

How has the COVID Crisis Impacted Local Governments' Sustainability Efforts? An Examination of Initial Effects

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Abstract

Although many U.S. municipalities have adopted climate protection and sustainability as explicit objectives, they are not among their traditional responsibilities. As a result, compared to policies focused around core functions, those related to sustainability may be at greater risk of retrenchment or change in times of crisis. This research examines how the COVID-19 pandemic has impacted local governments' sustainability efforts. Using data from a nation-wide survey, we examine the degree to which the pandemic has affected programmatic priorities, resources, and operations related to sustainability. Findings indicate that the pandemic hurt the implementation of sustainability initiatives in almost half of U.S. cities. At the same time, many cities increased the priority of economic and social sustainability initiatives in response to the pandemic. Cities which have formally included sustainability principles into a city plan appear more sensitive to COVID-induced challenges to their program operations.

Keywords

local sustainability, COVID-19, implementation, disruption, programmatic priorities

Introduction

The global COVID-19 pandemic has disrupted society in a manner not experienced in generations and required communities to adapt to meet new sets of needs. Situated on the front lines of the crisis, local governments have felt a particular impact. Simultaneous to the challenges caused by employees abruptly shifting to remote work, local governments were tasked with addressing multiple new demands, often including the design and implementation of new COVID-specific policies, the restructuring of operations for many standard programs and services, and the building of new e-government

platforms. Municipalities also faced an initial steep decline in their quarterly sales tax revenue, followed by considerable revenue uncertainty persisting throughout 2020 (McDonald and

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Larson 2020; U.S. Government Accountability Office 2021). In such a context, the provision of even basic services and fulfillment of fundamental responsibilities may be challenged. At the same time, disruption offers an opportunity to evaluate and amend business-as-usual practices and priorities. Using municipal sustainability initiatives as a lens, this article examines the impact of the COVID crisis on the nature and implementation of “non-traditional” local government objectives.

The 1950s through 1970s are described as an era of “great broadening” in the United States, during which the national government significantly expanded its scope of policy making (Jones et al. 2019). Beginning in the 1980s, this broadening has shifted downward whereby local governments have increased their scope of policy engagement to include issues—such as gun safety, immigration, and living wages—that had previously been considered the purview of higher-level governments. Climate protection and sustainability are two notable issues whose locus of action has shifted toward subnational governments and around which cities have assumed particularly active roles (Hsu et al. 2017; Hughes et al. 2020). Large numbers of city governments have explicitly adopted climate and sustainability-related objectives; however, many within their ranks still view these commitments as “extra” to their core missions (Krause and Hawkins 2021). As a result, compared to policies and programs focused around traditional municipal functions, those related to sustainability may be at greater risk of retrenchment in times of crisis. Certain organizational characteristics, such as the formal incorporation of sustainability objectives into a strategic or comprehensive plan, may strengthen its resilience as an actively pursued policy aim (Lyles, Berke, and Overstreet 2018). Others, like having a clear sustainability lead or champion to frame and promote the issue as meeting emergent needs, can help keep the issue relevant in a changing environment (MacDonald et al. 2020).

This research examines how the COVID-19 crisis has impacted local governments’ climate and sustainability efforts. Using data collected from US cities approximately one year into the pandemic, it examines two sets of related research

questions: (1) Have cities changed how they prioritize the social equity, environmental, and economic dimensions of sustainability as a result of their pandemic experiences? What factors associate with variation in observed changes across cities?; and (2) Has the pandemic affected the implementation and operation of local sustainability programming? What factors associate with variations in this impact? Although examined in a specific context, this paper’s findings have potential relevance to issues beyond sustainability and disruptions beyond those caused by COVID-19. They may offer insight into organizational, planning, and resource-related factors that enable the continuation or lead to changes in “non-core” municipal functions.

Local Prioritization (and Reprioritization) of Sustainability Dimensions

Sustainability, as an explicit policy objective, has a relatively short history in local governments. In part because of this, there remains considerable city-to-city variation in how it is approached and administered (Portney 2013; Krause et al. 2016). There is increasing consensus around the conceptual definition of sustainability, which is frequently represented as “meeting the needs of the present without compromising the ability of future generations to meet their own needs” (UN 1987) and as resting on the pillars of social, economic, and environmental well-being (Purvis et al. 2019). However, the amount of attention each of these three dimensions receive in practice varies considerably by place (Krause and Hawkins 2021; Opp and Saunders 2013). The manners in which local governments operationalize sustainability are often tied to local needs and available political entry points. As an illustration, Krause and Hawkins (2021) observe that the City of Oakland, California, designs its sustainability programming using racial equity as an explicit lens. Whereas El Paso, Texas, and Ann Arbor, Michigan respectively emphasize the economic and environmental dimensions of sustainability as a means of matching its broader aim with specific local priorities. The fluidity associated with

sustainability objectives, which, although often criticized for diluting the concept (see e.g., Johnston et al. 2007), offers a practical advantage in facilitating programmatic survival.

The crisis caused by the COVID-19 pandemic has dramatically reshaped the environment for local governments and many of their regular operations. The effects that this changing context has and will continue to have on the nature of municipal sustainability initiatives and their relative prioritization of its dimensions is unclear. There is the potential that the new set of needs and constraints generated by the pandemic will have an across-the-board negative impact on municipal sustainability efforts as attention is diverted to address more immediate challenges and shore up the provision of fundamental services. However, the crisis also offers an opportunity to reemphasize the value of a sustainability perspective and to call for its increased prioritization. This may be accomplished by linking the crisis, or its response, to one or more specific dimensions of sustainability. Although the issues are not directly related, experience with the COVID-19 pandemic may, in some communities, stimulate efforts to proactively address the potentially larger future disruptions that will be caused by climate change. Scholarly work has noted similarities between the two emergencies, including their irreversibility, the social and spatial inequalities that they generate, and the fact that the costs of preventing their worst-case scenarios are far less than the costs of adapting to them (Manzanedo and Manning, 2020). Both crises are fueled by the presence of externalities and necessitate wide-spread collective action for their resolution. Recognition of these parallels has also gained traction and been expressed in the popular media. For example, an article published in the Washington Post likened the pandemic to “climate change at warp speed” and observes that it serves as a stark reminder of our “collective vulnerability” to global threats (Tharoor 2020). From this perspective, the speed and the visibility of the on-going COVID crisis has the potential to *strengthen* the argument for taking action around environmental sustainability and climate change in particular. That said, reflecting the political polarization in

the United States, the extent to which the problematic global response to COVID will serve as a call to action on climate change is expected to be greater in communities that are ideologically liberal (Dunlap et al. 2016).

Experiences with COVID have also been used to call for an increased focus on equity and for more strongly institutionalizing it as a guiding value in local government operations (Deslatte et al. 2020). This call has been amplified by the fact that, in the United States, communities of color have been particularly hard hit by the pandemic. The disproportionate impact is a manifestation of decades of inequity and structural racism and highlights the need for a comprehensive public response (Gaynor and Wilson 2020; Wright and Merritt 2020). Sustainability’s social dimension—with its focus on justice, empowerment, equal access, and well-being—is considered the least developed of the sustainability pillars and is often not conceptualized distinctly from traditional welfare policies, which are themselves embedded in an unsustainable society (Boström 2012). While calls for increased attention to and a reimagining of social sustainability have become more frequent over the last decade (Cauvain 2018), the translation of this concept into concrete municipal actions has lagged (Opp 2017). Against this backdrop, the inequitable impact that COVID has had across communities may accelerate the prioritization of social sustainability initiatives.

Finally, the damage done by the COVID pandemic to certain economic sectors has resulted in a considerable focus on financial stabilization. As of mid-2021, governments around the world have poured an estimated \$17 trillion to shore up their economies in the wake of COVID (Harvey 2021). In the United States, as part of the much larger American Rescue Plan, local governments are eligible for \$120 billion in federal funding (U.S. Department of Treasury 2021). Many of those expenditures have little to do with sustainability and may ultimately challenge it in the long term. However, attempts have been made to clearly link post-pandemic economic recovery to broader sustainability objectives (Deslatte et al. 2020; Guerriero et al. 2020). It is possible that the nature of the economic instability,

coupled with the availability of federal funds may result in local governments placing greater emphasis on economic sustainability.

Implementation in the Face of Disruption

Even if sustainability, or one or more of its dimensions, benefits from increased prioritization as a result of COVID, the policy actions attempted in its pursuit may be obstructed by practical pandemic-related challenges. The need to shift already constrained or limited resources to address new demands can create difficult conditions for the steady continuation of ongoing policies. Moreover, the redirection of political attention to other more pressing issues or service delivery needs can disrupt implementation procedures and crowd-out sustainability-related actions, sending them to the proverbial “back burner.” Alternatively, cities may engage in “pragmatic municipalism” to continue providing public services during times of fiscal stress (Kim and Warner 2016). Pragmatic municipalism involves an array of strategies—often based in collaboration, consolidation or revenue raising—that offer alternatives to traditional austerity measures, like cuts and privatization, enabling the continuation of public service delivery (Aldag et al. 2019). Although some studies find that cuts are a more common response to fiscal stress in higher-poverty municipalities (Donald et al. 2014), others find that pragmatic municipalism is the dominant approach across most cities regardless of community demographics (Aldag et al. 2019). Nonetheless, while many cities took creative steps to mitigate the fiscal impacts of the pandemic, it exposed and amplified long-standing social and economic inequities within their jurisdictions (Su 2021).

Despite the previously described availability of federal recovery funds, throughout 2020 financial insecurity was a major local government concern. For example, a mid-2020 survey of North Carolina budget officials found that over 90% of them anticipated a shortfall greater than 10% in their general revenue funds for FY2021 (Afonso 2021), and to cope with the realized budget impacts of COVID, Atlanta and

Charlotte eliminated vacant positions, implemented a hiring freeze, used reserves, and transferred funds (Afonso, Allen, and Carey 2021; Eason, Hathaway, and Wheeler 2021).

The most commonly cited short-term strategy that municipalities used in response to COVID-19 revenue declines was to freeze discretionary spending (Maher et al. 2020). In the case of sustainability whether or not freezing discretionary spending counts as an example of pragmatic municipalism or a more traditional cut, may be directly tied to whether it is considered discretionary within a particular locale. The largely unstructured nature of sustainability funding is widely noted sustainability research (Cho, Kim and Park 2021; Hawkins et al. 2016); and according to many nation-wide surveys, less than a quarter of respondent cities have formally established a budget line dedicated to their sustainability efforts (ICMA, 2016). Thus, the effects of freezing discretionary spending may be particularly large on sustainability programs and has the potential transform into permanent cuts.

Although municipal governments indicated that laying off employees was one of their least frequently used strategies for dealing with COVID-related financial shortfalls (Maher et al. 2020), the pandemic caused a range of other disruptions to the workforce. For example, according to a nationwide survey of state and local government employees conducted in May 2020, only 26% were working fully in person. Just under 50% were back to working fully in-person by October 2020 (Liss-Levinson 2021). The change in work structure likely impacted the implementation of a variety of local government programs. Still, the implications may be largest for those that require collaboration from employees situated across government units and from organizations across the community, as is the case for many sustainability initiatives.

The overall level of support sustainability has from top city leadership, most notably elected officials and the city manager, may shape how it is valued during and after the disruptions caused by COVID. Support from top leadership is a key determinant of successful sustainability implementation (Krause and Hawkins 2021). Moreover, if city

Table 1. Comparison of Respondent and Non-Respondent Cities.

	Survey respondents (n = 591)	Non-respondents (n = 1259)	Significant difference
Total population	83,244	88,838	No
Percent with bachelors degree or higher	37.9%	32.1%	Yes
Median household income	\$69,972	\$67,061	Yes
Percent democrat vote	52.6%	51.1%	No

leaders already have strong baseline support for sustainability, they may be predisposed to accept narratives linking its importance to COVID and prioritize it further (Kahan 2010). The degree to which sustainability has been formally institutionalized in a city government, via its inclusion in city plans or through dedicated funding and staff, may also influence how it emerges from COVID disruptions. In general, we expect sustainability's level of institutionalization and post-COVID changes in prioritization to be positively associated. In the following section, we describe our process of data collection and methods used to descriptively examine how COVID-19 has impacted U.S. local governments' sustainability efforts.

Sample, Data, and Methods

City governments have been affected by and responded to the COVID crisis in numerous different ways. In particular, whether and how COVID-induced disruptions affected the focus and implementation of sustainability initiatives likely also varied across cities. Using a sample of 591 US cities, we examine how three sets of factors (i.e., local support for sustainability, the institutionalization of sustainability efforts in city operations, and local COVID vulnerabilities) associate with the impact that disruptions experienced during the first year of the COVID crisis had on local sustainability initiatives.

The 591 cities in our sample equate to 32% of the 1,850 US cities, which per the 2019 Census estimates, had populations above 20,000. The sample cities are those that completed a nationwide survey we administered on the topic of local sustainability implementation. Survey invitations were sent to the individual from each city government who was pre-identified as "most responsible" for its sustainability-related

efforts. A process based on a systematic search of city websites and, as necessary, phone calls were used to identify recipients and their contact information. A personalized invitation and link to an electronic survey were emailed to each, along with up to two email reminders. Finally, individuals who did not respond to an electronic survey were mailed a paper copy and a pre-stamped return envelope through the US Postal Service. The vast majority of responses were collected between January and March 2021. This is approximately one year after COVID was first detected in the U.S. Thus, although the situation remains dynamic, enough time had passed for initial effects to be felt.

Table 1 compares the respondent and non-responding cities on a series of basic demographic indicators. The two groups of cities are not significantly different in terms of their population sizes or county-level voting outcomes in the 2016 Presidential elections. However, they are significantly different from each other ($\alpha=0.05$) in their residents' average educational attainment and median household incomes. On both of these metrics, responding cities score more highly. Although the difference is only substantively meaningful around education rates, this should be considered when generalizing results beyond the included sample.

Variables operationalizing local support for sustainability, the institutionalization of sustainability efforts in city operations, and local COVID vulnerabilities come both from the survey and a range of archival sources. Table 2 presents the descriptions and sources of all variables. We examine this data using descriptive and logistic analysis. Standard errors are clustered by state to account for potential correlation among respondent cities within each state. Given the cross-sectional nature of the data all

Table 2. Variable Description and Source.

Variable	Description and source	Mean (std. dev.)
City responses to COVID disruptions		
Social equity priority	A dichotomous measure indicating whether a response of yes (1) or no (0) was given to the following question: "Has your city/town government made any of the following changes in response to COVID-19? Increased prioritization of social equity" <i>Source:</i> Sustainability Implementation Survey.	0.320 (0.467)
Environment/climate priority	A dichotomous measure indicating whether a response of yes (1) or no (0) was given to the following question: "Has your city/town government made any of the following changes in response to COVID-19? Increased prioritization of the environment or climate issues." <i>Source:</i> Sustainability Implementation Survey.	0.103 (0.304)
Economic development priority	A dichotomous measure indicating whether a response of yes (1) or no (0) was given to the following question: "Has your city/town government made any of the following changes in response to COVID-19? Increased prioritization of local economic development." <i>Source:</i> Sustainability Implementation Survey.	0.511 (0.500)
Impact on implementation	A three-point measure indicating whether the COVID-19 pandemic had a negative (1), no impact (2), or a positive impact (3) on a city's implementation of local sustainability programs. <i>Source:</i> Sustainability Implementation Survey.	1.585 (0.624)
Impact on sustainability staffing	A three-point measure indicating whether the COVID-19 pandemic had a negative (1), positive (3), or no impact (2) on the number of staff FTEs dedicated to sustainability work. <i>Source:</i> Sustainability Implementation Survey.	1.847 (0.471)
Impact on sustainability funding	A three-point measure indicating whether the COVID-19 pandemic had a negative (1), positive (3), or no impact (2) on the city's funding for sustainability efforts. <i>Source:</i> Sustainability Implementation Survey.	1.696 (0.579)
Impact on collaboration	A three-point measure indicating whether the COVID-19 pandemic had a negative (1), positive (3), or no impact (2) on the city's collaboration with external partners around sustainability efforts. <i>Source:</i> Sustainability Implementation Survey.	1.778 (0.639)
Local support for sustainability		
Percent voting Democrat	The percent of city residents that voted for the Democratic nominee in the 2016 presidential elections. <i>Source:</i> Harvard Election Data Archive precinct data, aggregated to city level.	52.666 (16.235)
Support from top administrator	A 5-point measure indicating the extent of support that sustainability efforts receive from the city's chief administrative officer, where 1 equals "no support" and 5 equals "high support." <i>Source:</i> Sustainability Implementation Survey.	3.689 (1.027)
Support from city commission/council	A 5-point measure indicating the extent of support that sustainability efforts receive from the city council/commission, where 1 equals "no support" and 5 equals "high support." <i>Source:</i> Sustainability Implementation Survey.	3.600 (1.039)
Institutionalization of sustainability		
Dedicated staff	A dichotomous measure indicating whether the city has dedicated staff for sustainability work. <i>Source:</i> Sustainability Implementation Survey.	0.532 (0.499)
Dedicated budget	A dichotomous measure indicating whether the city has dedicated budget working on sustainability initiatives. <i>Source:</i> Sustainability Implementation Survey.	0.241 (0.428)

(Continued)

Table 2. (Continued)

Variable	Description and source	Mean (std. dev.)
Sustainability in city plans	A dichotomous measure indicating whether the city has formally included sustainability principles into its strategic plan, comprehensive plan, and/or a stand-alone sustainability plan. <i>Source:</i> Sustainability Implementation Survey.	0.821 (0.384)
COVID impacts/vulnerabilities		
COVID deaths	Number of deaths from COVID-19 per 1000 residents during 2020. County-level data. <i>Source:</i> New York Times COVID 19-Data.	0.698 (0.435)
Race/ethnicity	Percent of each city's population that identifies Black or Hispanic. <i>Source:</i> American Community Survey 2019, five year estimates.	58.233 (23.814)
Food and entertainment economy	The percent of the total county payroll, in which each city is located, that comes from arts, entertainment, and recreation (NAICS 71) and accommodation and food services (NAICS 72). <i>Source:</i> U.S. Census, County Business Patterns, 2019	6.098 (3.244)
Controls		
Population	Each city's 2019 estimated population, logged. <i>Source:</i> American Community Survey 2019, five year estimates.	10.906 (0.809)
Education	The percent of each city's population over the age of 25 that has obtained a bachelor's degree or higher. <i>Source:</i> American Community Survey 2019, five year estimates.	37.853 (16.447)

results of the logistic regressions are interpreted as associational rather than causal.

Results and Discussion

COVID's Effect on How City Governments Prioritize Sustainability Dimensions

A city's experience with the COVID-19 crisis may change the priority it places on sustainability-related objectives. Some locales may broadly deprioritize sustainability as a result of having to divert attention and resources to respond to COVID-related challenges. However, it is possible that in others, these challenges will lead to greater recognition of the importance of one or more sustainability dimensions. Figure 1 shows the percent of cities that indicated that their city government *increased* the priority it places on environmental or climate, social equity, and/or local economic issues in response to COVID-19. Economic development is a traditional local government priority, and over 50% of cities indicate that they are doubling down on this as part of their COVID response. This comports with findings from other recent studies, which also

observed local governments adjusting their mix of economic development strategies and increasing emphasis on collaboration to navigate the uncertain economic conditions (Johnson et al. 2022).

In contrast, only 10% indicated that COVID resulted in the greater prioritization of environmental and/or climate concerns, suggesting that the parallels that have been made between COVID and climate change either yielded little effect or were overwhelmed by other concerns. Finally, approximately a third of city governments increased their prioritization of social equity in response to COVID. This is notable because social sustainability has long been considered the neglected pillar of sustainability (Opp 2017). Since the onset of the pandemic, numerous race-related incidents have shocked US cities and, in some, accelerated the adoption of an "equity lens" for sustainability initiatives (Glickman 2022). While cities' experiences with COVID cannot be completely disentangled from these other concerns, the data in Figure 1 suggests that sustainability leaders in 32% of cities specifically identify the pandemic as a factor that increased their government's emphasis on social sustainability.

Figure 1 also shows that there is a moderate positive tetrachoric correlation between cities' COVID-related responses across all three sustainability dimensions. Sixty percent of cities increased their prioritization of at least one dimension, with 21% increasing two, and 6% increasing all three. Notably, social equity appears to serve as a bridge, having meaningfully higher correlations with the prioritization of both economic and environmental issues than either of those have with each other.

How does the extent of local support for sustainability, its institutionalization within the city government, and local vulnerability to COVID associate with whether cities have responded to COVID by increasing their prioritization of one or more sustainability dimensions? Table 3 displays the results of a series of logistic regressions between the variables indicating a change in the prioritization of each sustainability dimension and those representing these sets of community and government characteristics.

Local support for sustainability, proxied by the percent of Democratic voters, is significantly associated with an increased prioritization of local equity and economics-related sustainability objectives as a response to COVID. Whereas, cities that have a city council or commission supportive of sustainability were more likely to experience an increase in the prioritization of environmental sustainability, all else equal. Overall, the degree to which sustainability has been institutionalized within a city government has little statistical association with whether cities' changed how they prioritize sustainability in response to COVID. The one exception is that cities with dedicated sustainability staff were significantly more likely to increase their prioritization of social sustainability. This might mean that sustainability officers, when faced with major social upheavals during the pandemic, were able to turn them into an opportunity to advance what was previously neglected aspect of sustainability. These individuals have the incentive and expertise to act as internal advocates and successfully frame sustainability as an important part of their city's larger COVID response (Krause and Hawkins 2021; MacDonald et al. 2020). Local economic vulnerability, as proxied by the percent of local jobs in the service sectors, is

associated with an increased prioritization of all sustainability dimensions. On the other hand, the number of COVID deaths experienced locally is consistently insignificant and the percent of cities Black and Hispanic residents is significantly negatively associated with the elevation of social sustainability concerns. This latter finding is unexpected.

COVID's Effect on Resources for and Implementation of Local Sustainability

Distinct from any priority-related intentions, the pandemic has introduced to city governments numerous practical challenges, including those related to workforce and funding stability. Disruptions to networks and workflows, along with the emergence of new demands, create difficult conditions for implementation. Figure 2 shows the impact that the pandemic has had on three different aspects of sustainability programming. Staffing appears to be the least affected aspect of cities' sustainability work. Over 75% of cities reported that COVID had no impact on the number of full-time equivalent (FTE) employees dedicated to sustainability work, while 20% reported a negative impact. One might accurately note that some of the cities reporting no impact likely did not have any sustainability staffing to start with. However, the numbers change only slightly when looking just at the subgroup of cities that do have dedicated sustainability staff ($n=311$). Among these cities, 72% noted no impact on FTEs, and 22% reported a negative impact. This reflects previous findings that laying off employees was one of the least frequently used strategies by local governments in the wake of COVID-related financial shortfalls and instability (Maher et al. 2020). The ability to furlough employees or otherwise force unpaid time-off, especially during the initial period of budget shock, may help account for the modest impact on FTEs. In comparison, overall funding for sustainability initiatives was more affected, with almost 37% of cities reporting a negative impact on their budget. Finally, perhaps as a culmination of these and other challenges, 49% of respondents reported that the pandemic has negatively affected their cities' overall implementation of

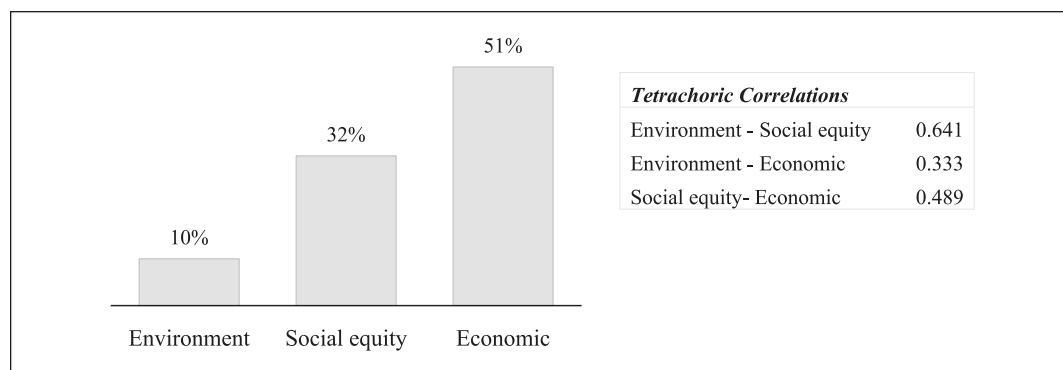


Figure 1. The percent of cities for which the prioritization of each sustainability dimension increased in response to the COVID-crisis.

Table 3. Results of Logistic Regression Showing Association Between Local Characteristics and Changes in Support for Sustainability Dimensions in Response to COVID.

	Social equity	Environment	Economics
Support for sustainability			
Pct Democrat	1.052*** (0.009)	1.018 (0.013)	1.015** (0.007)
CAO support	1.254* (0.162)	1.220 (0.189)	0.949 (0.118)
Council support	1.090 (0.186)	1.597** (0.327)	1.105 (0.166)
Institutionalization of sustainability			
Dedicated sust. staff	1.863*** (0.360)	1.326 (0.414)	0.920 (0.198)
Sust. budget	1.171 (0.291)	1.248 (0.442)	1.200 (0.185)
Sust. in city plan	0.651 (0.204)	2.274 (1.814)	1.187 (0.262)
COVID impacts/vulnerabilities			
COVID deaths	0.901 (0.220)	1.508 (0.484)	0.750 (0.149)
Pct. Black or Hispanic	0.975*** (0.007)	0.996 (0.009)	0.987* (0.007)
Pct. Service Industry jobs	1.084*** (0.027)	1.071*** (0.024)	1.061** (0.026)
Controls			
Population (logged)	1.514*** (0.230)	1.600*** (0.252)	1.434*** (0.195)
Education (Pct. BA+)	0.991 (0.008)	1.006 (0.008)	0.994 (0.009)
N	516	516	516
χ^2	126.65 (0.000)	43.92 (0.000)	116.02 (0.000)

Note: Odds ratios. Standard errors in parentheses.

* $p < .10$. ** $p < .05$. *** $p < .010$.

local sustainability programs. It is thus clear that the pandemic is placing a significant hardship on the continuation of sustainability-related efforts in many locales.

Expanding on these descriptive findings, Table 4 presents the results of three ordinal logistic regressions run on the sustainability resources and implementation dependent variables and a set of independent variables representing local support for sustainability, sustainability institutionalization, and local vulnerability to COVID. Looking

at the table as a whole, two observations stand out. First, controlling for other factors, cities with more Democratic-leaning populations are significantly more likely to have indicated that the pandemic had a negative impact on all three aspects of sustainability programming. Second, the inclusion of sustainability principles in a city plan is, likewise, consistently associated with COVID's reported negative impact on local sustainability efforts. These results may initially appear surprising, particularly when considering the results of Table 3,

which show a positive relationship between these same variables and the prioritization of different sustainability dimensions. Conventional wisdom might suggest that the same factors that create a supportive environment for local sustainability efforts would also buffer them against negative programmatic impacts from the pandemic. Instead, these supportive factors are associated with more program implementation challenges and greater reductions to staff and funding.

How to explain this? Recall that results from these analyses indicate association rather than causation. First, with this in mind, findings from recent research suggesting that ideologically liberal municipalities took greater precautions in response to COVID than conservative-leaning ones is relevant (Brandtner et al. 2021; Hansen et al. 2021). As such, despite their generally greater support for sustainability objectives, liberal-leaning cities may have experienced greater programmatic disruptions across-the-board during the height of the pandemic. Second, with regard to the negative relationship between the incorporation of sustainability principles into city plans and each of the program areas, the presence of sustainability-focused plans may result in a greater sensitivity to changes in the pace of implementation and an earlier awareness of challenges. Plans provide city governments with an agreed-upon and often formally adopted roadmap for action and thus make deviations away from it easier to identify (Krause and Hawkins, 2021). This may be especially so in locales with sustainability staff who are charged with responsibility to monitor this progress.

Beyond these, only three other variables—percent of county jobs in the service industry, the percent of adults with college degrees, and the percent of residents that are Hispanic or Black—show any significant association with the programmatic variables. All are in line with expectations, if somewhat inconsistently. Economic reliance on service industries and the presence of larger Black and Hispanic populations are used as proxies for local vulnerability to COVID. Their association with programmatic challenges is thus expected, although it is not clear why the former is significant only for sustainability implementation and the latter only for staffing challenges. Finally, consistent

with expectation, the presence of a more educated population is associated with fewer COVID-related implementation challenges.

Conclusion

The COVID-19 pandemic has disrupted the normal functioning of many local government programs and objectives. Those like sustainability, which are not embedded in the missions and operations of most city governments, may be particularly susceptible to retrenchment or change. This study examines how cities changed their prioritization of sustainability dimensions (i.e., economic, environmental, or social) in response to their pandemic-experiences and how COVID impacted their sustainability programming. Based on a survey administered approximately one year into the pandemic, we find that almost 50% of U.S. cities faced COVID-induced obstacles to the implementation of local sustainability programs. Although notably fewer experienced cuts to funding or staffing, the challenges are evident.

The ways that cities consider and approach sustainability appears also to have changed during this time. Whereas many consider the retrenchment of sustainability efforts as normatively bad, strategic adjustments to its programmatic emphasis have the potential to be beneficial (Krause and Hawkins 2021). Our survey results show that 60% of cities have increased the degree to which they prioritize one or more sustainability dimensions in the wake of COVID. Of these dimensions, the largest percent of cities (51%) have given greater attention to economic health as part of their pandemic response. Economic development is already a primary focus for most local governments. Although more research is needed to draw broader conclusions, it is possible that cities tend to double-down on key aims when faced with disruption. At the same time, the pandemic also spurred a third of cities to increase their prioritization of social sustainability. Although a less traditional area of emphasis for cities, the pandemic has helped highlight numerous shortcomings in this area, to which these cities may be responding. Overall, the flexibility of sustainability as a concept, while bemoaned by some,

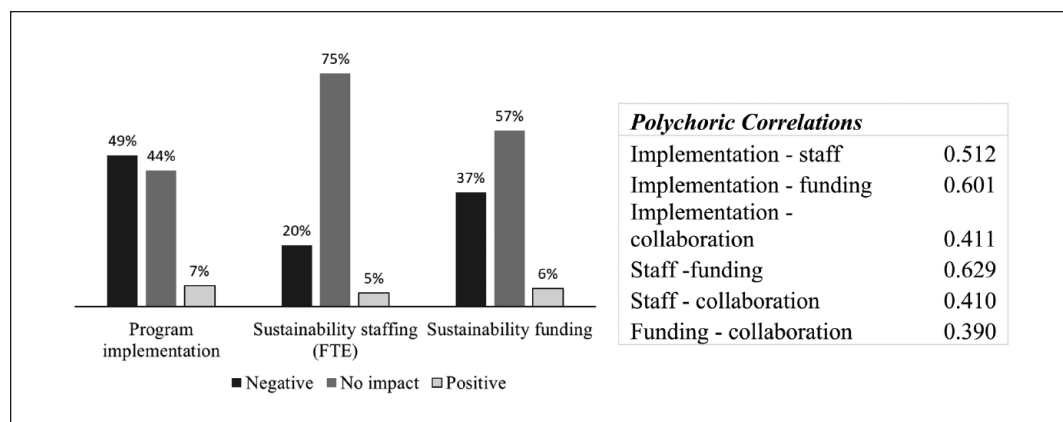


Figure 2. The impact of the COVID-crisis on sustainability resources and implementation.

Table 4. Results of Ordinal Logistic Regression Showing Associations Between Local Characteristics and the Impact Had by COVID on Sustainability Resources and Implementation.

	Program implementation	Sustainability staffing FTE	Sustainability funding
Support for sustainability			
Pct Democrat	0.973*** (0.007)	0.984** (0.007)	0.980*** (0.008)
CAO support	0.966 (0.094)	0.988 (0.121)	1.153 (0.135)
Council support	0.996 (0.106)	1.123 (0.159)	0.983 (0.137)
Institutionalization of sustainability			
Dedicated sust. staff	0.698** (0.127)	1.055 (0.288)	0.702 (0.242)
Sust. budget	0.891 (0.182)	0.879 (0.181)	1.085 (0.327)
Sust. in city plan	0.645** (0.126)	0.532*** (0.114)	0.628** (0.125)
COVID impacts/vulnerabilities			
COVID deaths	0.828 (0.150)	0.990 (0.233)	0.950 (0.171)
Pct. Black or Hispanic	1.004 (0.007)	0.986*** (0.005)	1.002 (0.008)
Pct. Service Industry jobs	0.948** (0.023)	0.998 (0.031)	0.960 (0.026)
Controls			
Population (logged)	0.827 (0.100)	1.055 (0.157)	0.963 (0.157)
Education (Pct. BA+)	1.018*** (0.007)	1.000 (0.007)	0.998 (0.009)
N	506	499	497
χ^2	147.92 (0.000)	52.98 (0.000)	63.82 (0.000)

Odds ratios. Standard errors in parentheses.

* $p < .10$. ** $p < .05$. *** $p < .010$.

allows it to adapt to changing circumstances while maintaining its core principle of securing long-term, balanced well-being (Purvis et al. 2019). Keeping local sustainability efforts current and in line with pressing needs and political realities may assist its programmatic survival during times of crisis.

Another important finding is from this research is that, controlling for other factors,

cities that have a sustainability plan are more likely to report that the pandemic had a negative impact on sustainability resource allocation programming. We surmise that this is because cities that have embedded sustainability principles into a formal plan likely have a broader on-going scope of work susceptible to disruption. A plan also may enable city staff to better recognize challenges to and deviations from the course of

actions needed to achieve objectives. More research is needed to tease-out and confirm the dynamics underlying these findings. Overall though, having a sustainability plan appears unable to satisfactorily compensate for the range of difficulties experienced during the pandemic. A robust strand of research exists that focuses on the presence and quality of city sustainability and climate plans; some of this attention could usefully be shifted to examine the role that plans play (or can play) in sustaining operations during times of disruption.

As introduced above, there remains considerable room for future research to advance this preliminary work. Many of the study's primary limitations are tied to the nature of the data. First, the data is cross-sectional, collected at a single point-in-time approximately one year into the pandemic. This prevents us from drawing casual conclusions, capturing relevant contextual shifts, and teasing out changing dynamics including with staffing and resource allocation. Secondly, data for our key variables are derived by asking staff to reflect on the impacts that COVID has had on their city government's sustainability efforts and the changes it made in response. Although there is a considerable precedent for the use of expert perception to measure policy and management outcomes (Bennett 2016), it remains a second-best approach.

As the scope of municipal responsibilities expands to fill gaps left by higher levels of government, an increasing portion of local efforts focus on objectives that are outside of their traditional core. In this respect, sustainability initiatives are accompanied by smart city initiatives, art and culture programming, and immigrant services, to name a few. Because they are non-traditional, they are often considered "extra" by city stakeholders both internal to and outside of the government. This increases their susceptibility to retrenchment or change in times of crisis. Disruptions—whether resulting from natural disasters, social or economic upheaval, or public health emergencies—are increasingly frequent. As such, it is important to build a foundation for understanding how various local function are likely to be impacted, even if indirectly, by them. This research is an initial step toward that larger aim.

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