

Grant Final Report

Grant ID: UC1HS016129

**El Dorado County Safety Net Technology
Project / ACCESS El Dorado**

Inclusive dates: 09/30/05 - 09/29/09

Principal Investigator:

Greg Walter Bergner, MD

Team members:

Sandra Defoe Dunn

Kimberly Dickson

Jon Lehrman, MD

Maria Chaves

Dana Davies

Trever Lee

Kirsten Rogers

Rob Quadri

Nancy Wise

Performing Organization:

Marshall Medical

Project Officer:

Erin Grace

Al Deal (Grants Management Specialist)

Submitted to:

The Agency for Healthcare Research and Quality (AHRQ)

U.S. Department of Health and Human Services

540 Gaither Road

Rockville, MD 20850

www.ahrq.gov

Abstract

Purpose: The overarching goal of Access El Dorado (ACCEL) is to improve access to medical care for low-income, minority and uninsured or publicly insured residents of El Dorado County, California.

Scope: This project focused on improving health care coordination between providers by 1) expanding the scope of Care Pathways, which are tools to systematically connect residents with health care, using standardized processes to facilitate outcome focused cross-agency case management, 2) developing iREACH, a web-based application to electronically manage Care Pathways, and 3) implementing a Health Information Exchange (HIE) through which providers can share patient clinical data.

Methods: Impact of the Care Pathways was measured using quantitative data from the program. Analysis of the implementation of iREACH and the HIE was evaluated through semi-structured interviews and focus groups with ACCEL participants.

Results: Care Pathways have successfully assisted over 3,300 children. Those who were connected to a medical home visited the emergency department (ED) less frequently, leading to a 40 percent reduction in hospital ED costs. The transition of Care Pathways to iREACH has led to greater efficiencies in case management. While ACCEL did not implement the HIE, it has laid groundwork to support future adoption.

Key Words: Health IT, El Dorado, rural health, safety net, Care Pathways

The authors of this report are responsible for its content. Statements in the report should not be construed as endorsement by the Agency for Healthcare Research and Quality or the U.S. Department of Health and Human Services of a particular drug, device, test, treatment, or other clinical service.

Final Report

Purpose

The overarching goal of Access El Dorado (ACCEL) is to improve access to medical care for the over 16,000 low-income, minority and uninsured or publicly insured residents of El Dorado County, California. The activities funded through the 2005 AHRQ Health Information Technology (HIT) Implementation Grant awarded to ACCEL focused on three goals for improving health care coordination across providers in this rural county:

1. **Expansion of the Scope and Geographic Reach of Care Pathways.** The ACCEL Care Pathways are a set of standardized protocols for inter-agency shared case management, through which ACCEL partners, who range from County Community Health Workers (CHWs) to medical providers, work to:
 - Increase the number of children who secure healthcare coverage, obtain and use medical homes, and gain access to mental health services
 - Decrease the use of the emergency department (thereby reducing costs) for non-urgent pediatric health conditions by ensuring that children have medical homes for routine care and that care follows clinical guidelines
2. **Implementation of a HIT tool for Care Pathways.** To facilitate the expansion of the Care Pathways, the grant supported the transition to an electronic information hub through which ACCEL participants can track, share, and update client progress through the pathways more efficiently. The HIT tool was intended to:
 - Help CHWs and referral specialists at provider sites manage Care Pathway tasks
 - Allow users to quickly pull up information on pathways clients to avoid the duplication of efforts
 - Improve analysis of pathways data, such as barriers to care, and reporting of pathways outcomes
3. **Development of a County-Wide Technology Infrastructure that Supports Clinical Data Sharing.** This second IT solution was aimed at improving the coordination of care for patients in El Dorado by providing:
 - A centralized index of patients served through ACCEL, reducing the potential for uncoordinated and duplicated services

- A strategy for IT connectivity across providers who are widely dispersed across a large, predominantly rural, mountainous region and are hence isolated from one another
- Through the shared IT platform, creation of a structure for a basic Health Information Exchange (HIE) and clinical data sharing among Safety Net Providers in El Dorado County

Ultimately, these investments were expected to improve health outcomes for residents in El Dorado County through better access to care, improved health care coverage, and enhanced coordinated treatment. The SPHERE Institute was tasked with completing the evaluation of these components of the ACCEL program.

Scope

Background and Context

In 1998, California was one of 26 states that entered into the landmark Tobacco Master Settlement Agreement with the tobacco industry, which required tobacco companies to make payments to the state, counties, and local governments in perpetuity.¹ Expecting to receive an estimated \$7.4 million from settlement funds for 2002-2006, El Dorado County conducted a needs assessment in 2002 to identify health-related areas that should be targeted with the newly available funds. The findings from the study triggered the creation of the El Dorado County Safety Net Provider Network, a collaboration of public and private organizations. The network was tasked with addressing concerns that particularly related to uninsured, underinsured, and publicly insured El Dorado residents. These concerns included the high number of uninsured children within the county (an estimated 7,335 in 2002), a lack of medical providers who accepted publically insured patients, and overutilization of emergency departments for non-urgent care due to uninsured patients.

Access El Dorado (ACCEL) Activities

In 2004, the Safety Net Provider Network formed Access El Dorado (ACCEL), after receiving a grant from the Health Resources and Services Administration (HRSA) to improve children's access to health insurance. Under this grant, ACCEL developed the Care Pathways, which are tools to systematically connect El Dorado's Safety Net population with health care, using standardized processes to facilitate cross-agency case management. Care Pathways are based on a model initially implemented by the Community Health Access Project (CHAP).² Each pathway defines a specific problem to be solved (e.g. lack of health coverage, need for a medical home) and the outcome to be achieved (e.g. enrollment in a health plan, securing a medical home). Community Health Workers (CHWs) serve as coordinators who help navigate patients through the Care Pathways, with collaboration from providers, hospitals, and other community partners. Care Pathways define common language, patient eligibility criteria, work

steps and user responsibilities. The goal is that by implementing standardized processes across agencies, and being aware of barriers to pathways, agencies can achieve greater success in connecting patients to care, and retaining them in care.

The Care Pathways adopted by ACCEL over the life of the project included six pathways; the following table describes each of the pathways in detail.

Table 1. ACCEL Care Pathways

Pathway	Description
Securing Health Care Coverage (SHCC)	Assists parents of uninsured children with the application process for obtaining health care coverage.
Annual Eligibility Review (AER)	All clients who successfully obtain health coverage through the SHCC pathway are referred to AER. The goal of this pathway is to assist clients with the annual eligibility review process to help them retain their existing health coverage.
(Newborn) Securing Health Care Coverage (NBSHCC)	Parallel to SHCC, but focuses on newborns at the hospitals whose births are covered by Medi-Cal, California’s Medicaid program. This pathway assists mothers in enrolling their newborns into Medi-Cal.
Pediatric Mental Health Consult (PMH)	Leverages the role of mental health providers by supporting primary care providers in addressing mental health needs as part of ongoing health care.
Newborn Using a Medical Home (UMH)	Promotes preventive health care and the use of a medical home, measured by the completion of four well-baby appointments and the receipt of immunizations within the first eight months of life.
Obtaining a Medical Home (OMH)	Connects children who visit the emergency department with a medical home – a primary care provider who accepts their current insurance.

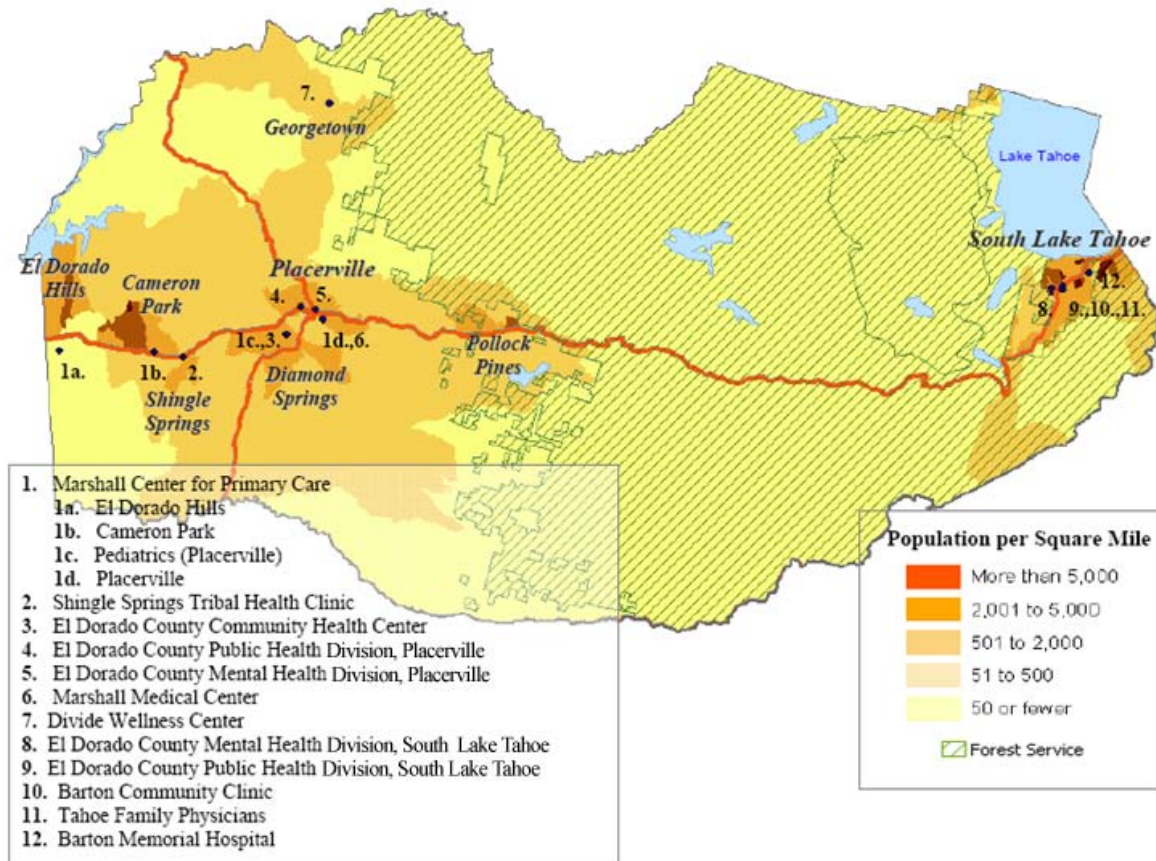
In 2005, ACCEL was awarded an AHRQ Health Information Technology Implementation Grant (HIT) grant. ACCEL used the HIT grant to design electronic support for the Care Pathways implementation using a web-based application (iREACH). iREACH allows CHWs and providers to track and manage their patients’ progress through the Care Pathways. ACCEL also worked to create an Electronic Master Patient Index (EMPI) that contained patient demographic data that could be shared among providers. Finally, ACCEL sought to build upon the EMPI to create a Health Information Exchange (HIE), which would allow providers to share patient clinical data. The EMPI and HIE were intended to lead to improved coordination and communication among providers, to give providers more accurate and timely health information about their patients, and to reduce duplication of services.

ACCEL Participants

ACCEL has 12 active member organizations, which include governmental agencies, community and rural health centers, a federally qualified health center, a tribal clinic, several private clinics, and two hospitals. ACCEL participants represent two separate health care communities, bisected by the Sierra Nevada mountain range. Located on the “western slope” of the county, situated near Placerville, are: Shingle Springs Tribal Health, the El Dorado County Community Health Center, offices of the Public Health Division including the Public Health and Mental Health Services Divisions, and Marshall Medical affiliates, including the Hospital, the Divide Wellness Center and four primary care clinics. The remaining members are located within the South Lake Tahoe on the “eastern slope.” These include offices of the Public Health

and Mental Health Services Divisions and Barton Health Care System affiliates – Barton Hospital, Tahoe Family Physicians and Barton Community Clinic. See Figure 3-1 for a map of El Dorado and the location of ACCEL participants.

Figure 1. El Dorado County and ACCEL participants



Methods

The ACCEL evaluation uses the following sets of measures to determine ACCEL’s success meeting its goals related to the HIT Implementation Grant:

1. Progress through the ACCEL Care Pathways
2. Reduction in Emergency Department Visits for Non-Urgent Care
3. Implementation of Care Pathways and the Health Information Exchange (HIE)

Measures 1 and 2 assess the progress made towards Goal 1 of the grant. Measure 3 addresses progress made towards Goals 2 and 3. The methods for evaluating these measures, which include both qualitative and quantitative data collection, are described below. These measures evolved over the grant's four annual evaluations to coincide with ACCEL's changing scope.

Progress through the ACCEL Care Pathways

Through this set of six Care Pathways measures, we assess whether the implementation of Care Pathways is improving access to health care. We compare the number of Care Pathways in operation, the number of clients served, and the share of successful cases each year over the grant's four years. Data for this measure were hand tallied by ACCEL participants and compiled by the Public Health Division (PHD) into an excel file. These data include the status of each Care Pathway each month (i.e. number of cases opened, successfully closed, unsuccessfully closed, and pending). Additionally, for successfully completed pathways, we received data on where patients are receiving their care. For pathways that were tracked in iREACH, similar data were also available directly from iREACH-generated summary reports.

For the period prior to the implementation of iREACH, we relied solely on data reported by the PHD for this measure. In some cases, we used data from iREACH summary reports for the period following implementation. We did not use iREACH in all cases because of differences in how data on pending cases are reported. In the reports from the PHD, the numbers of closed cases in a given report period include cases that were opened in previous report periods. In contrast, iREACH only reports the status of cases opened during the report period; for example, a case that opened in January but did not close until April is counted as pending in a January report but not counted at all in the April report in iREACH. This led to difficulty calculating accurate totals, as cases that were opened prior to iREACH but closed after its implementation were not represented in the iREACH reports.

Reduction in Emergency Department Visits

In this analysis we assess the impact of the Obtaining a Medical Home (OMH) Pathway on the frequency of visits and cost to the Marshall Hospital emergency department (ED). The OMH Pathway identifies children who visit the Marshall ED and do not have a medical home, and connects them to a primary care provider. Through improved access to primary care, we assume children will have better health outcomes and rely less on the ED, thereby decreasing health care costs.³ For each child served by the pathway, we received data on his/her age, date of enrollment in the pathway,⁴ and date of each ED visit from September 1, 2005 to June 28, 2009. We limited the sample to those children enrolled in the pathway before June 28, 2008 to capture at least one year's worth of information on ED visits after enrollment.

We compared the ED visit patterns of children *before* they entered the pathway to their ED visit patterns *after* they entered the pathway. For each child, the *before* period and the *after* period each equaled 12 months. This method had an inherent control for characteristics that could have influenced ED visits, such as gender, ethnicity, socioeconomic status, and chronic disease. Because these characteristics are held relatively constant over a child's life, we did not have to control for them through statistical methods.

Within this framework, we used two measures to assess the effects of the pathway. The first is *the average number of ED visits*, calculated by taking the average annual number of ED visits

by children successfully completing the OMH Pathway *before pathway enrollment*, and the average annual number of ED visits by these children *after pathway enrollment*. The second measure is *percent of frequent ED users*, which is more reliable because the goal of the pathway is to reduce the *overutilization* of the ED. The frequent ED user measure accounts for the fact that almost half of the children only had one ED visit, which was the visit that triggered program enrollment. These children might have been appropriately using the ED, and by including their triggering visits in the before period, the before period average is inflated. A high-frequency ED user was defined as having three or more ED visits during the 12-month period, a moderate-frequency ED user as having two ED visits during the 12-month period. These definitions were based on the distribution of ED visits in the before period.

We also estimated the impact of the OMH Pathway on ED costs. To do so, we used an estimate of the *average marginal cost* of an ED visit at a trauma hospital, based on a 2005 Rand study.^{5,6} Marginal costs referred to the cost of each additional patient seen in the ED, not including fixed costs such as building, staff salaries, and other overhead costs. To estimate the cost of ED visits prior to OMH Pathway implementation, we multiplied the annual average number of ED visits per client before pathway enrollment (1.5) by the number of clients successfully completing the OMH Pathway (249) by the average marginal cost. Then we compared this number to the product of the annual average number of ED visits *after* enrollment (0.9), the number of patients (249), and the average marginal cost. The difference between the two is the estimated annual savings due to implementation of the pathway.

Implementation of iREACH and the HIE

We relied on qualitative data captured through semi-structured one-on-one interviews and focus groups with CHWs, providers, PHD staff, ACCEL staff, and other stakeholders for updates on the implementation of iREACH, the development of the HIE, and lessons learned throughout the process. Interviews and focus groups were conducted twice a year. Although questions were tailored to each interviewee's expertise, common questions regarded the interviewee's role in ACCEL and their perception of ACCEL's main successes, the main challenges, and strategies for overcoming those challenges. The one-on-one interviews and focus groups were conducted with two SPHERE staff present, one of whom served as the main interviewer and the other as a note taker. Interviewees were informed that the information they shared would remain confidential; while their comments might be quoted or paraphrased in the report, they would not be identified by name. A debriefing session followed each interview or focus group, in which the interviewer and the note taker would review and discuss notes as well as identify any follow-up questions for interviewees.

Results

In this section, we highlight the key findings and results from the four-year evaluation of ACCEL. Each of the following sub-sections addresses the outcomes from each of the three sets of measures used in the evaluation.

Progress through the ACCEL Care Pathways

ACCEL has made notable progress in serving the needs of El Dorado children through the Care Pathways. Below, we review the growth and impact of the Care Pathways over the past four years. Our analysis uses data covering the period from June 2006 to June 2009. Note that iREACH was launched in the spring and summer of 2008, and was fully operational by July 2008. Hence, we relied on data from iREACH for the period from July 2008 through June 2009. Data covering the period prior to that was retrieved from the PHD, with exceptions noted below.

ACCEL has Gradually Expanded the Number and Geographic Reach of Care Pathways. In the first year of the grant, only three pathways were implemented on the western slope, none on the eastern slope. To address the changing health care needs within the county, new pathways have been added over the years. By Year Four, the total number of pathways in the county has grown to six in the western slope and four on the eastern slope. The distribution of the pathways remains uneven, reflecting the unique priorities of each slope.

Table 2. Scope and geographic reach of Care Pathways

Care Pathway	Year of Pathways: Western Slope—1	Year of Pathways: Western Slope—2	Year of Pathways: Western Slope—3	Year of Pathways: Western Slope—4	Year of Pathways: Eastern Slope—1	Year of Pathways: Eastern Slope—2	Year of Pathways: Eastern Slope—3	Year of Pathways: Eastern Slope—4
Securing Health Care Coverage (SHCC)	•	•	•	•		•	•	•
Annual Eligibility Review (AER)			•	•			•	•
(Newborn) Securing Health Care Coverage (NBSHCC)			•	•		•	•	•
Pediatric Mental Health Consult (PMH)	•	•	•	•				
Newborn Using a Medical Home (UMH)		•	•	•				
Obtaining Medical Home (OMH)	•	•	•	•				

Care Pathways have Successfully Improved Access to Health Care Services for over 3,000 Children. The Care Pathways have made significant achievements towards ACCEL’s overarching goal, including:

- Connecting over 2,000 children to health care coverage since the inception of the SHCC Pathway, with approximately 50 children benefiting per month. The vast majority of the pathways opened (92 percent) resulted in successful completion.
- Assisting 92 percent of children to re-enroll into health insurance programs. ACCEL launched the AER Pathway in Year Three, serving a total of 500 children. The pathway also saw an increase in share of successful cases from Year Three to Year Four.
- Increasing the number of newborns who successfully obtain health insurance. Through the life of the NBSHCC, the average number of cases opened per month has increased, from 20 in Years Two and Three to 27 in Year Four. Additionally, the share of successful cases has also increased from 74 percent in Year Two to 82 percent in Year Four.
- Expanding referrals to mental health treatment. Overall, 51 pathway enrollees (50 percent of total cases) were seen by the Mental Health Division (MHD) and their treatment plans were sent from MHD to the referring primary care physicians. Each year, the average number of cases opened per month steadily increased, growing from 1.6 per month in Year One, to 3.6 per month in Year Four.
- Assisting 140 newborns in obtaining well-baby exams and immunizations. By June 2009, 57 percent of open cases had completed four well-baby appointments and received appropriate immunizations, successfully completing the pathway. The average number of newborns enrolled each month increased every year, growing from an average of seven per month in Year One, to nine per month in Year Four. A large share of cases remains pending because the pathway can take up to nine months to complete.
- Successfully establishing a medical home for 358 (86 percent) of children after being seen in the Marshall ED. The share of successful cases jumped slightly from 84 percent in Year Three to 88 percent in Year Four.

Table 3. Summary of Care Pathways

Care Pathway	Date Launched	Cases Opened	Successful (Pathway Completed)	Unsuccessful (Pathway Not Completed)	Pending*
Securing Health Care Coverage Pathway SHCC	May 2006	2,036	1,903 (92%)	137 (7%)	23 (1%)
Annual Eligibility Review AER	Apr. 2008	500	462 (92%)	25 (5%)	13 (3%)
Newborn Securing Health Care Coverage Pathway NBSHCC	Jul. 2007	537	439 (82%)	80 (15%)	18 (3%)
Pediatric Mental Health Consult Pathway PMH	Jan. 2006	108	51 (50%)	44 (41%)	13 (12%)
Newborn Using a Medical Home Pathway UMH	Jan. 2007	244	140 (57%)	48 (20%)	56 (23%)
Obtaining a Medical Home Pathway (OMH)	Aug 2006	418	358 (86%)	60 (14%)	0 (0%)

Source: PHD data for the period 6/2006 – 6/2008 and iREACH data for 7/2008-6/2009, except for AER (iREACH data only) and SHCC (PHD data only). *Cases still open as of June 2009.

Continued Provider Participation Contributes to Success of OMH and UMH Pathways.

As Tables 4 and 5 and show, the majority of referrals for the OMH and UMH pathways are made to providers at the El Dorado County Community Health Center (EDCCHC), as most clients are publically insured. However, the Marshall Center for Primary Care (MCPC) also takes on a substantial share of referrals. The EDCCHC accounted for nearly two-thirds of all UMH referrals in Years Two and Three. In Year Four, the share of referrals to EDCCHC decreased to just under half, with a greater share of referrals being made to MCPC and other provider sites than in previous years. This reflects efforts of the CHW to distribute cases more evenly across providers participating in the UMH pathway. In contrast, the economic downturn led to more children qualifying for Medi-Cal, and as a result, the share of OMH referrals to the EDCCHC increased from 50 percent to 64 percent between Years Three and Four, with a corresponding decrease in referrals to MCPC.

Table 4. Provider referrals for OMH Pathway

Provider Site	Year Two	Year Three	Year Four
El Dorado County Community Health Center (EDCCHC)	51%	50%	64%
Marshall Center for Primary Care (MCPC)	29%	30%	21%
Divide Wellness Center	8%	3%	2%
Kaiser	1%	7%	2%
Tribal Health	5%	4%	7%
Cameron Park Pediatrics	0%	1%	0%
Private Practice Providers	3%	6%	3%
Referred out of County	3%	0%	0%

Table 5. Provider referrals for UMH Pathway

Provider Site	Year Two	Year Three	Year Four
El Dorado County Community Health Center (EDCCHC)	65%	63%	48%
Marshall Center for Primary Care (MCPC)	23%	25%	35%
Divide Wellness Center	1%	3%	3%
Kaiser	0%	2%	1%
Tribal Health	3%	5%	7%
Cameron Park Pediatrics	0%	0%	1%
Western Sierra Medical	0%	0%	1%
Private Practice Providers	7%	2%	5%

Reduction in Emergency Department Visits

Before enrollment in the OMH pathway, children visited the ED an average of 1.5 times. In contrast, we observed a lower average of 0.9 ED visits for children after program enrollment (Table 6). Fifty-three (21.3 percent) of children were moderate-frequency users (2 ED visits in a 12-month period) and 30 (12.1 percent) were high-frequency ED users (3 or more visits) before program enrollment. The number of moderate frequency users dropped to 25 (10 percent) after enrollment and the number of high-frequency users also dropped to 22 (8.8 percent). Following program enrollment, overall there was an approximate 43 percent reduction in the number of high and moderate-frequency ED users. These results suggest that the OMH Pathway reduced children’s overutilization of the ED.

Table 6. ED Visit patterns before and after enrollment

	12 Months Before Pathway Enrollment	12 Months After Pathway Enrollment
Average	1.5	0.9
Moderate-frequency (2 visits)	53 (21.3%)	25 (10.0%)
High-frequency (3 or more visits)	30 (12.1%)	22 (8.8%)

A reduction in ED visits should lead to a reduction in costs for Marshall Medical. A 2005 Rand study estimated the average marginal cost of an ED visit at a trauma hospital to be \$412 in 1998 dollars, which translates to approximately \$544 dollars in 2009 dollars.⁷ Marginal cost in this case refers to the cost of each additional patient seen in the ED, not including fixed costs such as building and other overhead costs. Depending on existing capacity, marginal costs may or may not include the costs of additional staff. Based on this estimate of marginal cost, the OMH Pathway saved the Marshall ED \$81,247 in one year, which represents a 40 percent reduction in cost compared to what would have been spent had these 249 patients not obtained a medical home.

In addition to the savings to Marshall, the reduction in emergency room visits also has other potential impacts which cannot be easily quantified, but are still important to consider. For example, the amount charged to patients and their health insurance plans for an emergency room visit are typically higher than that charged for an office visit. Furthermore, like many hospitals, Marshall absorbs the cost of treating low-income patients who were uninsured at the time of their ED visit. The financial burden of providing charity care pushes many hospitals to recover their losses by charging higher rates to insurance plans and other paying patients. By shifting children away from ED and towards a physician’s office for their primary care needs, the OMH pathway could potentially reduce the out-of-pocket costs for all patients. Lastly, through decreasing the frequency of ED visits for non-emergencies, the OMH pathway reduces wait times, allowing staff to devote more resources and time to treating patients with real emergencies.

Implementation of iREACH

ACCEL has successfully accomplished its goal of designing and installing iREACH, a web-based tool that allows users in multiple locations to track, share, and update client progress more efficiently through the Care Pathways. In the following discussion, we describe the system’s implementation process and functionalities, as well as present user feedback on the system. Finally, we end with a discussion of the issues which will affect the future success of iREACH.

iREACH is now an Integral Part of Care Pathways Management. ACCEL spent the first two years of the grant designing the Care Pathways by receiving input from multiple stakeholders on pathways processes and preferred functionalities. Creating detailed process flows was a necessary first step in this development phase. However, this task was time-consuming because CHWs often managed pathways unsystematically and thus it was difficult to create universally agreed upon process flows. ACCEL staff, who have expertise in both public health case management and IT tools, then acted as a bridge between these users and the iREACH’s vendor, Infocom, to convert the process flows into a software application. At this time, ACCEL also secured Barton Health Care System as iREACH’s host. Barton not only

stores iREACH on its main server, but acts as Infocom's contracting agency. This structure relieves ACCEL from the burdensome contracting requirements of El Dorado County.

During the third year of the grant, ACCEL trained iREACH users, including referral specialists and CHWs, for the launch. Trainings consisted of formal group demonstrations as well as ad hoc sessions, where users could benefit from tailored guidance provided by ACCEL staff. These trainings were accompanied by instruction manuals ACCEL developed, referred to as case studies, which walked users through the iREACH process based on different patient scenarios. ACCEL launched iREACH in the spring of 2008 for five pathways: Securing Health Care Coverage, (Newborn) Securing Health Care Coverage, Obtaining a Medical Home, Annual Eligibility Review and Pediatric Mental Health Consult. The (Newborn) Utilizing a Medical Home pathway was not incorporated into iREACH because it is part of a larger health initiative overseen by First 5 California, a State Commission that funds programs for families with children ages 5 and younger. Given that new technology systems always have glitches, all parties felt that the launch went relatively smoothly.

During the first several months, ACCEL acted as a responsive conduit of information between users and Infocom to fix system bugs and modify processes based on feedback. The final year of the grant has been dedicated to continual data quality checks and training users who tend to generate more data entry errors. After months of intense ACCEL involvement, "mistakes have really diminished," according to one user. iREACH is now an integral part of pathways management.

All ACCEL Participants have Adopted iREACH. All ACCEL agencies, including the Mental and Public Health Divisions on both slopes, Barton Health Care System, the El Dorado County Community Health Center, and Tribal Health have been using iREACH consistently over the last year. In the past, Marshall was hesitant to adopt iREACH due to competing priorities and reluctance to sign the ACCEL MOU. However, after Marshall's compliance officer and leadership received outside counsel on the issue, Marshall agreed to sign an MOU with ACCEL for iREACH adoption. ACCEL is just starting the process of training Marshall users. Most likely, adoption will begin at Marshall's emergency and OB/GYN departments. This will reduce the work of the CHWs, who are now responsible for receiving faxes from Marshall and inputting the referrals into iREACH. Once Marshall implements iREACH, staff can directly input the referrals themselves. Then, iREACH would move to the Marshall Centers for Primary Care, which receive referrals for OMH Pathways clients. It is encouraging that Marshall Medical has committed to implementing iREACH, having seen the benefits it brings to them as well as patients and providers at other sites.

Task and Client Tracking and Reporting are iREACH's Main Functionalities. A major function of iREACH is its ability to help users better track and access tasks, pathway status, and patient information. The system includes several features which support information tracking and management. First, at log-in to iREACH, users are presented with "My Tasks," a list of all pending items for all open pathways. Second, the system allows users to check the status of an individual pathway to remind themselves which steps have been completed and are still pending. Third, iREACH contains detailed information about how to complete each task and enables users to input comments in case the pathway must be taken over by a different CHW or referral specialist. Fourth, even when users are logged off, automated email messages provide reminders when a task needs completion. This system ensures that providers have access to necessary

patient information, in particular insurance status, which can support care provision as well as interpreting and acting upon county-level data.

The second major functionality is the system's generation of reports, which was incorporated into iREACH during this last year. These reports are essential because they facilitate quality assurance checks and quickly capture pathways outcomes. Each report and utility is described below:

- **Client Activity:** This report is at the client/pathway level. It contains the client's name, medical home and insurance, origin of the referral, and pathway outcome.
- **Pathway Duration:** This report measures the length of time between each milestone within a pathway and the total length of the pathway. A pathway is highlighted in yellow if it exceeds the recommended time limit or green if it beats the limit. If ACCEL finds that pathways tend to exceed time limits, staff meet to discuss why and modify processes. For example, through this report, ACCEL staff found that CHWs were not inputting data in real time and therefore several tasks would build up and occur on the same day. CHWs were then trained to input task completion upon occurrence. If pathways are consistently completed before the expected time period, expectations are also modified.
- **Pathway Referral Outcome Summary:** This report provides a snapshot of the status of each pathway, showing the total number of pathways opened, completed successfully, completed unsuccessfully, and pending.
- **Pathway Summary Report:** This report presents the number of pathways started and completed by quarter for each slope.
- **Securing Health Care Coverage Insurance:** This report describes the breakdown of health insurance for the Securing Health Care Coverage Pathway.

While in this transition period, the PHD continues to also use an Access database to record and track pathways' progress. Some discrepancies exist between the reports produced by iREACH and those generated from the "paper" tally. A discrepancy could occur if a pathway is opened and the client is deemed ineligible; therefore the pathway is deleted in iREACH, while remaining on the paper tally. Once ACCEL has created a system to deal with such issues and the PHD is confident that reports are consistent, staff will rely solely on the iREACH reports.

Users Better Manage Clients and Save Time with iREACH. iREACH users within the PHD and provider sites were most enthusiastic about how the iREACH system facilitates the tracking of patient information. Prior to iREACH, CHWs relied on faxes and phone calls to receive information from providers and tracked information on paper stored in large binders. One user whose clinic refers clients into the Pediatric Mental Health Consult Pathway and accepts medical home referrals stated "I feel that iREACH has been extremely efficient. I just know from before, it's a much less tedious process, more streamlined....The paper process was bogging us down." iREACH users acknowledged that while the system has a learning curve, it becomes more intuitive with time, with one user expressing, "Now that I understand it more, it's

a piece of cake. I like that it gives you a heads up on what's due. I check daily and get status updates." A third user called iREACH a "lifesaver."

In particular, the tracking capabilities allow providers to avoid duplicate work which can occur when patient information is unknown. For example, each month, the State sends the PHD a list of children in the county who have been granted temporary Medicaid (known as "gateway" Medicaid); the intent is that CHWs use the list in targeting their permanent Medicaid enrollment efforts. However, some gateway children may already have started the SHCC pathway by the time CHWs receive the list. Using iREACH allows CHWs to identify and filter out these children from the list and focus on those with whom they have not yet been in touch, saving time and resources.

Furthermore, users appreciate that iREACH provided them with a foot in the door on the HIT movement. Users gained skills and experience from iREACH, for which they were particularly grateful because many did not have high levels of technical expertise. For example, one provider site relies on paper-based systems to capture clinical information. The time saving benefits of iREACH made the user excited about their upcoming adoption of an EMR. Another user described working with iREACH as "the wave of the future." She states, "we'll be ahead of the curve because we have experience with meshing the human interaction with software configuration."

That said, the potential for iREACH to exchange information between providers is currently being underutilized. Much of the burden for updating and collecting information is placed on CHWs. ACCEL is working with providers outside of the PHD to help them to take on a greater role. We discuss this issue further in the following section.

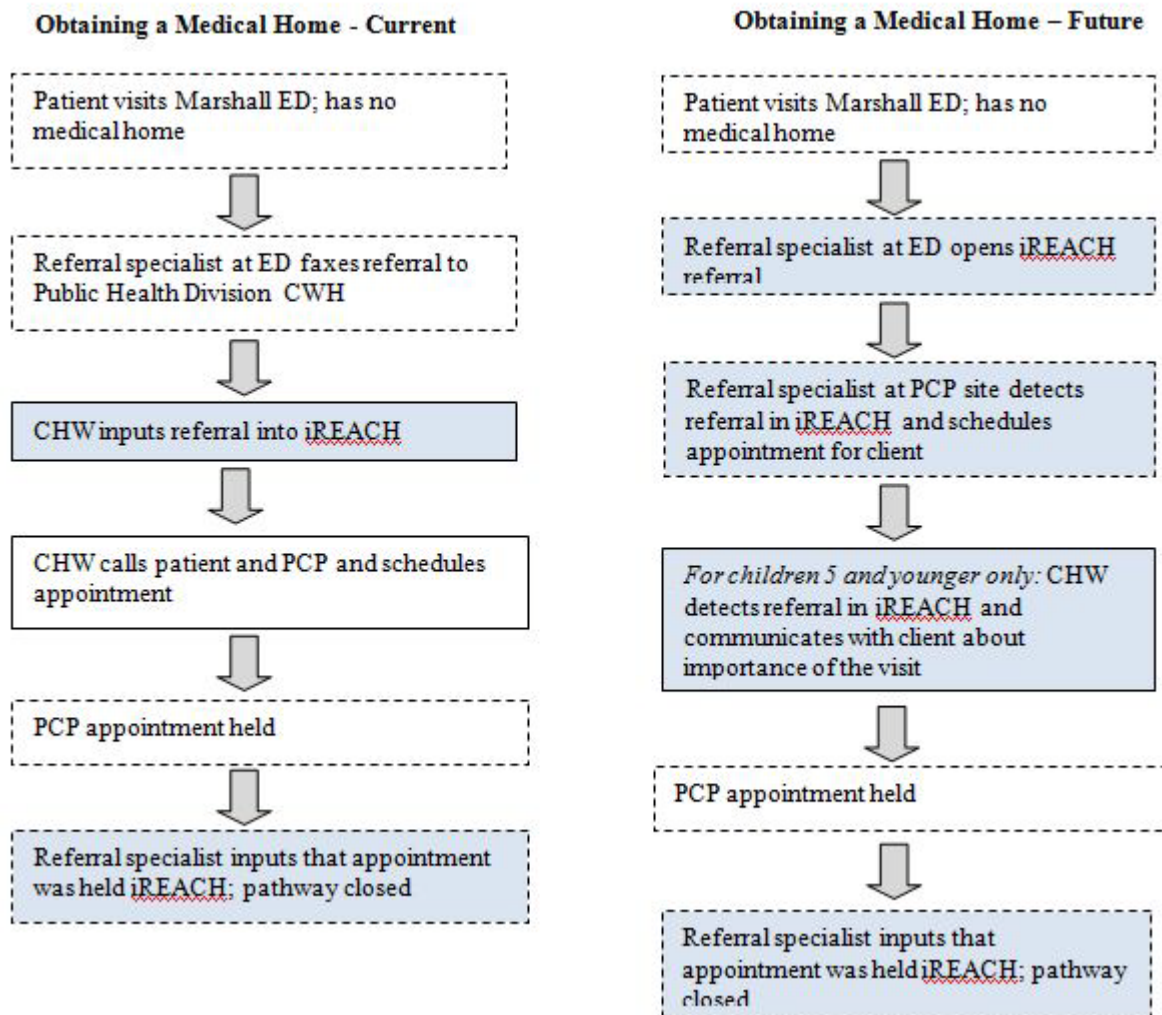
iREACH's Financial Future is Sound. As the end of AHRQ funding approaches, ACCEL is assessing the sustainability of iREACH. ACCEL has recently secured funding from Marshall Medical and Barton Health Care System to allow for the system to run in its current form. Annual maintenance of iREACH costs approximately \$42,000, including a \$27,000 licensing fee and a \$15,000 internet connection. Barton Hospital will continue to offer free help desk support. However, one potential hindrance to iREACH's success is that funding has not been identified for system upgrades or new features. ACCEL is interested in implementing modifications to the system that cost approximately \$10,000 per modification. One ACCEL user states that the more they use iREACH, the more potential improvements they identify. Some of these modifications are responses to changes in the health insurance application processes; others relate to issues that were unforeseeable to ACCEL until they began utilizing the system. Users worry that if additional funds are not made available to continually update iREACH, the system will become obsolete.

Providers Need to Become More Engaged in iREACH to Reduce CHW Burden.

Although all ACCEL major players have adopted or plan to adopt iREACH, their level of involvement varies. ACCEL recognizes that the system's future is dependent on increased provider engagement. For the system to reach its full potential, providers need to be committed to regularly updating patient information and responding to tasks within iREACH. Their increased involvement is particularly important given that many CHWs have been laid off due to budget cuts within the PHD. These users typically carry more of the burden of updating client information and following up with different providers to collect information. Additionally, First 5 California has become the sole source of funding support for CHWs, and therefore, CHWs

must focus on serving families with children ages 5 and younger. To remedy these issues and increase iREACH's sustainability, ACCEL staff and physician champions have been meeting frequently with providers to garner additional support for iREACH and to facilitate a shift in responsibility away from CHWs to users at provider sites. This strategy has paid off as users have expressed a willingness to rely less on CHWs for data entry. In the diagram above, we compare the current use of iREACH for the OMH Pathway with the future process for this pathway given greater provider involvement. Shaded boxes indicate steps involving iREACH; dotted lines indicate work conducted by ACCEL providers (i.e. non-PHD CHWs).

Figure 2. Current and future steps in the obtaining Medical Home Pathway



The process flow depicting the pathway's future shows that the CHWs from PHD will not be involved in the pathway, except for clients with children ages 5 and younger. For those clients, the CHWs will play an important role in educating the client about the importance of a medical home and attending the visit; for clients with children ages 6 and up, the referral specialists will

be trained to communicate this message directly to them. Referral specialists at the Marshall ED and the PCP will also input the referral and appointment information into iREACH.

Implementation of the HIE

The second component of the AHRQ grant was the development of the HIE. Although ACCEL made important progress toward meeting this goal, a number of factors hindered final implementation. In the following discussion, we describe the progress made and the reasons why the HIE will not be implemented in the short run.

ACCEL Built the Foundation for the HIE. ACCEL took three important steps to building the foundation for the HIE: establishing a Notice of Patient Privacy (NPP) for data exchange, implementing an Electronic Master Patient Index (EMPI), and establishing criteria for vendor selection. A standardized Notice of Patient Privacy (NPP) was implemented in all provider sites. This was a major feat because each provider site had its own privacy concerns and preferences regarding the language of the document. Once developed by the Privacy and Security Workgroup and approved by the Steering Committee, the NPP was disseminated to provider sites and front-line staff were trained. After the NPP was securely in place, it allowed ACCEL to legally share data electronically, both through the Care Pathways' iREACH system and eventually through the HIE.

The second major step toward creating the HIE was the development of the electronic master patient index (EMPI), a data repository of patient demographic information that allowed for the linkage of records that belonged to the same patient, but were submitted by multiple providers. Barton and the Public Health Department participated in the EMPI by submitting each of their client's name, birth date, gender, and contact information in a standard file format. The system was able to recognize when demographic data coming from each provider was actually associated with the same patient. If a new record belonged to a client already within the EMPI, the new record updated the existing record as opposed to creating a new one.

Parallel to the EMPI process, ACCEL established criteria to evaluate potential vendors of the HIE. After developing and disseminating a request for proposal to a previously identified group of vendors in December 2008, ACCEL evaluated the responses based on the following criteria:

1. Offers an EMR Lite: Not all ACCEL participants use an EMR. Therefore, it was considered necessary that the vendor offer an EMR lite—an application that is easier and cheaper to implement and use than a full-service EMR system—that could be adopted by providers, along with the HIE.
2. Exchanges Data across Disparate Systems: The HIE needed to have the capability to exchange data among providers that use different data capture systems.
3. Meets PHD Surveillance Requirements: The PHD required that the HIE contain tools that would allow the department to identify emerging disease outbreaks, report data to the state and federal government, and analyze aggregate data on chronic conditions.
4. Support Referrals for Specialty Care: ACCEL participants also wanted the system to be able to exchange documents, such as lab results and radiology reports.

5. Contains a Virtual Health Record: The system had to produce a snapshot of a client's health diagnoses and services.
6. Experience/Reputation: Finally, ACCEL required that the vendor have a sound reputation and considerable experience with HIE technology.

Several Factors Impeded ACCEL from Implementing the HIE. Despite this progress and rigorous vendor due diligence, when it came time for ACCEL to purchase a vendor's services to implement the HIE, numerous issues arose. The economic downturn of 2008-09 challenged all ACCEL partners' ability to consider significant investments in the HIE technology purchase and implementation. At the same time, as both the hospital systems (Barton in South Lake Tahoe and Marshall on the Western Slope) grappled with internal selection and financing of updated/streamlined health information technology systems, identifying and selecting an HIE vendor became increasingly complex. The California State budget crisis seriously challenged El Dorado County's ability to deliver resources to the safety net population while the other partners face reduced reimbursement and increased demand for charity care.

In the context of this economic situation, the estimated ongoing expenses of an HIE emerged as a major impediment to implementation. ACCEL providers wanted the greater functionality offered by proprietary software, while ACCEL staff favored an open source option because it was much more cost-effective and had been implemented successfully in a similar California system. The providers, however, felt that although the upfront costs of open source were less, they would have to allocate a greater percentage of their own IT departments to develop and sustain the open source software.

Because the providers are ultimately responsible for utilizing the HIE, during the summer of 2009, the Steering Committee of ACCEL opted for the proprietary system – Axolotl. Although the AHRQ grant and additional grants provided sufficient funds to cover vendor costs in the first year, installation and maintenance costs would fall on the HIE's participants, namely the PHD, Barton, and Marshall. Barton and Marshall began to estimate the amount of in-kind resources that the HIE would require in terms of internal staff. Their \$1 million estimate over a 5 year period far exceeded the expectations and resources of ACCEL participants. This high estimate made participants rethink the feasibility of the HIE for a county of 176,000 residents.

The recent passage of the American Recovery and Reinvestment Act of 2009 (ARRA) was another factor that influenced ACCEL's priorities with regards to the HIE. Initially, ACCEL was hopeful that the funds provided by its Health Information Technology for Economic and Clinical Health (HITECH) provision would serve as the needed bridge to support ACCEL's HIE. However, given the emerging clarity of the ARRA HITECH funding requirements and incentives, ACCEL stakeholders determined that their highest priority had to be investing in foundational capabilities (EMR/EHR) that will enable effective and efficient clinical data sharing in the long term. ACCEL's largest participants, Marshall and Barton, have moved toward adopting their own EMRs, which would encompass all their affiliate clinics. Because these EMRs would link primary care clinics, specialty care clinics, and hospital services within each network, the HIE became less necessary for the exchange of patient information. Barton has taken a step even further by opting to share in the future clinical data with sites in Nevada that receives many of its referrals. The El Dorado County Community Health Center will likely adopt the EMR that Marshall selects because both are located in the same service area, sharing

common patients as a result. This will enhance Marshall's ability to exchange patient data across a larger network as well.

Within the context of these EMRs, the HIE's added value would have been the exchange of data across the two major systems and the County. However, although Barton and Marshall are located in the same county, they seldom share patients. Residents of Placerville and its surrounding areas tend to go to neighboring cities in Sacramento County for care outside of Marshall, while South Lake Tahoe shares more patients with Nevada and the San Francisco Bay Area, whose residents visit the area for recreational sports. Both providers agreed that the main beneficiary of the HIE would be the PHD, which could use county-wide data to identify disease trends and treatment patterns. However, according to an ACCEL participant, the County did not have the same passion for the HIE as with iREACH because benefits were less tangible. In addition, as the County faced major budget cuts, they were unable to commit additional funds. Without the County's acting as a suspension bridge between the two slopes, the incentives for data sharing were diminished. In light of these issues, ACCEL eventually decided to remove the HIE from the agenda.

These political and financial changes unexpectedly impacted ACCEL HIE plans, and no one could have predicted them when ACCEL began their efforts. Nonetheless, the achievements accomplished, the leadership developed, and the experience gained, have been timely and worthwhile for El Dorado County. The infrastructure, the shared agreements, and the collaboration this project fostered will serve all partners well as the ACCEL community adapts, re-invents, and evolves health care in El Dorado County in the years to come.

References

1. E.G. Hill, "The Tobacco Settlement, What Will It Mean for California?" (Sacramento: Legislative Analyst's Office, 14 January 1999) Retrieved on 9/18/2009 from http://www.lao.ca.gov/1999/011499_tobacco_settlement.html
2. Community Health Access Project. Pathways: Building a Community Outcome Production Model. Retrieved on 9/18/ 2009 from: <http://www.chap-ohio.net/documents/PathwaysManual.pdf>
3. Steinbrook, R. "The Role of the Emergency Department." *The New England Journal of Medicine*. 334 (10). 1996. 657-658.
4. When a child had two enrollment dates, the earlier of the two was used.
5. A 2005 Rand study estimated the average marginal cost of an outpatient ED visit as \$412 (in 1998 dollars) for a trauma ED. Bamezai, A., Melnick, G., Nawathe, A., The Cost of an Emergency Department Visit and Its Relationship to Emergency Department Volume. *Annals of Emergency Medicine*, V.45. 2005. 483-490.
6. We used the Bureau of Labor Statistics inflation calculator to estimate costs in terms of 2009 dollars. http://www.bls.gov/data/inflation_calculator.htm
7. Bamezai, A., Melnick, G., Nawathe, A. The Cost of an Emergency Department Visit and Its Relationship to Emergency Department Volume. *Annals of Emergency Medicine*. 45. (2005). 483-490.

List of Publications and Products

AHRQ Health Care Innovations Exchange. County-Wide Collaborative Uses Pathways Model to Enhance Access to Insurance, Primary Care, and Mental Health Services for Low-Income Children. 2009 Jan. [Online]. Available from: <http://www.innovations.ahrq.gov/content.aspx?id=2391>

Bergner G (Access El Dorado, Placerville, CA). ACCEL. Presented at the AHRQ Annual Conference; 2008 Sep 7-10; Bethesda, MD.

Dunn SD. ACCEL Notification of Privacy Practices. Presented at the Convening of Blue Shield of California

Foundation HIE Grantees and Stakeholders; 2008 Apr 22; San Francisco, CA.

Rogers G, Homer CJ (National Initiative for Children's Healthcare Quality). Innovative Prevention Programs for Improving Children's Healthcare in California. The California Endowment; 2009 Jun. Available from: <http://www.nichq.org/innovations.html>

Wise N (Healthcare Technology Management Services, Indianapolis, IN). ACCEL Health Information Exchange Business Case. ACCEL/County of El Dorado; 2007 May. Contract No.: 503-PHD0106. Available from: ACCEL/County of El Dorado, Placerville, CA.