Community Collaboration for Appropriate Emergency Department Care Pilot Evaluation

Interim Report on Study Design and Baseline Measures

June 2010
Report 11.151

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RDA Research & Data Analysis Division

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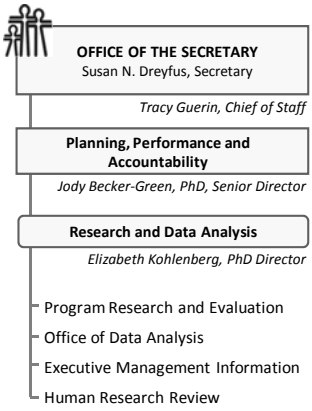

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Title: Community Collaboration for Appropriate Emergency Department Care Pilot Evaluation: Interim Report on Study Design and Baseline Measures

Abstract: Four pilot programs were launched in Washington State in 2008 to encourage the appropriate use of emergency department care. The pilots build on collaborations between hospitals and community health centers to connect patients with medical homes at community health care clinics. They seek to improve access to primary care and educate patients about when it is appropriate to visit an emergency department. This report lays the groundwork for an evaluation that will assess whether the pilot interventions were associated with a reduction in avoidable emergency department utilization and improved continuity of care. We describe the evaluation study design and present baseline client characteristics and health care utilization measures for statistically matched intervention and comparison groups.

Keywords: Emergency Department Utilization, Community Health Clinics, Medical Homes

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Community Collaboration for Appropriate Emergency Department Care Pilot Evaluation:

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APPENDIX

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Community Collaboration for Appropriate Emergency Department Care Pilot Evaluation:

Interim Report on Study Design and Baseline Measures

Melissa Ford Shah, MPP, Lijian He, PhD, David Mancuso, PhD, Beverly Court, PhD,
Irina Sharkova, PhD, Barbara Felver, MPA, MES, and Frederick Connell, MD, MPH

Report to Paul Scholz, Project Officer, Centers for Medicare and Medicaid Services, Center for Medicaid and State Operations (CMS/CMSO). In partial fulfillment of grant deliverables for CMS grant No. 1V0CMS030262, "Washington Community Collaboration for Appropriate Emergency Department Care"[1]

THE HEALTH AND RECOVERY SERVICES ADMINISTRATION (HRSA) of DSHS partnered with the Washington Association of Community and Migrant Health Centers (WACMHC) and the Washington State Hospital Association (WSHA) in 2008 to oversee and evaluate the implementation of four pilot programs aimed at encouraging the appropriate use of emergency department care. Although each pilot site has a distinct program design, all four aim to build collaborations between hospitals and community health centers and to connect patients with medical homes at community health care clinics. In general, the pilot sites are taking steps to make their clinics more accessible while also educating patients about when they should go to the emergency department and when they should contact their primary care provider instead.

This interim report lays the groundwork for an evaluation that will assess whether the pilot interventions were associated with a reduction in preventable or unnecessary emergency department utilization and improved continuity of care. It presents client characteristics and health care utilization measures for the baseline year (February 1, 2008 to January 31, 2009). A final report will compare changes over time in these measures, from the baseline year through the post-intervention year (April 1, 2009 to March 31, 2010) for individuals treated at pilot hospital emergency departments and matched groups of their peers.

Key Findings

- Absent a list of program participants, identifying geographic catchment areas for each site based on pilot hospital and clinic market shares yields a sufficiently large intervention group comprised of individuals who received outpatient services in pilot hospital emergency departments.
- A statistical technique known as propensity score matching produced comparison groups with similar observable characteristics to those of the intervention groups for each site and Medicaid client population (disabled clients and low-income families with children).
- In the baseline year, disabled clients were on average older, in poorer health, and had a higher prevalence of substance abuse and mental illness than low-income families with children. Disabled clients also tended to have higher health care utilization, though both groups exhibited an opportunity for reducing the number of avoidable visits to hospital emergency departments.

[1] The statements contained in this report are solely those of the authors and do not necessarily reflect the views or policies of the Centers for Medicare and Medicaid Services. The authors assume responsibility for the accuracy and completeness of the information contained in this report.

About the Community Collaboration for Appropriate Emergency Department Care Pilot Project

What is the Community Collaboration for Appropriate Emergency Department Care Pilot Project?

By design, all four selected pilot sites were given flexibility in designing their programs, but each site was required to implement the following three strategies: 1) Assure 24-hour access to professional services for Medicaid enrollees by providing a nurse-triage line to Medicaid enrollees in project communities, 2) Improve the ability of community health clinics (CHCs) to be effective Medical Homes and alternate emergency care providers, and 3) Create a case management system that is integrated with the nurse-triage system to follow-up on Medicaid emergency department visits and connect patients with other needed services (such as disease management programs, housing assistance, mental health services, or substance abuse treatment).

What is the intent of the pilot project?

The intent of the pilot project is to allow the four pilot sites to develop and test a variety of initiatives aimed at reducing inappropriate emergency department use among Medicaid enrollees and connecting them with medical homes and case management services. The project also seeks to educate Medicaid enrollees about the appropriate use of emergency departments and primary care and to improve access to the latter.

What are the distinguishing characteristics of each of the four pilot sites as originally designed?

CHAS. This pilot program is located in the second largest city in the state and serves a primarily urban and suburban population. It also serves as a designated Health Professional Shortage Area (HPSA). The program targets mothers and children who are receiving Medicaid, as well as Medicaid clients who are high utilizers of the emergency department, especially those with dental problems. As part of its original design, this site aimed to: 1) provide a 24-hour triage line using existing mid-level staff, 2) Add behavioral health services, 3) Promote the medical home concept, 4) Expand case management with an Emergency Department Patient Liaison, 5) Maintain collaboration with Holy Family Hospital to share records from CHAS' electronic health record system, 6) Increase managed care enrollment, and 7) Work with the hospital to immediately schedule follow-up appointments at the clinic.

HEALTHPOINT. This pilot program is located in urban Auburn and also serves surrounding rural communities. It has been designated a Medically Underserved Area. It tends to serve a large minority population, as well as individuals who are low-income, uninsured, and experiencing mental illness. As part of the program's original design, this site aimed to: 1) Expand clinic hours, 2) Expand case management and care coordination services, 3) Provide 24-hour access to a nurse triage line, 4) Assist with managed care enrollment and reduce access barriers, 5) Promote the medical home concept, 6) Reduce disparities in health care outcomes through the continuation of cultural competency training and a Quality of Care Review Committee, and 8) Initiate a health literacy campaign for parents and education for special populations.

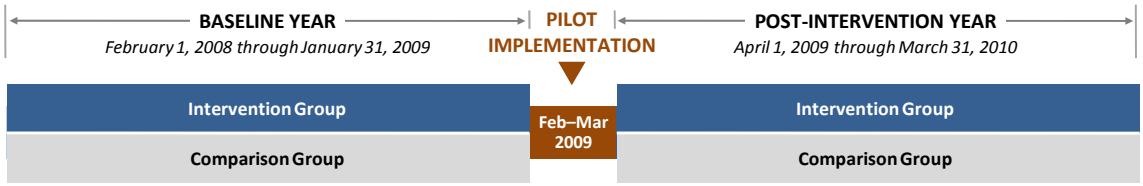
INTERFAITH. This pilot program is located in a rural area with one small city and has been designated a Health Professional Shortage Area (HPSA) with several Medically Underserved Areas. It targets the uninsured, as well as Medicare and Medicaid enrollees. As part of its original design, this site aimed to: 1) Provide 24-hour access to nurse triage services, 2) Expand service hours and promote the medical home concept, 3) Add a social worker, registered nurse case manager, and a customer service representative, 4) Provide emergency department dental follow-up and urgent walk-in dental care, 5) Provide outreach and education for new managed care clients, 6) Increase service hours for behavioral health counseling, 7) Hire a part-time access worker, and 8) Follow-up with all clients who do not make their scheduled appointments.

LOURDES. This pilot program is located in a farming community that is growing rapidly and has been designated a Health Professional Shortage Area (HPSA). The pilot serves a large Hispanic migrant population with low educational levels, high numbers of Medicaid and Medicare enrollees, and the highest teen pregnancy rate in the state. As part of its original design, this site aimed to: 1) Extend the nurse triage line to 24 hours with follow-up, 2) Locate case management in the emergency department, 3) Encourage use of the urgent care clinic located next to the hospital, 4) Add a behavioral health counselor to the community health center to assist primary care providers, 5) Promote the medical home concept, and 6) Initiate a community education campaign.

STUDY DESIGN

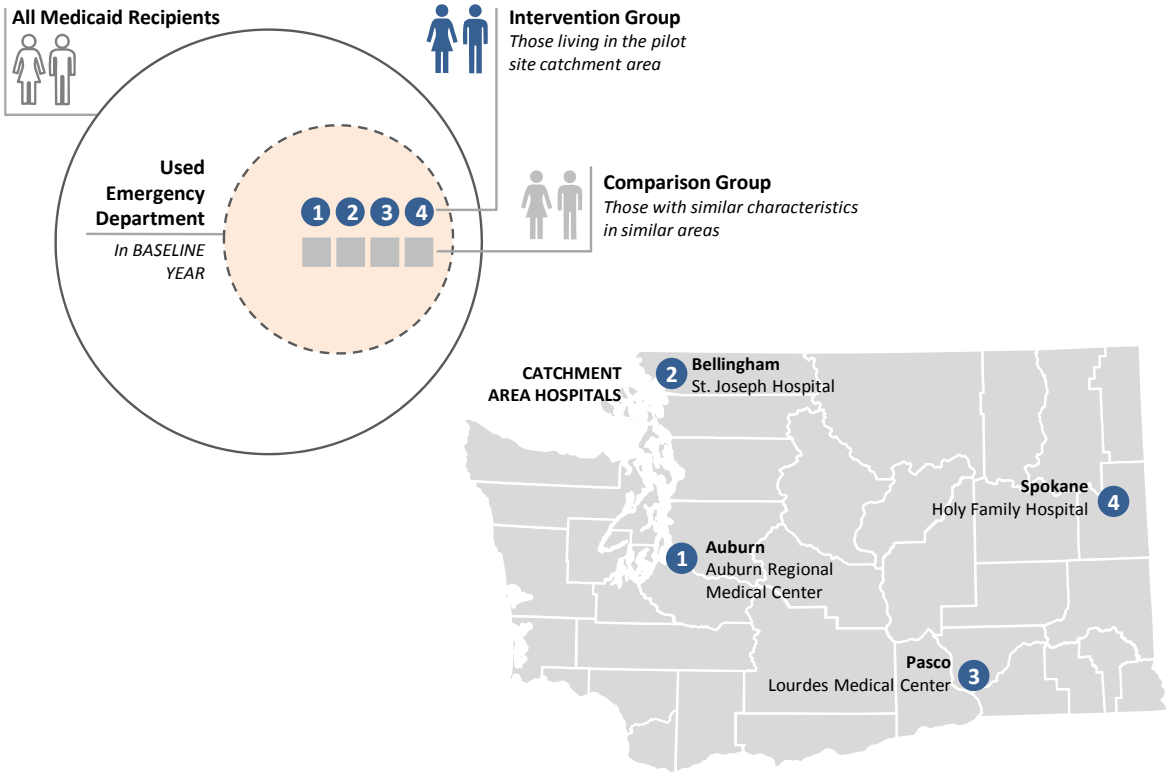
The evaluation of this pilot will explore whether patients seen in the emergency departments of the four pilot hospitals experience reductions in preventable or unnecessary emergency department use over time compared to similar Medicaid patients treated in the emergency departments of non-pilot hospitals throughout the state. The analysis will look at a subset of Medicaid clients who had at least one outpatient emergency department visit in the baseline year (February 1, 2008 through January 31, 2009). This group will be followed over time to see if they experience a reduction in unnecessary emergency department use in the post-intervention year.

Study Timeline | Baseline, Implementation, and Post-Intervention Period



Members of the intervention group will be compared to similar Medicaid clients who received outpatient services in emergency departments during the same time period and who did not reside in any of the pilot sites' geographic catchment areas. By construction, individuals in the comparison group also did not receive services from any provider associated with a pilot site and did not reside in a zip code in which a pilot hospital captured 5 percent market share or more for outpatient emergency department visits among disabled clients.

Study Population | Medicaid Clients with Outpatient Emergency Department Visits



Overview of Methodological Steps | Baseline Analysis

The purpose of this interim report is to describe the study methodology and present baseline measures. By design, the pilot programs seek to intervene at the community level to encourage the appropriate use of emergency department services among Medicaid clients. This makes it challenging to determine if the project has had any impact on the health care utilization patterns of specific individuals. Generally speaking, our approach to this challenge involved the following five steps:

1. We identified each pilot site's hospital and clinic market share by zip code among Medicaid patients who had an outpatient emergency department or clinic visit, respectively, in the baseline year.
2. We analyzed market share rates for two Medicaid populations, disabled clients and low-income families with children, using ranked lists of zip codes as well as maps for each site and service modality (outpatient emergency department or clinic visit) in order to define a geographic catchment area for each site.
3. We defined the intervention group for a given site as Medicaid clients who had at least one outpatient emergency department visit at that pilot hospital in the baseline year and who resided in that site's geographic catchment area at the time of the visit.
4. We defined the comparison group sampling pool as Medicaid-eligible individuals who a) had at least one outpatient emergency department visit provided through a non-pilot hospital in the baseline year, b) did not reside in a zip code in which a pilot hospital had 5 percent or more of the Medicaid market share for outpatient emergency department visits, and c) did not receive services from any provider associated with a pilot site.
5. We used a statistical technique known as propensity score matching to select a group of comparison group members for each site who were very similar to the respective site's intervention group on a number of key observable measures.

This interim report describes the study design in more detail and presents summary statistics on key observable client characteristics and measures of health care utilization and costs in the baseline year for the eight intervention and comparison groups. A final analysis will compare health care utilization and costs in the pre- and post-intervention period for the intervention group compared to the comparison group at each pilot site.

Two Distinct Client Populations | Disabled Clients and Low-Income Families with Children

Two distinct Medicaid populations are targeted by the pilot program and analyzed separately in this study: 1) disabled clients, and 2) low-income families with children.[2] In general, the former tend to be enrolled in fee-for-service and the latter in managed care Medicaid. However, data available as of the writing of this report only provides information on coverage type by the program in which a client is participating. So we may know that someone receives TANF cash assistance but not whether they are actually enrolled in Health Options, the managed care program for TANF recipients. We do know that approximately one-fourth of low-income families with children are likely to be fee-for-service. This may be the case, for example, if there is not a managed care plan available in their area or if they have not yet enrolled in a specific managed care plan. The final report will be able to distinguish between low-income families with children enrolled in managed care and those enrolled in fee-for-service.

[2] What we refer to here as the disabled client population includes a relatively small number of GA-U and ADATSA clients who have DSHS fee-for-service medical coverage but are not currently enrolled in Medicaid. These clients will be covered under Medicaid expansion, which will cover individuals earning up to 133 percent of the federal poverty level. The population we refer to here as low-income families with children includes Temporary Assistance for Needy Families (TANF) recipients, pregnant women, and children who are low-income, in foster care, or receiving adoption support.

METHODOLOGICAL STEPS

STEP 1. Identify Each Site's Hospital and Clinic Market Share among Medicaid Clients by Zip Code

The first step in the analysis was to identify each pilot hospital's market share among Medicaid clients by zip code. We began by identifying all disabled clients between February 1, 2008 and January 31, 2009 (the baseline year) who had at least one month of fee-for-service medical coverage and who were not dually eligible for Medicare coverage. For each pilot site, the denominator for determining hospital market share in each zip code was the total number of Medicaid-paid outpatient emergency department visits at any hospital in the baseline year while residing in that zip code among individuals enrolled in Medicaid. The numerator was the subset of these visits that were billed by the hospital associated with a given pilot site. We then ranked the zip codes for each site by the proportion of pilot hospital market share, with the top zip codes showing a market share that ranged from 58 percent in Auburn to 100 percent in Bellingham We then repeated this hospital market share analysis for low-income families with children who had at least one month of Medicaid coverage and were not dually eligible for Medicare in the baseline year.

Given that each pilot hospital was paired with one or more partnering clinics, we also identified the pilot clinics' market shares among Medicaid clients by zip code. As before, we began by identifying disabled clients with fee-for-service medical coverage who were not dually eligible for Medicare in the baseline year. For each pilot site, the denominator for a given zip code was the total number of Medicaid-paid physician or professional service provider visits (i.e., "clinic visits") in the baseline year while residing in that zip code among individuals enrolled in Medicaid. The numerator was the subset of these visits that were billed by a provider associated with a given pilot site. We ranked the zip codes for each site by the proportion of pilot clinic market share, with the top zip codes capturing a market share that ranged from 6 percent in Auburn to 24 percent in Pasco. We repeated this clinic market share analysis for low-income families with children who had at least one month of Medicaid coverage and who were not dually eligible for Medicare in the baseline year.

STEP 2. Define Each Pilot Site's Geographic Catchment Area

The aim of the second step of the analysis was to identify geographic catchment areas for each site that would be used to define the four intervention groups. We began by mapping the zip codes the sites had each identified as their target areas, as well as the zip codes in which the pilot sites appeared to be capturing a non-trivial share of the Medicaid market based on the analyses described in Step 1 above. For each site, we created separate maps for hospital market share and for clinic market share among the disabled client population, which resulted in the 8 maps shown below (see Figures 1-8). Based on what appeared to be fairly natural cut-points that were consistent across sites, we defined medium hospital market share as 14 to 39 percent and high hospital market share as 40 percent or higher (see Figures 1, 3, 5, and 7 below). As one might expect given the greater number of clinics relative to hospitals, the clinic market share captured by pilot providers tended to be relatively low. As a result, we did not distinguish between medium and high market share for clinics and mapped all zip codes with a market share of three percent or higher (see Figures 2, 4, 6, and 8 below).

A visual inspection of the first set of maps we produced, along with an analysis comparing the rates of market share ranked by zip code for hospitals and clinics and for both the disabled and low-income families with children client populations, allowed us to make further refinements. We removed a few zip codes that appeared to have high market share but could not realistically be considered part of a site's catchment area. In general, this was due to a combination of being too far away on a map and the zip code containing a very small number of Medicaid clients such that a high market share was misleading.

We also restricted the catchment areas to zip codes in which both the pilot hospital and pilot clinic(s) appeared to capture a substantial share of the Medicaid market (shaded as medium or high on the maps). Ultimately, there was not a common market share threshold for inclusion in the catchment areas across sites; however, none of the zip codes that were included had a hospital market share that fell below 20 percent or a clinic market share that fell below 3 percent among disabled clients. Tables A1-A4 in the Appendix show detailed hospital and clinic market share data by site for zip codes that we considered including in the four catchment areas. Included in these tables are zip codes that are shaded light or dark orange and/or have diagonal lines in Figures 1, 3, 5, and 7 below.

It is worth noting that although each pilot site's grant proposal included a list of zip codes that it would target, we have not included all of those zip codes in the catchment areas. The site-identified area zip codes are marked with diagonal lines in Figures 1-8 below and appear in Tables A1-A4. However, five zip codes identified in site proposals are not shown in either the maps or appendix tables because they were found to be Post Office box addresses already contained within area zip codes we have included in the respective catchment areas for these sites. In addition, all five of these zip codes had 0 percent hospital and clinic market share among both client populations (they are 98227, 98228, and 98276 in Bellingham, 99335 in Pasco, and 99020 in Spokane).

As discussed in Step 3 below, we selected individuals for the "intervention group" who had been treated at a pilot hospital. For this reason, we wanted to keep the catchment areas fairly tight in order to maximize the likelihood that an individual treated at a pilot hospital would actually be "touched" by the pilot intervention.

STEP 3. Define the Intervention Group for Each Site

The third step in the analysis was to define the intervention group for each of the four pilot sites. In the absence of a list of pilot program participants, we chose to identify Medicaid patients who had received outpatient services at the pilot hospitals' emergency departments in the baseline year since this was the population targeted for intervention. We began with all individuals who had at least one month of Medicaid coverage and who were not dually eligible for Medicare in the baseline year. From there, an individual was assigned to a given site's intervention group if he or she had at least one outpatient emergency department visit from a provider billing number associated with that pilot hospital while living in that site's geographic catchment area.

STEP 4. Define the Comparison Group Sampling Pool

The fourth step in the analysis was to identify the sampling pool from which the four comparison groups would be selected. Once again, we began with all individuals who had at least one month of Medicaid coverage and who were not dually eligible for Medicare in the baseline year. From there, we restricted the pool to individuals who had at least one Medicaid-paid outpatient emergency department visit at a non-pilot hospital. Moreover, individuals in the sampling pool could not have received services from any of the providers associated with any of the four pilot sites in the baseline year. Finally, at the time of their emergency department visit, these individuals could not have resided in a zip code in which any pilot hospital had a market share of five percent or higher.

STEP 5: Construct Statistically Matched Comparison Groups for Each Site

In the fifth and final step of the analysis, we employed a statistical technique known as propensity score matching to select a comparison group for each site that was very similar to the respective site's intervention group, with the exception that comparison group members likely did not have the opportunity to be "touched" by the pilot project. We leveraged observable data to estimate a logistic regression model and generate propensity scores reflecting the predicted probability that an individual would be a member of a given site's intervention group. Propensity scores were then used to match each intervention group member to a member of the comparison group sampling pool who was similar to them on key measures.

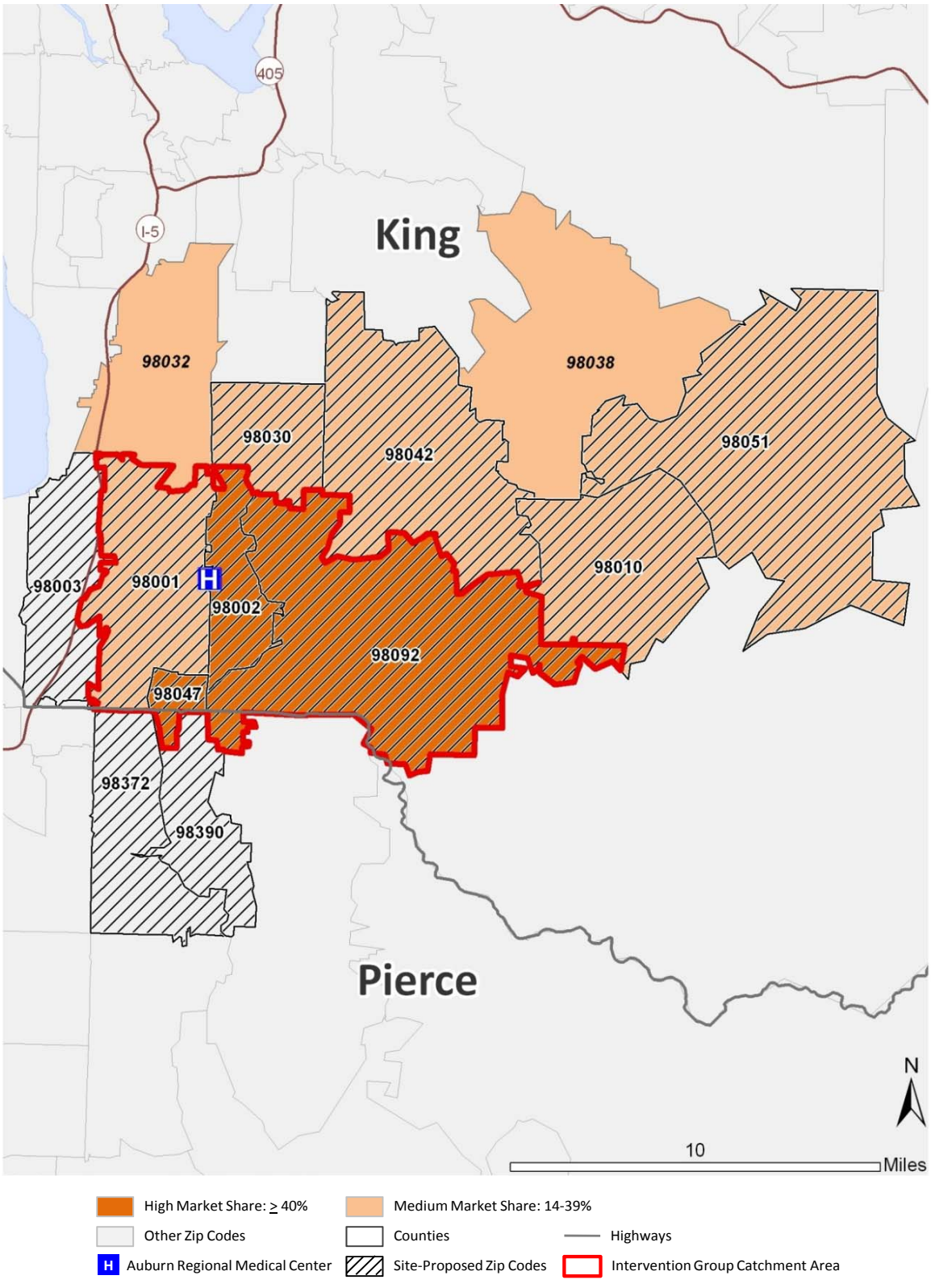
Tables 1-4 in the next section illustrate how this process resulted in statistically well-matched pairs that were comparable on key measures such that almost none of the differences between intervention and comparison groups were statistically significant. Notably, all of the variables presented in these tables were included in the propensity score regression models, with the exception that medical cost data is not available for managed care and so total medical costs per member per month were not included for that population.[3]

[3] To summarize, these variables are age, gender, race/ethnicity, percent urban, need for alcohol or other drug (AOD) treatment, diagnosis of psychotic/bipolar disorder or depression, prospective chronic disease risk score, number of months with DSHS medical eligibility, number of outpatient emergency department visits per member per month (pmpm), number of avoidable outpatient emergency department visits pmpm, number of inpatient emergency department visits pmpm, number of clinic visits pmpm, total Medicaid medical costs pmpm.

FIGURE 1

Auburn Regional Medical Center Market Share • Emergency Department Outpatient Visits

Disabled Clients

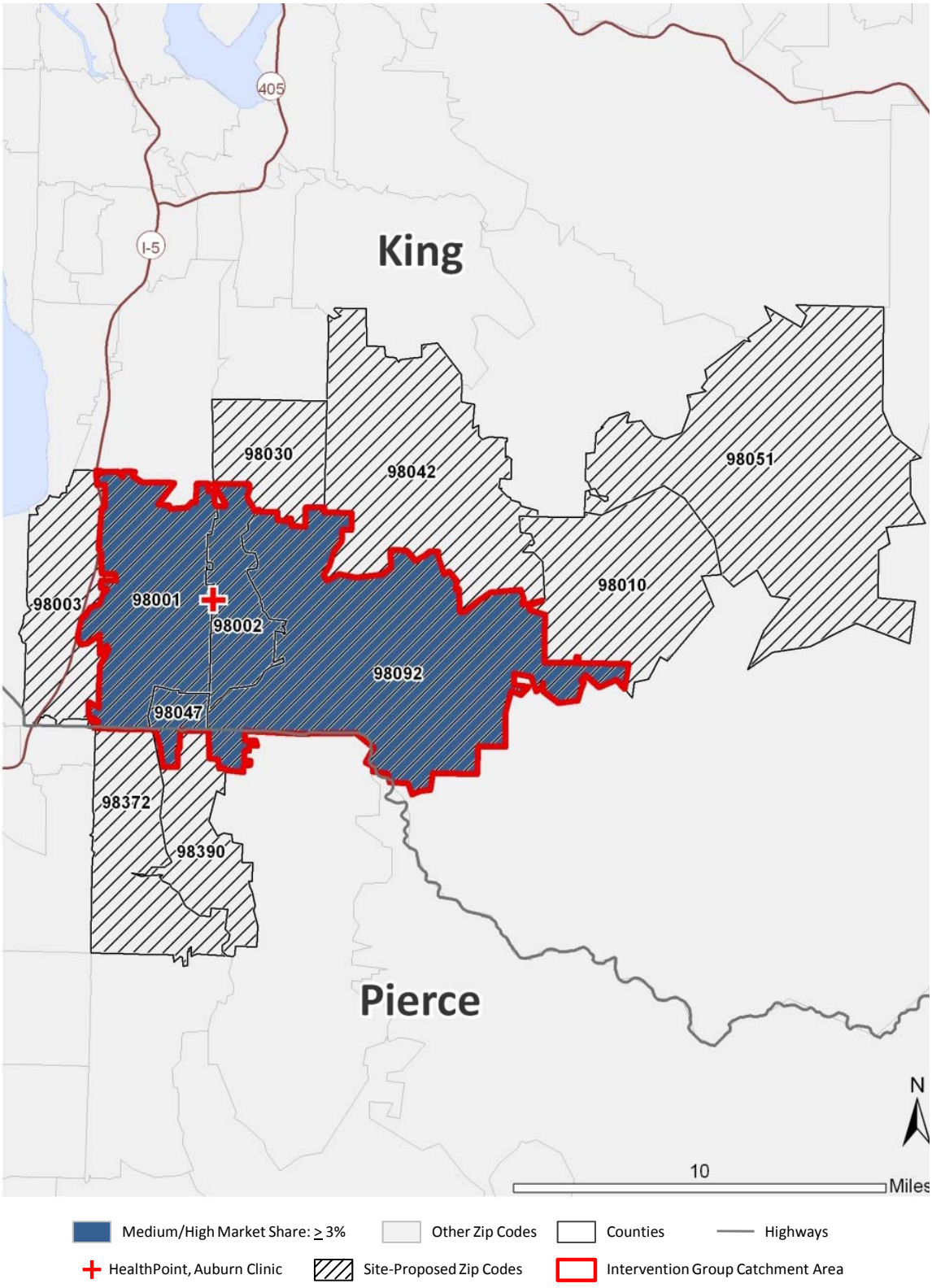


SOURCE: Integrated Database, Department of Social and Health Services, Planning, Performance and Accountability, Research and Data Analysis Division

FIGURE 2

HealthPoint (Auburn) Market Share • Clinic Visits

Disabled Clients

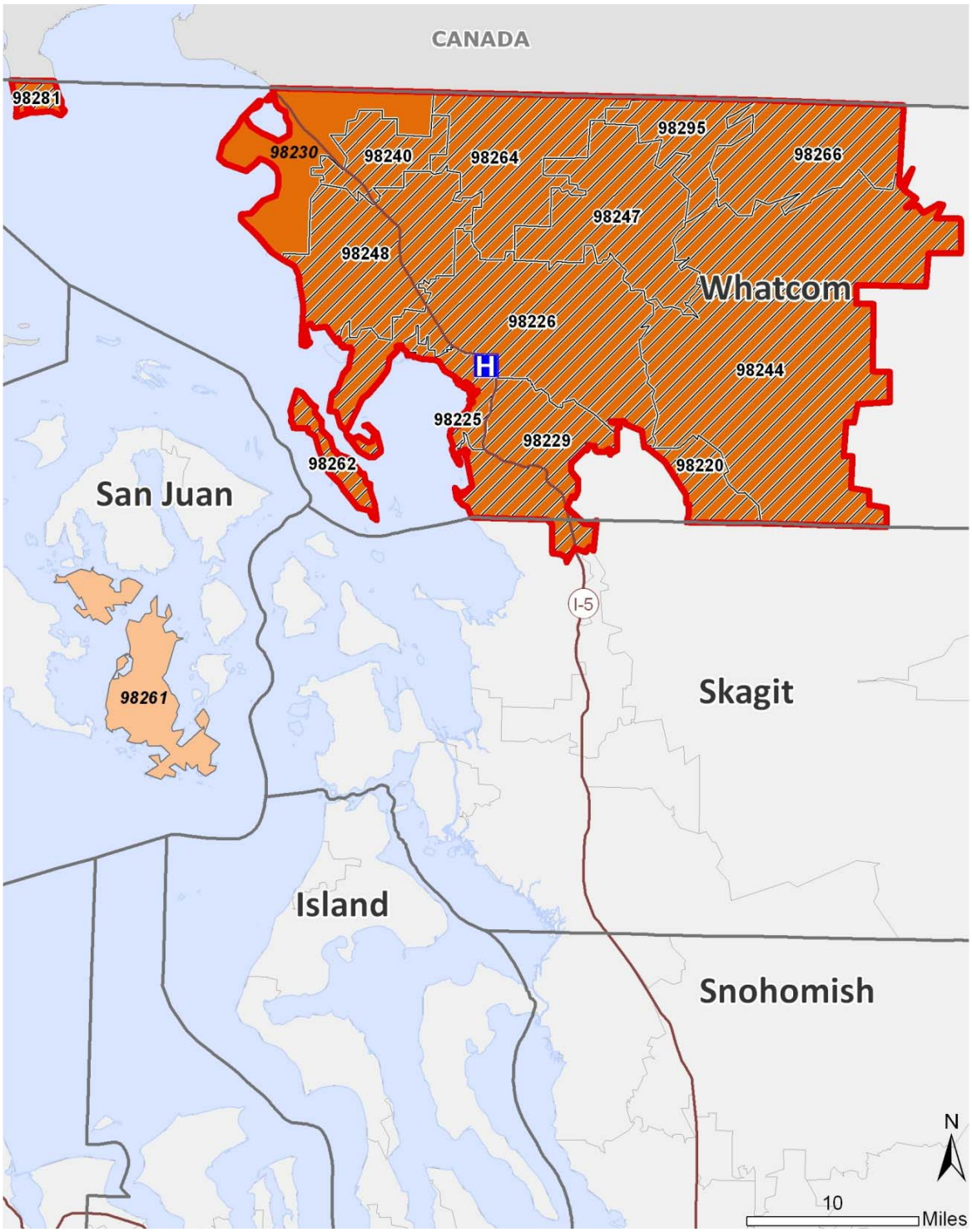


SOURCE: Integrated Database, Department of Social and Health Services, Planning, Performance and Accountability, Research and Data Analysis Division

FIGURE 3

St. Joseph Hospital (Bellingham) Market Share • Emergency Department Outpatient Visits

Disabled Clients

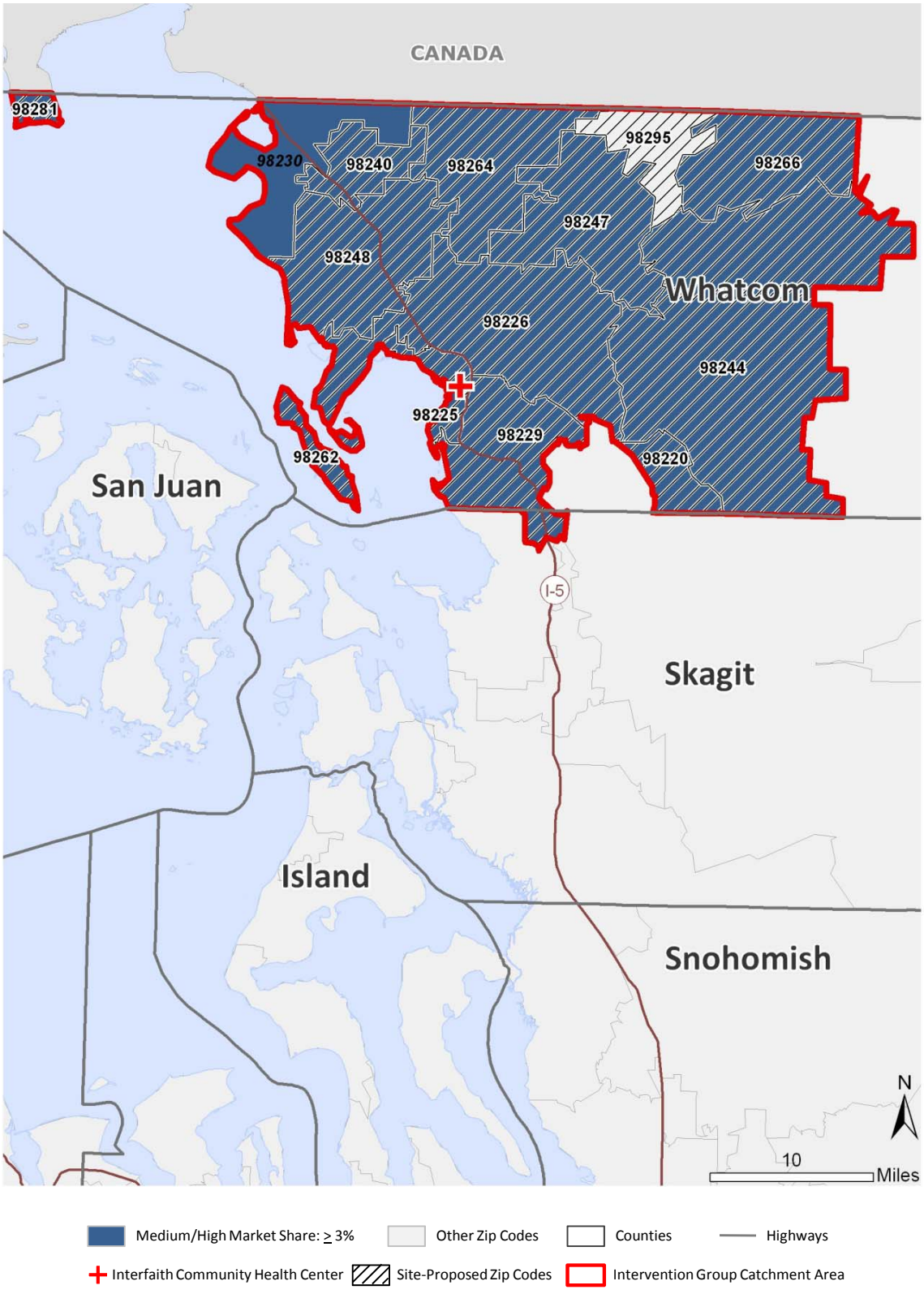


SOURCE: Integrated Database, Department of Social and Health Services, Planning, Performance and Accountability, Research and Data Analysis Division

FIGURE 4

Interfaith Community Health Center (Bellingham) Market Share • Clinic Visits

Disabled Clients

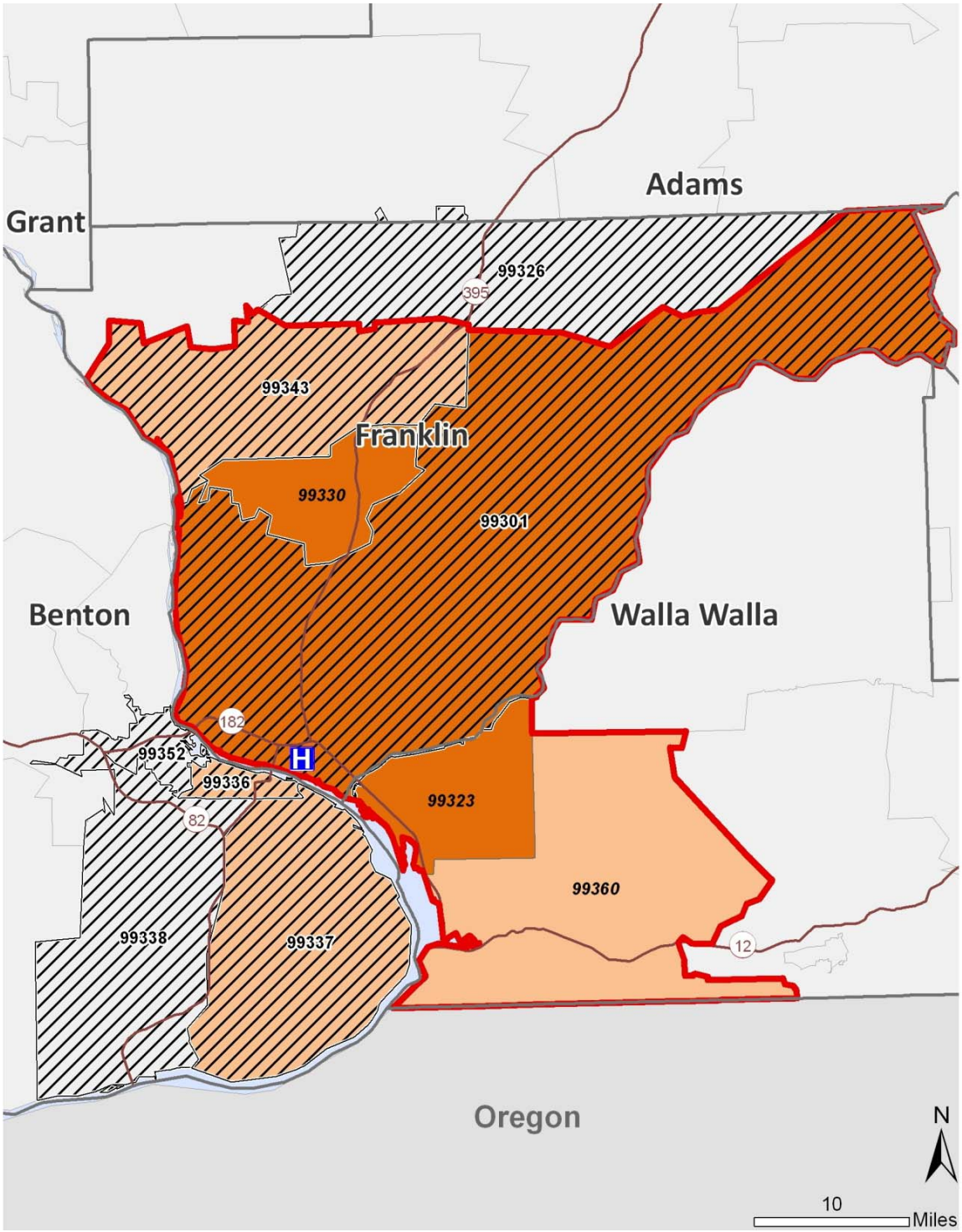


SOURCE: Integrated Database, Department of Social and Health Services, Planning, Performance and Accountability, Research and Data Analysis Division

FIGURE 5

Lourdes Medical Center (Pasco) Market Share • Emergency Department Outpatient Visits

Disabled Clients

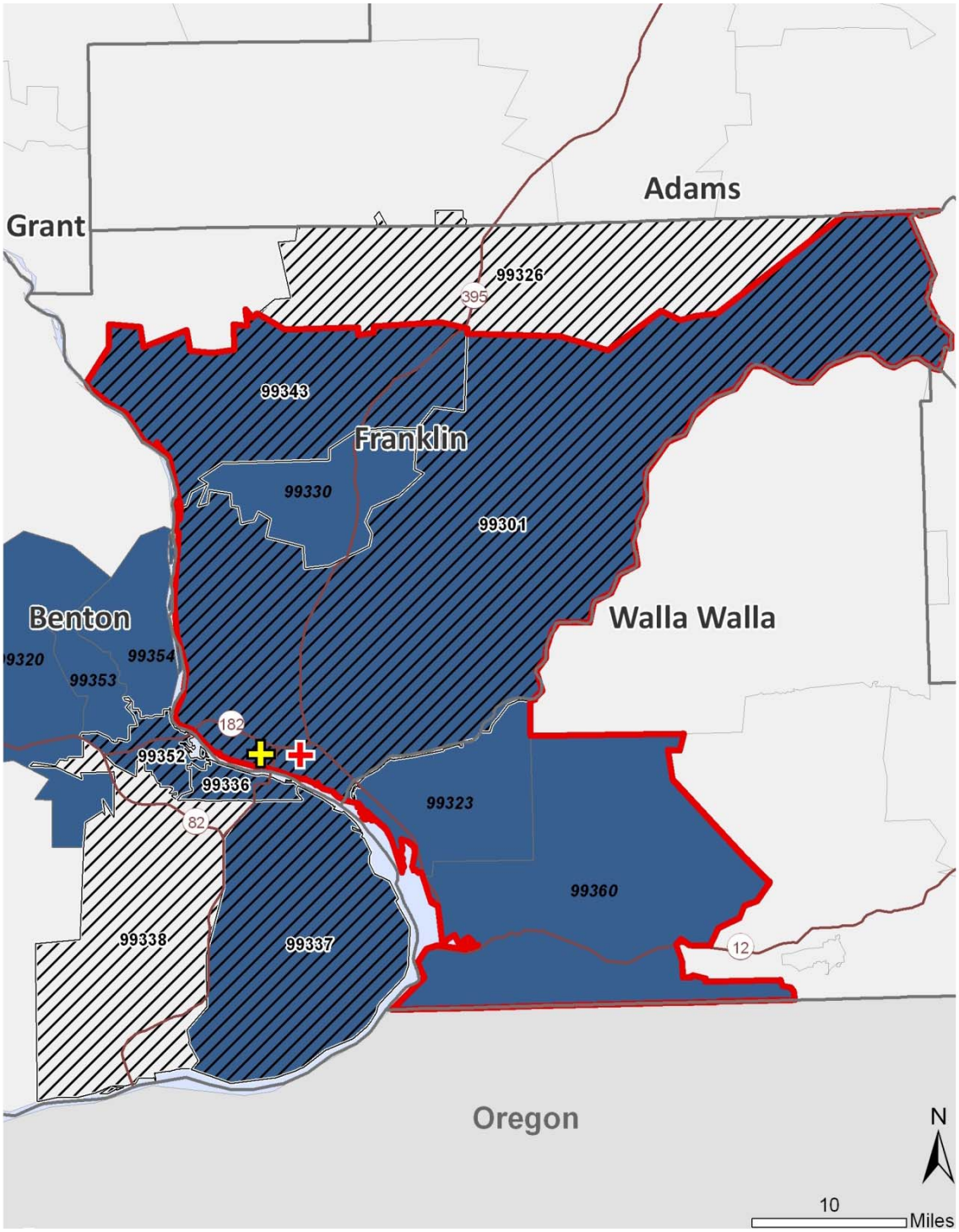


SOURCE: Integrated Database, Department of Social and Health Services, Planning, Performance and Accountability, Research and Data Analysis Division

FIGURE 6

La Clinica and Miramar Market Share (Pasco) • Clinic Visits

Disabled Clients



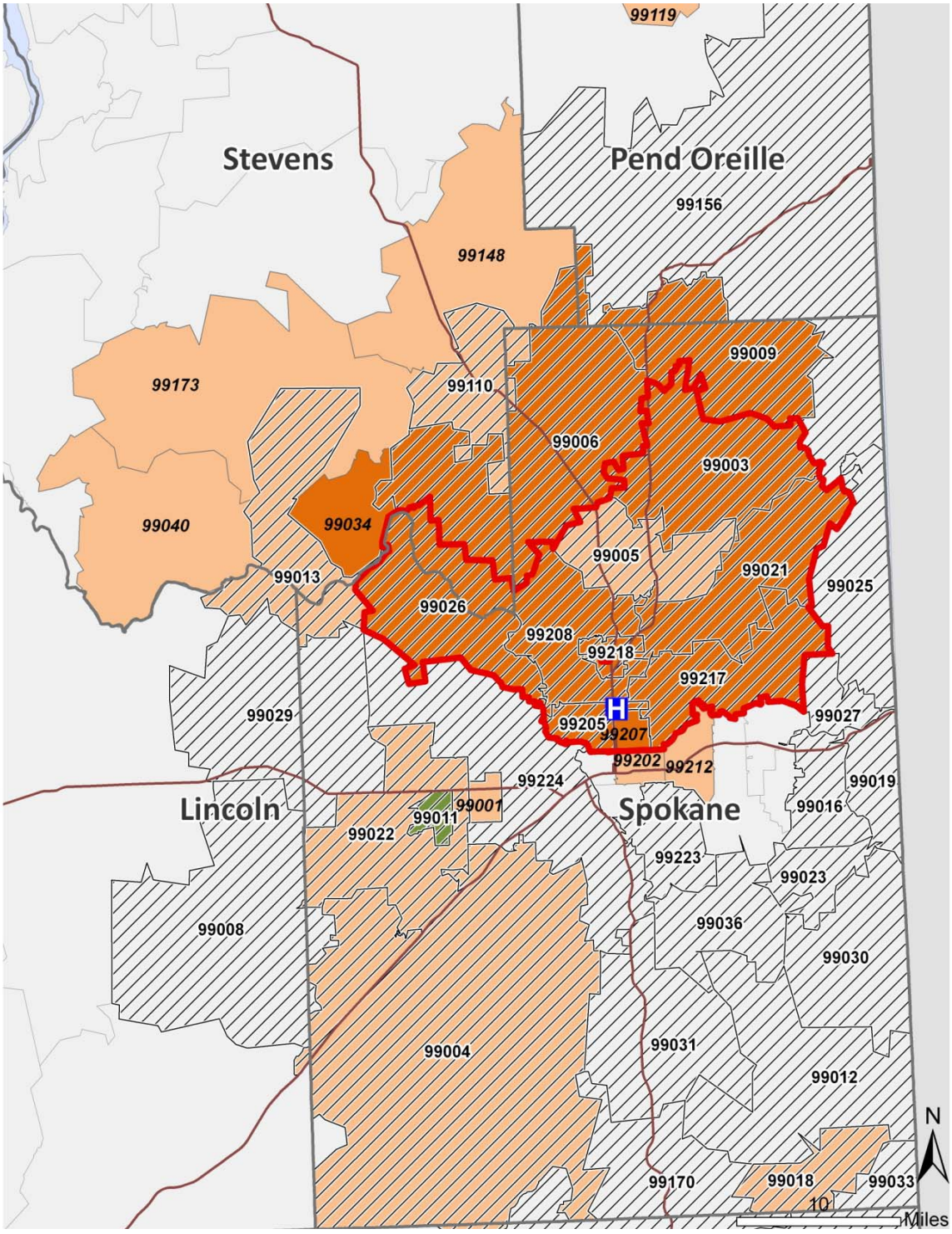
Medium/High Market Share: ≥ 3%
Other Zip Codes
Counties
Community Health Center-La Clinica
Site-Proposed Zip Codes
Yakima Valley Farm Workers Clinic-Miramar
Intervention Group Catchment Area
Highways

SOURCE: Integrated Database, Department of Social and Health Services, Planning, Performance and Accountability, Research and Data Analysis Division

FIGURE 7

Holy Family Hospital (Spokane) Market Share • Emergency Department Outpatient Visits

Disabled Clients

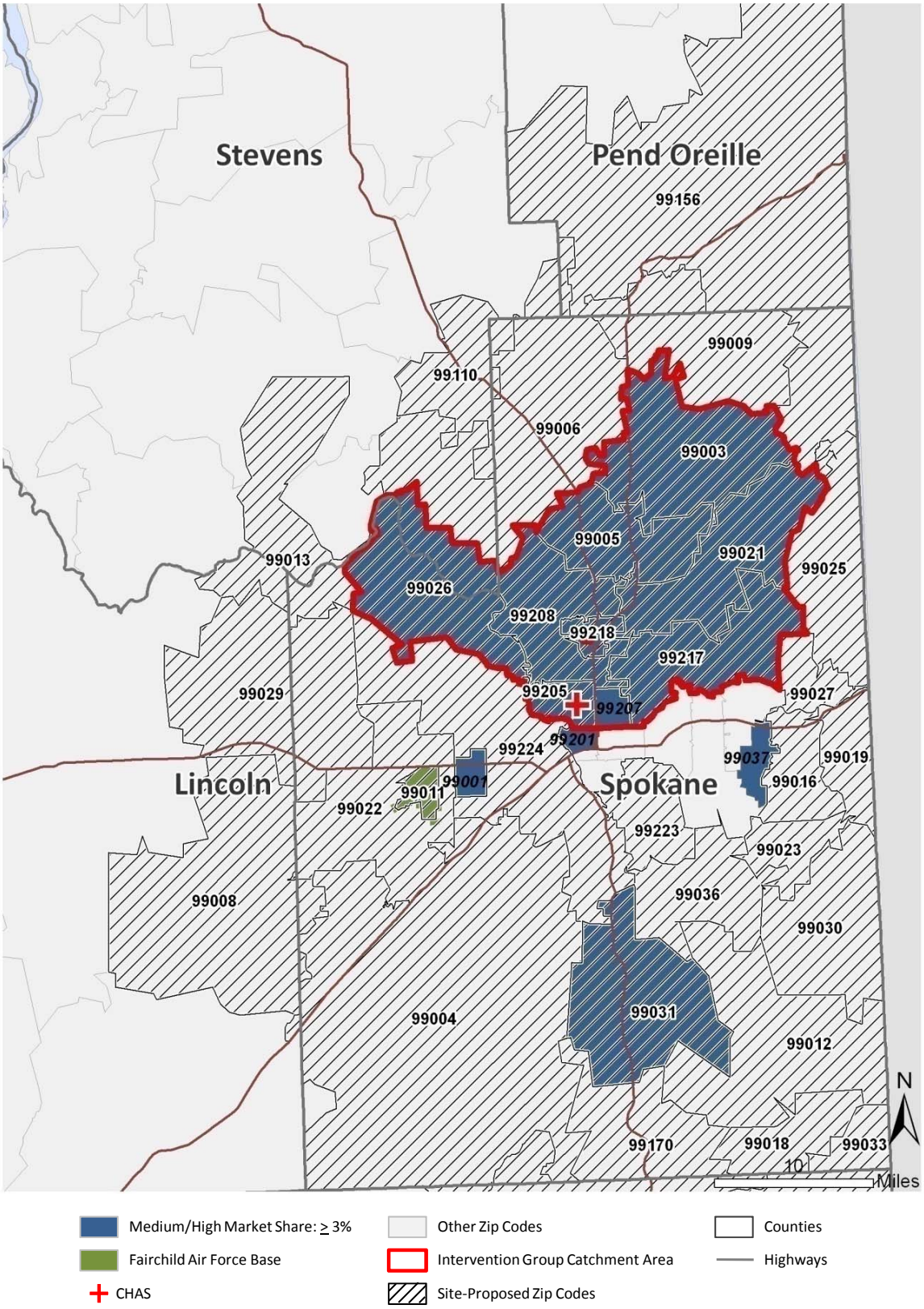


SOURCE: Integrated Database, Department of Social and Health Services, Planning, Performance and Accountability, Research and Data Analysis Division

FIGURE 8

Community Health Association of Spokane (CHAS) Market Share • Clinic Visits

Disabled Clients



SOURCE: Integrated Database, Department of Social and Health Services, Planning, Performance and Accountability, Research and Data Analysis Division

BASELINE MEASURES | Demographics, Risk Factors, and Health Care Utilization

We relied on RDA's integrated client database to provide information on demographics, medical and behavioral risk factors, and health care utilization in the baseline year. Specific measures and general findings are briefly described in this section, with a more detailed summary of the sample characteristics presented in Tables 1-4 below.

Demographic Composition

It is important to consider the demographic composition of the study population in terms of age, gender, race/ethnicity, and place of residence at baseline since these individual-level characteristics may influence factors such as access to primary care and health care utilization. We constructed a measure of the percent of a zip code's population that resides in an urbanized area and used this as a proxy for access to health care under the assumption that those in more densely populated areas may have better access to public transportation and a larger number of health care providers. We grouped this measure into four categories according to the percent residing in an urbanized area: rural (<60 percent), low density urban (60-75 percent), medium density urban (75.1-96.6 percent) and high density urban (96.7-100 percent). Figure A1 in the Appendix maps this measure for all zip codes in Washington State.

Medical and Behavioral Risk Factors

Another important consideration in this study is the degree and prevalence of chronic health, substance abuse, and mental health problems, as these factors are known to relate to health care utilization. We present average prospective chronic disease risk scores, which are based on Chronic Illness and Disability Payment System (CDPS) diagnoses and pharmacy claim information from the Medicaid-Rx pharmacy-based risk adjustment tool.[4] The prospective chronic disease risk score for the average categorically needy disabled Medicaid client is 1.0, which means that a client with a score of 1.3 would have expected medical costs that are 30 percent higher than the average client. Conversely, a client with a score less than 1.0 would have lower-than-average expected medical costs. We also present a measure indicating the potential need for alcohol or other drug (AOD) treatment, which was constructed based on the presence of any AOD-related medical diagnoses or pharmacy claims, receipt of AOD treatment, use of detoxification services, or drug- or alcohol-related arrests.[5] Measures of mental illness came from diagnoses in medical claims and mental health encounter records, as well as assessments made through the Aging and Disability Services Administration (ADSA).

Health Care Utilization

We consider a few key measures of DSHS medical coverage and utilization, including months of medical eligibility in the baseline year, as well as the number of outpatient emergency department and inpatient hospital visits per 1,000 member months. In addition, we present total DSHS medical costs per member per month (pmpm) and clinic visits per 1,000 member months for disabled clients. We also look at the number of outpatient emergency department visits that are classified as "avoidable" based on a patient's primary diagnosis, which is defined in this study as the first diagnosis field on a medical claim.

[4] See Gilmer, T., Kronick, R., Fishman, P., & Ganiats, T. G. (2001). The medicaid R-x model - Pharmacy-based risk adjustment for public programs. *Medical Care, 39*(11), 1188-1202 and Kronick, R., Gilmer, T., Dreyfus, T., & Lee, L. (2000). Improving health-based payment for Medicaid beneficiaries: CDPS. *Health Care Financing Review, 21*(3), 29-64.

[5] Sears, Jeanne, et al. (forthcoming), "The Use of Administrative Data as a Substitute for Individual Screening Scores in Observational Studies Related to Problematic Alcohol or Drug Use," *Drug and Alcohol Dependence*.

To classify outpatient emergency department visits, we relied on the Emergency Department Classification Algorithm developed by the New York University (NYU) Center for Health and Public Service Research.[6] This approach classifies emergency department visits into five major categories (visits in categories #1-3 are considered "avoidable"):

1. **Non-emergent:** The patient's initial complaint, presenting symptoms, vital signs, medical history, and age indicated that immediate medical care was not required within 12 hours;
2. **Emergent – Primary Care Treatable:** Based on information in the record, treatment was required within 12 hours, but care could have been provided effectively and safely in a primary care setting. The complaint did not require continuous observation, and no procedures were performed or resources used that are not available in a primary care setting (e.g., CAT scan or certain lab tests);
3. **Emergent – Emergency Department Care Needed - Preventable/Avoidable:** Emergency department care was required based on the complaint or procedures performed/resources used, but the emergent nature of the condition was potentially preventable/avoidable if timely and effective ambulatory care had been received during the episode of illness (e.g., the flare-ups of asthma, diabetes, congestive heart failure, etc.);
4. **Emergent – Emergency Department Care Needed - Not Preventable/Avoidable:** Emergency department care was required and ambulatory care treatment could not have prevented the condition (e.g., trauma, appendicitis, myocardial infarction, etc.); and
5. **Other:** Emergency department care led to a primary diagnosis of an injury, mental illness, an alcohol or drug-related problem, or was unclassified.

BASELINE MEASURES | Findings by Pilot Site

The baseline measures presented here show that 1) the comparison and intervention groups are well-matched for each site, 2) there are both similarities and differences between disabled clients and low-income families with children, and 3) there is opportunity for the four pilot programs to reduce inappropriate emergency department use among both of these client populations. In addition, Tables 1-4 demonstrate that the methodological approach discussed above produced sample sizes that are sufficiently large such that an impact analysis will be feasible. It is important for the reader to bear in mind that both intervention and comparison group members had at least one outpatient emergency department visit in the baseline year, so these baseline findings should not be generalized to the overall Medicaid population.

Site 1: HealthPoint (Auburn)

The intervention and comparison groups for the Auburn site are well-balanced on all measures for both client populations. In general, disabled clients are older and in poorer health relative to low-income families with children. The former also have a higher prevalence of need for alcohol or other drug (AOD) treatment and mental illness. Another notable difference between client populations is that a larger proportion of low-income families with children are Hispanic (20 percent of the intervention group) compared to disabled clients (4 percent). The vast majority of both disabled clients and low-income families with children at this site live in urban areas. With respect to emergency department visits that can be classified as avoidable, the disabled client population had 187 such visits per 1,000 member months and low-income families with children had 121 avoidable visits per 1,000 member months.

[6] See http://wagner.nyu.edu/chpsr/ed_background.shtml

Site 2: Interfaith (Bellingham)

The intervention and comparison groups for the Bellingham site are well-balanced on all measures, with the exception of the prospective chronic disease risk score among low-income families with children.[7] On average, disabled clients at this site are older, in poorer health, and exhibit higher levels of probable substance use and mental illness relative to low-income families with children. A higher proportion of the latter group is Hispanic (21 percent of the intervention group) compared to disabled clients (8 percent). Interestingly, while roughly half of disabled clients reside in rural areas, a larger proportion of low-income families with children (67 percent of the intervention group) reside in rural areas. In terms emergency department utilization, the disabled client population had 160 avoidable visits per 1,000 member months, and low-income families with children had 108 such visits per 1,000 member months.

Site 3: Lourdes (Pasco)

The intervention and comparison groups for the Pasco site are well-balanced on all measures, with the exception once again of the prospective chronic disease risk score among low-income families with children (p=.05). On average, disabled clients in this site's study population are older, in poorer health, and exhibit higher levels of probable substance use problems and mental illness relative to low-income families with children. While three-quarters of the latter group is Hispanic, just under half of the disabled client population falls into this group. The vast majority of both disabled clients (85 percent) and low-income families with children (91 percent) reside in urban areas of medium density. In terms of avoidable emergency department visits, the disabled client population had 233 visits per 1,000 member months and low-income families with children had 151 avoidable visits per 1,000 member months.

Site 4: CHAS (Spokane)

The intervention and comparison groups for the Spokane site are well-balanced on all measures for both client populations. On average, disabled clients in the study population are older, in poorer health, and have higher levels of probable substance abuse problems and mental illness. The racial and ethnic composition of the two client populations is roughly comparable, as is the percent of the population residing in urban versus rural areas (63 percent of disabled clients and 62 percent of low-income families with children reside in high density urban areas). With respect to emergency department utilization, the disabled client population had 201 avoidable visits per 1,000 members months and low-income families with children had 153 such visits.

[7] The difference between the intervention and comparison groups remains statistically significant (p<.0001) after matching for low-income families with children on this measure. A difference-in-difference approach used for the final analysis will help mitigate any lack of balance on this measure, which is quantitatively small. In addition, we may include this measure as a control variable in the final impact analyses, thus "holding it constant" between the intervention and comparison groups.

TABLE 1.

Sample Characteristics of Medicaid Clients, HealthPoint (Auburn)

	Disabled Clients *n = 1,444*		Low-Income Families with Children *n =5,734*	
	INTERVENTION *n = 722*	COMPARISON *n = 722*	INTERVENTION *n = 2,867*	COMPARISON *n = 2,867*
	MEAN AGE AND AGE DISTRIBUTION (%)			
Mean age	**42**	41	**14**	14
0 to 5 (%)			**36**	37
6 to 11 (%)			**15**	16
12 to 17 (%)			**13**	12
18 to 24 (%)			**14**	14
25 to 34 (%)			**14**	13
35+ (%)			**9**	9
<18 (%)	**4**	4		
18 to 24 (%)	**11**	11		
25 to 34 (%)	**17**	18		
35 to 44 (%)	**20**	23		
45 to 54 (%)	**28**	25		
55 to 64 (%)	**14**	14		
65+ (%)	**5**	4		
	GENDER (%)			
Female	**58**	56	**60**	59
Male	**42**	44	**40**	41
	RACE | ETHNICITY (%)			
American Indian	**6**	8	**7**	6
Asian | Pacific Islander	**4**	4	**5**	5
Black	**12**	11	**9**	8
Hispanic	**4**	4	**20**	20
White *Non-Hispanic*	**71**	70	**43**	43
Other	**2**	2	**6**	7
Missing	**.8**	1.0	**11**	11
	RURAL | URBAN (%)			
Rural	**.8**	.7	**1**	1
Urban – low density	**.4**	.6	**.4**	.5
Urban – medium density	**21**	24	**22**	21
Urban – high density	**77**	75	**76**	78
	MEDICAL AND BEHAVIORAL RISK FACTORS			
Prospective chronic disease risk score	**1.38**	1.31	**.43**	.41
Need for alcohol or other drug (AOD) treatment (%)	**36**	34	**6**	5
Psychotic or bipolar disorder (%)	**28**	28	**4**	4
Depression (%)	**36**	36	**9**	9
	MEDICAL ELIGIBILITY, UTILIZATION, AND COSTS			
Months of medical eligibility	**10**	10	**10**	10
Outpatient ED visits *per 1,000 member months*	**394**	374	**226**	226
Avoidable outpatient ED visits *per 1,000 member months*	**187**	181	**121**	121
Proportion of outpatient ED visits that were avoidable	**47%**	48%	**54%**	54%
Inpatient ED visits *per 1,000 member months*	**45**	40	**26**	25
Clinic visits *per 1,000 member months*	**2,111**	1,954		
Medical costs *pmpm*	**$1,458**	$1,290		

TABLE 2.

Sample Characteristics of Medicaid Clients, Interfaith (Bellingham)

	Disabled Clients *n = 3,454*		Low-Income Families with Children *n =9,868*	
	INTERVENTION *n = 1,727*	COMPARISON *n = 1,727*	INTERVENTION *n = 4,934*	COMPARISON *n = 4,934*
	MEAN AGE AND AGE DISTRIBUTION (%)			
Mean age	**41**	41	**15**	14
0 to 5 (%)			**32**	34
6 to 11 (%)			**15**	15
12 to 17 (%)			**15**	15
18 to 24 (%)			**16**	16
25 to 34 (%)			**14**	13
35+ (%)			**9**	8
<18 (%)	**5**	5		
18 to 24 (%)	**10**	8		
25 to 34 (%)	**18**	20		
35 to 44 (%)	**23**	24		
45 to 54 (%)	**27**	25		
55 to 64 (%)	**14**	15		
65+ (%)	**3**	3		
	GENDER (%)			
Female	**54**	54	**60**	58
Male	**46**	46	**40**	42
	RACE | ETHNICITY (%)			
American Indian	**13**	12	**13**	12
Asian | Pacific Islander	**2**	2	**2**	2
Black	**2**	2	**2**	1
Hispanic	**8**	9	**21**	22
White *Non-Hispanic*	**74**	73	**57**	57
Other	**.8**	.9	**2**	2
Missing	**.6**	.8	**4**	4
	RURAL | URBAN (%)			
Rural	**53**	52	**67**	67
Urban – low density	**.2**	.2	**.2**	.2
Urban – medium density	**13**	13	**14**	14
Urban – high density	**34**	35	**19**	18
	MEDICAL AND BEHAVIORAL RISK FACTORS			
Prospective chronic disease risk score	**1.38**	1.41	**.43**	.39
Need for alcohol or other drug (AOD) treatment (%)	**42**	43	**10**	9
Psychotic or bipolar disorder (%)	**23**	24	**4**	4
Depression (%)	**32**	31	**9**	9
	MEDICAL ELIGIBILITY, UTILIZATION, AND COSTS			
Months of medical eligibility	**10**	10	**10**	10
Outpatient ED visits *per 1,000 member months*	**353**	363	**204**	196
Avoidable outpatient ED visits *per 1,000 member months*	**160**	171	**108**	105
Proportion of outpatient ED visits that were avoidable	**45%**	47%	**53%**	54%
Inpatient ED visits *per 1,000 member months*	**41**	41	**20**	19
Clinic visits *per 1,000 member months*	**2,236**	2,295		
Medical costs *pmpm*	**$1,222**	$1,223		

TABLE 3.

Sample Characteristics of Medicaid Clients, Lourdes (Pasco)

	Disabled Clients *n = 1,186*		Low-Income Families with Children *n =5,770*	
	INTERVENTION *n = 593*	COMPARISON *n = 593*	INTERVENTION *n = 2,885*	COMPARISON *n = 2,885*
	MEAN AGE AND AGE DISTRIBUTION (%)			
Mean age	**38**	37	**12**	12
0 to 5 (%)			**42**	43
6 to 11 (%)			**17**	15
12 to 17 (%)			**13**	12
18 to 24 (%)			**11**	11
25 to 34 (%)			**12**	14
35+ (%)			**5**	5
<18 (%)	**16**	18		
18 to 24 (%)	**11**	12		
25 to 34 (%)	**16**	15		
35 to 44 (%)	**14**	14		
45 to 54 (%)	**22**	23		
55 to 64 (%)	**15**	12		
65+ (%)	**6**	7		
	GENDER (%)			
Female	**53**	52	**58**	58
Male	**47**	48	**42**	42
	RACE | ETHNICITY (%)			
American Indian	**.2**	.2	**.2**	.4
Asian | Pacific Islander	**1**	1	**.7**	.7
Black	**7**	8	**2**	2
Hispanic	**47**	48	**75**	75
White *Non-Hispanic*	**41**	38	**12**	12
Other	**3**	4	**5**	5
Missing	**1**	2	**5**	5
	RURAL | URBAN (%)			
Rural	**5**	5	**4**	5
Urban – low density	**.2**	0	**.1**	.1
Urban – medium density	**85**	84	**91**	91
Urban – high density	**9**	11	**4**	4
	MEDICAL AND BEHAVIORAL RISK FACTORS			
Prospective chronic disease risk score	**1.30**	1.26	**.43**	.40
Need for alcohol or other drug (AOD) treatment (%)	**27**	26	**4**	4
Psychotic or bipolar disorder (%)	**23**	24	**1**	1
Depression (%)	**38**	36	**5**	6
	MEDICAL ELIGIBILITY, UTILIZATION, AND COSTS			
Months of medical eligibility	**10**	10	**10**	10
Outpatient ED visits *per 1,000 member months*	**455**	424	**246**	251
Avoidable outpatient ED visits *per 1,000 member months*	**233**	230	**151**	157
Proportion of outpatient ED visits that were avoidable	**51%**	54%	**61%**	63%
Inpatient ED visits *per 1,000 member months*	**47**	46	**31**	30
Clinic visits *per 1,000 member months*	**2,276**	2,197		
Medical costs *pmpm*	**$1,589**	$1,593		

TABLE 4.

Sample Characteristics of Medicaid Clients, CHAS (Spokane)

	Disabled Clients *n = 3,312*		Low-Income Families with Children *n =10,478*	
	INTERVENTION *n = 1,656*	COMPARISON *n = 1,656*	INTERVENTION *n = 5,239*	COMPARISON *n = 5,239*
	MEAN AGE AND AGE DISTRIBUTION (%)			
Mean age	**38**	39	**16**	15
0 to 5 (%)			**30**	31
6 to 11 (%)			**14**	14
12 to 17 (%)			**13**	12
18 to 24 (%)			**17**	17
25 to 34 (%)			**17**	18
35+ (%)			**8**	8
<18 (%)	**11**	11		
18 to 24 (%)	**11**	10		
25 to 34 (%)	**17**	18		
35 to 44 (%)	**21**	19		
45 to 54 (%)	**25**	26		
55 to 64 (%)	**13**	13		
65+ (%)	**2**	2		
	GENDER (%)			
Female	**54**	54	**61**	60
Male	**46**	46	**39**	40
	RACE | ETHNICITY (%)			
American Indian	**6**	6	**7**	7
Asian | Pacific Islander	**1**	1	**2**	2
Black	**5**	5	**3**	3
Hispanic	**4**	4	**5**	5
White *Non-Hispanic*	**82**	84	**78**	78
Other	**.9**	.8	**2**	2
Missing	**.5**	.3	**3**	4
	RURAL | URBAN (%)			
Rural	**4**	4	**6**	6
Urban – low density	**14**	14	**11**	11
Urban – medium density	**18**	18	**21**	20
Urban – high density	**63**	64	**62**	62
	MEDICAL AND BEHAVIORAL RISK FACTORS			
Prospective chronic disease risk score	**1.27**	1.30	**.45**	.46
Need for alcohol or other drug (AOD) treatment (%)	**28**	27	**7**	7
Psychotic or bipolar disorder (%)	**18**	21	**3**	3
Depression (%)	**33**	34	**9**	9
	MEDICAL ELIGIBILITY, UTILIZATION, AND COSTS			
Months of medical eligibility	**10**	10	**10**	10
Outpatient ED visits *per 1,000 member months*	**420**	426	**272**	263
Avoidable outpatient ED visits *per 1,000 member months*	**201**	206	**153**	147
Proportion of outpatient ED visits that were avoidable	**48%**	48%	**56%**	56%
Inpatient ED visits *per 1,000 member months*	**38**	39	**20**	19
Clinic visits *per 1,000 member months*	**2,134**	2,180		
Medical costs *pmpm*	**$1,182**	$1,216		

DISCUSSION

Key Findings

- Absent a list of program participants, identifying geographic catchment areas for each site based on pilot hospital and clinic market shares yields a sufficiently large intervention group comprised of individuals who received outpatient services in pilot hospital emergency departments.
- A statistical technique known as propensity score matching produced comparison groups with similar observable characteristics to those of the intervention groups for each site and Medicaid client population (disabled clients and low-income families with children).
- In the baseline year, disabled clients were on average older, in poorer health, and had a higher prevalence of substance abuse and mental illness than low-income families with children. Disabled clients also tended to have higher health care utilization, though both groups exhibited an opportunity for reducing the number of avoidable visits to hospital emergency departments.

Limitations

One limitation of this study is that we do not have a way of determining whether an individual has actually been "touched" by the pilot program. As a result, it is possible that an individual in the intervention group will not have been exposed to any initiatives to improve access to care or reduce inappropriate emergency department use. On the other hand, it is also possible that individuals in both the intervention and comparison groups will have been exposed to a different program with similar aims and approach as the program under study here. For example, the Community Health Plan of Washington (CHPW) has developed a grant program for the community health centers in its network – which spans 33 counties in the state – that is also focused on reducing unnecessary (low complexity) emergency department visits. CHPW also encourages providers in its network to use the medical home model and a team-based approach to care. The implication of this limitation is that it will be difficult to isolate the effect of the four pilot sites' initiatives from other initiatives to which individuals in the study population may be exposed. We also lack information on the degree to which individuals treated at the pilot hospitals were exposed to the pilot sites' initiatives (if at all).

Next Steps

The next step for the outcome evaluation will involve a final analysis to be conducted in the spring of 2011, which will show separately for each site whether the program appears to have had an impact in reducing avoidable emergency department visits. That analysis will employ difference-in-difference regression models whereby the change from the baseline year and post-intervention year will be compared between the intervention and comparison groups. This approach will essentially control for "regression to the mean," a phenomenon in which clients with high baseline emergency department utilization are likely to have more average utilization patterns when observed later on. This is because the models will compare the change in utilization among individuals in the intervention group with the change among members of the comparison group, thus "differencing out" any natural regression to the mean.For the most part, we will maintain the same individuals in the intervention and comparison groups from baseline through follow-up; however, we may make some small refinements for the final impact analysis (such as imposing a restriction that individuals in the intervention group continue to be eligible for Medicaid and reside in the appropriate catchment area in the post-period).

APPENDIX

MAP

TABLES

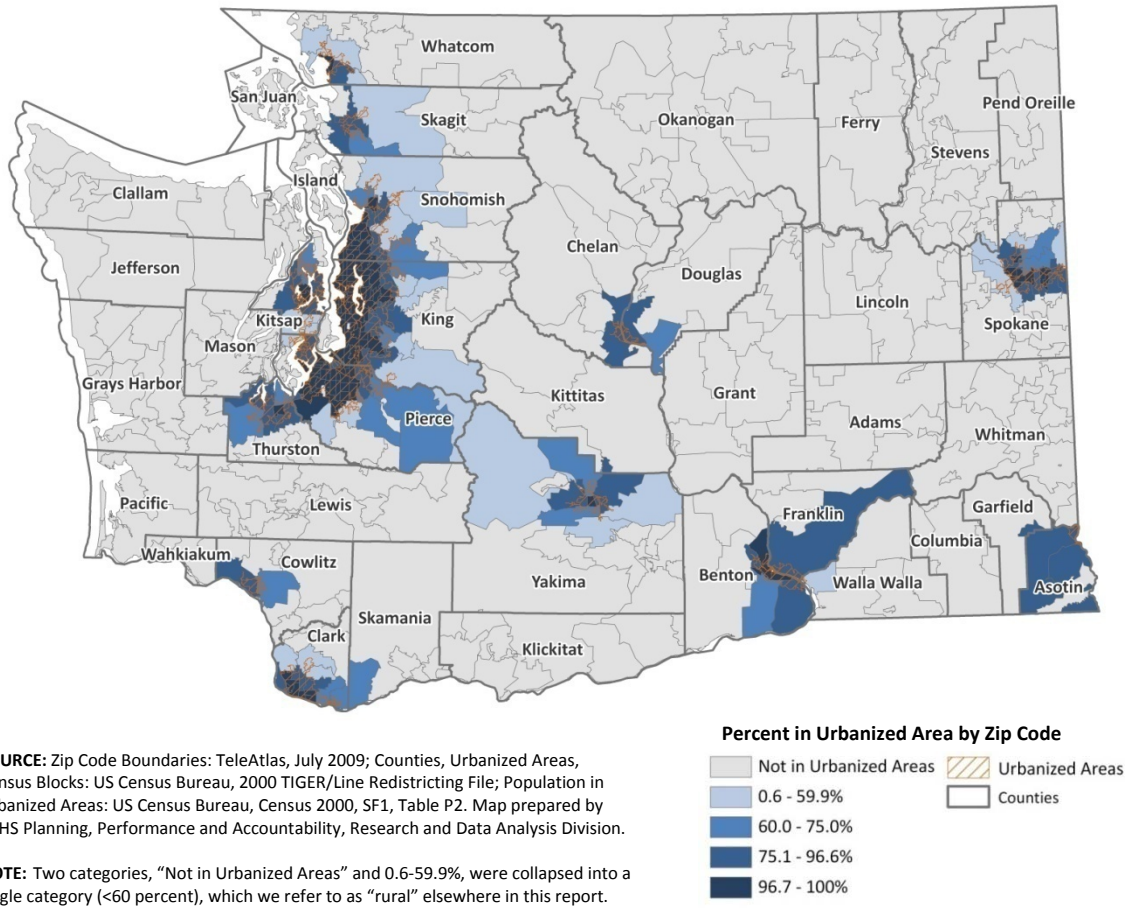
TECHNICAL NOTES

This report provides an analysis of baseline measures for a cohort of Medicaid clients who received outpatient services in the emergency departments of pilot hospitals compared to a statistically matched comparison group of individuals who had emergency department visits at non-pilot hospitals in the baseline year.

Data Sources

- RDA's Client Services Database provided client demographics and a common identifier for linking client information from multiple data sources.
- DBHR's TARGET data system provided information on alcohol or other drug (AOD) treatment and detoxification services, which was used in the construction of the indicator of need for AOD treatment.
- Medical claims and encounter records from the Medicaid Management Information System (MMIS) provided data on diagnoses, prescriptions, health care utilization, and medical costs. MMIS also provided information used to obtain clients' prospective chronic disease risk scores.
- Office of Financial Management eligibility data provided MMIS-based information on clients' medical coverage.
- TeleAtlas (July 2009) provided zip code boundaries for Figures 1-8 and Figure A1.
- US Census Bureau, 2000 TIGER/Line Redistricting File provided information for Figures 1-8 and Figure A1.
- WA State Department of Transportation provided information on highways for Figures 1-8.
- US Census Bureau, Census 2000, Summary File 1, Table P2 provided information used to calculate the percent of the population residing in an Urbanized Area.

Map A1. Urbanized Areas



SOURCE: Zip Code Boundaries: TeleAtlas, July 2009; Counties, Urbanized Areas, Census Blocks: US Census Bureau, 2000 TIGER/Line Redistricting File; Population in Urbanized Areas: US Census Bureau, Census 2000, SF1, Table P2. Map prepared by DSHS Planning, Performance and Accountability, Research and Data Analysis Division.

NOTE: Two categories, "Not in Urbanized Areas" and 0.6-59.9%, were collapsed into a single category (<60 percent), which we refer to as "rural" elsewhere in this report.

Table A1. Pilot Provider Market Share at HealthPoint (Auburn) Site

Medicaid Market Share				
Zip Code *SHADED CELLS = Zip codes selected for inclusion in the pilot site geographic catchment area*	**Visits among Disabled Clients**		**Visits among Low-Income Families with Children**	
	Auburn Regional Medical Center *Outpatient Emergency Department Visits*	**HealthPoint** *Clinic Visits*	**Auburn Regional Medical Center** *Outpatient Emergency Department Visits*	**HealthPoint** *Clinic Visits*
98002	58%	6%	69%	5%
98092	50%	4%	49%	2%
98047	40%	4%	66%	6%
98195	33%			
98001	29%	3%	29%	2%
98010	27%	1%	11%	2%
98051	24%	1%	24%	
98042	22%		25%	
98038	18%		18%	
98575	17%			
98030	15%		16%	
98032	14%		10%	
98390	10%		13%	
98372	4%		4%	
98003			7%	

Table A2. Pilot Provider Market Share at Interfaith (Bellingham) Site

Medicaid Market Share				
Zip Code *SHADED CELLS = Zip codes selected for inclusion in the pilot site geographic catchment area*	**Visits among Disabled Clients**		**Visits among Low-Income Families with Children**	
	St. Joseph Hospital *Outpatient Emergency Department Visits*	**Interfaith Community Health Center** *Clinic Visits*	**St. Joseph Hospital** *Outpatient Emergency Department Visits*	**Interfaith Community Health Center** *Clinic Visits*
98244	100%	6%	88%	2%
98281	100%	20%	100%	25%
98247	93%	3%	93%	
98248	91%	6%	93%	1%
98229	91%	8%	88%	2%
98264	90%	4%	93%	1%
98230	90%	5%	92%	1%
98295	88%	1%	97%	1%
98266	86%	4%	91%	
98225	85%	9%	91%	3%
98226	83%	6%	89%	1%
98262	80%	17%	100%	11%
98240	74%	13%	90%	
98220	64%	5%	18%	5%
98261	20%		15%	
98526	19%			
98320				
98321				

Table A3. Pilot Provider Market Share at Lourdes (Pasco) Site

Medicaid Market Share				
Zip Code *SHADED CELLS = Zip codes selected for inclusion in the pilot site geographic catchment area*	**Visits among Disabled Clients**		**Visits among Low-Income Families with Children**	
	Lourdes Medical Center *Outpatient Emergency Department Visits*	**La Clinica and Miramar** *Clinic Visits*	**Lourdes Medical Center** *Outpatient Emergency Department Visits*	**La Clinica and Miramar** *Clinic Visits*
99330	70%	24%	23%	10%
99301	53%	19%	36%	18%
99323	47%	18%	32%	10%
99343	30%	4%	15%	13%
99360	21%	5%	9%	4%
99337	16%	6%	5%	6%
99336	14%	6%	7%	8%
99352	10%	5%	4%	3%
99326	5%	2%	12%	10%
99338				

Table A4. Pilot Provider Market Share at CHAS (Spokane) Site

Medicaid Market Share				
Zip Code *SHADED CELLS = Zip codes selected for inclusion in the pilot site geographic catchment area*	**Visits among Disabled Clients**		**Visits among Low-Income Families with Children**	
	Holy Family Hospital *Outpatient Emergency Department Visits*	**Community Health Association of Spokane (CHAS)** *Clinic Visits*	**Holy Family Hospital** *Outpatient Emergency Department Visits*	**Community Health Association of Spokane (CHAS)** *Clinic Visits*
99021	73%	5%	60%	2%
99034	67%	2%	22%	
99217	64%	4%	47%	2%
99003	63%	8%	45%	1%
99208	62%	5%	54%	2%
99218	59%	5%	56%	1%
99207	56%	6%	47%	2%
99026	54%	6%	46%	3%
99006	53%	2%	38%	1%
99009	45%	3%	40%	1%
99205	42%	8%	42%	3%
99110	38%	1%	33%	
99005	28%	6%	55%	
99013	28%		24%	1%
99040	27%		29%	
99173	26%	1%	12%	
99148	20%	2%	11%	
99202	18%	3%	13%	1%
99119	18%		1%	
99158	18%		3%	
99018	17%		25%	
99001	16%	3%	10%	1%

99157	16%	1%	7%	
99219	15%	4%	14%	1%
99004	15%	2%	10%	
99022	15%	2%	10%	
99212	14%	2%	8%	1%
99223	10%		8%	1%
99019	10%		1%	1%
99170	7%		2%	1%
99156	7%	3%	5%	
99025	6%	3%	4%	
99016	5%	2%	2%	
99027	3%	2%	5%	
99029		2%	6%	1%
99224				
99011				2%
99008			5%	
99036		1%	4%	
99023				
99031		9%		2%
99030		1%		
99012			2%	
99033			5%	

Community Collaboration for Appropriate Emergency Department Care Pilot Evaluation

Interim Report on Study Design and Baseline Measures

An evaluation of four pilot programs aimed at encouraging the appropriate use of emergency department care.

Funded by the Centers for Medicare and Medicaid Services
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