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Rural Society and Barriers to Well-Being

ABSTRACT Service availability, access, and delivery are universal problems every society faces. Invariably, some members of any society are unable to access all of the services they need. This article identifies crucial factors that create service access barriers by using a modified Social Fabric Matrix (SFM) methodology. The components of the matrix go to the core of the question of well-being and are ideally suited to clarifying access rigidities. The primary result of the described research is that, while measures of service access rigidities are broadly consistent with other measures in explaining geographical variation in well-being, access rigidity measures also reveal differences not seen in other analyses.

KEYWORDS Alaska, well-being, Alaska Native, capability, Social Fabric Matrix (SFM), rural

Introduction

Service availability, access, and delivery are universal problems every society faces. Resource constraints are sometimes the cause (and often the blame) for the absence or poor provision of services. However, service rigidities do not arise solely from a lack of resources. Access rigidities do include obvious barriers like the absence of physical facilities (e.g., health clinics) and low incomes of citizens, but they also include less obvious barriers like social and family dynamics. Additionally, rigidities are often more severe in rural areas, sometimes to the extent that rural community sustainability is jeopardized by severe service access rigidities (Edwards 2007; Edwards & Natarajan 2008).

This article collects and summarizes recent research by Edwards (2007; 2009a–d) and Edwards & Natarajan (2007; 2008) on the well-being of at-risk groups in Alaska. The primary focus in this paper is

how the well-being of individuals is affected by barriers to services. First, the concept of well-being is used to codify the effects on at-risk groups in Alaska of barriers to vital services. This contextual question of well-being is formalized in terms of Amartya Sen's work on entitlements and capabilities. Second, the Social Fabric Matrix (SFM) is used to organize the analysis of service access questions. The SFM helps to make Sen's concepts more process oriented. Specifically, the matrix helps to identify existing entitlements, specify the basic capabilities that are expected to flow from the entitlements, and identify the individual and societal institutions that create or inhibit flows. Based on actual and desired achievements, rigidities that prevent the creation of functionings at the individual and societal level can be identified in context. Finally, numerical representations of service access rigidities are compared to other measures of well-being. The primary result is that while measures of service access rigidities are broadly consistent with other measures in explaining geographical variation in well-being, they also reveal differences not seen in other analyses.

Linkages. Services and Capabilities

As noted in Edwards & Natarajan (2008), the literature on entitlements and capabilities represents a shift away from the preoccupation with income and commodities as an explanation of poverty (Dreze & Sen 1989). The concept of entitlements and capabilities provides a rich and suitable paradigm to explain the function of services in the achievement of well-being at the individual level. In their introductory chapter, Stewart *et al*. (2007) explain that the capability approach assesses well-being as the freedom to live lives that are valued (i.e., the realization of human potential). The emphasis of the capabilities approach is on outcomes rather than just the means to enhancing income, which is the focus of monetary approaches:

> [...] monetary resources may not be a reliable indicator of capability outcomes because of differences individuals face in transforming those resources into valuable achievements (*functionings*), differences which depend on varying individual characteristics, [...] [and] differences in the contexts in which individuals live (e.g., between living in areas where basic public services are provided and areas where those services are absent) (Stewart *et al*. 2007: 15, original emphasis).

Furthermore, the authors argue that there is an element of arbitrariness in the choice of capabilities and that they are problematic to identify empirically, especially because they represent a set of potential rather than actual outcomes. Stewart *et al*. assert that if capabilities are considered basic, then individuals will not be willing to forgo them and therefore assessing their

actual achievements, or functionings, should reveal the constraints they face. Therefore, following the example of Stewart *et al*., capability outcomes and functionings are used here interchangeably. The basic capabilities that are identified by individual researchers differ based on the examined case. The most prominent studies on basic capabilities and respective indicators—Doyal & Gough (1991), Qizilbash (1998), Desai (1995), Nussbaum (1995), and the basic needs approach (Streeten *et al*. 1981)—all vastly differ from one another (Stewart *et al*. 2007). It should be no surprise, then, that capabilities and functionings identified in circumpolar arctic cases are different from capabilities and functionings identified elsewhere.

In Alaska the lack of access to basic services is caused not only by an inability to pay for the service but is due additionally to a gamut of complex factors. Identifying service access rigidities points not only to specific entitlements and capabilities but also to actual achievements (functionings). Some functionings, such as health indicated by longevity and education indicated by literacy, can be measured at various levels of aggregation while others cannot. Sen developed his ideas in the context of developing and underdeveloped regions of the world to help capture non-income and institutional factors that contribute to creating and deepening conditions of poverty. Even so, Sen's work is not regionally restricted because the central aim is to develop a viable framework for poverty analysis. It is therefore applicable to Alaska and virtually any other place (Edwards & Natarajan 2008). Alaska, with its unusual characteristics, presents unique rigidities that have differential impacts on groups of people, particularly Native Alaskans (Edwards & Natarajan 2007). The elementary concepts of entitlements, capabilities, and functionings provide direct insights into examining well-being among Natives. Employing Sen's ideas expands the number of factors to consider when evaluating service access rigidities. For example, if services are absent or difficult to access for some people, then the capabilities of those individuals might not be fully realized.

The major criticism of Sen's capabilities approach is the difficulty in applying it to specific situations. Attempts to operationalize the concept often end in simply redefining the ideas slightly and creating new categories of capability types that are equally difficult to operationalize (Alkire 2002). The concepts of entitlements and capabilities are specifically delineated and operationalized in identifying factors that contribute to service access rigidities (see Table 1 for a summary). Beginning with the ideas of entitlements and capabilities informs the specific way in which Hayden's Social Fabric Matrix will later be constructed and populated.

Alaska as an Example

Alaska is the largest state in the United States by area, but has one of the smallest populations. Even today, vast expanses of land remain undefined by political boundaries (see Fig. 1; the white areas of the map indicate unorganized territory). The state is quite remote—only Hawai'i is more geographically isolated than Alaska—and yet the flow of migration to and from this far away place occurs at one of the highest rates of any state (Edwards 2007; Edwards & Huskey 2008).

Fig. 1. Alaska boroughs. Map by Meghan Wilson, Institute of Social and Economic Research, University of Alaska Anchorage.

Poverty, as measured by a deprivation of income, is less widespread in Alaska than in other states. For example, Alaska has the most equitable distribution of income of any state. Alaska's Gini coefficient in 1999 was only 0.39, compared to the national average of about 0.43. Other income-based measures reveal similar results: Alaska, compared to most other states, displays less poverty by aggregated income measures (Howe 2004a; Howe 2004b). This overarching characteristic can be found in Alaska for the several past decades (Edwards & Natarajan 2007).

There are stark differences between life in rural communities and life in population centers. Rural residents and especially Alaska Natives face service access rigidities that urban residents do not face, and these rigidities surely reduce well-being. After all, theoretically available services have no

value if they are not, in reality, available for consumption (Edwards & Natarajan 2008). The argument is sometimes made that people who choose to live in rural communities are aware that access to services might be limited due to the remote nature of their residence and that, therefore, the people living there are implicitly choosing fewer services. Even if true, this does not mean that people living in rural areas have a preference for limited services. Ultimately, questions about service delivery are social questions that must be addressed by communities and government. What services will be delivered? How will the services be delivered? Where will the services be delivered? To whom will the services be delivered? These questions are inescapable matters of public policy (Edwards & Natarajan 2007).

The following discussion (adapted from Edwards & Natarajan 2007) briefly summarizes three specific categories of service access rigidities that exist in Alaska, highlighting some of the unique features of the place. These examples, while not exhaustive, are nevertheless instructive.

Health (Healthcare Access). Access rigidities reduce healthcare consumption. In rural Alaska, the general absence of connected roads, the scarcity of physicians and nurses, and the multi-level approval procedure for statute-provided care among many Natives all make service delivery difficult. Even if money is available to purchase healthcare, if the healthcare service itself is absent (or diminished), then the expected transaction cannot take place.

Alaskans experience high morbidity rates for terminal disease, especially rural residents and Natives, indicating an apparent unfilled need for healthcare services (Statewide Library Electronic Doorway 2005). Alaskans experience high suicide rates, especially among young adult male Natives (Einarsson *et al*. 2004). Non-terminal morbidities, such as Fetal Alcohol Spectrum Disorder, are also very high in Alaska, especially in the rural population (*State of Alaska* 2002; 2004). Clearly, the unmet need for healthcare services is great (Edwards 2009b).

Safety (Crime Exposure). Access rigidities to police protection increase exposure to crime (Edwards 2009a). In rural Alaska, there is a shortage of professional police officers in many places. Frequently, the only law enforcement official in a rural place is a Village Public Safety Officer. Reduced police protection leads to greater violent crime (Anderson 2003). Victims of violent crime experience negative health outcomes (both physical and emotional) and therefore reduced well-being.

Alaska has the highest crime rates in some categories, including the highest rate of forcible rape in the country, year after year. A reduction in access rigidities to police protection might reduce crime, especially violent crime, in rural places (Edwards & Natarajan 2007).

Justice (Access to Justice). Access rigidities to legal professionals and the court system impede resolution of disputes. Some examples include filing of restraining orders in connection with domestic abuse and violence toward women, divorce proceedings, and child support settlement enforcement (Edwards 2009c). Incidence of child abuse and neglect are often investigated and resolved through "non-police" agencies and personnel (social services, for example). Lack of non-police social service professionals makes more difficult the task of receiving justice through the court system, especially for at-risk groups who cannot adequately protect themselves.

If affordable legal advice is not available locally, some people will make uninformed decisions about legal matters or might remain outside the legal system altogether. In Alaska, the majority of the people live near population centers and can therefore access the justice system with relative ease. Rural residents, on the other hand, are sometimes isolated from the justice system due to the literal absence of courthouses and legal professionals in rural communities. Binding rigidities remain in many rural Alaska places (Edwards & Natarajan 2007).

While every place has unique characteristics, most places have some characteristics in common as well. As discussed in Edwards (2009d), the distinction is often a matter of the level of analysis. Consider Table 1. The first column is labeled "Global Category," and the second column is labeled "Local Factor." The Global Categories are general characteristics that are relevant to most places in the world. The Local Factors are narrower characteristics and are the particular instantiations of the broader Global Category. For example, the Global Category "Availability of the service" refers literally to whether the service is available to people in the area under consideration. This category is a relevant issue for every place in the world. If we consider a particular place, the availability of the service depends on the level of analysis, or, the Local Factor. In the Alaska case, we have identified three levels in the Local Factor column: Local, Regional, and Central. The relevance of the Global Category might be different depending on the Local Factor.

Table 1 shows the relevance of Local Factors for each of the three Service categories, Health, Justice (court system), and Safety (police protection). An "X" in a cell indicates that the Local Factor is a relevant consideration in the barrier or rigidity of the service category. Looking at the Global Category "Availability of the service," the Local Factor "Local" is relevant for all three service categories. This indicates that service access rigidities exist at the local level in Alaska for Health, Justice, and Safety. Therefore, in some places, especially rural ones, individuals face systematic barriers to services. At the regional level, systematic barriers to the Global Category exist only for Health, but not Justice and Safety. In other words, if an individual can

Table 1. Alaska Service Access Rigidities

Rigidity		**Service**		
Global Category	*Local Factor*	*Health*	*Justice*	*Safety*
Availability of the service	Local	X	X	X
	Regional	X	X	
	Central (Anchorage, Fairbanks, Juneau)	BASELINE	BASELINE	BASELINE
Cost	Nominal Explicit	X	X	
Length of queue to receive service	Population density	X	X	X
	Administrative (In)efficiency	X	X	X
Secondary costs	Travel	X	X	
	Overnight or extended stay	X	X	
	Child care	X	X	
	Loss of work income	X	X	
	Intangibles	X	X	X
Public funding provision	Political posture of administration	X	X	X
	Group dependent	X		
Assistance available	Political posture of administration	X	X	
	Group dependent	X	X	
Qualifications to receive assistance	Income tested	X		
	Group dependent	X		
Social factors	Race	X	X	X
	Gender	X		
	Class	X		
Community factors	Political will of local government	X		X
	Effectiveness of local administration	X	X	X
	Local leadership	X		X
Family factors	Family dynamic	X	X	X
Personal factors	Personal factors	X	X	X
Jurisdiction	Jurisdiction	X		X

reach a regional center then they will generally have access to police protection and the court system, but they might still not have access to health services. If individuals can reach Central locations, they face no systematic barriers to the Global Category.

It is important to observe that Safety is assumed to be a quasi-public

Table 2. Alaska Rural Rigidities in the Social Fabrik Matrix

		Local service availability 1	Local service availability 2	Regional service availability 1	Regional service availability 2	Central service availability	Nominal explicit cost	Population density queue	Administrative (In)efficiency queue	Travel cost	Cost of extended stay	Child care cost
		D01	E01	D02	E02	D03	D04	F01	D05	D06	D07	D08
Local service availability 1	D01						X	X	X	X	X	X
Local service availability 2	E01	X					X					
Regional service availability 1	D02	X							X	X	X	X
Regional service availability 2	E02			X								
Central service availability	D03	X		X					X	X	X	X
Nominal explicit cost	D04											
Population density queue	F01	X		X		X						
Administrative (In)efficiency queue	D05									X	X	X
Travel cost	D06											
Cost of extended stay	D07											
Child care cost	D08											
Loss of work income	D09											
Intangible costs	D10											
Political willingness to fund service	B01	X								X	X	X
Group dependent service funding	D11	X		X								
Political willingness to fund assistance programs	B02	X										
Group dependent assistance	D12	X		X								
Income tested assistance	D13	X										
Race	F02	X										
Gender	F03	X										
Class	D14	X										
Political will of local government	D15	X										
Effectiveness of local administration	D16	X										
Local leadership	C01	X										
Family dynamic	A01											
Individual dynamic	C02											
Jurisdiction	D17	X	X	X	X	X						

Legend: A: Cultural Values, B: Societal Beliefs, C: Personal Attitudes, D: Social Institutions, E: Technology, F: The Natural Environment

Loss of work income	Intangible costs	Political willingness to fund service	Group dependent service funding	Political willingness to fund assistance programs	Group dependent assistance	Income tested assistance	Race	Gender	Class	Political will of local government	Effectiveness of local administration	Local leadership	Family dynamic	Individual dynamic	Jurisdiction
D09	D10	B01	D11	B02	D12	D13	F02	F03	D14	D15	D16	C01	A01	C02	D17
X	X														X
											X				
X	X														X
X	X														
													X	X	
X	X														
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good (because of the possibility of exhaustion of the good), Justice to be a quasi-public good (because of explicit exclusion barriers like filing fees), and Health to be a (mostly) private good. From Table 1, it is clear that access barriers are more plentiful for the private good than they are for the quasi-public goods. As argued elsewhere, barriers are also more severe for private goods (Edwards & Natarajan 2007; 2008; Edwards 2007; 2009d).

Finally, because the ultimate goal is to quantify information identified in the table, it is important to note that numerical values will be difficult indeed to assign for some categories and factors. This is particularly true of family and social factors. Some information can be gleaned from surveys conducted in Alaska, such as the Survey of Living Conditions in the Arctic (Martin 2006), and from existing databases like the Alaska Division of Community Advocacy (www.commerce.state.ak.us/dca/commdb/CF_COMDB.htm). In some cases, proxies must be employed to approximate how family and personal factors create barriers to service access.

The Social Fabric Matrix

Before operationalizing the content into a measure, it is imperative to organize it. Gregory F. Hayden's Social Fabric Matrix (Hayden 2006) is well suited to the material and issues presented so far and provides greater structure than the description offered in Table 1 alone. Concerned with the narrow and superficial analysis sometimes used in economic inquiry, Hayden developed a cross-disciplinary methodology to "allow for the convergence and integration of conceptual frameworks in instrumental philosophy, general systems analysis, Boolean algebra, social system analysis, ecology, policy analysis, and geobased data systems" (Hayden 2006: 73). Hayden suggested six main components that must be identified and integrated in order to understand a problem, including Cultural Values, Societal Beliefs, Personal Attitudes, Social Institutions, Technology, and The Natural Environment. Table 2 presents a reorganizing of the content of Table 1 into the Social Fabric Matrix (SFM) framework.

Where an "X" appears in the SFM of Table 2 a "delivery" is indicated. According to Hayden's methodology, goods, services, funds, people, etc. flow through the system described by the SFM. The categories listed in the rows of the matrix deliver what flows through the system to the category in the column. For example, there is an "X" in the cell located at [D02, D01] in the matrix. This indicates that the row category, Regional service availability, makes a delivery to, or affects, the column category, Local service availability. While every cell indicating a delivery has unique and valuable information, there are two groups that are of particular interest. The first is the differences

in how service availability is affected by social institutions versus technology. The second is the vast array of deliveries into intangible costs.

Even though many rural places in Alaska do not have physical healthcare facilities, most do have high-speed Internet service via satellite communications. Technology, then, has made a dramatic difference in healthcare delivery in rural Alaska (Berman & Fenaughty 2005). This technology allows for teleconferencing between patients and medical professionals in different locations, expediting some services. Local service availability as a technology factor (E01), therefore, delivers into local service availability as a social institution (D01) in the SFM. The technology aspect of service availability also delivers into the nominal explicit cost of the service (D04) where a physical facility might not exist, whereas the social institution aspect of service availability does not. These sorts of distinctions are made abundantly clear by use of the SFM.

Of the twenty-seven characteristics analyzed in the SFM, seventeen of them make deliveries into intangible costs (D10), making that category a dominant force in the SFM. Intangible costs are often neglected in empirical analysis because objective measures for them are absent. The SFM indicates that it would be a serious mistake not to take into account the non-monetary costs of service access barriers. In the indices that are created from the information in the SFM, proxies should be sought to represent intangible costs because they are such a large part of the total social cost of service access rigidities.

The SFM informs the creation of service access barrier indices. Following Hayden's paradigm, the data points and weights afforded individual components of an index are determined by the interrelation of the categories in the matrix. The final information included in an index is somewhat limited by the availability of data. Nevertheless, the SFM helps to identify which data are relevant.

Access Rigidity Indices

Condensing information on access rigidities into a singular expression is convenient and useful for empirical analysis. Following the example of the Human Development Index (Fukuda-Parr & Shiva Kumar 2003: 245–253), access rigidity indices for regions (Census Areas) in Alaska are created. There are two broad categories of indexes: those measuring the *absence* or *deprivation* of a characteristic and those measuring the *presence* or *capability* of a characteristic. In the former case, the general equation is,

$$Z_j = \left(\frac{1}{I} \left(\sum_i^I X_i^{\alpha} \right) \right)^{\frac{1}{I}}$$

and the latter equation is,

$$Z_j = \left(\sum_i (\omega_i)(X_i)^{1-\varepsilon} \right)^{\frac{1}{1-\varepsilon}}$$

In equation (1), Z is the measured index calculated over "I" components (X) for a particular place "j." The weighting factor, α, gives larger importance in the index to larger numbers. Therefore, this index is useful in measuring a rigidity that exists—the absence of access. A higher index number indicates more difficulty in receiving the service.

In equation (2), Z is the measured index calculated over "I" components (X) for a particular place "j." The nominal weighting factor is ω for each component. In addition to ω, each component is also weighted by "1-ε," effectively penalizing smaller numbers. In equation (2), therefore, a smaller index number indicates a greater difficulty (barrier) in receiving the service in question.

Each component, X, is calculated either as an incidence percentage or as a deviation from goalpost boundaries. As in Fukuda-Parr and Shiva Kumar (2003: 247), deviation calculations are,

$$X_i^{calc} = \left[\frac{X_i - X^{low}}{X^{high} - X^{low}} \right]$$

The high and low goalpost values are determined on a case-by-case basis and usually reflect observed maximum and minimum values.

Following the basic guidelines provided by the Human Development Index and the indications of the Social Fabric Matrix, preliminary estimates of service access rigidity indices for each Census Area in Alaska were calculated. Because the indices are preliminary estimates, the numbers themselves are not shown (detailed discussions of the creation and calculation of the indices can be found in Edwards 2009a–c). Instead, Table 3 presents the ranks of the indices by Census Area. Each of these numbers measures the presence of a rigidity, so a higher number indicates greater difficulty in receiving the service. In addition to the service access rigidities indices, Table 3 also includes median income, the poverty rate, and ranks of two migration

preference indices for comparison. Fig. 2 is a map of census areas to help position geographically the index rankings.

Table 3. Ranks of Access Rigidities Indices (c. 2000)

Region (Census Area)	Median Income*	***Composite Index***‡	***Health Index***‡	***Justice Index***‡	***Safety Index***‡	Percent in Poverty†	Migration Preference+	Migration Out+
Aleutians East	13	26	24	26	26	13	11	4
Aleutians West	3	27	26	27	27	18	26	8
Anchorage	4	1	1	2.5	2.5	4	1	1
Bethel	25	8	6	12	13.5	5	27	15
Bristol Bay	7	16	7	19	16	26	16	26
Denali	6	17	8	19	19	3	15	16
Dillingham	18	22	15	19	21.5	1	9	11
Fairbanks North Star	11	5	5	2.5	5.5	24	7	2
Haines	21	14	16	19	10.5	7	4	13
Juneau	2	3	4	1.5	2.5	17	5	5
Kenai Peninsula	16	4	3	7.5	2.5	2	3	3
Ketchikan Gateway	9	9	17	19	5.5	16	18	7
Kodiak Island	5	11	25	7.5	8	8	23	19
Lake and Peninsula	24	23	23	19	21.5	23	10	27
Matanuska-Susitna	10	2	2	2.5	2.5	15	2	6
Nome	19	7	11	7.5	10.5	21	21	18
North Slope	1	18	13	7.5	24	9	12	21
Northwest Arctic	17	21	18	7.5	25	20	20	17
Prince of Wales-Outer Ketchikan	22	12	14	19	10.5	19	8	20
Sitka	8	6	10	7.5	7	6	22	10
Skagway-Hoonah-Angoon	20	19	9	19	20	11	25	25
Southeast Fairbanks	23	15	19	19	10.5	22	6	14
Valdez-Cordova	12	10	20	12	13.5	10	13	22
Wade Hampton	26	20	21	19	15	27	24	12
Wrangell-Petersburg	15	13	12	12	18	12	19	9
Yakutat	14	24	27	25	17	14	17	24
Yukon-Koyukuk	27	25	22	19	23	25	14	23

*Ranks based on real (99) dollars household income, source: US Bureau of the Census; Alaska Economic Trends; ISER; †Edwards and Natarajan (2008); ‡Edwards (2009a–d); +based on data in Edwards (2007).

In Table 3, Median Income is ranked from the highest income to the lowest, Percent in Poverty is ranked from the lowest to the highest poverty level, and the indices are ranked from the lowest measured rigidity to the highest. In each case, a lower rank number is preferred (less measured poverty, higher measured income, less measured service access rigidity, greater tendency to migrate toward a place, less tendency to migrate out). North Slope is ranked first for median income and ninth for poverty, but eighteenth for service access rigidity by the composite measure. Conversely, Fairbanks North Star is ranked fifth for the composite service access rigidity but twenty-fourth for poverty and eleventh for median income. In other areas, the rankings are more even. Sitka, for example, is ranked in the top half of the rankings by all measures and Wade Hampton is in the bottom half of the rankings by all measures (for more discussion, see Edwards 2009d).

A closer look at the individual service access indices shows that, for the

Fig. 2. Alaska census areas. Source: Alaska Bureau of Vital Statistics, 1999 Annual Report.

most part, they move together. At the same time, there is enough variation to demonstrate that a separate accounting for specific service access rigidities is productive. These differences in the separate indices might prove useful in explaining the complex dynamics of some observed economic decisions in Alaska. For example, there are extremely high rates of both in- and out-migration in some of the Census Areas in Alaska that are difficult to account for on the basis of common economic measures such as jobs, poverty, and income (Edwards 2007). Perhaps part of the explanation is due to regional amenities, or barriers to some amenities, like healthcare, justice, and safety (Edwards 2009d).

Conclusion

No single measure or approach to examining well-being will offer a complete picture. Simply because income-based measures conceal other important elements of well-being does not mean that they should be ignored entirely. At the same time, other information, like service access rigidities, should not be ignored simply because they are difficult to quantify or because they are not exhaustive. Integrating all relevant information gives the best overall picture. Beginning with Sen's conceptualization of well-being and then employing Hayden's Social Fabric Matrix, non-income factors directly relevant to service access rigidities are identified that are not otherwise nominally obvious. In this way, the indices created from the analysis contribute to further understanding of place-level well-being in Alaska, at least at the Census Area level.

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