Evaluation of the Quality of Care in the Clinical Centers of the National Centers of Excellence on Women's Health

Roger T. Anderson,Ph.D.[1*], Carol S. Weisman,Ph.D.[2], Sarah Hudson Scholle,DrPH[3], Jillian T. Henderson, MPH[2], Robert Oldendick,Ph.D[3] , and Fabian Camacho, MS[1]

[1] Department of Public Health Sciences, Wake Forest University School of Medicine, Winston-Salem, NC 27157

[2] University of Michigan School of Public Health, Ann Arbor, MI 48109

[3] Magee Womens Hospital, University of Pittsburgh, Pittsburgh, PA 15213

[4] Survey Research Lab, University of South Carolina, Columbia SC 29208

corresponding author: **rtanders@wfubmc.edu**, (336) 716-7057

Running Head: Evaluation of the Women's Health CoE Program

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Abstract

This study evaluated the quality of primary care services provided in 15 National Centers of Excellence in Women's Health (CoE) clinical sites in operation in 2001 based upon self-reported clinical preventive services and patient satisfaction as quality of care indicators. A survey sample of 3,111 women served by the CoE program was obtained and compared to quality of care benchmarks from national and local surveys. The benchmark surveys were: a nationally representative sample of 2,075 women from the 1998 Commonwealth Fund Survey of Women's Health; a community sample of women who lived within a geographical catchment area for three CoEs; and a sample of 71,438 women in the 1999 CAHPS national dataset. Adjusting for region, age, education, perceived health status, and managed care enrollment, women in the CoEs were more satisfied with their care and had received significantly more screening tests and counseling services than women in the benchmark samples. The largest effects among primary care services were physical breast exam, mammogram (ages 50+), and counseling for smoking, domestic violence, and sexually transmitted diseases.

Keywords: Women's health, quality of care, primary care, patient satisfaction

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<u>Introduction</u>

One of the core components of the Department of Health and Human Service (DHHS) National Centers of Excellence in Women's Health (CoE) program is the provision of comprehensive, multidisciplinary primary care services in women-friendly settings [1]. These clinical centers are expected to improve the quality of care for women by filling gaps and reducing redundancies in services, as well as by providing care in an environment in which clinicians collaborate, are sensitive to women's biopsychosocial needs and are aware of women's health research findings. This paper presents results of the first study of the quality of care provided in the 15 CoE clinical centers that were in operation in 2001.

<u>Background</u>

Women's health care is often both complex and compartmentalized. Because of the traditional separation of reproductive and non-reproductive health care women often must rely upon multiple providers, who often work in different settings and whose services are not necessarily coordinated [2]. A recent national survey of women ages 18 and over found the percentage of women who saw both a generalist physician (family practitioner or internist) and an obstetrician/gynecologist (ob/gyn) for their regular care ranged from 49% in managed care plans to 29% in traditional fee-for-service plans [3]. Studies also have shown that women seeing both a generalist and an obgyn receive more recommended clinical preventive services than women seeing a generalist alone [4-6].

The Institute of Medicine defines primary care as the point of first contact with the health system, providing ongoing care for new and old problems, identifying and coordinating specialty health care needs, and providing comprehensive services.[7] The organization of specialized primary health care "centers" for women represents a structural approach to addressing the need for improved coordination and comprehensiveness in women's health. These centers began in the 1960s and 1970s with the establishment of community-based health programs [8]. A second wave of women's health centers appeared in the 1980s and 1990s when hospitals began to establish programs providing a range of educational and clinical services for women [9]. By 1994, 32% of U.S. hospitals reported having a women's health center of some type [10]. In 1994, the National Survey of Women's Health Centers estimated that there were about 432 comprehensive primary care women's health centers in operation, including both hospital-affiliated and freestanding models [11].

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Since 1996, the DHHS CoE program designated 18 academic health centers throughout the U.S. and Puerto Rico as CoEs to develop standards for comprehensive, multidisciplinary, and culturally competent approaches to women's health across the lifespan. CoEs differ in structure and include "one-stop shopping" models in which comprehensive services are co-located in one facility, and "centers without walls" in which networked services are located in different sites but share a common philosophy of women's health care[12].

In a survey of the 15 CoE clinical centers in operation in 2001, Squires [13] found that most physicians in the centers were female, with four centers having no male medical staff. Most centers had registered nurses and nurse practitioners, and at least one mental health provider on staff and several employed other personnel (e.g., radiology technologists, nutritionists, social workers, and counselor/health educators). All CoE clinical centers provided a range of clinical services, and most had on-site radiology, laboratories, and translator/interpreter services. Patients served represent all life stages, although adolescents and women over age 65 were the smallest segments of the patient population served. Six of the CoEs reported serving patients who are predominantly women of color.

To date there have been relatively few studies of whether modern center-based models for women's healthcare, such as exemplified by the CoE program, offer particular advantages over the conventional array of clinic and center-based services accessed by women in the community at large. Two recent studies comparing women served in women's health centers with women served in general internal medicine practices measured differences in clinical preventive services received and patient's satisfaction with care [14, 15]. The results of these studies suggest that women's health centers may modestly improve women's receipt of some clinical preventive services and some dimensions of satisfaction with care.

This paper reports the first analyses of the quality of care provided in CoEs, and whether a specialized women's health program can improve the quality of care for women. Quality of care is defined here in terms of receipt of age-appropriate clinical preventive services and satisfaction with care. Medical textbooks and practice guidelines are defining the scope of women's health care and appropriate preventive services for women, and these standards may be used as a basis for examining quality of care. Most notably, the U.S. Preventive Services Task Force [16] issues evidence-based guidelines for screening tests, counseling, immunizations, and chemoprophylaxis in primary care for patient groups defined by age and gender. The American College of Obstetricians and Gynecologists (ACOG) provides guidelines for women's primary and preventive care across the lifespan [17]. Additional guidelines pertain to specific conditions, such as heart disease prevention [18]. Likewise, women's

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satisfaction with health care has been explored in recent work that has identified women's expectations for their care [19] and sources of dissatisfaction, and has led to the development of a new patient satisfaction tool for evaluation research [20, 21].

The purpose of this study is to measure the key primary care services received by women served in the CoEs, as examples of comprehensive primary care women's health centers. Two general hypotheses guide this study: (1) women served in CoEs receive more recommended clinical preventive services and report higher satisfaction with care compared with women in community samples; and (2) stronger primary care relationships with a CoE (e.g., having used the for a longer time period) are associated with more clinical preventive services received and higher satisfaction with care.

Methods

This observational study evaluates the quality of primary care services provided in 15 CoE clinical sites in operation in 2001. Two approaches are used to compare the quality of care in the CoE with care generally available in the community. In the first approach, self-report data on use of clinical preventive services among women served by the CoE program were compared to benchmarks obtained from a nationally representative sample of women from the 1998 Commonwealth Fund Survey of Women's Health [22] and from a local community sample of women who lived within a geographical catchment area for three CoEs. In addition, levels of patient satisfaction in the CoE sample were compared to the CAHPS national dataset of managed care enrollees, as well as against the local community sample that corresponded to three CoEs. In the second approach, analyses were conducted among women served in CoEs to assess whether the strength of their primary care relationship with the CoEs is related to receipt of preventive services and satisfaction with care.

CoE Sample

All of the 15 CoEs in operation in 2001 participated in this evaluation under IRB approval from each CoE and the survey center. Women 18 years of age and older who had made at least one primary care visit at the CoE within the prior year were eligible for the survey. Excluded from the study were women who had no visits to the CoE during the past year, or whose most recent CoE visit was solely for: an emergency visit, for dropping off a specimen, for a single procedure such as contraceptive injection, flu shot, a mammogram, allergy shot, or for a visit

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with an allied health service such as physical therapy. Also excluded were patients who did not see a doctor, nurse practitioner, nurse midwife, or physician's assistant at the most recent visit.

A target of 200 completed surveys was sought for each CoE using the following methods: a sampling frame was assembled of all patient visits during the last 3 months (for two sites this time frame was extended due to patient volume), a random sample of up to 400 names was selected for telephone contact and eligibility screening. A recruitment database containing names and identifying information for potentially eligible participants was kept separate, and these data were deleted from the recruitment database after the survey was completed or the callback protocol was fulfilled. Three centers required an "opt-out" process in which patients received mail notification of the planned telephone survey and were able to call or write to have their name removed from the list. The proportion of women who requested the latter ranged from 1% to 11% of all addressees. One site required an "opt-in" process where patients were systematically given a form to complete asking permission to contact them for this research study. For the latter site, more than one-third (37%) of the patients did not complete the card and therefore did not authorize contact. The surveys were conducted between August 2001 and January 2002.

The telephone interview was conducted using computerized telephone interviewing (CATI) at the University of South Carolina Survey Research Lab and required an average of 15 minutes to complete. Attempted telephone calls were made at different times of the days and on different days of the week in order to reach women who may be away from home on a regular basis. A minimum of 15 attempts were made. If the selected respondent was not at home or otherwise unable to complete the interview at the time of the initial contact, a callback time was scheduled and repeated attempts, as necessary, were made to complete the interview. The overall response rate (defined as the number of completed interviews out of the total number of completed and partial interviews and refusals) was 70.7% and varied across sites from 57.7% to 84.7%.

Benchmark Data Sources

Commonwealth Fund Survey. The 1998 Commonwealth Fund Survey of Women's Health (CWF) [22] was the primary comparison dataset in this study. The CWF was conducted between May-November 1998 by Louis Harris & Associates, Inc., using random digit dialing and CATI, and it provides one of the most comprehensive set of indicators of primary care services in women's health. The CWF is a weighted, nationally representative survey of 2,256 women's ages 18 years and older in 48 contiguous states. Stratified sampling procedures were used to obtain

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a representative sample, taking into account households with listed and unlisted telephone numbers and geographic location (region, central city, suburban, and rural residents). The CWF oversampled minority women ages 18 and older, including 429 African American, 404 Hispanic, and 400 Asian-American women. The completion rate (number of completed interviews divided by the number of completed interviews plus refusals and terminated interviews) for the cross-section sample is 55% overall. Population weights for the CWF data come from the 1997 Current Population Survey (U.S. Census Bureau) for age, race/ethnicity, education, insurance status, and geographic region to produce representative results for the 104 million women, ages 18 and over. For purposes of this study, benchmarks in women's health care were computed based on a subsample of the weighted sample of women who reported that they had made at least one physician visit in the past 12 months (n = 2,075).

Consumer Assessment of Health Plans Survey. Global patient satisfaction in the CoE is benchmarked with a single-item from the 1999 Consumer Assessment of Health Plans (CAHPS) adult survey administered by the National Committee for Quality Assurance (NCQA), which assesses consumers' experiences with and ratings of their managed care health plans [23]. The 1999 CAHPS was conducted in 206 commercial managed care health plans nationwide on 71,438 women ages 18 and over who were continuously enrolled in their health plans for the 12 months of the reporting year. Because the CAHPS data are collected for managed health care enrollees, only women in the CoE who are enrolled in managed care plans are included in the CAHPS benchmark analysis.

Community Comparison. The local community comparison sample of women aged 18 years and older living in a community served by one of three CoEs was conducted concurrently with the CoE patient survey. Funding limitations precluded comparison samples for all CoEs. A target of 200 completed surveys per community was sought using random digit dialing and comparable inclusion and exclusion criteria as above. Participants were required to have at least one primary care visit during the past year. The three communities were selected to include a diverse patient sample in terms of region, urban density, and socioeconomic status. A total of 611 interviews were completed fulfilling the study goal of 200 completed surveys per selected community. The response rates for the three community surveys were 52.1%, 53.9% and 59.3%. For this CoE comparison, only patients sampled from the three selected CoEs will be compared with the local community sample.

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Measures

A survey was developed to collect data on quality of care and strength of the patient's primary care relationship with the CoE. For the benchmark items, the CoE sample survey used the exact wording of the questions in the benchmark surveys.

Demographics and Background Variables

Participants verified age and reported race or ethnicity, marital status, employment status, education, income, and whether children under 18 were living in the household. Perceived general health status was assessed using a single item rating on a 5-point scale from excellent to poor. Women were also asked to indicate all the types of insurance coverage they had (including Medicaid, Medicare, private, and other insurance) and whether any of their insurance plans was a health maintenance organization, preferred provider organization or another type of managed care plan. Participants also indicated whether they had been uninsured at any point during the previous year. The total number of health care visits during the year, reason for the most recent health care visit (grouped as prenatal or postpartum care, routine exam or screening tests, treatment for a new health problem or injury, or follow-up care for an ongoing health problem), and type of health care provider were also assessed.

For women in both the CWF and the community comparison sample, the type of regular doctor or health professional was coded by specialty (generalist, obgyn, other or no regular provider) and gender (female versus male). Among women in the CoE group, this was coded for the regular health professional at the CoE.

Quality of Care

For the benchmark analyses, quality of care was defined in terms of 1) receipt of age-appropriate clinical preventive services generally recommended for women by such groups as the U.S. Preventive Services Task Force, and 2) global satisfaction with care rating. For the comparisons with the community sample and the analysis of the strength of CoE primary care relationship, ratings on a woman-specific measure of primary care satisfaction were also examined[20,21].

Preventive Services.   The healthcare services benchmark items are identical to the 1998 CWF survey. Preventive services assessed for all women ages 18 and over included routine physical exam, Pap smear , physical breast exam, and blood cholesterol test. For women ages 50 and older, age-appropriate services also included mammogram and colon cancer screening. Women were coded "yes" for the screening services if they had received

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the service during the past one, three, or five years depending upon prevailing recommendations. For the analyses of primary care relationship, receipt of preventive services was coded as high (all age-appropriate services received during the specified time period) versus other (any age-appropriate service not received.)

Preventive Counseling. Topics (with items identical to the CWF survey) include smoking or quitting smoking, diet and weight, exercise, alcohol or drug use, calcium intake, domestic violence, and sexually transmitted disease. For women ages 40 and over, hormone replacement therapy is also included. Women indicated whether a doctor or other health professional had discussed the topics with them during the past 12 months. For the analyses of primary care relationship, receipt of counseling services was coded as high (received counseling on greater than 50% of age-appropriate topics received during the past year) versus low (50% or less of age-appropriate topics discussed.)

Patient Satisfaction. Global patient satisfaction was assessed in the CoE and community surveys using one item from CAHPS:

"We want to know your rating of all your health care in the last 12 months from all doctors and other health providers. Use any number from 0 to 10, where 0 is the worst health care possible and 10 is the best health care possible. How would you rate all your health care?"

Results on this item are reported by NCQA as the percentage of health plan enrollees who respond with scores of 8, 9, or 10 [23,24].

In the community comparison sample, a new measure was added from the recently validated Primary Care Satisfaction Survey for Women (PCSSW) to assess women's satisfaction with care comprehensiveness and coordination of care. The PCSSW was developed through focus groups and cognitive interviews with women from across the country [20,21]. Items address topics specific to women (such as "the chance to get both gynecological and general health care here) and topics important to women but not gender specific ("the health professional's interest in my mental and emotional health). The PCSSW care comprehensiveness and coordination scale has 10 items which are rated on a five point scale from 1=not at all satisfied to 5 = extremely satisfied (total possible score is 50). The scale has excellent internal consistency (alpha=.95), discriminates well among women with high versus low comprehensiveness of services, and adds substantially to generic tools in explaining statistical variance in global satisfaction ratings (Scholle, Anderson and Weisman, unpublished data). The mean scale score was obtained by

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summing the items and dividing by the number of non-missing items. For the purpose of this report, the score distribution the PCSSW score was dichotomized as high/low at the 80th percentile.

Primary Care Relationship with CoE. Because previous literature suggests that the nature of the primary care relationship may affect quality and satisfaction with care, we assessed the strength of the woman's primary care relationship by examining the primary care domains of first contact care and longitudinality. Women were considered to use the CoE for first contact care if the CoE was their only regular place for care, as compared to women who had used the CoE in combination with other sites, who used other sites as their regular place, or who did not have a regular place of care. Longitudinal relationship was assessed by determining the length of time the woman had been seen at the CoE, dichotomized as two years or greater versus a shorter period of time.

Analysis

Comparisons of proportions of women seen in CoEs versus women in the benchmark samples are conducted using a logistic regression modeling approach. Data were analyzed using Stata$^©$ statistical software [26] and SAS REF [27]. The CoE clinical center sample is separately merged with each benchmark sample and adjustments are made to facilitate comparability and to account for the design features of each sample. To account for lack of independence among observations within the CoE sites (or clusters), robust variances are estimated using linearization methods developed for the analysis of complex survey data. Complex survey design features of benchmark data sources (such as weights, strata, and clusters in the CWF sample and clusters in the CAHPS sample) also are accounted for using statistical methods that obtain accurate design-based estimates.

The t-test ($p<0.05$) for significance of the regression coefficient for the CoE clinical sample indicator variable provides the statistical test of a CoE effect in all comparisons. The adjusted mean proportion of patients who reported receiving a screening test or counseling for the CoE survey sample versus the benchmark comparison samples are computed from the regression model, setting all control variables at their means. The models adjusted for: region, age, education, perceived health status, and managed care enrollment. The latter covariables were selected because they are known from prior research to be associated with receipt of clinical preventive services or with satisfaction with health care, and because women in the CoE sample were likely or known to differ significantly from women in the comparison samples on these variables. For example, satisfaction with health care

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is known to vary by region of the country, and lower satisfaction is reported by younger persons, by those with higher educational levels, by those in poorer health status, and by managed care enrollees (compared with those in other types of health plans). Receipt of some clinical preventive services also varies by region, age, education, and type of health plan. Adjusting for these variables reduces the likelihood that unmeasured differences between samples affect the results.

For analyses using the CWF survey to benchmark screening and counseling, the CWF sample includes women reporting at least one medical visit in the last 12 months, consistent with the derivation of the CoE clinical sample. For analyses using the CoE community survey to benchmark screening, counseling, and satisfaction, pooled data from the CoE community sample is compared to pooled data from the three corresponding CoE clinic survey sites. Region is controlled in these analyses by including indicator variables for each of the three sites in all regression models. As in the other analyses, the models are adjusted for age, education, perceived health status, and managed care enrollment.

Analyses of the dichotomized CAHPS satisfaction item score (i.e., proportion of respondents scoring 8-10 versus all lower scores) were performed on women aged 18 and older having made at least one health plan visit in the past year, and adjusted for the standard set of model covariables described above. The CoE survey comparisons are limited to women who are enrolled in commercial managed care plans for the CAHPS item only. Excluding women not enrolled in managed care plans is important for these comparisons because managed care enrollees tend to report lower satisfaction than women in traditional fee-for-service health plans, and CAHPS was developed to assess satisfaction in managed care. The item is benchmarked in two different comparisons. First, the entire CoE survey sample is compared to the 1999 CAHPS data. Second, the CoE clinic subsample is compared to the CoE community sample.

To interpret the meaningfulness of statistically significant differences found between samples, we used Cohen's *d* effect size statistic [28]. A value of 0.15 was held to indicate a small change or difference between groups. For each survey item used to assess quality of care, the effect size statistic was calculated by taking the difference in proportions between CoE and benchmark sample, and dividing it by the standard deviation of the benchmark sample for that item. Some agencies compiling health care services report card information have adopted a change of 10 percent over baseline as a small, meaningful change [29-31]. We apply the latter relative change as an additional informal criteria to assess the magnitude of difference between the CoE and national benchmark samples.

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To assess the effects of strength of the primary care relationship with the CoE, Generalized Estimating Equations (GEE) models were estimated in order to examine the relationship of first contact care and longitudinality measures to indicators of quality of care. The GEE method was used to take into account correlated observations due to CoE site clustering while simultaneously controlling for patient covariates used in the benchmark analyses above as well as the specialty of the regular provider at the CoE[32]. The SAS procedure GENMOD was used to fit the GEE models.

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Results

Information on demographic characteristics of the CoE survey respondents and the CWF subsample of women reporting at least one visit with a physician in the last 12 months is presented in Table 1. The mean age of respondents is approximately 45 years in both samples (ranging from 18 to > 90 years of age). Compared to the CWF sample, patients in the CoE survey include a higher percentage of non-white women (African-American and Hispanic), were somewhat less likely to be unemployed (37% versus 41% in the CWF), had a higher proportion of college graduates (56% versus 21%), and were more likely to be in the higher income categories (e.g. 11% versus 4% reported an annual household income of $75,000 to $100,000).

Descriptors of respondent's health insurance and provider type shown in Table 2 indicate that CoE respondents were less likely to be uninsured than those in the CWF survey (4% versus 14% in the CWF), with higher proportions covered by private insurance (67% versus 53%). While the proportions of respondents with public-sponsored insurance (Medicare and Medicaid) were similar, those in the CoE sample were somewhat more likely to be covered by Medicaid versus Medicare. More striking differences between the CoE and CWF were found for enrollment in a managed care plan (78% versus 48%) and having a female physician (92% versus 24%).

Screening and Counseling Services

Table 3 presents the adjusted means for screening and counseling services within the recommended time interval. Adjusting for region, age, education, perceived health status, and managed care enrollment, a statistically significant higher proportion of women in the CoE sample report receiving all six screening tests compared to women in the CWF sample. Likewise, women in CoEs were more likely to report counseling for smoking cessation, exercise, alcohol or drug abuse, domestic violence, and sexually transmitted diseases. Effect sizes above .15 were found for Pap tests, physical breast exam, mammogram, as well as for smoking cessation counseling.

Table 4 presents the adjusted means for comparisons of the three CoEs and the community sample. A higher proportion of women in CoEs had received four of the six screening services (Pap test, mammogram, physical breast exam and colon cancer screening) and four of eight counseling services (HRT, alcohol or drug abuse, domestic violence, and sexually transmitted diseases). Effect sizes above .15 were found for physical breast exam, and mammogram, as well as for counseling for alcohol or drug use, domestic violence, and sexually transmitted diseases.

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<u>Patient Satisfaction</u>

Table 5 shows the results for the benchmarked CAHPS item, with mean proportions adjusted for the standard set of model covariates the CoE respondents enrolled in non-Medicaid managed care plans. A higher proportion of women patients of the CoE were highly satisfied with their health care than in the CAHPS sample (81% vs. 73%). This finding was also obtained in the CoE community subsample comparison of three communities (86% vs. 79%). NCQA reports a plan-level mean proportion on this item of 70.2%, with health plans performing at the 90th percentile scoring 78%[24]. The effect size was 0.165 for the CoE vs. CWF comparison, and 0.089 for the community comparison.

The PCSSW Care Comprehensiveness and Coordination scale showed significantly (p < .001) higher levels of satisfaction with care in the CoEs than the community comparison survey. The effect size for this comparison was 0.449.

<u>Relationship to the CoE</u>

Table 6 shows how the primary care relationship affects quality of care among CoE patients. Approximately 48 percent of women in the CoE reported the CoE was the only source for their primary health care, and 53 percent had used the CoE for their care for 2 years or longer. Women who use the CoE for first contact care (their only regular place of care is the CoE) were significantly more likely to be highly satisfied with their care than women in the CoE who used the CoE services in tandem with another place of care, or who did not have a regular place of care. This result was found for both the global CAHPS item (OR= 1.15) and PCSSW scale (OR= 1.15). Women with more longitudinal relationships with their providers (length of time as a patient at the CoE of more than 2 years) were more likely to have a high number of counseling services (OR=1.17) and higher satisfaction (OR=1.39) on the CAHPS item.

Discussion

The findings presented here provide the first evidence comparing the quality of care in the DHHS-designated CoEs with national and local community benchmark samples. Because this study relied on self-report data, the definition of quality of care in this evaluation focused on satisfaction with care received and with receipt of clinical preventive services Β including screening services and counseling on specific health-related topics Β that are

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recommended in guidelines or by experts on women's health care. Compared to three independent samples (CWF, CAHPS, and the local community survey), women served in CoEs generally receive more clinical preventive services than women served elsewhere, and experience higher levels of satisfaction with care than women in the community at large. In addition, among CoE patients, there is some evidence that women with stronger primary care relationships with the CoE (as evidenced by their use of the CoE exclusively for first contact and their longitudinal relationship with the CoE) are more satisfied and are more likely to receive a full range of age-appropriate counseling services.

Specifically, in adjusted comparisons with a nationally representative sample of women, women served in CoEs were significantly more likely than in national and community comparison samples to receive all of the age-appropriate screening services measured: routine physical exam, Pap test, physical breast exam, mammogram, colon cancer screening. With regard to counseling, women served in CoEs were more likely to receive counseling on five out of eight topics measured: smoking cessation, exercise, alcohol or drugs, domestic violence, and sexually transmitted diseases. In comparisons with local community samples for three of the CoEs, women served in CoEs were significantly more likely to receive Pap tests, mammograms, colon cancer screening, and counseling on hormone replacement therapy, alcohol and drugs, domestic violence, and sexually transmitted disease. A CoE effect was not found for counseling on diet and weight or the importance of calcium intake. Importantly, the three counseling topics that are more likely to be addressed in CoEs in both the national and local benchmark comparisons (alcohol or drugs, domestic violence, and sexually transmitted diseases) are the most sensitive counseling topics in the measured set, suggesting that CoEs may provide an environment more conducive to addressing such topics in women's health.

The differences observed between the CoE and comparison samples for many of the preventive care screening and counseling services range from approximately 6 percent to 12 percent. For some services such as alcohol or drugs, domestic violence, and sexually transmitted diseases, the services provided in the CoEs represent a more than 30 percent increase in the proportion observed in the CWF. Effect size statistics have been used as a generic indicator of importance, taking into account the variability of the outcome (in the benchmark sample). The differences between the CoEs and CWF samples can be considered to range from small (e.g., routine physical exam, Pap test, colon cancer screening, counseling for sexually transmitted diseases) to moderate (e.g., mammogram and counseling on smoking, domestic violence, alcohol and drugs, and sexually transmitted diseases) when contrasted

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with effects obtained in clinical studies for common primary care topics such as increased control of high blood pressure and glycemia on life quality[33,34]. From another standpoint, reliable cutpoints for an important versus a trivial effects are elusive, and depend upon the potential yield in terms of disease prevented, or quality of life improved [35]. A recent NCQA report [29] estimated that a 1% increase in breast cancer screening observed in HEDIS in 1999 to 2000 applied to over 3.5 million eligible women (age 50 years and over) would correspond to 130 lives saved. This is based on model assumptions that regular screening of 10,000 women would avert 37 deaths before age 80 [36]. In the CoEs, the difference in routine mammography screening over the CWF benchmark was 11 percent. If this were applied to the 36% of women over age 50 served by the CoE program (estimated by DHHS Office on Women's Health staff to be approximately 450,000 for all ages), 17,820 additional women would be regularly screened. Applying the HEDIS calculations, this figure would translate to 66 additional lives saved before age 80 if the alternative were the rates for mammography reported in the CWF sample.

The findings with regard to patient satisfaction are consistent with the overall findings of more preventive care services, both traditional and those particularly targeted to women's health. In the CAHPS comparisons, based upon women enrolled in managed care plans, women served in CoEs reported significantly higher satisfaction with all health care received in the past twelve months, though the effect sizes for these differences in overall satisfaction appear small. In the local community comparison, women served in CoEs reported higher satisfaction with all care received in the past twelve months and with care comprehensiveness and coordination, the latter assessed in a new measure targeting women's perceptions of their health care. Care comprehensiveness and coordination was a key area of emphasis in the CoE program, and interestingly produced the largest effect obtained in the series of CoE comparisons. The results of this study provide evidence that the recently developed PCSSW instrument is highly sensitive to quality of women's health care, and appears to be more sensitive to appraisals of care associated with differences found in the CoEs than a standard generic measure like the CAHPS.

Finally, the findings show some evidence of a "dose response" with respect to care received in a CoE. That is, the more women depend on a CoE for care (based upon primary care concepts of first contact care and longitudinality), the higher the quality of care they receive. In particular, having been a patient in a CoE for more than two years is associated with receiving more counseling services and reporting higher satisfaction with care.

These promising results suggest that a specific type of women's health center (as embodied by the CoEs) may provide a higher standard of preventive care for adult women and may be associated with higher levels of

patient satisfaction than standard practice. This study provides the most systematic evidence available on the care provided in women's health centers because it includes more centers and a larger sample of women than in previous single-site studies and includes measures of a wider range of dependent variables than previous studies[14,15]. A strength of this study is that it used several independent benchmark sources yet found consistently positive effects of being served in a CoE, including a higher number of recommended screening and counseling services delivered to women and higher satisfaction with care. This evidence strongly suggests that the CoE programs delivered better care to their patients than what may have been otherwise accessed in the community at large.

Importantly, these analyses adjusted for age, region, education, health status and managed care enrollment that may have differed between the CoE and comparison samples and often associated with preventive care received or with satisfaction. Still, a main methodological challenge in this study is the likelihood of a "selection effect" in women's health centers. In case studies conducted as part of the 1994 National Survey of Women=s Health Centers, patient focus groups in four primary care centers provided qualitative information about why women selected the centers and their perceptions of how quality of care compared with other sites. The desire to be treated by female physicians in a women-friendly environment was a key motivator for patients, and patients uniformly reported that care provided in the women=s health centers was superior to that in other sites [37]. Two earlier studies of care provided in women=s health centers found that women served in centers are more likely to prefer female physicians compared with women in general internal medicine practices [14,15], and women physicians tend to provide more clinical preventive services to women compared with male physicians [38]. Thus, effects observed in this study could have arisen because highly motivated patients sought out women-focused care and female physicians in the CoEs. While our study controlled for other variables associated with selection of a women=s health center, we were unable to control for preference for women physicians or for women-centered care.

Another rival hypothesis has to do with quality of care in academic health centers. All of the CoEs are located in academic health centers where commitment to women=s health care is strong. Because no benchmark data for women=s health care in academic health centers are available, it is not known whether the quality of women=s primary care typically is better in academic health centers as opposed to settings in the community. An additional limitation comes from the fact the original benchmark and CoE surveys were conducted at different points in time. The CWF and CAHPS data were collected approximately two to three years earlier than the CoE survey data. Gradual increases over time in screening and other preventive care for women in the community may

have occurred which may have distorted the differences observed between the CoE and the benchmark data. However, our survey sample of three CoE communities was conducted at the same time as the CoE survey and the comparison showed a similar pattern of results found in the comparison of the CoE with the CWF surveys.

It is possible that one reason for the findings that women tend to receive more recommended clinical preventive services in CoEs compared with standard care is that women in CoEs are more likely to be treated by female physicians (92% of women in the CoE sample reported that their regular physician was female). Prior research generally has shown that women seeing female primary care physicians receive more clinical preventive services – particularly women-specific serves, such as breast and cervical cancer screening – than women seeing male primary care physicians[38,39,40]. This project has shown that the CoE "intervention" is confounded with female physician gender: we cannot disentangle the effects of female physician gender from the effects of the overall CoE clinical center with its features of comprehensive services, multidisciplinary staff, etc. Future studies should address how different components of women's health centers affect the quality of care provided.

Despite these limitations, the results reported here support the CoE model of primary care for women. A key policy question is whether resources should be devoted to extending the CoE model of care to other institutions or to encouraging the growth of women's health centers generally. While the results here are promising, the research to date cannot answer such questions as what specific attributes of the CoEs account for the positive findings or whether results would be the same for CoEs established by community hospitals or in non-hospital settings. Further research on the effectiveness of primary care women=s health centers clearly is called for, especially given these promising results from a national evaluation of the clinical centers in 15 CoEs.

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Table 1: Selected Demographic and Descriptive Characteristics of CoE and CWF Samples

Characteristic	COE Sample (n=3,111)		CWF Sample (n=2,075)	
	Mean or Proportion	95% Confidence Interval	Mean or Proportion	95% Confidence Interval
Mean age	45.24	(44.66, 45.81)	45.41	(44.56, 46.26)
	(range = 18-94)		(range = 18-97)	
Ethnicity				
White, non-Hispanic	0.552	(0.54, 0.56)	0.729	(0.71, 0.75)
African-American, non-Hispanic	0.242	(0.23, 0.25)	0.125	(0.11, 0.14)
Hispanic	0.117	(0.11, 0.12)	0.086	(0.08, 0.10)
Asian/Pacific Islander	0.039	(0.04, 0.04)	0.031	(0.03, 0.03)
Other	0.051	(0.05, 0.05)	0.029	(0.02, 0.04)
Martial status:				
Married/living with partner	0.544	(0.54, 0.55)	0.566	(0.54, 0.59)
Single	0.204	(0.20, 0.21)	0.187	(0.17, 0.21)
Widowed/separated/divorced	0.250	(0.24, 0.26)	0.247	(0.23, 0.27)
Employment status:				
Employed	0.628	(0.62, 0.64)	0.588	(0.57, 0.61)
Not employed	0.372	(0.36, 0.38)	0.412	(0.39, 0.43)
Children under 18 years in household	0.374	(0.37, 0.38)	0.400	(0.38, 0.42)
Education:				
Less than high school	0.084	(0.08, 0.09)	0.186	(0.17, 0.21)
High school/ some college	0.356	(0.35, 0.36)	0.604	(0.58, 0.63)
College graduate/ more	0.560	(0.55, 0.57)	0.210	(0.19, 0.23)
Income:				
$10,000 or less	0.153	(0.15, 0.16)	0.126	(0.11, 0.14)
$10,001 to $20,000	0.127	(0.12, 0.13)	0.170	(0.15, 0.19)
$20,001 to $30,000	0.110	(0.10, 0.12)	0.120	(0.10, 0.13)
$30,001 to $40,000	0.106	(0.10, 0.11)	0.154	(0.14, 0.17)
$40,001 to $50,000	0.093	(0.09, 0.10)	0.106	(0.09, 0.12)
$50,001 to $75,000	0.154	(0.15, 0.16)	0.124	(0.11, 0.14)
$75,001 to $100,000	0.114	(0.11, 0.12)	0.044	(0.04, 0.05)
$100,001 or above	0.143	(0.14, 0.15)	0.040	(0.03, 0.05)

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Table 2. Access and Utilization of Health Care in CoE and CWF Samples

Characteristic	COE Sample (n=3,111)		CWF Sample (n=2,075)	
	Mean or Proportion	**95% Confidence Interval**	**Mean or Proportion**	**95% Confidence Interval**
Health insurance type:				
Medicaid	0.148	(0.14, 0.15)	0.111	(0.10, 0.13)
Medicare	0.134	(0.13, 0.14)	0.164	(0.15, 0.18)
Private	0.672	(0.66, 0.68)	0.531	(0.51, 0.55)
Other	0.007	(0.01, 0.01)	0.059	(0.05, 0.07)
Uninsured	0.039	(0.04, 0.04)	0.135	(0.12, 0.15)
Insured women in HMO or PPO	0.780	(0.77, 0.79)	0.476	(0.45, 0.50)
Respondents with lack or lapse of health insurance in last 12 months	0.081	(0.08, 0.09)	0.080	(0.07, 0.09)
Mean number of visits in last year	8.65	(8.33, 8.96)	6.23	(5.79, 6.66)
Hospitalized in last year (other than childbirth)	0.155	(0.15, 0.16)	0.097	(0.08, 0.11)
Type of regular provider:				
Generalist	0.538	(0.52 0.56)	0.727	(0.70, .75)
ObGyn Only	0.186	(0.17 0.20)	0.059	(0.05, .07)
Other	0.107	(0.10 0.12)	0.052	(0.04, .06)
No regular provider	0.169	(0.16, 0.18)	0.162	(0.14, 0.18)
Gender of regular provider (female)	0.918	(0.91, 0.92)	0.238	(0.22, 0.26)

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Table 3. Benchmark Comparisons of Screening and Counseling Services: CoE Patient Survey and CWF
(Adjusted means and 95% CI)

	CoE Sample (n = 3,111)	CWF Sample[1] (n = 2,075)	Effect size[2]
Screening :			
Routine physical exam, past 3 years			
Adjusted mean[a] (95% CI)	0.929 (0.910,0.947)	0.856 (0.838,0.874)***	0.173
Pap test, past 3 years			
Adjusted mean[a] (95% CI)	0.952 (0.937,0.967)	0.886(0.870,0.903)***	0.172
Physical breast exam, past year			
Adjusted mean[a] (95% CI)	0.892 (0.871,0.914)	0.754 (0.732,0.775)***	0.278
Mammogram, Ages 50+, past year			
Adjusted mean[a] (95% CI)	0.917 (0.893,0.940)	0.803 (0.762,0.843)***	0.200
Cholesterol test, past 5 years			
Adjusted mean[a] (95% CI)	0.881 (0.859,0.902)	0.832 (0.811,0.855)**	0.100
Colon cancer screening, ages 50+, past 5 years			
Adjusted mean[a] (95% CI)	0.603 0.530,0.677)	0.432 0.369,0.495)***	0.193
Counseling (past 12 months):			
Smoking (for current smokers)			
Adjusted mean[a] (95% CI)	0.870 (0.834,0.905)	0.748 (0.697,0.798)***	0.210
Diet and weight			
Adjusted mean[a] (95% CI)	0.534 (0.487,0.580)	0.506 (0.482,0.530)	0.050
Exercise			
Adjusted mean[a] (95% CI)	0.612 (0.574,0.650)	0.540 (0.516,0.564)**	0131
Importance of calcium intake			
Adjusted mean[a] (95% CI)	0.476 (0.430,0.522)	0.450 0.424,0.475)	0.045
Hormone replacement therapy, Ages 40+			
Adjusted mean[a] (95% CI)	0.464 (0.410,0.518)	0.414 (0.363,0.464)	0.058
Alcohol and drugs			
Adjusted mean[a] (95% CI)	0.312 (0.286,0.338)	0.231 (0.210,0.251)***	0.171
Domestic violence			
Adjusted mean[a] (95% CI)	0.165 (0.139,0.191)	0.0735 (0.061,0.086)***	0.323
Sexually transmitted disease			
Adjusted mean[a] (95% CI)	0.189 (0.158,0.221)	0.111 (0.095,0.128)***	0.204

*** t-test p<.001   ** t-test p<.01 * t-test p<.05
[a] Means adjusted for : age, perceived health status, education, managed care, and region.
[1] CWF sample of women with a prior visit in last year to a primary care office.
[2] Effect size calculated as Cohen's d: difference between means / SD of CWF.

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Table 4.   Benchmark Comparisons of Screening and Counseling Services: CoE Patient Survey in Three Communities and Community Samples (Adjusted means and 95% CI)

	CoE Patient Sample (n = 618)	Community Sample[1] (n = 611):	Effect Size[2]
Screening:			
Routine physical exam, past 3 years			
Adjusted mean[a] (95% CI)	0.900 (0.876,0.924)	0.891 (0.866,0.917)	0.028
Pap test, past 3 years			
Adjusted mean[a] (95% CI)	0.965 (0.950,0.980)	0.943 (0.924,0.961)*	0.097
Physical breast exam, past year			
Adjusted mean[a] (95% CI)	0.921 (0.900,0.943)	0.837 (0.807,0.867)***	0.223
Mammogram, Ages 50+, past year			
Adjusted mean[a] (95% CI)	0.900 (0.847,0.953)	0.740 (0.657,0.822)***	0.232
Cholesterol test, past 5 years			
Adjusted mean[a] (95% CI)	0.870 (0.840,0.901)	0.895 (0.87,0.969)	-0.077
Colon cancer screening, ages 50+, past 5 years			
Adjusted mean[a] (95% CI)	0.684 (0.591,0.777)	0.587 (0.498,0.675) *	0.133
Counseling:			
Smoking (for current smokers)			
Adjusted mean[a] (95% CI)	0.855 (0.774,0.935)	0.754 (0.667,0.841)	0.211
Diet and weight			
Adjusted mean[a] (95% CI)	0.449 (0.409,0.489)	0.449 (0.409,0.489)	0.001
Exercise			
Adjusted mean[a] (95% CI)	0.540 (0.499,0.581)	0.573 (0.533,0.613)	-0.066
Importance of calcium intake			
Adjusted mean[a] (95% CI)	0.460 (0.418,0.501)	0.485 (0.444,0.526)	-0.051
Hormone replacement therapy, Ages 40+			
Adjusted mean[a] (95% CI)	0.563 (0.494,0.632)	0.469 (0.411,0.526) *	0.163
Alcohol and drugs			
Adjusted mean[a] (95% CI)	0.297 (0.233,0.306)	0.152 (0.123,0.181) ***	0.326
Domestic violence			
Adjusted mean[a] (95% CI)	0.180 (0.148,0.212)	0.0904 (0.067,0.113) ***	0.314
Sexually transmitted disease			
Adjusted mean[a] (95% CI)	0.128 (0.097,0.160)	0.0577 (0.399,0.076) ***	0.310

*** t-test $p<.001$ ** t-test $p<.01$ * t-test $p<.05$

[a] Means adjusted for: age, perceived health status, education, managed care, and site.

[1] Survey subsample of three pooled CoEs selected for community comparison study

[2] Random digit dialed survey of women 18 years and older living in community served by three selected CoEs

[3] Effect size calculated as Cohen's d: difference between means / SD of community sample.

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Table 5. Benchmark Comparisons for Patient Satisfaction (Adjusted means and 95% CI)

	1999 CAHPS	CoE Clinic Sample	Effect_Size	Community Sample	CoE Clinic Subsample
	(n = 71,438)	*(n = 1,876)*		*(n = 402)*	*(n= 382)*
CAHPS Score (%8-10) Adjusted mean (95% CI)	0.728 (0.721,0.734)	0.807 (0.775,0.838)***[a]	0.088	0.789 (0.767,0.831)	0.860 (0.825,0.896)*
PCSSW Scale [d] Adjusted mean[e] (95% CI)	n/a	n/a		*(n = 611)* 0.140 (0.113,0.168)	*(n =618)* 0.297 (0.260,0.334)*

*   T-test for significance of beta for CoE is significant at p < .05.
**   T-test for significance of beta for CoE or community is significant p<.01.
*** T-test for significance of beta for CoE or community is significant p<.001.

[a] This comparison uses the sample of women ages 18 and over who completed CAHPS in 1999 and the women in the CoE clinic sample who are enr
and are not insured by Medicaid. Variables adjusted for are: region (8 regions used by NCQA + Puerto Rico) , age , education , and perceived health

[b] This comparison uses women in the community sample and the CoE clinic subsample who are enrolled in managed care and are not insured by Me
for are: site, age, education, and perceived health status.

[c] This comparison uses all women in the CoE community sample and all women in the CoE clinic subsample. Variables adjusted for are: site, age, e
health status.

[d] The PCSSW Care Comprehensiveness and Coordination scale is scored as a dichotomy: women reporting scores in the top 20% (highest satisfactio
others.

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Table 6. Association of Primary Care Relationship Measures to Quality of Care Among CoE (n=3,111. Odds ratios and 95% c

	First Contact (CoE is regular provider)		Longitudinality (CoE for >2 years)	
	Odds Ratio	95%CI	Odds Ratio	95%CI
High preventive care[1]	1.00	0.86, 1.16	1.00	0.87, 1.16
High counseling services [2]	1.08	0.95, 1.22	1.17	1.02, 1.35
CAHPS Score (%8-10) [3]	1.15	1.02, 1.31	1.39	1.17, 1.65
PCSSW Care Coordination and Comprehensiveness Scale[4]	1.15	1.00, 1.32	1.13	0.90,1.43

Adjusted for : age, perceived health status, education, managed care, and type of regular

provider at the CoE (regular provider is obgyn and regular provider is other health professional

versus referent of no regular provider at CoE).

[1]Received all of age-appropriate clinical preventive services assessed.

[2]Received counseling on more than 50% of age-appropriate topics during the past 12 months.

[3]Rating of '8' or higher on CAHPS satisfaction score.

[4] The PCSSW Care Comprehensiveness and Coordination scale is scored as a dichotomy: women reporting scores in the top 20% (highest satisfaction others.

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