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Universal healthcare as pandemic preparedness: The lives and costs that could have been saved during the COVID-19 pandemic

Alison P. Galvani[a,1], Alyssa S. Parpia[a], Abhishek Pandey[a], Pratha Sah[a], Kenneth Colón[a,b], Gerald Friedman[c], Travis Campbell[c], James G. Kahn[d], Burton H. Singer[e,1], and Meagan C. Fitzpatrick[a,f]

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The fragmented and inefficient healthcare system in the United States leads to many preventable deaths and unnecessary costs every year. During a pandemic, the lives saved and economic benefits of a single-payer universal healthcare system relative to the status quo would be even greater. For Americans who are uninsured and underinsured, financial barriers to COVID-19 care delayed diagnosis and exacerbated transmission. Concurrently, deaths beyond COVID-19 accrued from the background rate of uninsurance. Universal healthcare would alleviate the mortality caused by the confluence of these factors. To evaluate the repercussions of incomplete insurance coverage in 2020, we calculated the elevated mortality attributable to the loss of employer-sponsored insurance and to background rates of uninsurance, summing with the increased COVID-19 mortality due to low insurance coverage. Incorporating the demography of the uninsured with age-specific COVID-19 and nonpandemic mortality, we estimated that a single-payer universal healthcare system would have saved about 212,000 lives in 2020 alone. We also calculated that US$105.6 billion of medical expenses associated with COVID-19 hospitalization could have been averted by a single-payer universal healthcare system over the course of the pandemic. These economic benefits are in addition to US$438 billion expected to be saved by single-payer universal healthcare during a nonpandemic year.

universal healthcare | pandemic preparedness | lives saved | costs saved

Significance

The fragmented and inefficient healthcare system in the United States leads to many preventable deaths and unnecessary costs every year. Universal healthcare could have alleviated the mortality caused by a confluence of negative COVID-related factors. Incorporating the demography of the uninsured with age-specific COVID-19 and nonpandemic mortality, we estimated that a single-payer universal healthcare system would have saved 212,000 lives in 2020 alone. We also calculated that US$105.6 billion of medical expenses associated with COVID-19 hospitalization could have been averted by a Medicare for All system.

Despite spending more on healthcare than any other country, both overall (1) and on a per capita basis (2), the United States does not provide universal healthcare, resulting in preventable deaths and excessive costs (3). In 2019, prior to the emergence of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), over 28 million adults were uninsured, an increase of 2.2 million from 2016 (4). Since 2020, the COVID-19 pandemic has underscored the public health, economic, and moral repercussions of widespread dependence on employer-sponsored insurance, the most common source of coverage for working-age Americans. Business closures and restrictions led to unemployment for more than 9 million individuals following the emergence of COVID-19 (5, 6). Consequently, many Americans lost their healthcare precisely at a time when COVID-19 sharply heightened the need for medical services.

With over 973,000 reported deaths attributed to COVID-19 as of 14 March 2022, the United States represents 16% of the documented worldwide mortality burden of the virus (7), while only composing 4% of the global population (8). Inadequate health insurance coverage has exacerbated the COVID-19 pandemic on both individual and population levels. At the individual level, concerns over medical expenses delay diagnosis and treatment (9), elevating case fatality rates (10). At the population level, postponement of diagnosis, and thus of case isolation, fuels transmission. In addition, fear of losing employer-sponsored health insurance during a pandemic may make it untenable for people to miss work even when they feel unwell. We quantify the financial benefits and lives saved if the United States had provided universal healthcare coverage to all individuals during the COVID-19 pandemic. As proposed by the Medicare for All Acts of 2019 (11) and 2021 (12), a major feature of such reform would be elimination of the high deductibles and copays that currently make medical services unaffordable even among many who are nominally insured (13).

Ramifications of Pandemic-Driven Unemployment for Health Insurance Coverage. While stay-at-home orders and temporary closures of nonessential businesses curbed the immediate spread of COVID-19 and prevented catastrophic demands on hospital capacity (14), the measures also led to spikes in unemployment. For employees, a layoff often results in insurance loss or the need to switch to a different type. To determine

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[1]To whom correspondence may be addressed. Email: bhsinger@epi.ufl.edu or alison.galvani@yale.edu.

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the changes in coverage by insurance type over the course of 2020, we combined data on monthly Medicaid/Children's Health Insurance Program (CHIP) enrollment (15), monthly employment (16, 17), and employer-sponsored health insurance plan participation rates (18), as well as insurance exchange enrollment during both the standard (19) and special enrollment periods (20). We calculated the difference in insurance enrollments for each month of 2020 compared to December 2019, the final month prior to pandemic disruptions. In March 2020, employment dipped slightly, followed by a steep drop in April, precipitating a loss of 14.5 million employer-sponsored insurance enrollments compared to December 2019 (Fig. 1*A*). Employment gradually rebounded but remained below its December 2019 level throughout 2020.

Concurrent with reductions in employer-sponsored insurance over the course of 2020, Medicaid/CHIP enrollments rose steadily from 71.6 million in March 2020 to 80.2 million in December 2020. There were fewer total insurance enrollments from March through September 2020 compared to December 2019, but increasing Medicaid/CHIP enrollment boosted total insurance enrollment to 3.5 million above that baseline by December 2020 (Fig. 1*B*). Increased Medicaid enrollments in 2020 may be a response to unemployment, the result of ongoing Medicaid expansion efforts (21), or due to individual perception of elevated risk during the pandemic. Another driver may be the disaggregation of family members previously covered together under an employer-sponsored family plan. On average, each employer-sponsored enrollment covers more than one individual. Some individuals may be eligible for employer-sponsored coverage through their spouse or may opt to purchase insurance, such that unemployment does not necessarily lead to becoming uninsured. Conversely, job loss may be associated with the loss of insurance for an entire family, potentially resulting in separate enrollments into Medicaid or CHIP for each family member. Such events might appear from the federal data as an increase in enrollments, when in reality the same number of individuals have coverage prior and subsequent to the job loss. Due to this disaggregation, the apparent rise in Medicaid/CHIP enrollments may not have translated to higher overall coverage, and the pandemic-driven insurance gap may have persisted longer than indicated by the raw data. Despite these sources of uncertainty, US Census Bureau data indicate that more Americans were uninsured at some point in 2020 compared to 2018 (22). Consistent with our evaluation, April was the most common month for insurance loss in 2020, contrasting with nonpandemic years (22, 23).

Insurance Gap Prior to the COVID-19 Pandemic. The pandemic-driven changes occurred against a backdrop of preexisting incomplete insurance coverage. To evaluate coverage when SARS-CoV-2 emerged, we calculated the age-specific number of uninsured individuals in 2019 by applying the change in overall reported coverage between 2018 and 2019 (24) to the 2018 coverage in each age cohort (25). We estimated that 40,963,120 Americans were uninsured in 2019 (*SI Appendix*, Table S1).

Life-Saving Potential of Universal Healthcare.

Quantifying lives that could be saved by universal healthcare in nonpandemic conditions. Demographic shifts and the expanding insurance gap combined to increase the annual lives that could have been saved by the provision of universal healthcare compared to our previous analysis (3), even in the absence of COVID-19. We previously calculated that enacting universal healthcare would have saved over 68,000 lives in 2017 (3). To update this analysis to the most recent nonpandemic year, we took into account the proportion of uninsured in each age class

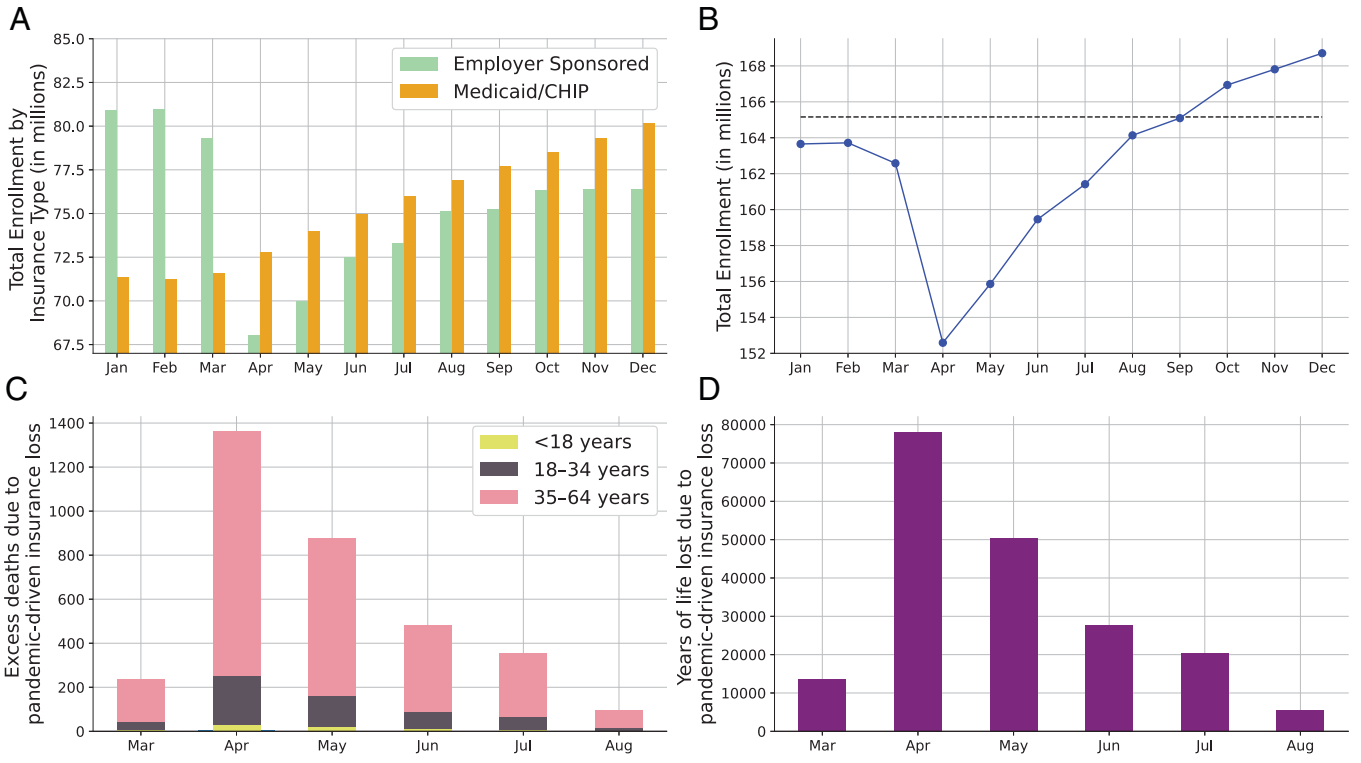

Fig. 1. Insurance enrollment, excess deaths, and years of life lost during the pandemic year 2020: (*A*) Monthly estimated enrollment in employer-sponsored insurance (green) and reported enrollment in Medicaid/CHIP (orange). (*B*) Monthly total enrollment in all insurance types (blue) compared with total enrollment in any insurance type in December 2019 (black). (*C*) Monthly excess deaths among those below age 65 due to pandemic-driven insurance loss between March and August 2020. (*D*) Years of life lost in each month between March and August 2020 due to pandemic-driven insurance loss.

for 2019, the size of every age class, age-specific life expectancy, and the elevation in mortality associated with lacking insurance (26). Our calculations indicate that 76,064 lives would have been saved by universal healthcare among individuals of all ages in 2019 (*SI Appendix*). Incorporating the life expectancy of the lives that were lost, we further calculated that 2,094,548 y of life would have been saved by universal healthcare in 2019 (*SI Appendix*), an increase of 360,519 compared to our calculation for 2017 (3). The greater loss of lives is due both to a widened insurance gap and to a rise in the average age of an uninsured individual (*SI Appendix*, Table S1).

We also evaluated the deaths and years of life lost that are attributable to uninsurance for 2020, based on demographic trends, for the counterfactual scenario where the COVID-19 pandemic did not occur (*SI Appendix*, Table S1). Using 2019 estimates for age-specific coverage and updating with 2020 population growth (27), we estimated that there were 77,675 excess deaths and 2,099,133 excess years of life lost in 2020 due to lack of insurance without including repercussions from the pandemic (which we calculate below in *Quantifying lives that could have been saved by universal healthcare during the COVID-19 pandemic*).

In addition to those without insurance, another 45.3 million adults are underinsured (13), burdened by copays and deductibles that are not affordable relative to their salary. Underinsured Americans often forgo healthcare that they require, thereby increasing their risks of mortality (28, 29). Consequently, our estimates are conservative with regard to the life-saving benefits of comprehensive universal healthcare that eliminates all costs to the patient.

Quantifying lives that could have been saved by universal healthcare during the COVID-19 pandemic. As well as demographic shifts since 2019, loss of employment and therefore insurance coverage during the COVID-19 pandemic further contributes to premature mortality. Using the same methods detailed in *Quantifying lives that could be saved by universal healthcare in nonpandemic conditions* for age-specific elevations in mortality among the uninsured, we estimated the mortality impact specifically among those who experienced pandemic-driven job loss. Given the high Medicare coverage among elderly, we applied the pandemic-driven enrollment changes only to those under 65 y of age. While coverage rose toward the end of 2020, these gains were insufficient to compensate for the extent of lower enrollment early in the pandemic. Incorporating both the widening and then contracting insurance gap, we estimated 2,784 lives lost over the course of the year. From the combination of pandemic-related and background uninsurance, we calculate 80,459 excess deaths and 2,214,033 y of life lost in 2020.

We previously calculated that 26.4% of the lives that were reported to be lost due to COVID-19 would likely have been saved if there had been universal healthcare throughout the pandemic (30). In addition, it has been estimated that 24.1% of COVID-19 fatalities were not documented on death certificates (31). In 2020, 377,883 deaths from COVID-19 were recorded (32), implying 497,870 actual deaths, of which 131,438 could have been averted if the United States had universal healthcare. Therefore, the number of lives that could have been saved in 2020 by universal healthcare from both non-COVID conditions and COVID-19 would be 211,897.

Across the entire time frame of the pandemic thus far, 973,459 COVID-19 deaths have been recorded in the United States (7), meaning that there were actually 1,282,555 deaths due to COVID in the United States. Therefore, 338,594 COVID deaths are attributable to incomplete insurance coverage in the United States.

Mechanisms by which Medicare for All would save lives and avert morbidity during a pandemic. The observed relationship between healthcare coverage and COVID-19 mortality is attributable to multiple factors, as detailed below.

Improved access to primary care and reduction in comorbidities. First, the prevalence of those underlying conditions which exacerbate COVID-19 severity would be reduced via equitable access to care. For example, uninsured adults are significantly more likely than insured adults to be unaware of their hypertension (33, 34), much less likely to be receiving treatment (35), and much less likely to have their hypertension under control (36). Hypertension specifically increases the risk of COVID-19 mortality by 188% (37). Additionally, uninsured women were found to have a higher prevalence of obesity (35), which is another risk factor for severe COVID-19. Diabetes has similarly been associated with significantly increased COVID-19 severity and mortality (38). Uninsured adults with diabetes were half as likely to be aware of their condition as their insured counterparts (39).

Early diagnosis and access to life-saving medical care. Financial barriers reduce and delay care for COVID-19. Due to apprehension about their ability to pay, 14% of US adults reported that even if they experienced the two most common symptoms of COVID-19, fever and dry cough, they would still avoid seeking care (40). These financial concerns are justified as 18% of the US population had medical debt even prior to the COVID-19 pandemic, collectively totaling $140 billion (41). Medical debt ballooned further during the pandemic as the confluence of lost insurance and lost income makes it more challenging to pay medical bills (42, 43). Removing financial obstacles to care can accelerate diagnosis. More timely medical attention increases the probability of recovery from COVID-19 infection (10, 44). For example, treatment with monoclonal antibodies early during the infection reduced the risk of severe outcomes (hospitalization or death) by 85% (45). Reducing the time to diagnosis also ensures more prompt isolation, which in turn reduces transmission to others.

The Coronavirus Aid, Relief, and Economic Security (CARES) Act subsidizes all testing and medical bills for the uninsured with COVID-19. However, hurdles still exist that may prevent individuals from seeking care. Since this program does not directly offer insurance to patients, uninsured individuals may be unaware that their COVID-19–related medical expenses can be reimbursed, which may prevent them from seeking treatment (46, 47). Furthermore, CARES Act provides financial assistance for only one disease. It is a possibility that people without insurance and seeking medical care for COVID-19 symptoms might be billed for a different diagnosis or other services associated with testing (48).

Geographic inequities in healthcare access have exacerbated case fatality rates in the United States (49). Specific provisions in the Medicare for All 2021 bill to iteratively monitor and address geographic and racial inequity (12) would have particular importance during a pandemic. Rural hospitals are disproportionately reimbursed at the relatively low rates paid by Medicaid (50) and have heavy burdens of uncompensated care (51), which has challenged the survival of rural facilities (52). Although hospital fees nationwide would be reduced by Medicare for All, applying Medicare rates across the board would actually increase support to those rural hospitals which currently serve substantial populations of Medicaid and uninsured patients (53). Furthermore, clinical outcomes such as mortality have been elevated among

rural communities during the COVID-19 pandemic (49). Rural hospitals were more prone to shortages of ventilators, personal protective equipment, ICU capacity, and healthcare workers (54). These factors would be rectified by investment to expand healthcare facilities and hospital capacity in rural areas (12).

Facilitation of COVID-19 preventative measures. COVID-19 mortality rates have been higher and vaccination rates lower among Black and Hispanic individuals relative to White individuals (55, 56). A key driver of these disparities is inequitable access to primary care (57, 58). For example, recommendation of COVID-19 vaccination to patients by their trusted primary care providers is effective in overcoming vaccine hesitancy (59, 60). Consequently, it is unsurprising that individuals without access to a primary care provider have lower rates of vaccine uptake despite it being free to the public. Universal healthcare would ameliorate such inequities, particularly given the provisions for investment to address racial and other disparities.

Alleviating pressure on hospitals during a pandemic. Beyond COVID-19 outcomes, high hospital caseloads impact non-COVID care and also lead to premature death from non-COVID causes during a pandemic. Removal of cost barriers and alleviation of comorbidities would have reduced not only the risk of COVID-19 death but also hospitalizations, with positive externalities specific to the pandemic context. Particularly during outbreak surges, high demand for COVID-19 hospital services often delayed procedures related to other health conditions. Reduced hospitalization rates facilitated by Medicare for All would have blunted these COVID-19 peaks and thereby freed capacity for non-COVID care.

Fully addressing health disparities requires a multifactorial strategy. Not all disparities in COVID-19 mortality could have been alleviated by adoption of a single-payer universal healthcare system. Even in countries with single-payer healthcare systems, there can be a steep income gradient associated with COVID-19 outcomes (61). While single-payer healthcare is paramount to addressing health disparities in the United States, the challenge is multifactorial. Pervasive inequities regarding income, education, and housing impact nutrition, mental health, exposure to pollution, and feasibility of accessing healthcare services. Paid sick leave, nutrition programs and affordable housing are among initiatives that are necessary to alleviate disease burdens overall and mitigate systemic gaps in health.

Economic Savings That Could Have Been Realized by Single-Payer Universal Healthcare during the COVID-19 Pandemic. We calculated the economic savings of a single-payer universal healthcare system in 2020, relative to status quo, by examining two sets of costs: medical costs unrelated to COVID-19 and those attributable to the treatment of COVID-19.

National healthcare costs unrelated to COVID-19. Per capita healthcare spending in the United States increased from US$10,682 in 2017 to $11,582 in 2019 (62). We previously calculated that a single-payer universal healthcare system would have saved $458 billion in 2017 (3). There are several factors driving these savings. Streamlined administration, negotiated pharmaceutical prices, and application of the Medicare fee schedule throughout the healthcare system are major reforms that would achieve substantial reductions in national medical costs (*SI Appendix*). Combined, the savings from these mechanisms more than compensate for the expanded utilization when coverage is extended to the entire population (*SI Appendix*).

Taking into account shifts in demography, healthcare utilization, and coverage composition, we updated our previous analysis and found that single-payer universal healthcare would have saved $438 billion in 2019. A key factor driving the slight reduction in savings compared to 2017 is the increase in the number of Americans who are underinsured from 41 million (63) to 45 million (13). In our analysis, we take into account that these individuals would likely have expanded utilization once provided with full healthcare coverage (64). Given the small difference in savings between 2017 and 2019, we anticipate that 2020 savings would have been similar in the absence of the COVID-19 pandemic.

National healthcare costs related to COVID-19. Hospitalization and healthcare fees attributable to cases of COVID-19 are much higher under the current system than would have been incurred under Medicare for All. In general, Medicare charges are 22% lower than those charged by private insurance for the same services (65). However, the discrepancy is even greater for COVID-19 in particular. Private insurers paid more than double the Medicare rate for a hospitalized COVID-19 case (66, 67).

To calculate the national expense associated with COVID-19 hospitalizations, we used the estimated cost of COVID-19 hospitalization with or without a ventilator stratified by whether the patient was insured and, if so, their type of insurance (67). While the average Medicare and Medicaid costs for a COVID-19 hospitalization that requires mechanical ventilation were $57,822 and $47,396, respectively, the average charge to private insurance was $114,842. Charges for hospitalizations that did not require ventilation were lower but showed a similar pattern across insurance types (*SI Appendix*, Table S5). We combined the age distribution of 11,832,077 [95% uncertainty interval (UI): (10,586,595, 13,077,559)] estimated hospitalizations through 12 March 2022 (68, 69) (*SI Appendix*), age-specific insurance coverage by type, and age-specific probability of ventilation given hospitalization to estimate the proportion of hospitalizations in each age group that were reimbursed at each different cost level (*SI Appendix*, Table S5). Since ratification of the CARES Act, the Federal Government has been reimbursing hospitals for the care of uninsured COVID-19 patients at Medicare rates. Therefore, we applied Medicare rates for uninsured individuals who were hospitalized. We calculated that the expense of COVID-19 hospitalization has totaled $365.8 [95% UI: (327.3, 404.3)] billion, of which $141.2 [95% UI: (126.3, 156.1)] billion occurred in 2020. If the Medicare rate had been applied to all hospitalizations, $105.6 [95% UI: (94.5, 116.7)] billion would have been saved during the pandemic thus far and $39.4 [95% UI: (35.2, 43.5)] billion in 2020.

Consolidating the expected general savings from a transition to Medicare for All with savings specific to COVID-19, single-payer universal healthcare could have cost $459 billion less in 2020 than our current system. These savings would alleviate the burden on employers and individuals to cover insurance premiums, copays, and deductibles. Since Medicare for All would achieve savings overall, the tax revenue needed to fund Medicare for All would be significantly lower than the healthcare premiums that are currently paid by employers and households.

The Consolidated Omnibus Budget Reconciliation Act (COBRA) of 1985 provided a mechanism by which individuals who become unemployed may temporarily retain healthcare insurance for themselves and their families. However, the unemployed individuals must shoulder the entire premium payments, including the proportion that was previously paid by their former employer, which on average is $21,342 annually for family coverage (70). Due to a 2% COBRA administrative fee, the premiums paid by the unemployed worker are actually higher than that paid when they were employed. The American Rescue Plan of 2021 included subsidies to cover COBRA

premiums for individuals who lost employment during the pandemic. While essential to relieve household financial strain due to prolonged reliance on COBRA, an estimated $57 billion in subsidies will ultimately flow to insurers (71). In 2020, many of these companies made multibillion-dollar second quarter profits, double the amount for the previous nonpandemic year (72). Under a universal single-payer system, the recently unemployed keep their coverage, and the taxpayer is not subsidizing these profits.

COVID-19 can also have long-term health and economic consequences. Among survivors of COVID-19, there can be substantial and often long-term morbidity (73). The debilitating symptoms of long COVID can include pulmonary and cardiovascular disorders, mental health impairments, neurologic symptoms, and functional mobility impairments (73). The cost of treatment for these symptoms is substantial (74). Uninsured individuals, including many whose unemployment was precipitated by the pandemic, would have to bear the full cost of these treatments. Further, long COVID may affect the ability to work, potentially reducing income or leading to insurance loss (75). As with acute COVID, affordability may be a deterrent to seeking needed care for long COVID, particularly for low-income families (75). By curtailing the spread of COVID-19, Medicare for All would also have reduced the incidence of long COVID. Additionally, medical expenses associated with long COVID would be lower under a more efficient healthcare system and covered for the patient regardless of employment status.

Medicare for All as Pandemic Preparedness. The COVID-19 outbreak has underscored the societal vulnerabilities that arise from the fragmented healthcare system in the United States. Universal healthcare coverage decoupled from employment and disconnected from profit motivations would have stood the country in better stead against a pandemic. Emergence of virulent pathogens is becoming more frequent, driven by climate change and other global forces (76). Universal single-payer healthcare is fundamental to pandemic preparedness. We determined that such a system could have saved 211,897 lives in 2020 alone. Strikingly, it would have done so at lower cost than the current healthcare system, saving the US $459 billion in 2020 at a time of economic tumult. To facilitate recovery from the ongoing crisis and bolster pandemic preparedness, as well as safeguard well-being and prosperity more broadly, now is the time to transition to a healthcare system that can better serve the American people.

Data Availability. All study data are included in the article and/or *SI Appendix*.

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Author affiliations: [a]Center for Infectious Disease Modeling and Analysis, Yale School of Public Health, New Haven, CT 06510; [b]Maxwell School of Citizenship and Public Affairs, Syracuse University, Syracuse, NY 13244; [c]Department of Economics, College of Social and Behavioral Sciences, University of Massachusetts Amherst, Amherst, MA 01002; [d]Institute for Health Policy Studies, School of Medicine, University of California, San Francisco, CA 94118; [e]Emerging Pathogens Institute, University of Florida, Gainesville, FL 32610; and [f]Center for Vaccine Development and Global Health, University of Maryland School of Medicine, Baltimore, MD 21201

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