

A Systems Approach to Person-Centric Health Economics

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ABSTRACT The economics of health and the economics of health care are not the same, and in fact can be competitors for resources in some cases. Using a traditional supply/demand framework can clarify the forces at work in person-centric health economics. Use of cost-effectiveness analysis, employing a broader systems perspective that incorporates sectors other than health care, and nudging individuals to better health habits are three strategies that can help to drive a shift from health care to health.

INTRODUCTION

Grossman observed that individuals invest in their health through the purchase of health care, diet, exercise, recreation, and housing.¹ Through these purchases, they build stock in their overall health to increase future enjoyment in life. Healthy individuals derive greater pleasure from leisure time, and they are more productive at work than unhealthy individuals. In Grossman's model, the demand for health care is derived from a demand for overall health that will maximize the enjoyment of life's activities. The World Health Organization defines health as "a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity."² Yet, our health care system does not appear to achieve this more holistic notion of health. The USA, currently, spends nearly 18% of gross domestic product on health care,³ but these resources primarily fund the treatment of disease rather than the achievement of a more holistic concept of health. Medical services aimed at treating disease are crowding out the role of other inputs that produce physical, mental, and social well-being.

The USA keeps track of annual health care expenditures by type and funding source using the National Health Expenditure Accounts (NHEA). In 2014, NHEA were over \$3 trillion, with projections of over \$5.6 trillion by 2025.³ However, there are both indirect and direct health care expenditures that are missing from the NHEA. Among other things, missing expenditures include imputed caregiver expenses for home care,

some types of alternative medicine, and nutritional supplements.⁴ Additionally, the NHEA do not account for expenditures on *health* that occur predominantly at the individual level: healthy food, running shoes, gym memberships, exercise classes, etc. Some policymakers and analysts suggest that the rising percentage of gross domestic product spent on health care is not necessarily bad; it merely reflects society's collective choices on how to allocate resources.⁵ However, allocating scarce resources to provide more *medical intervention* may reduce the resources available for *health* in general.

Controlling rising health care expenditures is necessary but not sufficient for increasing investment in health. A wholesale, rebalancing transfer of funds from health care to activities that improve health is impossible. The medical system is a complex entity, with powerful interest groups. Government and other institutions pay for many of the expenditures in the NHEA, while much of what is spent on health is paid for by individuals. Payers, concerned with their bottom line, already search for ways to limit the care they are responsible for, and do not find a business case where paying for health is profitable. Likewise, consumers, who are frequently shielded from the full costs of their care because they may only pay an insurance co-payment or deductible, are motivated to ensure they receive the best medical care available, often mistaking more care for better care. Clearly, perverse incentives exist that need to be addressed. In this paper, we will discuss several strategies that can help ameliorate this imbalance.

The discussion that follows begins with the heart of health care – the relationship between provider and patient, then describes what this relationship means for traditional notions of supply and demand, and finally reviews some existing cost-effective strategies for encouraging a shift towards health promotion.

THE TRADITIONAL HEALTH CARE MARKET

Principal Agent Theory

The provider–patient relationship, at the center of health care, is heavily influenced by information asymmetry. Even

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with the vast amount of health information available today from various channels, patients remain dependent on providers to make the majority of the decisions regarding their health care. This means that patients are not the sole, or even the primary, driver of their health care consumption decisions. The provider (supplier), as the patient's principal, has a fiduciary responsibility to act in the best interests of the patient (demander), and is in a position to recommend care deemed appropriate by her, for the patients. Therefore, the level of health care consumed in a provider–patient encounter is considerably influenced by the provider.

Yet, this fiduciary duty is confounded by at least two issues. First, the provider's income, in today's fee-for-service dominated market, is frequently dependent on the type and quantity of treatment recommended to the patients. Second, and perhaps less obvious, is the fact that the role of fiduciary to a single patient may compel different behavior than the role of fiduciary to a group or population of patients.⁶ Therefore, to effect meaningful change in how health care resources are allocated, the provider must be appropriately engaged to use and recommend cost-effective interventions not only for their individual patient but also for their patient population.

Demand

On the demand side of the provider–patient relationship, it is difficult to determine the true demand for health care using the standard economic analyses of quantity or prices. Price and quantity studies only give an indication of the demand that was met – there is certainly unmet demand present throughout the system. This unmet demand may derive from those who cannot afford needed medical services or, as frequently is the case in rural areas, services may not be readily available to those in need of medical services.⁷ Additionally, the presence of increasingly comprehensive health insurance creates the opportunity for moral hazard. The presence of moral hazard tends to lead to the overutilization of services as patients face only a portion of the true cost of health care. Consequently, observed demand, as measured by services used or total cost, may not accurately reflect the true demand in terms of what was medically necessary or appropriate.

Despite rapidly increasing costs, the demand for health care tends to be fairly inelastic, meaning that a change in price has a relatively small impact on the quantity of health care demanded.^{8–11} These studies indicate that a 1% increase in the price of health care will result in anywhere from a 0.17% to 0.67% decrease in health care expenditures. However, the Rand Health Insurance Experiment (HIE) did show that elasticity tended to increase as the cost to the patient increased beyond 25% of claims, but only slightly.⁸

Additionally, the price elasticity of health care differs based on the type of health care being sought. In particular, preventive services tend to have a higher level of price elasticity than other types of health care: an increase in cost for a

routine diabetic screening is more likely to influence a patient to skip it than an increase in cost for an appendectomy is to influence a patient to forego the operation.⁸ One possible explanation offered was that preventive services may be viewed as more of a luxury that can be delayed when the price of care increases whereas care being sought when one is actually sick or injured is seen as an immediate necessity. The Rand researchers also reasoned that there are substitutes to preventive care such as eating healthier or exercising.⁸

If the price of health care has only a marginal impact on the demand for services, what are the drivers? With the population over the age of 65 rapidly expanding, the tendency of the elderly to have a higher prevalence of chronic disease and utilize health care services more frequently, often leads to an assumption that they are primary drivers of demand.¹² However, Burner, Waldo, and McKusick found that an aging population actually increases the per year expenditure growth on health care only marginally – approximately 0.5% per year.¹³ Reinhardt et al expanded on this point, noting that although the average per capita spending on health care for those aged 65 and older is more than triple that of the younger population, this is only a cross-sectional assessment.⁵ Growth of this population is occurring much more slowly than the increase in per capita health care spending. Thus, it appears that changes in the demand for health care seen today are driven, as Grossman proposed, by an increased quantity of health care services consumed per capita, rather than just by changes related to underlying demographics.¹ If this is true, opportunity exists to decrease health care consumption through improving patient and provider decision-making and thus decreasing the demand for more health care services.

Supply

While a large part of the onus regarding one's health rests with the individual, health care providers play an important role in not only returning the individual to a healthy status but also in educating and encouraging them to maintain or improve their health. One could argue that primary care providers play the largest role, since they are typically the individual's first and most frequent contact with the health care system. In a health-focused economy, they may also be the symphony conductors, directing their patients to health coaches who can guide them to health-enhancing interventions and habits outside of the health care system. Two noteworthy challenges, however, are defensive medicine and provider-induced demand. Defensive medicine occurs when a doctor provides treatment primarily to avoid possible malpractice litigation.¹⁴ Provider-induced demand occurs when a doctor provides treatment primarily for their own (typically financial) benefit. PID has been extensively researched by economists. In one example of this research, Yip found that thoracic surgeons increased patient volume to compensate

for Medicare fee reductions.¹⁵ Both of these phenomena lead to overtreatment and, thereby, to waste.¹⁶ In essence, in terms of supply, the U.S. health care market has been found to be technically (and comparatively) inefficient on multiple levels.¹⁷ Opportunity exists to improve efficiency in the production of health and to reallocate inefficiently used inputs to areas and interventions that produce more value – outcomes per dollar spent as experienced by the person.¹⁸

THREE FOCUSED SUGGESTIONS FOR SHIFTING THE BALANCE

Cost-Effectiveness Analysis

Comparative effectiveness is essential for good supply-side decision-making. Resources are not endless, and while disruptive innovation can create newfound resources by changing the game, we cannot simply wait for it. In the meantime, value-informed treatment choices free up resources for the medical commons – the amazing capacity of our health care system to develop and provide new therapies.¹⁸ Cost-benefit analyses of therapies would enable decision-making processes that create value. In the USA, however, this type of analysis faces considerable challenges. Our independent culture is hesitant to put a monetary value on improvement in quality of life. The Affordable Care Act (ACA), while directing the increased use of comparative effectiveness analysis, expressly prohibits the use of costs. ACA prohibition aside, the provider–patient relationship can also hinder acceptance of cost-effectiveness analysis. Providers who benefit monetarily from performing greater numbers of more costly procedures are incentivized to do the more costly of two procedures with equal benefits.

Yet, even in today's market-focused health care, the opportunity to create incentives that encourage the use of higher value interventions exists. Some portion of provider and hospital remuneration could be based on the use of cost-effective technology/treatments (i.e., higher levels of reimbursement for implementing cost-effective interventions), which would provide incentive on the supply-side of health care.¹⁹ Likewise, tiered copayments for patients (lower copayments for the most cost-effective treatments, similar to pharmaceutical formularies) could provide incentive on the demand side.²⁰ In essence, both providers and patients can be guided to choose treatments that are not only efficacious but also cost-effective. Health care policy is also trending towards a value-based model. In October of 2016, Centers for Medicare and Medicaid Services unveiled details of The Medicare Access and CHIP Reauthorization Act, including a major overhaul in physician reimbursement with a goal of creating incentives for high-value care.²¹

An industry focus on increasing longevity, rather than continued adherence to a disease-specific economic model, could lengthen years of life, both in the absolute and in quality of those years. The resulting increase in productivity, combined with modifications to social insurance programs,

could make this outcome feasible.²² It is exciting to think about what interventions would be developed in this new model. It seems possible that insurance reimbursement for behavioral interventions such as the Ornish Spectrum lifestyle management program might become the norm.

Choosing optimal preventive practices requires cost-effectiveness analysis, just as medical interventions do. Simply spending more on any and all preventive measures and less on complex health care is neither cost-saving nor cost-effective. Prevention, especially broadly applied diagnostic screening, can increase costs by screening entire populations for a disease only prevalent in known subgroups or that would be unlikely to progress to a clinical condition even if found. As an example, each quality-adjusted life year (a measure developed to account for changes in overall quality of life per year lived) garnered from screening for cervical cancer annually costs greater than \$500,000 more than biannual screening,²⁰ with minimal gains in life expectancy.²³ Diagnostic prevention measures must result in a tangible clinical benefit and be cost-effective.

Cost-effectiveness should not be the sole determination of prioritization of interventions. The additional quality-adjusted life years gained from a primary prevention initiative like seat-belt use are a bargain.²⁴ Yet, comparisons of disparate interventions seem problematic²⁵: how do you compare purchase of a magnetic resonance imaging to investment in nutritional education?²⁵ Clearly, both are important in improving quality-adjusted life years despite having disparate costs. Cost-effectiveness does, however, justify using restraint when ordering an magnetic resonance imaging, even if scanning everyone would slightly increase quality-adjusted life years.

Finally, heterogeneity, specifically patients who vary in health, may complicate relative value estimates. All things being equal, a healthier patient will have better outcomes from a procedure than the average patient. The healthy, strong victim of a car wreck who sustains a broken leg will heal more quickly. In Grossman's¹ terms, in times of traumatic injury, an individual makes a withdrawal from their reserves of health investment, and the amount available for withdrawal affects the need for (demand of) health care. Even in the most complex of medical cases, other demand-side factors are important.

Cross-Pollinating With Other Sectors

Just as crowd out may occur at the person-level in the health production function, it may also exist at the community level. Investments in the medical care infrastructure, by their sheer magnitude and importance, can crowd out investments in other areas, such as social services, housing, transportation, and education. When expenditures on social services are added to expenditures on health care, the USA is no longer the highest-cost nation: it falls to 10th.²⁶ This shows that the USA is spending disproportionately less in other sectors that impact health. Significant opportunity exists in these

sectors to execute health-improving strategies. Oliver²⁷ described the benefits of a “health in all policies” approach to address health determinants outside of the medical care system. The USA may be recognizing the potential value in inter-agency coordination for improving prevention, wellness, and health promotion. The Affordable Care Act established the National Prevention Council, chaired by the Surgeon General with the representation of 20 executive agencies, including the Departments of Transportation, Labor, and Interior.²⁸ Through coordinated efforts, businesses, government agencies, and the community can implement targeted interventions that create an environment that promotes health-enhancing behaviors. Cross-pollination of ideas and strategies that work among these groups will not only benefit the community but will also reduce waste by avoiding duplicative investments. New and enhanced inter-sector communication is required. Identifying overlaps between sectors present an opportunity to capitalize on and coordinate investments. Community planning must include strategies that create opportunities for citizens to maximize their health. For instance, additional investments in parks, recreational facilities, and safe transportation alternatives, while not a part of the NHEA, will help to promote healthier choices. Moreover, existing community assets such as school athletic fields must be leveraged to promote health-enhancing activities.²⁹ Health-improving strategies must go beyond cost-effectiveness analysis and pay for desired performance and outcomes of medical care. It takes a village to effectively invest in and adopt health strategies that motivate the type of behaviors that enhance health in the long run. The synergistic impact of a balanced approach of investing in both health care services and social services is demonstrated by the collaborative work of Hennepin Health of Hennepin County, Minnesota and its local health systems. By finding the appropriate balance between health care services and social services, and investing in projects such as a Sobering Center, Transitional Housing, Behavioral Health Continuum, Psychiatric Consult Model, Intensive Primary Care Clinic and Vocational Services, the system has experienced remarkable return on investment in the form of an 80% reduction in Emergency Department costs for patients requiring detox services. They have also realized that a 2-day reduction in hospitalization fully funds 1 month of transitional housing. The expected overall cost reduction ranges between 30% and 50%.³⁰

Nudging Persons (and Patients)

For at least a decade now, researchers have documented that one’s health is influenced by numerous determinants, including socio-economic status, education, employment status, social support networks, physical environment, genetics, access to health services, and individual characteristics and behaviors.³¹ Obviously, an individual has little to no control over many of these determinants, such as genetics, but some are well within an individual’s control. We, as individuals,

routinely make conscious decisions about these controllable determinants, that will increase our health, thereby decreasing our demand for health care.

Decisions regarding health, health care, and insurance are prime examples of instances where the decision-maker might need a nudge to make the optimal choice. Nudging involves designing choice architecture so that individuals are inclined to make the best overall decision, one that typically takes into account less visible factors, such as externalities and consequences not likely to be felt for a period of time. In daily choices regarding health, benefits of positive health behaviors may be delayed and undervalued. There is no instant gratification for walking instead of driving to the grocery store. In health care, treatment decisions are difficult because feedback is not received for the counterfactual: no one can know whether the results would have been any different if a different medication had been taken. In choosing health insurance plans, the uncertainty of future health status and health care needs complicates decision-making: cheaper plans may not provide coverage for the condition you develop 10 years later. In these instances, nudges could prove beneficial.³²

Imagine the activities of a normal day. Suzy wakes up at 6:00 AM after getting only four hours of sleep. Looking at her “life ticker” watch, she realizes her life expectancy has been reduced by ten seconds! She gets the kids ready for school, grabs yogurt and a banana, and walks along a well-maintained bike trail to the subway station to head to work. (Her employer provides an incentive for using public transportation.) It is a busy day, but as usual, she makes time at lunch for at least a half-hour walk with a friend. Afterwards, she eats a grilled chicken salad in her workplace cafeteria, using a coupon for healthy foods, and then returns to her office. After work, Suzy reverses her commute, and then walks to the local farmer’s market to refill a prescription written by her health care provider for fruits and vegetables. Suzy and her husband relax in the evening by watching a short movie together on the sofa. Suzy reviews her activity tracker step results, and increases her goal for the next day: she is only a few steps from reaching a level that earns a discount on her health insurance premium. She sets a reminder to make a follow up doctor’s appointment for her son in the morning, and goes to bed at 10:00 PM to ensure she gets 8-hours of sleep before starting another day.

Throughout this scenario, several nudges were utilized, including insurance discounts for fitness and healthy eating, non-drug prescriptions, mass transit subsidies, peer support, and individual motivation. Nudges can prove beneficial: the question is who will do the nudging? Payers and employers can play a big role here, but the nudging will still have to pass a profitability test – a hurdle not yet overcome. Although often touted as successful, the evidence is mixed regarding the effectiveness of employer wellness programs.³³ Employer-based health insurance results in employees (insureds) moving between plans as they change jobs. This

churn makes investing in current insureds seem less desirable. Additionally, some nudges (e.g., desire for longevity, buddy motivational systems) are strictly at the individual level, and this individual activity is generally excluded from the health care market. Creating a strong business case for these nudges will require addressing these challenges.

CONCLUSION

In our current system, there is considerable investment in health care, but far less on health due to the complexity of multiple determinants. Health care-related activities are somewhat easy to count, and appear in the metrics used to analyze the U.S. health sector. The same cannot be said for measurements of investment in healthy activities. Decisions regarding healthy living (and their costs) are overshadowed by consumption of traditional health care (and its costs). We tend to analyze a system that is designed to treat illness and disease to see if it creates people who are healthy, ignoring the findings that only a small portion of health, perhaps as low as 10%, is actually derived from the provision of health care.³¹ Yet, the incentives in these systems are different: maintaining health and consuming health care are not synonymous. The fact that much of chronic disease is preventable suggests that our continued focus on treatment and “medical interventions” and their inherent risk is driven not by a desire to achieve the WHO’s model of complete physical, mental and social well-being, but rather an economic force to sustain a self-perpetuating system that was never designed to address the outcomes of poor health choices. This paper identified three specific strategies that could help to rebalance the nation’s focus on health and lead to higher value care. Targeted, tiered physician reimbursement represents a supply-side initiative. Tiered copayments and behavioral nudges represent demand-side initiatives. Cross-pollination with non-health sectors represents an overarching system initiative. Strategies that make economic sense for all involved parties can truly improve health and wellness while lowering costs.

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