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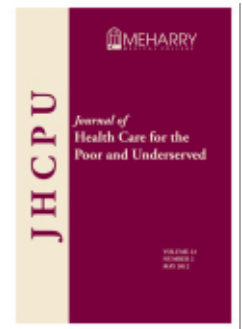
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## What is the Quality of Preventive Care Provided in a Student-Run Free Clinic?

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**Abstract: Background.** The quality of preventive care provided in student-run free clinics has not been well documented, although an increasing number of vulnerable populations seek care in these settings. **Objective.** To examine the rate of preventive care services provided in one student-run free clinic compared with national data. **Design.** Cross-sectional chart review. **Participants.** Randomly selected patients seen between October 2008 and 2009. **Main Measures.** Preventive screening guidelines by the U.S. Preventive Services Task Force (USPSTF) and the American Diabetes Association (ADA). **Key results.** Among 114 patient charts examined, 48 (42.1%) received an HIV test, which did not differ from national rates (40.8%,  $p=.78$ ). Similarly, 63.3% of patients received a fasting blood glucose test (64.2%,  $p=.92$ ). Among eligible patients, 59.6% received a fasting lipid panel and 54.6% a Pap smear; lower than national rates (86.6%,  $p<.001$ , and 70.5%,  $p=.001$  respectively), but not different compared with uninsured nationally (61.5%,  $p=.79$ , and 54.7%,  $p=.98$ ). **Conclusions.** This student-run free clinic provided preventive services at comparable rates to national levels, but short of goals specified in *Healthy People 2020*.

**Key words:** Student-run clinic, preventive care, underserved, uninsured, Behavioral Risk Factor Surveillance System (BRFSS).

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Disease prevention and wellness promotion have been receiving increasing attention in the national discourse, exemplified by vibrant emphasis in *Healthy People 2020*\* and the landmark 2010 Affordable Care Act.<sup>1</sup> Uninsured, undocumented, and minority individuals represent subpopulations that are much less likely than others to receive preventive services.<sup>2,3</sup> Many uninsured and undocumented individuals seek care at core safety-net providers,<sup>4</sup> including student-run free clinics associated with medical and other health professional schools.<sup>5,6</sup> While several studies have examined management of patients with certain diseases at student-run free clinics,<sup>7-9</sup> the quality of preventive care in such settings has not been fully explored.

Measurement of quality of care at student-run free clinics is particularly important given the significant proliferation of these clinics over the past decades, with a total of 111 clinics identified in 2005.<sup>10</sup> Student-run free clinics not only serve as centers for treating acute illness or managing chronic illness, but also play important roles in disease prevention and health promotion for their patient populations. In addition to the vulnerability of patient population and resource constraints that plague many core safety-net providers,<sup>4</sup> the high turnover of volunteers, relative inexperience of students as clinicians, and potentially competing goals of service and student education represent challenges unique to student-run free clinics that may reduce the quality of care provided.<sup>11</sup> However, there is a dearth of published data examining such concerns. Examination of quality of preventive care at a student-run free clinic can help fill this gap in the literature. Additionally, assessing quality of care can highlight areas where a given clinic is performing well and can identify opportunities to improve quality. Furthermore, incorporating quality improvement into the culture of a student-run free clinic can provide important training for students and support the increasingly recognized systems-based practice and quality improvement components of medical education.

In this study we assess the provision of preventive screening services at the Healthcare, Advocacy, Volunteerism, Education, Neighborhood (HAVEN) Free Clinic, a free clinic operated by health professional students at Yale University. To determine how receipt of preventive services at this clinic compares with receipt of such preventive services nationwide, we used data from the Behavioral Risk Factor Surveillance System (BRFSS), an annual national survey conducted by the Centers for Disease Control and Prevention.<sup>12</sup>

## Methods

**Setting.** HAVEN Free Clinic is a weekly student-run clinic that operates on Saturdays in partnership with Fair Haven Community Health Center (FHCHC), a federally qualified health center located in the Fair Haven neighborhood of New Haven, Connecticut.

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\**Healthy People 2020* is a federal government Website managed by the U.S. Department of Health and Human Services: <http://www.healthypeople.gov/2020/default.aspx>. The Healthy People team, which is responsible for Healthy People 2020, can be reached at Office of Disease Prevention and Health Promotion, P.O. Box 1133, Washington, DC 20013-1133 or [healthypeople@nhic.org](mailto:healthypeople@nhic.org).

HAVEN's catchment area is limited to the Fair Haven neighborhood, a low-income, urban area with a population of approximately 14,000. A patient must demonstrate that s/he is an uninsured adult living within the Fair Haven ZIP code to be eligible for HAVEN services. After one year at HAVEN, any patients with persistent medical problems are transferred to a more long-term medical home at FHCHC. From its opening in November 2005 until December 2009, HAVEN conducted over 2,100 adult patient visits, representing more than 450 unique patients with an average of 15 patients seen each week. Patients are seen by teams of senior and junior students, with guidance from faculty preceptors. Nearly 70% of the patients are undocumented immigrants from Mexico or Central or South America, and Spanish interpreting services are readily available. In addition to providing primary care, HAVEN offers specialty referrals, assistance in identifying and applying to pharmaceutical assistance programs, eligibility screening for insurance programs, referrals to social services, women's and men's support groups, and one-on-one health education counseling.

For many of its patients, HAVEN serves as the point of entry into the United States health care system. Though the majority of patients present seeking care for an acute complaint, HAVEN has seen this as an opportunity to offer preventative and screening services to this vulnerable population. To this end, the students and faculty have developed the HAVEN Routine Health Maintenance Comprehensive Guide outlining the age appropriate health screening measures that should be offered. The guide follows standard recommendations of the U.S. Preventative Services Task Force (USPSTF) and other preventive service guidelines while emphasizing the measures most feasible and important for this immigrant population. This guide is used as a teaching tool during orientation of the clinical team members, and tracking of performance on preventive measures is accomplished by documentation on the health history sheet in the patient's paper-based medical chart.

**Participants and study design.** A chart review was conducted of patients that kept at least one clinical visit between October 26th, 2008 and October 25th, 2009; 368 patients were eligible. The patients were ordered according to date of initial visit, and a one in four sampling strategy was used to achieve an equal distribution across the clinic year. Patients with missing charts (e.g., due to being under clinical use at the time of data abstraction) were replaced by the subsequent patient in the ordered list. Additional patients were randomly selected for inclusion to increase sample size. The resulting sample included 114 patients. Our study design was approved by the Yale Human Investigations Committee and is in compliance with the Health Insurance Portability and Accountability Act (HIPAA) regulations.

**Data collection.** Clinic data were abstracted from charts by student volunteers using a two-page chart abstraction tool, and were subsequently entered into an electronic database using Microsoft Access 2007 (Microsoft, Seattle, WA).

Data from the 2009 BRFSS Survey was used to compare adequacy of preventive services delivery. The BRFSS is an annual national survey of civilian, non-institutionalized individuals aged 18 and older sponsored by the Centers for Disease Control and Prevention conducted *via* random digit dialing of land-line telephones.<sup>12</sup>

**Measures.** Demographic information was obtained from all new patients at their

first clinical visit. This included gender, date of birth, race/ethnicity, primary language, highest education, and employment status.

Preventive screening services examined included HIV testing, fasting lipid panel, fasting blood sugar, and Pap smear. These services are grade A or B recommendations of the USPSTF or are standards of care of the American Diabetes Association (ADA) Guidelines, and are included in both the HAVEN Routine Health Maintenance Comprehensive Guide and the BRFSS.<sup>13,14</sup>

Eligibility criteria and guidelines for receiving these services are listed in Box 1 and are adopted from the USPSTF and ADA guidelines. A clinic patient was considered to receive adequate service if the service was documented in the chart as being rendered at any clinical visit within the time period specified by the guidelines prior to and including the last clinical visit documented in the chart. For instance, a fasting lipid panel must have been documented in the three years prior to and including the last clinical visit, for women aged 45 and over or men aged 35 and over. Receipt of fasting lipid panel and fasting blood glucose was not assessed for younger patients, since it was not possible to determine if such patients were at high risk from the chart abstraction.

Identical eligibility criteria and guidelines were used to examine data on nationwide receipt of preventive services from the BRFSS. These analyses were also performed on

### **Box 1.**

#### **CRITERIA AND GUIDELINES FOR PERFORMANCE OF PREVENTIVE HEALTH SERVICES AT HAVEN FREE CLINIC**

<b>Preventive Health Service</b>	<b>Criteria for performance</b>
HIV test <sup>a</sup>	Consider screening all patients once regardless of risk factors.
Fasting lipid panel <sup>a</sup>	Screen every 5 years for women aged 45 and over and men aged 35 and over. For women under age 45 and men under age 35, screen only if at increased risk for coronary heart disease.
Fasting blood glucose <sup>b</sup>	Screen every 3 years for those aged 45 and over. For those under age 45, only screen if at increased risk for insulin resistance.
Pap smear <sup>a</sup>	Screen every year for women aged 18–30 within 3 years of being sexually active or age 21 (whichever comes first). For those over age 30, screen every 3 years with 3 consecutive normal tests.

<sup>a</sup>US Preventive Task Force health maintenance guideline.

<sup>b</sup>American Diabetic Association health maintenance guideline.

HAVEN = Healthcare, Advocacy, Volunteerism, Education, Neighborhood

the subpopulation of individuals from the BRFSS who did not have any kind of health insurance coverage, a population more comparable to that of HAVEN.

**Statistical analysis.** Statistical analysis was performed comparing the percentages of clinic and BRFSS patients receiving adequate preventive screening services, defined as the number of eligible patients receiving the service within the recommended time period divided by the total number of eligible patients within that period. For statistical purposes, BRFSS data were considered to represent national care rates. One-sample tests of proportions were used to compare receipt of services between HAVEN and the nationwide BRFSS sample, as well as the BRFSS subsample of individuals without health insurance coverage. All tests are two-tailed and we used .05 as a cutoff for significance. Complex survey sampling was taken into account when analyzing data from BRFSS using STATA 11.0 IC (StataCorp, College Station, TX).

## Results

This study examined a total of 114 patient charts (Table 1). The mean age of patients at HAVEN was 35 years (SD: 10.45). The gender breakdown among HAVEN patients was nearly equal, with 51% men (n=58) and 49% women (n=55). The predominant race/ethnicity of HAVEN patients was Latino (90%; n=94) followed by African American (8%; n=8). The primary language for 87% of patients was Spanish (n=86), while only 10% reported English as their primary language (n=10). Over 31% (n=31) of patients reported completion of secondary school as their highest level of education, and an additional 23% had completed a Bachelor's or advanced degree (n=23). Fifty-seven percent of HAVEN patients reported some form of employment, with 24% working full time (n=24) and 33% working part time (n=34).

Clinical adherence to guidelines for preventive health services varied widely by service (Table 2). Of the 114 patients, 48 received an HIV test (42.1%). This did not differ significantly from the rate for all eligible individuals nationwide (40.8%; p=.78) or the national rate for the eligible population without health coverage (44.7%; p=.80). Of 47 eligible patients, 28 received a fasting lipid panel at HAVEN in the last five years (59.6%). This was significantly lower than the rate for all eligible individuals nationwide (86.6%; p<.001), but did not differ significantly from the national rate for eligible individuals without health coverage (61.5%; p=.79). Of 30 eligible patients, 19 received a fasting blood glucose at HAVEN in the last three years (63.3%). This was not significantly different from the rate for all eligible individuals nationwide (64.2%; p=.92), but was higher in magnitude (with borderline significance) than the rate for eligible individuals without health coverage (47.3%; p=.08). Of 55 eligible patients, 30 received a Pap smear within the recommended time period (54.6%). This rate was significantly lower than for all eligible individuals nationwide (70.5%; p=.001), but did not differ significantly from the rate for eligible individuals without health coverage (54.7%; p=.98). One chart did not record the patient's gender and thus was excluded from analysis that considered fasting lipids and Pap smear.

**Table 1.****HAVEN PATIENT DEMOGRAPHIC CHARACTERISTICS**

Demographic Characteristics	N (%)
N	114 (100%)
Age (years)	107 (100%)
20–29	38 (35.5%)
30–39	32 (29.9%)
40–49	26 (24.3%)
50–59	9 (8.4%)
60–69	2 (1.9%)
Gender	113 (100%)
Male	58 (51.3%)
Female	55 (48.7%)
Race/ethnicity	105 (100%)
Latino	94 (89.5%)
African American	8 (7.62%)
Other	2 (1.9%)
Non-Latino White	1 (1.0%)
Primary language	99 (100%)
Spanish	86 (86.9%)
English	10 (10.1%)
Other	3 (3.0%)
Highest education	98 (100%)
Primary	31 (31.6%)
Some secondary	13 (13.27%)
Secondary/GED	31 (31.6%)
Bachelor's	19 (19.4%)
Graduate/professional	4 (4.1%)
Employment status	102 (100%)
Full-time	24 (23.5%)
Part-time	34 (33.3%)
Looking	37 (36.2%)
Not looking	5 (4.9%)
Other	2 (2.0%)

HAVEN = Healthcare, Advocacy, Volunteerism, Education, Neighborhood

**Discussion**

The population served at HAVEN Free Clinic is particularly vulnerable in terms of preventive health services. Predominantly, patients at HAVEN are Latino with a Spanish language preference, and most have not completed college and do not have full-time employment. Virtually all patients were uninsured. Many studies have found a link

**Table 2.****COMPARISON OF HAVEN FREE CLINIC PERFORMANCE WITH BRFSS ON SELECTED PREVENTIVE HEALTH SERVICES**

Preventive Health Service	HAVEN	HAVEN	BRFSS No health coverage	BRFSS Nationwide
	# eligible	Percentage receiving (95% CI)	Percentage receiving (p-value for comparison with HAVEN)	Percentage receiving (p-value for comparison with HAVEN)
HIV test	114	42.1 (33.0, 51.2)	43.3 (.80)	40.8 (.78)
Fasting lipid panel	47	59.6 (45.5, 73.6)	61.5 (.79)	86.6 (<.001)
Fasting blood glucose	30	63.3 (46.1, 80.6)	47.3 (.08)	64.2 (.92)
Pap smear	55	54.6 (41.4, 67.7)	54.7 (.98)	70.5 (.001)

CI = Confidence Interval  
HAVEN = Healthcare, Advocacy, Volunteerism, Education, Neighborhood

between lack of insurance and decreased preventive care services.<sup>3,15-17</sup> In addition, Latinos in the U.S. report lower overall receipt of preventive services, and U.S. Latinos with a Spanish language preference were less likely to receive many preventive health services than English language preference Latinos.<sup>18</sup> Furthermore, Latinas without any college education or without full time employment were significantly less likely than those with some college education or full-time employment to receive mammograms.<sup>19</sup>

This study found that eligible HAVEN patients received HIV testing and fasting blood glucose at rates similar to those of eligible individuals nationwide. Eligible HAVEN patients received fasting lipid panel and Pap smear services at rates lower than those of eligible individuals nationwide. However, they received these two services at similar rates as eligible individuals nationwide without health insurance coverage. Benchmarking of point estimates reflects positively on the clinic's performance given the heightened vulnerability of HAVEN's patients and unique challenges a student-run free clinic faces as a core safety-net provider, though HAVEN should strive to achieve higher rates than the uninsured at large.

This paper contributes to the burgeoning literature on quality of care student-run free clinics. One study on quality of diabetes care in a student-run free clinic in East Harlem also found that quality of care indicators ranged widely, but were comparable to averages reported for uninsured populations in most areas.<sup>8</sup> An additional study on quality of mental health care at the same East Harlem clinic found that care was comparable to services received in insured populations.<sup>9</sup> Another student-run free clinic in New Jersey found that patients with hypertension received care according to national



guidelines and were at the blood pressure goal set by *Healthy People 2010*.<sup>7</sup> However, each of these studies examined quality of care in a population defined by a particular diagnosis. This paper examines preventive measures for all adult individuals regardless of medical status as long as they meet certain demographic eligibility.

Despite HAVEN's comparable performance on prevention measures described in this study, a student-run free clinic should strive to reach nationwide targets. Several of the preventive measures described in this study are emphasized specifically in the goals outlined in *Healthy People 2020*. For example, the national goals for receipt of preventive service among eligible individuals are 82% for fasting lipid panel and 93% for Pap smears. None of the rates among HAVEN's patients for these preventive services met these goals.

We believe a variety of factors could complicate provision of all preventive services at HAVEN. First, patients at HAVEN are seen a limited number of times. The median number of visits for any patient at the clinic was four, with 21% of patients only being seen at the clinic for one visit at the time of chart review. This presents few opportunities for providers to offer preventive services, especially those that require patient preparation, such as fasting blood tests. Additionally, continuity of care can be compromised by turnover in a student-run free clinic, hindering preventive services. Providers may not offer screening, focusing instead on patient's acute concerns. Furthermore, some patients may refuse preventive screening if they present with an acute concern. In this study, patient refusal was documented for three patients for HIV testing, two eligible patients for fasting lipid panel, one eligible patient for blood glucose, and three eligible patients for a Pap smear. We did not document the degree to which patients scheduled for follow-up appointments for preventive screenings did not return.

Consequently, this study highlights an important opportunity for change at HAVEN. Based on these findings, HAVEN is implementing a performance improvement project with the goal of improving delivery of preventative care through offering all recommended services within the first year of patients' treatment at HAVEN, using Wagner's Chronic Care Model as a theoretical framework.<sup>20</sup> This model, though developed to improve delivery of care to patients with chronic disease, has important applications to prevention and has demonstrated utility in improving delivery of preventative services.<sup>21</sup>

The project will focus on improvement in four of the six elements in the model (Box 2). First, we will address delivery system design by requiring junior clinical team members to place a reminder sticker in each patient's chart at the time of taking vital signs prompting the senior clinical team member of several key preventative services that are due for that patient. Second, we will improve clinical information systems at HAVEN by requiring review of completion of the health maintenance part of the history sheet by students as part of the attending physician's evaluation of the student note. Third, we will provide decision support through presentations on health maintenance during volunteer trainings and weekly pre-clinic conferences, and by reminding preceptors to evaluate students' oral presentations with respect to including a patient's prevention needs. Finally, we will address patient self management support by utilizing HAVEN's education department to display educational materials on preventative services in the waiting room and to develop individualized, take-home, health maintenance patient records after one-on-one counseling sessions with patients. Each of these changes will

**Box 2.****PERFORMANCE INTERVENTION TO IMPROVE RATE OF PROVISION OF PREVENTIVE SERVICES AT HAVEN****Chronic Care****Model Component****HAVEN Intervention**

<b>Model Component</b>	<b>HAVEN Intervention</b>
Delivery System Design	<ul style="list-style-type: none"> <li>• Students required to complete preventive care stickers placed in each daily progress note</li> </ul>
Clinical Information Systems	<ul style="list-style-type: none"> <li>• Evaluation of the health maintenance flow sheet by preceptor as part of note review.</li> </ul>
Decision Support	<ul style="list-style-type: none"> <li>• Standardized training of all new HAVEN providers on expected standards for preventive care at each visit</li> <li>• Weekly discussions at pre-clinic conferences on preventive care and clinic-specific procedures</li> <li>• Weekly reminders to preceptors to evaluate students' oral presentations, including patient's preventive care needs at each visit</li> </ul>
Patient Self Management Support	<ul style="list-style-type: none"> <li>• Posters and brochures in waiting rooms and exam rooms on importance of screening for HIV, diabetes, cholesterol, and Pap smears</li> <li>• Individualized health maintenance patient record developed through one-on-one counseling on the importance of the routine health maintenance screening and modifiable risk factors, including weight loss, exercise, and smoking cessation in collaboration with Education Department</li> </ul>

HAVEN = Healthcare, Advocacy, Volunteerism, Education, Neighborhood

be implemented and evaluated using the rapid cycle Plan-Do-Study-Act method.<sup>22</sup> HAVEN will assess the impact of this performance improvement project by annual chart review and monthly monitoring by the Quality Committee of the HAVEN student board overseen by the Medical Directors.

Such a model for quality improvement can extend to student-run free clinics nationally. For instance, the high rate of turnover at student-run free clinics requires frequent volunteer trainings. Such trainings represent an important opportunity for change and can serve as a catalyst for improving quality of care. Furthermore, the high frequency of such trainings can allow rapid cycles for implementing and improving upon quality improvement interventions.

This study has some limitations. Despite a rigorous attempt to keep the sampling systematic, the small number of missing charts altered the selection process. Additionally, preventive services that were delivered at the clinic may not have been documented

fully in the charts, which may bias the results towards a reduction in apparent provision of care compared with what was actually delivered. Although we did not detect significant differences in rates of preventive services provision compared with a population of individuals without access to health services nationwide, our confidence intervals were wide due to the limited sample size. However, based upon our lower confidence bounds, we can conclude that the differences between HAVEN performance rates and the no health-coverage BRFSS rates are not in excess of  $-10.3\%$  for HIV testing,  $-16.0\%$  for fasting lipid panel,  $-1.2\%$  for fasting blood glucose, and  $-13.3\%$  for Pap smear. Finally, the nationwide comparisons may not be strictly comparable, as BRFSS is a patient survey and data from HAVEN stems from a chart review. Additionally, the patients at HAVEN all have access to a free health care provider, whereas cost may be a concern for individuals nationwide without health coverage who attempt to access other health care providers in the social safety net. To test this hypothesis, a sensitivity analysis was performed that restricted the BRFSS sample to individuals who were both without health insurance and reported that “cost was not a limiting factor in seeing a doctor.” The HAVEN patient rates did not differ significantly from the national rates of this subpopulation, and thus it is unlikely that this limitation substantially affected the results.

This study describes for the first time quality of preventive services in a population of all patients irrespective of diagnosis in a student-run free clinic. The provision of several preventive services at HAVEN equals or exceeds rates nationwide in an uninsured population, yet fails to meet several national goals. These data should enable students to think critically about quality improvement interventions and present an evidence-based model for quality improvement that can extend to other student-run free clinics nationwide.

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