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Grand Junction, Colorado: How A Community Drew On Its Values To Shape A Superior Health System

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ABSTRACT For the past decade, the high-quality, relatively low-cost health care delivered in Grand Junction, Colorado, has led that community to outperform most others in the United States. Medicare patients in Grand Junction have fewer hospitalizations, shorter hospitalizations, and lower mortality rates after hospitalization than do Medicare patients in comparison hospitals. Effective, efficient care is delivered in Grand Junction through separate, self-governing organizations that perceive health care as a community resource. This article describes how the various stakeholders in Grand Junction have addressed problems and set standards for the system. The lessons could apply to broader health reform efforts in communities around the country.

In 1996 the first *Dartmouth Atlas of Health Care,* which documents the use of medical resources paid for by Medicare in geographically defined hospital markets, identified the Grand Junction, Colorado, Hospital Referral Region (HRR) as an efficient health care market. The region, with its seven nonprofit hospitals, ranked 304th out of 306 regions for cost of care in the last two years of life for Medicare beneficiaries dying in 1992.[1] The region's ranking on the same "cost of care in the last two years of life" measurement was 301st in 2006.[2] Grand Junction was the only region to remain among the five lowest-cost Hospital Referral Regions since the atlas's reporting started.[3]

The population center of the area represented by the Hospital Referral Region is the Grand Junction Metropolitan Statistical Area, which in 2008 reported a population of 143,171. Grand Junction is located in Mesa County, whose population is 96 percent white, 11 percent Hispanic, 15 percent older than sixty-five, and 12 percent with incomes below the federal poverty level.[4] The county has three hospitals, two of which are in Grand Junction: Community Hospital and St. Mary's Hospital and Regional Medical Center. (Grand Junction also has a Veterans Affairs [VA] Medical Center that is not captured in the *Dartmouth Atlas*'s Medicare data.)

St. Mary's Hospital is the dominant provider, with 346 of the 675 Medicare-certified hospital beds in the region in 2007. St. Mary's is the only sizable hospital between Denver, Colorado, and Salt Lake City, Utah. The other hospitals in Grand Junction range in size from twenty-four to seventy-eight beds.

Grand Junction's Health Care History

Grand Junction has a long history in the development of medical services.[5] In 1896 two Sisters of Charity from Leavenworth, Kansas, opened St. Mary's Hospital, which then had ten beds, with the mission to improve "the health of the individuals and communities we serve, especially those who are poor or vulnerable."[6] The Mesa County Medical Society was also established in the late 1800s, and Community Hospital was founded in 1946.

Early on, independent providers in Grand Junction established a pattern of forging shared solutions when developments appeared to

threaten the community's well-being. An example was the creation of the Rocky Mountain Health Maintenance Organization (HMO), now Rocky Mountain Health Plans, in 1974.

The establishment of the Medicaid program in the late 1960s coincided with a period of rapid population growth in Mesa County. The result was a large group of enrollees in a program—Medicaid—that did not pay providers particularly well. Physician leaders became concerned that the low Medicaid payments would affect the community's ability to retain enough primary care physicians. They worried about the potential effect on health outcomes, physicians' incomes, access to health care, and community well-being.

As a result, local physicians and business leaders started Rocky Mountain HMO as a local nonprofit organization serving Medicaid recipients. Similar shared solutions to common challenges also were developed over the years. Physician and hospital leaders won grants in the 1970s to create the region's first hospice. Also in the 1970s, the county medical society created a practice network, now Mesa County Physicians Independent Practice Association (IPA), to address shared issues for area physicians. And St. Mary's Hospital established a family practice training program in 1977 to supply more primary care physicians to the region.

In 1988 Community Hospital and St. Mary's Hospital agreed to sponsor a clinic for uninsured patients, to be funded according to the proportion of hospital bed days each institution provides for patients of all ages, insured and uninsured alike. Local specialists agreed to accept a fair share of uncompensated referrals. A successful rehabilitation provider sold its medical operations to St. Mary's Hospital in 1997, which allowed the provider to expand its role as a source of integrated community and social services under the name of Hilltop Community Services.

Together, Mesa County Physicians IPA and Rocky Mountain Health Plans voluntarily provided $2.5 million to develop an electronic information sharing platform in 2004 and relinquished control of it to a new, independent, local quality improvement organization called Quality Health Network.

Today's Landscape

Today, St. Mary's Hospital is a Level II trauma center that provides tertiary referral services for all of western Colorado and eastern Utah. Although still owned by the Sisters of Charity of Leavenworth Health System, St. Mary's Hospital has a local administrative leadership team and board of directors. The hospital performs above the national average on all but two of the twenty-four Medicare clinical quality indicators.[7] It recently earned the designation of a "Highest Value Hospital" by the private-sector Leapfrog Group.[8]

Hospice and Palliative Care of Western Colorado serves more than 1,000 patients a year with roughly 600 active volunteers. Hilltop Community Services now manages twenty-four community-based social service programs and receives financial support from individuals, businesses, St. Mary's and Community Hospitals, and Rocky Mountain Health Plans, in addition to government payments.

Rocky Mountain Health Plans now offers Medicaid, Medicare, and commercial plans and covers about 40 percent of the local population. Commercial health insurance rates for the Grand Junction area are competitive with other parts of Colorado, and we found no evidence of substantial shifting of costs away from Medicare fee-for-service to other payment sources.

The Quality Health Network is used for electronic health information exchange by more than 1,500 licensed users, including more than 90 percent of the area's physicians. The network routinely analyzes local data, sponsors cooperative improvement activities, and supports the physician association by publishing information on physicians' care patterns.

Study Data And Methods

We sought to learn more about how the Grand Junction health care community functioned, so we launched a study using three data sources. These were fee-for-service Medicare claims data, which allowed us to build upon the *Dartmouth Atlas* reports; process maps, or detailed diagrams of how the system functions, derived from direct observations and interviews of numerous medical service providers; and semistructured interviews of local health care stakeholders, which provided insights on the evolution of the health care community and how the quality and efficiency of medical services are sustained.

Staff from the Colorado Foundation for Medical Care, which is the Medicare Quality Improvement Organization for Colorado, observed the health care processes and studied the health care culture in Grand Junction. The work was part of two Centers for Medicare and Medicaid Services (CMS) pilot projects to improve transitional care and health care efficiency in 2006–8. Both pilot projects—Variation Analysis by Location—Understanding Efficiency (VALUE) and Transitions of Care—were designed to identify practices that could reduce the rate of patients' being

rehospitalized within thirty days of discharge from the hospital. We compared metrics calculated for St. Mary's Hospital with a combined convenience sample of the other twenty hospitals in three states involved in the VALUE project.

For utilization metrics, we used all discharges from July 1 through September 30, 2005, to identify so-called index cases. These are defined as the first inpatient hospitalization for a particular patient, with a principal discharge diagnosis of acute myocardial infarction, heart failure, or pneumonia.[9] Patients with a secondary *International Classification of Diseases*, Ninth Revision, Clinical Modification (ICD-9-CM) code of pneumonia, and with a principal diagnosis of either respiratory failure or sepsis, were categorized as having pneumonia.

For these patients, we analyzed Part A and Part B Medicare fee-for-service claims from July 1, 2005, through June 30, 2006. We determined rehospitalizations to the same hospital, use of intensive care and critical care unit services, lengths of hospital stays, and discharge disposition. We obtained beneficiary death dates from the enrollment database. Comparisons of the selected characteristics relied on *t*-tests for rehospitalization or chi-square tests for mortality.

To account for the number of days in which patients were at risk for readmission, we used an offset—a statistical device that allows for the modeling of a rate, rather than a direct count. The offset allows and corrects for variable beneficiary exposure in the analysis. To compare the two groups—St. Mary's Hospital and the twenty other hospitals—regarding the number of readmissions, we used a generalized linear model, along with a negative binomial distribution and log link to address observed overdispersion (the presence of greater variability than would be expected based on our statistical model). Data analyses used Statistical Analysis Software, or SAS, version 9.1.

We used the open-ended appreciative inquiry method[10] for stakeholder interviews, starting with twelve leaders from provider settings included in the Transitions of Care pilot project. We asked each interview subject to refer us to other key stakeholders who should be interviewed. We interviewed by phone or in person everyone who had at least two such recommendations.

Each interview lasted approximately one hour and used a semistructured appreciative inquiry interview guide. All interviews included three standard questions, described in more detail below. We transcribed the interviews and analyzed them using qualitative indexing methods.[11] Three team members indexed comments and identified top themes separately, before discussing the findings for a joint report.

The interview process shed much light on how Grand Junction's health care community grew and developed.

Neither pilot project aimed to compare hospitals or communities, but rather to understand variations and learn how to spark improvement. Because this effort was part of Medicare-contracted work aimed at local improvement and also required compliance with strict guidelines for protection of confidentiality, it did not require review for protection of human subjects in research. After we explained the project to each interview subject, each consented to be interviewed.

Study Results

UTILIZATION PROFILE OF ST. MARY'S HOSPITAL

St. Mary's Hospital provided 73 percent of all Medicare hospitalizations for residents of Mesa County and 41 percent for the area defined as the Grand Junction Hospital Referral Region during calendar year 2007.

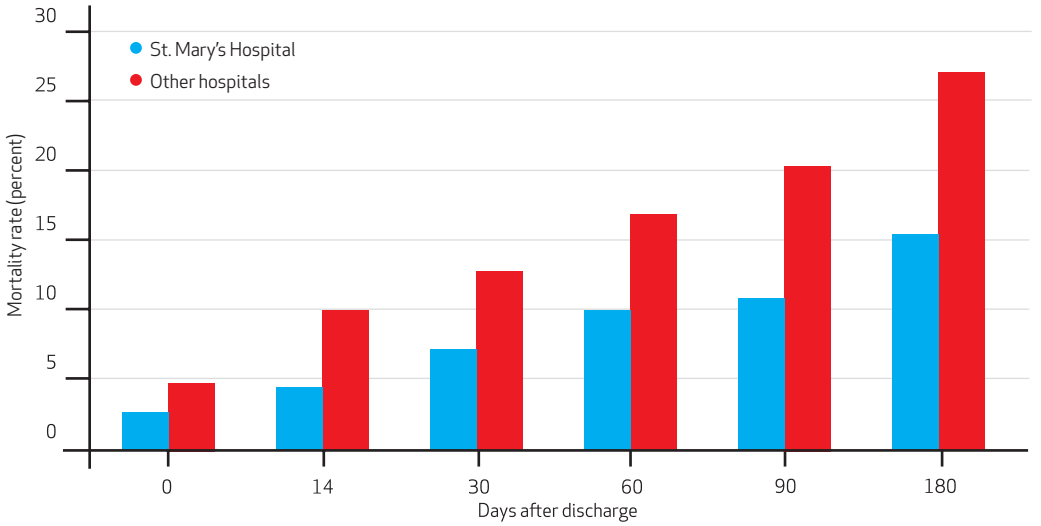
Characteristics of discharges for pneumonia, heart failure, and myocardial infarction using national claims data included an average patient age of 76.0 years and a 5.6-day mean length-of-stay. A total of 21.4 percent of hospital admissions included care given in an intensive care or critical care unit, and 50.1 percent of admissions were discharged directly to home.

Index hospitalizations for pneumonia, heart failure, and myocardial infarction at St. Mary's Hospital were similar to those at the other hospitals. The mean patient age was 76.9 years for St. Mary's, versus 75.8 years ($p = 0.2980$) at the other hospitals in the sample. The proportion of admissions that included care in an intensive care or critical care unit was 28.8 percent at St. Mary's, versus 26.4 percent at other sampled hospitals ($p = 0.96$). However, the mean length-of-stay was shorter at St. Mary's—4.17 days, versus 6.24 days for other hospitals ($p < 0.0001$).

Additionally, more patients were discharged directly to home from St. Mary's—66.1 percent versus 43.8 percent at other sampled hospitals

EXHIBIT 1

Mortality After Hospitalization At St. Mary's Hospital And Twenty Other Hospitals



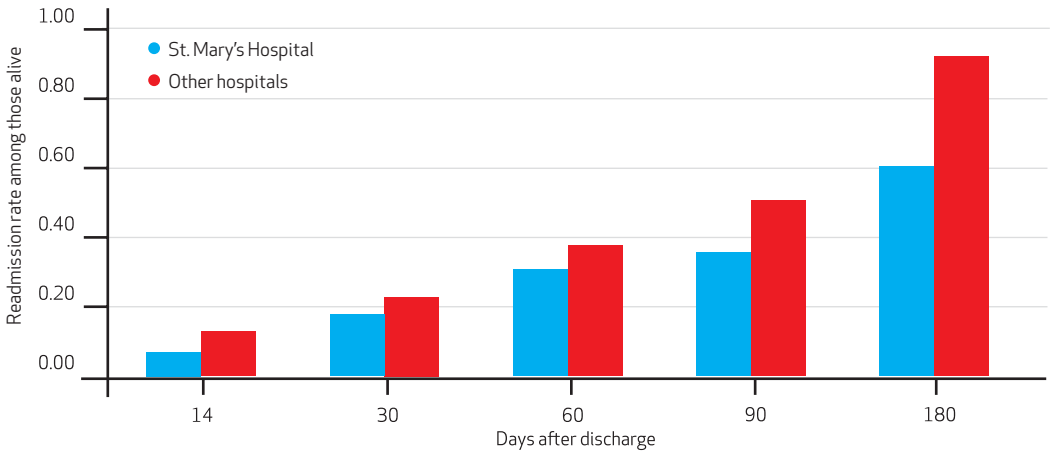
SOURCE Authors' analysis. **NOTES** Hospitalization for heart failure, pneumonia, or myocardial infarction at St. Mary's Hospital, in Grand Junction, Colorado. St. Mary's had 109 index admissions; other hospitals together had 1,608. The twenty comparison hospitals were located in New Jersey, New Mexico, and Colorado, excluding Grand Junction. Exhibit shows cumulative metrics.

($p < 0.0001$). Mortality during and after hospitalization and rehospitalization at St. Mary's Hospital trended lower than at the other hospitals for every time interval examined (Exhibit 1). The reductions were statistically significant for both measures after six months (Exhibit 2). For more detailed results on hospitalization, see Appendix Exhibit 1.[12]

PROCESS ASSESSMENTS The Grand Junction facilities already had process maps when the Medicare Quality Improvement Organization for Colorado began its research. In contrast, in the other two Colorado communities that were included in the study, the process-map technique was not in routine use. The Grand Junction processes were much less complicated than those in the other Colorado communities; they showed fewer steps, loops, and decision points.

EXHIBIT 2

Readmissions After Hospitalization At St. Mary's Hospital And Twenty Other Hospitals



SOURCE Authors' analysis. **NOTES** Readmissions after index hospitalization for heart failure, pneumonia, or myocardial infarction at St. Mary's Hospital, in Grand Junction, Colorado, compared with twenty other hospitals. St. Mary's had 109 index admissions; other hospitals together had 1,608. The twenty comparison hospitals were located in New Jersey, New Mexico, and Colorado, excluding Grand Junction. Exhibit shows cumulative metrics. Readmission incidences reflect total number of readmissions per beneficiary-days at risk.

Some of the simplification appeared to result from routine semiannual examination of quality processes by St. Mary's Hospital and its frequent partners, as well as from having patient records routinely available across settings through the Quality Health Network.

INTERVIEWS We interviewed twenty-eight individuals from health care organizations, including physicians, nurses, Catholic nuns, chief executive officers, administrators, directors, and project managers. About one-third of the interviewees fit in two of those categories; all had leadership functions in their organizations.

When these individuals were asked what they thought was the cause of Grand Junction's health care structure, their responses fell into three broad groups. Twenty percent cited a need to foster organizational interdependency for fiscal responsibility and therefore community survival or well-being. Another 20 percent felt that cooperation had initially been "forced" on physicians and other health care stakeholders, which produced resentment but still led to successful collaborative health care delivery. Nearly as many respondents—19 percent—attributed the community's cohesiveness to a strongly held core value of providing universal and equal access to high-quality care (Exhibit 3).

Many comments referred to the founding mission of the Catholic nuns at St. Mary's Hospital and cited their actions and beliefs as the most direct and persistent influence. Nineteen com-

EXHIBIT 3

Results Of Stakeholder Interviews In Grand Junction, Colorado

Theme of responses	Percent of respondents	Selected quotations
WHAT ATTRACTED YOU TO THIS COMMUNITY? WHAT KEEPS YOU HERE?[a]		
Culture/mission	37	"The mission is nonprofit focused." "Surrounded by culture entire life, mentored by physicians here."
Lifestyle/outdoor recreation	17	"Grand Junction is big enough to meet interesting people, but small enough to meet people you know in the grocery store."
Family	15	"My wife grew up here."
Environment/weather	14	"Wanted to be in this environment—beautiful scenery, the outdoors."
Work	13	"I/my spouse like(s) job." "I can get things done here."
Other[b]	5	
WHAT DO YOU KNOW ABOUT HOW THIS HEALTH CARE COMMUNITY WAS BUILT? WHAT WERE THE ORIGINS OF ITS CURRENT STRUCTURE AND FUNCTIONING?[c]		
Cooperation (including forced)	20	"Although there were two hospitals, with some resentment between them, they worked together and divided the care."
Culture/mission	19	"We provide a medical home for patients, we're a family medicine town, and we're not greedy."
Coordination of care/care management	11	"Our physicians would rather make sure there is good communication between providers than argue over turf."
Relationships/Mesa County Physicians IPA	9	"The IPA will issue reports back to the physicians so you know where you fall and if you've improved."
Collaborative partnerships	8	"RMHP [Rocky Mountain Health Plans], IPA, the hospitals consistently come to the table with business leaders to align incentives so providers' and payers' goals and objectives are aligned in parallel and we don't duplicate work."
Medical leadership	7	"What has been unique about RMHP was that it was started by physicians and they have been the drivers of this bus. They are responsible for holding everything together."
Community pride	5	"Everyone is committed to the community and people. Everyone finds a way to contribute, whether it's through monies or in kind."
Geographic isolation	5	"We're geographically isolated, that makes a huge difference. We had to rely on each other to survive."
High quality/transparency	4	"We try to reduce paperwork for physicians and facilities so they can focus on doing what they do best—caring for the patient. We share information."
More in primary care/training	4	"Starting the residency program. 60 percent of graduates have stayed on the Western Slope."
Utilization review	2	"Each readmission is reviewed by medical practice review committee."
Other[d]	5	

SOURCE Authors' analysis. **NOTE** Percentages do not total 100 because of rounding. [a]149 responses. [b]Seven single responses did not fit into general categories and have been combined into "Other." [c]255 responses. [d]Three single responses did not fit into general categories and have been combined into "Other."

The idea that change is best accomplished through collective action is ingrained deeply in Grand Junction.

ments mentioned specific people who had been visionary leaders.

Looking to the future, most interview subjects were optimistic about their community. The top reasons cited for this optimism included ongoing collaboration and partnerships among health care providers; a focus on maintaining the culture, mission, and "sense of community"; and the commitment to access, high-quality patient care, and care that focuses on the entire patient.

The interview process shed much light on how Grand Junction's health care community grew and developed—a process not without occasional discord. According to one unnamed respondent: "It has not always been smooth sailing. In the 1980s a new doctor came to town and became the new president of the IPA. A whole new mind-set was just about money and not just taking good care of the patient.

"The physicians had a big meeting. It was very heated. Everyone hated each other [and] thought each other was making too much money.What happened was that the doctors fired the entire board and the president.

"It isn't like we all get along all of the time; we argue and disagree. The first lesson we learned was that in life you have to show up. If you leave it up to administrators, they make mistakes, [and] you may not like what the decision is."

Discussion

Grand Junction appears to have developed a more efficient and higher-quality medical care system than is generally the case in the United States. The system was created by diverse stakeholders, without strong governmental authority or action, in what was initially almost entirely a fee-for-service environment. This achievement could point the way to an expanded range of options as the nation undertakes broad delivery system reform.

There continues to be uncertainty over whether Grand Junction somehow has a healthier population, with people needing less hospitalization and less medical care in their final two years of life. There is a pervasive problem of "endogeneity" in claims data, meaning that a factor such as being healthier could influence the volume of medical claims, while at the same time the volume of claims could also influence whether the population is healthy. Therefore, it is difficult to sort out the cause from the effect.

For present purposes, the *Dartmouth Atlas*'s findings of costs in the last two years of life of elderly people[13] demonstrate that Grand Junction is more efficient in delivering care, rather than that the population is just healthier. This report also makes it clear that other factors—such as community action in defense of values, mission orientation, and workforce planning—play key roles.

The descriptive methods used here have limitations. Interviews are subject to various reporting biases and analytic oversights. Our claims-based comparisons used national Medicare data and a convenience sample of hospitals without adjustment.

Additionally, the project did not investigate referral patterns outside of the Hospital Referral Region or rehospitalizations outside of the index hospital, St. Mary's. Nevertheless, the findings strongly support the claim that Grand Junction is what management science would call "a positive deviant"—that is, a system that is behaving much better than parallel systems.[14] The study of positive deviants provides an important opportunity to understand the possibilities for improvement in parallel systems.

One major element in the success of the Grand Junction model is the presence of convening authorities. Instead of just one entity that manages the system, in Grand Junction a series of institutions and coalitions of providers and community leaders formed to take coordinated action on important issues as they were identified. Early on, the Catholic nuns and some allied physicians effectively convened the community. Having a single dominant hospital with a strong mission of public service undoubtedly streamlined the discussions and decision making. The fact that Grand Junction was relatively isolated geographically probably helped encourage a sense of autonomy and the need to take responsibility.

Still, Mesa County Physicians IPA and Rocky Mountain Health Plans have been independent and important collaborators with St. Mary's. The regional health information exchange complements the work of the partners by providing both

patient information and summarized statistics. No single formalized platform for common action exists in Grand Junction, as would be the case in a formally integrated system, but the idea that change is best accomplished through collective action is ingrained deeply.

The commitment and active participation of a locally embedded nonprofit payer—Rocky Mountain Health Plans—seem especially important, both to ensure responsible action on behalf of the poor and to provide key funding and leadership. Examples of Rocky Mountain Health Plans' influence include requiring providers to serve all lines of business; paying for medical review across settings to improve care coordination; reinvesting profits in community priorities, such as an electronic information exchange; and providing mobile and Web-based clinical support tools and generic drug samples to individual providers.

The community value of high-quality health care for all is reinforced through mature health care services and practices such as the information exchange, equitable payment arrangements, shared support of the clinic for the poor, and expectations of regular exchanges of site visits among members of the medical community. The semiannual exercise of mapping shared processes by St. Mary's Hospital and its major providers of posthospital services institutionalizes cooperation toward high-value services.

The community's expectations are reinforced through social networks, which generate negative consequences for those attempting self-serving actions. The foundation of the local core values is apparently a time-honored galvanizing mission statement, supported by self-reliance as a community necessity, personal attachment to the community, and a sense that interdependency is needed for survival.

We found that the Grand Junction model corroborates the research of David McMillan and David Chavis.[15] They identified four elements as essential to creating a sustainable sense of community: membership, influence, integration and fulfillment of needs, and shared emotional connection.

Furthermore, the Grand Junction experience appears to underscore the potential importance of the concept of management of "common-pool resources."[16] This is a social and economic framework grounded in observation of voluntary organizations that manage shared natural resources such as fishing grounds and water supplies. Common-pool resources are accessible to all but degradable or exhaustible through overuse. These characteristics also apply in the short term to health care services, especially in a remote area such as Grand Junction.

The fact that Grand Junction has accomplished so much with no formal government authority is intriguing.

Principles of common-pool resource management that are associated with the maintenance of that resource include clearly defining the resource, such as the boundaries of the forest, and identifying all parties entitled to use that resource; allowing all resource users to participate in setting utilization limits and monitor each other's utilization; providing inexpensive and easily available conflict-resolution mechanisms; and providing graduated sanctions for resource users who do not respect community rules.[17]

In Grand Junction, constrained use of health care dollars is supported by a collective agreement among a finite group of service providers, who supply the majority of services and are known to each other, that the goal of services is to improve the health of the total community, which is also finite and visible; a local payer that can promote and reward standards that discourage unnecessary use; an IPA that publishes physician utilization rankings; a shared information exchange used by a preponderance of community physicians; a long-standing history of and commitment to open negotiations and collective decision making; and adverse social and professional consequences associated with nonadherence to community decisions.

Deliberately encouraging perceptions of health care as a common-pool resource could benefit innovations such as the forthcoming accountable care organizations and could shape other reforms anchored in geographic regions.

Taking the findings together, the Grand Junction health care delivery system is likely to be doing a better job than many others in directing acute care services to the people and situations most likely to benefit from them. The system is also managing much of the chronic disease and end-of-life care burden without undue reliance on hospitalization. Although low rates of hospitalization might engender concerns over inap-

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propriate underuse of hospital care, the fact that St. Mary's and the comparison hospitals had roughly the same rates of rehospitalization and use of the intensive care or critical care unit among those who are hospitalized tends to show that the threshold for use of hospital or critical care resources was in line with usual standards of care.

Our process assessment and interviews showed a strong emphasis on primary, home health, and hospice care; a culture of exchanging site visits and sharing quality metrics; and a reliance on the infrastructure to support the exchange of clinical information and the appropriate use of social services.[17] Most striking is the fact that Grand Junction achieves remarkably high-value care despite having many independent providers.

Both the Institute for Healthcare Improvement's "triple aim" statement[18] and a recent report by Patrick Conway and Carolyn Clancy[19] point to the need for an integrating authority to engineer "small area" reforms. Most stakeholders would assume that such an authority would look like county governance in Scandinavia, primary care trusts in Britain, or integrated organizations like the Veterans Affairs health system or Kaiser Permanente in the United States. The fact that Grand Junction has accomplished so much with no formal government authority is intriguing. Indeed, Grand Junction did not have incorporated institutions for cooperative action until relatively recently, with the advent of Mesa County Physicians IPA, the health plans, and the quality network.

One key finding of this case study is that the community deliberately embraced the course that led it to create and maintain its high-value and equitable delivery system. Although the Grand Junction model has produced successes in managed, medical home, and palliative care, the unifying observation is that the community developed these solutions in response to local stakeholders' taking a shared, community-centered view of each problem.

This crucial point may be underappreciated in current reform initiatives. These typically ignore the potential either to encourage or to disrupt the "social capital" that generates cooperation and problem solving. It is important to explore how to create such values and traditions deliberately, along with whether specific policies might help sustain and extend them in communities where social capital already exists.

Conclusion

The Grand Junction model of health services delivery arose from long-standing local values and voluntary provider arrangements that deliberately solved problems in a community-centered way. The effectiveness of a series of ad hoc collaborations speaks to enduring standards and values that reformers would do well to nurture where possible. In addition, they should be wary of actions that would disrupt this degree of effective cooperation and integration of the care system, where it already exists.

At least for serious chronic diseases, effective reform has to involve most providers in a geographic area, because sick and disabled patients use many providers, not just physicians and hospitals. However, regional and local reforms in the United States have a very short history. Most effective reforms either have reflected state or national policy or have affected only one provider organization. We do not yet have the body of experience and insight that can guide reform for a sizable geographical community.

In business and human resources management, the examination of naturally occurring "positive deviants" is standard strategy. This paper provides insights on how Grand Junction, Colorado, provides high-value health care, and leaders elsewhere may find inspiration and guidance in that story. Insights from the literature of economics and social psychology concerning pooled community resources may also guide reformers who want to achieve local improvements. Moving from waste and error toward high-value care is undoubtedly more difficult than building that better care from the start. However, the story of one persistently successful community provides both guidance and inspiration. ■

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