

Value-based Care and Decarbonization Converge at Value

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United States health care leaders, as in Robert Frost's famous poem *The Road Not Taken*,¹ face two existential paths: the paradigm shift toward value-based care and climate change mitigation through the decarbonization of operations. However, unlike Frost's dilemma of choice, health care leaders must successfully travel both paths simultaneously to the place where they converge in order to succeed in their organization's mission and planetary sustainability.

Value-Based Care

Peering down one path, leaders see the sector's emergence from the historical fee-for-service model that has been plagued by unsustainable spending with low value achieved. As recent as 2021, US health care spending reached a staggering \$4.3 trillion, an amount equivalent to 18.3% of the total gross domestic product.² The value-based care paradigm aims to improve the quality of care and health outcomes for populations while controlling delivery costs. This is achieved by paying health care providers, including hospitals and physicians, for results based on quality, equity, and cost of care through a spectrum of pay-

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ment strategies known as alternative payment models. By aligning reimbursement with value, derived from measuring health outcomes against costs, health care leaders are freed from the fee-for-service constraints to deploy innovative evidence-based and cost-effective strategies to optimize disease prevention, man-

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age chronic disease, and tackle the influential social determinants of health.

While value-based care models are increasingly prevalent, fee-for-service still remains the dominant form at 60%.³ Unfortunately, due to unique challenges, safety-net health centers and rural organizations historically have been more hesitant to adopt alternative payment models, disproportionately excluding racial minorities, persons with disabilities, the uninsured, and lower socioeconomic status populations from the potential benefits of value-based care.⁴

Regardless of organization readiness for value-based care and payment adoption, progressive forces will continue to drive participation through financial rewards to successful participants, the imposition of negative financial impacts for nonparticipants, and the use of both voluntary and mandatory programs. Notably, the Center for Medicare and Medicaid Innovation (CMS Innovation Center) has proclaimed the goal to have every tradi-

tional Medicare beneficiary—and the majority of Medicaid beneficiaries—participating in a value-based care model by 2030.⁵ Beyond the Centers for Medicare and Medicaid Services, the use of value-based care models has been projected to increase by both public and private payers alike.⁶

Along this path, value-based care offers health care organizations the potential for performance improvements. Accountable care organizations (ACOs), the most common model, have demonstrated the ability to outperform fee-for-service models across all quadruple aim goals with enhanced patient experience, improved population health, reduced costs, and improved work-life for health care staff.⁷

In response to stakeholders' drive to leverage equity goals within value-based payments, the CMS Innovation Center will deploy the new ACO Realizing Equity, Access, and Community Health (ACO REACH) model. ACO REACH provides additional support for clinicians who care for marginalized populations and increased delivery of benefits to low-income and disproportionately marginalized communities.⁸

Decarbonization

Looking down the other path, leaders will see

a climate crisis described by the World Health Organization as “the single biggest health threat facing humanity.”⁹ Of all the social determinants of health, climate change has garnered novel interest due to its profound direct impacts on population health and its overarching and progressive consequential effects on all other social determinants of health.¹⁰ Although climate change will affect the health and well-being of all people, older populations, low-income communities, communities of color, children, people with underlying health problems, and rural environments will be disproportionately affected.

The health care sector is a major contributor to climate change, responsible for 8.5% of national carbon emissions.¹¹ While numerous voluntary efforts have responded to calls to decarbonize health care, mandates do not exist. One example is the Health Sector Climate Pledge, a voluntary commitment signed by many of the largest US hospitals, health systems, suppliers, pharmaceutical companies, and other industry stakeholders to cut their organization’s greenhouse gas emissions 50% by 2030, achieve net zero emissions by 2050, and to designate an executive lead for their decarbonizing work.¹² Toward this goal, the Inflation Reduction Act of 2022 provided significant federal tax credits to support proactive health care decarbonization efforts.¹³

Similar to value-based care models, decarbonization efforts can improve organization performance with more preventive and higher-quality care models that reduce overutilization and low value health care, while increasing population health.¹⁴ The overarching business case for improved environmental sustainability performance has been made as a driver of competitive advantage through stakeholder engagement, improved risk management, innovation, customer loyalty, employee engagement and retention, and improved financial performance from all categories.¹⁵ Health care organizations, specifically, have demonstrated positive returns on investments for decarbonization interventions, such as installation of on-site renewable energy, the purchase of renewable energy, and waste reduction.¹⁴

Because the health of individuals and populations depends on functioning ecosystems and

planetary health, quality of care and environmental sustainability with decarbonization are extensively linked.¹⁶ Health care organizations should, therefore, consider decarbonization as part of ongoing quality improvement within value-based care. Due to the interconnectedness of these domains, environmental sustainability has been proposed for inclusion to the Institute of Medicine’s domains of quality: safe, effective, patient-centered, timely, efficient, and equitable.¹⁷ Quality exists as one component of the more comprehensive goal of achieving value in health care.

Convergence at Value

It is common for stakeholders to have divergent interpretations of value that can result in conflicting agendas to achieve it.¹⁸ Since its earlier description as an equation with health outcomes achieved per dollar spent, the value definition has evolved. Value-based care models provide a platform for the decarbonization of health care delivery through integration of environmental and financial costs and clinical performance.¹⁹ Together, their potential to enable performance improvement within multiple domains illuminates their convergence at the overarching goal of value in health care. For a more sustainable organization and planet, it will be incumbent on health care leaders to expand their concept of value. The sustainable value equation—Value = (outcomes for patients and populations)/(environmental + social + financial impacts)—provides a practical framework that integrates environmentally sustainable operations and clinical quality.¹⁷

Tragedy of the Commons and Prisoner’s Dilemma

For systems thinkers, the shifts to value-based care and decarbonization are clear paths for organization and planetary success. However, the delay to fully engage these objectives by some leaders can be explained in part by the tragedy of the commons metaphor and the prisoner’s dilemma game theory construct. The former describes the tension between the responsibility to be stewards of public health and natural resources with the perceived self-benefit to neglect such responsibilities in the short term. The latter dilemma identifies how

hesitant leaders may delay needed action due to a lack of trust that their competitors will join in these pursuits while they continue to exploit the current fee-for-service paradigm and environmentally unsustainable operations for perceived short-term benefits.

Nevertheless, societal and financial forces will continue to nudge health care organizations toward value-based care models and decarbonization. . Health care leaders must heed sustainability science’s evidence-based conclusions that the tragedy of the commons and prisoner’s dilemma can mislead them, and proactive leaders will realize “the potential self-benefit of understanding the dynamics of major system change better than one’s competitors.”²⁰

Conclusion

Beyond the ethical imperative to do no harm, health care leaders and organizations are now called upon to expand and improve the value of care provided to patients and populations within planetary boundaries. As forces accumulate to drive value-based care and decarbonization, proactive leaders are needed to implement sustainable value-informed decision-making through a lens of health equity to drive performance success. To conclude in honor of Frost’s poem: *two roads converged in a wood, and I took both to where they met, and that has made all the difference.*

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Letters to the Editor

continued from page 331

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Examining the Relationship Between Obstructive Sleep Apnea During Pregnancy and Autistic Spectrum Disorder in Children

Dear Editor,

We recently reviewed the article "Are Symptoms of Obstructive Sleep Apnea During Pregnancy Associated With Autism Spectrum Disorder in Children: A Case-Control Study" by Nick et al¹ with great interest. Obstructive sleep apnea (OSA) is a common and serious condition. While treatments like continuous positive airway pressure (CPAP) and mandibular advancement splints are effective, many patients struggle with adherence.²

The study offers valuable insights into OSA but could be strengthened by exploring neuroinflammation in offspring due to gestational OSA and the sex-specific effects on children. These areas hold potential for uncovering new pathways and biomarkers, paving the way for more targeted treatments. Notably, a recent study revealed an increased soluble vascular endothelial growth factor receptor 1/PIGF ratio and reduced levels of pregnancy-associated plasma protein A in individuals with sleep

disorder breathing, after adjusting for key factors.³

The study by Nick et al relied on self-reported symptoms and medical history rather than objective sleep testing, which may have influenced the findings. Previous research shows that increased daytime drowsiness is common during pregnancy, so this factor could affect results.⁴ While somnolence is not always a reliable indicator of severe sleep disorders in pregnancy, exploring more clinical markers could enhance the understanding of OSA's impact. Including confounding factors, such as maternal health and social circumstances, in future studies would provide a more comprehensive analysis.⁵

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