HEALTH POLICY

The Impact of Health Plan Physician-Tiering on Access to Care

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BACKGROUND: In an attempt to improve quality and control costs, health plans are creating tiered products that encourage enrollees to seek care from “high-value” physicians. However, tiered products may limit access to care because patients may have to travel unreasonable distances to visit the nearest high-value physician.

OBJECTIVE: To assess geographic access to high-value physicians, particularly for disadvantaged populations.

DESIGN: Cross-sectional observational study.

PARTICIPANTS: Physicians and adult patients in Massachusetts.

MAIN MEASURES: Travel time from census block centroid to nearest physician address under two scenarios: patients can see (1) any physician or (2) only high-value physicians.

KEY RESULTS: Among the physicians, 768 (20.9%) primary care physicians (PCPs), 225 (26.6%) obstetricians/gynecologists, 69 (10.3%) cardiologists, and 31 (6.0%) general surgeons met the definition of high-value. Statewide mean travel times to the nearest PCP, obstetrician/gynecologist, cardiologist, or general surgeon under the two scenarios (any physician vs. only high-value physicians) were 2.8 vs. 4.8, 6.0 vs. 7.2, 7.0 vs. 12.4, and 6.6 vs. 14.8 minutes, respectively. Across the four specialties, between 89.4%–99.4% of the population lived within 30 minutes of the nearest high-value physician. Rural populations had considerably longer travel times to see high-value physicians, but other disadvantaged populations generally had shorter travel times than comparison groups.

CONCLUSIONS: Most patients in Massachusetts are likely to have reasonable geographic access to high-value physicians in tiered health plans. However, local demographics, especially rural residence, should be taken into consideration when applying tiered health plans broadly. Future work should investigate whether patients can and will switch to receive care from high-value physicians.

KEY WORDS: access; high value care; disparities.

J Gen Intern Med 26(4):440–5

DOI: 10.1007/s11606-010-1607-3

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INTRODUCTION

In an effort to improve the value of care received by their enrollees, health plans are creating products in which enrollees have an incentive or are forced to seek care from “high-value” (i.e., low cost and high quality) physicians or hospitals.¹ In a selective network, patients can only be reimbursed for care from high-value physicians. In tiered networks, enrollees pay differential co-payments based on value. For example, an enrollee may have a copayment of \$15 for seeing a high-value physician versus \$25 for a low-value physician.² In theory these products encourage patients to seek care from high-value physicians, and, in response to losing patients, “low-value” physicians would seek to improve the quality and decrease the costs of their care.

Selective and tiered health plan products have generated significant controversy. Most of the concern has focused on the methodology for creating quality and cost metrics.^{3–6} An additional concern is whether patients are able to switch from low-value physicians to high-value physicians. If a patient must travel a significantly greater distance to see a high-value physician, his or her ability to switch to a high-value physician may be limited. Without reasonable access to high-value physicians, a tiered network would simply lead to higher patient out-of-pocket costs without improving healthcare cost and quality. Concerns about access are particularly relevant for sociodemographic groups which already suffer from health disparities, such as the poor, certain racial minorities, or those that live in rural areas.^{7,8} Tiered networks might exacerbate existing disparities because physicians may selectively avoid certain patients and on average it may be more difficult for these patients to travel longer distances^{9,10}.

To address this concern, we examined the impact of a tiered health plan on geographic access by looking at the travel times from patients to physicians. Using methods similar to those used by many health plans, we created quality and cost profiles to identify high-value physicians in adult primary care and in three sub-specialties in Massachusetts. We then compared access to care under two scenarios, one where patients could see any physician and one where patients could see only high-value physicians. Our analyses focused on the whole population as well as certain sociodemographic groups. Our hypothesis was that access to

Electronic supplementary material The online version of this article (doi:10.1007/s11606-010-1607-3) contains supplementary material, which is available to authorized users.

Received May 24, 2010

Revised October 26, 2010

Accepted November 22, 2010

Published online December 23, 2010

high-value physicians would be insufficient, particularly for disadvantaged populations.

METHODS

Data Sources for Creating Physician Profiles

Our data sources, physician population, and patient population use for creating physician profiles are described in more depth elsewhere.¹¹ In brief, four health plans in Massachusetts, who together have an estimated 85% of commercial enrollees in the state, provided us with all of their claims (i.e., professional, facility, pharmaceutical, and ancillary) for 2004-5. Patient data were used if the patients were continuously enrolled for the two years, had filed at least one claim, and were 18 to 64 years old.

Physician Eligible for Profiling

Physicians were eligible for profiling if they submitted at least one claim to one or more of the four participating health plans, had a Massachusetts address, and were in one of our selected specialties: adult primary care (general internal medicine and family practice), obstetrics/gynecology, cardiology, and general surgery. These are specialties commonly profiled by health plans¹² and together they offer a spectrum of inpatient, outpatient, medical and surgical care. Specialty was self-selected by the physician. We did not include non-physician providers because tiered networks in current use appear to only focus on physicians.

Determining Physician Cost and Quality

We profiled each physician on their costs and quality using techniques commonly employed by health plans. The steps we took to create these profiles are described in more depth elsewhere.^{4,11,13} Here we provide an overview.

Cost determinations were based on healthcare episodes which were created from claims data using Symmetry Episode Treatment Group software (ETG) version 6.0. The costs of a healthcare episode comprises the reimbursement for the office visits, diagnostic tests, and prescriptions that are associated with a given condition. Each healthcare episode was assigned to the physician with the greatest fraction of professional costs for the episode, following the attribution rule most commonly used by health plans.⁵ The expected cost for a healthcare episode was defined as the average cost for all episodes attributed to physicians of the same specialty for patients with the same level of comorbidity. Physician cost score was defined as the sum of the total costs of all episodes assigned to that physician divided by the sum of the expected costs for all comparable episodes.

Physician quality was determined by analyzing the same claims data using RAND Quality Assessment Tools (QAT) Claims-Based system, which uses 127 different process quality measures for acute, chronic and preventive care among 23 common conditions. These quality indicators were captured

independent of healthcare episodes. Physician quality score was defined as the rate at which the physician complied with the process measure divided by the average rate for physicians of the same specialty.

Identifying High-Value Physicians

Physicians were profiled on costs if they had a minimum of 30 assigned episodes and on quality if they had a minimum of 30 assigned quality events. Physicians who did not have both cost and quality profiles were ineligible for being considered high-value. This is consistent with the practices of most health plans, which will place physicians who have insufficient data for profiling into a default tier. To determine which physicians were statistically different than the average physician in their specialty on costs and quality ($p < 0.05$), we tested whether the physician's score was statistically different from the average physician in the specialty.¹¹ Requiring that physicians be both high-quality *and* low-cost resulted in less than 5% of physicians being labeled high-value. Because most health plans identify a larger group of physicians as high-value,¹⁴ we expanded our definition of "high-value" to include physicians if they were high quality and low cost, high quality and average cost, or low cost and average quality (see Figure 1 in online Appendix). We also performed sensitivity analyses using different methods of designating physicians as eligible for a lower copayment. The results of these analyses were similar to our primary analysis and are available in the Online Appendix.

Measuring Access Using Travel Times

We looked at access using travel time in two ways: (1) statewide average travel time to the nearest physician and (2) fraction of population within a 30-minute drive to the nearest physician. We selected a 30-minute cutoff because it is used by the Health Resources and Services Administration when designating Primary Care Health Professional Shortage Areas (HPSA).¹⁵

Using ArcMap 9.3 (Redlands, CA), we mapped each profiled physician's address, including those physicians who were ineligible for being considered high-value due to insufficient number of cost episodes or quality events. Addresses were obtained from the Massachusetts Board of Registration in Medicine database for which physicians self-enter their information. For those street addresses which were mapped with a questionable degree of confidence (ArcGIS geocoding score < 80), latitude and longitude coordinates were obtained using other mapping programs.¹⁶ A total of 92.8% of profiled physicians in the four specialties could be mapped and were included in the analysis.

Travel time was determined from each census block centroid in the state to the nearest physician using the Network Analyst extension within ArcGIS Desktop 9.3 (Redlands, CA). Of 109,997 census blocks in Massachusetts, 21,682 had populations of zero, and there were an additional 69 blocks where travel times could not be calculated, leaving 88,246 blocks for analysis. The travel time calculations incorporated average speed limits for each type of road (e.g., faster speeds on highways) but did not incorporate typical levels of traffic. The

travel time for each block was weighted for block population and averaged across the state.

Travel Times for the Total Population and Sociodemographic Groups

Population and sociodemographic data for Massachusetts residents were obtained from the Census Bureau. For all travel time analyses, we used only the adult population. For travel times to obstetrician/gynecologists, we used only adult women. For sociodemographic analyses, we focused on variables known to be associated with healthcare disparities⁷: race, income, education, urban or rural residence, and disability. The Census defines rural blocks based on the population density in the block itself and in surrounding blocks; it uses the same criteria for designating rural areas for all blocks in the U.S.

Population-weighted statewide mean travel times were calculated for the total population and for each sociodemographic group for adult primary care, obstetrics/gynecology, cardiology, and general surgery. We also examined access to care by gender (with the exception of obstetrician/gynecologists) and education status. The results were similar so to simplify our tables, we chose not to include those data. Because in our analyses, we were not dealing with a sample of patients but rather the state's entire population, we did not perform statistical testing.

RESULTS

Our analyses included 3,677 PCPs, 846 obstetricians/gynecologists, 673 cardiologists, and 516 general surgeons. Of these, 768 (20.9%) PCPs, 225 (26.6%) obstetricians/gynecologists, 69 (10.3%) cardiologists, and 31 (6.0%) general surgeons met our definition of high-value (Table 1).

Access for Entire State Population Measured by Travel Times

Under the scenario where a patient could see any physician, the average statewide travel times to the nearest PCP, obstetrician/gynecologist, cardiologist, and general surgeon were 2.8, 6.0, 7.0,

and 6.6 minutes, respectively (Table 1). Under the scenario where a patient could only see a high-value physician, the travel times to the nearest PCP, obstetrician/gynecologist, cardiologist, or general surgeon were modestly higher at 4.8, 7.2, 12.4, and 14.8 minutes, respectively. Under the scenario where a patient could see any physician, the fractions of the state's population that lived within a 30-minute drive of the nearest PCP, obstetrician/gynecologist, cardiologist, and general surgeon were 100%, 99.8%, 99.0%, and 99.5%, respectively (Table 1). Under the scenario where a patient could only see a high-value physician, the fractions of the state's population that lived within a 30-minute drive of a high value PCP, obstetrician/gynecologist, cardiologist, and general surgeon were 99.4%, 99.4%, 93.1%, and 89.4%, respectively. Travel time to the nearest physician varied geographically across the state (Fig. 1). In general, longer travel times were found in the Western, more rural, part of the state. However, we found that geographic distribution of high-value physicians was similar to that of the total population (i.e., they did not cluster toward the large academic medical centers) (see Figures 2-5 in the online Appendix).

Access for Disadvantaged Populations

Travel times for different sociodemographic groups are presented in Table 2. The most notable difference was between the rural and urban populations. Patients living in rural areas had to travel 5.9 minutes longer to see a high-value PCP whereas patients in urban areas needed to travel only an additional 1.6 minutes. For general surgery, rural patients had to travel an additional 15.1 minutes to see a high-value general surgeon whereas urban patients needed to travel an additional 7.5 minutes. Among other sociodemographic groups, the differences were small and often lower among traditionally disadvantaged groups. For example, among low-income (less than poverty line) and high-income (>\$125,000) populations, the average travel times to the nearest PCP under a scenario where they could only see high-value physicians were 3.8 and 5.2 minutes, respectively. Similar sociodemographic trends in travel time were observed for the other specialties.

DISCUSSION

The growing number of selective and tiered health plans has raised the concern that these plans will adversely impact

Table 1. Access to Care Using Travel Time to Nearest Physician Under Two Scenarios: (1) Patients Can See Any Physician or (2) Patients Can Only See High-Value Physicians

	Number of physicians		Average travel time (minutes)†		Percentage of population within 30 minutes	
	Scenario 1: Any physician	Scenario 2: Only high-value physicians	Scenario 1: Any physician	Scenario 2: Only high-value physicians	Scenario 1: Any physician	Scenario 2: Only high-value physicians
PCP	3677 (100%)	768 (20.9%)*	2.8	4.8	100.0%	99.4%
Obstetrics/gynecology‡	846 (100%)	225 (26.6%)*	6.0	7.2	99.8%	99.4%
Cardiology	673 (100%)	69 (10.3%)*	7.0	12.5	99.0%	93.1%
General Surgery	516 (100%)	31 (6.0%)*	6.6	14.8	99.5%	89.4%

*Percent of all physicians in that specialty in Massachusetts

†Population-weighted means for Massachusetts

‡Analysis for Obstetrics/gynecology included only adult women

Figure 1. Geographic distribution of travel times*. *Time in minutes from block centroid to nearest physician.

access to care especially for disadvantaged sociodemographic groups. Contrary to our hypothesis we did not find any significant increase in travel time to physicians in a scenario where patients could only visit high-value physicians. It seems reasonable that patients would be willing to travel an extra 2.0 minutes to see a high-value PCP and an extra 8.2 minutes

to see a high-value general surgeon. The notable exception was for rural populations, which had to travel 5.9 minutes longer to see the nearest high-value PCP and 15.1 minutes longer to see the nearest high-value general surgeon. While these travel times may still be reasonable for rural populations who are accustomed to traveling greater distances, caution should be

Table 2. Travel Times for Sociodemographic Populations*

		Scenario 1—Patients can see any physician				Scenario 2—Patients can only see high value physicians			
		PCP	Ob/gyn†	Cardiology	General Surgery	PCP	Ob/gyn†	Cardiology	General Surgery
All adults		2.8	6.0	7.0	6.6	4.8	7.2	12.4	14.8
Race	White	3.0	6.4	7.4	7.1	5.1	7.6	13.3	15.8
	Black	1.6	4.4	5.1	5.0	3.7	5.9	8.2	8.5
	Hispanic	1.6	3.4	3.9	3.7	2.8	4.9	7.5	10.2
	Other	1.9	3.9	4.6	4.4	3.2	5.1	8.2	9.5
Income	< Poverty line	2.0	4.7	5.5	5.1	3.8	6.0	10.4	12.3
	>95th percentile	3.1	6.4	7.3	7.4	5.2	7.5	11.9	14.5
Residence location	Urban	2.5	5.3	6.1	6.0	4.1	6.5	11.2	13.5
	Rural	6.9	14.1	17.0	14.4	12.8	15.8	26.5	29.5
Disability	Non-disabled	2.9	6.1	7.1	6.7	4.9	7.3	12.4	14.9
	Disabled	2.5	5.6	6.6	6.2	4.6	6.8	12.4	14.4

*Population-weighted means for Massachusetts

†Analysis for Obstetrics/gynecology included only adult women

taken when applying tiering networks to rural populations since they are most susceptible to increases in travel times to high-value physicians.

Our findings did not support that access to high-value physicians is inequitable for other disadvantaged populations. This is consistent with a study of one health plan which found minorities are fairly evenly distributed among specialists of varying efficiency performance.¹⁴ In fact, we found that poor, black, and Hispanic populations had the shortest average travel times.

We selected to study geographic access because it is the most basic level of access—if there are no physicians within a reasonable distance, patients will not be able to see a physician. However, our study did not address other dimensions of access. For example, we did not directly address whether the high-value physicians have the capacity to see more patients. If we divide the number of available high-value physicians by the adult population, it is clear that the supply of high-value physicians is not sufficient for the whole population. If patients were restricted to seeing only high-value PCPs, the statewide population-physician ratio would increase from 1,318:1 to 6,308:1, which is well above the cut-off of 3,500:1 used for designation of Primary Care HPSAs.¹⁵ Similarly, the population-physician ratios would increase dramatically if patients could only see high-value obstetrician/gynecologists, cardiologists, and general surgeons. There is no single population-physician ratio used as a cut-off for insufficient access for specialist physicians.¹⁷ However, the ratios of 70,210:1 and 156,274:1 which we found for cardiologists and general surgeons, respectively, are much higher than the 9,400:1 ratio previously cited for cardiologists^{18,19} and 20,000:1 for general surgeons.²⁰ Considering results from travel time analyses and population-physician ratios, it appears that access may not be an issue if only a small aspect of the population is enrolled in a selective or tiered product, but access could become critically limited if a large fraction of the population is in a tiered product.

Future work should explore this and other dimensions of access, including whether patients have transportation to the physician practice, whether physicians are accepting new patients, and whether wait times to see high-value physicians are within reason. These latter two concerns may be especially important in primary care where fewer physicians in Massachusetts are accepting new patients and where wait times continue to increase^{21–23}. Additionally, if patients have access, it will be important to investigate whether patients will trust physician ratings²⁴ and actually switch from their current provider to a new, high-value physician.

Our study has several limitations. First, our data sources did not permit us to measure travel times from each individual patient's home address to their actual provider so our results are an estimation of how travel times might change in aggregate across the state. Second, we conducted our analysis in Massachusetts, which has the most physicians per capita in the U.S.²⁵; therefore it is unclear whether analyses in other states would find similar results. Third, travel times depend on the pool of high-value physicians and can differ if a different method for designating high-value physicians is used, although it is likely that health plans would create tiering products similar to ones presented here and assessed in our sensitivity analyses. Fourth, we assumed that the four individual health plans included in this study were distributed

uniformly throughout the state and used the same profiling and tiering methods; however each health plan tends to have its own market around which it clusters and each plan uses different tiering methods so that physician and enrollee experience with tiering would vary by location.

Contrary to our hypothesis, we found that patients were within a reasonable travel time of the nearest high-value physician in adult primary care specialties and three subspecialties in Massachusetts, and that, with the exception of rural patients, disadvantaged sociodemographic groups did not have worse access to high-value physicians.

Acknowledgements: This work was supported by funding from RAND and the University of Pittsburgh School of Medicine. We also are grateful for the critical advice provided by John Adams and for programming support from Supriya Munshaw.

Conflict of Interest: None disclosed.

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