, healthcare organizations, and the federal government.

METHODS: In this research, we delineate social network theory and its relationship to multilevel cancer interventions, analyze links that three cancer advocacy organizations have at different levels, and propose the implications of these findings to dissemination of cancer control messages.

FINDINGS: The organizations analyzed used communication with peer organizations and organizations that could advance their cause. They also were linked to individuals, and some were connected to federal organizations. However, providers and healthcare organizations were largely missing from these SNS. In addition, organizations' presence online was generally related to the size and density of their networks online.

CONCLUSIONS: SNS can provide innovative ways to promote cancer control multilevel interventions. However, providers and healthcare organizations need to join these new communication media to be included in this new public sphere.

Satisfaction with a Breast Cancer Patient Navigation Program: Perspectives of Patients, Navigators, and Clinical Staff

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ABSTRACT CATEGORY: Multilevel interventions in an era of healthcare reform and personalized medicine.

INTRODUCTION: Patient navigation is an emerging approach to reducing cancer disparities. The purpose of this study was to evaluate perceptions of a breast cancer patient navigation program among patients, patient navigators (PNs), and breast cancer clinic staff members.

METHODS: Post-program interviews were conducted with 218 navigated patients. Individual semi-structured interviews were conducted with 5 PNs. Surveys were administered to 19 clinic staff.

RESULTS: Fifty-three percent of the patients were African American ($n=108$); 14.7% were Hispanic ($n=30$); 33.7% were married ($n=69$); 65.0% had a high school degree ($n=132$); and 75.0% had an annual income $< \$20,000$ ($n=153$). The mean age was 44 years. Eighty-six percent of the patients rated their overall satisfaction with the navigation services as excellent ($n=194$); 98.2% stated they received the types of services that they needed ($n=214$); and all reported that they would recommend the program to others.

PERCEPTIONS AMONG NAVIGATORS: Overall the navigators expressed high levels of satisfaction with improving patient access to care; however, the navigators voiced some institutional and programmatic barriers.

PERCEPTIONS AMONG CLINIC STAFF MEMBERS: All respondents agreed/strongly agreed that navigators were knowledgeable, available when needed, and related well with navigated patients, breast clinicians, and staff. Respondents agreed/strongly agreed that compared to patients who did not have a navigator, navigated patients were more prepared with requested documents needed for the clinic appointment (73.7%), missed fewer clinic appointments (76.5%), were more informed about their breast cancer treatment (89.5%), and received more timely breast cancer treatment (68.4%).

CONCLUSIONS: We adopted a ‘triangulation’ strategy to integrate perceptions of a patient navigation program through the eyes of patients, navigators, and breast cancer clinic staff members. The results show that the patient navigation program was favorably reviewed by these constituencies.

Community Members' Perceptions and Reports: Implications for the Development of a Multilevel Intervention to Enhance Minority Recruitment in Clinical Trials

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ABSTRACT CATEGORY: Multilevel interventions in an era of healthcare reform and personalized medicine

INTRODUCTION: We conducted focus groups with African Americans (AAs) and Hispanics/ Latinos (HLs). We elicited their suggestions for strategies to improve participation in clinical trials using a model adapted from the Institute of Medicine Report Unequal Treatment.

METHODS: We conducted six focus groups with 32 AAs and 25 HLs in South Carolina. The questioning protocol included domains addressing solutions to access to clinical trials, trust in medical researchers, organizational barriers to trials participation, and preference for a trial navigator. We used the NVIVO software program to identify themes within and across racial/ ethnic groups.

RESULTS: Characteristics of healthcare systems: As a solution to: (a) responsibility of healthcare systems for adverse effects, participants wanted guarantees that free healthcare would be provided if adverse effects occurred; (b) lack of diversity in research teams, AAs suggested coaching clinicians in better communication; (c) language barriers, HLs suggested having Spanish-speaking clinicians and patient advocates.

CHARACTERISTICS OF RESEARCHERS: As a solution to: (a) poor communication, participants noted that trust played a major role in enhancing communication; (b) concerns about immigration status, HLs recommended that researchers explain that immigration status would not be documented.

PATIENT PREFERENCES/ATTITUDES: As a solution to: (a) concern over past abuses of the healthcare system, AAs suggested that medical universities acknowledge past discriminatory conduct; (b) lack of understandable study materials, HLs suggested that materials be in Spanish and written in appropriate grade reading level.

IMPLICATIONS FOR MULTILEVEL STRATEGIES: To reduce system-level barriers, organizations could include a diverse staff to improve communication and build trust and train staff to educate patients about trials. Provider-level concerns could be resolved through protocols to address patient-centered counseling to improve trust. Patient-level issues could be managed through formulating/disseminating understandable study materials; messages could include information about compensation, charges for treatment, and confidentiality of immigration status.

Using Social Network To Improve Heart Failure Care

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ABSTRACT CATEGORIES: Multilevel interventions in an era of healthcare reform and personalized medicine

PURPOSE: The goals of the Chronic Heart Failure (CHF) Quality Enhancement Research Initiative (QUERI) within the Department of Veterans Affairs (VA) are to identify areas of need for improved quality of care for heart failure (HF) patients and implement evidence-based practices. According to Rogers Diffusion of Innovation Theory (2003), social networks significantly affect performance and innovation. Also, the Promoting Action on Research Implementation in Health Services framework emphasizes the function of dynamic relationships among evidence, context, and facilitation. In July 2006 the CHF QUERI established a social network of front-line healthcare providers from VA medical centers (facilities) to improve the quality of care of HF patients called the Heart Failure (HF) Network.

METHOD: Over 695 providers from 150 facilities are members of the HF Network. They include chiefs of medicine (5%), chiefs of cardiology (11%), physicians (35%), nurses/NPs (30%), pharmacists (2%), facility leadership (4%), regional leadership (5%) and others (8%). The HF Network operates via bi-monthly web-based meetings/conference calls, an annual in-person meeting, e-mails and web-based surveys.

FINDINGS: Over time, 1-18 members participate from each facility. Main achievements to date are: 20 web-based meetings and or conference calls and 5 annual in-person meetings with 25 to 92 members attending each meetings, 33 members have presented HF programs at their facilities, focusing on barriers and facilitators; 62 proposals have been submitted, out of which 32 proposals have been funded, establishing new affiliations/collaborations; 4 quality improvement (QI) projects have been conducted; and local opinion leaders have been identified for implementation of local QI projects. Formative evaluation has shown that members see the Network providing a unique opportunity for bi-directional flow of ideas for innovation and implementation.

CONCLUSIONS: Involvement and active participation of the HF Network members is crucial to improve care of heart failure patients.

The Capability Approach as a Guide to Multilevel Interventions for Health Behaviors

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ABSTRACT CATEGORIES: Multi-disciplinary theory and models; Measurement, including operational definitions, validity, and reliability; Conceptual framework and taxonomy

PURPOSE: Promoting healthy behavior is essential to reducing the burden of cancer, but progress has been elusive, due at least in part to the constraints on healthy living imposed by social determinants of health. A potentially useful way to conceptualize and address social determinants in a multilevel context is Amartya Sen's Capability Approach, a framework for evaluating people's real freedoms and opportunities to pursue what they value, in the context of personal and environmental resources.

METHODS: The poster will present the Capability Approach, using supporting data from an AHRQ-funded community-based participatory research project. In partnership with a grass-roots organization from a disadvantaged Latino community in San Antonio, TX, we conducted 14 bilingual focus groups on health behaviors with residents suffering from obesity or diabetes mellitus. Focus group transcripts were coded and themes identified through qualitative analysis using the framework approach.

FINDINGS: Respondents identified key determinants of their ability to achieve desired changes in diet and physical activity, including opportunity to pursue healthy behaviors through available community resources, the relative convenience of doing so, prices of relevant goods and services, and social norms for behavior. Beyond features of the retail and physical environment, other factors that mediate individuals' ability to turn available goods and services into real opportunities for health include family support, mental disorders, and the perception of disrespect or shame.

CONCLUSIONS: Focusing on connections between the social environment and individual agency, the Capability Approach holds promise for guiding multilevel interventions in community or clinical populations. Next steps in this line of investigation include creating and evaluating a brief capability measure for health behaviors (now in progress) and then developing interventions that bridge clinic and community to enhance opportunities for healthy living. Advantages and disadvantages of this conceptual framework and its operational definitions will be considered.

A Mammography Outreach Effort Affecting Women at Risk, Providers and a Health Plan

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ABSTRACT CATEGORY: Multilevel interventions in an era of healthcare reform and personalized medicine

PURPOSE: Increase regular screening mammography; alleviate the primary care provider's (PCPs) burden of reminding, recommending, and counseling women; Provide the healthcare plan with a cost-effective comparison of three proven outreach methods.

METHODS: The participants are women ages 51-64. Subjects are randomized to one of three arms: reminder letter, reminder letter followed by reminder call, reminder letter followed by second letter/booklet and counselor's call. Only women coming due/overdue for mammograms receive interventions. Mammograms are booked during calls. Counselors use a CATI protocol incorporating motivational interviewing techniques. Four rounds of intervention are possible. The clinic setting: Capitated group practice of a community healthcare plan. PCPs agree to review women in their panel for eligibility, permit their electronic signature on study letters to subjects, include women <85, back the recommendation of a 2-year screening interval. Radiologists permit us to enter their booking system directly and will open up mammography appointment times to accommodate our scheduling needs. The healthcare plan setting: The plan agrees to suspend its routine reminder letters to all women eligible for the study; institutionalize the most cost-effective intervention. Both the healthcare plan and group practice permit data streams to study personnel.

FINDINGS: Since June 2010, 14,000 women in the plan for 18 months were randomized. Of these, 2,632 are 18 months from a prior mammogram and have completed round one of interventions. Triangulating the CATI system, plan database, and clinic database in order to track study subjects has proved challenging. So far, PCPs have had no complaints about our "interfering" with their patients. All outreach interventions have been well received by the women.

CONCLUSIONS: We anticipate that a firm recommendation based on cost-effectiveness data will be forthcoming. The opportunity to assess the effectiveness of repeated interventions will add much to our understanding of booster interventions.

Development and Testing of a Multilevel Theoretical Model and Intervention to Change Adolescent Indoor Tanning Use

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ABSTRACT CATEGORIES: Multilevel interventions in an era of healthcare reform and personalized medicine; Conceptual framework and taxonomy

PURPOSE: Indoor tanning typically begins in adolescence, increases melanoma risk, and is potentially influenced by factors at multiple levels. We developed a multilevel intervention to test the effect of intrapersonal, interpersonal, and environmental influences on adolescent intentions to tan indoors.

METHODS: Using a theory-based model and key themes related to indoor tanning obtained from focus groups with adolescents and parents, we developed print materials that informed mothers and daughters about indoor tanning risks (intrapersonal), informed mothers of state regulations on adolescent indoor tanning use (environmental), and prompted mother-daughter communication about indoor tanning (interpersonal). We randomly assigned mothers and daughters in a health plan to receive (43 pairs) or not receive (17 pairs) the intervention. Telephone interviews were conducted 1 month after materials receipt. Using mediation analysis, we assessed the effect of: (1) daughters reading the materials on their indoor tanning intentions through perceptions of indoor tanning benefits or parental disapproval, (2) mothers reading the materials on disapproval of their daughters tanning indoors through knowledge of state regulations, and (3) mothers' disapproval on daughters' indoor tanning intentions.

FINDINGS: Daughters who read the materials reported lower intention to tan indoors ($p = .02$), achieved through reducing their perception of a tan's attractiveness and increasing their perception of parental disapproval ($p = .04$). Although mothers' disapproval of teen indoor tanning also reduced daughters' tanning intentions ($p = .02$), the effect was not achieved by reading the materials, either directly ($p = .53$), or indirectly by learning more about state regulations ($p = .20$).

CONCLUSION: Intervening at the intra- and interpersonal levels had greater effect on adolescent indoor tanning intentions than increasing mothers' awareness of related state regulations. As this was a small, cross-sectional study, more work is needed to understand how to use environmental influences to reduce adolescent indoor tanning.

The Multilevel Determinants of Dental Utilization for Vulnerable Children: A New Conceptual Model

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ABSTRACT CATEGORIES: Multi-disciplinary theory and models; Conceptual framework and taxonomy

PURPOSE: Existing models on dental utilization have failed to improve access to dental care for vulnerable children. With the goal of developing a multilevel conceptual model on dental utilization, two hypotheses were tested: (1) the determinants of dental utilization are present at multiple levels, and (2) the multilevel determinants are heterogeneous for use of different types of dental care.

METHODS: Using Iowa Medicaid data (2003–2008) for children less than age 18 years, nine model covariates were classified into four-levels: (1) Individual (chronic health condition [no/yes], ages, exmedical care use [no/yes]); (2) household (whether the child had a Medicaid-enrolled sibling [no/yes], whether there was a Medicaid-enrolled adult in the household [no/yes], the statistical interaction between these two factors); (3) community (rurality [metropolitan/urban/rural]); (4) system (whether the child lived in a dental Health Professional Shortage Area [no/yes]).

There were five outcome measures, representing use of different types of dental care: preventive, diagnostic, routine restorative, complex restorative, dental treatment under general anesthesia. Covariate-adjusted odds ratios and hazard ratios were compared across the four levels for each type of dental care. Findings were used to construct a preliminary conceptual model.

FINDINGS: Chronic health conditions, age, male sex, and medical care use (individual-level covariates) and not living in a dental Health Professional Shortage Area (system-level covariate) were positively associated with use of all types of dental care. The interaction between the two household-level covariates was significant in all models, except for complex restorative and dental treatment under general anesthesia. Rural children (community-level covariate) were more likely to use all types of dental care, except for preventive care.

CONCLUSIONS: While the determinants of dental utilization for vulnerable children are present at multiple levels, these determinants are not homogeneous for use of different types of dental care. These findings have implications for future intervention and policy development.

Feasibility of Novel Electronic Health Records Tools to Promote Physical Activity in Underserved Populations

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ABSTRACT CATEGORIES: Measurement, including operational definitions, validity, and reliability; Research infrastructure

PURPOSE: Evaluate the feasibility of multiple electronic health records (EHR) tools to promote physical activity in underserved patients at a community health center organization in Rochester, NY.

METHODS: Using an iterative approach based on clinician and staff input, we developed EHR tools to support clinicians' ($n=13$) counseling about physical activity at the point of care. The four tools, integrated into patients' charts, are (1) templates to prompt interviewing and problemsolving about physical activity; (2) a link for goal setting and prescription; (3) a resource page containing evidence-based guidelines, handouts, and billing/coding information; and (4) a referral link to the Healthy Living Program, a low-cost community program partnering with the clinical site. Using the EHR software, we measured utilization of the tools over the initial adoption period (December 2009-May 2010). We conducted interviews with clinicians asking about their experiences with the tools.

FINDINGS: The most frequently used tool was the referral link ($n=72$ referrals generated) due to its ease, speed, and consistency. Less frequently used tools were the interviewing templates ($n=16$ uses), resource page ($n=7$), and prescription/goal-setting page ($n=3$). Clinicians expressed enthusiasm about the variety and content of tools available. Clinicians described multiple challenges to using the tools in clinical care: (1) inconsistent functioning of the tools, (2) limited ability to print materials, (3) unpredictable delays and freezes in the system due to server problems, and (4) uncertainty about how to link the tools to diagnosis(es) for charting, billing, and/or coding purposes.

CONCLUSIONS: The EHR tools resulted in rapid uptake of referrals to a community program to promote physical activity. Clinician enthusiasm about the tools overall is high, yet design and implementation issues are challenging. This project demonstrates the potential power and limitations of EHR tools to promote behavior change.

A Communication Intervention to Promote 5As Physical Activity Counseling: Examining Patient Autonomous Motivation and Perceived Competence

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ABSTRACT CATEGORIES: Measurement, including operational definitions, validity, and reliability;
Analytic approaches

PURPOSE: Evaluate the association between autonomous motivation, perceived competence, and patient report of 5As in physical activity discussions in underserved populations.

METHODS: Two-group RCT (intervention vs wait-list control) currently underway. Family medicine clinicians ($n=13$) are the unit of randomization and receive the intervention; patients ($n=194$) are the unit of analysis. The setting is an urban community health center organization in Rochester, NY. The intervention consists of four 1-hour training sessions for clinicians designed to teach and reinforce the 5As (Ask, Advise, Agree, Assist, Arrange) for physical activity counseling. Patients completed surveys at baseline, post-intervention, and 6 months follow-up evaluating their clinicians' use of the 5As and communication skills. Here, we describe patient reports of clinician autonomy support and perceived competence at baseline and immediately post-intervention.

FINDINGS: Patients were a mean of 44.1 years old and were 73.5% African American, 11.8 % Hispanic, and 14.6% Caucasian. Most (58.2%) had Medicaid insurance. Patients' average BMI was 31.9, and comorbidities included diabetes (19.9%), hypertension (51.1%), depression (30.1%), and osteoarthritis (14.5%) or chronic pain (46.8%). Patients' reports of their clinician's autonomy support were higher in the post-intervention group (mean=20.1) vs baseline (mean=18.3). Patients' perceived competence to change their physical activity based on their communication with their clinician was not significantly different between the two groups. Overall, patients' perceived competence was most strongly associated with Assess and least for Ask.

CONCLUSIONS: Preliminary results show that the intervention is effective in increasing autonomous motivation but not perceived competence immediately post-intervention. Results suggest that patient-perceived competence may be enhanced further by improving clinician Assess skills.

An Organizational Informatics Approach to Studying Colorectal, Breast, and Cervical Cancer Screening Clinical Decision Support and Information Systems

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ABSTRACT CATEGORIES: Multi-disciplinary theory and models; Research design; Conceptual framework and taxonomy

ANALYTIC APPROACHES: A study design has been developed that uses a dual modeling approach to identify factors associated with facility-level cancer screening improvement and how this is mediated by the use of clinical decision support. This dual modeling approach combines principles of (1) Health Informatics, (2) Behavioral Oncology, (3) Health Services Research, and (4) Organizational Change/Theory. The study design builds upon the constructs of a conceptual framework developed by Jane Zapka, namely, (1) organizational and/or practice settings, (2) provider characteristics, and (3) patient population characteristics. These constructs have been operationalized as measures in a 2005 HRSAINCI Health Disparities Cancer Collaborative inventory of 40 community health centers. The first, statistical models, will use sequential, multivariable regression models to test for the organizational determinants that may account for the presence and intensity-of-use of clinical decision support (CDS) and information systems (IS) within community health centers for use in colorectal, breast, and cervical cancer screening. A subsequent test will assess the impact of CDS/IS on provider-reported cancer screening improvement rates. The second, computational models, will use a multi-agent model of network evolution called CONSTRUCT® to identify the agents, tasks, knowledge, groups, and beliefs of cancer screening practices and CDS/IS use to inform both CDS/IS implementation and cancer screening intervention strategies. This virtual experiment will facilitate hypothesis-generation through computer simulation exercises. The outcome of this research will be to identify barriers and facilitators to CDS/IS adoption and use to promote cancer screening. Stakeholders for this work include both national and local community health center IT leadership, as well as clinical managers deploying IT strategies to improve cancer screening among vulnerable patient populations.

Using Multilevel Analyses in the Assessment of, the Socio-Ecological Determinants of Health and Addressing Health Disparities

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ABSTRACT CATEGORY: Multi-disciplinary theory and models

BACKGROUND: Ethnic minorities and persons of lower socioeconomic standing bear an unequal burden of disease. The root causes of health disparities are complex and multidimensional. The development of a comprehensive theoretical approach and standard measurement assessing the broad socio-ecological contexts affecting health outcomes remain in its infancy.

PURPOSE/METHOD: This work explores the applicability of a theoretical framework adopting the model developed by the World Health Organization's Commission on the Social Determinants of Health (CSDH) to provide a comprehensive conceptual foundation for multilevel analyses research.

FINDINGS: The enhanced CSDH Model informs a brief measurement instrument entitled the "Socio-Ecological Stress Measure" that assesses the impact of primary socio-ecological contexts on population health outcomes. The enhanced Model articulates structural and intermediary social determinants. Structural determinants include the sociopolitical and demographic context that generates and reinforces social stratification (e.g., ethnicity, gender, age, discrimination), and socio-economic context (e.g., income, education, occupation, social class). The intermediary determinants (i.e., psychosocial, behavioral, environmental, biological, health system contexts) further shape health or disease outcomes. The intermediary determinants are themselves multidimensional and are categorized into domains. The psychosocial context includes social support, psychological status, family stability, and functional domains. The behavioral context includes smoking, diet, and physical activity. The environmental context assesses exposure to disease-promoting agents. The biological context taps into genetic vulnerabilities, while health systems measure access/quality of care.

DISCUSSION: The "Socio-Ecological Stress Measure" can be used as a screening tool to create a socio-ecological profile representing a person's socio-ecological comorbidities that can inform further assessments into targeted areas of concerns, and more comprehensive, person-centered treatment plan. This work directly addresses some of the challenges and new opportunities presented by DHHS/NIH/CDC/IOM to eliminate health disparities via addressing the role of socio-ecologic components.

Variation in Patients' Experiences of Hospital Care: A Three-Level Analysis

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ABSTRACT CATEGORIES: Research design; Analytic approaches

PURPOSE: To investigate the relative contributions of patient, service, and hospital to variation in patients' experiences of hospital care; to examine the association of patient-, service-, and hospital-level variables with patients' experiences; and to determine whether the strength of the relationship between patients' experiences and self-reported health varies across services or hospitals.

METHODS: This study used the 2007 Hospital Consumer Assessment of Healthcare Providers and Systems survey National CAHPS Benchmarking Database data from 1,092 hospitals across the U.S. The sample consisted of 475,094 adult patients discharged from medical, surgical, or obstetric service from October 2006 to September 2007. A sequence of three-level models was conducted, with patients nested within services within hospitals.

FINDINGS: Services and hospitals together accounted for 4.1-6.6% of the variation in patients' experiences. For the dimensions of communication with doctors, communication about medications, discharge information, and pain management, variation across services was larger than those across hospitals. Patients with better self-rated health, less-educated patients, and those not admitted via the emergency department had better care experiences. Females, younger patients, and those whose primary language was English reported poorer experiences. Compared with non-Hispanic Whites, Hispanics and Blacks had better experiences, while Asians had worse experiences. Across three service lines, obstetric patients had the best experiences, followed by surgical patients. Medical patients had the worst experiences. Among institutional characteristics, hospital bed size, teaching status, and for-profit status were negatively related to patients' experiences. The strength of the relationship between patients' experiences and self-reported health varies by service and hospital.

CONCLUSIONS: This study demonstrates the usefulness of multilevel analysis in studying patients' experiences, for its ability to model variability at each level of the hierarchy separately and to assess cross-level interaction effects, and offers evidence about the potential stratification of publicly reported data by service.

The Impact of a Multilevel Intervention on Tobacco Control in African American Families

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ABSTRACT CATEGORY: Research design

PURPOSE: African American (AA) children suffer some of the nation's highest rates of second-hand smoke (SHS) exposure, and their parents often have a lack of resources and tailored support for successful cessation. Parents/guardians serve as role models for children and often "intergenerational transmission" of health behaviors occurs. The approach for this NCI-funded multilevel study began with developing a community advisory board (CAB) with representation of community, school, and parent leaders partnering with academic researchers. The CAB were indigenous members (i.e., ethnically, linguistically, socio-economically, and experientially) of rural and urban communities and had unique contextual knowledge and experiences.

METHODS: Meetings were held with the CAB to assist the investigative team with fostering trust and culturally sensitive plans for study design, recruitment, retention, and study implementation. An approach that addressed four levels was identified and included the individual child (4th grade), their peers, their family (at minimum one parent/guardian), and their school.

FINDINGS: The randomized control trial (RCT) includes 14 schools, seven rural and seven urban and multilevel interventions of school-based intervention targeting tobacco prevention and avoidance of SHS exposure through skills training, family-based intervention completed at home by the parent and child, tailored cessation strategies of motivational interviewing and nicotine replacement therapy (both over 8 weeks); and tobacco policy and procedures evaluation of the school's consistency with the CDC school guidelines for tobacco control. The control condition receives the same multilevel components; however, the emphasis is on general health education (the ADA food pyramid, physical activity, risk factors for cancer, cardiovascular disease), and parents are provided information on cessation strategies and the state toll-free quit-line. Self-report and biological (salivary cotinine) measures are assessed for tobacco prevention, SHS exposure, and cessation.

CONCLUSIONS: The RCT is ongoing, and study results will evaluate the impact and effectiveness of the multilevel approach on tobacco control in AA families.

Breast Health Behaviors in Immigrant Afghan Women in Northern California

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ABSTRACT CATEGORY: Research design

PURPOSE: The purpose of this CBPR research was to provide a preliminary understanding of how Afghan women in Northern California view their breast health.

RESEARCH GOALS: (1) To identify what the Afghan women believe to be their greatest concerns and barriers to breast healthcare and (2) to identify Afghan women's knowledge and attitudes toward breast healthcare.

METHODS: Demographics and in-depth semi-structured interviews were conducted with 53 non-English-speaking, first-generation immigrant Muslim Afghan women 40 years and older with no history of breast cancer living in Northern California. ATLAS.tL was used for the management and evaluation of qualitative data. Codes and categories were systematically sorted, compared, and contrasted until they were "saturated." Themes and concepts were used to compare within and across transcripts in the data set and across cases. 28.3% had a clinical breast examination (CBE) less than 2 years ago, 30.2% more than two years ago, and 41% reported never having a CBE. Among the 65.9% who reported having had a mammogram, more than 50% reported having had one more than two years ago, and almost 34% reported never having had a mammogram.

DEVELOPED THEMES: a) understanding and meaning of health and concept of prevention; b) gender roles, family structure; c) religious and spiritual beliefs related to health; d) female modesty; e) low level of knowledge about breast cancer and lack of awareness of breast cancer symptoms, risk factors, screening procedures and guidelines; f) access barriers; g) healthcare provider needs; h) preferred sources of breast health information and education. Results showed very low levels of knowledge and awareness about breast cancer and low utilization of screening and early detection examinations for breast cancer among participants. There is a significant need for a community-based breast health education program incorporating the unique social, cultural, and religious dynamics of the Muslim Afghan community.

VA Cancer Quality Improvement Initiatives-Research Infrastructure

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ABSTRACT CATEGORY: Research infrastructure

PURPOSE: To describe the VA research infrastructure developed for cancer quality improvement research and implementation.

METHODS: Using an integrated approach of research and quality improvement, and operations, the VA developed a colorectal cancer quality measurement initiative and tool for the VA healthcare system. The research infrastructure included CanCORS (Cancer Care Outcomes Research and Surveillance), the largest cancer quality measurement study in the VA. Funded jointly by NCI and the VA, this consortium examined the quality of lung and colorectal cancer in VA, HMO, and fee-for-service settings. In the VA, gaps in colorectal cancer care were identified as areas for study. Additional research support from NCI and VA led to the development of an electronic cancer quality measurement system, the Cancer Care Quality Measurement System (CCQMS). The CCQMS, based on National Comprehensive Cancer Network Guidelines, was used to measure colorectal cancer care quality in representative VA sites. Results led to a VA-wide quality improvement effort that provided feedback on quality of colorectal cancer care to all VA hospitals. Facilities had the opportunity to implement change based on the results. Subsequently, an annual performance monitor was instituted throughout VA to measure colorectal cancer care quality. Currently, all facilities are required to measure some aspect of colorectal cancer care delivery, identify targets for improvement, implement changes, and measure the outcomes of those changes. Each facility reports its results to the VA central office on a regular basis. In addition, there have been subsequent quality monitoring initiatives at the provider and patient level.

FINDINGS: A research infrastructure that incorporates quality improvement and operations can be an effective means of initiating change in healthcare systems at the patient, provider, and system levels.

CONCLUSIONS: The results of these multilevel activities have led to ongoing efforts to measure and improve VA cancer care.