

Distance and Networks: A Regional Analysis of Health Insurance Marketplaces

Abigail R. Barker, PhD
Alena R. Wheeler, MPH
Leah M. Kemper, MPH
Timothy D. McBride, PhD
Keith J. Mueller, PhD

January 2018



**Rural Health Research
& Policy Centers**

Funded by the Federal Office of Rural Health Policy
www.ruralhealthresearch.org



RURAL POLICY RESEARCH INSTITUTE

RUPRI Center for Rural Health Policy Analysis
University of Iowa, College of Public Health
Department of Health Management and Policy
145 N. Riverside Drive, Iowa City, IA 52242
(319) 384-3832

<http://www.public-health.uiowa.edu/rupri>

e-mail: cph-rupri-inquiries@uiowa.edu

This report was funded by the Federal Office of Rural Health Policy, Health Resources and Services Administration, US Department of Health and Human Services, Grant U1C RH20419.

Table of Contents

Executive Summary	1
Introduction.....	2
Methods.....	4
Results.....	6
Conclusions.....	12
Endnotes.....	13

Executive Summary

The Patient Protection and Affordable Care Act of 2010 (ACA) required that all 50 states and the District of Columbia establish Health Insurance Marketplaces (HIMs) (originally called Health Insurance Exchanges and sometimes referred to as Exchanges). As of the fourth year of implementation, one characteristic consistently evident in the data – in issuer participation, numbers of plans available, premiums charged, and enrollment – is that there is a significant amount of geographic variation, both in terms of region of the country and in terms of rural and urban status of the place.

The purpose of this paper is to examine whether rating area design and network adequacy standards may have contributed to HIMs' success, in terms of enrollment and/or affordability, or lack thereof in rural places. Using 2015-16 data on insurance issuer (or "firm") participation, premiums, and enrollment success for 15 Midwestern states, this project examines the possibility that geographic distance to care plays a role in this variation through its effect on network adequacy from several angles and attempts to assess the moderating role that state-level policies on network adequacy standards and Rating Area design may have.

Key findings are listed below; they are discussed in detail in the full document.

1. In certain cases when long travel times and distances are in play, network adequacy standards may prompt a firm to stay out of a particular rural county, even when it offers plans in a nearby urban area, but for the most part it does not seem to make firm absence much more likely. In fact, in states with lower standards, firm absence from a rural county even when present in a nearby urban area is somewhat more common.
2. Premiums are highest, on average, in counties within states that subject all marketplace plans to quantitative network adequacy standards and in counties in which over 60 miles or 60 minutes of travel is needed to access a county with 50 or more doctors. In states with some quantitative standards for marketplace plan networks, premiums were higher, on average, than in states with no quantitative standards for marketplace plan networks.
3. The relationship between the average premiums in a county and the degree of alignment of the county's rating area with its service delivery region – which is a proxy for the firm's potential difficulty in forming networks – is not uniform and is of small magnitude. There is also no clear relationship between enrollment growth rates between 2015 and 2016 and whether a county's rating area is well-aligned with the service delivery region.
4. There is a relationship between number of firms and size of the potential market, but only in places without network adequacy standards: the number of firms increases with the size of the potential market, but the relationship does not hold when there are network adequacy standards. It seems that the size of the market available for pooling or sharing risk can be a significant factor on the number of firms offering coverage.

Although the importance of travel time and distance when thinking about network formation and a firm's decision to offer health insurance coverage in a particular rural area is often

taken as given, our analysis found only weak associations among the concepts of distance, networks, and premiums. While some evidence supports the hypothesis that premiums increase when network adequacy standards force firms to offer coverage in places that are farther from any central source of health care, there is no corresponding evidence that consumers' experience of networks over greater distances is negative. Ultimately, firms' decisions to offer plans in a particular place may be less related to distance and other factors, such as the costs and benefits of establishing contracts and the size of the risk pool, may be more relevant. A more nuanced study of contracts in rural areas is needed to understand when market power (on the part of the firm or on the part of a provider or hospital system) affects this outcome, as well as affecting the size of premiums and plan characteristics offered.

Introduction

The Patient Protection and Affordable Care Act of 2010 (ACA) required that all 50 states and the District of Columbia establish Health Insurance Marketplaces (HIMs) (originally Health Insurance Exchanges and sometimes referred to as Exchanges). As of the fourth year of implementation, one characteristic consistently evident in the data – in firm participation, numbers of plans available, premiums charged, and enrollment – is that there is a significant amount of geographic variation, across regions of the country and between rural and urban locations. While some of this variation is undoubtedly due to underlying costs, attributable to differences in care delivery and the demographic mix of the population, it is also quite possible that some of the variation has arisen because of state policies regarding rating area design and network adequacy standards.

The purpose of this paper is to examine whether rating area design and network adequacy standards may have contributed to HIMs' success, in terms of enrollment and/or affordability, or lack thereof in rural places. Rural communities face many health care access barriers including long distances to available providers as well as health provider shortages.¹ Past studies have shown that distance and travel time is a factor in access to and utilization of care, especially for rural residents.^{2,3} Firms operating in HIMs may find it difficult (i.e. less profitable, more complicated) to develop adequate provider networks in rural markets due to constraints specific to rural communities such as rural health workforce shortages and geographical dispersion of the population.⁴ While strict network adequacy standards may be implemented as a protection for HIM consumers, they may also affect a firm's willingness to serve rural areas if the standards prove too difficult to meet.⁴ This analysis explicitly investigates how restrictions on patients' maximum travel distance and travel time may play a role in firm participation, premiums, and enrollment in HIMs.

The design of rating areas was and is a state-level decision, and it is apparent from the variety of designs that states had different approaches to setting rating areas. Rating areas are geographic divisions in a state within which health insurance plans must charge the same premium to people of the same age, family status, and tobacco use status.⁵ Compliance with the regulations enacted to carry out the ACA may be achieved through uniform geographic

rating areas for the entire state or by creating no more geographic rating areas than the number of metropolitan statistical areas (MSAs) in the state plus one.⁶ Additionally, states were allowed to petition the Department of Health and Human Services (HHS) to approve larger numbers of rating areas if they felt such a division was actuarially justified.⁶ Rating areas may also be comprised of noncontiguous regions. The final rule on geographic rating areas specifies that “a state's rating areas must be based on one of the following geographic divisions: counties, three-digit ZIP codes, or MSAs and non-MSAs.”⁷ Finally, the rule specifies that if a state does not actively establish adequate rating areas, “the default is one rating area for each MSA and one rating area for all other non-MSA portions of the state.”⁸ As a result of the flexibility in the final rule, what constitutes a rating area varies significantly across states.

The ACA also established national standards for network adequacy for all plans offered through the HIMs.⁹ As a result, plans offered through the HIMs must maintain a provider network that is sufficient in terms of numbers and types of providers to ensure that all services can be attained without unreasonable delay.¹⁰ The ACA gives states the authority to enforce additional state requirements regarding network adequacy standards.¹¹ As of January 2014, 27 states had rules that required at least some HIM plans to satisfy one or more quantitative measures of network adequacy.¹² Of these 27 states, 16 states required that all HIM plans be subject to state quantitative standards.¹² In the remaining 11 states only some HIM plans (e.g. Health Maintenance Organizations, or HMOs) were subjected to state quantitative standards. The quantitative standards varied across states but most frequently the states specified a travel time and/or distance limit on how far a beneficiary must travel to access specified services covered by their insurance policy.¹²

The variation in state-designed rating areas and state requirements regarding network adequacy standards creates potential for variation in availability of competing plans within and across rating areas. This analysis focuses on a large contiguous region of 15 mostly Midwestern states (Arkansas, Illinois, Indiana, Iowa, Kansas, Kentucky, Minnesota, Missouri, Montana, Nebraska, North Dakota, Oklahoma, South Dakota, Tennessee, and Wyoming). Using this 15-state region, this analysis describes where health insurance firms are absent and characterizes these places demographically and geographically. Research has shown that insurance firm participation in the HIMs varies statewide, and rural areas tend to have fewer insurers.¹³ The notion of firm “absence” from a rural market was defined to mean that the firm was present in a nearby area, but chose not to offer coverage in the rural county. In other words, we are identifying rural counties excluded from a firm’s service area even when a firm offers coverage in some portion of that same rating area.

The initial hypothesis tested in this analysis is that patients’ distance from care plays a role in predicting the absence of firms from rural markets and that, when present, firms’ premiums be higher. We expect the latter will be due to a combination of higher costs of contracting due to perceived monopolies on the provider side and less ability to share risk across a smaller pool, but these are not testable hypotheses with the current data. Because the states’ differing sizes and population densities made it hard to capture any uniform notion of distance, and

because the data showed very few outright absences, the analysis presented here focuses on county-level enrollment as an indicator of viability of a firm's plan offerings, i.e. its ability to capture sufficient market share to continue to operate over time, in rural counties.

Methods

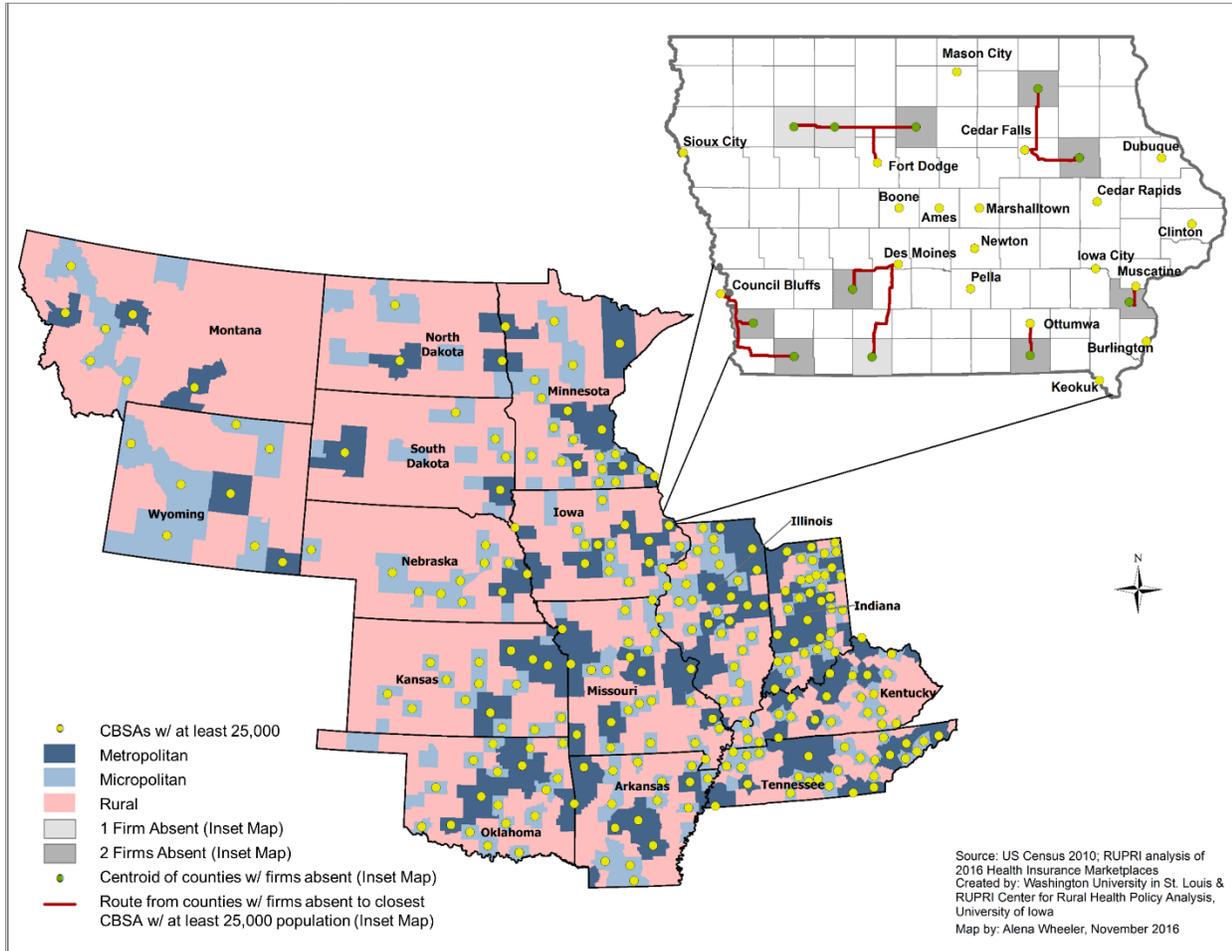
Using Geographic Information Systems (GIS) software, this research was conducted with a range of experimental definitions for how distance might matter in the context of HIMs. To focus on the question of whether and why firms might offer plans in just part of a rating area, perhaps omitting some of the less populated counties from their service area, the notion of a firm being "absent" from a rural county is defined in various ways:

- First, distance (and travel time) is measured from rural counties to the nearest micropolitan and metropolitan counties within the same rating area, and a firm is considered to be absent from a rural county if it *did* offer coverage in the nearest Core-Based Statistical Area (CBSA)¹⁴ but *not* in that rural county.
- Second, variables are created using the counties with cities of at least 25,000 people as the reference: in this case, firm absence meant the firm *did* participate in the HIM in counties that contained cities of at least 25,000, but *not* in the nearby rural county within the same rating area.
- Third, this analysis looks specifically at counties that had at least 50 medical doctors, and a firm is considered to be absent from a rural county if it *did* offer coverage in another part of the rating area where there were 50 or more doctors but did *not* offer coverage in the county itself.

We experimented with the numerical cutoffs for city sizes considered adequate (e.g. 50,000 and 100,000 people), and with the numbers of doctors considered sufficient (e.g. 25, 75, 100). Figure 1 illustrates the study region of 15 states, with reference to the second of the three notions of distance described above, which separates counties by whether they contain sizeable cities. The inset shows an example of travel routes from counties not containing a city of 25,000 people to the nearest city of at least 25,000 people.

Network adequacy standards are controlled for here as follows: using data gathered by Giovannelli, Lucia, and Corlette of The Commonwealth Fund,¹² each of the study states is characterized as having quantitative network adequacy standards in all, some, or none of its Health Insurance Marketplace (HIM) plans. Quantitative standards typically set maximum travel times and/or travel distances, for access to primary and specialty care. Qualitative standards – such as updating directories of in-network physicians – are not controlled for here.

Figure 1. The Study Region



The role of rating area design in firms’ decisions is also considered here. Three study states (North Dakota, Oklahoma, and Wyoming) used the “MSAs+1” rating area design, and several other states drew boundaries that visually did not correspond well with derived hospital system service areas. GIS was used to develop regions based on cities located within Dartmouth Hospital Referral Regions (HRRs).¹⁵ These HRR cities are where major surgical procedures are performed. In this analysis, the HRR cities represent a point of service to which residents may travel to in order to receive complex care, and where firms would be likely to establish a robust provider network. GIS was used to calculate the shortest driving distance between each county and the closest HRR city in the study area. Counties were then grouped into regions based on their closest HRR city. These HRR city regions represent geographical areas where residents may travel the shortest distance in order to seek care. Next, GIS is used to overlay these derived HRR city regions with rating areas. Each county is “scored” according to whether it was in the “best-aligned” rating area. “Best-aligned” rating areas are those that also contained their nearest HRR city. The hypothesis is that a rural county that is separated by rating area boundaries from its closest HRR city is more likely to be separated from its natural hospital system, which would make firm “absence” from that rural county more likely when present in the closest HRR city.

Each rating area was also scored according to whether it lay entirely within one hospital system service area or not – some rating areas were comprised of pieces of up to eight service areas. This leads to the hypothesis that fragmentation makes network formation more difficult, which in turn leads to firm absence and/or higher premiums for consumers.

In many cases, it seems that firms may be expected or required to say that they offered coverage throughout the state – not just the rating area. In such cases, it might be expected that a firm would have plans listed, but that they would not be perceived as viable to the local consumer. Therefore, the hypothesis is that a comparison of enrollment rates between 2015 and 2016, as percentages of the estimated potential market, will show low and/or decreasing enrollment in counties where firms are technically participating due to such requirements but are offering inadequate networks due to a lack of alignment between hospital system service areas and rating area boundaries.

Results

First, to increase intuition about the definitions of firm “absence,” counts of firms not present, depending on the definition used and separated by rural/urban status of counties, are reported in Table 1. For example, on 63 occasions a firm is “absent” in a rural county even when that particular firm offers coverage elsewhere in a CBSA in the same rating area, out of a total of 924 rural counties in the study area where this could have occurred.

Table 1. Number of Firms “Absent” in Part of a Rating Area When Present in Another Part of the Rating Area, by Definition Used

	Number of Times a Firm is “Absent” from 924 Rural Counties	Number of Times a Firm is “Absent” from 334 Urban Counties
Firm is present in a CBSA in the same rating area	63	36
Firm is present in a city of 25,000+ in the same rating area	84	24
Firm is present in a county with 50+ doctors in the same rating area	97	48

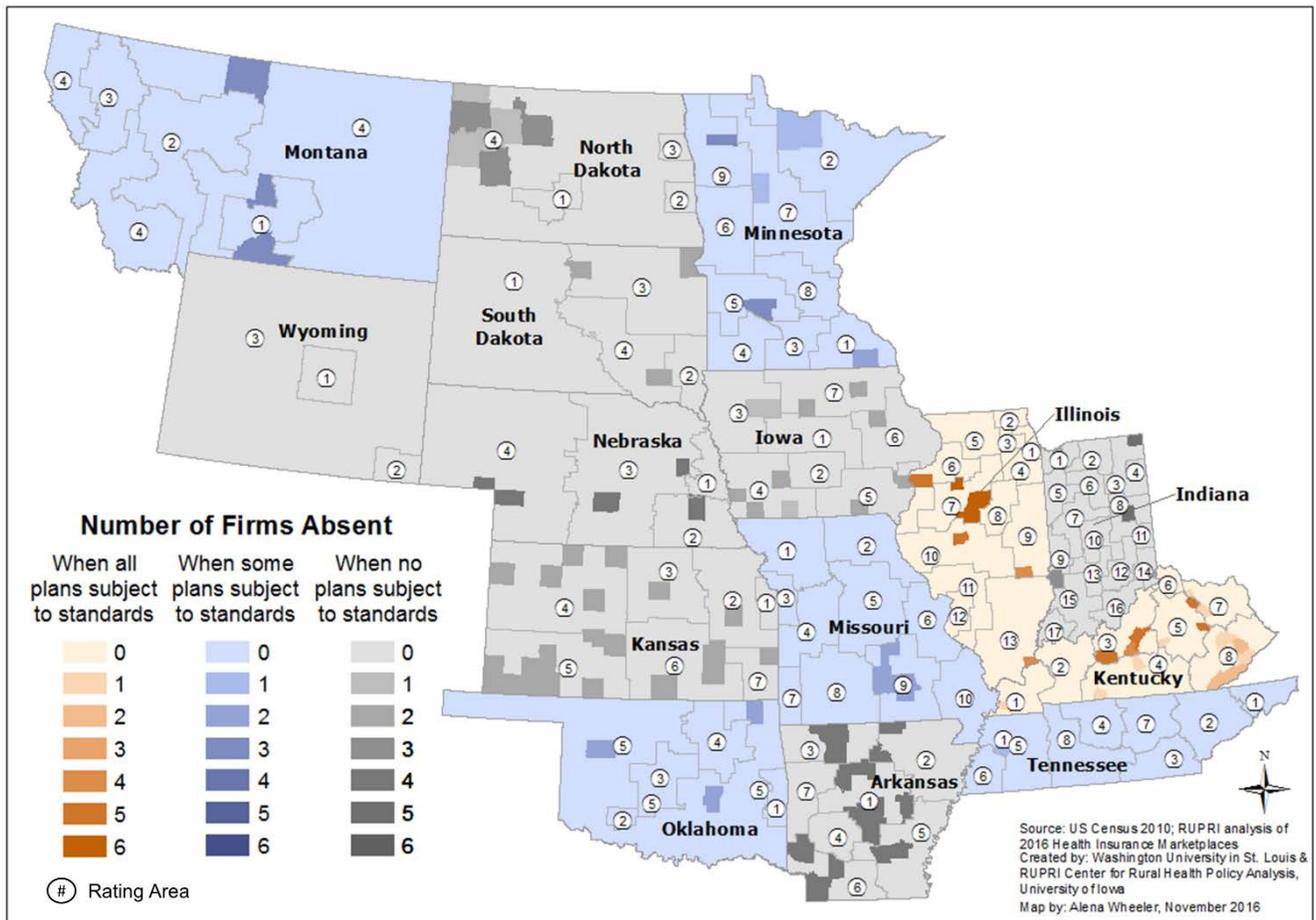
Relationship of network standards to firm absence

Figure 2 shows the number of firms absent in each county – when present in a city of at least 25,000 people in the same rating area – by state network adequacy standards. The three different colors (grey, blue, and orange) represent the types of network adequacy standards established by states in our study region. Shades of grey represent states that do not subject HIM plans to any state-enforced quantitative network adequacy standards. Conversely, shades of orange represent states that require all HIM plans to satisfy state-based quantitative network adequacy standards. Lastly, shades of blue represent states that require some HIM plans, most commonly HMOs, to satisfy quantitative network adequacy standards. Within each color category, the various shades represent the number of firms absent in each county based on the definition of ‘absence’.

The map was created using insurer names exactly as listed in the original data. So in certain cases, firm absence occurs when one product line (for example, HMOs sold by BlueCross BlueShield Kansas Solutions) is not offered, but in fact another product from the same parent company (PPOs sold by Blue Cross and Blue Shield of Kansas) remains in the county. This is not common, but a small number of firm absences occur in such circumstances.

Note that network adequacy standards may prompt a firm to stay out of a county if there are long travel times and distances in play (e.g. rural Kentucky) but for the most part it does not seem to make firm absence much more likely. In fact, in states without standards, or without complete standards, firm absence is somewhat more common than in states with standards. This may be because network formation in areas with long travel times and distances may be costly as the federal minimum network adequacy requirement remains in place; contracting with providers at low rates may be less feasible; or the small number of customers gained may not be worth the cost. States without network adequacy standards may also be more lenient in permitting firms to pick and choose where to operate, rather than requiring participation throughout the rating area. Broadly, the map shows that rural areas with no or partial network adequacy are more likely to have firms “absent” from some counties. Overall, however, firm absence is less prevalent than might be expected.

Figure 2. Number of Firms Absent by State Network Adequacy Standards by Rating Area



Challenges to forming networks and firm absence

Switching to a provider-based definition, the variation in average adjusted premiums¹⁶ in counties by state network adequacy standards is reported in Table 2. The table is separated into categories based on distance to a county with at least 50 doctors and travel time to a county with at least 50 doctors. It is possible that differences exist in average premiums for several reasons, including cost of network formation and lack of competition in places with strict network adequacy standards. Premiums are in fact highest, on average, in counties within states that subject all marketplace plans to state quantitative standards and in counties in which over 60 miles or 60 minutes of travel is needed to access a county with at least 50 doctors. In states with some quantitative standards for marketplace plan networks, premiums were higher, on average, than in states with no quantitative standards for marketplace plan networks. The fact that few firms participate in counties with long travel distances and times in states with all plans subject to network adequacy standards suggests that network formation may indeed be more expensive, and/or the firms offering coverage do so in a less competitive environment and are therefore able to recoup any such costs more successfully through higher premiums.

Table 2. Average premiums in states with varying network adequacy standards by distance and travel time.

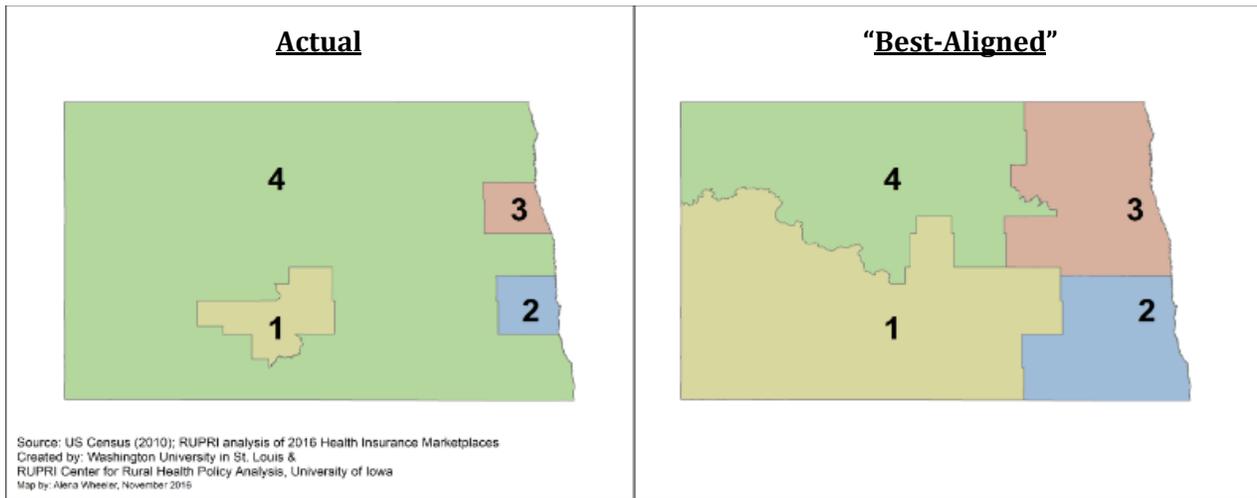
		No HIM Plans Subject to Network Adequacy Standards	Some HIM Plans Subject to Network Adequacy Standards	All HIM Plans Subject to Network Adequacy Standards
Distance to a County with 50+ MDs	Under 60 mi	\$291.68 n=327	\$308.27 n=317	\$294.86 n=277
	Over 60 mi	\$300.31 n=204	\$298.90 n=113	\$320.70 n=20
Travel Time to a County with 50+ MDs	Under 60 min	\$291.20 n=209	\$306.20 n=202	\$290.82 n=210
	Over 60 min	\$297.46 n=322	\$305.46 n=228	\$310.54 n=87

Effects of rating area design

The relationship between network adequacy and premiums reported in Table 2 suggests that the design of rating areas might matter as well. If firms can contract with a small number of large groups of providers throughout a rating area, avoiding the need to contract with individual providers or many small groups, presumably they would be more likely to participate in the marketplace in this rating area and would be less likely to charge an above-average premium. Therefore, we looked for a relationship between the degree of alignment of rating areas with distance-defined service areas and the average premium.

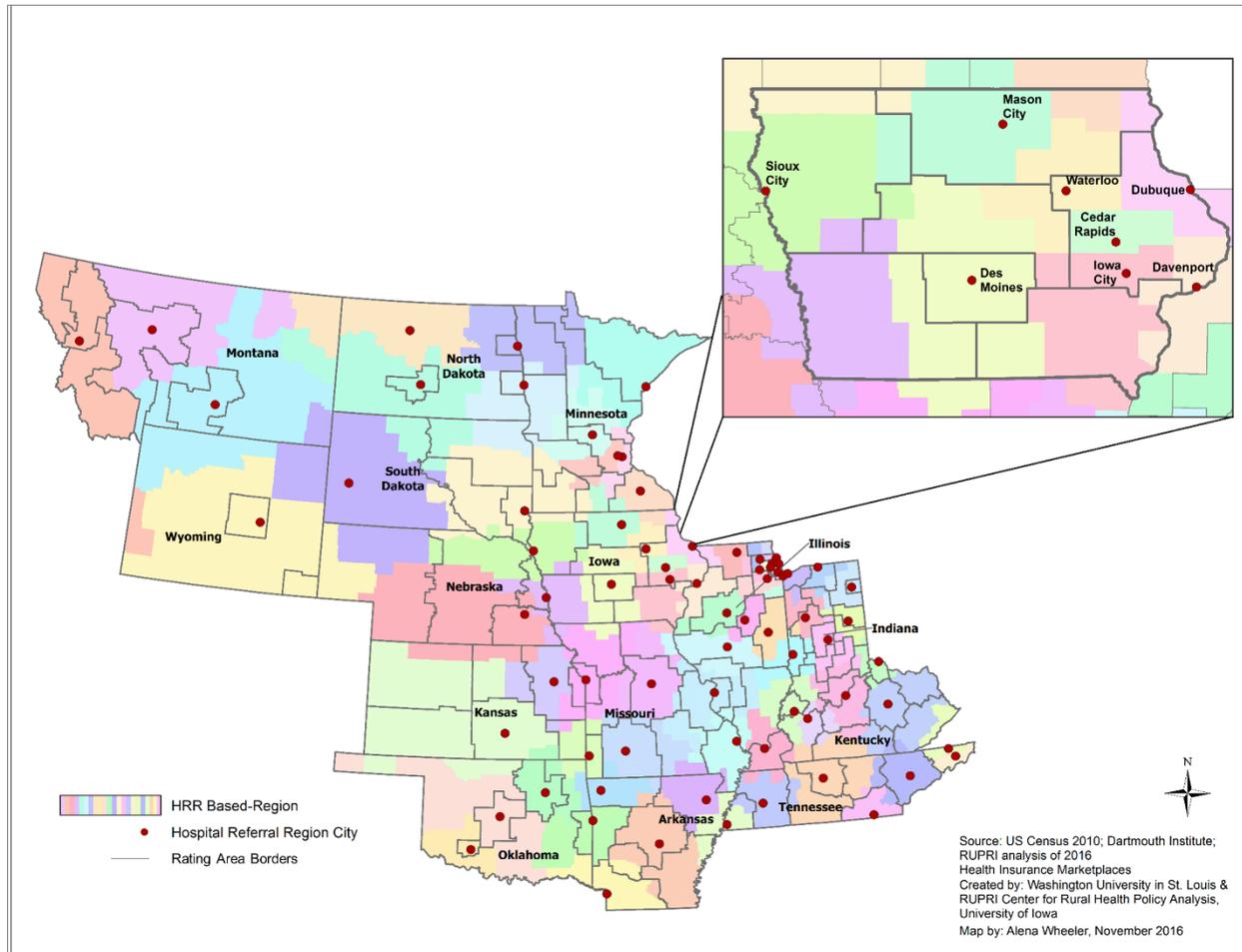
Figure 3 illustrates the intuition behind the approach by providing a comparison between the actual rating areas in North Dakota in the left panel, and hypothetical “best-aligned” rating areas in the right panel that could potentially be a better fit for the state in terms of delivery networks. One might expect that, compared to the “best-aligned” case, the residents of Rating Area 4 may face higher actual premiums due to the more complicated process of network formation across a larger geographic area. With multiple hospital referral regions within a rating area, there would be multiple hospitals, provider groups, etc. with whom rates would need to be negotiated in order to offer coverage (or coverage might be offered in name only, a question to be explored in the next section).

Figure 3. Actual and “Best-Aligned” Rating Areas in North Dakota



To create “best-aligned” rating area boundaries throughout the study region, counties were grouped according to their closest HRR city. These HRR city regions represent geographical areas where residents may travel the shortest distance in order to seek care. Each county was then coded as either already belonging to the “best-aligned” rating area that we created, or not. We wanted to test whether this difference in alignment was associated with a premium differential or any changes in enrollment growth over time. Results appear in Table 3’s leftmost two columns. As another variation, we coded each actual rating area according to how many hospital referral regions it partially contained to assess whether rating areas that are predominately or exclusively comprised of one HRR-based area (one color on the map in Figure 4) fare better in terms of premiums and enrollment for reasons similar to those discussed above. For example, in the Iowa inset of Figure 4, the northwest corner rating area is comprised of pieces of four HRR-based regions, whereas the southwest corner is comprised of just two. These results appear in Table 3’s rightmost three columns.

Figure 4. HRR-City Derived Regions Compared to Rating Areas



The bottom row of Table 3 shows slightly higher premiums for rural counties that belong to rating areas with no HRR city, but the difference is small (\$299.62 vs. \$304.19); the relationship between premiums and the number of different HRR-based regions that overlap the rating area is not uniform and is again of small magnitude (from \$295.18 to \$305.63). The small increase in enrollment success rate (defined as the rating area’s share of the state’s

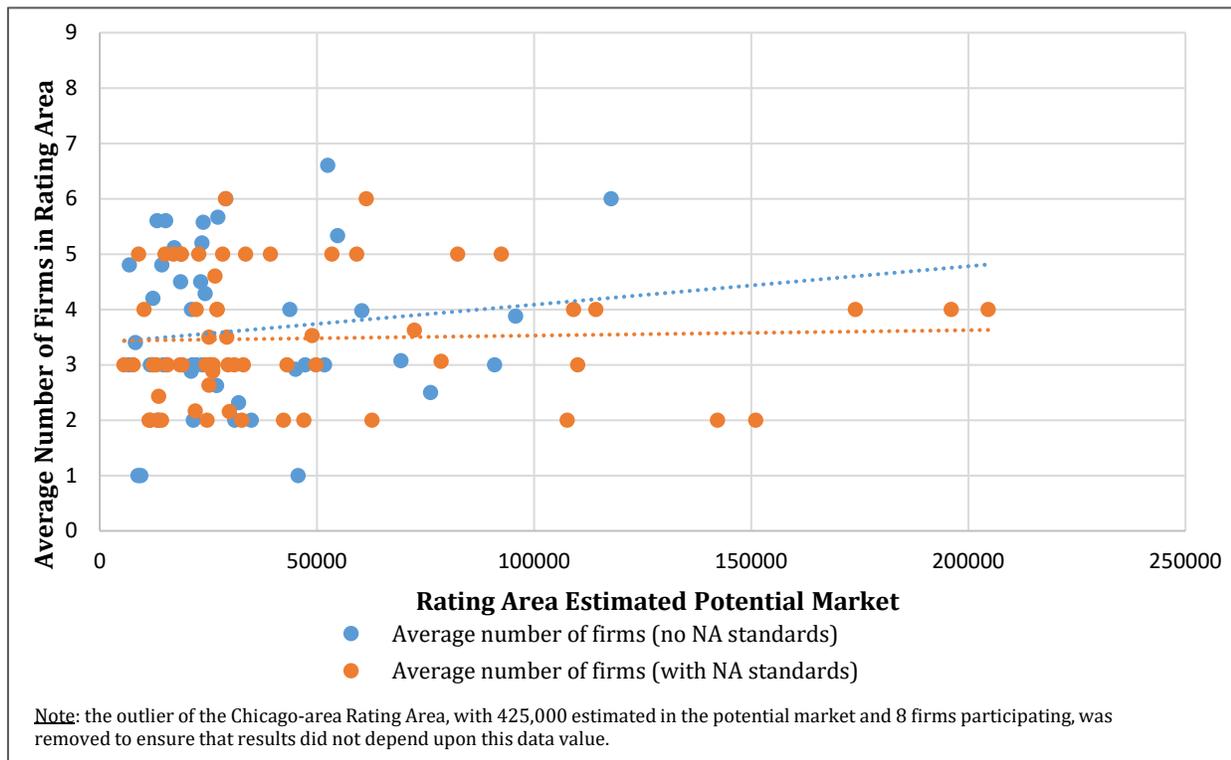
Table 3. Enrollment Success in 2015 and 2016 for Places with and without Easy Network Formation

	County Level (Rural Only)		Rating Area Level (Low Density Only)		
	County Belongs to a Rating Area with a HRR City	County Belongs to a Rating Area without a HRR City	Only one HRR-based region in the Rating Area	Two or three HRR-based regions in the Rating Area	Four or more HRR-based regions in the Rating Area
Enrollment rate as a percent of potential market, 2015	33.5%	34.8%	30.8%	33.7%	32.2%
Enrollment rate as a percent of potential market, 2016	38.0%	40.9%	34.3%	37.2%	37.4%
Average adjusted premium, 2016	\$299.62	\$304.19	\$299.73	\$295.18	\$305.63

“potential market” as calculated by Kaiser Family Foundation,¹⁷ and reported in the first two rows of Table 3) does not suggest that consumers are finding networks inadequate in these places, as we would expect that enrollment rates might drop from 2015 to 2016 in such a case. However, enrollment rates from 2015 to 2016 increased by about 4 to 5 percentage points across all groupings of counties, almost uniformly. Therefore, there is no evidence that consumers in 2015 found their options inferior in the network adequacy sense. Plan-level enrollment data, if it were available, could address this question more fully. We also note that some consumers may stay enrolled to avoid the tax penalty associated with having no health insurance, so these null findings cannot be interpreted to mean consumers are necessarily satisfied with their networks.

Rating area design, then, does not seem to matter much in the context of firms being readily able to form networks that consumers find adequate – or at least sufficient to avoid discouraging enrollment. In fact, enrollment in North Dakota as a percent of the potential market is strong in the “plus one” rating area that is comprised of all of the non-MSA counties in the state. Perhaps this is because this combination results in a larger risk pool: this rating area has approximately 45,100 potential HIM participants, compared with 6,700, 11,600, and 15,500 in its three MSA-based rating areas. Premiums are very similar across all four rating areas, and in fact the “plus one” rating area has the second-lowest average premium. Our estimated enrollment success rate for this area is 28%, compared to 24-28% for the others. So rather than discouraging enrollment due to poor alignment in terms of networks, it may even be that this design has advantages.

Figure 5. Relationship between Size of Potential Market and Number of Firms, 2016



Does rating area design matter in terms of lowering risk (by potentially creating larger risk pools) and thereby encouraging firms to participate in the HIMs? The average number of firms present in each rating area is computed across the study region, with some rating areas having a uniform value throughout multiple counties and others having variation.¹⁸ Figure 5 shows first that there is indeed a relationship between number of firms and size of the potential market, but only in places without network adequacy standards: the trend line is upward-sloping in this case, but virtually flat when there are network adequacy standards. Second, in states with some or all plans subject to network adequacy standards, there is more uniformity (i.e. whole number averages) in firms offering coverage. Third, even though it helps to have a larger potential market, there are some fairly small rating areas that still have strong levels of firm participation. This suggests that, as we commonly find in HIM analysis, there is not one uniform story. There are rural places where HIMs are performing quite well, with three or more firms competing. However, as we turn to 2017 plan offerings, we find that options have dwindled considerably. Therefore, a fourth explanation is that it has taken time for this new market to adjust into an equilibrium, and that a stronger relationship is emerging.

Conclusions

The importance of travel time and distance when thinking about network formation, and in turn the importance of network formation to understanding the firm's decision to offer health insurance coverage in a particular rural place, is often taken as given, but our analysis found only weak associations among the concepts of distance, networks, and premiums. While some evidence supports the hypothesis that premiums increase when network adequacy standards force firms to offer coverage in places that are farther from any central source of health care, there is no corresponding evidence that consumers' experience of networks that are formed at greater distances is unattractive – at least, that it does not obviously discourage enrollment.

In the course of studying this question, evidence was found that the firm entry decision seems to be made at a number of levels. Firms decide to operate in a particular state, and if allowed, they choose rating areas or even counties within a rating area after that initial choice. Overall volume of available enrollees (the size of the potential market) may influence the state-level choice, but it has only limited correlation with the choices at lower levels of geography. More analysis that examines each level of decision is needed.

Ultimately, firms' decision to offer plans in a particular place seems to be less related to distance than we originally hypothesized. Limited evidence gleaned from the firm level data suggest that other factors, such as the costs and benefits of establishing contracts and the size of the risk pool, may be more relevant. A more nuanced study of contracts in rural areas is needed to understand when market power (on the part of the firm or on the part of a provider or hospital system) affects this outcome, as well as affecting the size of premiums and plan characteristics offered. We also need to identify when the size of the market is a significant factor and when there is a fundamental lack of providers available for network adequacy. Understanding these issues will help inform state policy decisions such as redesigning rating areas and strengthening or developing quantitative network adequacy standards.

Endnotes

¹ Pathman DE, Ricketts III TC, Konrad TR. How adults' access to outpatient physician services relates to the local supply of primary care physicians in the rural southeast. *Health Serv Res.* 2006;41(1):79-102. doi: 10.1111/j.1475-6773.2005.00454.

² Fiedler, J. L. (1981). A review of the literature on access and utilization of medical care with special emphasis on rural primary care. *Social Science & Medicine. Part C: Medical Economics*, 15(3), 129-142. doi:10.1016/0160-7995(81)90028-9

³ Nemet, G. F., & Bailey, A. J. (2000). Distance and health care utilization among the rural elderly. *Social Science & Medicine*, 50(9), 1197-1208. doi:10.1016/s0277-9536(99)00365-2

⁴ Talbot, J. A., Coburn, A., Croll, Z. and Ziller, E. (2013), Rural Considerations in Establishing Network Adequacy Standards for Qualified Health Plans in State and Regional Health Insurance Exchanges. *The Journal of Rural Health*, 29: 327–335. doi:10.1111/jrh.12012

⁵ PPACA Section 2701(a)(2).

⁶ Two states, Colorado and Missouri, did so; Colorado later collapsed four of its rating areas to two. See “A Guide to Understanding the Variation in Premiums in Rural Health Insurance Marketplaces,” May 2014, available at <https://www.public-health.uiowa.edu/rupri/publications/policybriefs/2014/Rural%20HIM.pdf>, for a full discussion of rating areas.

⁷ Federal Register, Section 147.102(b)(3), available at <http://www.gpo.gov/fdsys/pkg/FR-2013-02-27/pdf/2013-04335.pdf>.

⁸ Federal Register, Section 147.102(b)(3), available at <http://www.gpo.gov/fdsys/pkg/FR-2013-02-27/pdf/2013-04335.pdf>.

⁹ Pub. L. 111-148, 124 Stat. 782 (2010) § 1311(c)(1)(B) (codified at 42 U.S.C. § 18031(c)(1)(B)).

¹⁰ 45 CFR 156.230 - Network adequacy standards.

¹¹ Patient Protection and Affordable Care Act; Establishment of Exchanges and Qualified Health Plans; Exchange Standards for Employers, Final Rule, Interim Final Rule, 77 Fed. Reg. 18310, 18418-20 (Mar. 27, 2012) (the “ACA Exchange Standards Final Rule”).

¹² J. Giovannelli, K. W. Lucia, and S. Corlette, *Implementing the Affordable Care Act: State Regulation of Marketplace Plan Provider Networks*, The Commonwealth Fund, May 2015

¹³ <http://kff.org/health-reform/issue-brief/analysis-of-2017-premium-changes-and-insurer-participation-in-the-affordable-care-acts-health-insurance-marketplaces/>

¹⁴ “The term “Core Based Statistical Area” (CBSA) is a collective term for both metro and micro areas. A metro area contains a core urban area of 50,000 or more population, and a micro area contains an urban core of at least 10,000 (but less than 50,000) population. Each metro or micro area consists of one or more counties and includes the counties containing the core urban area, as well as any adjacent counties that have a high degree of social and economic integration (as measured by commuting to work) with the urban core.” See, for more information, “Metropolitan and Micropolitan Statistical Areas Main”, The United States Census, accessed Oct 18, 2016, <https://www.census.gov/population/metro/>

¹⁵ HRRs represent regional health care markets for tertiary medical care that generally requires the services of a major referral center. The HRRs were named for the hospital service area containing the referral hospital or hospitals most often used by residents of the region. See, for more information, “Appendix on the Geography of Health Care in the United States”, The Dartmouth Institute, 1999, accessed Oct. 11, 2016, <http://www.dartmouthatlas.org/downloads/methods/geogappdx.pdf>

¹⁶ See Barker, A. et al, “A Guide to Understanding the Variation in Premiums in Rural Health Insurance Marketplaces,” May 2014, available at <https://www.public-health.uiowa.edu/rupri/publications/policybriefs/2014/Rural%20HIM.pdf> for a discussion of the premium adjustment methodology, including cost-of-living.

¹⁷ The potential market is calculated for each state by the Kaiser Family Foundation. Estimates and methodology available at <http://kff.org/health-reform/state-indicator/marketplace-enrollment-as-a-share-of-the-potential-marketplace-population-2015/>

¹⁸ The average is a whole number when all counties have the same number of firms. It is a fractional value when there is variation at the county level in number of firms offering coverage in a rating area.