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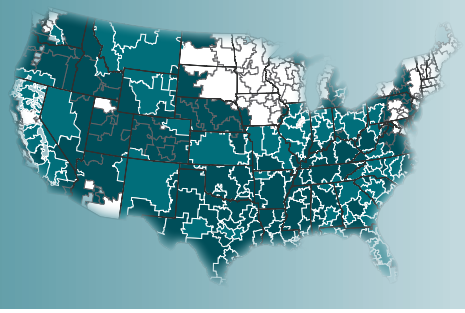

Tucson and Southern Arizona: A Desert Region Pursuing Better Health and Health System Performance

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ABSTRACT: The southern Arizona region encompassing Tucson ranks in the top quartile among 306 U.S. regions on The Commonwealth Fund's *Scorecard on Local Health System Performance, 2012*, outperforming many other regions with similar socioeconomic characteristics. Its performance may stem from the emphasis providers place on delivery system innovation and best practices and the prevalence of managed care arrangements. The region also benefits from the activity of several nonprofit organizations that collaborate with government agencies, health systems, and academic institutions to support patient education and population health initiatives. Also notable are efforts to improve the accessibility and quality of care for underserved populations through the expansion of federally qualified health centers, the creation of health promotion programs by local Native American tribal organizations for their communities, and the use of telemedicine and community health workers.

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BACKGROUND

The Commonwealth Fund's *Scorecard on Local Health System Performance, 2012,* found wide variation across 306 regions* of the United States on 43 indicators assessing health care access, quality, efficiency, and outcomes (Appendix A).[1] This case study series examines selected U.S. regions that performed relatively well on the *Scorecard*—overall or on particular dimensions of performance—despite challenges associated with poorer performance, such as higher poverty rates compared with similarly performing peers.[2]

This report focuses on the Tucson "hospital referral region," which includes all or parts of seven counties in southern Arizona (Exhibit 1). The region ranked 69th on the *Scorecard,* placing it in the top quartile of regions on measures of prevention and treatment and of potentially avoidable hospital use and costs of care

* The unit of analysis for the *Scorecard on Local Health System Performance, 2012,* is the hospital referral region, defined by the *Dartmouth Atlas of Health Care* on the basis of travel and referral patterns for complex care among Medicare beneficiaries.

(Exhibit 2). The case study draws on interviews with a range of local stakeholders to identify factors that may contribute to better performance in the region.

OVERVIEW OF THE GREATER TUCSON REGION

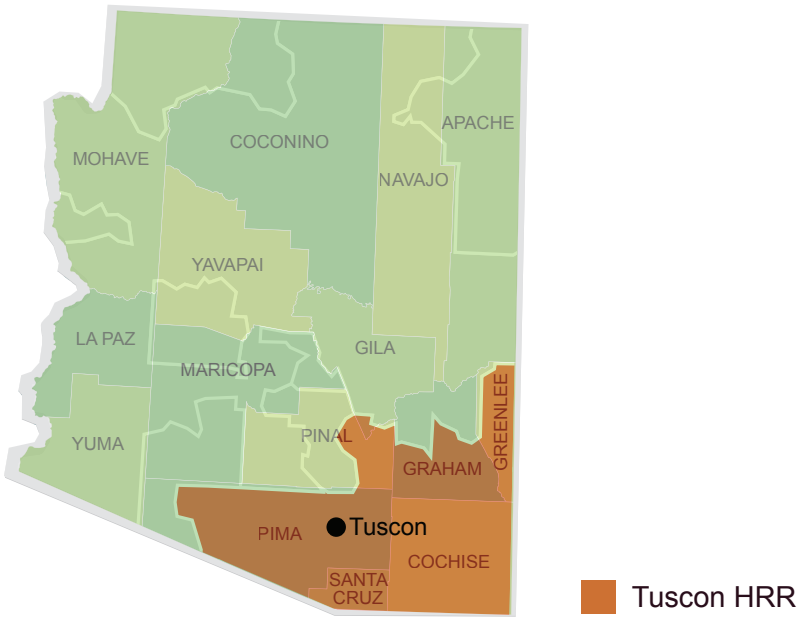
With more than 350 days of sunshine per year and temperate winters, the desert oasis that encompasses Tucson, Arizona, benefits from "place luck." Its climate appears to encourage outdoor activity and healthy behavior. Only one of five residents in Pima County (which accounts for the majority of the region's population) reports no leisure-time physical activity, placing it above the 90th percentile among all U.S. counties. Smoking rates are also relatively low in the Tucson region, as they are statewide.

Perhaps because of its attractive climate and a diversified economy, the area's population has risen dramatically—increasing by 16 percent between 2000 and 2010 in Pima County alone. While some of the new arrivals are retirement-age, the percentage of the region's residents age 65 and older is only slightly above the median for all regions (Appendix B).

Residents say opportunities abound to share in one another's cultural traditions through outdoor events such as street fairs, creating a sense of community that is further reinforced by a rich array of nonprofit organizations that work together to identify shared values. One of the most prominent is "Imagine Greater Tucson," a community-based effort that seeks to protect and enhance quality of life in the region and spur economic development as the local population grows.

Still, the area faces a number of challenges, many of which Imagine Greater Tucson and other organizations are working to address. It had the sixth-highest poverty rate among large U.S. metropolitan areas in 2011.[3] Other regional challenges include substance abuse, rates of which exceed the state average, and drug trafficking across the border from neighboring Mexico. Access to health care is uneven: eight of the region's 18 primary care service areas face a shortage of health professionals.[4] Access barriers can be particularly acute for Native Americans living on tribal lands, many of whom are hours away from the nearest clinic, as well as for both documented and undocumented immigrants.

Exhibit 1. The Tucson Hospital Referral Region in Southern Arizona



Note: The Tucson hospital referral region includes ZIP codes in the following Arizona counties: Cochise, Gila, Graham, Greenlee, Pima, Pinal, and Santa Cruz.
Source: Adapted from the Dartmouth Atlas of Health Care, www.dartmouthatlas.org.

Exhibit 2. Performance Summary for the Tucson Hospital Referral Region

Dimension	Quartile	Rank
Overall	1	69
Access	2	133
Prevention and Treatment	1	69
Potentially Avoidable Hospital Use and Cost	1	42
Healthy Lives	2	88

Note: Performance generally represents the time period 2008–2010, with some exceptions. See Appendix A for a complete list of indicators and the specific time periods they cover.
Source: The Commonwealth Fund *Scorecard on Local Health System Performance, 2012.*

PATHWAYS TO HIGHER PERFORMANCE

Stakeholders described four pathways by which the southern Arizona region appears to be achieving or making progress toward relatively strong performance in certain dimensions. These performance pathways include: 1) community-organizing efforts to promote health and physical activity, 2) the use of advanced managed care techniques to improve quality and drive efficiency, 3) collaboration among providers and community groups to improve continuity of care and encourage better chronic-disease management, and 4) programs to address the needs of underserved and uninsured patients (Exhibit 3).

Although these pathways do not account for every aspect of the region's performance, they offer a framework for understanding the multifaceted ways in which stakeholders in the Tucson region are addressing challenges and working to improve the local health system. Some activities described below have occurred since the time period measured by the *Scorecard,* and exemplify how the region's efforts are progressing along these pathways.

Community-Organizing Efforts to Promote Health and Physical Activity

Tucson began a concerted effort to promote health and physical activity in 2003 when the city's then-mayor, Robert E. Walkup, took on a challenge from U.S. Surgeon General Richard Carmona, M.D., to make the community a model of a healthy metropolis.[5] Walkup responded by launching the Healthy Tucson Initiative, which focused on publicly encouraging residents to lead healthy lifestyles, improve their emotional health, and prevent substance abuse and violence.[6] One result was the Tucson Challenge, a 12-week model weight-loss and physical activity program that was developed by the University of Arizona Center for Physical Activity and Nutrition, in partnership with community organizations, and was associated with measurable weight loss among participants.[7]

The Healthy Tucson Initiative also laid the foundation for Tucson's participation in the "Activate America" campaign, part of the YMCA's 2004 Pioneering Healthier Communities Program.[8] "Activate Tucson," much like the Healthy Tucson Initiative, has helped to engage a wide array of stakeholders—local nonprofit organizations, health and transportation departments, schools and academia, hospitals and physician groups, consumer and faith-based groups, and business leaders—in efforts to encourage disease prevention and promote public policies that address the social and economic determinants of health, often with input from University of Arizona faculty and staff with expertise in public health.[9]

These efforts have focused heavily on opportunities to promote healthy eating and physical activity in area schools and neighborhoods. For example, faculty and staff at the university have worked with the local school district to embed curricula on nutrition and physical activity into existing educational programs. A "walking school bus" program encourages students and parents to walk to school as a group. The collaborative also has taken aim at the lack of access to healthy food in some neighborhoods by pursuing zoning changes that allow big box stores to sell food there and by permitting local residents to sell privately grown produce. Other supportive policies have allowed residents to use schoolyards as parks, expanded bike lanes, and led to the investment of $70 million in a 131-mile trail that loops around the city and provides opportunities for residents to bike, run, and walk.

Exhibit 3. Key Demographic and Health System Characteristics: Greater Tucson Region[10]

Demographics and Health

The population of the Tucson hospital referral region, 1.2 million, is more racially and ethnically diverse than other U.S. regions (Appendix B). During 2007–2011, Hispanics and Latinos made up more than one-third of the population; nonwhite races, including Native Americans belonging to Tohono O'odham and Pascua Yaqui tribes, accounted for 21 percent. Although median household income in the region was close to the median for all U.S. regions, the percentage of individuals with family income below the poverty level (17.9%) was much higher than the median for all regions (14.8%), and especially high in the city of Tucson (22.6%) and on local tribal reservations (e.g., 43.4% within the Tohono O'odham Nation). Compared with other regions, the Tucson region had similar rates of adult obesity and premature death, higher rates of suicide and infant mortality, a lower rate of smoking, and middling performance on measures of self-reported health (Appendix A).

Hospitals and Health Systems

The region's hospital market, with 16 hospitals, is moderately concentrated compared with the U.S. median. Four health systems compete in the Greater Tucson market, with average daily occupancy of less than two-thirds of the hospital beds:

1. **Carondelet Health Network,** a nonprofit Catholic health system and member of Ascension Health, operates three local hospitals and two institutes with 912 beds. The Carondelet Medical Group employs 85 primary-care and specialty-care physicians who practice with nurse practitioners and physician assistants in 20 locations.[11]
2. **University of Arizona Health Network** brings together the state's only academic medical center with 40 clinics, a health plan and a faculty practice for 600 physicians affiliated with the College of Medicine. The network operates two acute-care hospitals, with a total of 627 beds, one of which is the region's Level 1 Trauma Center and the other a former county hospital.
3. **Tucson Medical Center,** a 617-bed, community-based hospital, has partnered with 150 physicians, affiliated medical groups, and federally qualified health centers (FQHCs) to form Arizona Connected Care, a physician-led accountable care organization (ACO) serving Medicare and commercially insured patients.
4. **Northwest Healthcare,** owned by the for-profit Community Health Systems, operates two acute-care hospitals in the region, including the 267-bed **Northwest Medical Center** in Tucson, in addition to several urgent-care centers and physician offices.

Physicians and Health Centers

The number of physicians per capita is close to the U.S. median. Small, single-specialty independent physician groups are the norm. The area is also served by several FQHCs. In addition to those affiliated with health systems (mentioned above), some representative physician groups include:

1. **El Rio Community Health Center,** one of the state's and the nation's largest FQHCs, which provides primary care, dental, pharmacy, and care management services to 76,000 underserved and uninsured patients at 17 area locations. The health center, together with two other FQHCs, is participating in Arizona Connected Care, the local ACO.
2. **New Pueblo Medicine,** a primary care practice made up of seven internists and two nurse practitioners, which led the formation of Arizona Connected Care and has been recognized as a patient-centered medical home.
3. **Arizona Community Physicians,** a physician-owned "virtual" medical group of 136 predominantly primary care physicians who practice in 56 locations throughout the area.
4. **The Indian Health Service (IHS),** operating three outpatient health centers, in addition to a 14-bed hospital, that annually treat about 20,000 patients belonging to the Tohono O'odham Nation. The Pascua Yaqui Tribe arranges health care for its members through a tribal self-determination contract.

Health insurers

The commercial health insurance market in the Tucson region is less concentrated than in other regions. Insurers include UnitedHealthcare, Aetna, Cigna, Humana, and Blue Cross Blue Shield of Arizona, among others. Almost one-third (30.2%) of the region's insured population is enrolled in health maintenance organizations (HMOs), nearly twice the median (16.5%) among all U.S. regions.

The Arizona Health Care Cost Containment System (Arizona's Medicaid Agency) contracts with private firms to offer Medicaid managed care plans and managed long-term care programs for low-income individuals. The Pima Community Access Program offers low-income, uninsured residents of Pima County access to a network of health care providers at discounted prices.

Employers

The region's economy is driven predominantly by service sector jobs and tourism; manufacturing and high-tech industries also play an important role. Some major employers include Raytheon Missile Systems, Freeport MacMoran Copper and Gold, Wal-Mart Stores, Carondelet Health Network, the University of Arizona, and government agencies.

Activate Tucson also relies heavily on employers and community-based groups to promote healthy behavior, including many local faith-based organizations that have established health ministries and trained members as "health ministers" to oversee computerized health assessments, promote walking groups, and connect congregants to community providers.[12] Employers receive technical assistance in assessing their environment, conducting on-site health assessments, and launching wellness programs. Some 361 businesses now participate in Activate Tucson, with some organizing walking groups and/or offering healthier food choices in employee cafeterias.

These efforts extend to the neighborhood level. In predominantly Hispanic neighborhoods of South Tucson, for example, community leaders joined with community health workers (*promotores de salud*) to form a health coalition with support from the University of Arizona's Zuckerman College of Public Health and a series of federal grants. The coalition has partnered with schools, the county, local businesses, the YMCA, and other community organizations to increase the availability of healthy food, prevent substance abuse, reduce diabetes, and increase cancer screening.[13] To encourage outdoor exercise, community outreach workers, or *promotores*—who live and work in the community—are collaborating with the local Boys & Girls Club to promote safe bicycling.

One premise underlying many of these programs is that better population health and a more desirable built environment will foster economic development by attracting visitors, lowering health care costs, and increasing worker productivity, a point reinforced by Pima County officials when they noted that the 131-mile trail is expected to return $9.40 in economic benefit for every dollar invested in the project.[14] The area's investment in population health programs also enabled Pima County to qualify in 2010 for a three-year, $15.7 million federal grant from the Centers for Disease Control and Prevention's "Communities Putting Prevention to Work" program,[15] which provided a forum for stakeholders to identify new opportunities for collaborative action. That in turn has led to the creation of "Healthy Pima," a health improvement plan that focuses on supporting healthy lifestyles, improving health literacy, reducing health disparities, and increasing access to care.

Use of Advanced Managed Care Techniques to Improve Quality and Help Drive Efficiency

The region performs relatively well on measures of quality and efficiency, which may reflect the historical dominance of managed care in the area (Appendix A).[16] Arizona was the last state to join the Medicaid program but the first to require that beneficiaries enroll in managed care plans. Providers' experience with managed care—which grew to cover a large portion of the commercial and Medicare markets—appears to have encouraged a conservative practice style as well as programs to prevent unnecessary hospitalizations and improve coordination of care. (The region has fewer hospital beds per capita than the median for all regions, yet hospitals operate only at about two-thirds capacity,[17] which likely reflects the influence of managed care incentives to reduce utilization.[18])

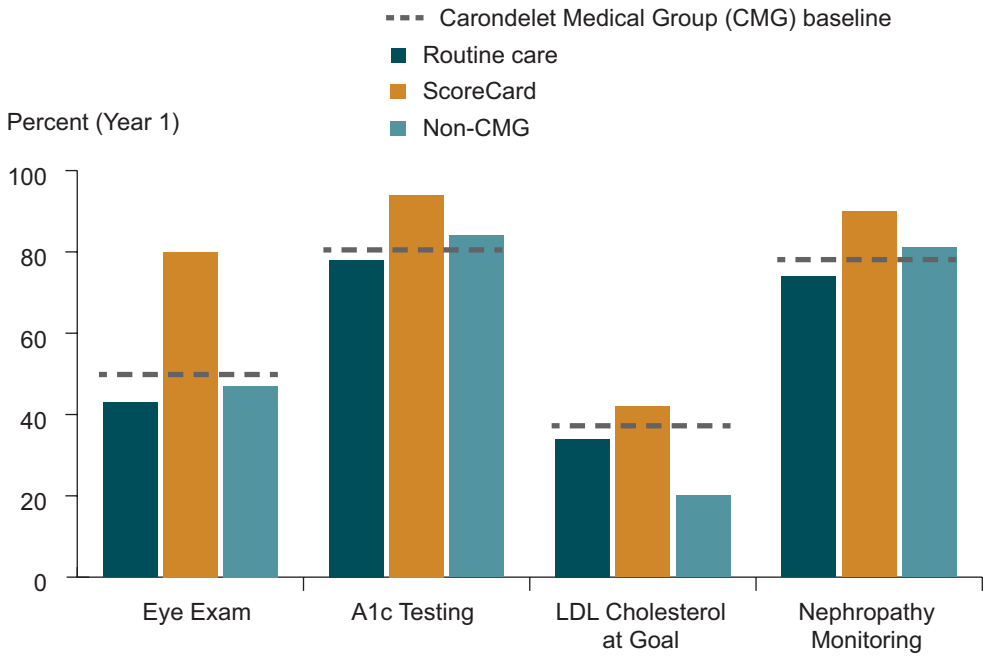
Although providers' organizational responses to managed care at the time of its ascendance in the 1990s—these included forming physician–hospital alliances or large group practices—were not all sustained, the experience created an awareness of the potential benefits and pitfalls of risk-based contracting while at the same time prompting a desire to do better in the future, according to local leaders. (Today, the region is dominated by single-specialty medical practices, so intentional effort to coordinate care across multiple practices is required to create the kind of virtually integrated care envisioned by the architects of managed care.)

Several health systems and physician groups now use a mix of payment incentives, advanced data analytics, and care management techniques to encourage more efficient, high-quality care. Much of this work focuses on reducing inappropriate emergency department use by increasing access to ambulatory

care and patient-centered medical homes. Among these efforts:

- ***Tucson Medical Center (TMC)*** has worked to reduce unnecessary hospital admissions to the emergency department through a stringent admission review process, which was initially designed to avoid nonpayment for services, but ultimately led to better coordination between hospital staff and community physicians. "[We] devised a system where we get the [emergency department] doctor, the admitting hospitalist, and the referring physician on the phone, along with the nurse, to determine and document the reason for the admission," says Judy Rich, TMC's president and CEO. The medical center also has developed a strong inpatient interdisciplinary palliative care program and a home hospice service that offers patients a supportive way to set goals, manage symptoms, and avoid unwanted hospital visits when stepping down from intensive care at the end of life.
- ***New Pueblo Medicine,*** a seven-physician primary care practice, has invested resources in improving care coordination and efficiency by building electronic linkages to Tucson Medical Center. Those electronic ties enable the practice to share and obtain vital health information about its patients and avoid duplicative tests; they have also enabled its physicians to confer with emergency department staff and New Pueblo's hospitalists to ensure that the practice's patients are not admitted for conditions that can be addressed in an outpatient setting, says Michael Cracovaner, New Pueblo's CEO.
- ***El Rio Community Health Cente***r assigns nursing staff to follow up with patients after they are discharged from area hospitals to make sure they have their medications and understand next steps in care. As a result of

Exhibit 4. Results of Carondelet Medical Group's Diabetes ScoreCard Program



Notes: Baseline data for non-CMG patients living in Pima County were not available for this analysis. This data point is provided for comparative purposes, describing the relative quality of care for patients under care of CMG versus other health plan members. Non-CMG patients score better than routine care for three of the four measures; ScoreCard patients have the highest quality marks for all measures.
Source: Saint Louis University Center for Outcomes Research, Feb. 5, 2013.

that program, readmissions of health plan patients dropped by about 20 percent, says Kathy Byrne, El Rio's executive director. El Rio also uses its electronic medical record system to identify and maintain contact with those in need of care, including diabetics whose hemoglobin A1c levels are higher than desired and children due for preventive services. Pharmacy-based diabetes clinics in three health centers help patients manage their drug regimens and engage in self-care. To help meet the special needs of underserved patients, El Rio offers an array of educational and support services, such as community health advisors who help patients obtain needed social services to meet nonmedical needs.

- ***Carondelet Medical Group*** has developed a sophisticated system to improve outcomes for patients with diabetes. Using teams comprising nurse educators, dieticians, and *promotores*, who help patients navigate the health care system, the program has improved quality of care (Exhibit 4) and has reduced inpatient hospital costs by 48 percent.[19] A Web-based ScoreCard ranks patients by risk; those with high scores are scheduled for more frequent visits with nurse educators and dieticians. If necessary, they receive home telemonitoring devices that provide feedback to the patient, which also is used to help nurses tailor their advice to the patient's individual circumstances. Physicians in the medical groups and those in Carondelet hospitals can access patients' records as well.

Having experience with managed care techniques was also helpful to area providers in forming an accountable care organization (ACO) that is participating in the federal government's Medicare Shared Savings Program, as well as serving members of UnitedHealthcare's Medicare Advantage and commercial insurance plans. The ACO—Arizona Connected Care—is a partnership between Tucson Medical Center and local primary-care physicians. Its leaders say the ACO offers physicians the opportunity to refine their approach to managed care using data and analytics that were not available in the 1990s. "The technology [has] advanced so much that physicians [are] able to make decisions that they would have liked to make years ago, but didn't have the real-time data to be able to do it," says Palmer Evans, M.D., Tucson Medical Center's senior vice president and chief medical officer. The ACO also is reviving programs that were piloted in the 1990s, such as a hospital-to-home program to improve care transitions and reduce readmissions among patients with heart failure.[20]

Collaboration Among Providers and Community Groups to Improve Continuity of Care and Encourage Better Chronic Disease Management

In southern Arizona, a number of local hospitals and physician groups are using community outreach workers to provide support services that promote improved continuity of care and chronic disease management. For instance, Carondelet has a voluntary network of nurses who perform health assessments and provide diabetes education to church congregants of several denominations. Likewise, Carondelet employs community health workers as navigators in its emergency department to help connect uninsured and homeless patients to community health centers, a program that saved the health system $200,000 in one recent six-month period.

Many regional outreach programs focus on the elderly, perhaps contributing to the region's much lower rate of hospital admissions for ambulatory care–sensitive conditions among Medicare beneficiaries compared with the nation as a whole (4,057 per 100,000 versus 6,184 per 100,000). Pima County Council on Aging plays a central role by offering an array of services, many staffed by trained volunteers who work in cooperation with community and faith-based organizations to help older adults remain independent in their homes and to support family caregivers in their role. For example, the council trains community residents to educate elderly patients about the risk of falls and about self-management of chronic

conditions using Stanford Medical School's evidence-based model.[21]

The council also deploys social workers and care navigators to work with Carondelet's transitional care nurses to reduce hospital readmissions of high-risk patients as part of the Centers for Medicare and Medicaid Services' Community-Based Care Transitions Program. The intervention has focused on patients with multiple chronic conditions as well as those with congestive heart failure, pneumonia, chronic obstructive pulmonary disease, and renal failure, and includes a reengineered hospital discharge process, home-based support services and referrals, and a preferred network of postacute care providers that report on readmissions and patient satisfaction. Telemonitoring and a health information exchange are used to improve communication and care coordination by a team that includes a nurse, social worker, and community health worker.[22]

Results of the partnership, which began in 2012, have augmented those of the Council's existing transition coaching program and a pilot program at Carondelet that helped reduce the 30-day readmission rate for high-risk heart failure patients to about 8 percent, compared with a rate of more than 20 percent for all heart failure patients. Readmission rates for all patients in the program are reported monthly and range from 7 percent to 13 percent.

El Rio Community Health Center, which has 17 clinics and is one of the state's, and the nation's, largest federally qualified health centers, also has tapped the Council on Aging to provide fitness classes to its senior patients. Likewise, the Tucson Medical Center partners with the council to provide volunteer counselors to Medicare and Medicaid beneficiaries who need assistance. "They become their friend, helper, and mentor," Evans says.

Recently, the YMCA of Southern Arizona developed a "clinic to community" collaboration with other public and private partners—including health systems, tribal organizations, and the Council on Aging—to help prevent or delay the onset of diabetes among the estimated 226,000 local residents with prediabetes, most of whom do not know they are at risk. The program coordinates free glucose screenings for adults and, for those diagnosed with prediabetes, provides physicians and clinics with referral pathways to community chronic disease prevention programs. During the past year, the YMCA's Diabetes Prevention Program served 350 residents through this program.

Programs to Address the Needs of Underserved and Uninsured Patients

The region also has demonstrated a willingness to create and finance programs that fill gaps in care. For example, local voters recently approved bond initiatives to finance the development of two new behavioral health centers, which opened in 2011. They provide a full continuum of services for patients experiencing mental health and/or substance abuse issues—from triage and assessment in an emergency department to inpatient and outpatient care. The regional behavioral health authority, Community Partnership for Southern Arizona—which partnered with the county, the local medical school, and university physicians to run the center—also publishes provider report cards that measure not only timeliness of treatment, but also patient-reported outcomes and rates of patient satisfaction.[23]

In the 1990s, the state legislature provided startup funding for the University of Arizona's College of Medicine in Tucson to establish a statewide telemedicine program, now supported by membership fees.[24] This infrastructure is used by several Tucson-area health care providers, including the university, Tucson Medical Center, El Rio, the Indian Health Service, and Carondelet, to offer specialty teleconsultations and other programs such as tele-education on diabetes to outlying communities and tribes in the region. One such program, operated by Carondelet, provides cardiology consultations to patients at a critical-access hospital, enabling those patients to avoid costly helicopter transport to a Carondelet facility. In one six-month period, "We were able to keep 27 [of 36] patients in that rural hospital, at a cost savings of about $500,000," says Donna Zazworsky, R.N., M.S., Carondelet's vice president of community health and continuum care.

Improving Access to Care for Native Americans in Southern Arizona

The Tohono O'odham Nation, the Pascua Yaqui Tribe, and the Tucson Indian Center have been working to reduce the pronounced disparities in outcomes and access on the region's American Indian reservations, where rates of obesity and diabetes greatly exceed those in the surrounding communities.[25] Unemployment and poverty rates are high on the reservations, while access to transportation and sources of healthy food is limited, and basic infrastructure—such as indoor plumbing, electricity, and paved roads—is often lacking.

The tribes are addressing these challenges through innovative programs that emphasize cultural revitalization and incorporate traditional medicine and healing techniques.[26] The nonprofit grassroots organization Tohono O'odham Community Action, for instance, encourages the cultivation, distribution, and use of traditional foods (such as high-fiber tepary beans) that help regulate blood sugar.[27]

To address the shortage of health care professionals as well as the geographic challenge of accessing health care services on the Tohono O'odham reservation, community health representatives have been providing outreach and support services, including help for residents in getting to medical appointments and navigating the health care system.

INSIGHTS AND CHALLENGES

Tucson's health improvement efforts demonstrate how communities can create collaborative efforts to improve population health by identifying and prioritizing community needs. The Healthy Tucson and Activate Tucson initiatives, for example, have not only enabled participating government and nonprofit organizations to reinforce one another's programs, but also strengthened them through partnerships with academic experts at the University of Arizona.

The university "helps community partners coalesce" around issues of prevention and wellness, and it provides guidance on effective intervention and treatment programs, says Sherry Daniels, M.S., M.P.H., R.N., former director of Pima County's health department. Working effectively with the community requires an attitude of listening and supportive partnership. "We as public health professionals are there to provide resources to the community, not to go in and tell the community what they need," says Martha Moore-Monroy, who manages grant-funded community programs through the University of Arizona's Zuckerman College of Public Health. To translate ideas into action, community-based initiatives must "show small successes quickly, share credit infinitely, [and] plan for sustainability from day one," she advises.

The federal Communities Putting Prevention to Work grant was instrumental in transforming the mission of the Pima County Health Department from one of providing preventive services to a larger one promoting community health improvement in partnership with the local academic medical center, the FQHCs, community-based organizations, local hospitals, and physician groups. The grant "was a very important opportunity for us to delve into the domain of health and wellness. It also provided the county [with a reason] to engage with a lot of stakeholder across a lot of different platforms and across a lot of different topics," says Francisco A. R. Garcia, M.D., director of Pima County's health department.

Despite these successes, the region still faces some significant challenges, as noted in Pima County's 2012 Community Health Needs Assessment.[28] These include inequality in access to services; transportation barriers and lack of the health literacy needed to navigate the health system; lack of nutritious food choices in schools and neighborhoods; and underfunding of public services leading to a dependency on grants. The fact that community leaders continue to perceive such deficits suggests that the initiatives described above have just begun to make headway in addressing complex social problems.

State policies also play a critical role in determining the community's resources and capacity for improvement. Cutbacks to Arizona's Medicaid program, which threatened to destabilize the safety net at the height of the economic recession, were recently reversed by the state legislature, which also approved Governor Jan Brewer's plan to expand Medicaid eligibility with funding from the Affordable Care Act starting in 2014.[29] Assuming this expansion survives a legal challenge, many more underserved patients will be enrolled in capitated Medicaid managed care plans, which have the potential to promote efficient use of resources.[30] Arizona's voter-approved statewide ban on smoking in workplaces, including bars and restaurants, is likewise contributing to lower health care costs because of a reduced rate of hospital admissions for conditions associated with secondhand smoke.[31]

The region's performance on measures of healthy lives may also be attributed, at least in part, to the "Hispanic paradox," whereby Hispanic Americans experience better health outcomes than would be expected given their generally lower socioeconomic status compared with non-Hispanic white Americans.[32] The phenomenon is complex, and likely reflects an interplay of factors including social norms as well as a lower rate and intensity of smoking among Hispanic Americans.[33]

These countervailing trends—higher poverty on one hand, and better-than-expected health on the other—suggest that the Tucson region benefits in unexpected ways from its unique demographic profile. On the other hand, a recent series of news stories highlighted the personal and regional economic challenges of the area's low-paying jobs and low average wages, which lag the national average,[34] resulting in relatively fewer collective resources for health coverage and health system improvement than in more affluent areas of the country. Local leaders are optimistic that a focus on population health will serve as a tool of economic development, helping to reverse some of these challenges. In the meantime, the region's social institutions are collaborating to meet the health challenges, which are not unlike those facing other areas of the country, while its health care providers are demonstrating the ability to adapt to the new accountable care environment. Altogether, these factors make the region one to watch as the nation finds its way forward in an uncertain era of social change.

Appendix A. Local Scorecard Performance Results for the Tucson Hospital Referral Region

Dimension and Indicator	Data Year	TUSCON		All-HRR Median	Top 90th Percentile	Top 99th Percentile	AZ State Rate
		HRR Quartile	HRR Rate				
Access							
Percent of adults ages 18–64 who are insured	2009–2010	3	80.0	80.2	87.5	92.6	77.3
Percent of children ages 0–17 who are insured	2009–2010	4	89.3	93.8	96.3	98.2	87.6
Percent of adults who reported no cost-related problem seeing doctor when they needed to within past year	2009–2010	1	89.3	85.3	90.7	93.9	87.6
Percent of at-risk adults who visited doctor for routine checkup in past two years	2009–2010	2	85.4	85.2	90.4	92.9	84.2
Percent of adults who visited dentist, dental hygienist, or dental clinic within past year	2010	2	70.5	69.7	77.9	82.7	70.6
Prevention and Treatment							
Percent of adults with usual source of care	2009–2010	2	82.7	82.4	88.8	92.0	81.4
Percent of adults age 50 and older who received recommended screening and preventive care	2008 & 2010	2	44.5	44.2	50.8	54.5	44.2
Percent of adult diabetics who received recommended preventive care	2008–2010	2	49.5	45.5	55.7	63.1	44.8
Percent of Medicare beneficiaries who received at least one drug that should be avoided in elderly[1]	2007	1	22.2	25.0	17.9	12.9	n/a
Percent of Medicare beneficiaries with dementia, hip/pelvic fracture, or chronic renal failure who received prescriptions in an ambulatory care setting that are contraindicated for that condition[1]	2007	1	15.0	19.7	15.3	12.5	n/a
Percent of patients hospitalized for heart failure who received recommended care[2]	2010	3	92.8	94.7	97.5	98.9	93.6
Percent of patients hospitalized for pneumonia who received recommended care[2]	2010	3	93.5	95.1	96.9	98.3	94.1
Percent of surgical patients who received appropriate care to prevent complications[2]	2010	3	96.2	96.2	97.4	98.6	95.4
Percent of hospitalized patients given information about what to do during their recovery at home	2010	3	82.4	82.6	86.2	87.9	82.1
Percent of patients who reported that hospital staff always managed pain well, responded when they needed help to get to bathroom or pressed call button, and explained medicines and side effects	2010	3	61.5	63.2	67.1	70.3	62.5
Risk-adjusted 30-day mortality among Medicare patients hospitalized for heart attack[3]	7/2007–6/2010	2	15.5	15.6	14.4	13.1	15.7
Risk-adjusted 30-day mortality among Medicare patients hospitalized for heart failure[3]	7/2007–6/2010	2	10.8	11.4	9.9	9.1	10.5
Risk-adjusted 30-day mortality among Medicare patients hospitalized for pneumonia[3]	7/2007–6/2010	2	11.6	11.8	10.6	9.5	11.5
Percent of home health care patients whose ability to walk or move around improved[4]	4/2010–3/2011	4	46.9	53.4	56.7	58.6	46.9
Percent of home health care patients whose wounds improved or healed after an operation[4]	4/2010–3/2011	4	86.8	88.0	90.3	92.0	85.7
Percent of high-risk nursing home residents with pressure sores[5]	2008–2009	3	8.4	10.9	7.9	6.1	n/a
Percent of long-stay nursing home residents who were physically restrained[5]	2008–2009	3	3.6	3.3	1.5	0.6	n/a
Percent of long-stay nursing home residents who had moderate to severe pain[5]	2008–2009	3	4.8	3.6	2.2	1.4	n/a
Percent of Medicare decedents with cancer diagnosis without any hospice or who enrolled in hospice during last three days of life	2007	1	44.8	55.6	46.6	38.6	43.3

Dimension and Indicator	Data Year	TUSCON HRR Quartile	TUSCON HRR Rate	All-HRR Median	Top 90th Percentile	Top 99th Percentile	AZ State Rate
Potentially Avoidable Hospital Use and Cost							
Hospital admissions among Medicare beneficiaries for ambulatory care–sensitive conditions, per 100,000 beneficiaries	2009	1	4,057	6,184	4,045	2,691	4,165
Readmissions within 30 days of discharge as percent of all admissions among Medicare beneficiaries	2008	2	16.7	17.7	15.1	13.1	17.0
Potentially avoidable emergency department visits among Medicare beneficiaries, per 1,000 beneficiaries	2009	1	165	197	162	139	190
Percent of long-stay nursing home residents hospitalized within six-month period	2008	1	9.5	20.0	11.9	8.3	10.8
Percent of first-time nursing home residents readmitted to hospital within 30 days of discharge to nursing home	2008	3	21.4	20.6	15.8	12.7	21.8
Percent of home health care patients with hospital admission	4/2010–3/2011	2	25.8	26.6	22.4	19.9	26.9
Medicare imaging costs per enrollee	2008	4	$393	$288	$189	$143	$429
Total Medicare (Parts A & B) reimbursements per enrollee[6] (expressed as ratio to all-HRR median)	2008	2	$7,201 (0.91)	$7,952	$6,432	$5,699	$7,563
Total reimbursements per commercially insured enrollee ages 18–64[6] (expressed as ratio to all-HRR median)	2009	1	$2,603 (0.79)	$3,314	$2,801	$2,524	$3,130
Healthy Lives							
Potentially preventable mortality, deaths per 100,000 population[7]	2007–2009	2	91.2	91.3	71.6	59.1	82.3
Breast cancer deaths per 100,000 female population[8]	1996–2005	1	21.6	28.9	22.6	19.4	21.5
Colorectal cancer deaths per 100,000 population[8]	1996–2005	1	15.6	22.8	16.9	12.8	16.3
Infant mortality, deaths per 1,000 live births[8]	1996–2005	3	7.4	6.8	4.9	4.0	6.7
Percent of live births with low birth weight[8]	1996–2005	2	7.1	7.5	6.0	5.4	7.0
Suicide deaths per 100,000 population[8]	1996–2005	3	17.5	15.4	8.2	4.7	16.0
Percent of adults who smoke	2009–2010	1	14.3	19.0	12.6	8.4	14.9
Percent of adults ages 18–64 who are obese (BMI >= 30)	2009–2010	2	29.5	29.5	23.8	17.9	27.0
Percent of adults ages 18–64 who have lost six or more teeth because of tooth decay, infection, or gum disease	2009–2010	3	10.7	10.1	5.9	3.6	9.1
Percent of adults ages 18–64 who report fair/poor health, 14 or more bad mental health days, or activity limitations	2009–2010	3	31.1	29.5	23.5	19.6	29.4

HRR = hospital referral region, as defined by the *Dartmouth Atlas of Health Care*
n/a = data are not available for this indicator for this HRR.
[1] Metric forms part of the score reflecting potentially inappropriate prescribing among elderly Medicare beneficiaries.
[2] Metric forms part of the score reflecting receipt of recommended hospital care.
[3] Metric forms part of the score reflecting hospital mortality.
[4] Metric forms part of the score reflecting quality of home health care.
[5] Metric forms part of the score reflecting quality of nursing home care.
[6] Total per-person Medicare spending estimates include payments made for hospital (Part A) and outpatient (Part B) services. Estimates exclude extra payments to support graduate medical education and treatment of a disproportionate share of low-income patients; adjustments are made for regional wage differences. Commercial spending estimates, generated from a sophisticated regression model, include reimbursed costs for health care services from all sources of payment, including the health plan, enrollee, and any third-party payers, incurred during 2009. Outpatient prescription drug charges are excluded, as are enrollees with capitated plans and their associated claims. Commercial spending estimates were adjusted for enrollee age and sex, the interaction of age and sex, partial-year enrollment, and regional wage differences.
[7] Data for this indicator come from county-level 2005–2007 NVSS-M data files, aggregated to the HRR level, for most HRRs. Estimates for the Anchorage and Honolulu HRRs represent state-level data and are compiled from years 2006–2007.
[8] Data for this indicator come from the Community Health Status Indicators (CHSI) database. CHSI data are reported at the county level. Counties with small populations require more years of data for stable estimates. HRR-level estimates can, but do not necessarily, include data from each year between 1996 and 2005, depending on the population sizes in the counties in the HRR.
Note: Refer to Appendix B in the *Scorecard on Local Health System Performance, 2012*, for indicator descriptions, data sources, and other notes about methodology.

Appendix B. Demographic and Market Characteristics

	Data Source	Data Years	City of Tucson	Tucson HRR	Arizona	Median HRR
Demographic characteristics						
Total population	American Community Survey, U.S. Census	2007–2011	520,981	1,298,642	6,337,373	616,212
Age under 18			23.1	23.3	25.6	23.7
Age 65 and older			11.8	15.2	13.6	13.6
Race[1]						
White	American Community Survey, U.S. Census	2007–2011	74.7	78.5	78.7	82.6
Black or African American			4.8	3.3	4.0	6.5
Other race or multiracial			20.5	18.2	17.3	7.4
Ethnicity						
Hispanic or Latino			41.3	35.4	29.4	6.6
Non-Hispanic, white			47.9	55.4	58.2	74.4
Non-Hispanic, black or African American			4.4	3.0	3.8	6.3
Non-Hispanic, other race or multiracial			6.4	6.2	8.6	4.1
Median household income			$37,448	$48,049	$50,752	$49,276
Percent below federal poverty level (FPL)			22.6	17.9	16.2	14.8
Percent below 200% FPL			46.8	38.6	36.1	34.5
High school education or less, adults over age 25			41.1	38.6	39.5	45.3
Bachelor's degree or higher			24.5	27.1	26.4	24.1
Market characteristics						
Hospital beds per 1,000 population	*Dartmouth Atlas*	2006		2.0	2.1	2.4
Hospital market concentration[2]	Medicare Provider of Service File	2010		1,563 (moderate)	1,669* (moderate)	2,541 (high)
Primary care physicians per 100,000 residents	*Dartmouth Atlas*	2006		66.7	61.1*	68.8
Specialty physicians per 100,000 residents				124.3	113.7*	117.5
Market share of top three insurers (commercial)	Managed Market Surveyor, Healthleaders-Interstudy[3]	2010		65.1	66.9	74.6
HMO penetration (among all payers)				30.2	24.9	16.5
Total reimbursements per commercially insured patient under age 65	Commercial claims[4]	2009		$2,603	$3,130	$3,314
Total standardized Medicare (Parts A & B) spending per beneficiary	IOM analysis of Medicare claims[5]	2009		$7,556	$7,906	$8,483
Percent change in standardized Medicare spending per beneficiary (2007–2011)	IOM analysis of Medicare claims[5]	2007–2011		9.2	12.5	10.5

HRR = hospital referral region, as defined by the *Dartmouth Atlas of Health Care*.

Note: The U.S. rate represents the median of all HRR-level rates.

* State rate not available. Figure reported represents the median of all HRRs anchored within the state.

[1] The authors stratified each region's population by those identifying as "white only," "black or African American only," or "any other race or combination of racial backgrounds." These three categories capture 100 percent of the population. Individuals identifying as Hispanic or Latino ethnicity (and non-Hispanic racial prevalence) are displayed separately.

[2] Market concentration is calculated using the Herfindahl-Hirschmann Index (HHI). General standards outlined by the U.S. Department of Justice divide the spectrum of market concentration into three broad categories: unconcentrated (HHI below 1,000), moderately concentrated (HHI from 1,000 to 1,800), and highly concentrated (HHI above 1,800).

[3] The Commonwealth Fund's analysis of Managed Market Surveyor, Healthleaders-Interstudy (Jan. 2010). HealthLeaders-Interstudy. Used with Permission. All Rights Reserved.

[4] Commercial spending estimates provided by M. Chernew, Harvard Medical School Department of Health Care Policy, analysis of the Thomson Reuters MarketScan Database. Total per-enrollee spending estimates generated from a sophisticated regression model include reimbursed costs for health care services from all sources of payment, including the health plan, the enrollee, and any third-party payers incurred during 2009. Outpatient prescription drug charges are excluded, as were enrollees with capitated plans and their associated claims. Estimates for each HRR were adjusted for enrollees' age and sex, the interaction of age and sex, partial-year enrollment, and regional wage differences.

[5] Analysis performed by the Institute of Medicine. Total Medicare per-person spending estimates include payments made for hospital (Part A) and outpatient (Part B) services. Estimates exclude extra payments to support graduate medical education and treating a disproportionate share of low-income patients. Data are standardized by making adjustments for regional wage differences.

NOTES

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2 Among 26 hospital referral regions with more than 1 million population that ranked in the top quarter overall on the *Scorecard,* the Tucson HRR was one of the four regions with the highest poverty rates (percentage of people with family income below the federal poverty level) during 2007–2011. The others are Grand Rapids, Michigan, and Buffalo and Rochester, New York.

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