Healthy San Francisco: Changes in Access to and Utilization of Health Care Services

Final Report

June 30, 2011

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I. BACKGROUND AND SUMMARY OF RESULTS

Healthy San Francisco (HSF) is a health care access program implemented by the San Francisco Department of Public Health (SFDPH) in 2007 to ensure access to appropriate and timely medical care for low-income uninsured adults ages 18 to 64 living in San Francisco. The program provides primary care (including preventive and routine care), as well as specialty, hospital, and behavioral health care and prescription drugs. HSF provides many of its services through a network of established clinics in San Francisco that historically have served a number of different patient populations and neighborhoods.

A cornerstone of HSF is participants' selection of a medical home—that is, a place or provider, most typically a clinic—at the time of enrollment. HSF defines the medical home as the place where a participant goes for basic medical care, including routine and preventive care, acute care, and care for ongoing health problems, such as asthma or diabetes. The medical home is intended to serve as the usual source of care, although its providers may refer participants as needed to other providers in the HSF network for certain types of care. Participants may change medical homes at the time of renewal, which occurs every 12 months. More than 30 medical homes, varying in size, are included in the HSF network of providers.

HSF is not an insurance product, and access is limited to care provided in the City and County of San Francisco. It is an alternative approach to reducing the barriers to accessing consistent, comprehensive primary care that low-income, uninsured adults often face. The program provides primary care (including preventive and routine care) through a group of medical homes that include clinics affiliated with the SFDPH, San Francisco Community Clinic Consortium (SFCCC), Chinese Community Health Care Association and Chinese Hospital (CCHCA/CH), Kaiser Permanente, and Sister Mary Philippa Health Center, as well as specialty, hospital, and behavioral health care and prescription drugs. Participants pay a quarterly fee to participate in the program and a point-of-service (POS) fee for doctor visits, prescriptions, and emergency department (ED) visits. Both of these fees vary by family income; those with incomes below 100 percent of the Federal Poverty Level (FPL) pay no participant fees and, depending on the medical home, may pay no POS fees.

In addition to addressing access, the HSF program also includes delivery system changes intended to improve both the quality of health care for HSF participants and efficiencies within the resource-constrained safety net environment. HSF participants are required to choose one of the participating clinics as their point of first contact for all of their basic medical care. This approach of selecting and seeking care at a specific primary care medical home is expected to alter the experience for both the provider and the patient, change utilization patterns, and ultimately improve the quality of care and control costs by reducing non-emergent ED visits and potentially avoidable hospital admissions.

In this paper, we draw on encounter data from HSF providers for HSF enrollees submitted to HSF's third-party administrator, the San Francisco Health Plan (SFHP), to examine health care utilization patterns of HSF enrollees. We also include in this analysis self-reported utilization data from a questionnaire administered by HSF since December 2008. In addition, we use California's Office of Statewide Health Planning and Development (OSHPD) data to compare trends in ED visits since 2005 at San Francisco General Hospital (SFGH) and those at other public hospitals in California. We supplement these analyses with data from focus groups that we conducted with adults who are (or were) enrolled in HSF as well as data obtained from a survey of HSF providers.

These various data enable us to address the following questions regarding access to and utilization of health care services among HSF enrollees:

1. Has HSF changed access to services?
2. To what extent are HSF participants utilizing available primary care services?
3. To what extent has HSF led to a decrease in potentially avoidable hospitalizations and non-emergent ED use?

A. Summary of Results

1. Access to Care

In general, HSF participants are very satisfied with their access to health care services. The majority of respondents to a survey conducted when they renewed their enrollment in HSF at the twelve-month mark, or re-enrolled after a short gap (one to four months) in enrollment, said that it was not at all difficult for them to access the medical care they need. While close to 40 percent of HSF participants who completed this survey, both upon initial enrollment and again at renewal or re-enrollment, gave the same response to ease of access to needed medical care in the 12 months prior to enrollment as in the first 12 months of enrollment; a similar percentage reported that access was easier in the program than before enrollment.

Of those survey participants who gave a response to this question, fewer than one in ten said that they had experienced a delay in getting medical care or medicine in the previous 12 months of enrollment. More than 70 percent of HSF enrollees stated that they had not experienced delays in obtaining care or medicine previous to enrolling in HSF, perhaps reflecting their ability to obtain timely care in the San Francisco safety net system. However, 82 percent of the participants who stated that they faced delays prior to enrolling did not report delays during the first 12 months of enrollment.

Taken together, these results suggest that, even though the majority of these HSF participants were established patients in the HSF medical homes prior to enrolling, participating in the program alleviated financial and nonfinancial barriers to medical care for a large portion of enrollees. In most cases, the majority of providers we surveyed saw no change in their ability to provide services to established patients once they were enrolled in HSF. Approximately one in five, however, thought that they were now better able to coordinate care with other providers, provide referrals to specialists, and provide ongoing care to those with chronic conditions.

2. Utilization of Primary Care and Preventive Services

Three out of four HSF enrollees had at least one physician visit within the first year of enrollment. The HSF primary care medical home system provides each HSF participant with a usual source of care, with the expectation that they will benefit from routinely seeking care from a familiar place that provides the core primary care functions and coordination of care for chronic conditions. For many enrollees, initial enrollment takes place when they seek care at one of the medical homes. Thus, it is not surprising that most have an encounter during that initial week of enrollment. However, almost all of those with an encounter during that first week have additional visits during the year.

Almost half of HSF participants received at least one recommended preventive service during the first 12 months of enrollment. There was some variation among the HSF participants in the likelihood of receiving preventive care services. For example, older individuals, those with higher household incomes, those with greater chronic disease burdens, and those with a mental health or substance abuse diagnosis were more likely to get measured services. On average, enrollees with these characteristics were also more likely to have multiple physician visits during the year.

The majority of providers that we surveyed saw no change in primary care utilization by established patients who joined HSF; however, those who did thought that their HSF patients were requesting preventive care services and following prescribed medication regimens more frequently than before enrolling in HSF.

3. Changes in ED Use and Inpatient Hospital Admissions

HSF participants show steadily declining ED use over time. HSF participants show declining use of the ED as their enrollment in the program continues. The decline in emergent ED visits (injuries, all visits leading to inpatient admission, and probable emergencies, such as heart attack symptoms) by the HSF population was similar to the decline in non-emergent ED visits. Approximately one in five of ED visits occurred during the first month of enrollment. The majority of ED visits are emergent visits. Most HSF enrollees do not have multiple ED visits.

HSF appears associated with a decrease in the number of non-emergent ED visits to SFGH made by uninsured adults. There was a decline in the number of non-emergent ED visits between 2006 and 2009. The number of ED visits to SFGH made by the elderly and children over this same time period was steady and the number for insured nonelderly adults increased. More than 30 percent of the providers surveyed replied that they did not know if there had been a change in ED use among those patients they had treated both before and after enrolling in HSF, but virtually all of the providers who did think there had been a change responded that this group of patients had decreased their use of the ED since enrolling.

High levels of emergent ED visits may be the result of poor primary care and chronic condition management but also may reflect a very sick panel of patients. High levels of non-emergent ED visits often occur due to barriers to obtaining routine care, but patients' willingness to go to clinics during office hours also plays a role. The decline in both rates suggests that the HSF primary care medical home model and focus on chronic care management are having an impact on both the need for ED care and the use of the ED for non-emergent care. Bolstering this latter conclusion is the observation that non-emergent ED visits at SFGH by uninsured adults declined from 2005 to 2009, in contrast to an increase in the average number of visits in other public hospitals in California. Several participants in the focus groups talked about their ability to develop a relationship with a provider who is trying to discover underlying health problems, provide primary care, and *"keep you out of the emergency room, which is much, much better."*

The launching of the HSF program is associated with an observed decrease in potentially avoidable hospitalizations made by uninsured adults in San Francisco. Beginning in 2007, the percentage of hospitalizations potentially avoidable among the uninsured at SFGH began to decline, while the percentage among insured adults at SFGH and both uninsured and insured adults in all other public hospitals in California remained steady.

Among HSF participants, chronic disease burden, homelessness, and ethnicity were correlated with the probability of having an ED visit and inpatient hospitalization. Certain chronic diseases are

associated with ED visits and hospitalizations that could be prevented if the disease were properly managed in the outpatient setting. HSF put into place a number of programs, such as Strength in Numbers, which are aimed at diabetics and others with chronic conditions, to improve disease management and health education. Both in the provider survey and the site visits, providers commented on the positive impact of HSF on access, quality, and continuity of care, particularly for those patients with chronic illness. Many participants in the focus groups commented on the care they received for chronic conditions, echoing the comments of one participant: *"I'm trying to know how to eat healthier as a diabetic and stuff, something I never had before I got into this program; it wasn't offered to me."* Although correlation does not prove causation, these data suggest that HSF is improving health outcomes for these patients.

We elaborate on these key findings below. The paper begins with a description of the data sources, methods, and analytic approach we have taken to address the questions regarding whether participation in HSF has changed the access to and utilization of medical care for these low-income uninsured adults. We then discuss the findings from our analyses. We conclude by discussing some of the implications of our findings for the HSF program.

II. METHODS[1]

A. Data Sources

HSF Enrollment and Encounter Data. Our primary data sources are enrollment and encounter records for HSF participants. Enrollment records were obtained from the SFDPH and cover the period from July 2007 through March 2011. Encounter data were extracted by the SFHP in March 2011. We used encounter data from July 2007 through December 2010 to allow sufficient time for complete reporting. Most analyses conducted were focused on HSF participants with at least 12 months of continuous enrollment, provided the 12th month occurred no later than December 2010 (n=60,008). Because one of the goals of HSF is to change care-seeking behavior, restricting analyses to this group increases our ability to estimate the program's potential effects, as we would not expect behavioral change for participants who are enrolled only briefly. To provide perspective on the degree to which participants obtain "one-time" care through HSF, we also present utilization data on the ever-enrolled population through March 2011 (n=95,580).

Health Access Questionnaire. Since December 2008, SFDPH has administered a Health Access Questionnaire (HAQ) at enrollment, renewal (when a participant elects to continue enrollment immediately at the end of a 12-month period), and re-enrollment (when a prior participant elects to rejoin HSF after a gap in enrollment). This 10-question instrument assesses perceived health status and access to care in the prior 12 months (captured by usual source of care, use of the emergency department, and difficulty in receiving medical care). Our analysis utilizes HAQ responses from December 2008 through June 2010. We identified two samples: (1) those who completed an HAQ at renewal or re-enrollment after a short gap of one to four months (n=18,036), and (2) those who met the above criteria *and* had completed a survey upon initial enrollment (n=5,622).[2] We used the first sample to understand perceived access among HSF participants and the second sample to assess changes in perceived access over time that may be due to HSF.

[1] In addition to the methods presented in this section, we considered, but did not complete, analyses with comparison groups drawn from Medi-Cal beneficiaries residing in San Francisco and participants in San Francisco's Healthy Workers program. We also explored conducting an impact analysis that would examine changes in the rate of preventive health care services at San Francisco primary care clinics that participate in HSF relative to other matched comparison clinics in California. Appendix B discusses each of these potential analyses and the data quality or acquisition challenges that led us to exclude them from this report.

[2] HAQ questions may be answered by the enrollee or by another household member (for example, a spouse or parent) applying for enrollment. Our analysis did not suggest differences in data quality between those who responded for themselves and those for whom another household member responded (for example, comparable rates of "don't know" and "refusal" responses were observed for both groups). Thus, we present the data together and do not distinguish between self- and other-respondents.

Hospital Inpatient and ED Discharges. To assess the possible effect of HSF on potentially avoidable hospital admissions and non-emergent ED visits, we obtained individual-level records from OSHPD of all inpatient and ED discharges occurring in California hospitals from 2005 through 2009. For all analyses in this report, individual-level records were rolled up to the hospital level to compare trends at SFGH to those in other public hospitals in California.[3]

Focus Groups. The analysis incorporates findings from three focus groups conducted in July 2010 and two conducted in October 2010.[4] The sample for the July focus groups was drawn from participants who completed an enrollee satisfaction survey conducted by the Kaiser Family Foundation (KFF) in March 2009 and were still enrolled as of July 2010;[5] the sample for the October focus groups was drawn from participants who had exited from the program at least once, with some having re-enrolled and others still not participating in the program as of October 2010. In both the July and October focus groups, we collected information both on their perceived changes in access to health care since entering the program and their utilization of preventive and other health care services while in the program. Individuals were selected for these groups based on a random sample of HSF participants stratified by age, health status, and medical home. The three groups in July included one conducted in English, one in Cantonese, and one in Spanish. Both groups in October were conducted in English.

HSF Provider Survey. In May–June 2010, we conducted a self-administered online survey of providers participating in HSF as of April 2010, including physicians, nurse practitioners, nurse midwives, physician assistants, nurses, social workers, and other providers.[6] Of the 578 persons comprising the sample of providers for whom we had contact information, 389 responded to the survey. The survey collected information on such topics as the activities related to and perspectives on care coordination, access, and quality improvement as well as the providers' perceptions of changes in the care-seeking behavior of HSF participants.

Site Visits. We also incorporate relevant information collected during our site visits in San Francisco in October 2009, February 2010, and February 2011. The aim of these visits was to gather qualitative information on HSF origins, structure, goals, implementation experiences, and sustainability from key informants who have been involved closely with the program. These individuals included DPH HSF leaders and staff; SFHP leaders and staff; physicians, administrators,

[3] Other public acute care hospitals in California (n=16) included: Alameda County Medical Center, Contra Costa Regional Medical Center, Kern Medical Center, LAC/Harbor-UCLA Medical Center, LAC+USC Medical Center, Los Angeles County Olive View-UCLA Medical Center, Natividad Medical Center, University of California Irvine Medical Center, Riverside County Regional Medical Center, University of California Davis Medical Center, Arrowhead Regional Medical Center, University of California San Diego Medical Center, San Joaquin General Hospital, San Mateo Medical Center, Santa Clara Valley Medical Center, and Ventura County Medical Center. We limited our analysis to public hospitals because they are the dominant providers of care to the uninsured population and are more similar to SFGH in mission and patient population than private hospitals.

[4] Corey, Canapary, and Galanis Research (CCG) conducted these focus groups.

[5] See http://www.healthysanfrancisco.org/files/PDF/HSF_Satisfaction_Survey_Kaiser.pdf for a description of the survey and the findings.

[6] The survey was administered by CCG Research. Kaiser Permanente (KP) was unable to participate in the provider survey because of the relatively short duration of its participation in the program and difficulty in identifying KP clinicians with adequate HSF participant interaction.

and other staff in various HSF medical homes; members of HSF advisory bodies; and San Francisco city employees who have been involved with HSF. In October 2009, Mathematica researchers spoke with 62 key informants; in February 2010, we spoke with 38 key informants; and in February 2011, we spoke with 50 key informants. We discussed a broad range of topics, including program features and the role and function of the medical home. These discussions have given us a better understanding of staff and provider perspectives on utilization patterns.

B. Analytic Approach

We applied descriptive and multivariate methods to examine participants' perceptions of access to care and observed trends in utilization. Descriptive methods present information about the level of use and observed differences in utilization across subpopulations, whereas regression analyses enable us to control for confounding individual factors that may affect health care utilization and identify more clearly the characteristics associated with use of physician services, inpatient care, and ED visits. Where appropriate, we draw on quantitative data from the provider survey and qualitative data from the focus groups and site visits to illuminate and add depth to the quantitative results. Below, we describe our specific quantitative approach to each analysis.

How satisfied are HSF participants with their access to services? We conducted a descriptive analysis of 18,036 responses to the HAQ survey completed upon renewal or re-enrollment after a short gap to evaluate satisfaction with access to HSF services. By restricting our sample to participants who are or were recently enrolled in HSF, we ensure that respondents reflecting on their care over the prior 12 months describe their access to and utilization of care provided through the HSF program, not their situation prior to enrollment. We also assessed variations in perceived access to care by demographic characteristics, including gender, age, ethnicity, spoken language, economic status, and medical home.

Of the 18,036 participants who completed the HAQ upon renewal or re-enrollment in HSF, about 75 percent provided complete responses to questions describing access to HSF services. We analyzed trends in response rate by demographic characteristics; where response rates were low, we are less confident that the results are representative and comparable to other groups. Response rates varied across demographic subgroups, most notably race and ethnic group, homeless status, and medical home assignment. For example, ethnically Chinese participants were more likely to respond to the HAQ (84 percent) compared to whites (63 percent) and blacks (56 percent). Those who were never homeless also provided complete responses more often (81 percent) than those who were ever homeless (29 percent). Complete response rates by question are provided in Table A.1.

Has HSF improved access to services? To evaluate whether HSF participation led to easier access to care, we analyzed changes in access to health care services and self-reported health status, as measured by the HAQ. We also examined the ways in which responses varied by demographic characteristics. Our analysis included responses from 5,622 participants who completed the HAQ both upon initial enrollment and again upon renewal or re-enrollment following a short gap (one to four months) in participation. The responses that participants provided at enrollment reflect their access to care prior to joining HSF, while the responses at renewal or re-enrollment reflect their experience in the HSF program. We compared responses from the second survey to those from the first survey to assess potential effects of the program on access. For example, if a participant reported that access to medical care over the past twelve months was "somewhat difficult" upon initial enrollment but reported that access was "not at all difficult" upon renewal, we would consider

that person to have experienced improved access to medical care while enrolled in HSF. In this approach, enrollees serve as their own control. There are limitations to this analysis, however, because factors other than enrolling in HSF can change over the year—for example, the onset of a new health care condition—and affect perceptions about access to and satisfaction with health care.

Response rates varied by question (56 percent to 81 percent) and by demographic group for this subgroup of participants. Across all questions, on average, participants who provided complete responses were most frequently female (68 percent), young (69 percent [ages 18 to 24]), Chinese (74 percent), Chinese speaking (74 percent),[7] or receiving care at SFCCC-North East Medical Services (NEMS) clinics (78 percent). Those who were least likely to provide complete responses to relevant questions were most often black (43 percent), white (52 percent), English speaking (55 percent), ever homeless (26 percent), or receiving care at an SFDPH clinic (50 percent). As described above, we are less confident that statistics for groups with low response rates are representative, and therefore comparable, to other populations. See Table 2 for overall response rates by question and Table A.2 for response rates by question and demographic subgroup.

To what extent are HSF participants utilizing available primary care services? What individual and program characteristics influence the likelihood that participants will utilize these services? HSF aims to improve health status and reduce hospitalizations and ED use by facilitating closer connections with a primary care medical home, leading to more consistent use of primary care and preventive services. Accordingly, we evaluated (1) utilization of physician services, (2) receipt of specific preventive care services, and (3) physician outpatient follow-up to inpatient and ED events.

In evaluating whether HSF enrollees are taking advantage of improved access to primary care services, we considered (1) a physician visit within two months of enrollment and (2) receipt of one or more of seven specific preventive services recommended by the U.S. Preventive Services Task Force (USPSTF): alcohol misuse counseling or screening, blood glucose testing, flu vaccination, cholesterol testing (ages 35+), colorectal cancer screening (ages 50+), pneumococcal vaccination (ages 50+), and screening for sexually transmitted diseases.[8]

To examine the individual and program characteristics influencing primary and preventive care receipt, we constructed two types of regression models. First, we modeled the likelihood of having any physician visit within the first 12 months of enrollment as well as the likelihood of receiving any of the seven specific preventive services. Then, among individuals with at least one physician visit,

[7] The survey allowed respondents to indicate Chinese, Cantonese, or Mandarin. All responses are categorized as Chinese speakers.

[8] We also examined, but do not report on, the use of depression screening among HSF participants. This service was never reported in the encounter records. The list of preventive services that we examined does not reflect all USPSTF recommendations. Some recommended preventive services for adults, such as breast and cervical cancer screening, are known to be underreported in HSF encounter data because they are reimbursed through other programs. Appropriate delivery of some other recommended services—for example, blood pressure screening—cannot be readily identified from administrative data.

we developed a model estimating the total number of visits during the first year of enrollment.[9] Regression model samples were limited to individuals with 12 months of continuous enrollment (n=60,008).

Control variables in the regression model included demographic characteristics (age, gender, race/ethnicity, language spoken); income level; medical home; homelessness status; and a measure of an individual's chronic disease burden. To construct the chronic disease variables, we applied the Chronic Illness and Disability Payment System (CDPS) algorithm to all encounter records pertaining to the first 12 months of enrollment. The CDPS generates a series of indicators for chronic conditions in 20 different major categories.[10] Our regressions included indicators for whether an individual had one chronic condition or at least two chronic conditions as identified by the CDPS. We also included specific indicators for a diagnosis of substance abuse or mental illness, as these individuals may have substantially different utilization patterns. We included prior use of medical home and renewal decision as variables that may capture the strength of an individual's existing relationship with his or her medical home and anticipated enrollment duration, respectively. Finally, variables for cohort are included (cohort 1 includes those initially enrolled between July 2007 – December 2007; cohort 2 spans January 2008 – August 2008; cohort 3 spans September 2008 – January 2009; cohort 4 spans February 2009 – June 2009; and cohort 5 spans July 2009 – December 2009) to account for the possibility that the earliest enrollees at HSF pilot sites may have had particularly strong medical home relationships that influenced their utilization.[11]

To identify inpatient stays, ED visits, and physician visits, we implemented the service and revenue coding specifications used by SFHP to produce the HSF annual report.[12] Although encounter data provide the best available tool to gain insight on service use by HSF enrollees, they are incomplete. For example, although all nonprofit hospitals in San Francisco might provide services to HSF enrollees, and the providers have agreed to report these admissions, the SFDPH suspects underreporting from hospitals other than SFGH and is working to improve data collection; however, at present, hospital-based services in the encounter data are primarily those reported by SFGH.

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[9] The distribution of physician visits was skewed; there was a small portion of individuals with a large number of visits. We used the natural log of the number of visits to reduce the influence of these few extreme cases. As a sensitivity test, we also ran models excluding the top one percent of users and found no differences from the results presented in this paper.

[10] The CDPS is a diagnostic classification system developed to describe different burdens of illness among Medicaid beneficiaries. Using ICD-9 codes, the CDPS categorizes diagnoses into 20 major categories that correspond to body systems. Each of the major categories is subdivided according to the degree of increased expenditures associated with the diagnosis. Kronick et al. "Improving Health-Based Payment for Medicaid Beneficiaries: CDPS." *Health Care Financing Review*, vol. 21, no. 3, 2000, pp. 29–64.

[11] For a fuller discussion of these cohorts, see Colby, Margaret, Catherine McLaughlin, Gregory Bee, and Tricia Collins Higgins. "Participation in Healthy San Francisco: Trends in Enrollment and Retention." Washington, DC: Mathematica Policy Research, February 2011. Available at: [http://www.healthysanfrancisco.org/files/PDF/Trends_in_Enrollment_and_Retention.pdf].

[12] We do not separate physician office from outpatient visits because two major primary care clinics for HSF participants are based at SFGH.

We examined the percentage of participants utilizing each type of service, as well as the timing of utilization. For each ED and inpatient event, we reviewed the encounter record for evidence of a physician visit one month following the event. ED utilization is particularly high in the first month of enrollment, since some participants first become aware of their HSF eligibility after visiting the ED. Accordingly, we distinguish those enrollees with ED visits within the first month of enrollment from those with later first-time ED use and assess their patterns of repeat ED use separately.

To what extent is HSF associated with a decrease in non-emergent ED use and potentially avoidable hospitalizations? Because we lack utilization data for HSF participants prior to their enrollment in the program, we cannot examine changes in their service use that may be attributable to participation in the program. Instead, we looked at utilization patterns by uninsured adults receiving ED and inpatient services at SFGH, the city's primary safety net hospital, which alone accounted for more than 60 percent of inpatient admissions among self-pay and uninsured adults in San Francisco in 2009.[13] Because we estimate that HSF has enrolled more than half of the uninsured nonelderly adults in the city,[14] we hypothesize that changes in hospital utilization patterns among HSF participants may be sufficiently large to affect observed utilization trends among uninsured nonelderly adult patients using SFGH. Accordingly, we examined whether HSF is associated with a decrease in ED visits and potentially avoidable hospitalizations by looking at trends among uninsured or self-pay adults ages 18 to 64 from 2005 through 2009 (HSF was implemented in 2007) at SFGH. As controls, we considered trends at public short-term general hospitals in other counties in California (n=16). We also examined trends for insured adults, children, and the elderly to understand whether there may be underlying citywide utilization trends driven by broader provider supply or accessibility changes. If HSF has had an impact on ED use or potentially avoidable hospitalizations, use among the uninsured or self-pay adult population at SFGH should have shown a decline beginning in 2007 relative to the trends in use for other populations and at other hospitals.

An ED visit was considered emergent if it met one of three criteria: (1) resulted in an inpatient hospitalization; (2) had a diagnosis code indicating injury; or (3) had a diagnosis code indicating emergent care was needed with greater than 70 percent probability, per the ED classification algorithm developed by New York University (NYU).[15] ED visits not meeting one of these criteria were considered non-emergent.

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[13] Authors' calculation using OSHPD patient discharge data. USCF Medical Center and California Pacific Medical Center were the next largest providers of safety net hospital services, accounting for 11 percent and 9 percent, respectively of inpatient admissions among self-pay and uninsured adults.

[14] Colby et al. February 2011.

[15] The ED classification algorithm developed by NYU (http://wagner.nyu.edu//chpsr/ed_background.shtml) uses the primary diagnosis code available on a claim to assign probabilities that a visit was likely emergent or non-emergent. The NYU team determined these probabilities by reviewing the complete medical chart for approximately 6,000 ED visits. A panel of physicians determined whether each case was emergent and claims then were reviewed to assess the primary diagnosis recorded in each case. Some diagnoses were associated with both emergent and non-emergent cases; for example, a claim may be considered 30 percent emergent and 70 percent non-emergent and, as such, the algorithm is intended for population-level analyses, not for assessing whether a particular visit was appropriate. To assign individual visits, we have dichotomized the probabilities assigned by the algorithm; visits with a diagnosis code indicating that emergent care was needed with greater than 70 percent probability were considered emergent visits. Analyses are not

To calculate the rate of potentially avoidable hospitalizations, we applied a software tool designed by the Agency for Healthcare Research and Quality (AHRQ) to inpatient discharge records from 2005 through 2009 and identified eight types of potentially avoidable admissions among adults: short-term diabetes complications, chronic obstructive pulmonary disease (COPD), asthma, hypertension, congestive heart failure, dehydration, bacterial pneumonia, and urinary tract infections.[16] We computed the ratio of potentially avoidable admissions to total admissions for the self-pay or uninsured adult population and the other population comparison groups, then compared the trends in these rates over time for SFGH and other public short-term general hospitals in California.

In a separate analysis using encounter data for HSF participants, we examined trends in utilization following enrollment in HSF. We charted the number of emergent and non-emergent ED visits per 1,000 members for each month since enrollment. If access to care and health status improves as a result of HSF, we expect utilization rates to decline as enrollment in the program continues. Declining use of non-emergent ED visits may reflect better access to routine care appointments or improved participant understanding that the medical home should be the primary source of care. Declining use of emergent ED visits may reflect improved management of chronic health conditions.

In addition to these descriptive analyses, we developed logistic regression models predicting the likelihood of having any emergent ED, non-emergent ED, and inpatient admission as a function of medical home and demographic characteristics.

C. Limitations to the Study

While analyses presented in this paper are based on the best available data, we faced several challenges in assessing the effects of HSF on utilization. The strongest analysis would examine utilization patterns before and after enrollment in the HSF program for a representative sample of HSF participants and a matched control sample of similar individuals who did not enroll in HSF. Since such data are not available, we pursued two alternative approaches, each with limitations. We also considered, but were not able to implement, analyses described in Appendix B.

To capture potential effects of HSF on ED and inpatient hospital utilization, we examined trends in participants' use of services while enrolled in HSF by using encounter data for HSF participants, which are known to be incomplete, particularly regarding ED and inpatient services.

(continued)

sensitive to setting a more stringent threshold, such as 80 percent. While using the ED algorithm greatly expands our ability to classify visits, it is important to note that diagnoses that did not appear in the 6,000 sample ED cases are not classified.

[16] Potentially avoidable admissions are cases in which hospitalization could be avoided if the patient received timely and adequate outpatient care; thus, this measure reflects the performance of the primary care system as a whole, including care management efforts by HSF providers. We used the AHRQ software tool, version 4.2, available at: [http://qualityindicators.ahrq.gov/pqi_download.htm]. The tool also identifies the following preventable hospitalizations which we did not consider: long-term diabetes complications (three measures—unlikely to be affected within the HSF timeframe), angina (small sample size), readmission after appendix removal (small sample size), and low birth weight (outside scope of HSF).

SFGH is the only hospital with available data from the beginning of the program. While many hospitals began reporting encounters for their own medical home patients as early as December 2008, reporting of charity care encounters for HSF participants enrolled with other medical homes did not begin until July 2009. No data are available from hospitals, clinics, and physicians that do not participate in HSF. We found that only about 40 percent of those who self-reported an ED visit during the previous 12 months on their renewal HAQ had an encounter record of an ED visit, even when we expanded beyond the previous 12 months of data. This finding suggests that the scope of the undercount problem could be substantial.

We also examined trends in the use of ED and inpatient utilization among uninsured adults seen at SFGH over the period from 2005 to 2009. We feel fairly confident, given the large and growing share of San Francisco charity care provided by SFGH, that patients were not simply seeking ED and inpatient services at other San Francisco hospitals during this time period. However, we cannot state with certainty that the observed patterns are due to the HSF program, as opposed to some other factor (such as new ED intake procedures) uniquely affecting uninsured patients at SFGH.

Finally, we note that diagnoses and procedures are inconsistently coded, perhaps because providers do not receive fee-for-service reimbursement and therefore may lack strong incentives to provide that level of detailed information. For example, we found no instances of depression screening, which we know is not the case from our interviews with providers. Instead, the absence of this procedure in the encounter data likely is due to inadequate procedure-specific coding, so we dropped this indicator from our set of recommended preventive services.

III. RESULTS

A. How did HSF change access to health care services?

1. How satisfied are HSF participants with their access to services?

In general, HSF participants were satisfied with their access to needed health care services during the previous 12 months of enrollment. In the HAQ, few of those responding at the time of renewal or re-enrollment stated that they experienced delays in obtaining needed care during the previous 12 months in the program. Participants in the focus groups stressed their satisfaction with access to primary care services in general and preventive services in particular. At the same time, many of these participants expressed concerns over the wait to see a specialist, a concern echoed by providers who participated in our survey. We do not know whether the perceptions of the one in four enrollees who responded either "don't know" or refused to answer this and other questions on the HAQ are similar to the perceptions of those who responded. Similarly, it is difficult to generalize from the comments of those who participated in the focus groups.

Overall, 74 percent of those who did respond to this question said that it was not at all difficult for them to access medical care (Table 1). Ability to access care varied by race, ethnicity, income level, and medical home use prior to enrollment in HSF.[17] Latinos and Spanish speakers were least likely to report easy access to care (69 percent and 67 percent, respectively), while blacks were most likely to report easy access (79 percent). Participants with income above 300 percent of the FPL were also least likely to report that it was not at all difficult to access care (62 percent) compared to other income groups.

Most participants never delayed seeking care or filling a prescription while enrolled in HSF. Overall, 93 percent of those giving a response in the HAQ at time of renewal or re-enrollment said they had not delayed seeking care or filling a pescription during the previous 12 months, although responses varied by homeless status, race, and ethnicity. Participants who were homeless at any point were the most likely to report a delay in seeking care (15 percent).

Chinese participants were least likely to report that they delayed seeking care (97 percent reported no delay), while whites were most likely to delay care (84 percent reported no delay). Similiarly, 97 percent of Chinese speakers reported no delay compared to 88 percent of English speakers. Participants at the SFCCC-NEMS clinic also were most likely to report no delays (97 percent). It is important to note that SFCCC-NEMS clinics have particular expertise in working with Asian populations, so throughout our analysis, the trends for ethnically Chinese, Chinese-speaking populations, and the subgroup receiving care at SFCCC-NEMS clinics track closely. The participants in the Chinese-language focus group were very satisfied with the care that they were receiving, even stating that they received referrals to specialists very quickly.

[17] Only 190 (one percent) of the 18,036 enrollees who completed the HAQ had not used their medical home prior to enrolling. We thus are reluctant to make any generalizations about differences in perceptions between those with prior experience and those without.

Table 1. Perceived Access to Care and Rating of Care Quality in HSF, by Demographic Characteristics

	Total Sample		Overall, how difficult is it for you and/or your family to get medical care when you need it?	During the past 12 months, did you either delay getting care or not get a medicine that a doctor prescribed for you?	How do you rate the medical care that you received in the past 12 months?
Characteristics	N	%	Not at all Difficult %*	No Delay %*	Excellent, Very Good, or Good %*
Total	18,036	100	93	74	91
Gender					
Male	9,093	50	93	74	91
Female	8,943	50	93	74	90
Initial Age Group					
18-24	2,045	11	93	73	90
25-44	6,633	37	91	71	90
45-54	4,966	28	93	75	92
55-64	4,392	24	95	79	91
Race/Ethnic Group					
Black	1,131	6	89	79	93
Chinese	6,237	35	97	75	90
Latino	4,079	23	92	69	91
White	3,037	17	84	73	93
Other	3,552	20	92	77	92
Initial FPL Level					
0-100%	11,526	64	92	74	91
101-200%	4,905	27	93	74	91
201-300%	1,502	8	93	76	91
301%+	103	1	91	62	92
Spoken Language					
Chinese	6,130	34	97	76	89
English	7,869	44	88	75	92
Spanish	3,244	18	92	67	90
Other	793	4	94	83	96
Initial Medical Home					
Large DPH Clinic	2,972	16	89	72	90
Other DPH Clinic	5,718	32	90	69	92
SFCCC-NEMS	5,411	30	97	76	90
Other SFCCC	2,789	15	87	70	93
All other, unknown	1,146	6	99	97	95
Homeless Status					
Homeless at any point	2,241	12	85	73	90
Never homeless	15,795	88	93	74	91
Medical Home Prior Usage					
Yes	17,846	99	93	74	91
No	190	1	82	56	82

Source: Mathematica analysis of HAQ responses collected December 2008 through June 2010 among 18,036 respondents who completed a survey at renewal or re-enrollment after a short gap (one to four months).

*On average, 25 percent of those surveyed either refused to answer one of these questions or said that they did not know the answer (see Table A.1 in Appendix A). The percentages presented here are of the sample that gave a response.

Most participants rated the care they received from HSF clinics favorably. In both the HAQ and the focus groups, there was uniform agreement that the quality of care they were receiving was quite high. The vast majority of participants (91 percent) rated their care as good to excellent. Ratings were uniformly high across demographic subgroups, with one exception. Those who had never used a medical home were less likely to rate their care favorably (82 percent), although with only one percent of the sample in this category, it is difficult to make generalizations from these data.

2. Has HSF improved access to health care services?

In addition to looking at perceptions about access to and satisfaction with the care received during their first 12 months in the program, we also looked at changes in the responses to these questions for those HSF enrollees who filled in the HAQ at time of enrollment and then again at time of renewal or re-enrollment. The responses provided at enrollment reflect their access to care prior to joining HSF, while the responses at renewal or re-enrollment reflect their experience in the HSF program. Even though enrolling in HSF is not the only change that could affect perceived access (for example, a participant could sustain an injury during the year), comparing responses from the second survey to responses from the first survey does provide some indications as to whether participants, on average, perceived a change in their access to health care services during enrollment in HSF.

More than one-third of participants felt that access to care was easier now that they were in HSF, while an equal proportion felt that access did not change with participation in HSF. Although a sizeable portion reported no change in access to care (38 percent; Table 2), 38 percent reported that they were better able to access care for themselves and their families after participation in HSF. Participants who were white (47 percent) and above 200 percent of the FPL (43 and 47 percent) were most likely to report easier access to care now that they were in HSF (Table 3). Chinese (30 percent) participants and those receiving care at the SFCCC-NEMS clinic actually were least likely to express an improvement in access (30 percent and 27 percent, respectively).[18] Overall, 23 percent of HSF participants reported that access to care was more difficult now that they had joined HSF and those who were ever homeless were most likely to report increased difficulties in accessing care (34 percent).

Some participants were better able to seek care or fill a prescription after participation in HSF. The majority of participants did not report delaying care when they first enrolled in HSF and did not report a change in delays to care after a year of enrollment in HSF (79 percent; Table 2). Others reported delays at both enrollment and a year following participation in HSF (7 percent; Table 2). A notable portion, however, reported some delays in care seeking at enrollment but no delays after participation in HSF (14 percent). Those who experienced an improvement in delays to care more often were white (29 percent; Table 3) or black (25 percent), and less often Chinese or Chinese speaking (6 percent each). Participants who experienced an improvement in delays to care also were frequently above 301 percent of FPL (39 percent) or receiving care at an SFDPH clinic.

[18] The literature suggests that there are systematic differences among different ethnic groups in responses to questions about satisfaction and perceptions. In this case, however, we are comparing responses given by an individual when first enrolling to responses given by that same individual to the same question a year later.

Although many of the participants frequented a doctor's office or clinic for medical care before enrolling in HSF, some participants were able to move to a doctor's office or clinic for their usual source of care while participating in HSF. The majority of participants reported visiting a clinic or doctor's office as their usual source of care both before and after enrolling in HSF (76 percent; Table 2). A small group reported visiting the ED for usual medical care before and after enrollment in HSF (5 percent). The remaining 19 percent were able to transition from visiting EDs (or not having a usual source of care) to visiting a doctor's office or a clinic as their usual source of care. Compared to their peers, those participants who were Latino (25 percent) or Spanish speaking (26 percent), ever homeless (28 percent), or had never before used a medical home (26 percent) reported moving to a doctor's office or clinic most often (Table 3).

Table 2. Overall Changes in Access to Care and Perceived Health Status Among HSF Participants

	Number of Responses	%*
Overall, how difficult is it for you and/or your family to get medical care when you need it?		
Member found access easier with time	1,231	38
Member found access the same with time	1,218	38
Member found access more difficult with time	751	23
Responded don't know or refused on one or both surveys	2,422	--
What kind of place do you go to most often to get medical care?		
Visited doctor's office or clinic for both surveys	2,855	76
Visited ED/other for both surveys	65	2
Move to ED /other	107	3
Move to doctor's office or clinic	724	19
Responded don't know or refused on one or both surveys	1,871	--
During the past 12 months, did you either delay getting care or not get a medicine that a doctor prescribed for you?		
Reported delayed care for both surveys	90	3
Reported delayed care for first survey, not for second	467	14
Reported delayed care for second survey, not for first	128	4
No delayed care for both surveys	2,607	79
Responded don't know or refused on one or both surveys	2,330	0
How do you rate the medical care that you received in the past 12 months?		
Rated medical care as better	911	32
Rated medical care as the same	1,285	45
Rated medical care as worse	672	23
Responded don't know or refused on one or both surveys	2,754	--
In the last 12 months, did you visit a hospital ED for your own health?		
Responded yes to both surveys	181	5
Responded yes to first survey, no to second	394	10
Responded no to first survey, yes to second	331	9
Responded no to both surveys	2,954	77
Responded don't know or refused on one or both surveys	1,762	--

Source: Mathematica analysis of HAQ responses collected December 2008 through June 2010 among 5,622 respondents who completed a survey upon initial enrollment and again at renewal or re-enrollment after a short gap (one to four months).

* The percentage responding to any individual question excludes those who responded "don't know" or refused to respond to this question on one or both surveys.

Table 3. Percentage Reporting Change in Access to Care, Care Quality, and Perceived Health Status, by Demographic Characteristics

Response	Access Easier Over Time	Access Harder Over Time	Delayed Care in First Survey, Not Second	Moved to Physician Office or Clinic	Medical Care Better	Medical Care Worse	Health Improves	Health Declines
Total Respondents	3,200		3,292	3,751	2,868		4,561	
% responding*	%	%	%	%	%	%	%	%
Overall	38	23	14	19	32	23	39	26
Gender								
Male	38	23	15	22	32	24	42	25
Female	38	24	14	17	31	23	36	26
Initial Age Group								
18-24	37	24	8	14	28	27	39	27
25-44	39	23	17	22	33	24	43	24
45-54	39	23	13	19	31	20	38	26
55-64	37	24	15	21	34	23	34	28
Race/Ethnic Group								
Black	43	23	25	19	41	22	48	21
Chinese	30	25	6	18	25	23	29	32
Latino	41	25	18	25	33	27	49	20
White	47	17	29	18	40	18	43	23
Other	44	23	12	18	35	25	41	24
Initial FPL Level								
0-100%	39	24	14	21	32	24	41	26
101-200%	36	24	13	16	30	23	35	25
201-300%	43	20	16	15	33	24	33	29
301%+	47	22	39	12	38	23	52	13
Spoken Language								
Chinese	30	25	6	17	26	22	30	31
English	43	22	20	18	37	23	42	25
Spanish	41	25	18	25	31	30	51	18
Other	54	13	15	32	30	22	41	19
Initial Medical Home								
Large DPH Clinic	45	24	25	29	39	27	47	19
Other DPH Clinic	44	29	23	23	39	26	46	20
SFCCC-NEMS	27	28	7	18	22	25	29	34
Other SFCCC	44	23	17	18	38	24	52	19
All other, unknown	48	4	6	9	34	11	26	30
Homeless Status								
Homeless any point	35	34	13	28	44	25	63	14
Never homeless	39	23	14	19	31	23	37	27
Medical Home Prior Usage								
Yes	38	23	14	19	32	23	39	26
No	53	31	10	27	30	28	39	13

Source: Mathematica analysis of HAQ responses collected December 2008 through June 2010 among 5,622 respondents who completed a survey upon initial enrollment and again at renewal or re-enrollment after a short gap (one to four months).

* The percentage responding excludes those who responded "don't know" or refused to respond on one or both surveys.

One in three participants felt that the quality of their care improved with participation in HSF. Although many participants felt that their care before and after enrolling in HSF was the same (45 percent; Table 2), 32 percent said that it improved. Compared to their peers, those who experienced improvements in care were most often black (41 percent; Table 3), white (40 percent), or ever homeless (44 percent). Many participants who received care from a SFDPH clinic also reported improvements in care (39 percent). Slightly less than one-fourth of respondents (23 percent) felt that their care worsened while participating in HSF; younger participants (27 percent of those 18 to 24 years of age), Latinos, and Spanish speakers were more likely to express this (27 and 30 percent, respectively). Those who said that the quality of their care had improved were more likely than those who reported no change or worse care to reply that they experienced easier access to needed medical care now that they were in HSF (53 percent versus 28 percent and 18 percent).

Participants were most likely to report that their health status improved while receiving care from HSF clinics. Overall, 39 percent of respondents indicated improvements in self-reported health status over the year that they participated in HSF (Table 3). Health improvement varied by ethnicity, income level, age, and clinic selection. Reported improvements were most likely among participants who were black (48 percent) or Latino (49 percent), and Spanish speaking (51 percent; Table 3). Participants who had incomes above 301 percent of FPL or who were ever homeless were also more likely to report improvements in health status (52 percent and 63 percent, respectively). Older participants were less likely to report improvements in their health (34 percent). The remaining respondents reported that their health either stayed the same (35 percent) or declined (26 percent; Table 2). Reported declines were most likely among participants who were Chinese (32 percent) or receiving care at an SFCCC-NEMS facility (34 percent).

The majority of providers surveyed did not perceive any change in their ability to provide referrals to specialists or hospitals for existing patients who switched to HSF or to provide ongoing care to those with chronic conditions. For those who did perceive a change, they were more likely to report improvement in their ability to provide these services than being less able (Table 4). The one area where notable numbers of physicians and nurses perceived a decrease was in their ability to provide referrals for specialists, echoing concerns we heard from some participants in the focus groups.

Table 4. Perceived Effect of HSF Enrollment for Patients Seen by Providers Both Before and After Enrolling in HSF, Overall and by Provider Type

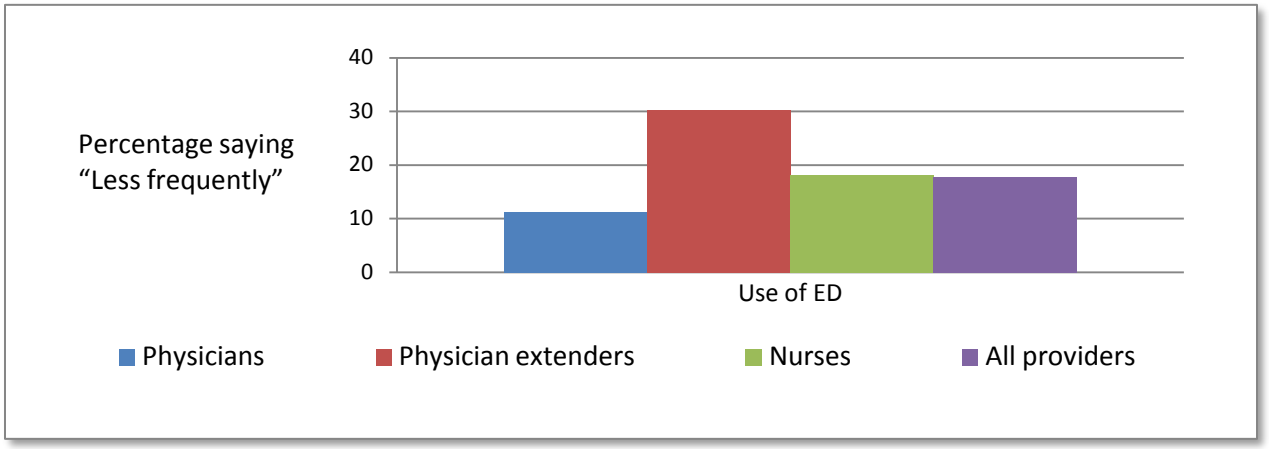
	Overall	Physicians	Physician Extenders	Nurses
Providers reporting being more able to (%):				
Provide referrals for specialists	20	15	35	14
Provide referrals for hospitals	13	10	26	10
Provide ongoing care to those with chronic conditions	20	21	27	14
Providers reporting no change in ability to (%):				
Provide referrals for specialists	68	71	57	66
Provide referrals for hospitals	79	82	67	81
Provide ongoing care to those with chronic conditions	75	73	71	83
Providers reporting being less able to:				
Provide referrals for specialists	13	14	7	20
Provide referrals for hospitals	8	8	7	10
Provide ongoing care to those with chronic conditions	4	6	2	3

Source: Mathematica's analysis of HSF Provider Survey, May–June 2010.

Most participants reported that they did not seek care at an ED before or during their participation in HSF. Seventy-seven percent of respondents reported at both enrollment and at renewal or re-enrollment that they did not visit a hospital ED for their own health in the prior 12 months (Table 2). A small portion of participants reported visiting the ED both before and after participation in HSF (5 percent). Of the remaining respondents, changes in reported ED utilization before and after participation in HSF were balanced; 10 percent visited an ED before participation but not afterwards, while 9 percent visited an ED after but not before participation in HSF.

Close to 40 percent of those who reported that they had used the ED before joining HSF but not during the year after enrolling also reported that their health status had improved; one-fourth reported that their health status had declined. The reverse pattern held for those who said that they used the ED after enrolling but not before and also reported that their health status had declined in the first 12 months of enrollment—37 percent reported a decline in health status and only 23 percent reported that their health status had improved. While these responses suggest that ED use is connected with health problems, it is important to note that recall bias may affect participants' self-reports of ED utilization.[19] Interestingly, although the majority of the providers surveyed reported that they saw no change in the use of the ED by HSF patients whom they had treated before they were enrolled in HSF, virtually none thought there had been an increase and quite a few thought there had been a decrease (Figure 1).

Figure 1. Perceptions of Providers as to Whether Patients Seen by Providers Both Before and After Enrolling in HSF are Visiting the ED Less Frequently, by Provider Type



Source: Mathematica's analysis of HSF Provider Survey, May–June 2010.

[19]We compared HAQ responses with encounter data on ED visits to assess recall bias and completeness of encounter data on ED visits. Among those who did not report ED use, 7 percent have an encounter record indicating an ED visit. Among those reporting ED use on the HAQ, only 40 percent had encounter records indicating an ED visit within the prior 12 months. When we allow ED visits outside of the 12-month window, we still find records for only 40 percent of those who self-reported an ED visit. While it is possible that it is 5 times more likely that someone would forget that an ED visit had occurred within the last year than think an ED visit was more recent than it was, another explanation of this asymmetry is that we are missing encounter data. We note that SFGH is the only hospital with complete reporting of ED visits for HSF participants. Other hospitals began submitting encounter data for HSF participants as early as December 2008; however, more than 93 percent of captured hospital encounters are at SFGH (http://www.healthysanfrancisco.org/files/PDF/2009-10_HSF_Annual_Report.pdf). The low percentage of HAQ respondents who indicated ED usage and had a documented visit suggests the undercount problem may be substantial.

B. To what extent are HSF participants utilizing available primary care services?

Having HSF participants select a medical home is intended, in part, to provide a usual source of care that strengthens the connection to primary care, with the aim of improving timely access to needed primary care and increasing preventive care. Through requiring participants to select a medical home, the HSF program establishes or, for those already seeking care in these settings, formalizes, a usual source of care for those enrolled. Prior research has shown a positive association between having a usual source of care and increased receipt of recommended preventive services for adults, such as flu shots and screening for cervical cancer, breast cancer, hypertension, and hyperlipidemia.[20] We found that most HSF participants are visiting their medical homes and many are receiving recommended preventive services. There is considerable variation across different subgroups that will be discussed below.

Table 5. Likelihood of Any Utilization Among HSF Participants, by Time Period

	Ever Enrolled in HSF*			Participants with 12 Months Continuous Enrollment**		
	N	% of Total	% of Those with Encounters	N	% of Total	% with Encounters
Total Sample	**95,580**	**100**	- -	**60,008**	**100**	- -
Has at least one encounter during enrollment	67,284	70	100	47,879	80	100
Has at least one encounter in first 365 days	62,515	65	93	43,573	73	91
Has at least one encounter after first week	64,120	67	95	46,540	78	97
Has at least one encounter during first week	16,325	17	24	10,238	17	21
Has encounters only during first week	3,164	3	5	1,339	2	3

Source: Mathematica analysis of HSF enrollment and encounter data, July 2007 through March 2011.

*Includes individuals enrolled in HSF for any length of time through March 31, 2011, the date on which encounter data were extracted.

**Includes individuals enrolled in HSF for at least 12 continuous months, provided the 12th month occurred on or before December 2010, the last month during which we consider encounter data reporting to be complete.

Most HSF participants utilize services while enrolled in the program, often during their first week of eligibility. Participants using HSF for "one-time" care are rare. Among those ever enrolled in HSF through March 2011, 70 percent had at least one service record for physician, inpatient, or ED care (Table 5). For those enrolled for at least 12 continuous months, 80 percent received at least one service. Seventeen percent (10,238) of those who used services did so within the first week of enrollment; and only ten percent (1,339) of those with first-week service use did not go

[20] DeVoe et al. "Receipt of Preventive Care Among Adults: Insurance Status and Usual Source of Care." *American Journal of Public Health*, vol. 93, no. 5, 2003, pp786-91; Xu et al. "Usual Source of Care in Preventive Service Use: A Regular Doctor versus a Regular Site." *Health Services Research,* vol.37, no. 6 2002, pp1509-529; Ettner et al. "The Relationship Between Continuity of Care and the Health Behaviors of Patients: Does Having a Usual Physician Make a Difference?" *Medical Care*, vol. 37, no. 6, 1999, pp. 547-55; Ettner et al "The Timing of Preventive Services for Women and Children: the Effect of Having a Usual Source of Care." *American Journal of Public Health,* vol. 86, no. 12, 1996, pp. 1748-754.

on to use additional services, suggesting that enrollment in HSF for "one-time" care is rare and that most HSF participants have engaged with the program or their medical home.[21]

Table 6. Frequency of CDPS- Flagged Chronic Conditions Among HSF Participants

	HSF Participants with 12 Months Continuous Enrollment (n=60,008)	
Category	N	%
One Chronic Condition	12,195	20
2+ Chronic Conditions	25,439	42
CDPS Category		
Cardiovascular	11,667	19
Pulmonary	11,196	19
Metabolic	10,286	17
Skeletal and Connective	7,624	13
Skin	6,105	10
Psychiatric	5,665	9
Gastrointestinal	5,620	9
Genital	5,618	9
Eye	4,752	8
Nervous System	4,664	8
Infectious Disease	4,410	7
Diabetes	4,286	7
Renal	3,255	5
Cancer	2,468	4
Substance Abuse	2,283	4
Ear	2,003	3
Hematological	1,529	3
HIV/AIDS	1,305	2
Pregnancy	792	1
Cerebrovascular	354	1
Birth	110	0.2
Developmental Disability	25	0.0

Source: Mathematica analysis of HSF enrollment and encounter data, July 2007 through December 2010. Encounter data extracted in March 2011. For more information on CDPS classification system, see Kronick et al. 2000.

Chronic disease is prevalent among HSF participants, suggesting that the need for services and care coordination is likely to be high. The HSF program serves a population with a substantial chronic disease burden. Among those enrolled for at least 12 continuous months, the most common chronic disease diagnoses were cardiovascular, pulmonary, or metabolic conditions (Table 6). Overall, 62 percent had at least one diagnosed chronic condition, and more than 40 percent had multiple comorbidities.

[21] Among those ever enrolled, only 18 percent of those with first-week service use did not use additional services. This statistic likely underestimates the percentage of participants who will go on to use additional services because the ever-enrolled population includes those who have been enrolled in HSF for fewer than 12 months; observations of their service use thus are truncated.

Nearly three-quarters of HSF participants had at least one physician visit within the first year of enrollment, and almost half received at least one recommended preventive service. Seventy-one percent of HSF participants had at least one physician visit during the first year of enrollment, and just over 40 percent did so within the first two months of enrollment, indicating that many HSF participants promptly engaged with primary care providers (Table 7). Considering specific preventive services, 48 percent received at least one of seven services we examined. Blood glucose testing was the most common, with 42 percent of participants receiving lab work that included glucose screening. Similarly, 40 percent of those over 35, for whom the USPSTF recommends cholesterol screening, received the test during their first year of enrollment in HSF, and one-quarter of those over 50 received colorectal cancer screenings.

Table 7. Receipt of Preventive Care Services Among HSF Participants During First 12 Months of Enrollment

	N	% of Target Panel of Patients*
Total Sample	**60,008**	**100**
Any physician visit	42,509	71
Visit within first two months	25,483	42
Any specified preventive service	28,946	48
Alcohol misuse counseling/screening (All ages)	162	0
Blood glucose testing (All ages)	25,407	42
STDs screening (All ages)	13,156	22
Flu vaccine (All ages)	6,580	11
Cholesterol testing (Target panel ages 35+)	15,556	40
Colorectal cancer screening (Target panel ages 50+)	5,194	26
Pneumonia vaccine (Target panel ages 50+)	632	3

Source: Mathematica analysis of HSF enrollment and encounter data, July 2007 through December 2010. Encounter data extracted in March 2011. For more information on U.S. Preventive Services Task Force recommendations, see "Recommendations for Adults." Available at: [http://www.uspreventiveservicestaskforce.org/adultrec.htm]. Accessed April 18, 2011. The list of codes to identify specific preventive services was developed by Mathematica and includes both standard and California-specific procedure codes.

*Denominators for these calculations are limited to the age-appropriate target panel for each preventive service. For example, roughly 38,900 of the 60,008 sample members were ages 35 or older; of those, 15,556—or about 40 percent—received recommended cholesterol testing.

We expect that some rates that appear to be relatively low—such as alcohol misuse counseling or screening—actually are underreported, in part because the clinics are not reimbursed for providing specific services, so many procedures are subsumed within a more inclusive office visit classification. In other cases, it is difficult to discern the real target population from administrative records. For example, STD screenings typically are not indicated for older individuals in committed partnerships; however, we have no way of distinguishing that group in the data. As another example, pneumonia vaccines for the over-50 group are not administered annually because they provide longer-term protection. Many in the HSF population may have received the vaccine prior to enrolling. The service use rates for HSF presented here are best viewed as baselines from which to gauge future performance.

Nearly all individual characteristics that we examined were significant predictors of the likelihood of receiving primary and preventive care, reflecting the fact that voluntary care (in contrast to emergency or inpatient care) may be more subject to cultural or social network influences. Descriptive differences in the likelihood that HSF participants received primary or

preventive care (Table A.3) generally remained statistically significant in regression models that controlled for individual characteristics (Table 8). For brevity, we focus the discussion on regression-controlled results.

For physician services, factors predicting receipt of care at any point during the year were somewhat different than those predicting which participants had a physician visit within two months of enrollment. For example, women were 6 percent more likely to have any physician visits during the year when compared with men; however, they were 12 percent less likely to have one within two months after enrollment (Table 8).[22] Young adults (those younger than 25) were less likely to have a visit during the first two months than those older than 45, but there were no significant differences between the youngest and the oldest in the likelihood of having a visit during the first year. White participants were more likely than all but black participants to visit a physician within the first two months, however, they were less likely to have any physician visit during the first twelve months than black participants, and ethnicity had no influence on the likelihood of visiting a physician.

Those with higher chronic disease burden were more likely to have any visits and receive visits within two months, as were those with a mental health diagnosis; however, participants with a substance abuse diagnosis were less likely to have a physician visit. English speakers and those for whom an SFCCC clinic is their medical home were also more likely to have one or more physician visit during the first year and during the first two months. However, those who were not previous users of their HSF medical home and the homeless were less likely.

For preventive services, older individuals, non-whites, higher income groups, Chinese speakers, individuals with greater chronic disease burdens, and those enrolled with SFDPH medical homes all were more likely to receive at least one specified preventive service. Older participants were more likely to have any physician visits, both within the first year and within the first two months, and more likely to receive preventive services. Also, for both prompt and preventive care, the higher levels increased with age (for example, participants 45–54 years of age were approximately twice as likely to receive preventive services as those under 25 years old, whereas those 55 years of age and older were almost three times as likely as the youngest group.

[22]Table 8 presents estimated odds ratios from logistic regression models predicting the likelihood of a physician visit and the receipt of preventive services. An odds ratio of 1.0 means that the event was as likely to occur in the group of interest (for example, women) as in the reference group (for example, men). An odds ratio greater than 1.0 means the event was more likely to occur than in the reference group, while an odd ratio less than 1.0 means the event was less likely to occur.

Table 8. Individual Characteristics Associated with the Likelihood of Primary and Preventive Care Receipt: Regression Results

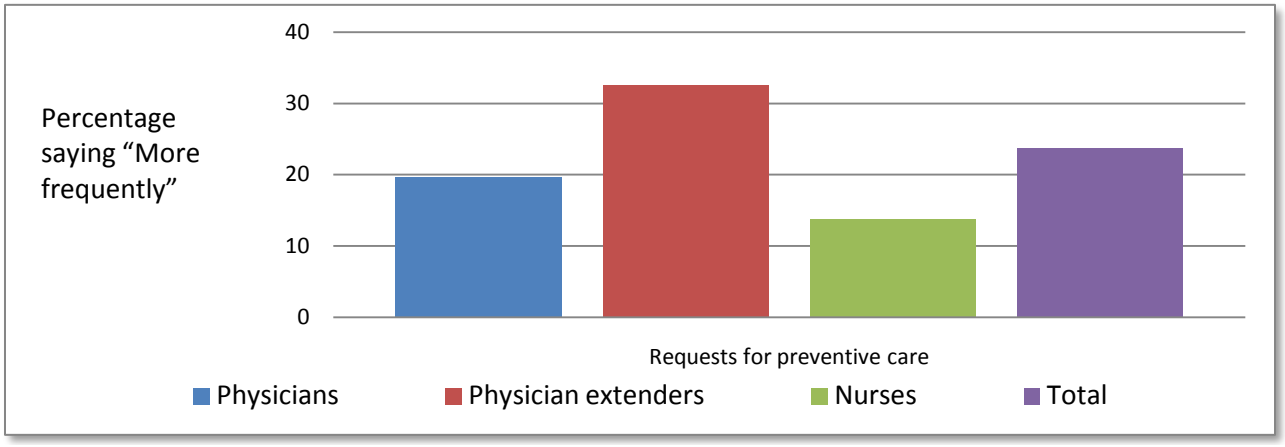
	Estimated Odds Ratios		
	Physician Services		
	Within First 12 Months	Within First 2 Months	Any Specified Preventive Services
Gender			
Male	Reference	Reference	Reference
Female	1.06*	0.88**	1.01
Initial Age Group			
18-24	Reference	Reference	Reference
25-44	1.10**	1.12**	1.31**
45-54	1.08	1.19**	1.90**
55+	0.99	1.35**	2.58**
Race/Ethnic Group			
Black	1.18**	1.09*	1.14**
Chinese	1.11	0.95	1.68**
Latino	0.93	0.92*	1.22**
White	Reference	Reference	Reference
Other/unknown	0.95	0.92**	1.27**
Initial FPL Level			
≤ 100%	Reference	Reference	Reference
101-200%	1.09*	0.86**	1.12**
201-300%	1.21**	0.93	1.18**
301%+	0.82	0.76*	0.97
Spoken Language			
Chinese	0.96	0.84**	1.31**
English	Reference	Reference	Reference
Spanish	0.82**	0.82**	0.98
Other/unknown	0.98	0.79**	1.16*
Chronic Conditions			
No chronic conditions	Reference	Reference	Reference
One chronic condition	25.95**	5.06**	7.42**
Two or more chronic conditions	103.12**	10.30**	22.70**
Substance Abuse Diagnosis	0.48**	0.92	1.48**
Mental Health Diagnosis	1.23*	1.24**	1.35**
Cohort			
1st cohort (7/07-12/07)	Reference	Reference	Reference
2nd cohort (1/08-8/08)	1.01	0.95	0.91*
3rd cohort (9/08-1/09)	1.29**	0.96	0.98
4th cohort (2/09-6/09)	1.38**	1.24**	1.09*
5th cohort (7/09-12/09)	1.36**	1.18**	1.27**
Initial Medical Home			
DPH	Reference	Reference	Reference
SFCCC	1.28**	1.29**	0.79**
Other	0.70**	0.82**	0.47**
Not a Prior User of Medical Home	0.87**	0.90**	0.87**
Homeless at Some Point	0.57**	0.94*	0.69**
Immediate Renewal at 365 Days	1.52**	0.86**	1.49**

Source: Mathematica analysis of HSF enrollment and encounter data, July 2007 through December 2010. Encounter data extracted in March 2011. Regression sample included 60,008 individuals with at least 12 months continuous enrollment, provided the 12th month occurred in December 2010 or earlier.

**Significant at $p < 0.01$.
*Significant at $p < 0.05$.

HSF has implemented initiatives to improve the delivery of chronic care, particularly for those with diabetes. Several of the participants in the focus groups were diabetics, all of whom reported a noticeable (and appreciated) increase in the amount of services they received tailored to controlling their condition. In addition, while many providers responding to our survey reported no perceived change in the requests for preventive care from their patients after they enrolled in HSF, those providers who did perceive a change reported an increase in requests for these services (Figure 2). Although enrollees in an SFCCC medical home were more likely than those in an SFDPH medical home to have one or more physician visit during the first year, they were less likely to receive one or more of the specified preventive services. While this finding may reflect different provider protocols or patient needs, another explanation is that providers in the SFCCC medical homes are less likely to code these specific procedures and instead simply indicate a routine office visit.

Figure 2. Perceptions of Providers as to Whether Patients Seen by Providers Both Before and After Enrolling in HSF are Requesting Preventive Care More Frequently, by Provider Type



Source: Mathematica's analysis of HSF Provider Survey, May–June 2010.

Most HSF participants had between one and six physician visits per year, and a small percentage had monthly, or more frequent, visits. About 29 percent of HSF participants had no physician visits, another 27 percent had just one or two visits, and 28 percent had between three and six visits during the first year (Table 9). Five percent had 12 or more visits during the year.

Table 9. Distribution of Physician Visits Among HSF Participants During the First Year of Enrollment

	N	%
Total Sample	60,008	100
No physician visits	17,499	29
1-2 visits	16,207	27
3-6 visits	16,822	28
7-11 visits	6,654	11
12+ visits	2,826	5

Source: Mathematica analysis of HSF enrollment and encounter data, July 2007 through December 2010. Encounter data extracted in March 2011.

Older individuals, those with greater chronic disease burden, enrollees in one of the SFDPH medical homes, and those who went on to renew enrollment in HSF had more physician visits. Women, Chinese, individuals from households below the FPL, and those who have been homeless had fewer visits. There was also a decrease, controlling for all observed individual characteristics, in the number of visits for later cohorts. Among those with at least one physician visit, the number of physician visits increased with age. Those ages 25 to 44 received 7 percent more visits than those ages 18 to 24, while the oldest group—those ages 55 to 64—received 24 percent more visits (Table 10). Similarly, physician office use increased with increasing chronic disease burden. Those with two or more chronic conditions were expected to have 169 percent more visits than those with no chronic conditions. Those who went on to immediately renew enrollment in HSF had about 18 percent more visits than those who did not immediately renew, a result consistent with participants weighing the costs and benefits of HSF participation before making their next enrollment decision.

Table 10. Individual Characteristics Associated with Frequency of Physician Visits Among Those with at Least One Visit During the First Year of Enrollment: Regression Results

	Predicted Percentage Change in Number of Visits
Gender	
Male	Reference
Female	-2.5**
Initial Age Group	
18-24	Reference
25-44	7.0**
45-54	19.1**
55+	23.7**
Race/Ethnic Group	
Black	0.8
Chinese	-3.1
Latino	1.9
White	Reference
Other/unknown	-2.6*
Initial FPL Level	
<=100%	Reference
101-200%	-3.6**
201-300%	-1.0
301%+	-5.6
Spoken Language	
Chinese	-9.7**
English	Reference
Spanish	0.1
Other/unknown	2.4
Chronic Conditions	
No chronic conditions	Reference
One chronic condition	34.4**
Two or more chronic conditions	169.2**
Substance Abuse	5.4**
Mental Health Diagnosis	20.0**
Cohort	
1st cohort (7/07-12/07)	Reference
2nd cohort (1/08-8/08)	-4.7**
3rd cohort (9/08-1/09)	-4.4**
4th cohort (2/09-6/09)	-6.0**
5th cohort (7/09-12/09)	-9.7**
Initial Medical Home	
DPH	Reference
SFCCC	3.7**
Other	0.5
Not a Prior User of Medical Home	-8.0**
Homeless at Some Point	-5.7**
Immediate Renewal at 365 Days	17.6**

Source: Mathematica analysis of HSF enrollment and encounter data, July 2007 through December 2010. Encounter data extracted in March 2011. Regression sample included 42,509 individuals with at least 12 months continuous enrollment, provided the 12th month occurred in December 2010 or earlier, and at least one physician visit within the first 12 months of enrollment.

**Significant at $p < 0.01$.
*Significant at $p < 0.05$.

Most participants with ED visits or inpatient admissions received prompt outpatient followup. Eleven percent of HSF participants had an ED visit, while 3 percent had an inpatient hospitalization during their first year of enrollment (Table 11). While most participants using hospital services received a follow-up physician visit within one month of discharge, about 44 percent of participants with ED visits and 29 percent of patients with an inpatient admission did not obtain a follow-up outpatient visit within one month.[23] Improving the hospital-to-primary care transition, particularly for the large number of HSF participants with serious chronic disease burden, may be an important strategy for realizing further health improvements for participants, and ultimately long-term savings for San Francisco's health care system. Participants' education on appropriate care following hospitalization (for example, following up with their medical home) may be one strategy for improving care coordination.

Table 11. Likelihood of Physician Visit Followup to Inpatient and ED Use by HSF Participants Continuously Enrolled for at Least 12 Months

	HSF (n=60,008)		
Measure	Participants with at Least One Event	% of Total	% of Those with Event
ED Visit	6,876	11	100
ED visit with physician followup within one month	3,821	--	56
ED visit without physician followup within one month	3,055	--	44
Inpatient Admission	1,604	3	100
Inpatient admission with physician followup within one month	1,133	--	71
Inpatient admission without physician followup within one month	471	--	29

Source: Mathematica analysis of HSF enrollment and encounter data, July 2007 through December 2010. Encounter data extracted in March 2011.

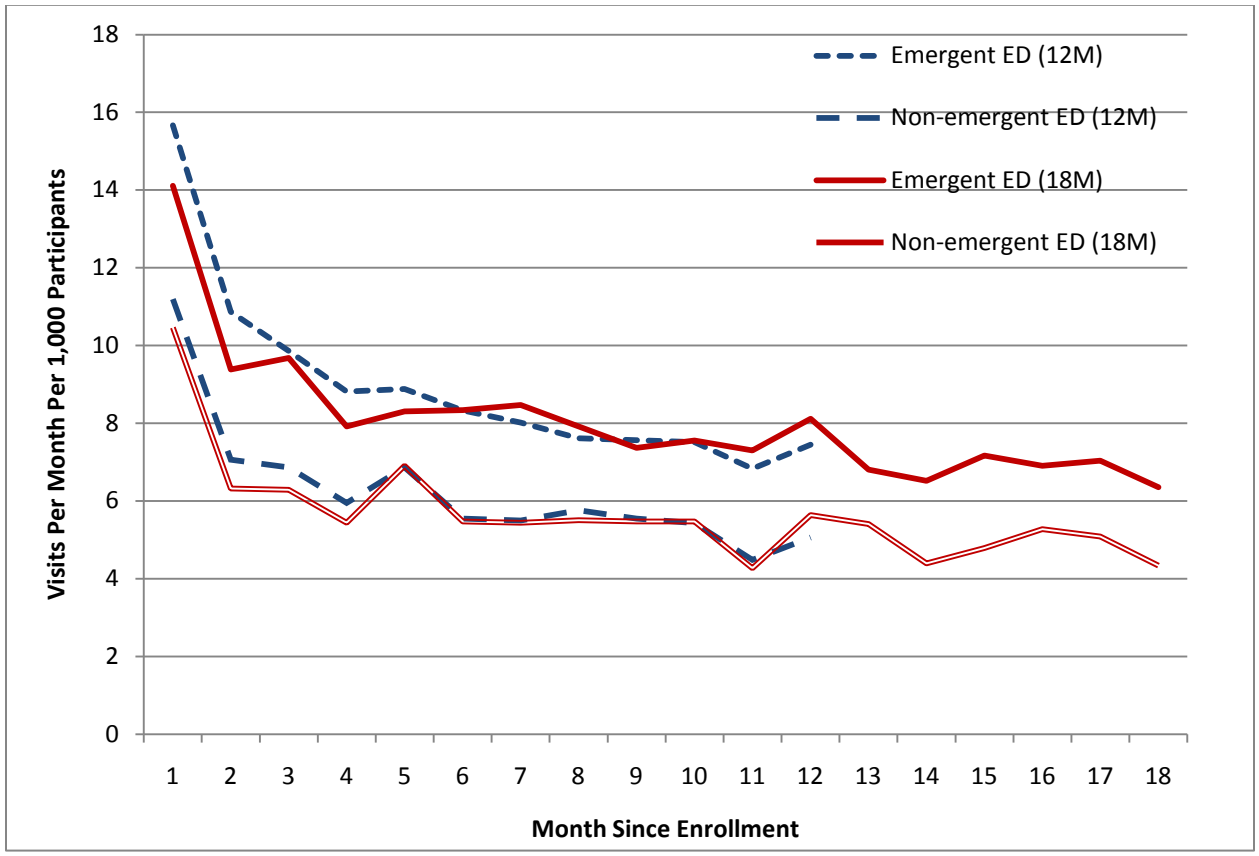
C. To what extent has HSF led to a decrease in emergent and non-emergent ED visits and in potentially avoidable hospitalizations?

HSF participants show steadily declining ED use over time. Although direct followup to hospitalizations could be improved, HSF participants show steadily declining use of the ED as their enrollment in the program continues (Figure 3).[24] Declines in the use of the ED for non-emergent care suggest that HSF has successfully encouraged beneficiaries to shift some of their non-urgent care to the more appropriate medical home setting.

[23] Table 11 presents statistics at the individual level; that is, 44 percent of patients with at least one ED visit had at least one instance in which the visit did not have a physician visit followup within a month. Because most users of ED and inpatient services had only one visit, these statistics do not differ when we consider the percentage of *visits* with followup rather than the percentage of *individuals* with followup.

[24] We looked at both 12- and 18-month timeframes. The sample of HSF participants who were enrolled continuously for 18 months provides information about whether the downward trend observed during the first year continued for those who renew or whether the incidence rate "bottomed out" during the first year.

Figure 3. Monthly Emergent and Non- Emergent Visits per 1,000 Participants Enrolled for at Least 12 and 18 Continuous Months



Source: Mathematica analysis of HSF enrollment and encounter data, July 2007 through December 2010. Encounter data extracted in March 2011. For individuals with at least 12 months continuous enrollment (n=60,008), the 12th month occurred in December 2010 or earlier. For individuals with at least 18 months continuous enrollment (n=30,689), the 18th month occurred in December 2010 or earlier.

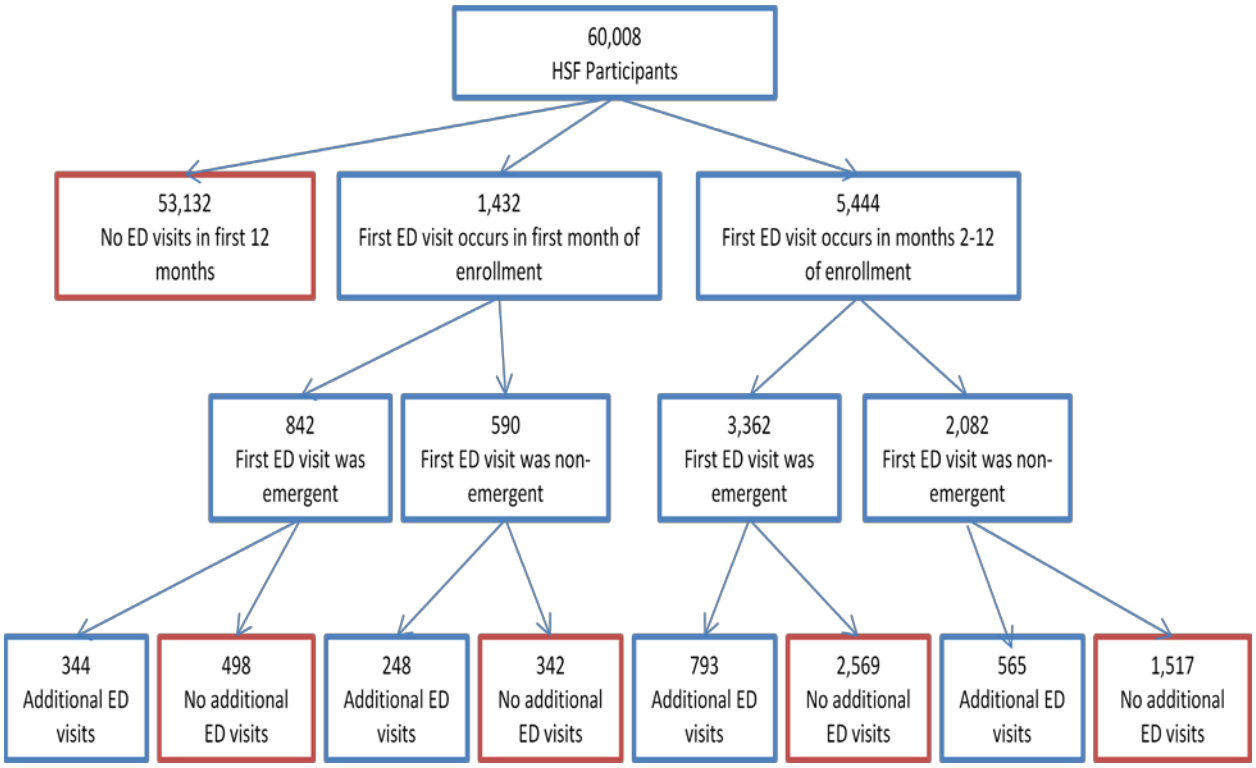
We note that non-emergent ER use will never reach zero because primary care clinics do not provide 24/7 access to care and some participants inevitably will develop urgent conditions during evening or weekend hours that are treatable in a primary care setting. In their study of ED visits by nonelderly adults in Massachusetts, Long and Stockley found that three out of four adults who used the ED for non-emergency care gave "Needed care after normal operating hours" as the reason.[25] Encouragingly, HSF participants also use the ED for fewer *emergent* visits. Declines in emergent care use may be due to health status improvements that beneficiaries have realized as a result of improved primary care through their HSF medical home.[26]

[25] Long, Sharon K. and Karen Stockley. "Who Uses Emergency Care and Why?" Washington DC: Urban Institute, September 2009.

[26] Our data on ED utilization primarily reflect care delivered at SFGH. While some hospitals participating in HSF began reporting ED and inpatient use in 2009, other participating hospitals began submitting these data only recently. In addition, some HSF participants may receive care at hospitals that do not participate in HSF. As such, we cannot rule out the possibility that at least part of the observed declines is due to participants shifting their utilization to other emergency

Most HSF participants did not make multiple ED visits, suggesting they are not inappropriately utilizing the ED for routine care. ED use was particularly high during the first month of enrollment because many HSF participants first became aware of the program at the time of an ED visit. We separated those with an ED visit in the first month from those with later events and examined the likelihood of repeat ED utilization (Figure 4). About one-fifth of all first-time ED visits among HSF participants (1,432 of 6,876 first ED visits) occurred within the first month of enrollment, and about 59 percent of those visits were for emergencies (842 of the 1,432 first ED visits occurring within the first month). Almost 60 percent of this group had no further ED use during the first year of enrollment (498 of the 842 emergent ED visits). Seventy-nine percent (5,444) of first-time ED visits occurred after the first month of enrollment. For this group, 62 percent (3,362) were for emergencies, and 76 percent of these individuals (2,569) had no further ED visits during the year.

Figure 4. Initial and Repeat ED Utilization Among HSF Participants with at Least 12 Months Continuous Enrollment



Source: Mathematica analysis of HSF enrollment and encounter data, July 2007 through December 2010. Encounter data extracted in March 2011.

Chronic disease burden, homelessness, language/ethnicity, and medical home were the primary factors predicting both ED and inpatient hospitalizations. Household income also predicted ED use, and age predicted inpatient hospitalizations. Rates of ED visits and inpatient hospitalizations varied across different population subgroups (Table A.4). Participants with one or

(continued)
facilities in San Francisco. However, we have no evidence to believe that this is occurring. Indeed, OSPHD patient discharge data suggest that SFGH provided a greater proportion of San Francisco's charity care in 2009 relative to 2007.

more chronic conditions were more likely to have non-emergent ED visits, emergent ED visits, and inpatient hospitalizations. Those with two or more conditions were eight times as likely as those with no chronic conditions to have an emergent ED visit (Table 12). Those with substance abuse diagnoses also were more likely to use all hospital services, and those with mental health problems were more likely to have non-emergent ED visits but less likely to have an inpatient admission. Reflecting their increased exposure to health hazards (inconsistent nutrition and shelter) and likely reduced ability to connect with available primary care services to manage chronic conditions consistently, homeless individuals were about twice as likely to use the ED and 65 percent more likely to have a hospitalization.

In contrast, non-English speakers and ethnically Chinese participants were less likely to use both ED and inpatient hospital services. While these findings may reflect a difference in participant behavior, we do not have a strong theoretical basis for believing that use of hospital care—particularly emergent ED use and inpatient hospitalizations, which are less driven by individual choice—should be influenced by language and ethnicity in models that include several controls for health status. HSF participants enrolled in an SFCCC medical home also were less likely to use all three forms of hospital services than were those enrolled in an SFDPH medical home. We believe the most likely explanation for all of these findings is one related to data quality. As noted earlier, virtually all hospital services included in the data set used for these analyses were rendered at SFGH. If non-English speakers and those who selected an SFCCC clinic as their medical home are more likely to visit other San Francisco hospitals for ED and inpatient services, we would observe fewer hospital visits, even though these individuals may be receiving hospital services at the same, or an even greater, rate than English speakers and SFDPH enrollees concentrating their utilization at SFGH.

In addition to these characteristics, race and household income were significant predictors of ED use (but not inpatient hospitalization). In contrast, age was a significant predictor of hospitalizations but not ED use. Blacks were more likely to have non-emergent and emergent ED visits than were whites (27 and 26 percent, respectively). Participants from households with incomes above the FPL were less likely to use the ED than those from households below. It is possible that higher-income individuals may have more experience with private health insurance and receiving primary care services in a physician's office and are less likely to consider the ED for non-emergent care. Older participants, even controlling for chronic disease burden, are more likely to have an inpatient stay than those under 25 years of age.

Table 12. Individual Characteristics Associated with the Likelihood of ED Visit and Inpatient Hospital Admission Among HSF Participants During the First 12 Months of Enrollment: Regression Results

	Estimated Odds Ratios		
	Non-Emergent ED Use	Emergent ED Use	Inpatient Hospitalization
Gender			
Male	Reference	Reference	Reference
Female	0.93	0.82*	0.81**
Initial Age Group			
18-24	Reference	Reference	Reference
25-44	1.07	0.99	1.32*
45-54	0.95	0.90	1.40**
55+	0.86	0.69**	1.32*
Race/Ethnic Group			
Black	1.27**	1.26**	1.06
Chinese	0.74**	0.51**	0.54**
Latino	0.91	1.00	1.05
White	Reference	Reference	Reference
Other/unknown	0.89*	0.85**	0.83*
Initial FPL Level			
≤ 100%	Reference	Reference	Reference
101-200%	0.82**	0.87**	0.86
201-300%	0.61**	0.65**	0.99
301%+	0.90	0.49**	0.77
Spoken Language			
Chinese	0.48**	0.70**	0.60**
English	Reference	Reference	Reference
Spanish	0.78**	0.66**	0.56**
Other/unknown	0.67**	0.72**	0.61**
Chronic Conditions			
No chronic conditions	Reference	Reference	Reference
One chronic condition	4.62**	3.00**	6.84**
Two or more chronic conditions	9.63**	8.44**	41.89**
Substance Abuse Diagnosis	2.86**	2.00**	2.42**
Mental Health Diagnosis	1.37**	0.92	0.70**
Cohort			
1st cohort (7/07-12/07)	Reference	Reference	Reference
2nd cohort (1/08-8/08)	0.87*	0.95	0.84*
3rd cohort (9/08-1/09)	0.93	1.05	0.86
4th cohort (2/09-6/09)	0.95	1.05	0.82*
5th cohort (7/09-12/09)	0.94	1.05	0.79*
Initial Medical Home			
DPH	Reference	Reference	Reference
SFCCC	0.83**	0.77**	0.79**
Other	1.69**	1.06	0.87
Not a Prior User of Medical Home	1.00	0.92	0.98
Homeless at Some Point	2.10**	2.00**	1.65**
Immediate Renewal at 365 Days	0.93*	0.93*	0.99

Source: Mathematica analysis of HSF enrollment and encounter data, July 2007 through December 2010. Encounter data extracted in March 2011. Regression sample included 60,008 individuals with at least 12 months continuous enrollment, provided the 12th month occurred in December 2010 or earlier.

**Significant at $p < 0.01$.
*Significant at $p < 0.05$.

To analyze the impact of HSF on ED use and potentially avoidable hospitalizations, we examined trends at SFGH, the primary hospital for HSF participants, compared to all other public hospitals in California (n=16). We compared trends for the HSF target population (uninsured or self-paying nonelderly adults) to three control groups: insured adults (Medi-Cal, Medicare, or private insurance), children, and the elderly. Because HSF has enrolled more than half of uninsured adults in the city, we would expect that changes in hospital utilization patterns among HSF participants may be sufficiently large to affect the utilization trends among uninsured patients using SFGH. Trends for insured adults, children, and the elderly illustrate whether there may be underlying citywide or statewide utilization trends driven by provider supply or accessibility. If HSF has had an impact on ED use or potentially avoidable hospitalizations, use among the uninsured or self-pay adult population at SFGH should have declined beginning in 2007 relative to the trends in use for other populations and at other hospitals.

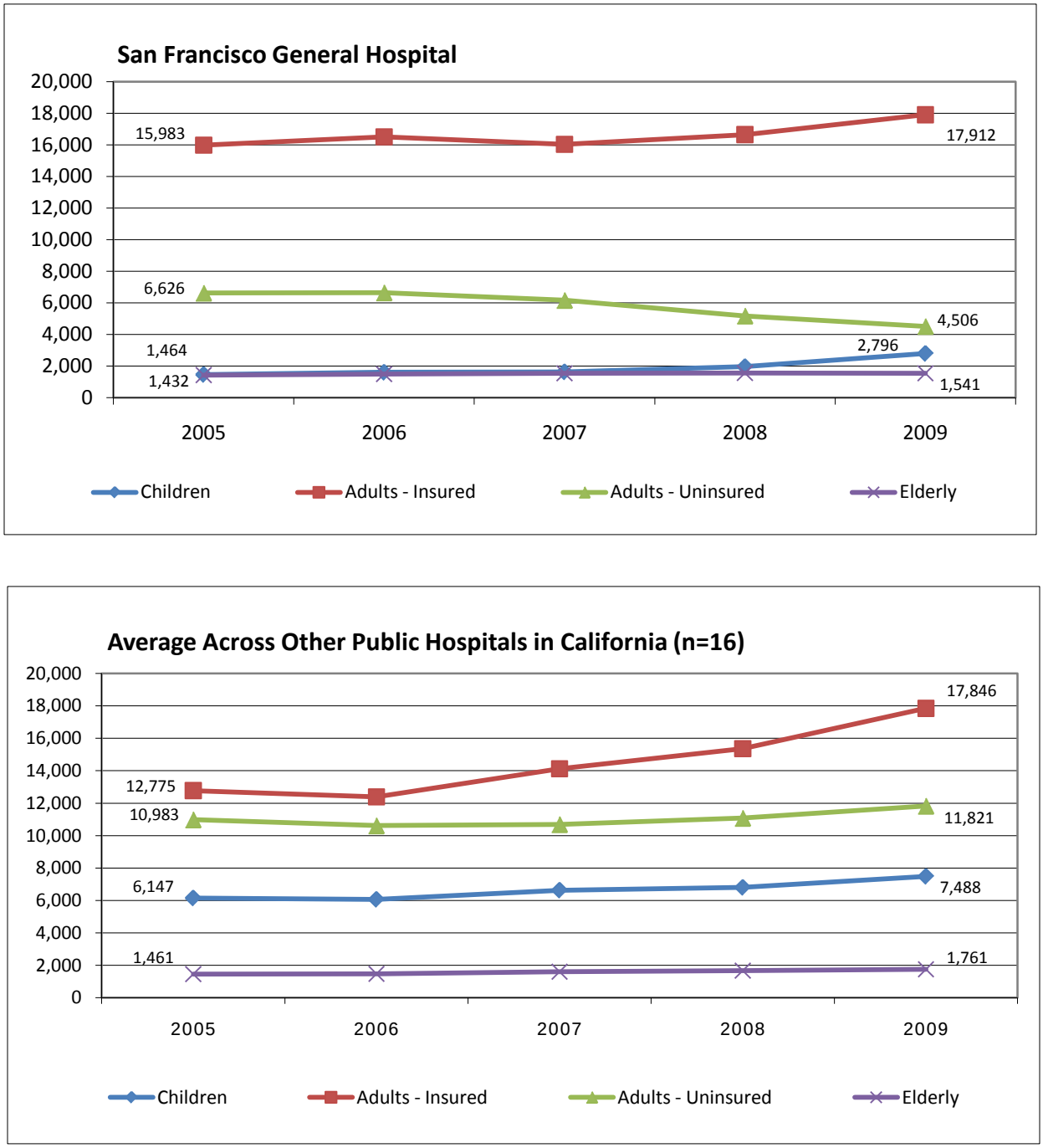
HSF appears to be associated with a decrease in the number of non-emergent ED visits to SFGH made by uninsured adults. In 2005 and 2006, uninsured adults made about 6,600 non-emergent ED visits to SFGH (Figure 5). In 2007, the year during which HSF was launched, the number of non-emergent ED visits made by uninsured adults began to decline, reaching 4,500 visits by 2009.[27] Concurrent with this decline, HSF enrollment grew steadily, reaching more than 45,000 by the end of 2009. In contrast, the average number of non-emergent ED visits among uninsured adults at other public hospitals in California grew from 2005 to 2009. Insured adults and children made slightly more non-emergent ED visits to SFGH and other public hospitals in 2009 than in 2005, and use among the elderly remained steady. Because the decrease in non-emergent ED visits began in the year that HSF was launched, was seen only in the program's target population group, and was different from the general trend for California public hospitals, there is evidence that the HSF program has led to uninsured adults in San Francisco reducing their use of the SFGH ED for non-emergent care. Lending further support to this hypothesis, the pool of uninsured San Francisco residents potentially utilizing SFGH grew by an estimated seven percent from 2007 to 2009, a trend that would be expected to *increase* the number of visits made by this group.[28]

Uninsured adults in San Francisco made fewer emergent ED visits in 2009 than in 2007, but we are uncertain that the decline can be attributed to the HSF program. From 2005 to 2009, the number of emergent ED visits to SFGH by uninsured adults declined steadily, reaching 1,985 in 2009 (Figure 6). During the same period, the number of emergent ED visits for all other groups increased. Children and the elderly made slightly more emergent ED visits to SFGH and other public hospitals in 2009 compared to 2005 and insured adults at all public hospitals made many more visits. While we are certain that HSF's target population made fewer emergent ED visits during the program's operation (2007 to 2009), the decline was a continuation of the trend that began before the launch of HSF. Thus, while it is possible that HSF allowed this trend to persist or accelerate, we are uncertain whether the decline in emergent ED visits can be attributed to the HSF program.

[27] We present counts of ED visits rather than a rate—for example, the percentage of uninsured nonelderly adult residents with an ED visit—because we do not have accurate estimates of the appropriate denominator (the number of uninsured and insured nonelderly adults, elderly adults, and children) on an annual basis for San Francisco and the other counties in California.

[28] The number of uninsured adult San Francisco residents increased from an estimated 60,000 to 64,000 from 2007 to 2009. California Health Interview Survey. Query submitted on April 21, 2011.

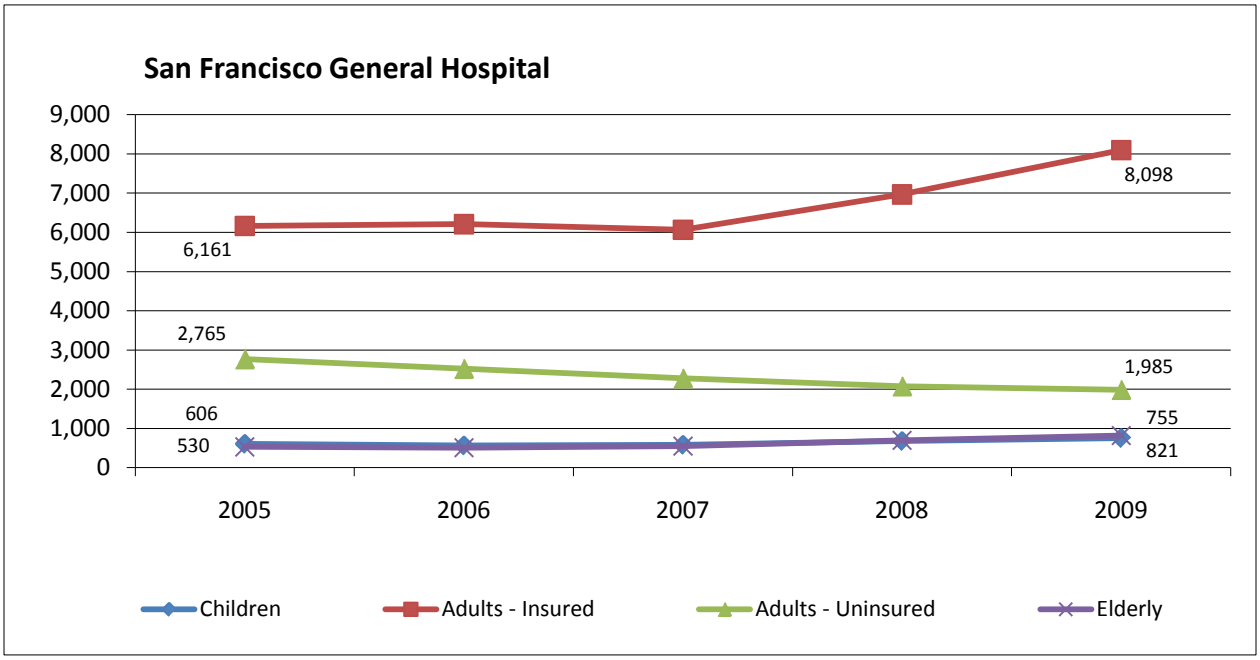
Figure 5. Number of Non- Emergent ED Visits to SFGH and Other Public California Hospitals, 2005–2009[29]

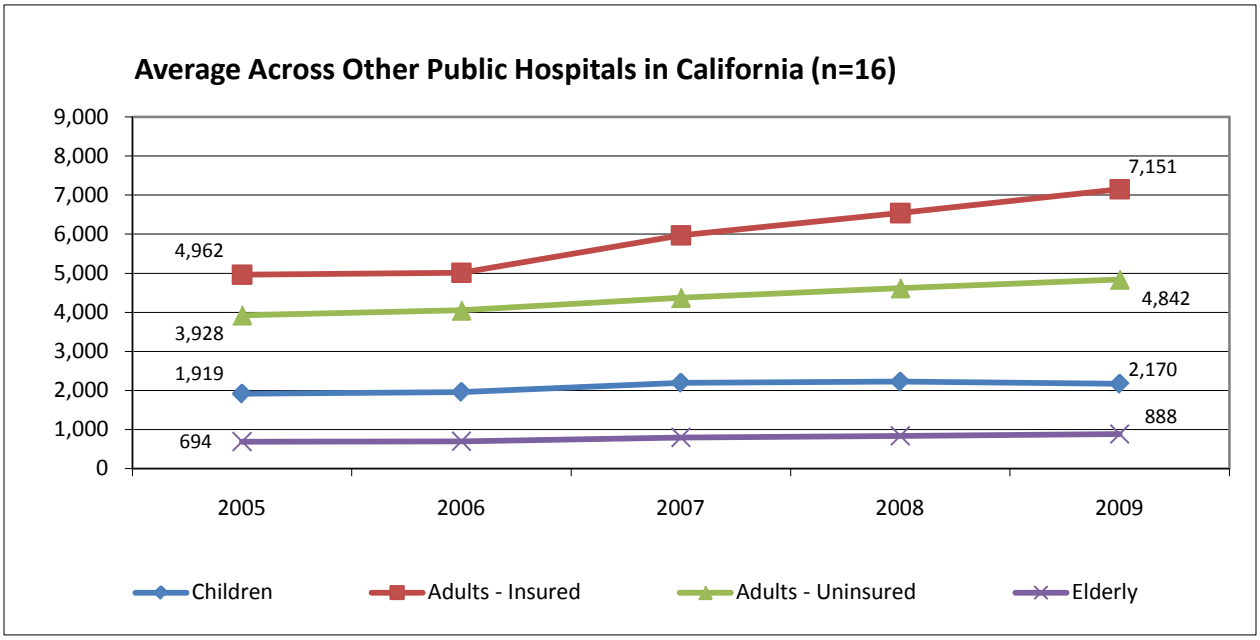


Source: Mathematica analysis of ED discharge records for California hospitals in 2005–2009, collected by the California Office of Statewide Health Planning and Development.

[29] We also compared trends at SFGH to trends in other California hospitals with (1) a comprehensive ED or (2) more than 500 beds. The trends in visits to hospitals with a high skill intensity and large size mirror those found in all other California public hospitals combined. For this reason, we compare visits to SFGH to average visits across all other California public hospitals throughout the analysis.

Figure 6. Number of Emergent ED Visits in SFGH and Other Public California Hospitals, 2005–2009



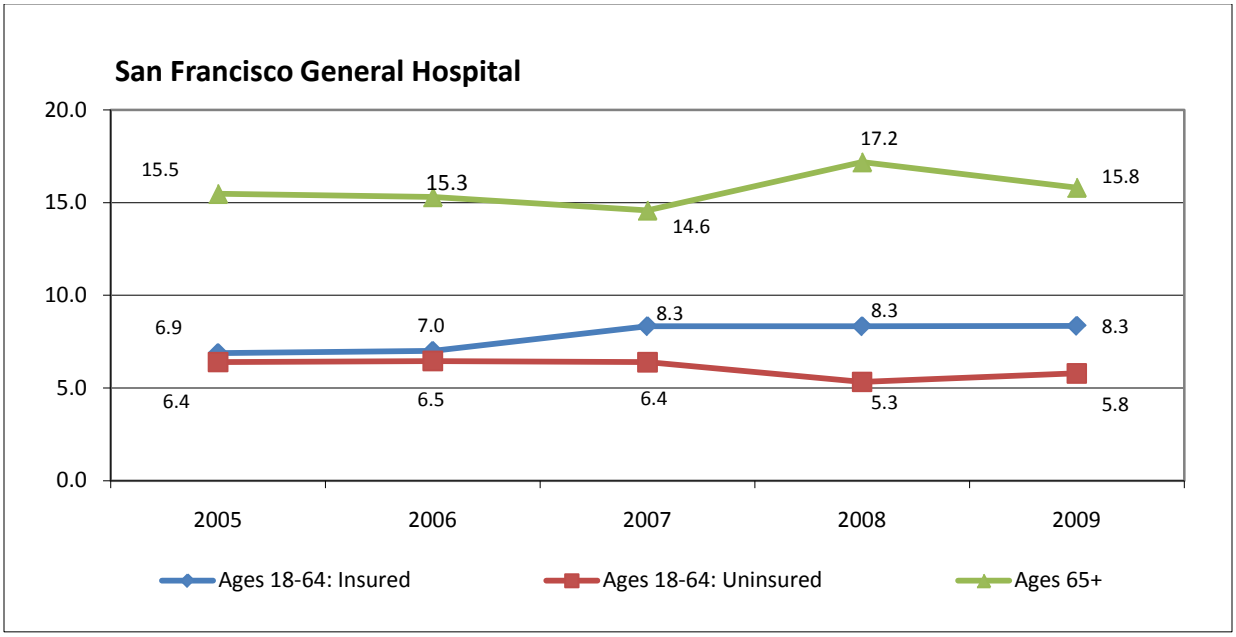


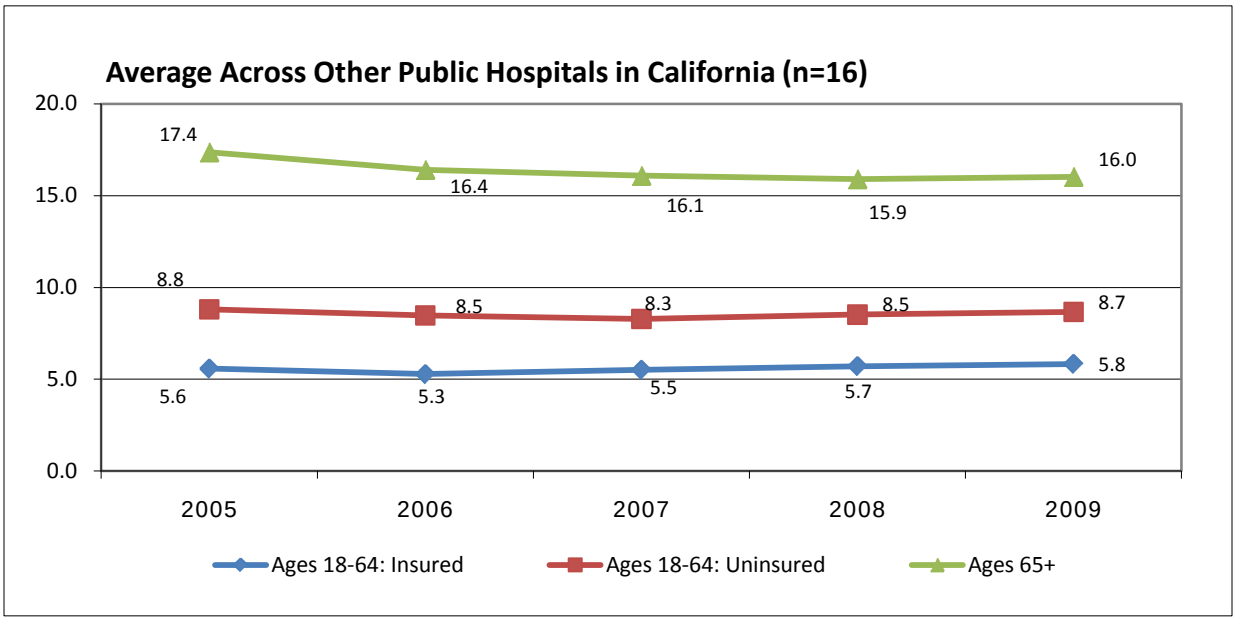
Source: Mathematica analysis of ED discharge records for California hospitals in 2005-2009, collected by the California Office of Statewide Health Planning and Development.

HSF appears to be associated with a decrease in potentially avoidable hospitalizations made by uninsured adults in San Francisco. In 2005 and 2006, about 6.5 percent of hospitalizations for uninsured adults at SFGH were potentially avoidable (Figure 7). Beginning in 2007, the year of HSF's launch, potentially avoidable hospitalizations among the uninsured at SFGH began to decline, reaching 5.8 percent of all hospitalizations by 2009. In contrast, the percentage of potentially avoidable hospitalizations among insured adults at SFGH remained steady from 2007 to 2009, while the rate among the elderly grew from 14.6 to 15.8 percent. At all other public hospitals in California, the percentage of potentially avoidable hospitalizations among insured and uninsured

adults rose over the period from 2007 to 2009 and remained steady for the elderly. Because the percentage of potentially avoidable hospitalizations began to decline in the year that HSF was launched, was seen only in the program's target population group in San Francisco, and was different from the trends for adults in other California public hospitals, there is evidence that the HSF program has helped uninsured adults in San Francisco avoid hospitalizations for preventable conditions.

Figure 7. Percentage of Hospitalizations that are Potentially Preventable in SFGH and Other California Public Hospitals, 2005–2009





Source: Mathematica analysis of inpatient discharge records for California hospitals in 2005-2009, collected by the California Office of Statewide Health Planning and Development.

IV. CONCLUSIONS AND PROGRAM IMPLICATIONS

Our analyses suggest that HSF is providing access to timely and coordinated primary care services to a population that greatly needs them. More than 40 percent of HSF participants suffer from two or more chronic conditions. In general, HSF participants are regularly receiving outpatient care at their medical homes, including recommended preventive services, and are using fewer ED services over time, both emergent and non-emergent, which suggests both improved care-seeking behavior and health status. The number of ED visits and potentially avoidable inpatient admissions at SFGH from 2005 to 2009 declined beginning in 2007, a signal that the HSF program, which began in 2007, may have had an impact on utilization among the uninsured.

While the encounter data that we received do not include services rendered at nonparticipating providers and may be underreported for some of the participating providers and thus inadequate for assessing the level of service use at a point in time, we note that they are more reliable for assessing trends over time because data completeness has improved over the course of the program. That captured ED visits decreased over time, despite increased reporting, gives us greater confidence in the conclusion that HSF has led to improved access to primary care for participants. In addition, the hoped-for impact on the behavior of HSF participants is large enough that we see changes in SFGH-level data, which is strong evidence that HSF has had an impact on the low-income uninsured adult population in San Francisco.

Our analyses also show that, while most participants access care early in their enrollment, many also have subsequent visits during the first year of enrollment, suggesting that, for the most part, participants are not just enrolling in the program when they seek care at SFGH's ED or at one of the medical homes and then disengaging. HSF participants who have one of the SFDPH clinics as their medical home are more likely than others to report that they had delayed care prior to enrolling in HSF but not after enrolling. In general, participants rate the care they receive at their medical homes favorably and approximately 15 percent reported switching from not having a usual source of care to seeing their clinic as their primary source of health care.

We suspect that outpatient procedures received at participating providers, particularly preventive services, also are underreported in the encounter data we analyzed, in part because providers do not receive fee-for-service reimbursement for services and therefore may lack strong incentives to report specific preventive care services rendered. In our final report, we will examine data for a comparison group of enrollees in San Francisco's Healthy Workers program, whose members typically use the same providers as HSF participants. By examining their utilization patterns, we will be better able to judge the limitations of HSF encounter data.

A. Program Implications

There is evidence that HSF is increasing access to primary care for participating adults, improving self-reported health status, and altering their care-seeking behavior. Some opportunities for improvement exist. For example, Latinos and Spanish speakers were more likely than other participants to think that their current medical care was worse than before they joined HSF. Since this calculation is based on a change in how each respondent evaluated their care from when they first enrolled to when they renewed or re-enrolled in HSF, this finding should not reflect cultural response bias. It may be worth investigating further, however.

The success of the Strength in Numbers program, especially its focus on improving the coordination of care for diabetics, suggests that HSF should look for possibilities to expand the

program to include ways of improving care delivery and coordination to patients with other chronic conditions. Reducing the number of emergent ED visits and potentially avoidable hospitalizations for patients with chronic conditions not only increases the health status of these patients and the satisfaction of both patients and providers, but also may reduce financial resources devoted to these patients.

Even after controlling for age, race, ethnicity, chronic conditions, and diagnoses for mental health or substance abuse problems, those who had been homeless at some point were less likely to have a physician visit in the first 12 months of enrollment and to have received any of the measured preventive services. It is possible that this group disproportionately receives health care somewhere other than HSF medical homes and so their care is not captured in our data; however, those who had been homeless were also more likely to report difficulties in accessing needed care and, in fact, more likely to report that access was more difficult now that they were enrolled in HSF. These perceived access problems may reflect a lack of understanding of the HSF system, a desire to go to the closest clinic or ED when they feel they need care, an inability to keep track of appointments or foresee the need for care in a timely fashion, and difficulties in getting to a designated medical home for an outpatient visit. At the same time, this population was also more likely to say that the quality of care they were receiving in HSF was better and that their health status had improved. This population group presents challenges to any health care provider, but the HSF program may be well positioned to target efforts and increase utilization of appropriate outpatient primary care by these individuals, as well as education efforts on when and what care is needed.

APPENDIX A

SUPPLEMENTARY DATA

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Table A.1. Response Rates to HAQ at Renewal or Re- enrollment, by Demographic Characteristic

	Total Sample		Overall, how difficult is it for you and/or your family to get medical care when you need it?	During the past 12 months, did you either delay getting care or not get a medicine that a doctor prescribed for you?	How do you rate the medical care that you received in the past 12 months?
Characteristic	N	%	Any response (% of total)	Any response (% of total)	Any response (% of total)
Total	18,036	100	75	75	74
Gender					
Male	9,093	50	69	70	68
Female	8,943	50	81	81	80
Initial Age Group					
18-24	2,045	11	76	76	74
25-44	6,633	37	72	71	70
45-54	4,966	28	74	75	74
55-64	4,392	24	80	81	80
Race/Ethnic Group					
Black	1,131	6	56	56	56
Chinese	6,237	35	83	85	82
Latino	4,079	23	79	78	78
Other	3,552	20	72	72	71
White	3,037	17	63	63	62
Initial FPL Level					
0-100%	11,526	64	72	72	71
101-200%	4,905	27	80	81	79
201-300%	1,502	8	81	82	80
301%+	103	1	64	67	60
Spoken Language					
Chinese	6,130	34	83	85	82
English	7,869	44	66	66	65
Spanish	3,244	18	81	79	80
Other	793	4	79	79	79
Initial Medical Home					
Large DPH Clinic	2,972	16	71	71	70
Other DPH Clinic	5,718	32	63	62	61
SFCCC-NEMS	5,411	30	88	90	87
Other SFCCC	2,789	15	73	72	73
All other and unknown	1,146	6	89	89	88
Homeless Status					
Homeless at any point	2,241	12	29	29	29
Never homeless	15,795	88	82	82	80
Medical Home Prior Usage					
Yes	17,846	99	75	75	74
No	190	1	66	64	63

Source: Mathematica analysis of HAQ responses collected December 2008 through June 2010 among 18,036 respondents who completed a survey at renewal or re-enrollment after a short gap (one to four months).

Table A.2. Response Rates for Participants who Completed an HAQ at Initial Enrollment and Renewal or Re- enrollment, by Demographic Characteristic

	Total Sample		Overall, how difficult is it for you and/or your family to get medical care when you need it?	During the past 12 months, did you either delay getting care or not get a medicine that a doctor prescribed for you?	What kind of place do you go to most often to get medical care?	How do you rate the medical care that you received in the past 12 months?	Would you say that in general your health is excellent, very good, good, fair, or poor?
Characteristic	N	%	Any response (% of total)	Any response (% of total)	Any response (% of total)	Any response (% of total)	Any response (% of total)
Overall	5,622	100	57	59	67	51	81
Gender							
Male	2,919	52	52	54	61	46	78
Female	2,703	48	62	64	72	57	85
Initial Age Group							
18-24	920	16	63	63	75	57	86
25-44	2,160	38	53	54	61	47	78
45-54	1,398	25	56	58	66	49	80
55-64	1,144	20	60	63	71	55	84
Race/Ethnic Group							
Black	362	6	40	38	43	36	59
Chinese	1,838	33	66	72	82	61	92
Latino	1,137	20	59	57	67	53	82
White	1,075	19	48	49	53	40	71
Other	1,210	22	55	55	63	49	79
Initial FPL Level							
0-100%	3,711	66	55	56	64	48	78
101-200%	1,365	24	62	64	73	57	88
201-300%	477	8	61	67	72	57	87
301%+	69	1	46	45	61	38	81
Spoken Language							
Chinese	1,802	32	65	71	80	61	93
English	2,783	50	51	51	57	44	72
Spanish	841	15	60	58	69	55	86
Other	196	3	57	55	68	47	80
Initial Medical Home							
Large DPH Clinic	771	14	47	49	54	42	68
Other DPH Clinic	1,615	29	43	43	51	36	68
SFCCC-NEMS	1,690	30	69	75	86	65	95
Other SFCCC	1,021	18	57	53	61	49	82
All other and unknown	525	9	78	78	84	72	95
Homeless Status							
Homeless at any point	744	13	22	22	25	17	44
Never homeless	4,878	87	62	64	73	56	87
Medical Home Prior Usage							
Yes	5,525	98	57	59	67	51	81
No	97	2	53	53	69	44	86

Source: Mathematica analysis of HAQ responses collected December 2008 through June 2010 among 5,622 respondents who completed a survey upon initial enrollment and again at renewal or re-enrollment after a short gap (one to four months).

Table A.3. Receipt of Primary and Preventive Care Among HSF Participants During the First 12 Months of Enrollment, by Demographic and Program Characteristics

	Total Enrollees	Number of visits among users	Physician visit		Physician visit within two months of enrollment		Any specified preventive services	
Characteristics	N	Mean	N	%	N	%	N	%
Overall	60,008	3.31	42,509	71	25,483	42	28,946	48
Gender								
Male	31,626	3.26	21,590	68	13,489	43	14,463	46
Female	28,382	3.37	20,919	74	11,994	42	14,483	51
Initial Age Group								
18-24	7,816	1.85	4,510	58	2,425	31	2,225	28
25-44	25,649	2.80	17,191	67	10,139	40	10,251	40
45-54	14,496	3.97	10,958	76	6,653	46	8,130	56
55-64	12,047	4.54	9,850	82	6,266	52	8,340	69
Race/Ethnic Group								
Black	5,628	3.82	4,163	74	2,813	50	2,724	48
Chinese	15,556	2.99	11,365	73	6,334	41	8,716	56
Latino	14,881	3.31	10,087	68	5,869	39	6,599	44
Other	12,535	3.22	8,720	70	5,191	41	5,833	47
White	11,408	3.60	8,174	72	5,276	46	5,074	44
Initial FPL Level								
0-100%	43,546	3.36	30,422	70	18,852	43	20,422	47
101-200%	11,919	3.11	8,692	73	4,700	39	6,115	51
201-300%	4,044	3.39	3,058	76	1,740	43	2,180	54
301%+	499	2.90	337	68	191	38	229	46
Spoken Language								
Chinese	15,105	3.03	11,108	74	6,181	41	8,647	57
English	31,653	3.43	22,349	71	14,206	45	14,246	45
Spanish	11,125	3.24	7,445	67	4,205	38	4,872	44
Other	2,125	3.85	1,607	76	891	42	1,181	56
Initial Medical Home								
DPH	31,017	3.63	22,366	71	13,453	44	15,793	49
SFCCC	25,609	2.97	17,905	72	10,845	43	11,807	52
Other	3,382	2.95	2,238	72	1,185	41	1,346	54
Homeless Status								
Homeless at any point	9,590	3.50	6,407	67	4,329	45	4,072	42
Never homeless	50,418	3.27	36,102	72	21,154	42	24,874	49
Medical Home Prior Usage								
Yes	47,759	3.56	34,934	73	21,053	44	24,338	51
No	12,249	2.34	7,575	62	4,430	36	4,608	38
Chronic Conditions								
No chronic conditions	22,374	0.59	6,601	30	3,360	15	2,757	12
One chronic condition	12,195	2.60	11,114	91	5,720	47	6,210	51
Two or more conditions	25,439	6.05	24,794	97	16,403	64	19,979	79
Cohort								
1st (7/07-12/07)	7,257	4.08	5,431	75	3,420	47	4,132	57
2nd (1/08-8/08)	20,010	3.43	14,094	70	8,263	41	9,782	49
3rd (9/08-1/09)	9,768	3.28	6,975	71	3,892	40	4,495	46
4th (1/09-6/09)	11,621	3.15	8,274	71	5,182	45	5,384	46
5th (7/09-12/09)	11,352	2.81	7,735	68	4,726	42	5,153	45
Renewal decision								
Renews immediately	32,991	3.97	25,546	77	14,618	44	18,862	57
Does not renew	27,017	2.51	16,963	63	10,865	40	10,084	37

Source: Mathematica analysis of HSF enrollment and encounter data, July 2007 through December 2010. Encounter data extracted in March 2011.

Table A.4. Frequency of ED Visit and Inpatient Utilization Among HSF Participants During the First 12 Months of Enrollment, by Demographic and Program Characteristics

	Total Enrollees	Non-Emergent ED Use		Emergent ED Use		Inpatient Hospitalization	
Characteristics	N	N	%	N	%	N	%
Overall	60,008	3,221	5	4,706	8	1,604	3
Gender							
Male	31,626	1,980	6	2,961	9	1,027	3
Female	28,382	1,241	4	1,745	6	577	2
Initial Age Group							
18-24	7,816	275	4	441	6	87	1
25-44	25,649	1,530	6	2,211	9	674	3
45-54	14,496	895	6	1,332	9	507	3
55-64	12,047	521	4	722	6	336	3
Ethnic Group							
Black	5,628	650	12	928	16	308	5
Chinese	15,556	256	2	391	3	139	1
Latino	14,881	704	5	1,105	7	365	2
White	11,408	943	8	1,310	11	469	4
Other	12,535	668	5	972	8	323	3
Initial FPL Level							
0-100%	43,546	2,721	6	3,896	9	1,312	3
101-200%	11,919	366	3	607	5	193	2
201-300%	4,044	112	3	184	5	90	2
301%+	499	22	4	19	4	9	2
Spoken Language							
Chinese	15,105	229	2	383	3	137	1
English	31,653	2,489	8	3,550	11	1,230	4
Spanish	11,125	429	4	653	6	198	2
Other	2,125	74	3	120	6	39	2
Initial Medical Home							
DPH	31,017	2,132	7	3,189	10	1,131	4
SFCCC	25,609	885	3	1,293	5	411	2
Other	3,382	204	6	224	7	62	2
Homeless Status							
Homeless at any point	9,590	1,266	13	1,691	18	570	6
Never homeless	50,418	1,955	4	3,015	6	1,034	2
Medical Home Prior Usage							
Yes	47,759	2,696	6	3,944	8	1,367	3
No	12,249	525	4	792	6	237	2
Chronic Conditions							
No chronic conditions	22,374	202	1	424	2	28	0
One chronic condition	12,195	518	4	661	5	107	1
Two or more conditions	25,439	2,501	10	3,621	14	1,469	6
Cohort							
1st (7/07-12/07)	7,257	455	6	612	8	258	4
2nd (1/08-8/08)	20,010	1,017	5	1,523	8	552	3
3rd (9/08-1/09)	9,768	512	5	764	8	246	3
4th (2/09-6/09)	11,621	614	5	913	8	287	5
5th (7/09-12/09)	11,352	614	5	894	8	261	2
Renewal Decision							
Renews immediately	32,991	1,753	5	2,554	8	927	3
Does not renew	27,017	1,468	5	2,152	8	677	3

Source: Mathematica analysis of HSF enrollment and encounter data, July 2007 through December 2010. Encounter data extracted in March 2011.

APPENDIX B

ANALYSIS OF MEDI- CAL HEALTHY WORKERS AND OSHPD DATA

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To address research questions related to service utilization, Mathematica proposed additional analyses that were not conducted due to challenges in data acquisition or poor data quality. In this appendix, we briefly describe the proposed analyses and barriers to completion.

A. Comparison groups

Utilization analyses presented in this paper only include data on the Healthy San Francisco (HSF) population. For this reason, we cannot discern whether observed trends in utilization are due to programmatic elements of HSF or to citywide utilization trends that may be driven, for example, by provider behavior. Mathematica originally identified two control groups whose utilization could be compared to that of HSF participants so that we could evaluate whether changes in HSF utilization were more or less likely due to the program's design. These two groups were working-age adult Medicaid (Medi-Cal in California) recipients residing in San Francisco and San Francisco Healthy Workers participants. While both of these groups are insured—a notable difference from HSF participants—members have relatively low incomes and use many of the same safety net providers that serve HSF participants.

We were not able to include either of these control groups in the analyses presented in this paper. For the Medi-Cal population, we first attempted to obtain data through the San Francisco Health Plan (SFHP), which administers a Medi-Cal plan in San Francisco. However, we learned that instead, we would have to request data directly from the California Department of Health Care Services (DHCS). Although we requested de-identified data, DHCS determined that we would need to complete the full application and internal institutional review board process and cautioned that, due to low staffing levels, the delay in data acquisition might be substantial. Given the timeline for this evaluation (completion in July 2011), we agreed with the HSF program director, Tangerine Brigham, to drop the Medi-Cal comparison group from the analysis.

For Healthy Workers, we obtained authorization to receive de-identified enrollment and encounter data from the program administrator. SFHP, which also administers the Healthy Workers program, provided Mathematica with an extract of enrollment and encounter data for working-age adults enrolled from July 2007 through April 2010. During the process of data cleaning and constructing analytic variables for analyses in this paper, we identified apparent errors, raising doubts that we had obtained the full set of encounters for the Healthy Workers population. We are working with SFHP to resolve those errors and hope to include the Healthy Workers comparison group in updated utilization analyses presented in the final report.

B. Impact Analysis of Change in Preventive Services Use

To obtain a more rigorous estimate of the impact of HSF on the use of preventive services, Mathematica proposed a clinic-level analysis that would use data from the California Office of Statewide Health Planning and Development (OSHPD) to examine changes in preventive service use over the period from 2005 through 2009. Each year, primary care clinics statewide report to OSHPD their total number of patients (by demographic characteristics) and the total number of encounters provided. Several specific preventive service encounters that might be influenced by HSF are reported, including adult preventive care visits, pneumococcal vaccines, flu vaccines, pap

smears, and mammograms.[30] We identified eight clinics in the SFCCC system with an estimated HSF enrollment of approximately 25 percent or more of patients in 2007–2008. We anticipated that, at this threshold, we might have the power to detect changes at the clinic level in behavior or service receipt among HSF patients.[31]

For each of the eight clinics, we proposed identifying a set of quantitatively similar "control" clinics, drawn from other California primary care clinics outside of San Francisco County. Using a regression framework, we would then model changes in the rate of preventive service delivery at HSF clinics and the set of control clinics over the period from 2005 to 2009. Because HSF was implemented in 2007, this approach would allow us to estimate the impact of the program on preventive service delivery.

At the time the analysis was proposed, OSHPD data were available from 2005 through 2007. When we reviewed those data at the clinic level, year-to-year changes in service delivery were reasonably stable. However, when we obtained data from 2008 and 2009, we discovered that data quality did not appear reliable for the more recent years. For example, one clinic provided about 2,400 adult preventive service encounters each year from 2005 through 2007. In 2008, the clinic reported only 1,800 encounters and in 2009 just 60 encounters.

To address variability at the individual level, we considered conducting a descriptive analysis rather than an impact analysis. With this approach, we would look at average changes in preventive service use in 2005–2007 (pre-HSF) and 2008–2009 (post-HSF) across the nine HSF clinics in comparison with a group of control clinics. However, preliminary analyses showed that even average changes were not credible. For example, the rate of flu vaccinations appeared to rise by 75 percent from 2005–2007 to 2008–2009, and the rate of pneumococcal vaccinations appeared to fall by 37 percent. Given the poor data quality in the post-HSF period, we do not believe OSHPD clinic-level data can be used to interpret changes in preventive service use that may be due to HSF.

[30] While pap smears and mammograms are likely to be paid for by other state programs and not by HSF, it is still possible that by more systematically tying patients to medical homes and promoting preventive care, HSF increases the rate with which these screenings occur. Since our analyses focused on services delivered by the clinic, regardless of payer, we planned to include these outcomes.

[31] We also identified DPH clinics meeting the 25 percent criteria; however, we discovered that DPH clinics typically do not report data to OSHPD and that DPH could not produce comparable statistics at the clinic level during the period from 2005 to 2009.

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