

# Navigating the Healthcare Conundrum: Leadership Perspective from a Premier Healthcare Organization in Loma Linda's Blue Zone

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**Abstract:** Navigating the healthcare conundrum in the Blue Zone of Loma Linda, California, requires understanding the unique factors that make this region stand out in terms of health and longevity. But more important is understanding the healthcare system sustaining the Blue Zone in Loma Linda, California. In an era marked by soaring healthcare costs and diminishing reimbursement rates, hospitals and physicians face an unprecedented challenge: providing excellent patient care while maintaining financial sustainability. This leadership perspective publication paper delves into the multifaceted struggles encountered by healthcare and hospital leaders, exploring the root causes, implications, and potential solutions for this complex issue. As we examine the evolving healthcare landscape, we aim to shed light on the critical need for innovative approaches to sustain the future of healthcare excellence in one of the five original Blue Zones.

**Keywords:** blue zone, Loma Linda, healthcare cost, leadership healthcare, longevity, California

## Introduction

### Blue Zone Intro

The National Geographic fellow and Blue Zones founder, Dan Buettner, is credited for discovering and creating the concept of Blue Zones. His work designated five locations worldwide as Blue Zones: 1. Japan's Okinawa; 2. Sardinia, Italy's Ogliastra Region; 3. Nicoya Peninsula, Costa Rica 4. Ikaria, Greece, and 5. Loma Linda (California).<sup>1</sup>

Blue Zones, as defined by Dan Buettner's research, are areas or locations with a high percentage of elderly individuals free of conditions including obesity, cancer, diabetes, and heart issues.<sup>2</sup> Using four categories, practices and characteristics in the Blue Zones, Buettner and his team found nine commonalities.

These are: 1. move naturally, right outlook about exercising; 2. purpose in life; 3. downshift the stressors in life; 4. 80% rule: eating wisely and stop eating before being full; 5. plant slant; 6. wine at five (except Adventists); 7. right tribe that supports healthy behavior; 8. loved ones first; and 9. belonging to a faith-based community. These elements, which are grouped together as the Power of 9, are arranged in a triangle with the idea of belonging and the three elements—commonalities or practices—forming the base and move at the top.<sup>2,3</sup>

Of the five identified Blue Zones, Loma Linda is unique because it also has a large Seventh-day Adventist population, where the average lifespan is higher than it is elsewhere.<sup>2</sup> In addition to respecting the biblical teachings of the Sabbath,

which is a day set aside for God's people to enjoy, worship, relax and meditate. The outlook to live as positive examples of God's love and care, including taking care of their health, has resulted in a high proportion of Adventists that follow a vegetarian diet.<sup>4</sup> While it is not evident if any one specific factor is the result of longevity, a combination of spiritual and holistic health wellness is likely the reason for the increase in life expectancy. It is also just as essential to have preventative medical interventions as it is inevitable that as we age, medical complications will arise and medical care will be sought after. Within Loma Linda, California (CA) resides Loma Linda University and Loma Linda University Medical Center.

Loma Linda University is part of the Seventh-day Adventist higher education system for more than 1400 medical students, residents and fellows. Founded in 1905, the University was designated by the Seventh-day Adventist Church as a center for educating health professionals like Loma Linda University School of Medicine, to ensure that the healing ministry of Jesus Christ continued through Loma Linda University. Loma Linda University Health (LLUH) was formed and is in the heart of the "Blue Zone" in Loma Linda, California. LLUH is a nonprofit religious corporation in Loma Linda, California, in the southern portion of the US (United States) state of California. It is located within the Inland Empire area. LLUH is the umbrella organization for its core and affiliate organizations that include Loma Linda University, Loma Linda University Medical Center, Loma Linda University Medical Center East Campus, Loma Linda University Surgical Hospital, Loma Linda University Behavioral Medical Center, Loma Linda University Children's Hospital, Loma Linda University Medical Center – Murrieta, and Loma Linda University School of Medicine's clinical faculty corporation, Loma Linda University Faculty Medical Group.<sup>5</sup>

The Health system, with its approximate 1000 faculty physicians and 300 advanced practitioners, is integrated within the LLUH system to provide care in a tertiary medical facility, Level 1 regional trauma center for Inyo, Mono, Riverside and San Bernardino counties and delivers care for approximately 1.5 million patients each year. Loma Linda University serves as a fundamental pillar for the region and is essential for maintaining the well-being of "blue zone" citizens and the surrounding communities by addressing both acute and chronic health issues. Regular access to healthcare facilities, preventive services, and medical professionals is paramount in the early detection and treatment of illnesses, helping curb disease progression before they become life-threatening. In essence, access to healthcare is not just a luxury; it's a necessity that fosters healthier and more productive communities, contributing to overall societal growth and prosperity.

The healthcare industry in the United States is at a critical crossroads. Unsurprisingly, healthcare in the Inland Empire (the region that includes Loma Linda) is also at a crossroads. Of the approximately 9000 Adventists that make up Loma Linda, California's Blue Zone,<sup>6,7</sup> equates to about 35% of Loma Linda being "blue-zoners" and the remaining 65% being "non-blue zoners". What is also worth noting is that Loma Linda University Medical Center is the largest academic safety-net hospital for the "non-blue zone" counties of San Bernardino, Riverside, Inyo and Mono. Respectively, Loma Linda University Medical Center serves a combined county population of approximately 4.6 million patients. While Loma Linda University Medical Center is present to service the 0.1% "blue-zoners" its mission and purpose is also to serve the remaining 99.9% "non-blue zones".

To meet the "blue zoners" and "non-blue zoners" healthcare needs, LLUMC has leveraged medical advances and technological innovations to help deliver higher-quality care. Much like many health systems, the escalating costs of healthcare and dwindling reimbursement rates pose significant hurdles to LLU Health and physicians. This paper examines the key challenges associated with these concurrent trends and highlights the need for adaptive strategies to ensure the continued provision of excellent patient care.

## Barriers to a Sustainable Healthcare Model

### Escalating Healthcare Costs

#### Pharmaceutical Costs

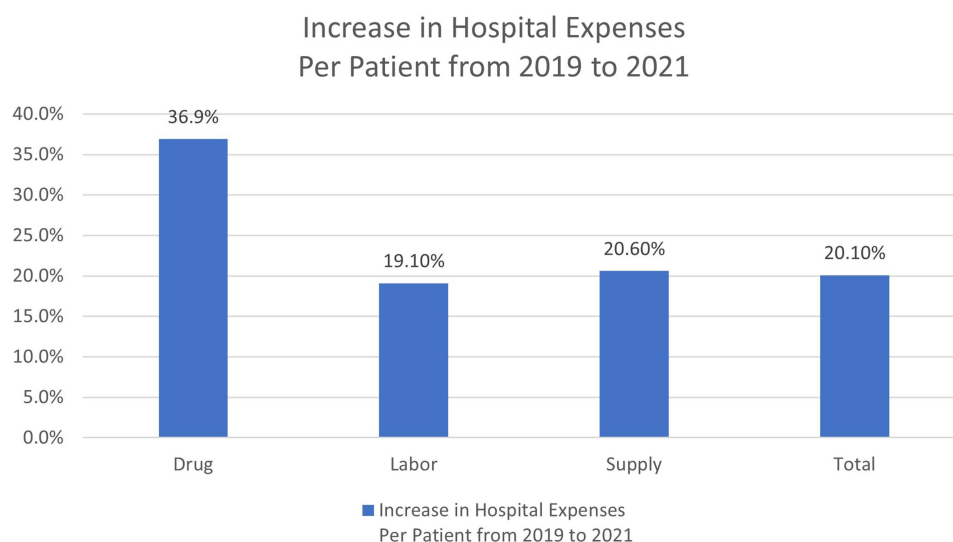
Over the last two decades, pharmaceutical costs have rapidly increased as a significant health factor. Medication is one of the main cost items and is considered an essential and integral part of health care. In most countries, pharmaceutical costs form a large share of the government's public health budget. On average, Organization for Economic Cooperation and Development (OECD) countries spend 17% of their healthcare costs on pharmaceutical affairs.<sup>8,9</sup> In the United States,

retail prescription drug spending was estimated to account for nearly 12% of total personal healthcare services in 2019 (up from about 7% in the 1990s).<sup>10</sup> One of the primary drivers of rising healthcare costs is the exorbitant prices of pharmaceuticals. By the end of 2021, total drug expenses were 28.2% higher than pre-pandemic levels. When taken as a share of all non-labor expenses, drug expenses have grown from approximately 8.2% in January 2019, to 9.3% in January 2021, and to 10.6% in January 2022.<sup>11</sup> Costly prescription medications strain hospital budgets and create barriers to patient access.

### Labor and Administrative Expenses

Prior to the COVID-19 pandemic in 2020, hospital administration and clinical costs grew by about 4% annually between 2016 and 2019. Whereas the median clinical expenses increased by 0.6%, the median administrative expenditures increased by 6.2% between 2019 and 2020. The yearly growth in clinical expenses prior to COVID-19 of 3.7% (95% CI, 3.5 to 4%) was not different in 2020 (0.5%; 95% CI, -0.3 to 1.4%).<sup>12</sup> Administrative expenses (ie, costs associated with invoicing and insurance, claims handling, clinical coding and paperwork, and costs unrelated to invoicing and insurance) grew much faster than clinical expenses, resulting in a larger share of hospital financial resources allocated to administrative activities.<sup>12</sup> The astronomical fees that contract staffing companies demanded were the main cause of the additional surge in labor costs associated with healthcare for hospitals and health systems. Hospital labor costs per patient were 19.1% higher than pre-pandemic levels at the end of 2021 (see Figure 1), and they reached a peak of 57% in January 2022. Costs were expected to rise during 2022, with predicted non-labor spending up to \$49 billion and labor costs increasing by \$86 billion. This would result in approximately \$135 billion increase above the previous year level.<sup>13</sup>

The state of California recently added to the increasing labor costs by passing Senate Bill 525 (SB 525) and Senate Bill 616 (SB 616).<sup>14,15</sup> SB 525 establishes a \$25/hour minimum wage for all California healthcare workers in various health facilities and physician practices with 25 or more physicians. With healthcare reimbursements being essentially flat or decreasing in some instances, identifying areas in healthcare to offset the additional cost is necessary, as this bill will increase healthcare costs by \$8 billion annually and the state government alone \$4 billion, with half coming from federal funds and another half from California taxpayers through state general funding.<sup>16</sup> This also does not consider the millions in cost to private and academic systems in healthcare (see Table 1). SB 616 was also passed in October of 2023, amending California's paid sick leave law to expand mandatory paid sick leave from three days or twenty-four hours to five days or forty hours.<sup>14</sup> The additional two days or sixteen hours will cost approximately \$3.3 million for the Loma Linda University Health (LLUH) system. These problems are not unique to LLUH but to all healthcare systems in California and, in some instances, nationally. The ever increasing demand for healthcare services intensifies the need for



**Figure 1** Increase in Hospital Expenses Per Patient from 2019 to 2021. Data from KaufmanHall.<sup>11</sup>

Table 1 Senate Bill 525<sup>17</sup>

Sector	2024	2025	2026	2027	2028
Physician groups with 25 or more Physicians	\$21		\$23		\$25
Physician groups part of large health systems with more than 10,000 workers and dialysis clinics	\$23	\$24	\$25		
Community Clinics	\$21		\$22		\$25
Hospitals with high mix of Medi-cal and Medicare patients and rural independent hospitals	\$18	Increases 3.5% annually until it reaches \$25 in 2023			

a skilled workforce, resulting in escalating labor costs and paid sick time leave. Additionally, the complexity of insurance claims and billing necessitates extensive administrative resources, resulting in additional expenses.

Technological Advancements

While medical technology advances have improved patient outcomes, the upfront costs of implementing these technologies are substantial, and ongoing maintenance can strain hospital budgets. Technology’s overall effects on healthcare expenses can be far more extensive and offset any potential savings. A capital-embodied technology’s direct costs, which include both the capital cost and the running costs necessary to put it into practice, are frequently overlooked. Because operating and supervisory staff, training, insurance, supplies, and space are required, even the most capital-intensive systems may have higher running expenses than expected. Conversely, a novel medication or apparatus can come with a higher upfront cost but a lower administration cost than its substitutes.<sup>18</sup>

In addition, new technology may also have an impact on the use of other medical services. These outcomes make up a technology’s “induced” costs and savings. A new diagnostic test may lead to treatments that were not previously thought of,<sup>19</sup> or therapies might be skipped all together due to the new technology.<sup>20</sup>

Declining Reimbursement Rates  
Medicare and Medicaid

Despite having the highest per capita healthcare spending of any nation, about 37 million Americans lack health insurance, and another 41 million have insufficient access to care.<sup>21</sup> Government programs like Medicare and Medicaid significantly affect healthcare reimbursement. In recent years, these programs have struggled to keep pace with inflation and healthcare cost increases, leading to reduced payments for hospitals and physicians (see Figures 2 and 3). According to the American Hospital Association, Medicare pays hospitals a non-negotiable reimbursement amount that is less than the cost of

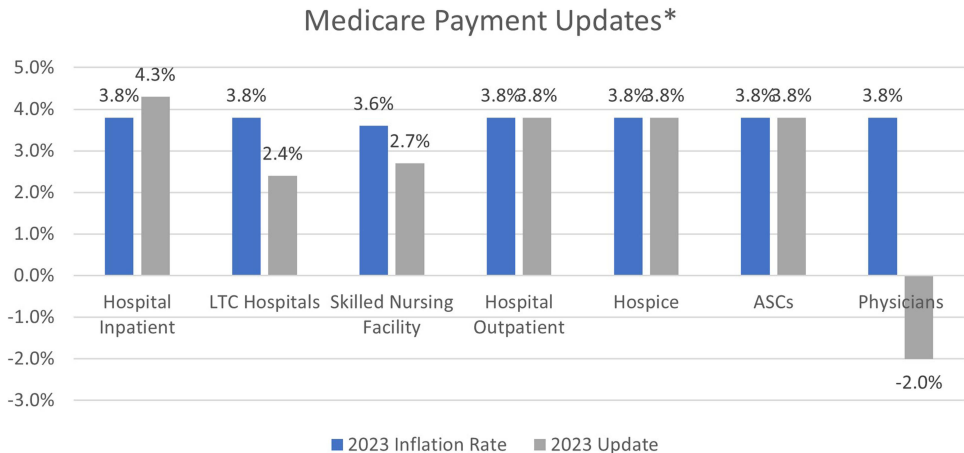
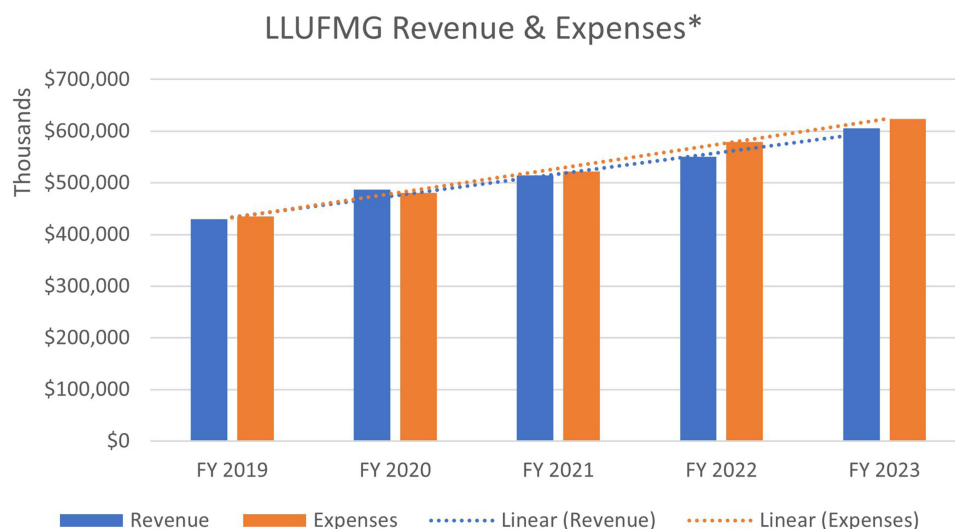


Figure 2 Medicare Payment Updates. Reprinted from American Medical Association.<sup>22</sup> \*Without passage of the Consolidated Appropriations Act of 2023 (PL 117–328), the update for 2023 would have been –4.5%.  
Abbreviations: LTC, long term care; ASC, ambulatory surgery center.



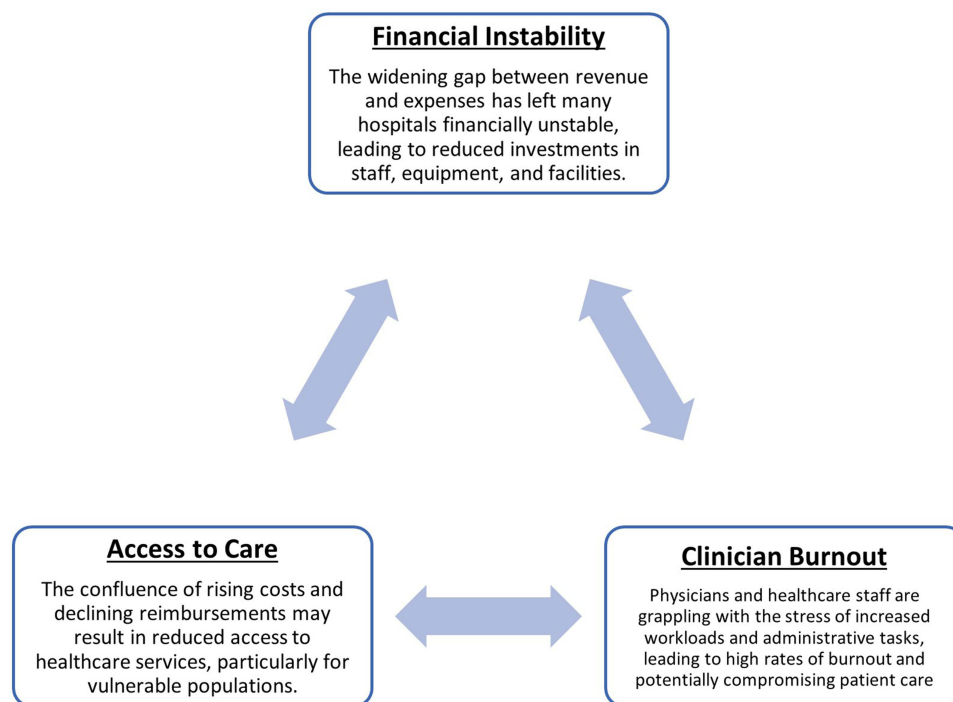
**Figure 3** Loma Linda University Faculty Medical Group (LLUFMG) – Expenses Exceeding Revenue. \*Normalized for volume would slow rate change only.  
**Abbreviation:** FY, Fiscal Year.

delivering care. Hospitals saw a  $-8.5\%$  margin on Medicare services in 2020, according to the Medicare Payment Advisory Commission, and that margin is expected to drop to  $-9\%$  in 2022. Medicare and Medicaid underpayments to hospitals totaled \$100 billion in 2020, up from \$76 billion the previous year. The majority of hospital utilization is covered by Medicare and Medicaid, which increases the strain. Healthcare systems are greatly impacted by the ongoing decline in payments, particularly in light of the substantial rise in labor, medication, and supply costs as well as the effects of inflation on hospital viability.<sup>13</sup>

Physician compensation under Medicare is not nearly as generous as it formerly was. Medicare physician compensation decreased by 20%, or 1.1% per year, on average, between 2001 and 2021 after accounting for practice cost inflation.<sup>23</sup> Market consolidation is encouraged by the growing gap between real payments and the costs of operating a hospital system or medical practice, as well as the administrative and financial strain of being a Medicare participant. This can lead to higher healthcare prices or even system insolvency.<sup>22</sup> Medicare payments to doctors having a Centers for Medicare and Medicaid Services (CMS) conversion factor of \$32.74 will be lowered by \$1.15, or 3.4%, from 2023 to 2024 under the Medicare Physician Fee Schedule rule. Similarly, from 3.8% to 4.6% this year, the Medicare Economic Index (MEI), a government indicator of inflation in medical practice expenses, would rise.<sup>24</sup> Substantial reductions in physician reimbursement will only widen the gap between physician practice expenses and reimbursement rates (see Figure 3).

## Private Insurance

Private insurers are increasingly shifting the burden of healthcare costs onto patients through higher deductibles and co-pays, leaving healthcare systems and providers with a growing population of underinsured patients.<sup>21</sup> Additional steps and denials in authorizations have also led to significant increases in healthcare resources and, in some cases delay in care. In a study performed by Wharam et al, people from lower socioeconomic backgrounds, in the first year after registering in deductible plans, experienced a decline in hospitalization and, in the second year, experienced an increase in hospitalization; but such changes were not found in people from higher socioeconomic backgrounds.<sup>25</sup> Delays in healthcare due to increasing required authorizations, high deductibles and co-pays can result in increased mortality and morbidity. The poverty status of San Bernardino County is 13.3%, and Loma Linda approximately 13.6% living below the poverty line, a number higher than the national average of 11.5%.<sup>26</sup> A shift in higher deductibles and co-pays can significantly impact healthcare utilization and, due to delayed healthcare visits, an increase in healthcare costs. In addition to higher deductibles and co-pays, health insurance company takeback schemes also cost physicians and hospitals more than \$1.6 billion monthly. In contrast, average-size health systems



**Figure 4** Barriers to Loma Linda University Health (LLUH).

faced 110,000 claim denials due to prior authorization and other factors in 2022.<sup>27</sup> Between July and August 2022, payer takebacks averaged 1.8% of monthly debit-account receivables. According to the Crowe report, that is 29% from the 1.4% recorded between January 2021 and June 2022.<sup>27,28</sup> Changes by Medicare and Medicaid and challenges faced with private insurances, as mentioned above, also contribute to the widening gap between physician practice expenses and reimbursement rates (see [Figure 3](#)).

## Implications for Loma Linda University Health and Physicians

Loma Linda, CA, has been found to have an increased concentration of centenarians in addition to clusters of people who have reached old age without disease. The barriers to Loma Linda University Health system as outlined in this paper, as well as financial instability, clinician burnout and access to care constraints (see [Figure 4](#)), are leading to an unsustainable healthcare model which could result in the Loma Linda University Health hospitals system being unable to function as a safety-net hospital as well as providing the care necessary for those in the “non-blue zone” and eventual medical care needed for those in the “blue zone”.

A safety net hospital as defined by the Institute of Medicine by mission or mandate, provides care to a substantial share of vulnerable patients regardless of their ability to pay.<sup>29</sup> Since 1905, Loma Linda University has provided care for the most vulnerable without having direct access to taxpayer support, lower costs of capital via municipal bonds, or hospital revenue bonds, which most government-owned and operated facilities have access to. As a result, LLUH hospitals have to be extremely selective on services being provided to the community. In some cases, LLU Health has already closed several clinical services due to financial concerns. Much like many in the nation, our facility is facing significant struggles to remain solvent due to state-mandated healthcare wage increases (ie, SB 525, SB 616), inflationary staffing cost, physician burnout and retention and increased demand for healthcare with a simultaneous decrease in reimbursement. Without a change in reimbursement, early adoption of technology for healthcare, policy reform, deep review of insurers and a focus on living healthy as a community (see [Table 2](#)), many healthcare systems will struggle to stay financially solvent and will be unable to provide the services, access and timely care needed, especially for those in the region with limited choices.



**Table 2** Potential Solutions to a Complex Problem

Potential Solutions to a Complex Problem
<p><b>Value-Based Care:</b></p> <ul style="list-style-type: none"> <li>Shifting from fee-for-service models to value-based care can incentivize better patient outcomes and reduce costs through preventive care and care coordination</li> <li>Expand risk models with two sides (upside and downside risk). Providers only get paid in an upside-risk model when they surpass quality, cost, or equity criteria. If providers do not reach the predetermined objectives, they lose money under a downside risk model. A two-sided risk model could produce better results, like a decrease in hospital admissions.</li> <li>Value-based care must also determine how social determinants of health (SDOH) play into upside/downside risk models. SDOH has a material impact on health outcomes, but the root causes are far beyond the physician office and hospital walls</li> </ul>
<p><b>Healthcare Technology:</b></p> <ul style="list-style-type: none"> <li>Implementing cost-effective technologies, like telemedicine and electronic health records, can streamline operations and reduce administrative expenses. There is a great need for continued and permanent Medicare and commercial insurance reimbursement for telehealth services to patients in their homes</li> <li>A continued physician role is also needed in designing and implementing digital health care technologies such as artificial intelligence to ensure that the innovative technology is safe, evidence-based, and improves patient care while also avoiding increased non-clinical tasks for the physician</li> </ul>
<p><b>Policy Reform:</b></p> <ul style="list-style-type: none"> <li>In order to reduce prescription costs, state and federal agencies should investigate comprehensive pharmaceutical policy solutions that address cost drivers throughout the drug supply chain</li> <li>Advocating for policy changes that address healthcare cost drivers and improve reimbursement rates is essential for long-term sustainability.</li> <li>All available measures should be taken to mitigate the projected physician payment drop in 2024 in order to guarantee Medicare beneficiaries keep or enhance their access to care and to protect the financial sustainability of physician practices.</li> <li>Increase physician payment rates. The cost of operating a medical practice has significantly increased, while physician payment rates have not kept up. Without adjusting for inflation, Medicare physician payment rates are significantly lower, highlighting the extent of the gap between reimbursement and costs</li> <li>An additional reform that is worth mentioning and beyond the scope of this paper is the necessity to increase payments for graduate medical education and academic teaching institutions, which are typically safety net hospitals and care for the poorest of the poor</li> </ul>
<p><b>Deep Review of Insurers:</b></p> <ul style="list-style-type: none"> <li>A deep review of insurers is core to the revenue gap between insurers and health systems. The government incentivized the privatization of Medicare and Medicaid programs, which has led to more money being spent on these programs by the government. Unfortunately, the additional revenue stays with insurers, while reimbursement to providers from the insurers stays flat</li> <li>The nation's largest insurers reported profits up to 28% higher than the same period, totaling \$5.3 billion in revenue for just one insurer. The gap between provider and payer profits continues to widen. Re-evaluating the payer structure and implementing measures that will decrease the gap<sup>30</sup></li> <li>Payers should implement a higher reimbursement structure that promotes a preventive healthcare model</li> <li>A review and reform of insurance policies that will result in an efficient process that decreases the spending needed to comply with new insurance policies</li> <li>A deep dive is needed to review insurance authorization requirements, as healthcare systems are having to increase dedicated resources for prior authorization and/or challenging authorization denials</li> </ul>
<p><b>Community Healthy Living Focus – a healthy lifestyle can slow aging and minimize healthcare costs needed to manage chronic diseases</b></p> <ul style="list-style-type: none"> <li>1. Move naturally and have the right outlook about exercising; 2. Have a purpose in life; 3. Downshift the stressors in life; 4. Follow the 80% rule: Eat wisely and stop eating before being full; 5. pPlant slant; 6. Wine at five (except Adventists); 7. Right tribe that supports healthy behavior; 8. Loved ones first; and 9. Belonging to a faith-based community</li> <li>Implementing Blue Zone lifestyle behaviors leads to healthier communities and, in some instances, can decrease healthcare costs by up to 40%<sup>1</sup></li> </ul>

## Conclusion

In the face of the relentless surge in healthcare costs and the persistent constraints on reimbursement rates, the challenges that hospitals and physicians confront are undeniable. The road ahead is undeniably arduous, but the importance of this journey cannot be overstated. The commitment to maintaining excellence in patient care is not just a goal but an imperative. Without the necessary changes and adaptations, the healthcare system in the “blue zone” in Loma Linda, California, and indeed across

the nation, stands at the precipice of failure. This is a call to action, a plea for change as outlined in Table 2, and an urgent reminder that the health and well-being of communities depend on the collective will and dedication of those within the healthcare system to ensure that excellence in patient care remains an unwavering standard.

## Disclosure

The authors report no conflicts of interest in this work.

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