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ABSTRACT: Healthcare spending in the United States occupies an increasingly large portion of the federal budget and will continue to grow at an alarming rate if measures are not taken to reform the sector. Pharmaceuticals, hospitals, and insurance providers combine with heavy federal and state regulations to create a complex, fragmented delivery system that ultimately confuses and masks true costs from the general population. Incentivized by the current payment system, the sector focuses on disease care rather than preventive care. There continues to be a lack of national consensus as reflected by the difficulty Congress faces in finding a solution to the healthcare debate, which can delay, dilute, and even dismiss any momentum for meaningful change. This stagnation will drive additional mandatory federal spending at the expense of discretionary programs critical to national prosperity and security, including investments in diplomacy and defense necessary for an effective foreign policy. Ultimately, the complexity of healthcare in the United States creates exorbitant inefficiencies which inflate costs, reduce access, and place value on quantity over quality. Consequently, through extensive field investigations and academic research, this report examines the current status of healthcare in America along with future constraints and opportunities, then provides realistic and achievable recommendations to target improved population health and healthcare value.

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INTRODUCTION

Healthcare in the United States is costly and complex. With mandatory healthcare spending currently at 25 percent of the federal budget for Fiscal Year 2017¹, federal obligations are anticipated to increase as the population ages and economic inequalities continue to grow. While the time appears favorable for a system-wide overhaul, there is a clear lack of national consensus as reflected by the difficulty Congress faces in finding a solution to the national healthcare debate. Regrettably, while discord and stagnation limit meaningful reform, healthcare expenses continue to rise at an unsustainable rate. This growth drives additional mandatory federal spending at the expense of discretionary programs also critical to national security and economic prosperity, including investments in diplomacy and defense necessary for an effective foreign policy.

While many Americans question whether healthcare is a right or privilege, their true objective may be how to achieve health equity. The Centers for Disease Control and Prevention (CDC) and the World Health Organization (WHO) describe health equity achievement when “every person has the opportunity to attain his or her full health potential and no one is disadvantaged from achieving this potential because of the social position or other socially determined circumstance.”² Other nations achieve health equity by providing healthcare at much lower prices than the United States; the American system stands in stark contrast to the rest of the developed world. Health insurers play an intermediary role, confusing patients with fee-for-service bills coded in nearly indecipherable alphanumeric sequences. Furthermore, healthcare payments incentivize quantity, making the United States system more about caring for disease rather than preventing it. Not only does the United States lack health equity, but it spends more per capita on healthcare while experiencing less favorable outcomes.³ The nearly \$3 trillion invested annually – 75 percent of which represents spending on preventable conditions like diabetes and heart disease – reflects this motivation.⁴ The popular 2004 documentary film, *Super Size Me*, demonstrates the deleterious health effects of America’s fast-food culture. While director and star Morgan Spurlock explores the consequences of this culture in an extreme and personal fashion, the film effectively underscores the American appetite for unhealthy behaviors and sedentary lifestyles.⁵ Yet, the United States remains a global leader in healthcare innovation, from training and educating providers to developing the next miracle drugs. This seemingly paradoxical relationship demonstrates the complexities of a heavily regulated, segmented system.

How complex is healthcare? Consider Figure 1, a systemigram illustrating the critical nodes driving healthcare consumption at the national, state, regional and local levels.⁶ These nodes can be distilled to four healthcare categories – delivery, insurance, pharmaceuticals, and policy – to analyze healthcare consumption in the United States through the lenses of cost, quality, access, and innovation. **Ultimately, the complexity of healthcare in the United States creates exorbitant inefficiencies which inflate costs, reduce access, and place value on quantity over quality.** Consequently, this report will define the American healthcare system, examine current conditions and challenges, contemplate future headwinds and opportunities, and offer realistic and achievable recommendations for meaningful healthcare reform targeting improved population health and healthcare value. Finally, the report concludes by offering



essays on global health and military healthcare delivery to address two supplementary topics influencing healthcare and to reinforce the diversity of associated themes.

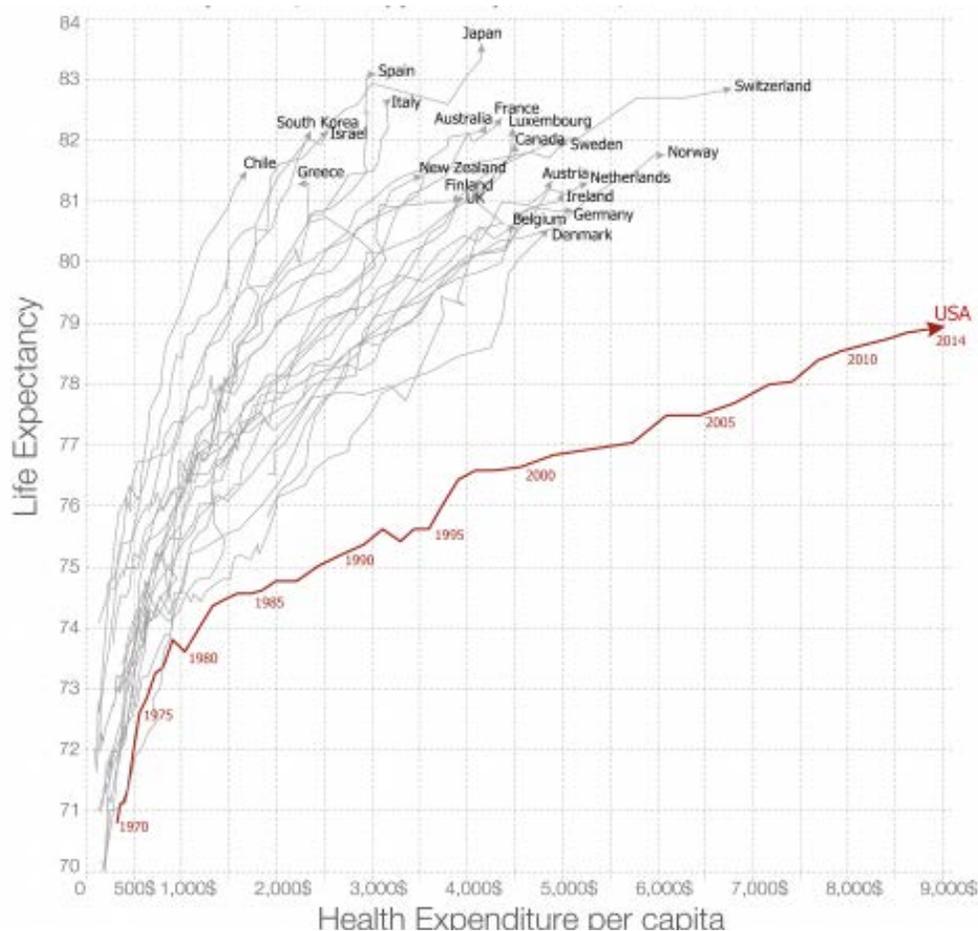


CURRENT CONDITIONS

Cost-Benefit of American Healthcare

Healthcare spending in the United States has escalated at an alarming rate for decades, with costs for procedures, pharmaceuticals, and related services seemingly out of control. The United States healthcare industry accounts for 40 percent of the \$7.6 trillion spent each year on healthcare globally.¹¹ Of the \$3 trillion expended annually on healthcare in the United States, approximately one-third originates from tax revenue to fund four health insurance programs – Medicare, Medicaid, the Children’s Health Insurance Program (CHIP), and Affordable Care Act (ACA) marketplace subsidies – accounting for 25 percent of the federal budget.¹² At nearly \$10,000 per person, the United States spends more per capita annually than any other nation, representing nearly 18 percent of its \$18 trillion gross domestic product (GDP).¹³ Moreover, government projections suggest United States health spending will continue to increase at over five percent annually, outpacing the anticipated growth in GDP.¹⁴ This escalation will drive additional mandatory federal spending at the expense of discretionary programs critical to economic prosperity and national security, including education, infrastructure, diplomacy, and defense. As billionaire Warren Buffett declared in a recent Berkshire Hathaway shareholder meeting, “medical costs are the tapeworm of American economic competitiveness.”¹⁵

Figure 2. Life expectancy versus health expenditures for OECD member countries.¹⁶



So, what is America's return on this substantial healthcare investment? The United States has the world's most advanced healthcare system, invests the most in cutting-edge research, and has the most highly trained medical workforce, but these characteristics do not correlate favorably to the best health outcomes when compared to other developed nations.¹⁷ Figure 2 provides an illustrative example, comparing life expectancy to per capita health expenditures for countries belonging to the Organization for Economic Cooperation and Development (OECD). While all OECD countries demonstrate a positive correlation between life expectancy as expenditures increase, gains in life expectancy from additional investment within the United States were much smaller than other high-income countries.¹⁸ Additionally, a recent study by the National Research Council and Institute of Medicine ranked the United States last among 17 developed nations in quality of healthcare, underscoring a highly consistent and extensive pattern of higher mortality and inferior health beginning at birth and persisting through all life stages. The study's search for reasons to this paradox revealed that important factors to good health – such as access to quality healthcare and advancement of health-related behaviors – are problematic in the United States.¹⁹ A recent report from the University of Washington substantiated these factors, highlighting the existence of a geographical gap in America where life expectancy varies by as much as 20 years based on behaviors and access to care.²⁰

United States Healthcare Market Structure

Most countries in the world employ one of four basic healthcare systems:²¹

1. Publicly funded national healthcare systems (e.g., England). This model finances and provides healthcare exclusively by the government to all citizens through tax revenues.
2. Multi-payer universal healthcare systems (e.g., Germany). This model, like publicly funded systems, covers all citizens and is usually financed jointly by employers and employees through payroll deduction. Providers and hospitals tend to be private; stringent regulation gives government much of the same cost-control clout provided to publicly funded systems.
3. National health insurance systems (e.g., Canada). This model contains elements of both publicly funded and multi-payer systems. Payment originates from government-run insurance programs that every citizen pays into, but unlike England's National Healthcare System, clinicians are not employed by the government.
4. Out-of-pocket healthcare systems (e.g., India). This model is common in most of the world's developing countries too poor or too disorganized to provide established medical care. Countries with this type of healthcare system favor the affluent.

The United States healthcare system is unique when compared to the rest of the world. Rather than employing one of the four basic models, it operates as a hybrid, maintaining separate systems for separate groups of people.²² The federal government is the sole payer and provider of healthcare for active-duty military and veterans, much like England's National Health System. Working-age Americans participate in a system more akin to Germany, where health insurance is typically purchased independently or provided as a benefit through employers to pay for private-sector care. Citizens 65 or older and younger adults with lower incomes or certain disabilities utilize private-sector providers paid through government programs like Medicare and Medicaid, similar to Canada. Moreover, the roughly 29 million Americans²³ without health insurance must either pay out-of-pocket, like India, or forego all but emergency care. Ultimately, America



leverages a single-payer system for the elderly and the poor while the working middle class have subsidized private health plans limiting their freedom of choice. As columnist Megan McArdle remarked, “neither of these facts commend [this] system to devotees of the free market.”²⁴

There are relatively few government restrictions on most economic activities within the United States, which allows the American economy to approach the free-market benchmark with its efficient economic outcomes.²⁵ However, as previously discussed, healthcare is an unusual and fragmented sector of the American economy and serves as a noteworthy exception to the norm. Noted professors Michael Porter and Elizabeth Teisberg collaborated to evaluate this unique framework and subsequently set out to determine the main issues negatively influencing the healthcare market. In their critique, the scholars characterized United States healthcare as “largely private and subject to more competition than virtually any place else in the world.”²⁶ While this sounds promising, the competition is not indicative of the healthy free markets found in well-functioning industries characterized by steady process improvements that drive lower costs. Instead, healthcare distinguishes itself by unhealthy and sometimes non-existent competition. When competition within the sector is detected, it occurs “over the wrong things and in the wrong geographic markets at the wrong time.”²⁷ Porter and Teisberg go on to say:

The most fundamental and unrecognized problem in United States healthcare today is that competition operates at the wrong level. It takes place at the level of health plans, networks, and hospital groups. It should occur in the prevention, diagnosis, and treatment of individual health conditions. It is at this level that true value is created, disease by disease and patient by patient... it is here where competition would drive improvements in efficiency and effectiveness, reduce errors, and spark innovation.²⁸

To better understand how healthcare in the United States functions in its current form, the dominant industries within the sector (i.e., those places where Porter and Teisberg emphasize the existence of unhealthy competition) are explored in greater detail below.

Pharmaceuticals

IBISWorld, a leading publisher of business industry research, defined the pharmaceutical industry as prescription and over-the-counter products for the prevention or treatment of illnesses in humans or animals.²⁹ IBISWorld divides the industry between brand-name and generic pharmaceuticals. Firms patent brand-name drugs, which enjoy legal protection from competition in the marketplace. The United States Patent and Trademark Office issues patents for new discoveries, such as drug products that contain a new molecular entity, to promote scientific innovation.³⁰ In addition to a patent, separate drug law provisions offer additional market exclusivity following approval from the Food and Drug Administration (FDA) to help make up for time lost on a patent while seeking FDA approval. A generic drug, on the other hand, is a copycat of a brand-name drug and cannot be sold as a competing drug in the marketplace until the patent for the brand-name drug it intends to mimic has expired.

Prescription drug spending offers a window into the monopolistic pricing phenomena created by patents where brand-name drugs represent only 10 percent of all dispensed prescriptions in the United States, yet they account for over 70 percent of drug spending.³¹ Furthermore, brand-name drug prices have increased 164 percent between 2008 and 2015.³² Consistent with Figure 2, numerous studies have shown pharmaceutical expenditures are a



positive correlate of health outcomes in industrialized nations,³³⁻³⁵ but these price increases have yielded disproportionate profit margins for brand-name drug companies (25 percent in 2016),³⁶ and represent a major contributor to cost growth within the sector. Additionally, the brand-name drug industry expects to see its annual revenue increase another \$210 billion through 2021 due in part to the growing demand for high-margin biologic drugs.³⁷ Generic drugs, in contrast, have much smaller profit margins by comparison (roughly 11 percent), but still manage to enjoy strong annual growth.³⁸ Michael Porter's widely accepted "Five Forces" model for industry competition explains why American patents allow brand-name drug companies monopolistic pricing power.³⁹ Porter posits the intensity level of these forces shape competition in any given industry. They are: (1) threat of new entrants, (2) bargaining power of suppliers, (3) threat of substitute products or services, (4) bargaining power of buyers, and (5) rivalry among existing competitors.⁴⁰ In short, Porter explains how these forces work:

If the forces are intense, as they are in such industries as airlines, textiles, and hotels, almost no company earns attractive returns on investment. If the forces are benign, as they are in industries such as software, soft drinks, and toiletries, many companies are profitable. Industry structure drives competition and profitability, not whether an industry produces a product or service, is emerging or mature, high tech or low tech, regulated or unregulated.⁴¹

As previously indicated, the pharmaceutical industry divides into two separate structures due to patent and market exclusivity protections. Porter's five forces are benign for brand-name drugs while patent-protected. The time and financial commitments to develop new drugs are also high barriers to entry, often taking firms ten years and \$2.5 billion to bring drugs to market.⁴² As a result, consumers have no bargaining power to choose among competing treatments or substitute products. Because the active ingredients for a typical drug are not scarce, suppliers of these ingredients do not possess intense bargaining power with the drug companies either. Alternatively, the generic drug industry possesses a high level of competitive intensity. When a brand-name patent expires and the competitive force of new entrants flood the market, competition among rivals spikes and prices drop accordingly. An FDA analysis of retail sales data for single-ingredient pharmaceutical products sold in the United States demonstrated the entry of a single generic competitor lowered the average relative price per dose by nearly 50 percent, while six competitors dropped this average to 26 percent of the original price.⁴³

Insurance

IBISWorld characterizes insurance as the transfer of risk in exchange for payment.⁴⁴ In the case of health insurance, risk refers to the loss of revenue in the form of payments to providers, pharmaceuticals, or medical device manufacturers who supply associated goods and services to consumers. The United States health insurance industry generates over \$800 billion in revenue and \$41 billion in profits annually.⁴⁵ The health insurance market provides a range of products and services, most notably pharmacy benefits, Medicaid and Medicare management through private companies, as well as a series of insurance plans framed as point of service, fee for service, health maintenance organization (HMO), preferred provider, and high-deductible health plans.⁴⁶ Under the existing ACA framework, projections over the next five years indicate strong growth in the majority of health insurance products and services as well as consolidations, allowing large insurance firms to potentially corner market share through monopolistic competition or outright monopolies.⁴⁷



Health insurance in the United States has its roots in the Great Depression, with the introduction of plans to offset unpaid hospital bills.⁴⁸ Guidelines from the American Hospital Association in 1933 required prepaid group hospitalization plans using the Blue Cross symbol to “stress the public welfare, limit benefits to hospital charges, organize as a non-profit, and run on a sound economic basis.”⁴⁹ The introduction of commercial choices in the 1950s created direct competition in markets whereby “commercial health insurers were not bound to establish premiums using the Blue Cross community rating principle, which linked premiums to average claims costs across a geographic area.” Rather, commercial insurers set premiums based on the claims experience of specific groups.⁵⁰ Consequently, commercial insurers used this “experience rating” approach to underbid Blue Cross for companies that employed healthier-than-average individuals, which were generally less expensive to insure. The loss of healthier pools subsequently raised average costs among remaining groups, thus impeding the ability of Blue Cross organizations to compete with commercial insurers on price. This shift in market structure not only impacted insurers’ ability to mitigate payment risk using diverse pools of individuals, but also set the country on a path of inefficient risk management in local markets and has played a prominent role in the rise of healthcare costs ever since.⁵¹

Hospitals

According to IBISWorld, there are three basic types of hospitals in the United States: proprietary (for-profit) hospitals, nonprofit hospitals, and charity or government-supported hospitals. The services offered within these categories vary considerably, organized according to the objectives of the institution, but typically include operating rooms, in-house laboratories, pharmacies, radiology, and various outpatient services. Proprietary hospitals include general and specialized hospitals, and are usually corporately owned with an aim to profit from services provided. Nonprofit institutions typically serve as teaching hospitals and attempt to maintain some degree of profitability to preserve and modernize facilities. Charity and tax-supported hospitals are focused primarily on providing healthcare to a specific region or community run by a board of directors who serve without pay.⁵² Not surprisingly, the market for hospitals in the United States is concentrated in regions with larger populations and is denser in areas supporting older populations. Accordingly, the Southeastern United States, namely Texas and Florida, account for nearly 25 percent of all hospitals.⁵³

On a national scale, market concentration for hospitals is low, with hundreds of hospitals dispersed throughout the country. No firm accounts for more than five percent of the \$1 trillion in annual revenue and the four largest firms combine to account for only 10 percent of industry market share.⁵⁴ This composition suggests a highly competitive market. However, a regional framework arises when evaluating hospitals through a reduced aperture. For instance, Hospital Corporation of America concentrates its hospitals in Florida and Texas where it holds as much as 40 percent of the market share. Another large firm, Community Health Systems, focuses on markets outside municipal areas where no competitors exist.⁵⁵ Thus, many hospitals operate in markets with limited competition or even monopolies. Moreover, the near-term outlook for these firms is favorable. Over the next five years, both the aging population and increases in insurance enrollment resulting from the current ACA framework will support revenue growth. Overall, industry revenue is expected to increase by over three percent each year, reaching \$1.2 trillion by 2022.⁵⁶ Any changes to healthcare legislation will, of course, affect this outlook.



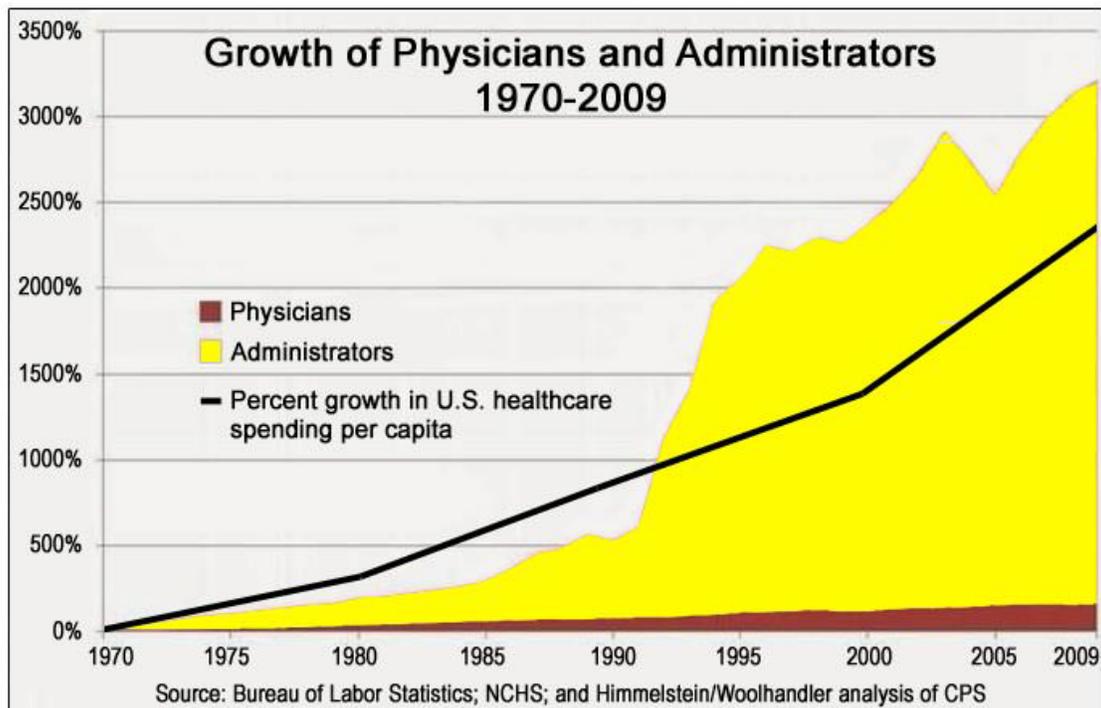
CHALLENGES

The United States healthcare sector experiences a broad-spectrum of challenges, originating from local markets and the federal government alike. In evaluating these challenges, trends emerge through the lenses of cost, quality, and access.

Cost

Most consumers do not appreciate nor fully comprehend the true price of healthcare. Lack of financial transparency, surreptitious coding, price-point variables, and brand-name versus generic medicines all combine to complicate a patient's understanding of healthcare costs. Insurance firms complicate the process, serving as intermediaries between patients and providers and often masking costs in cryptic bills. Insurance adds further burden to consumers, with insurance premiums outpacing wage growth and accounting for as much as 13 percent of median household income.⁵⁸⁻⁶⁰ For comparison sake, if a dozen eggs and a gallon of milk increased at an equivalent rate to historic insurance hikes, each would cost around \$50.⁶⁰ The sheer number of private insurers also forces providers to increase costly administrative staffs to deal with them. Dr. David Cutler of Harvard University described the excessive administrative overhead in an interview with the *New Yorker*, citing Duke University Hospital as a prime example where one and a half billers are employed for every inpatient hospital bed.⁶¹ Figure 3 shows just how rapid the pace of growth has been with healthcare administrators relative to physicians over the past 40 years. Growth at this pace – over 2,300 percent since 1970 – points to an industry rife with inefficiencies and underscores the need for reform.

Figure 3. Growth of Physicians and Administrators in United States Healthcare Delivery, 1970-2009.⁶²



Unlike products or services in most markets, healthcare consumers do not have the quality and cost information necessary to make informed choices, and are unable to exert influence on the market and drive competition to increase quality and reduce costs.⁶³ It is a longstanding, common belief that medical information is complex and providers are much better informed than patients due to their extensive education and training.⁶⁴ Furthermore, prices for common procedures vary wildly by regional market and even within the same city and same facility. For example, hospital-based Magnetic Resonance Imaging (MRI) of lower limb joints vary by a factor of 12 across the United States and by a factor of six within Philadelphia.⁶⁵ Increasing transparency of both cost and treatment efficacy will provide power to the consumer and diminish this market failure. If multiple providers offer the same service, the cost variance for an MRI should be insignificant. By creating financial transparency, local and regional market prices will begin to self-regulate to achieve more reasonable costs based on consumer demand. Thanks to the internet and other digital platforms, healthcare pricing information is becoming less mysterious over time and financial transparency appears to be an attainable goal.⁶⁶

In addition to the financial ambiguity and cost variance, preventable medical errors and profound waste also accumulate vast unnecessary cost. *The New England Journal of Medicine* reports 25 percent of all hospitalized patients experience a preventable medical error during their stay.⁶⁷ Even if one percent of admissions suffer a negligent adverse event, avoidable costs could exceed \$90 billion each year.⁶⁸ Another staggering statistic deals with the astounding waste encountered in healthcare delivery on an annual basis. Experts estimate up to one-third of the \$3 trillion spent each year on healthcare in the United States is unnecessary (that amounts to approximately six percent of America's GDP or over 1.6 times the annual defense budget). Sources of waste include the aforementioned administrative fees along with absurdly high prices, unnecessary procedures, and waste in prescription drugs. Take, for example, the top three selling brand-name drugs for rheumatoid arthritis. These drugs combined account for over \$30 billion in annual sales, yet they achieve a clinical efficacy of around 30 percent at best.⁶⁹ All of these costs pale in comparison to chronic diseases, many of which are preventable, representing 86 percent of all healthcare spending.⁷⁰ Chronic diseases are on the rise, with 61 percent increase since 2012, and account for seven of the top 10 causes of death in the United States.⁷¹

Quality

As previously highlighted, the United States spends the most per capita of any nation on healthcare, but outcomes – including life expectancy – do not justify the expense. Additionally, medical errors account for over 250,000 deaths annually.⁷² Quality metrics are emerging, but the fee-for-service culture within America's healthcare system incentivizes profit over value. Even though the United States Centers for Medicare and Medicaid Services (CMS) have undertaken standardization of value-based outcome payments, a lack of standardization and agreement on outcome measures across the industry creates inefficiencies and slows innovation.⁷³ Geography also determines the quality of healthcare. For example, three low-income zip codes located in Washington, D.C. rank worst in the greater metro area for health outcomes.⁷⁴ The lack of health equity within the mid-Atlantic region is indicative of quality and access issues affecting healthcare delivery markets nationwide.



Access

Not surprisingly, uninsured and low-income Americans are less likely to receive medical care and are more likely to have poor health and die prematurely relative to their fellow citizens.⁷⁵ The aforementioned zip code disparity also illustrates challenges to healthcare access, not only in cities, but also in rural areas where there is less than one licensed doctor for every 3,500 people versus one for every 370 people across the nation at large.⁷⁶ Furthermore, private insurance in some areas of the country is unable to establish diverse pools with sufficient healthy people to mitigate financial risk, leading to market failures and serving as an additional barrier to accessing quality healthcare.⁷⁷ Without question, access to care at an affordable price will continue to challenge the United States as federal legislators negotiate changes to the ACA.

OUTLOOK

Health as a National Resource

Healthy individuals, families, and communities are the building blocks for a strong America. In fact, health has a positive and statistically significant effect on economic growth. One study from the Harvard School of Public Health suggests that a one-year improvement in a population's life expectancy contributes to an increase of four percent in economic growth.⁷⁸ Consequently, a strong, innovative, and growing United States economy requires a healthy population. Not only is the economy an instrument of power in its own right, but it underwrites a strong military and influential diplomacy that grants the freedom to execute an assertive foreign policy. An unhealthy population, on the other hand, contributes to a diminished productive capacity, increased unemployment, and decreased tax revenue. Unfortunately, with more than a third of American adults characterized as obese and chronic diseases like diabetes, hypertension, and heart disease on the rise, the United States faces a grave public health crisis. Although public health experts, the media, and government officials have paid a great deal of attention to this crisis in the general population, its direct impacts on national security are too often overlooked.

The United States military is not immune to the negative effects of America's growing health epidemic. However, compared to other large organizations, the military is especially dependent on the health of its people. Within the military-age general population, one in four potential candidates eligible for military service does not qualify because of their weight.⁷⁹ Even those who do serve still struggle with weight issues. In a 2011 health behaviors survey of 40,000 active-duty personnel, approximately 12 percent are considered obese based on height and weight criteria established by the CDC, a 61 percent increase since 2002.⁸⁰ The American people demand that service members be in peak condition to accomplish their challenging wartime missions. Even those in administrative and support roles must remain healthy to guarantee overall force readiness. Though the military remains healthier than the remainder of the United States population, alarming public health trends place a substantial burden on the military to attract enough healthy recruits and maintain that health over the course of service to avoid replacing highly trained professionals at significant cost.⁸¹



Aging Population

Aging demographics and increased life expectancy exacerbate the distressing escalation in United States healthcare costs, with over 10,000 Americans turning 65 and enrolling in Medicare every day.⁸² The older population, representing roughly one in every seven Americans today, is expected to swell to 22 percent of the population by 2040.⁸³ This growth will see an astonishing rise in the number of Medicare enrollees. In fact, the Congressional Budget Office projects 80 million Americans will be Medicare-eligible by 2035, up from the current enrollment of 57 million,^{84,85} driving additional mandatory federal spending at the expense of other critical national security programs. While strategies to contain these projected cost increases are vital, successful cost control will equally emphasize the ability of researchers and providers to prevent and cure age-related diseases and disorders that produce the greatest long-term care requirements.⁸⁶

Advances in Digital Technology

In his book, *The Internet of Healthy Things*, connected health pioneer Dr. Joe Kvedar envisions a world in the foreseeable future where consumers and patients constantly connect with online health platforms through the use of mobile and wearable devices. When this technology is leveraged to its full potential, real-time biometric data will be automatically obtained and used to learn more about the impact of lifestyle choices on healthy living and chronic diseases, and ultimately alter behaviors to improve health in the general population.⁸⁷ Additionally, the general population will be more enlightened about their health generating better informed consumers in the health care marketplace. This revolution, along with the healthcare industry as a whole, will generate extraordinary amounts of data through proprietary systems that are often isolated and difficult to share. Consequently, the industry will place greater emphasis on interoperability of these systems and the big data they generate. Innovative cognitive computing machines like IBM's Watson will be fully leveraged to make sense of it all, assisting physicians with diagnoses and research, and enabling them to understand their patients' preferences and behaviors through predictive analytics.⁸⁸

One important avenue for engendering a more enlightened population and efficient delivery system is through the use of Electronic Health Records (EHR). When first introduced, EHR was a highly-anticipated technology advancement to integrate large volumes of information, improve efficiency, increase safety, heighten decision making, and enhance data retrieval. In reality, the results are mixed. Studies demonstrate benefits of improved care delivery with clinical guidelines, reduced medication errors, and decreased treatment redundancy.⁸⁹ Other studies demonstrate higher provider burnout due to EHR clerical tasks,⁹⁰ costly acquisition and maintenance, disruptions in workflow, and – rather unexpected and counter to its design – increased errors with certain systems.⁹¹ Many advances in technology such as voice recognition and remote data synchronization (e.g., scan a bar code on the patient's identification card and a blood pressure machine automatically sends the measurement to the EHR) are not routinely incorporated in to EHR platforms and should be leveraged for more efficient documentation. Although EHR has not yielded the magic solution, providers should not throw in the towel just yet; improvements in software and interoperability will continue to advance its innumerable benefits.



Advances in Science

Since first sequencing the human genome in 2001, the rapid expansion of high-throughput technologies and computational frameworks has enabled the examination of unique biological systems in extraordinary detail, and with increasingly faster and cheaper methods. The ability to study a patient's genetic makeup with relative ease will lead to significant advances in personalized and precision healthcare and transform the practice of medicine from traditional diagnosis and treatment of symptoms towards one characterized by early diagnostics and prevention.⁹² The benefits and applications of these advancements are already starting to bear fruit. For example, at a biotechnology company in Boston, researchers are leveraging a genome editing technology known as CRISPR (Clustered Regularly Interspaced Short Palindromic Repeats) to develop transformative medicines aimed at treating diseases at the DNA level.⁹³ Similarly, at a global pharmaceutical firm, researchers are transforming healthcare by developing medicines matched to patients most likely to benefit from them. These approaches require a thorough understanding of the biology of a disease and identification of biomarkers in patients so physicians know who is most likely to respond favorably to targeted therapy.⁹⁴

Global Healthcare Demand

Developing countries, like India, are experiencing substantial growth in their middle class. The Brookings Institution estimates the global middle class is set to grow by 160 million people per year through 2030. In a little over a decade, approximately 60 percent of the global population will be middle class and their consumption could be \$30 trillion more than today, with only \$1 trillion expected to come from advanced economies.⁹⁵ This growth will accompany an appetite for middle-class comforts that promote lifestyle changes leading to greater incidence of costly chronic illnesses like diabetes and heart disease, as witnessed in industrialized nations. Increased health concerns will, in turn, create a demand for more robust indigenous healthcare that may, in some cases, compete with existing healthcare industry players.⁹⁶ What this means for the United States is that it may experience difficulty competing for global healthcare talent, which will exacerbate existing provider shortages within United States healthcare markets. On the bright side, an expanding global middle class will provide opportunities for the United States healthcare industry and patients alike. American companies, like General Electric, have become more attentive to the needs of various foreign markets, while patients are increasing the occurrence of medical tourism abroad for less expensive treatments, which may motivate healthy competition and lower domestic prices.⁹⁷

GOVERNMENT GOALS AND ROLE

Although potentially counterintuitive, because of its size, the federal government drives healthcare payment innovation through Medicare and Medicaid reimbursements.⁹⁸ The CMS is pursuing alternative payment models to devalue fee-for-service claims and instead incentivize quality or value-based payments.⁹⁹ Payment initiatives seek to transition away from the fee-for-service model through a series of pilot programs gradually introduced in select states.¹⁰⁰ The new model could see a savings as large as \$34 billion over the next nine years.¹⁰¹ Similarly, as payment innovation evolves to incentivize outcome-based metrics, other industries within the healthcare sector will be encouraged to innovate.



In addition to subtle, yet important, course corrections in Medicaid and Medicare, the federal government is currently attempting to reform American healthcare on a grand scale. This is not the first time the United States has debated controversial healthcare proposals; the road to healthcare reform is well traveled. Every president from Harry Truman has, in some measure, proposed or supported changes to the American healthcare system. The most notable reform came in the passage of the Patient Protection and Affordable Care Act (informally known as ACA or Obamacare), which increased the federal government's role in healthcare. Approved into law on March 21, 2010, the ACA created the individual mandate and marketplace exchanges for health insurance. The mandate provisioned subsidies for premiums and cost-sharing for low-income purchasers, eliminated the ability of insurers to exclude or limit purchasers with preexisting conditions, and greatly expanded Medicaid.¹⁰² These provisions reduced the number of uninsured Americans from nearly 50 million in 2010 to approximately 28 million today, or an uninsured rate of 8.8 percent.¹⁰³ While the ACA's effort to improve access through health insurance significantly reduced the number of uninsured Americans, it did little to control costs. Despite a desire by many to make the ACA as much about cost as access, cost provisions in early ACA drafts were diluted or eliminated altogether.¹⁰⁴

The ACA's future remains uncertain. As of this report, the House passed H.R. 1628, The American Health Care Act of 2017, with a vote of 217 to 213.¹⁰⁵ While any examination of this resolution's outcomes would be purely speculative – especially since the measure has yet to pass the Senate – the United States government has the opportunity and obligation to profoundly influence health equity and positively impact cost, access, and quality through population health and healthcare value incentives. Consequently, the proposed recommendations in the following section target healthcare's largest expenditure of preventable diseases while promoting access to healthier lifestyle options. Recommendations also consider improvements to health insurance and pharmaceuticals, existing federal and state programs, and other efficiencies to advance quality and pragmatically reduce costs. The recommendations span not only the federal and state government, but also target patients and associated markets.

POLICY AND SYSTEM REFORM RECOMMENDATIONS

1. Reduce the influence of lobbyist and special interest groups. Legislating the control of healthcare spending is a tenuous effort. Any reduction in cost for the greater good comes at the expense of revenue and resulting profits across the healthcare sector. As a result, healthcare interest groups routinely spend over \$500 million per year on lobbying efforts to protect the equities of their respective industries.¹⁰⁶ In 2016, for example, pharmaceutical and health products companies spent \$244 million on lobbying, while health insurance companies invested another \$147 million.¹⁰⁷ Reducing the influence of lobbyists requires considerations well outside the boundaries of healthcare, especially since the First Amendment defends the right of lobbyists “to petition the government for a redress of grievances.” Correlating influence with money, policies to reduce campaign contributions from lobbyists could begin to diminish such undue influence, like that from the American Crystal Sugar political action committee, which ranked in the top 20 for all federal campaign donations in 2015-2016.¹⁰⁸ Information also correlates with influence. The Congressional Research Service (CRS) requested funding in 2017 for 22 additional employees, which appropriators subsequently denied.¹⁰⁹ Grant additional funding to CRS for decreased reliance on external sources of analysis.



2. Provide healthy nutrition options. With rising obesity rates and a steadily aging demographic, the United States must adjust its approach to wellbeing. Migrating to a culture of preventive care requires a paradigm shift that starts with individuals and expands to community leaders and legislators at all levels of government. Meaningful investment in population health is a force multiplier; healthy behaviors will contribute to fewer incidents of preventable diseases and lower overall healthcare expenditures.

Although a shift to healthy behavior begins with the individual, it is truly a team sport requiring the support of communities to enable and sustain desired behaviors. Communities truly have the potential to make the most significant impact on chronic disease prevention. Consequently, leaders should integrate health plans into all facets of a community, including school programs, to promote health and wellness through nutrition education and by encouraging the consumption of fruits, vegetables, and whole grains, while limiting the intake of unnecessary sugars and saturated fats.¹¹⁰ However, this practice should not be implemented exclusively in schools. Communities should seek opportunities to introduce or improve access to healthy foods to the general population. All levels of government can incentivize businesses to create healthy food establishments and wellness programs. For example, the Healthy Corner Store Program supported by the United States Department of Agriculture (USDA) illustrates an initiative to introduce healthy food options in America's inner cities.¹¹¹ Starting in 2004 with a non-profit in Philadelphia, the program has grown to a nationwide success, providing networking, education, and healthy food options in corner stores, which often provide the sole source of nutrition for inner-city residents.¹¹² Patience is required for programs like this, as outcomes may not be seen for a generation or appear indirectly through a decrease in chronic diseases.

3. Implement healthy community planning. In addition to making healthy food accessible to the general population, communities should also strive to create environments discouraging sedentary lifestyles. A guest lecturer at the Eisenhower School defined community planning from a health perspective; while most architects intuitively design "green" buildings to use minimal energy, health does not garner similar consideration.¹¹³ Proper community planning can promote physical activity for its residents and serve as a deterrent for preventable diseases. Cities should consider policies mandating sidewalks and parks in new development plans. In established areas, communities should consider maximizing spaces to promote physical activity. The federal government can, and should, assist communities in this endeavor by incentivizing this type of health-seeking development. For example, infrastructure modernization grants can be provided to make communities better suited for pedestrians and bicycles.

4. Incentivize the individual. Health improvement requires patience and perseverance, and demands a measured, multi-sector approach that includes modifications to health insurance coverage and clinician case management. Clinical preventive services are already mandated in the ACA and should continue to be required. More specifically, the ACA requires insurance coverage for evidence-based screening and counseling, routine immunizations, preventive services for children and women, and other health promotion services.¹¹⁴ In addition to the mandated insurance coverage targeting clinical preventive services, private employers and insurance firms should consider expanding incentives for healthy community and individual living. As an example, consider incentives targeting healthy living choices such as employer-



sponsored exercise time, healthy nutrition options in the work environment, and evidenced-based healthy behaviors. A holistic approach to chronic disease prevention and management requires action by consumers, producers, healthcare providers, businesses, and all levels of government.

5. Prevent insurance market failures and improve cost and value to consumers.

Health insurance firms are close to creating market failures due to the untenable risk assumed when narrow groups of the population are privately insured. These firms must remain in markets, as they have proven effective to produce value when properly configured. Larger pools lead to less risk for firms and facilitate access to more consumers. To guarantee coverage, the federal government should consider collecting income-based premiums as an increased deduction under the Federal Insurance Contributions Act (FICA). Additionally, the federal government can empower states to disburse funds to private insurance firms and eliminate the group insurance requirement for employers. This framework already exists in Germany and Australia, both of which enjoy favorable outcomes.¹¹⁵ However, not to be conflated with the single-payer system, this initiative implements the ACA mandate through private exchanges and seeks to broaden risk pools with those who consume less healthcare, especially in markets where risk is increasing for insurance firms. Private insurance firms should be able to thrive in viable markets owing to the broader risk pools. Additionally, the federal government avoids excessive overhead by disbursing to the states, who could assist with fund management and disbursement.

Insurance market corrections can reduce cost and improve access without compromising quality. The California Public Employees' Retirement System (CalPERS), which provides health insurance for 1.3 million people, offers an example of how this relationship between insurer and insured can be effective. After paying anywhere from \$12,000 to \$75,000 for joint replacement surgery, CalPERS reduced the cost of the procedure in California hospitals by 60 percent simply by setting a maximum price and requiring consumers to pay out of pocket for any cost exceeding the reference price. Once it was clear leading hospitals in California could meet CalPERS's price, it did not take long for others to follow.¹¹⁶

6. Target incentives for healthcare delivery using telemedicine. Medicare's reimbursement for telehealth should expand and reduce barriers. In 2015, Medicare paid \$17.6 million for telehealth services spread across 272,000 claims.¹¹⁷ While these results include a 27-percent increase in telehealth claims and a 25-percent increase in total payments, the growth in total payments is not attributable to reimbursement increases, but rather to more providers employing telehealth services with their patients.¹¹⁸ A bipartisan group of Senators has introduced legislation to remove many of the existing telehealth restrictions under Medicare, including stipulations that the patient must be located in a Health Care Professional Shortage Area and must originate a telehealth consultation from a qualifying medical facility.¹¹⁹

7. Support cognitive computing research and ease EHR data sharing barriers.

Cognitive computing with industry giants like IBM may also reveal more efficient means of delivering healthcare from administrative and clinical perspectives. Consequently, the federal government should consider incentivizing cognitive computing use for disease recognition, predictive analytics, and other optimal treatment options. Data accumulation on proprietary digital platforms deserves similar attention to reduce sharing and interoperability barriers. Revising Health Insurance Portability and Accountability Act (HIPAA) requirements may



encourage interoperability between systems and data aggregation. The federal government should play a more predominate role in standardizing EHR requirement that result in improved interoperability without sacrificing proprietary information or patient privacy. The resulting aggregate data will have a significant impact on both healthcare delivery and population health. Similarly, improved EHR interface can provide additional mechanisms for patients to access providers (e.g., review test results, provide feedback on the efficacy of procedures, ask questions, etc.), while also offering potential for improved patient engagement in their own health.

8. Reform existing laws to reduce pharmaceutical costs. The federal government can reduce pharmaceutical costs for patients by modernizing the Hatch-Waxman Act to focus on three broad areas of reform without compromising industry innovation. The first area addresses the practice of “evergreening,” by curbing the ability of brand-name drugs to extend exclusivities or patent protections through slight modifications. The combination of a 20-year patent and a guarantee of market exclusivity following FDA approval provides sufficient incentive for pharmaceuticals to develop new, innovative drugs. The second reform area provides the FDA greater discretion to dismiss a competing drug company’s citizen petition. Dismissal discretion prevents a brand-name drug company from using FDA regulations to maintain a market advantage. The third broad area involves complex generic drug approval. Reforms to the Hatch-Waxman Act should provide the FDA more latitude to accommodate safe generics which do not “trigger patient confusion or present other public health risks.”¹²⁰

CONCLUSION

Healthcare spending in the United States occupies an untenable share of the federal budget and will continue to outpace GDP growth if measures are not taken to reform the industry. Hospitals, pharmaceuticals, and insurance providers combine with heavy government regulations to create a complex, fragmented, and inefficient delivery system that ultimately confuses the general population and masks the true costs of healthcare. It is also a system characteristically designed to profit from disease rather than health and incentivizes quantity over quality. While system-wide reform is clearly needed, there is a clear lack of national consensus reflected in the struggle Congress currently faces in enacting a comprehensive solution to the national healthcare debate. This national discord all but guarantees any needed relief will be hard-fought and protracted.

The recommendations provided in this report to improve population health and healthcare delivery are by no means comprehensive. Recalling the systemigram in Figure 1, a change to one node within the healthcare sector will most certainly affect others. Similarly, if one industry within the sector innovates and seeks efficiencies, it will influence other industries to also reduce costs, increase access, and embrace value-based outcomes. While the future seems bleak, system-wide reform will take patience and commitment; “little wins” in local markets are already taking hold across the country. There is no ability to simply execute a “cold reboot” of the American healthcare system; pragmatic changes will empower consumers with information to make quality decisions in the prevention and treatment of chronic diseases to affect a problem set spanning generations. From producing the world’s healthiest and fittest military force to providing sound nutritional options for our inner cities, healthcare reform is an imperative. Our prosperity and security as a nation depends on it.



ESSAYS ON SELECT TOPICS IN HEALTHCARE

Global Health

Global health is defined generally by the World Health Organization (WHO) as the health of populations in the global context. A 2009 article from *The Lancet*, “Towards a Common Definition of Global Health,” defines it as “the area of study, research, and practice that places a priority on improving health and achieving health equity for people worldwide.”¹²¹ From a foreign policy and national security perspective, and from the donor perspective of the United States, global health is viewed in terms of international engagement with efforts to promote better health outcomes worldwide. This engagement is called *health diplomacy*.

In considering threats to global health, and the potential impact of these threats to national security, some very positive trends emerging over the past two decades must be acknowledged, particularly among the poorest and most vulnerable segments. These gains are an overlooked and, perhaps, surprising good news story among the doom and gloom assessments of the state of the world’s poor, and much of these gains are attributable to international efforts to reduce poverty and improve health and nutrition. With support from the United States and other donor nations, major progress has been achieved towards the United Nations’ eight Millennium Development Goals (MDG), a 15-year plan established in 2000 to alleviate poverty and improve health, nutrition, and other essential indicators of wellbeing among the world’s poor. In 2016, the United Nations reported significant progress towards these goals including the following:¹²²

- An upward trend in malaria cases was reversed and 6.2 million malaria deaths were averted since 2000;
- The number of individuals living in extreme poverty worldwide declined by more than half since 1990, falling from 1.9 billion to 836 million (with biggest drop since 2000);
- Maternal mortality dropped by 45 percent since 1990, with most of the improvement in South Asia and Sub-Saharan Africa where the majority of the world’s poor reside;
- Child mortality (i.e., children under five) dropped by more than half since 1990; and
- New HIV infections fell by 40 percent between 2000 and 2013, and international donor-funded anti-retroviral therapy was credited with averting 7.6 million deaths since 1995.

The primary global health concerns for the consideration of United States policy-makers, and the international community writ large, are demographic realities. The most troubling is population growth in poorer nations, which negatively impacts the health status of local populations due to elevated demands on resources such as clean water, environmental degradation, etc. An additional major concern is decreased access to civilian populations in major conflict zones (e.g., South Sudan, Yemen) resulting in denial of basic market activity, essential services such as clean water and basic health care, vaccines, and humanitarian assistance where emergency need exists. Furthermore, severely conflict-affected regions, and failed or failing states, are in some cases producing massive outward migration and regional



instability. Pandemic disease and the threat of transnational or transregional spread of infectious diseases – as has been witnessed during outbreaks of respiratory syndromes, Avian influenza, and Ebola – pose economic and potential national security threats to the United States and the international community. Therefore, the United States and other wealthy nations have a direct stake in the health status of global populations, particularly in volatile regions and in failing or potentially failing states. **The economic and national security interests of the United States and its allies are best served by their continued investments in ensuring basic health standards globally and especially in these vulnerable regions.**

The United States is the global leader among donor nations in investments to promote basic health standards and prevent the spread of infectious disease in the developing world. United States efforts to promote global health and nutrition are primarily unilateral but also include multi-lateral efforts through the United Nations and other instruments. United States government investments in global health are directed primarily through the United States Agency for International Development (USAID), Department of State (HIV/AIDS prevention and support of the Global Fund), Centers for Disease Control and Prevention (a component of the Department of Health and Human Services), and the Department of Defense (DoD). DoD has important capabilities to support major emergency health responses such as the Ebola crisis, but these are typically limited to logistical and material support, not direct care, and are used sparingly. Private-sector donors in the United States and Europe have emerged as major players to promote health, access to clean water, and combat infectious disease transmission; a leader among them is the Bill and Melinda Gates Foundation, which plays a major role in addressing malaria, tuberculosis, and HIV/AIDS.

In most developing world nations, especially in conflict-affected regions and where good governance is lacking, local government investments in health fall far short of requirements, which contributes to lack of access to services by the poorest segments of local populations. This creates major practical and policy dilemmas for the United States and the international donor community, as sustainable solutions ultimately must include local government policy commitment and resource investment. To plan effectively for the coming decade, the United States government and its foreign affairs agencies will need to fully assess the state of global health concerns, particularly in volatile regions, as the impacts of degraded health conditions, massive outward migration, and spread of infectious disease are indeed a threat to the security and economic wellbeing.

Military Healthcare System

The Military Health System (MHS) is a global health enterprise. It serves to fulfill the commitment to care for America's Service Members and their families. Within the MHS, the Army, Navy, and Air Force Medical Departments support their respective Services with separate hospitals, clinics, and systems focused on ready warfighters and a ready medical force. The MHS is enormous with 55 hospitals and 373 clinics; filling over 2.5 million prescriptions, delivering over 119,000 babies, and providing 1.9 million clinic visits per year.¹²³ The MHS is much more than combat care and garrison hospitals; the organization encompasses a public health system, education and training system, comprehensive medical and research and development program, hospital system, outpatient care, and a health insurance plan.¹²⁴



The MHS employs the Quadruple Aim for strategic direction, focused on increased readiness, better care, better health, and lower costs.¹²⁵ In 2014, The Secretary of Defense launched an extensive review on access, quality, and safety with comparison to national standards and benchmarks for more than 100 metrics. Overall, the report demonstrated, “MHS meets or exceeds many internal and external standards and benchmarks in the areas of access, quality, and safety, but there is variability within MHS and some performance gaps.”¹²⁶ The MHS Review provided an unprecedented opportunity to share and compare data with the civilian sector and resulted in six major recommendations and more than 70 specific recommendations. Although, it highlighted variability throughout the enterprise and a need for continuous evolution in the MHS,¹²⁷ “the report provided no evidence of substantive deficiencies in the safety, quality, and access to care at MHS that would warrant broad and urgent changes.”¹²⁸ Pockets of mediocre performance are not acceptable when caring for America’s Sons and Daughters and the MHS started the journey of improvement to a high-reliability organization. With the cost to the taxpayer at \$50 billion,¹²⁹ this system is also targeted for efficiencies. Former Secretary of Defense Robert Gates stated, “healthcare costs are eating the Defense Department alive.”¹³⁰ The Defense Health Budget for 2017 was 9.4 percent of the DoD budget.¹³¹ Consequently, policy recommendations to achieve better quality and value include:

1. Revoke the NDAA 2017 provision that directs the Defense Health Agency to take responsibility for the administration of each MTF. The most recent NDAA places the management of all MTFs under the DHA, moving the medical departments further from their respective Services and closer to a consolidated medical force to gain efficiencies. The unification of the Military System is an over-studied topic with recommendations that vary, most ending in some merger of the three Service Medical Departments.¹³² These studies do not sufficiently address the outcomes and risk in combining this complex system and fail to recognize that realignment of medical services has a secondary impact in aligning away from the warfighter. The DHA provided cost savings and requires time to mature and capitalize on its gains and continue to enhance market sharing in geographic areas. Service Medical Departments should continue to focus on healthcare delivery and a ready medical force. Aligned with the warfighter, these departments will remain relevant and the MTF platforms provide the foundation for clinical currency and medical leadership opportunities to support a ready medical force.

2. Establish additional clinical centers of excellence and identify measures of success for integrating patient safety, information technology with analytics, and administrative support. Clinical business processes and patient safety must be aligned with technology. DHA is responsible for the new electronic health record (EHR). The MHS should develop additional centers of excellence within the direct care system and align administrative support to develop practice guidelines and integrate them into the EHR, clinical business process, patient safety services, and quality measures across all MTFs at a quicker rate with more integration than current guidelines. Clinical centers of excellence support volume in healthcare conditions and these models spark innovation, leverage process improvement, decrease variation, and improve value.¹³³ “Quality improvement is the most powerful driver of cost containment and value improvement, where quality is health outcomes.”¹³⁴ The MHS has few centers of excellence such as the Joint Trauma System which provides care, evaluates outcomes, creates new knowledge, and produces guidelines. This, as well as models, such as the clinical process improvement teams at Intermountain Health, provide examples for consideration.¹³⁵



3. Patient Safety Reporting software should be overhauled for greater usability by clinicians and leaders at the MTF level for improvement, such as real-time application based notifications, as well as integration with the EHR and big data for predictive modeling and analytics. In 2014, the MTFs reported 174 sentinel events; each incident requires a root cause analysis which includes recommendations of measures to prevent reoccurrence.¹³⁶ Patient safety numbers are also readily available; personnel reported a total of 81,433 harm events with another 40,907 near misses in 2014.¹³⁷ Despite the aggregate data, the Patient Safety System is difficult to use and does not allow for timely analysis, feedback, and search capability at the user level where performance improvement initiatives are born.

4. The MHS should move from civilian sector fee-for-service and determine a health-focused outcome measurement system to determine staffing in direct care and focus on value-based reimbursement in purchased care. The goal for the customer is better health while the private industry incentivizes treatments, prescriptions, and procedures. Organizations that combine payer and healthcare provider systems are designed to bridge this divide, although it is not the norm for United States healthcare. Civilian healthcare is not bound by the same federal regulation nor is it responsible for readiness or global healthcare.

5. Legislative leaders should stabilize funding across the MHS and reform human resource policies to support an agile and responsible system to include work hours and hiring and firing practices for healthcare personnel. Areas for improvement include utilizing additional title 10 employees,¹³⁸ direct hire authority, adaptable hours to fit the workload, and decreasing hiring time will enable the MHS to attract and retain the best talent.

If the MHS builds a quality healthcare system comparable to the highest performing firm in the civilian sector, it has failed. The mission of the MHS is extensive and encompasses far more than the civilian sector offers. It must remain vigilant to avoid blindly investing in practices without analysis of possible unintended effects that disrupt the support to the warfighter and the focus on health and readiness. Understanding stakeholders, culture, and the human factor in the pursuit of excellence is essential when considering realignment of capabilities to improve efficiency. Military medicine adapts over time and in the continued pursuit of improvement, it can become a leader in the goal of value-based healthcare in the United States.



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