

HEALTH CARE EXPENDITURES AND OUTCOMES IN THE UNITED STATES AND JAPAN:

YOU DON'T ALWAYS GET WHAT YOU PAY FOR

By

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A Thesis Submitted to the Honors College

In Partial Fulfillment of the Bachelors Degree
With Honors in

Physiology

THE UNIVERSITY OF ARIZONA

DECEMBER 2017

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ABSTRACT

For the first time in decades, life-expectancy in the United States declined, while U.S. per capita health expenditures hit an all-time high - more than 2.5 times the average for all other countries. In contrast, Japan spends far less per capita on health care, yet has the highest life expectancy of developed countries. This thesis explores correlations between health care financing and population health outcomes in the U.S. and Japan. Research included an extensive literature review and analysis. Lessons from Japan's health care system could inform U.S. health reform initiatives such as investing in and expanding primary and preventive services. As Americans shoulder more health costs through co-pays, deductibles, and cost sharing, more transparency and education about the cost of care could affect individual decisions about accessing health services.

INTRODUCTION

For the first time in decades, U.S. life expectancy declined from 78.9 to 78.8 years between 2014 and 2015,¹ causing alarm in researchers^{2,3} and inciting mass media attention.^{4,5} Life expectancy had not fallen since 1993 when HIV-related deaths were at all-time highs.⁶

The U.S. has one of the lowest life expectancies of developed countries, yet spends 2.5 times the world average on health care.⁷ For comparison, Japan has the highest life expectancy in the world at 83.7 years.⁸ The U.S. has a fragmented, multi-payer health care system, with publicly subsidized health coverage (including Medicaid and Medicare), private tax-exempt employer-sponsored insurance, individual health insurance (also called non-group coverage)

provided on or off the Affordable Care Act's (ACA's) state and federally facilitated Marketplaces⁹ and 28 million individuals without health insurance coverage.¹⁰

Most developed countries have single-payer, "universal" government-run health systems¹¹ using tax revenue to purchase health services for the country's population. While multi-payer coverage generally has less government controls and more consumer choices of insurers and health providers,⁷ single-payer is typically government controlled and offers fewer coverage and provider options.⁹ Out-of-pocket expenses¹² differ in multi- versus single-payer health systems, possibly influencing individual access to care, and population health outcomes.

Japan has a universal system where all citizens are required (mandated by law) to have health insurance.¹³ Japan has lower per capita health costs, with better population health outcomes than the U.S., in terms of infant mortality and life-expectancy.¹⁴ Health care cost has been a primary reason for health system reform in many countries.¹⁵ In 2010, the U.S. enacted the ACA, reducing the uninsured rate to historic lows.^{10,16} However, U.S. health expenditures continued to increase¹⁷ while life expectancy declined.¹

This thesis explores correlations between the financing of health coverage, payment for services in multi- versus single-payer health systems, the rising costs of health care, and population health outcomes including life expectancy. Further, the U.S.'s multi-payer health system will be compared to Japan's single-payer system.

MULTI-PAYER VERSUS SINGLE-PAYER

'Single-payer' and 'universal' are often use interchangeably to describe national health systems. Israel and the Netherlands have 'universal' systems with multi-payer components.

Every taxpayer is required to sign up for coverage with one of the many competing insurers¹⁸ rather than being enrolled in one centralized government-sponsored single-payer program.

Developed countries have unique aspects in their universal, single-payer, or multi-payer health care systems.¹¹ The U.S. is the only developed country with a multi-payer system that leaves a significant portion of its population uninsured (8.8% or 28 million individuals).^{10,19} Health system financing also varies between countries in terms of cost sharing components,¹¹ government subsidization of the delivery system or coverage, employer sponsored coverage, and individual or family responsibility through premiums, deductibles, co-payments, and out-of-pocket spending.^{9,18} In universal systems, financing comes primarily from tax revenues, with variable degrees of cost sharing from those insured.⁹ Multi-payer systems tend to have more costs covered by those insured.¹¹ Collecting insurance revenues via taxes in single-payer systems can be more cost efficient with lower administrative costs.⁹ It can also increase the enrollment participation and thus spread the fiscal risk across a larger population. Multiplayer systems may allow insurers to decide which benefits are covered, build a contractual network with health providers, and charge more based on different factors (location, age, pre-existing medical conditions, gender and other risk factors) to mitigate fiscal risk and control costs.^{9,18}

HEALTH CARE SYSTEMS: U.S. VERSUS JAPAN

United States

Almost all Americans with health insurance coverage receive federal subsidies, including almost half (150 million or about 47%) of the U.S. population covered by employer-sponsored health insurance (ESI).²⁰ ESI limits employee choices in terms of insurers and their contracted

health providers; less than 30% of those with ESI have unrestricted access to providers.¹¹ ESI premiums are exempt from federal income and payroll taxes, as is the portion of premiums paid for by employees. The ESI tax exclusion represents an estimated \$260 billion tax expenditure, the largest single U.S. tax expenditure in 2017.²¹

Publicly sponsored and/or subsidized health insurance in the U.S. is authorized through Social Security Act (SSA) titles including Medicare (Title XVIII), Medicaid (Title XIX), the Children's Health Insurance Program, CHIP (Title XXI), the ACA Marketplace, and by TRICARE (covers active duty, dependents, retired service members and families) programs – which combine to cover 141 million or 44% of Americans.²² The ACA created state and federally facilitated Marketplace coverage plans, with subsidies to help pay the cost of premiums and other cost sharing through advance premium tax credits (APTCs) and cost sharing reductions (CSRs).^{7,23} Eligibility, enrollment periods, and benefits vary by program. Even these publicly sponsored or subsidized programs are often rechanneled through private health insurance vendors (including state Medicaid programs, Medicare Advantage plans – also called Medicare Part C, and TRICARE).^{7,11,23,24} There are many other Americans covered by publicly sponsored or subsidized health insurance (including federal and state employees in government and public education institutions) who tend to be included in employer sponsored insurance numbers.²³

Publicly sponsored insurance, including Medicare, Medicaid, CHIP, ACA and TRICARE, covers 44% of the population. Medicaid and CHIP cover 75 million Americans, Medicare covers 57 million, 9 million are covered by both Medicaid and Medicare, 2 million are on both TRICARE and Medicare, ACA's effectuated enrollment is 10.3 million, and TRICARE covers 9.4 million people.²²⁻²⁶

Medicare – Enrollment of 57 million in 2017, Expenditures of \$646 billion in 2015

Medicare is publicly subsidized health insurance for those at or above the age of 65, permanently disabled, or those with end-stage renal disease. Medicare covers 18% of the population.²⁷ Medicare is divided into parts, A through D.

Medicare Part A primarily covers inpatient hospital costs, but not for long-term care and only for medically necessary procedures, as it covers only hospital services but not physician services provided in the hospital. It covers hospice care if the patient is diagnosed with a terminal illness and has a life expectancy of six or less months. Part A requires no premium cost sharing for most beneficiaries²⁷ after a \$1,316 deductible is paid.²⁸

Medicare Part B is an optional add-on service that covers outpatient services such as physician services, chemotherapy and some preventive care measures, like diabetes screenings and mammograms.²⁷ In 2017, Part B has a standard monthly premium cost share of \$134, with an additional \$183 per year deductible. Following meeting the Part B deductible, the standard beneficiary also pays for 20% of the cost of services.²⁸

Medicare Part C, or Medicare Advantage, is a combined plan of both Part A and Part B through Medicare-approved private insurers. Additionally, most Medicare Advantage plans cover prescription drug coverage.²⁷ The premiums for Part C vary depending on the selected plan, and one can expect to have to pay copayments and deductibles.²⁸

Medicare Part D provides prescription drug coverage as an additional plan added on to Part A and B, but is often combined in Part C Medicare Advantage plans. Part D will cover all prescription drug costs up to a certain amount (dependent on the plan) per calendar year.²⁷ Like Medicare Advantage plans, the premiums and cost sharing are dependent on income level.²⁸

Medicaid/CHIP – Enrollment of 75 million in 2017, Expenditures of \$555 billion in 2015

Medicaid is a state and federal publicly-funded health insurance with many eligibility categories, benefits, and requirements that vary considerably between states. It is closely aligned with the Children’s Health Insurance Program (CHIP), and often uses the same eligibility and enrollment system in states. Over 23% of Americans are on Medicaid (70M) or CHIP (5M), and over half of the Medicaid/CHIP enrollees are low-income children.^{24,25} By Social Security Act statute, no less than half of a state’s Medicaid program costs are paid for by the federal government, based on a formula related to a state’s per capita income compared to the national average, and modified each year. The federal share of a state’s Medicaid program costs is called the Federal Medical Assistance Percentage (FMAP), averages 57% across the states, and ranges from 50-75%.²³ The federal government provides at least half of the Medicaid program funding, but is administered by each state.¹¹ The ACA allowed states to expand Medicaid eligibility to 138% of the Federal Poverty Level (FPL). The FPL is re-calculated and announced each January in the Federal Register.²⁹ To date two-thirds of the states have expanded Medicaid.²⁵ Medicaid covers low-income children, pregnant women, childless

adults, the disabled, and those on long-term medical care such as in assisted living and residence in nursing homes.¹¹

The U.S. health care system is the most costly in the world, with unsustainable annual increases in cost growth, and millions without health insurance coverage or access to affordable health care. The average cost of care per person in the U.S. was \$9,990 in 2015,²² more than 2.5-times the Organisation for Economic Co-operation and Development (OECD)³⁰ average of \$3,661 per person per year.⁷ Government spending has also steadily increased. In 2015, U.S. health expenditures hit \$3.2 trillion, representing 17.8% of the nation's Gross Domestic Product (GDP),³¹ and an increase from 17.1% GDP in 2013.⁷ National health expenditures and per capita spending are projected to increase 5.6% and 4.7% per year, respectively until 2025.³² The spiraling costs of pharmaceuticals contributes to these increases.³³

Out-of-pocket health spending in the U.S. is second highest of the OECD countries, an average of \$1,054 per person in 2016. Self-pay decreased in the past few years due to increased coverage of 20 million Americans.³⁴ Only Switzerland spent more out-of-pocket at \$1,630 per person. Considering the payment of premiums and other private spending, the U.S. spent an average \$3,442 per person.⁷ For public spending, the U.S. is one of the OECD countries, along with Norway and Netherlands, to spend the highest at an average of \$4,197 per person.⁷ While many OECD countries cover upwards of 90% of health care costs, the U.S. government spends about half that amount.¹¹

The U.S. averages 4.0 annual physician and hospital visits annually; the OECD averages 6.5 visits. There are fewer acute care hospitals and physicians in the U.S. than the world average.⁷ Demand for health services increases as the population grows and ages.^{35,36} The number of practicing physicians in the U.S. is not keeping pace with population growth and demand.³⁵ Waiting times for health services are lower and utilization is higher in other developed countries.¹¹

Japan

Japan has a universal health care system, also known as a “social insurance system,” which was established in 1961 and is overseen by three entities: (1) Health Insurance Society, (2) Japan Health Insurance Association, and (3) National Health Insurance. Health Insurance Society is intended for those working for large private businesses. The Japan Health Insurance Association provides insurance for individuals working for smaller and medium-sized enterprises. National Health Insurance is operated by municipalities rather than the federal Japanese government.³⁷ There are two insurance subsystems: (1) Employment-based Health Insurance and (2) National Health Insurance. Larger organizations and businesses are required to provide Employment-based Health Insurance to employees and their dependents. National Health Insurance provides insurance coverage to employees of small enterprises (those that financially are unable to provide insurance), self-employed individuals, and those unemployed and retired.³⁸

With the use of an insurance card, Japanese citizens are able to access low-cost medical care.^{37,38} There is no limit to how many times a patient can visit a hospital or clinic. In Japan, it is

more common for individuals to visit hospitals than clinics for outpatient procedures.³⁸ Japan has the highest number of hospital and physician visits by individuals of the OECD developed countries.⁷

However, Japan also has the lowest ratio of practicing physicians to population – even lower than the U.S. ratio. This may be due to the relatively low fee-for-service reimbursement set every two years³⁹ by a committee made up of the Health Ministry and the Central Social Insurance Medical Council. Reimbursement is based on points assigned for each service relating to the level of skill required and the cost of providing the service.⁴¹ Japan leads the OECD countries in the number of acute care hospitals and rate of MRI and CT utilization.⁷

Japanese health care financing is by public subsidy from taxes (32%), insurance premiums (34%), patient out-of-pocket expenses (12%), and employer contribution (22%).⁴¹ Inpatient medical services are costly for those under the age of 70, reaching upwards of 25% of an individual's average annual income. Out-of-pocket spending increases with age until age 70,³⁸ when it declines 60-80%. Prior to 1983 those over 70 years of age received free health care.³⁸ The number of visits increases drastically when individuals turn 70, partially due to the decrease in cost sharing. Many also wait to have surgeries until they turn 70.³⁸ The average out-of-pocket cost per person in Japan is as low as \$503, private spending on premiums averages \$124, and public spending per capita averages \$2,965 per year.⁷ Even though Japan has low-cost health care compared to other developed countries, costs are steadily increasing, especially for pharmaceuticals – second only to the U.S. for medication costs per capita.⁴²

The rate of growth of spending is higher than all other developed countries, in part due to the aging of the population and other factors.^{39,42} Japanese hospital beds are more often

occupied by less urgent cases, diminishing capacity for higher severity admissions.³⁹ The overcrowding of public hospitals, lower pay, and long hours contribute to physician shortages in the public sector, as they leave to practice in private facilities.³⁹ Japan addresses shortages by increasing the number of medical school admissions.⁴³ There are also concerns of quality of care in primary care facilities in comparison to hospital care, and a lack of differentiation of services provided by each type of facility.⁴⁴

LIFE EXPECTANCY & POSSIBLE FACTORS

Life expectancy is one population health outcome metric that has been used to compare health systems.⁴⁵

United States

Male life expectancy decreased by 0.2 years and females by 0.1 year between 2014-15. For those age 65 years, life expectancy remained at 18 years for males and 20.6 years for females, an average of living 19.4 years after age 65 for both sexes.¹ The decline could be due to increases in the leading causes of death (Tables 1-3).⁵

Table 1. The ten leading causes of death comprise 74.2% of all U.S. deaths:

- Heart Disease
- Cancer
- Chronic Lower Respiratory Diseases
- Unintentional injuries

- Stroke
- Alzheimer's Disease
- Diabetes
- Influenza and Pneumonia
- Kidney Disease
- Suicide

*Table 2. Eight of the ten leading causes of death had significant **increases**:*

- Heart Disease (0.9% increase)
- Chronic Lower Respiratory Diseases (2.7%)
- Unintentional Injuries (6.7%)
- Stroke (3.0%)
- Alzheimer's disease (15.7%)
- Diabetes (1.9%)
- Kidney Disease (1.5%)
- Suicide (2.3%)

*Table 3. Two of the ten leading causes of death had a **decrease or no changes**:*

- Cancer (1.7% decrease)
- Influenza and Pneumonia (no change)

There was no significant increase for overall U.S. infant mortality rates,¹ but continues at an alarming 6 deaths per 1000 live births, compared to the OECD the average of 3.5.^{7,46} U.S. infant mortality rate is twice as high for individuals with lower socioeconomic status.⁴⁶ The leading causes of infant mortality in the U.S. are shown in *Table 4*.

Table 4. Ten leading causes of infant mortality comprise 68.8% of all U.S. infant deaths:

- Congenital malformations
- Low birth weight
- Sudden infant death syndrome
- Maternal complications
- Unintentional injuries
- Cord and placental complications
- Bacterial sepsis of newborn
- Respiratory distress of newborn
- Diseases of circulatory system
- Neonatal hemorrhage

The only significant change from 2014-15 in infant deaths was an increase of 11.3% of Unintentional Injuries from 29.1 (per 100,000 live births) in 2014 to 32.4 in 2015.¹

The age-adjusted death rate increased 1.2% from 2014 to 2015, and a significant increase was noted for non-Hispanic black males (0.9%), non-Hispanic white males (1.0%) and

non-Hispanic white females (1.6%). There was no significant change noted for non-Hispanic black females, Hispanic males and Hispanic females.¹

The U.S. has one of the lowest rates of smoking of developed OECD countries. The U.S. ranks the highest in obesity and alcohol consumption is increasing;⁴⁷ both are risk factors for cardiovascular disease (CVD), which is the leading cause of death in the U.S., causing one-third of all deaths, and generating about 17% of all U.S. health spending.^{48,49} CVD cost is projected to increase significantly by 2035, when it will affect 45% of the population⁵⁰ and nearly triple⁴⁹ CVD-related national health care expenditures to over a trillion dollars.⁵⁰

Japan

In Japan, average life expectancy is the highest in the world at 83.7 years, 80.5 years for males and 86.8 years for females.^{3,42} Japan also has the lowest infant mortality rate of all developed countries at 2.1 per 1000 live births² and the lowest CVD rate of the OECD developed countries.⁴² However, Japan has a higher rate of hospital admissions for diabetes, and has among the highest suicide rates.⁴² See *Table 5*.

Table 5. The ten leading causes of death in Japan in 2015-16:⁵¹

- Alzheimer's Disease (69.4%)
- Heart Disease (16.1%)
- Cerebrovascular Disease (8.4%)
- Lower Respiratory Infections (25.2%)
- Lung Cancer (15.6%)

- Stomach Cancer (4.1%)
- Colorectal Cancer (15.8%)
- Chronic Kidney Disease (31.0%)
- Liver Cancer (4.5%)
- COPD (24.2%)

While the U.S. has increasing alcohol use, Japan experienced a decline. However, almost 70% of the alcohol is consumed by only 20% of the population,⁴² which could be indicative of higher rates of alcoholism or dangerous drinking habits in the population.

Life expectancy in Japan may be higher due to “diet, regular physical activity, extended work years, and aggressive government intervention.”⁵² Japan has focused on prevention and reducing CVD and other risk factors.⁵³

DISCUSSION & ANALYSIS

Life expectancy has been increasing in the U.S. for decades. However, in 2015 life expectancy declined even as health expenditures continued to rise. Many variables contribute to mortality and life expectancy. Correlations between the increasing cost of health care and declining U.S. life expectancy in the U.S. could not be obtained from literature review alone. Possible explanations for the decline in life expectancy include the high cost of care delaying or discouraging necessary health care and preventive services, shifts in cost sharing to individuals, rising rates of obesity and other CVD risk factors, the aging of the population, shortages of

accessible health providers, the rising costs of pharmaceuticals, and other factors. Eight of the ten leading causes of death in the U.S. increased as life expectancy declined.

Japan's lower-cost care correlates with its higher life expectancy, but additional factors including diet, regular activity, access to primary and preventive services, and lifestyle factors may also contribute. Additional population health research could identify which factor(s) measurably improve health outcomes such as the type of care available (primary and preventive services, specialty care, hospital, ambulatory, and other health services), the costs and cost sharing for health services, demographics (race, ethnicity, socioeconomic, gender and other factors), type of insurance (public, private, employer sponsored, individual/non-group, single-payer, combinations of public-private government), and facilitating and obstructing factors in accessing high quality, affordable health services.

The U.S. and Japan have very different health care delivery and financing systems, different lifestyles, diets and other cultural and environmental factors. The U.S. health care system is the most costly in the world, yet its population health outcomes do not favorably compare to developed countries that spend far less. Japan's costs are relatively low with some of the best population health outcomes.

In the U.S, Medicare eligibility begins at age 65 with substantial individual cost sharing. In Japan, National Health Insurance eligibility is at age 70, with far less cost sharing. Both populations are aging, increasing health services demand and the rate of growth of health expenditures by the elderly population. The U.S. health system is changing rapidly, with major shifts in public and private health coverage and costs. Japan's system is more cost efficient with better population health outcomes in a universal system offering some consumer choice in

providers. Japan's system reviews reimbursement and costs, and updates provider payment for health services biannually. In the U.S., little policy attention has been given to the most rapidly rising component of health expenditures – pharmaceutical costs.

Japan's health system focuses and invests in primary care and prevention especially for the leading causes of disease morbidity, mortality and costs. CVD is the leading cause of U.S. deaths and a significant percentage of its national health expenditures. The U.S. could learn from Japan's approaches to provision of primary and preventive care, management of chronic disease, and promotion of healthy lifestyles that reduce CVD.

METHODS

The literature review used the following keywords: *United States life expectancy, United States health care system, United States disease and cost, Japan life expectancy, Japan health care system, Japan health care costs, world health care systems and life expectancies*. PubMed was primarily used in the search of peer-reviewed journal articles. Other sources included OECD, the Commonwealth Fund, Kaiser Family Foundation, and other publicly available data resources not published in peer-reviewed journals.

ACKNOWLEDGEMENTS

The author gratefully acknowledges Daniel Derksen, M.D., Professor of public health at the University of Arizona Health Sciences, Mel and Enid Zuckerman College of Public Health, Department of Community, Environment and Policy for his support throughout the research, writing, and editing of this manuscript.

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