

The need for Economies of Alignment in the US Healthcare system

Introduction

The trigger for this note is the article in the NY Times on ‘The big fix’ [1]. In this are references to the work of Peter Orszag on HealthCare Policy. The talk worth listening to is by Peter at Stanford [2], the background to which is the significant shortcomings in overuse, underuse and misuse of healthcare services [3].

The Federal Context

In essence, Medicare and Medicaid are projected to grow disproportionately:

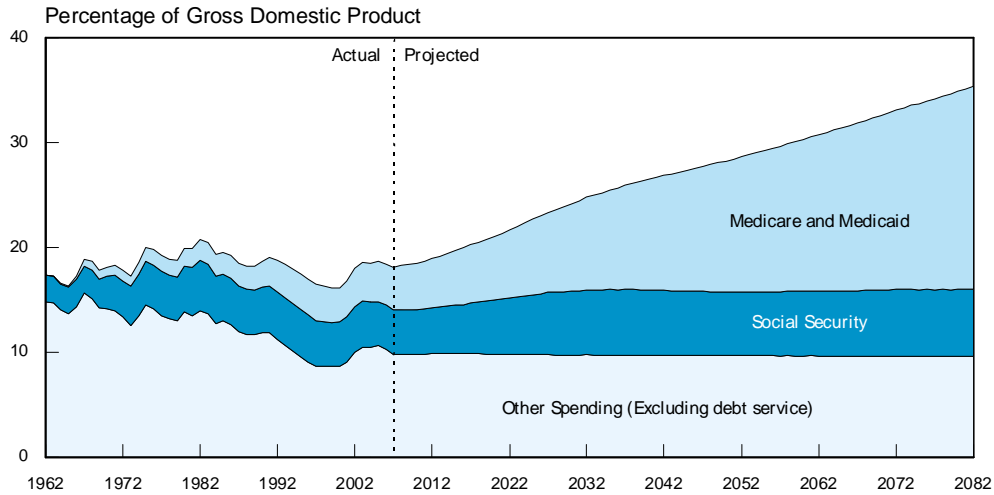


Figure 1: Federal Spending under CBO’s Alternative Fiscal Scenario [4]

When this growth is looked at more closely, we see that its main cause is the effect of excess cost growth combined with the way this excess cost growth interacts with aging:

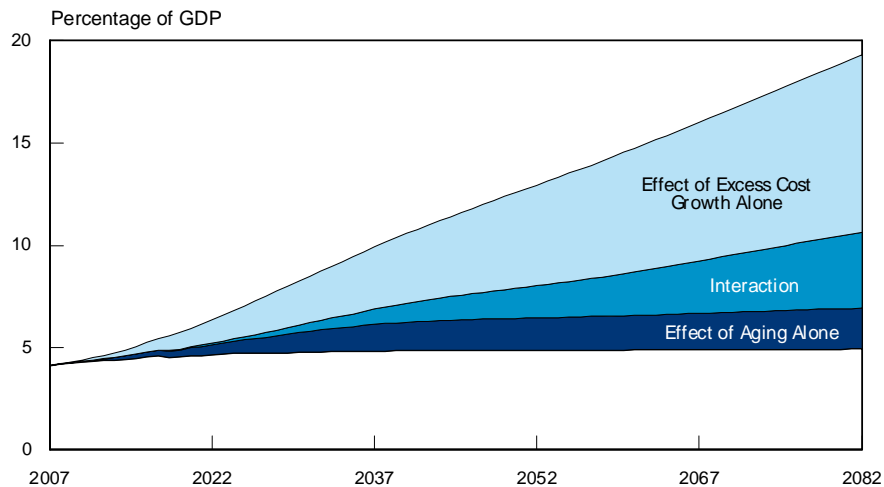


Figure 2: Sources of Growth in Projected Federal Spending on Medicare and Medicaid [4]

Close examination of this excess cost growth shows it to be closely correlated with all other spending on HealthCare, so that conclusions here can be generalized:

Percentage Points

	Medicare	Medicaid	All Other	Total
1975 to 1990	2.9	2.9	2.4	2.6
1990 to 2005	1.8	1.3	1.4	1.5
1975 to 2005	2.4	2.2	2.0	2.1

Figure 3: Excess Cost Growth in Medicare, Medicaid, and All Other Spending on Health Care [4]

And when this spending is examined on a regional basis, there are wide variations, so that we can understand the excess by reference to this experience within the USA rather than having to make international comparisons:

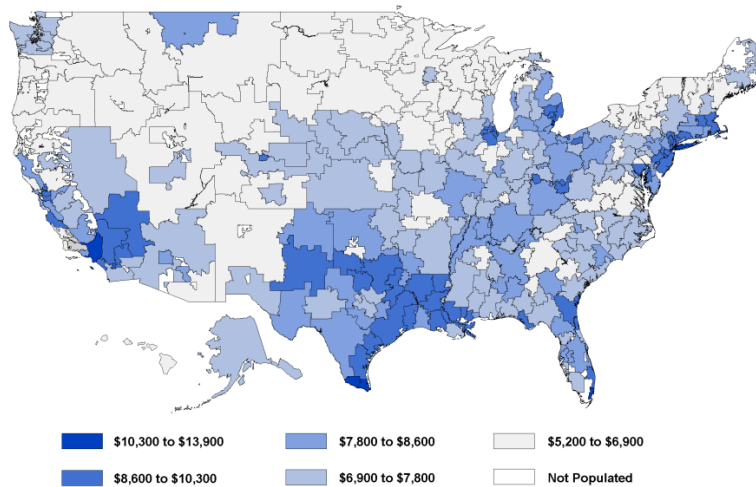


Figure 4: Medicare Spending per Beneficiary in the United States, by Hospital Referral Region, 2005 [4]

The reasons for the variation

To get an insight into this variation, three medical centers are compared using biologically targeted interventions and care-delivery methods. The result is that two of these cost nearly twice the third:

	UCLA Medical Center	Massachusetts General Hospital	Mayo Clinic (St. Mary's Hospital)
Biologically Targeted Interventions:			
Acute Inpatient Care			
CMS composite quality score	81.5	85.9	90.4
Care Delivery? and Spending? Among Medicare Patients in Last Six Months of Life			
Total Medicare spending	50,522	40,181	26,330
Hospital days	19.2	17.7	12.9
Physician visits	52.1	42.2	23.9
Ratio, medical specialist / primary care	2.9	1.0	1.1

Figure 5: Variations Among Academic Medical Centers [4]

One part of the answer is the number of days in hospital. The following gives an indication of the extent of the variation in the number of days in hospital during the last 6 months of life:

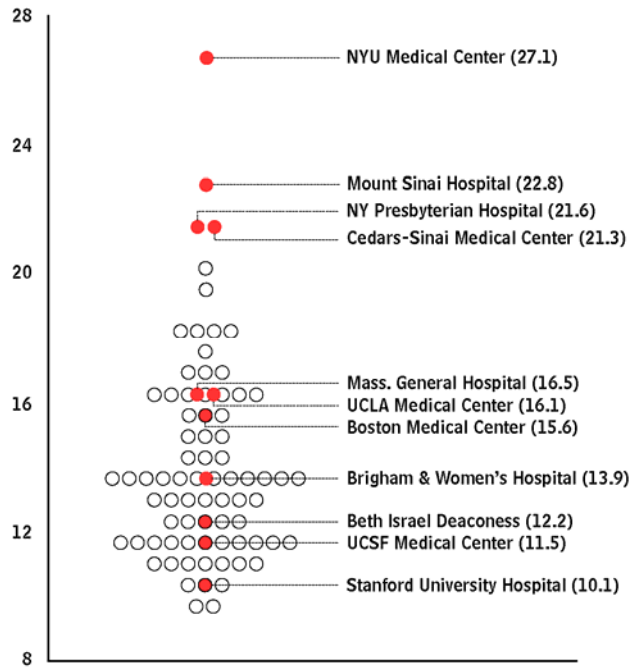


Figure 6: Variations Among Academic Medical Centers [4]

Another is this analysis of the relationship between quality of care and medicare spending by state in 2004, showing if anything an inverse trend:

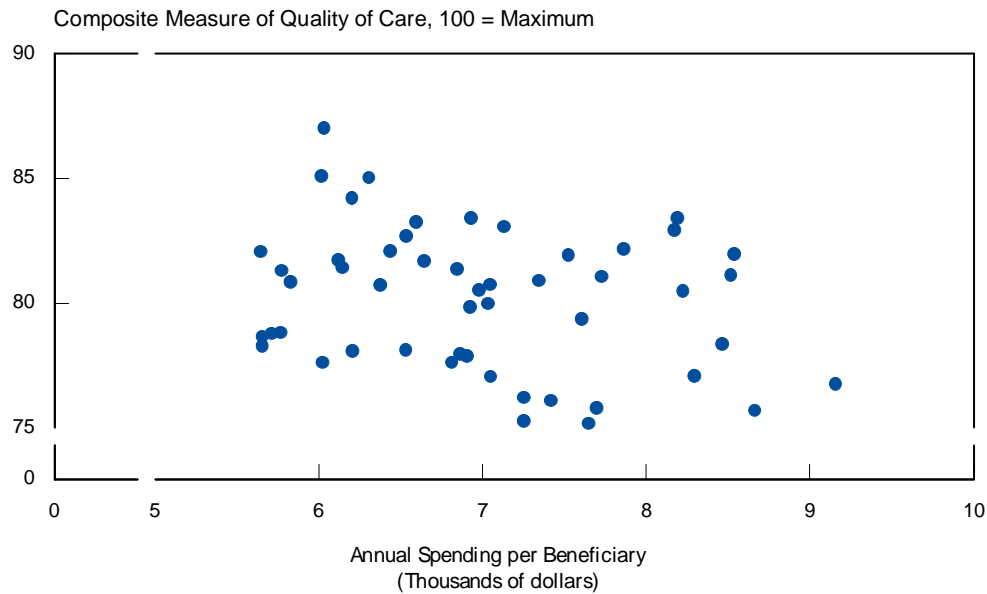


Figure 7: The Relationship Between Quality of Care and Medicare Spending, by State, 2004 [4]

The final slide shows what additional services are provided in high-spending regions:

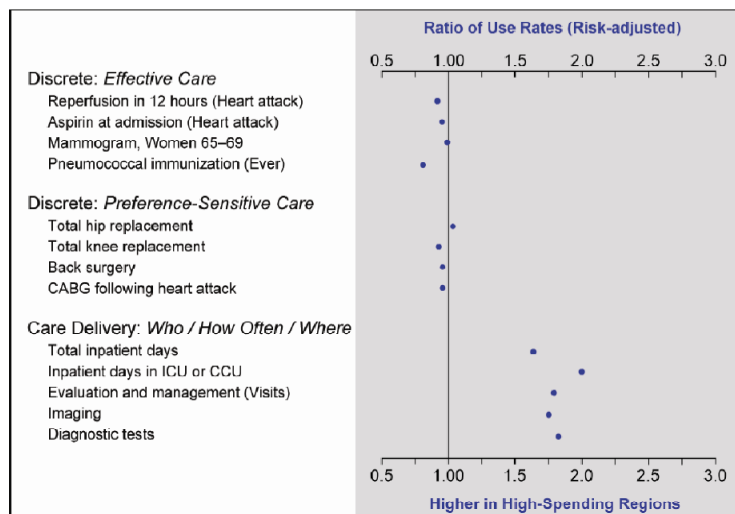


Figure 8: What Additional Services are provided in High-Spending Regions? [4]

This analysis shows the variation to be not in the costs of the individual treatments, but in the care delivery – **the way the individual treatments are aligned to the patient’s condition.**

Implications of the analysis

If we look at this in terms of the six-layer stratification in Figure 9, then we can express the implications of the analysis in terms of the following:

- The existing healthcare system delivers an effective focus on the economies of scale and scope associated with engineering treatments/treatment protocols. (hence the comparability of the ‘discrete’ elements of cost.)
- It does *not* deliver an effective focus on generating economies of alignment of these treatments to the patient’s condition through the life of that condition.

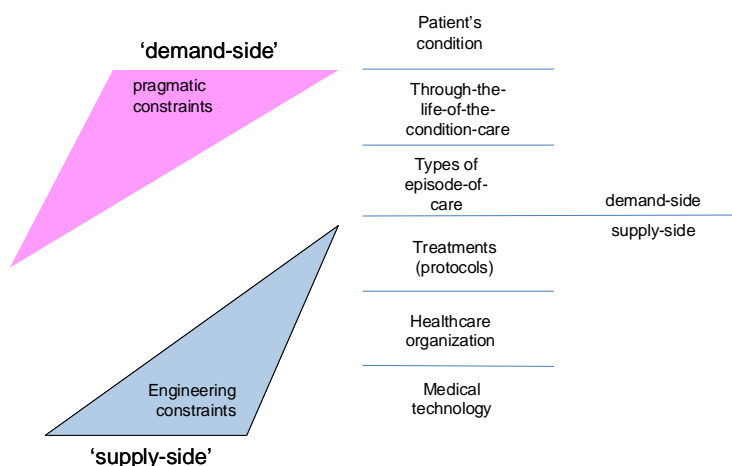


Figure 9: Stratifying the relationship between medical technology and the patient’s condition

The stratification shows the relationships of suppliers, clients and their customers within an overall ecosystem.

Conclusion

Targeting the client position in Figure 10, rather than the (systems) supplier position, allows a value proposition to enable the client to generate *economies of alignment* through the way the client manages its systems of systems within the larger socio-technical ecosystem.

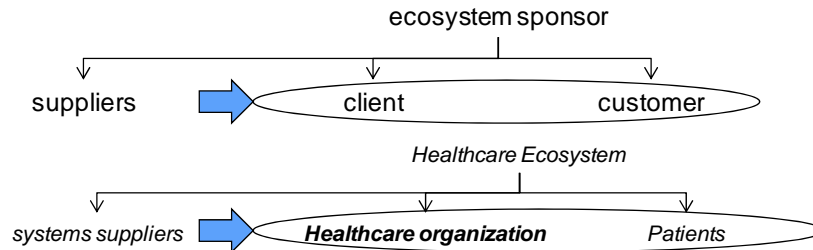


Figure 10: The relationships of supplier-client-customer within the ecosystem context

The core challenge in this is to engineer along the two axes of a multi-sided matrix [5] in which the columns represent the generation of direct (computational) behaviors by systems, and the rows represent the support/sustainment of coordinations/collaborations that are appropriately agile with respect to the varieties of context-of-use presented by the customers/patients. This is challenging because it calls for a different approach to value within the larger ecosystem [6-8].

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References

1. Leonhardt, D., *The Big Fix*, in *The New York Times*. 2009.
2. Orszag, P. *Demographics, Access and Costs: A Federal Perspective on Health Care Policy and Innovation*. in *Better Health, Lower Costs: Can Innovation Save Health Reform?* 2008. Stanford University: Freeman Spogli Institute for International Studies.
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5. Boxer, P. and R. Kazman, *Analyzing the Architectures of Software-Intensive Ecosystems*. *IEEE Transactions on Software Engineering*, 2010. **(submitted)**.
6. Cohen, B. and P. Boxer, *Why Critical Systems Need Help To Evolve*. *Computer*, 2010. **43(5)**: p. 56-63.
7. Boxer, P., *Valuing Multi-Sided Systems*. 2009, CMU/SEI-2009-SR-012 unlimited distribution (in draft): Pittsburgh.
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