

Applying Ostrom's Model of Sustained Voluntary Institutions Managing Common Pool Resources to the Challenges of Health Care

Working Paper

Joanne Lynn, Jane Brock

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Elinor Ostrom's work to describe long-lived voluntary social arrangements that manage natural resources to optimize their use over time and prevent degradation through individual exploitation has been an important counterpoint to the previously dominant perception that successful management of limited natural resources depended upon having the resource owned by one private party or managed by strong government action. The idea that the people who use the resource can manage it collectively has appealed to us and to others¹ when addressing health care reforms. However, there are obvious differences between health care delivery and harvesting fish or trees. This essay sets out to examine the similarities and differences, to state the analogies that might make health care similar to a common pool resource, and then to apply the main elements of Ostrom's observations as to success or failure of institutions governing common pool resources to health care reform in the US. For this essay, we will be drawing from Ostrom's Governing the Commons²

Fundamentals

In Ostrom's work, the resource in question usually arises in nature: fish in the sea, grazing land, water in an underground reservoir. People can have affected the amount or reliability of the supply, e.g., by building a dam to increase the supply of water, but the resource and the need to govern its use existed before that intervention. To qualify as a common pool resource, it must have an optimal production rate which is likely to be exceeded if all individuals who are able to use the resource (called appropriators) take what they can from the pool, and exceeding that use rate will degrade the resource itself. For example, a forest in the Alps can sustainably produce only a certain amount of wood. If people overharvest the forest, then production in future years will be severely curtailed.

In health care, the useful analogy lies in the widespread and growing sense that the aggregate of health care services is effectively constrained to the current "draw" from the society's production rate. In other words, the resources that the society is willing to put into health care has hit its limit and citizens and the government are unwilling to keep expanding the pool devoted to health care. That may or may not be true, of course; leading politicians and economists have been predicting that the US had hit the maximum sustainable rate of investment in health care for more than a quarter century while

¹ <http://www.ihi.org/IHI/Programs/AudioAndWebPrograms/BerwickForumKeynote2009.htm>

² *Governing the Commons: The Evolution of Institutions for Collective Action*, Elinor Ostrom, (New York: Cambridge University Press, 1990), 270 pp.

the rate kept expanding, and the country has just decided to provide one more major investment in order to get nearly all Americans covered by health care insurance.³ However, there is certainly a growing sense among providers, at least, that the ongoing expansion of health care services is coming to an end, that efficiency is going to become a goal, and that living within constraints will become a way of doing business. At the least, if there is no effective constraint upon expanding health care services, then Ostrom's models will not apply.

Building on the claim that the society will behave as if the aggregate supply of health care services is now at or near its tolerable limit, we need to examine some additional characteristics to fill out the analogy with natural resources. First, the target for this analysis cannot be "health" or even all societal services that yield improved (or worsened) health. That broad scope would include much of the ordinary functions and products of the society, including housing, jobs, environment, and business practices. Clearly, the scope of a limited resource has to be much more defined. For our purposes here, we will take the constrained supply to apply to medical services such as those conventionally covered under Medicare. This not only excludes the broad array of social endeavors that affect health but it also excludes long-term supportive housing and personal care that arises from poor health or disability. There are many imprecise boundaries between medical services and the rest of societal goods, but the boundary is stable and broadly understood, at least enough to anchor the analogy with Ostrom's model.

One might object that the aggregate investment in medical services is unlike a natural resource in that the funding and other resources can support an unlimited number of different allocations that yield different actual services. For example, one could imagine a major shift to fund medications rather than doctors, or to fund services for children rather than for older persons. This may be true over many years (just as it might be true in changing the species available in a forest), but the flexibility of use of financial resources is so constrained by the actual supply of personal, capital, and technical resources that major shifts take a great deal of time. Basically, we are constrained to be buying only a little different array of services each year than we did the year before. When tuberculosis sanatoria became anachronisms with the advent of effective antibiotic treatment, they did not promptly close. Instead, they provided much the same services to other populations (the elderly, the mentally ill).

The other main element of Ostrom's baseline situation for common pool resource management is that there are appropriators whose overuse can degrade the resource itself. The analogy in medical care could be that the licensed providers are the appropriators – the physicians, hospitals, skilled nursing homes, hospices, etc. Although they require the collaboration of patients and the financing services of insurers, it seems reasonably true that the final common pathway for expenditures to happen and medical services to be provided always involves the actions of a licensed provider. However, can their overuse degrade the resource? There are two ways that overuse leads to degradation. First, overuse by one provider or group of providers distorts the optimum array of services for the population, making access to services inefficient and inequitable. Second, overuse by many providers affects the society's willingness to invest in medical care and thus actually reduces the available pool over time.

³ http://frwebgate.access.gpo.gov/cgi-bin/getdoc.cgi?dbname=111_cong_bills&docid=f:h3590enr.txt.pdf

Still, the analogy won't be perfect. Resources that arise from the operations of nature are more readily seen as, in a sense, "owned" by the community that lives in the area than are resources that arise from the operations of businesses and human economies. A fishery that yields mostly tuna is relatively easy to enumerate and assess value, while a medical services enterprise for a sizable community yields a broad variety of services and effects of rather imprecise value. And degrading the will to expand investment operates in a society in very different ways than degrading the availability of water or the supply of fish.

Nevertheless, for our purposes, let us accept the claim that the supply of investment in medical services (as defined by being covered by medical insurance such as Medicare) is now limited (as a proportion of the GDP), and that the appropriators of those resources are the licensed providers. Clearly, the medical care delivery system has a number of forces acting upon it already – national and state requirements for quality and honest billing, for example. Insurers regulate some aspects of service delivery, aiming to increase their margin (for private insurers) or to control escalating taxes (for public insurers) through more efficient service delivery. Individual providers and provider organizations have their own business forces and professional accountability at stake. It is quite uncommon, however, for any party in the current array to define success in terms of optimization of services for the population, within constraints of available resources. Indeed, in the usual marketplace for medical services, a single provider setting out to optimize population effects would usually mean that the provider would produce services that are underpaid, which is not a winning business model.

This reasoning is important because most in the society agree that equitable opportunities to have important medical services are a societal goal, so it cannot be sufficient that there are people in need of most services, or especially useful services, which are regularly under-supplied. The US ethos has been split over time as to whether medical services are public or private goods, and whether investments in medical care - or even in innovations for treatment – are available for private exploitation or are, in some sense, the property of the community. While this essay does not presume to settle this question, the recent increase in public investment makes clear that the public has a strong hand in shaping priorities. Very few people now pay directly for medical care, and public and private insurers and other payers ordinarily represent large pools of people, approaching "the public" in size and diversity. So, considering medical care investment as if it were a natural resource may make sense.

Two additional formal requirements for a common pool resource must be addressed. First, in common pool resource models, using the resource in one way bars the use of that part of the resource in another way: fish taken by one fisherman are not available to another. If the "pool" of investment in medical services is fixed, then this will apply also to that resource: funds used by one physician to have a PET scan for a dementia patient are not available for cancer treatment services for children. The constraints are somewhat different in that the fish simply are present or already taken, whereas the PET scan or the cancer care services are created on the spot, using the resources at hand and the funds from the pool. In an individual case, the trade-offs are not nearly so obvious, and the fact that the services are enabled to exist by the funding but are not the funding itself makes for more elasticity in the model than would exist in a straightforward natural resource model. Nevertheless, it seems plausible that the

funding for medical services for a population can be constructed as being subtractable, even though the exact services that any particular amount of funds can buy consist of a variety of service types.

Access to the common pool resource must also be difficult to limit to a small number of appropriators. While there are some limits imposed by licensure and certificate of need regulations and some limits from supply of personnel and technology, these are fairly trivial. In general, there are a large number of appropriators who have access to the pool.



Thus, adapting Ostrom's model to fit the challenge of medical care requires some reasonable interpretations, and the subject area is sufficiently distant from the original examples that implications from the observed examples may or may not be illuminating. However, the potential of intermediary institutions (lying between actions of individuals and firms, on the one hand, and government on the other) to provide a fertile pathway for improvement activities is well worth exploring. Not only are the microsystem and government approaches yielding inadequate reforms, but the nature of illness now calls for system corrections that stretch across providers and provider organizations within a geographic area. Most people with substantial illness now need services from a set of sequential and concurrent providers (both individuals and organizations), and most seek those services in their home locale. In many countries, some organized entity watches over the priorities and appropriations for each area (the County Council in Sweden, the Primary Care and Hospital Trusts in Britain, the LHINs in Ontario, etc). The US has not developed strong local organizations that are allegiant to the priorities in service needs

for their local population. The US is not likely to engender such entities through government at the present time, so considering the alternative of voluntary, self-sustaining organizations is appealing.

An Example – Grand Junction, CO

Grand Junction, Colorado, is a small city in the high prairie, removed from other population centers. The medical care system there has been unusually high quality and low cost, at least in Medicare services. The medical service providers have developed a series of voluntary associations to govern and develop their service delivery system over time⁴. Ostrom listed seven characteristics of successful institutions to manage common pool resources. The table below shows how Grand Junction fits the first six criteria. The seventh addresses nesting of rules in larger systems, which is probably relevant here but much more difficult to trace.

CPR Management	Grand Junction Model
Clearly defined borders	Geographic isolation, perception of a finite and visible population to serve, known number of providers (about 94% of area physicians) participating in a regional health information exchange (Quality Health Network, QHN),
Local adaptation of access ‘rules’	Providers set up a local payer (Rocky Mountain Health Plan, RMHP) to meet community needs to ensure adequate services to the majority of the population. RMHP now encourages individual provider cost containment through deliberate incentives and open reporting. Also develops and participates in consensus-building to establish and drive collective goals and methods.
Participation of ‘appropriators’ in decision-making process	Longstanding culture of collective action, now assisted through data sharing (QHN), payment incentives (RMHP), and peer-to-peer personal education and accountability. Consolidation of hospice services (Hospice and Palliative Care of Western Colorado and multiple community support services (Hilltop) enables representation of non-medical health infrastructure in consensus-setting endeavors

⁴ http://www.newamerica.net/publications/policy/grand_junction_colorado

Effective monitoring by appropriators	Physician utilization comparison ranking shared among all physicians, ‘taking new docs aside and explaining the way we do things around here,’ tradition of regular formal exchange of quality measures, processes, and improvement strategies between institutions such as hospitals, nursing homes and home health agencies
Graduated sanctions for those not respecting community rules	Payment incentives, physician pride in efficiency ranking, reduced access to and/or removal from leadership roles for physicians who have refused to participate in the community vision
Conflict resolution mechanisms that are cheap and accessible	IPA culture which supports community vision and provides a mechanism for unifying physician influence, payment incentives, social networks – ‘the grocery store factor’

Considerations and Implications of Ostrom's Model

- *Ostrom's work stipulates (p 31) that "This analysis related to situations in which CPR appropriators have no power in a final-good market, nor do their actions have significant impact on the environment of others living outside the range of their CPR."*

This consideration calls upon us to make explicit the boundaries of the common pool resource. This is not an easy issue, since medical care services are never completely tied to a limited geography. Nevertheless, the Dartmouth Atlas investigators are able to show that the utilization patterns in Medicare draw out geographically-based markets (HSRs or HRRs) in which the vast majority of beneficiaries use services within that area⁵. This is a strategy that could be intentionally incorporated into community-based quality improvement or payment adjustment initiatives using Medicare data, if it would support development of CPR management principles to control cost growth. In the Care Transitions projects,⁶ the overlap of beneficiary home addresses and hospital utilization can readily be calculated and the geographic area and hospital list redrawn to optimize overlap, thus ensuring that one defines an area that includes both the hospitals and the patients who use those hospitals. It could additionally describe the proportionate resource consumption of the various providers/appropriators supplying medical services to the defined population. Other considerations in defining a boundary include adhering to conventional political divisions, since it is much easier to organize providers who share an ordinary geographic identity and a government. Nevertheless, there will be some potential medical service markets that are so large and unwieldy as

⁵ <http://www.dartmouthatlas.org/>

⁶ <http://www.cfmc.org/caretransitions/>

to bar effective organizing but which also resist reasonable sub-division because of extensive overlap of service areas for providers.

However, Ostrom's claim concerning the role of appropriators in a final goods market and their impact upon others illuminates a potential difference between medical care and natural resource utilization. In medical care, if there is a final goods market at all, it seems to be at the point of service, since the services are so tied to geography. So, local dysfunction affects local situations profoundly, but local actions have only very attenuated effects upon other markets. This fact is underscored by the wide variation in utilization and quality among areas in the country.

Ostrom notes that improvements to the system have to be simultaneously available to all appropriators (p. 31)

This consideration is one that is violated in most situations in medical care. Certainly, some improvements are of this sort – giving patients their records or having an open information exchange in a region might be examples. However, it is quite possible to greatly improve (or worsen) efficiency in some part of the medical service delivery system and limit the effect of that to some appropriators, or for an individual provider to maintain their draw on the pool of funding despite their reduced need for those funds in order to produce services.

- *Each appropriator is tempted to overconsume if possible and to free-ride on improvements –*

This observation is a reasonably close fit. Each provider is tempted to make the most of the funding opportunities available, without regard to the overall pool. If the pool expands or utilization of it drops due to the actions of others, each provider is tempted to advantage itself by using all available resources.

- *Getting information about the resource may be costly*

Information about the utilization of services in a defined population is almost never readily available. Information about Medicare and perhaps Medicaid may be available, and perhaps some other insurers are willing to join in at times, but estimating the size of the overall pool is quite difficult.

- *Willingness to invest In CPR controls and improvements turns heavily on the appropriators' discount rate (for the importance of the CPR into the future)*

Until recently, the sense that the pool was indefinitely expandable precluded attention to the discount rate. Now that medical care resources are coming to be limited to something like current values, the intention of providers to stay in the business over the long term is becoming important. A community-based hospital with a local board of governors or a physician with deep family roots in the area are likely to be willing to undertake work to ensure the future of the endeavor. However, a for-profit home care agency may well be willing to pull out and invest elsewhere if the cost of doing business goes up because of the work needed to support local allocation and improvement work.

- *Ostrom, p. 39 "...the problem facing CPR appropriators is one of organizing: how to change the situation from one in which appropriators act independently to one in which they adopt coordinated strategies to obtain higher joint benefits or reduce their joint harm." p. 40 "The costs involved in transforming a situation from one in which individuals act independently to one in which they coordinate activities can be quite high. And the benefits are shared by all appropriators, whether or not they share any of the costs of transforming the situation."*

These observations appear to fit medical care readily. In a field in which independent action and competition has been valued, are the costs of cooperation justified? If a provider is profiting from the current situation, very likely that provider will face real risks of newly limited returns in a more population-focused cooperative venture. There would have to be palpable risks of harm in continuing, a low discount rate, and/or remarkable leadership in order to invest in change in such situations.

- *Ostrom, quoting Bates, p. 43 "...establishing trust and establishing a sense of community are, in Bates's view, mechanisms for solving the problem of supplying new institutions."*

This would seem to be very important in medical service delivery at this time. One of the strongest claims for cooperative work on high value health care is the well-being of one's own community (which every provider has to use for her and for her loved ones). As businesses fail due to medical care costs and thus the well-being of the community slides, medical care costs become a community concern. The professionalism ideals of the clinical providers also support a dedication to patient well-being rather than provider earnings. But establishing the trust and balances of power that might allow progress will be challenging when building on the recent history of more overt competition in pursuit of high-yield services and market share.

- *Ostrom, p. 50, "One assumes that both the rules of the game and physical technological constraints are given and will not change during the frame of analysis."*

In order for Ostrom's model to apply, the situation must be relatively stable. With the ongoing growth in capabilities of medical interventions and the upcoming changes in payment and rules at the governmental level, the situation may be more fluid than Ostrom assumes. It is not clear that this changes much about the implications and desirability of using her model as a lens in which to see intermediary institutions in medical care, however.

- *Ostrom, p. 51 "'Institutions' can be defined as the sets of working rules that are used to determine who is eligible to make decisions in some arena, what actions are allowed or constrained, what aggregation rules will be used, what procedures must be followed, what information must or must not be provided and what payoffs will be assigned to individuals dependent on their actions."*

A very concise definition.

- *Ostrom, p. 51 – “working rules are common knowledge and are monitored and enforced...to some extent at least by those directly involved.”*

This observation is certainly true and supportive of cooperative pursuit of high-value medical care in Grand Junction and in some integrated systems to deliver medical care such as Kaiser and the Veterans Health Care System. In the usual Medicare “fee-for-service” or commercially insured marketplace, the working rules often simply do not account for the possibility of locally generated and enforced rules.

- *Ostrom, p. 51 – “All rules are nested in another set of rules that define how the first set of rules can be changed.”*

The locus of rule-changing rules will be quite complicated in many parts of medical services delivery, since there is such a thin tradition of local control. Rule-changing may be at various federal or state agencies, provider institutions, anti-trust laws, insurer practices, licensure or accreditation, and other venues. But they certainly exist.

- *Ostrom, p. 52 – changes to the deeper-level rules are usually more difficult to accomplish, thus increasing the stability of the operational rules.*

This observation is seemingly confirmed by our observations of the Grand Junction system. If common-pool resource management arrangements are to be deliberately encouraged it will be important to develop methods of measuring progress towards deeper-level rules.

- *Ostrom, p. 149 “Even when individuals have considerable capabilities to engage in self-governance, there is no guarantee that solutions to all problems will be achieved. Individuals who do not have similar images of the problems they face, who do not work out mechanisms to disaggregate complex problems in subparts, and who do not recognize the legitimacy of diverse interests are unlikely to solve their problems even when the institutional means to do so are available to them.”*

This is an important set of observations from her natural resources work that seems quite true in medical care. Our early experience in the Care Transitions Theme confirms that local healthcare markets contain substantial complexity and widely varying views of problems and barriers, even when the work is relatively focused on a single problem (hospital readmissions).

- *Ostrom, p. 184 “When individuals who have high discount rates and little mutual trust act independently, without the capacity to communicate, to enter into binding agreements, and to arrange for monitoring and enforcing mechanisms, they are not likely to choose jointly beneficial strategies unless such strategies happen to be their dominant strategies. ... They are far less useful for characterizing the behavior of appropriators in the smaller-scale CPRs that are the focus of this inquiry. In such situations, individuals repeatedly communicate and interact with one another in a localized physical setting. Thus, it is possible that they can learn whom to trust, what effect their actions will have on each other and on the CPR, and how to organize*

themselves to gain benefits and avoid harm. When individuals have lived in such situations for a substantial time and have developed shared norms and patterns of reciprocity, they possess social capital with which they can build institutional arrangements for resolving CPR dilemmas.”

This is the hope and part of the conceptual focus of emerging projects aimed at improving medical services delivery within small regions or communities. Pilot work in transitional care improvement demonstrates that simple facilitation of social network development is useful for creating willingness to change, and for initiating change/improvement activities (data not published).

- *Variables regularly shown to be important to achieving collective benefits by individuals acting independently AND for institutions set up to achieve collective benefits – though there are lots of exceptions –*
 - *Total number of decision-makers (manageable number)*
 - *Number of participants minimally necessary to achieve the collective benefit (does not have to be all)*
 - *The discount rate in use*
 - *Similarities of interests*
 - *The presence of individuals with substantial leadership or other assets.*

These all seem relevant also in the medical care arena, and could be useful in designing experiments or projects to drive small area cost containment.

- *Model for choice about institutional change – p. 193ff.*

The components of the model illuminate a number of considerations in medical care that affect whether an area might engender a “common pool resource management institution” for medical care.

- *Ostrom p. 209 – “Given the substantial uncertainty associated with any change in rules, individuals are less likely to adopt unfamiliar rules than they are to adopt rules used by others in similar circumstances that have been known to work relatively well.*

This is what motivates much of our work in cataloging what others are doing.

- *Ostrom, p. 210 “Clearly, we can reject the notion that appropriators are incapable of supplying their own institutions to solve CPR problems, but we cannot replace it with a presumption that appropriators will adopt new rules whenever the net benefits of rule change will exceed net costs. Net benefits and costs do not exist in the world as independent variables easily available to CPR appropriators or officials of external regimes to use in a simple maximization calculation. Benefits and costs have to be discovered and weighed by individuals using human judgment in highly uncertain and complex situations that are made even more complex to the extent that others behave strategically.”*

This observation points to the merits of providing technical support and some funding to help localities generate their CPR institutions for medical care, if such institutions prove to be effective components of high-value medical care service arrays.