



Movement under state and non-state authorities during COVID-19: Evidence from Lebanon

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ABSTRACT

COVID-19 has presented governing authorities with challenging decisions that have required them to consider the tradeoffs between movement restriction and economic activity. We propose that non-state armed groups may make different decisions than state governments in response to these challenges. Drawing upon the case of Hezbollah in Lebanon, we investigate whether movement levels differed between areas with Hezbollah private governance in comparison to other areas of Lebanon. Using Google COVID-19 mobility data and a difference in differences model, we show that following the first COVID-related death in Lebanon, movement in districts with private Hezbollah governance decreased significantly less than in other districts. We present a number of potential reasons for this disparity, arguing that the most probable explanation is the relatively high level of economic assistance that Hezbollah provided to people living in areas under Hezbollah's authority, which led to comparatively lesser rates of movement decline.

COVID-19 has presented a challenge to governing authorities, confronting them with difficult choices regarding which policies to implement in response to the pandemic. In particular, the initial emergence of COVID-19 commonly resulted in governing authorities limiting physical interactions and reducing the movement of people, which came at the expense of lower economic activity – at least in the short term (Laborde, 2020).

Political scientists and economists have naturally taken an interest in how state governments have addressed challenges related to the tradeoff between movement and economic activity and its implications for authorities' actions. In particular, economic factors have been examined as potential determinants for variation in physical movement reductions. For instance, work-related movement reductions are lower on average in regions with higher levels of poverty in African and Latin American countries (e.g., Bargain & Aminjonov, 2021). That is, the movement-economic activity tradeoff may translate to a health-hunger tradeoff in poorer regions, resulting in less movement reduction in favor of economic activity.

While evidence suggests that economic factors may affect the severity of the movement-economic activity tradeoff and thus movement levels, other factors may also impact variability in movement levels. In contrast to focusing on economic factors affecting movement

restrictions, our study concentrates on political factors. We concentrate specifically on variability in governing authority type and its implications for movement (e.g., Dunn & Laterzo, 2021).

State governments are not the only governing authorities that were required to make decisions in light of the movement-economic activity tradeoff. Non-state armed groups, such as Ha'ayt Tahrir al-Sham in Syria, Al-Shabaab in Somalia, and Hamas in the Gaza Strip, rule over an estimated 60–80 million civilians worldwide, and emerged as part of the global response to COVID-19. As a result, some researchers have also examined how non-state armed groups (henceforth, armed groups), have addressed the COVID-19 pandemic in areas under their influence (Furlan, 2020, Swed, 2021). Armed groups have responded with a wide range of policies, for instance, promoting preventive measures, developing infrastructure to address the pandemic, and placing movement restrictions (Breslawski, 2022). One of the armed groups that has received the most positive attention surrounding its response is Hezbollah (Alijla, 2021).

Hezbollah had a relatively quick and robust response to the pandemic. The robustness of Hezbollah's response is perhaps unsurprising, as the group had a pre-existing and well-developed healthcare system, especially for its constituent areas (Cammatt, 2014). Hezbollah used its extant welfare governance system and mobilization capacity to

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provide private health governance measures to its constituencies. For instance, areas with Hezbollah private governance,¹ such as Baalbak, were challenging to enter without a facemask (Alijla, 2021).

However, despite the positive attention that Hezbollah has garnered as a result of its response to COVID-19, to our knowledge, no research has compared the results of Hezbollah's response to other governing authorities in Lebanon. That is, reports of Hezbollah governance activities illustrate the group's robust response to COVID-19. Yet, we lack a comparison to areas in which Hezbollah is less active and provides less private governance, preventing an understanding of whether Hezbollah's private governance activities actually resulted in distinct outcomes that helped to prevent the transmission of COVID-19 compared to areas in Lebanon with less Hezbollah private governance.

In particular, a better understanding of movement levels in areas with and without Hezbollah private governance would be helpful. Movement restrictions have been lauded as essential for reducing physical interactions and thus COVID-19 transmission. Yet, movement restrictions may result in significantly adverse effects on economic activity (Bargain & Aminjonov, 2021). Adverse economic effects are a challenge for any governing body, but because of Lebanon's already deteriorating economic and political conditions, it may have been especially challenging for Hezbollah and the Lebanese government.

We address empirically variation in movement activity in Lebanese districts with Hezbollah private governance compared to districts without Hezbollah private governance. Using data from Google's COVID-19 Community Mobility Report and a difference in differences research design (DiD), we provide descriptive evidence of differences in movement activity. Specifically, we examine people's movement related to retail and recreation,² the workplace, and to grocery stores and pharmacies.³

Results from the DiD model demonstrate that districts with Hezbollah private governance witnessed significantly lower reductions in movement after Lebanon's first known COVID-19 related death compared to compared to districts without Hezbollah private governance. Compared to people in districts with Hezbollah private governance, people in districts without Hezbollah private governance decreased their movement 63% more for retail and recreation and 26% more for workplace purposes. The difference for grocery stores and pharmacy-related movement is even more stark. People in districts without Hezbollah private governance decreased their movement to grocery stores and pharmacies by 3% after the first COVID-19 related death. However, in districts with Hezbollah private governance, people increased their movement to grocery stores and pharmacies by 275%. While existing studies suggest that Hezbollah responded to COVID-19 with robust public health measures, to our knowledge, previous studies have not compared pandemic-related outcomes between areas with state and non-state actors. By contrast, our findings demonstrate that areas with Hezbollah private governance experienced less of a movement reduction compared to other areas in Lebanon.

Because of non-random distribution of Hezbollah's authority, it is possible that factors other than Hezbollah's governing decisions are driving the results. For instance, areas with Hezbollah private governance may have higher poverty levels than areas without Hezbollah private governance, which may explain the observed lower rate of

movement reduction in Hezbollah private governance areas. However, using district-level data on electricity levels, urban-rural levels, and road density, our results suggest that differences in movement activity in districts with and without Hezbollah private governance are not a function of poverty-related differences.

We supplement our descriptive empirical approach with several possible explanations for the lower rate of movement reduction in districts with Hezbollah private governance. We argue that the most probable explanation is the relatively high level of economic assistance provided by Hezbollah in areas under their authority, which resulted in the provision of food, medicine, and banking services that may have increased movement. The results from the DiD model are suggestive of this mechanism, as districts with Hezbollah private governance observed a substantive increase in movement related to groceries and pharmacies, while other districts experienced a decrease. We consider a number of alternative explanations, but the economic assistance explanation has the greatest amount of empirical support.

This article makes a number of contributions. First, and broadly speaking, the study builds on a robust literature on the interplay between public health and politics (e.g., Bargain & Aminjonov, 2021; Dunn & Laterzo, 2021), providing a theoretical and empirical explanation addressing the tradeoffs political leaders face in their decisions (Frey et al., 2020; Can; Grasse et al., 2021; Kavakli 2020; 2020Pulejo & Querubín). Existing work is limited in that it focuses largely on state governments, rendering it unable to speak to many areas in which people live under the influence of control of non-state actors (Arjona et al., 2015). In contrast, our article draws upon current understandings of public health responses to develop expectations for how armed groups' considerations and their constituents differ from those of state governments when responding to public health emergencies.

Second and more specifically, the article contributes to our understanding of how non-state armed groups respond to public health emergencies, adding to studies that focus specifically on Hezbollah (e.g., Alijla, 2021). Existing studies have highlighted the health governance actions that armed groups have taken in response to COVID-19. In contrast to a number of existing studies, our article provides a comparative analysis, examining variation in a common metric highly relevant for COVID-19 – people's movement (e.g., Bargain & Aminjonov, 2021). By comparing movement across districts with and without Hezbollah private governance, we are better able to understand how people fare under different governing authorities.

We note that our study focuses on Hezbollah. Hezbollah is defined by a number of characteristics that make it distinct from other non-state groups, such as simultaneous participation in electoral politics and the government, relative military strength compared to the government, and a history of military conflict with a neighboring state. Additionally, Lebanon is distinct from other countries in conflict with non-state armed groups in that it is defined by hybrid and multi-layered governance, in which relations between Hezbollah and the government are not always zero-sum or oppositional. As a result, we do not make claims related to generalizability. Rather, the purpose of this article is a first step towards examining movement levels in areas governed by non-state armed groups in the case of Hezbollah – an armed group that has received perhaps the greatest level of attention for their robust response to the COVID-19 pandemic.

The rest of the study proceeds as follows. We first describe features of Lebanon and Hezbollah relevant for the comparison. We then discuss the tradeoff governing authorities in Lebanon faced with the onset of COVID-19, specifically the economic costs of reducing people's movements. Third, we describe the Google COVID-19 mobility data on people's movement at the district level in Lebanon. Our difference in differences analysis follows. Finally, we consider possible factors that may explain the statistical differences between districts with and without Hezbollah private governance, concluding that Hezbollah's economic assistance has the greatest level of empirical support.

¹ Hezbollah's private governance refers to the organization's contribution of governance services outside the purview of the Lebanese government and outside the purview of Hezbollah's participation in the Lebanese government. Hezbollah's governance activities though its participation in the Lebanese government are not classified as private governance activity. See pages 8–10 for a fuller conceptualization.

² Retail and recreation refer to movement around restaurants, cafes, shopping centers, theme parks, museums, libraries, or movie theaters.

³ The measure refers to movement for grocery markets, farmers markets, specialty food shops, drug stores, or pharmacies purposes.

1. Hezbollah and Lebanon

Lebanon is a parliamentary democratic republic with a confessional system. Under the confessional system, political positions are allocated by sectarian community. The position of President of Lebanon is reserved for a Maronite Christian. The Sunni Muslim community provides a candidate for the Prime Minister, and the Speaker of the Parliament is reserved for the Shia community.

Within Lebanon's complicated confessional system of governance, Hezbollah operates as a predominantly Shia militant organization and political party. Unlike other militias from the Lebanese Civil War, Hezbollah maintains its military arsenal. Yet, Hezbollah does not just maintain its military capabilities. The organization provides social and economic services to areas in which it predominates, resulting in commentators describing Hezbollah's position as a 'state within a state' (دولة داخل دولة) ("Hezbollah is investing in the Corona crisis" April 1, 2020).

Hezbollah maintains a presence and provides significant governance in parts of southern Lebanon, the southern suburbs of Beirut and parts of the Beqaa Valley (Congressional Research Service, 2021). The state within a state is thus limited geographically, motivating observers to describe some Lebanese areas as under Hezbollah's authority.

Yet, Hezbollah's relationship with the Lebanese state is more complicated than its description as a state within a state. First, Hezbollah governance is sometimes conducted in coordination/cooperation with the Lebanese government and has been referred to as plural governance, characterized by hybrid sovereignty (Hazbun, 2016). That is, non-state actors such as Hezbollah are not always in conflict with the government. Rather, Hezbollah and the Lebanese government sometimes coordinate their political behavior or act cooperatively.

Second, and also complicating the 'state within a state' description, Hezbollah is not a completely distinct actor from the government. Rather, in addition to maintaining its private military forces and other governing institutions, Hezbollah also participates in Lebanese electoral politics and is involved in the government. For instance, the current Health Minister of Lebanon is a Hezbollah member. While defined as a rebel group by commonly used civil war datasets (e.g., Gleditsch et al., 2002), Hezbollah's participation in the government distinguishes it from a significant number of rebel groups. Hezbollah's cooperation/coordination with the government as well as Hezbollah dual position as extra-government administrator of governance and participant in the Lebanese government complicate the state within a state description.

Hezbollah's dual position both in and out of the government suggests that Hezbollah's governance can be described as public in some instances and private in others. Hezbollah's participation in the government suggests organizational resources are devoted to the Lebanese government. For instance, the Health Minister of Lebanon is a Hezbollah member and together with other organizations that participate in the government administer health services to the Lebanese public. That is, Hezbollah, along with other actors, contributes to Lebanon's governance, which we refer to as Hezbollah's public governance contributions.

In contrast, Hezbollah's contribution of governance services outside the purview of the Lebanese government suggests organizational resources may also be devoted to specific geographic areas and constituencies that maintain a distinct relationship to Hezbollah. That is, Hezbollah contributes governance services to areas of greater relevance and support to the organization (Cammatt, 2014) and through channels unrelated to its direct participation in the Lebanese government. We refer to this as Hezbollah's private governance contributions.⁴

Hezbollah's private provision of governance, that is, Hezbollah activities that are not channeled through its participation in the Lebanese

⁴ See Alijla (2021) for description of Hezbollah's governance measures conducted through the government (which we describe as public) and through its own service provisions (which we describe as private).

government, suggests governance levels may differ in quantity and quality when making within-Lebanon comparisons. More specifically, some of the within-Lebanon variation in movement may be due to Hezbollah's unique and distinct relationship with specific geographic areas and constituencies and provision of governance that is not channeled through the Lebanese government.

2. Movement and governance

COVID-19 presented government and non-state actor governing authorities with challenging tradeoffs. Policies that contribute to the health of populations are often associated with certain political and economic costs, at least in the short term (Buheji et al., 2020).⁵ Governing authorities may choose from a range of different policies in order to address public health emergencies, including information campaigns, service provision, and restrictions in movement, among others. Movement restrictions, with the aim of reducing physical interactions, in particular were instruments employed by governing actors across the world to reduce spread (e.g., Kraemer, Sadilek, et al., 2020) and mortality (e.g., Sulyok & Walker, 2021).

Yet, restricting movement tends to be politically costly for governing authorities because of its damaging effect on the civilian population economically (at least in the short term), which in turn may lead to decreased support for political authorities (Duch & Stevenson, 2008). Indeed, across the globe, multiple governments have witnessed protests against restrictive measures during the time of COVID-19. In a number of contexts, people tend to be more concerned with the economic consequences of the emergency than the health consequences (Oliver, 2020).⁶

The tradeoff between movement restrictions and short term economic activity may be especially acute in poorer countries where people are less able to handle economic shocks due to low extant economic levels (Bargain & Aminjonov, 2021). Prior to the emergence of COVID-19, Lebanon was suffering from deteriorating economic conditions.

In consideration of the acute tradeoff the Lebanese government and Hezbollah faced in dealing with the twin crises of COVID-19 and a rapidly deteriorating economy, we examine empirically if districts with Hezbollah private governance presence observed a reduced rate of movement compared to districts without Hezbollah private governance.

3. Data and analysis

We examine differences in districts with and without Hezbollah private governance presence with data from Google Community Mobility Reports, which extend from February 16, 2020 to December 31, 2020. We estimate a difference in differences model, which compares changes in movement from a baseline in the time before and after the first death in Lebanon across districts with and without Hezbollah private governance. We include 17 of Lebanon's 25 districts and Beirut in our analysis, due to limitations in the availability of Google Community Mobility Reports. The result is an unbalanced panel, as for some days in some districts there are not enough data for Google to ensure anonymity.⁷ Nine districts – Hermel, Reshaya, Western Beqaa, Bint Jbeil, Hasbaya, Marjeyoun, Bsharri, Miniyeh-Danniyeh, and Jezzines –

⁵ This tradeoff may not exist for countries with wealthier populations, which saw trust in the government increase in response to lockdowns (Bol et al., 2021). Our argument reflects the situation of less wealthy countries, and thus assumes a 1:1 tradeoff between policies designed to counter COVID-19 and policies designed to bolster the short term political wellbeing of the governing entity.

⁶ Survey of people across 12 developed and developing countries.

⁷ Table A1 in the appendix shows how many days are included for each district.

are thus not included in analysis.⁸

We classify the following districts as having Hezbollah private governance presence: Baalbek, Nabatiyeh, and Sour, which are summarized in Table 1. While districts are not the ideal administrative level for classifying Hezbollah private governance, they represent the lowest administrative district at which the data from Google Community Mobility Reports are available.

Our classification scheme is broadly based on Hezbollah’s relatively large governance presence in Shia-dominated areas, such as southern Lebanon, northern Beqaa Valley, and the southern suburbs of Beirut (e.g., Norton, 2007), as well as in areas in which Hezbollah provides welfare services (Cammett & Issar, 2010). Our classification scheme is more specifically based on two features. Districts are classified as having private Hezbollah governance if: 1) if the largest sectarian population is Shia in the electoral district based on the 2017 law (International Foundation for Electoral Systems, 2017) and 2) if >25% of a district’s public services are Hezbollah operated [(includes healthcare and educational services, based on data from Cammett (2014)]. We consider sectarian population because of Hezbollah’s and their political ally Amal’s relative popularity with the Shia population. There is of course Shia opposition to Hezbollah and Shia support for other political actors, but in general Hezbollah is considered to operate more in Shia-populated areas and provide more services to the Shia population (e.g., Norton, 2007).

Two districts present potential classification challenges. First, there are some districts that are not easily classified, such as Saida and Baabda. Saida district is divided in the 2017 electoral districts. The division stems from Saida City vs. other Saida district areas distinctions. The largest city in the district – Saida City – consists primarily of Sunni Muslims, is the home base of the Hariri family, a prominent Sunni political family, and is a strong area of support for the Future Movement (Ghaddar, 2016). While Hezbollah maintains a presence away from the coastal plain and in more rural areas such as those surrounding Jezzine, the large Sunni and Future Movement presence in Saida City complicate classification. We also note that Saida District does not reach the >25%

Table 1
Districts included in analysis.

Districts without Hezbollah private governance	Districts with Hezbollah private governance
Aakkar	Baalbek
Aalay	Baabda ^a
Batroun	Nabatiyeh
Beirut	Saida (Sidon) ^a
Chouf	Sour (Tyre)
Jbeil (Byblos)	
Kesrouane	
Koura	
Matn	
Tripoli	
Zahlé	
Zgharta	

^a Districts added in robustness checks.

⁸ It is possible that not including these districts in our analysis could bias our results. To provide some insight into whether this is the case, we check the balance of other covariates (including road density, population, etc.) for the full sample and compare it to the sample limited by the mobility data availability. The only difference between the two samples is that in the limited sample, the difference in road density between districts with Hezbollah private governance and other areas is statistically significant, while in the full sample it is not. Comparisons can be found in Tables A2a and A2b in the appendix. We address the difference in road density between districts in our sample with and without Hezbollah private governance in robustness checks.

Hezbollah operated health clinics.

Baabda district contains Dahieh, a southern suburb of Beirut with significant Hezbollah governing infrastructure and supporters. For instance, 31% of public services in Baabda are Hezbollah operated. Yet, other areas of Baabda contain other sectarian populations, including Maronite Christians and Druze, with significant presence of and support for other political parties, and maintain less Hezbollah private governing institutions. The mix of Hezbollah governing institutions and Shia population with non-Shia populations and presence of other political parties hinder clear classification of Baabda.

Saida and Baabda districts provide challenges in classifying them as having Hezbollah private governance or not. Both districts also contain other sectarian populations and significant presence of other political actors. Saida does not reach the >25% Hezbollah clinic threshold, while Shia are not the largest sectarian population in Baabda. We address the challenging issue of the presence of Hezbollah private governance not fitting completely with district borders by excluding Saida and Baabda districts in the primary analysis but including the districts in robustness checks.

A second challenge is that even in districts with private Hezbollah governance, there were other actors responding to the COVID-19 pandemic. For instance, in Baalbek, Nabatiyeh, and Sour – the districts we identify as having private Hezbollah governance – Harb et al. (2021) found that about a third of actions taken in response to the pandemic were carried out by INGOs, NGOs, and civil society actors. (Harb et al., 2021). We address this empirically in robustness checks.

We use the first known death related to COVID-19 in Lebanon, March 10, 2020, as the cut off point in implementing a difference-in-difference design and as a division for two time periods. A day after its first death, Lebanon implemented a closing of daily economic activities, including malls, restaurants, tourist sites, and public gardens. A stay-at-home order was soon issued, and non-essential services stopped. Because of the significant difference in restrictions on daily economic activity, we consider March 10 an appropriate divisor for generating two time periods.

Our three outcome variables measure distinct categories of movement and are drawn from Google’s COVID-19 Community Mobility Reports, which provides data at the district-day level. The reports chart movement trends over time across different categories of places. We examine movement changes in time spent on (i) retail and recreation, (ii) workplaces, and (iii) grocery stores and pharmacies. Higher values of each dependent variable indicate more time spent in these locations. Specifically, the data show how visitors to categorized places changed compared to district-specific baseline periods (calculated using the median movement values from January 3 to February 6, 2020). The measures are advantageous in that changes in movement in time are relative to these district baseline levels, accounting in the measure for pre-first COVID-19 related death district movement levels.

Google aggregates and anonymizes data from users who enable the Location History setting. While, to our knowledge, there is no study of what percentage of those residing in Lebanon keep their location history turned on, a recent study found that nine out of ten people in the United States do so (Kaplan, 2016). Other studies also rely on Google COVID-19 mobility data (Bargain & Aminjonov, 2021; Sommer & Rappel-Kroyzer, 2021) and suggest that mobility data can be a relevant proxy for physical distancing (e.g., Nouvellet et al., 2021; Yu et al., 2019). We recognize the potential limitations of using Google COVID-19 mobility data, including data limited to a segment of the population. Yet, Lebanon maintains a relatively high smartphone usage, especially in comparison to other emerging economies (85% of adults use a social media platform or messaging service and 78% of Lebanese use a smartphone) (Silver et al., 2019), bolstering confidence in the measure (e.g., Kraemer et al., 2020), as does the high use of Android devices in middle and low economies (Ruktanonchai et al., 2018).

Importantly, the data comply with the parallel trends assumption, with districts with and without Hezbollah private governance mirroring

one another prior to the first COVID-19-related death, and then diverging. Despite there being no formal tests for this assumption, one method is to plot the underlying trends in the dependent variable (movement) across the treatment and control groups (districts with and without the influence of Hezbollah). Fig. 1 below illustrates the average change in movement for districts with Hezbollah private governance vs. districts without Hezbollah private governance. The dotted black line marks March 10, when the first death due to COVID-19 occurred in Lebanon. No discernible distinction in movement trends characterize districts with and without Hezbollah private governance prior to March 10.

Because districts with Hezbollah private governance are likely different from those without, we include a number of covariates in subsequent models and our formal analysis. All of these measures are time invariant and measured at the district level in our analysis.

First, we control for district population (logged).¹⁰ It may be harder for governing authorities to restrict population movement in districts with larger populations. Moreover, larger populations may have less trust in governing authorities and be less willing to restrict movement for a common good.

We also include two measures that capture economic development, measured using five-point scales of electricity distribution capacity and density of roads (Sanchez & December, 2018).¹¹ Economic levels may differ in districts with and without Hezbollah private governance. Rather than Hezbollah causing any increase in movement, lower economic levels, which disproportionately characterize Hezbollah districts, may drive people to engage in more movement. Decreasing movement activity may be less feasible for families of lower economic status due to the fact that the type of work that poorer people do may be more likely to require in-person activity, resulting in movement. Poorer people may also be unable to reduce work hours due to more immediate needs for money (Bargain & Aminjonov, 2021). While we rely upon objective measures of economic development in the main analysis, we also control for average financial satisfaction in the appendix (see Table A11).¹²

We also control for the average level of education¹³ for each district (e.g., Hawkins et al., 2020). It is possible that more educated people are more aware of the health consequences of COVID-19 and willing to comply with movement restriction policies. Alternatively, more educated people may participate in economic activity that requires less movement, lessening the costs of reduced movement activity.

Table 2 below includes six OLS models – two for each dependent variable – changes in time spent at retail and recreation, workplaces, and grocery stores and pharmacies. For each dependent variable, we model the relationship with and without covariates. Standard errors are clustered by district.

The interaction coefficient is in the expected direction with $p < 0.01$ across all models, indicating a statistically significant difference in the rate in which people decreased their movement in the districts with Hezbollah private governance and those without in the period after the first COVID-related death across all three of the categories. Inclusion of the theoretically relevant covariates does not significantly affect the coefficient for the interaction term across any of the models. Coefficient

sizes and standard errors remain consistent with the models that only contain the interaction measure and constituent terms. Overall, results from the OLS regressions indicate that people living in districts with Hezbollah private governance decreased their movement (compared to the district-specific baseline periods) to retail and recreation and workplaces less than those living in districts without Hezbollah private governance. To illustrate the substantive effects, predicted probabilities are generated below in Fig. 2.

Across the three movement types, districts with Hezbollah private governance observed substantively lower reductions in movement activity. Following the first COVID-related death, people in districts with Hezbollah private governance decreased their movement to locations of retail and recreation as well as to their workplace to a lesser extent than people in other areas of Lebanon. Note again that the dependent variable is measured relative to the reference period of January 3 - February 6, 2020, accounting for district baseline movement levels.

Retail and recreation movement levels in districts with Hezbollah private governance vs. other districts is relatively similar in the period preceding the first COVID-related death. Yet, retail and recreation movement changed at different rates following the first COVID-related death, in districts with Hezbollah private governance vs. other districts. Specifically, people in districts with Hezbollah private governance decreased the time they spent at retail and recreation locations 63% less than people in other districts of Lebanon.

A similar trend is seen in workplace-related movement. The results indicate that districts with Hezbollah private governance decreased the relative time spent at workplace 26% less in comparison to districts without Hezbollah private governance. We highlight again that the changes in the dependent variables are relative to the reference period of January 3 - February 6, 2020, accounting for district specificities.

Note that for retail and recreation as well as work related movement, districts with and without Hezbollah private governance both observed declines. Yet, the results indicate a smaller reduction in movement in districts with private Hezbollah governance, that is, the rate of reduction was lower.

We highlight that districts with Hezbollah private governance decreased movement to retail and recreation areas at higher rates compared to work-related movement. The distinction is relevant. Studies find that poorer areas responded to COVID-19 with lower movement reduction – and the effect is stronger for work-related movement. The finding is attributed to poorer people needing to move at higher rates for work compared to other reasons (Bargain & Aminjonov, 2021). In contrast, our results suggest that differences in poverty are not driving the distinctions in movement activity – as a poverty explanation suggests that districts without Hezbollah private governance would have larger movement reductions in work-related movement compared to other categories of movement.

When examining time spent at groceries and pharmacies, differences in changes in movement following the first COVID-related death between districts with private Hezbollah governance and other districts are even more stark. Prior to the first COVID-related death, grocery and pharmacy-related movement levels are statistically indistinguishable in districts with and without Hezbollah private governance. Yet, following the first COVID-related death, districts with and without Hezbollah private governance observe substantive divergence. People in districts without Hezbollah private governance decreased their movement to grocery stores and pharmacies by 3% after the first COVID-related death. In contrast, movement to grocery stores and pharmacies increased in districts with Hezbollah private governance by 275%.

The increase in the rate of movement to grocery stores and pharmacies in districts with Hezbollah private governance may be unsurprising given Lebanon's food insecurity situation and demand for food. With a decline in food access, driven partly by currency value collapse and sharp increases in food prices, food and other basic goods have recently become more unaffordable to a growing percentage of Lebanese. Inability to afford basic food goods for some segment of the

⁹ Time period shortened to two months in plots for readability.

¹⁰ City Population, 2022.

¹¹ Categories were created by Sanchez and December (2018). For electricity distribution capacity, 1 = 0–10, 2 = 10–30, 3 = 30–60, 4 = 60–100, 5 = 100–350. For road density, 1 = 0–0.15 km of road/km², 2 = 0.15–0.3, 3 = 0.3–0.6, 4 = 0.6–1, 5 = 1–6.

¹² To construct this measure, we draw upon the most recent World Values Survey (Wave 7) and generate a district-level average of the question that asks individuals to rate their financial satisfaction on a scale of one to ten. We then match the district mean education for each district used in our analysis.

¹³ A question on education from World Values Survey, Wave 7 is used and aggregated to the district level.

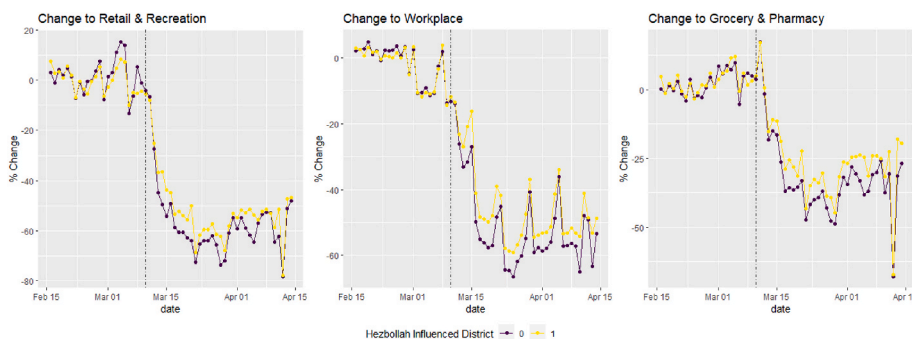


Fig. 1. Change in movement over time.⁹

Table 2
The effect of Hezbollah private governance on change in movement.

	Dependent variable:					
	Retail & Recreation		Workplace		Grocery & Pharmacy	
	(1)	(2)	(3)	(4)	(5)	(6)
Post Death	-23.229*** (3.263)	-22.916*** (3.159)	-27.728*** (1.282)	-27.565*** (1.223)	-1.239 (2.863)	-1.274 (2.843)
Hezbollah	0.306 (1.705)	-16.608* (9.334)	0.018 (1.736)	-8.010** (3.959)	5.096*** (0.851)	2.009 (7.239)
Population		-4.341 (3.189)		-2.225** (0.964)		0.405 (2.496)
Electricity		-6.382* (3.851)		-2.096 (1.340)		-0.288 (3.576)
Road Density		-6.590*** (1.809)		-2.504*** (0.709)		-5.729*** (2.223)
Education		-3.977 (3.498)		1.233 (0.979)		-4.638 (3.425)
Post Death*Hezbollah	15.023*** (3.552)	14.919*** (3.402)	7.662*** (1.449)	7.578*** (1.398)	11.999*** (3.467)	12.373*** (3.513)
Constant	0.675 (1.215)	120.808*** (42.994)	-2.234*** (0.347)	36.938*** (13.211)	1.551* (0.846)	41.361 (34.637)

Note: *p < 0.1 **p < 0.05 ***p < 0.01.



Fig. 2. Predicted changes in movement.

population may have reduced movement to grocery stores and pharmacies for some Lebanese. We speculate, and with more detail later, that Hezbollah provided basic food goods at lower prices, increasing food access to poorer Lebanese in their districts but also resulting in increased grocery and pharmacy movement in those districts.

We employ several robustness checks to further investigate the relationship between governance type and movement changes. All results can be found in the Appendix. First, we change how we classify districts with and without Hezbollah private governance, adding Saida and Baabda to the analysis. Using this specification leads to the

coefficient of the interaction term no longer meeting conventional levels of statistical significance, however plotting the predicted probabilities illustrate that the expected interaction is still present (Table A3 and Figure A1 in the Appendix).

Next, because the results from the difference of difference analysis are highly dependent on the comparison group, we examine a number of variations in the comparison. First consider the possibility that the small number of Hezbollah districts may produce potentially spurious results. More specifically, it is possible that a single Hezbollah district may act as an outlier and drive the different rates in movement change between

districts with and without Hezbollah private governance presence. We thus iteratively drop each district with Hezbollah private governance presence from the analysis to examine whether one district is driving the results. Results remain consistent with the primary analysis when examining the difference of difference without each of the Hezbollah districts. See [Tables A4 – A6](#) in the Appendix.

We consider the presence and actions of other actors, since INGOs and NGOs played a considerable role in the country's response to COVID-19. Drawing upon data collected by [Harb et al. \(2021\)](#) on various political authorities' responses to COVID-19 in Lebanon from March to June 2020, we find that INGOs and NGOs were less active in districts with private Hezbollah governance than other districts of Lebanon. Second, we find that controlling for INGOs' and NGOs' presence in our models does not change the main results. See [Table A7](#) in the Appendix.

We also consider the possibility that major urban areas without Hezbollah private governance presence are driving the results. Beirut and Tripoli are the two largest cities in Lebanon. Populations in larger cities may act differently compared to populations in smaller cities and rural areas. It is possible that observations from Beirut and Tripoli districts are driving the results. Beirut and Tripoli district observations are thus dropped, and analysis rerun. The results remain consistent with the primary analysis ([Table A8](#) in the Appendix).

Along these same lines, we include models that control for the distribution of residents that live in urban and rural areas.¹⁴ Hezbollah predominates in three primarily rural districts, in addition to Dahieh which is added in our robustness checks as part of Baabda district. Rural areas may require more movement to access the same facilities. That is, access to goods may be spread out over longer distances, requiring more movement. Rural areas may also have been at distinct risk levels of COVID-19, especially at the start of the pandemic. Yet, when including an urban level variable, the results for the Hezbollah private governance measure remain consistent with the primary analysis. Urban vs. rural differences do not appear to explain the differences in movement in districts with and without Hezbollah private governance ([Table A9](#) in the Appendix).

Another concern is that our limited sample (which drops districts with insufficient mobility data) is biased. As described in Footnote 8, a notable difference between samples is that in our limited sample the difference in road density between districts with Hezbollah private governance and other districts is statistically significant, while in the full sample of Lebanese districts it is not. To address if road density differences are driving the results, we dropped further observations to facilitate a comparison based on a more balanced comparison along road density. We dropped Baalbak district observations from the Hezbollah private governance category because it had the lowest road density value. We then dropped observations from non-Hezbollah districts with the highest road density value. This resulted in the dropping of observations from Beirut, Baabda, Matn, and Tripoli districts. Dropping extreme values of road density results in a more balanced comparison of units along road density values with no statistically significant difference in road density for Hezbollah and non-Hezbollah districts. The primary models are run on this subsample and the results are consistent with the primary analysis. See [Table A15](#) in the Appendix.

We also consider an alternative measurement of movement. Rather than consider measures that predicted lower rates of change in Hezbollah influenced districts, we focus on a measure for the change in time spent in residential locations. We expect that districts without Hezbollah private governance will observe a higher rate of positive change for time spent in residential locations. That is, districts without Hezbollah private governance presence will see a greater increase in the amount of time spent at home compared to districts with Hezbollah private governance.

¹⁴ To create this measure, we draw upon the most recent survey conducted by the World Values Survey (WAVE 7), and calculate the percentage of survey respondents from each district that resided in an urban area.

Consistent with the main analysis, people living in districts with Hezbollah private governance increased their time spent at residential locations significantly less than people living in districts without Hezbollah private governance. People in districts without Hezbollah private governance increased their time at residential locations 90% more than people in areas with Hezbollah private governance. The results suggest that districts without Hezbollah private governance increased time spent at home at a higher rate compared to people in districts with Hezbollah private governance. See [Table A10](#) and [Figure A2](#) in the Appendix.

Overall, examining alternative specifications of the main models does not change the primary results. The interaction of districts with Hezbollah private governance and COVID-19 timing maintains a robust association with lower rates of movement change in activities related to retail and recreation, the workplace, and groceries and pharmacies. Moreover, districts without Hezbollah private governance saw a greater rate of change for time spent in residential areas. The primary statistical analysis and robustness checks provide systematic evidence of lower rates of movement reduction in districts with Hezbollah private governance.

These results are somewhat puzzling due to the fact that Hezbollah has a security apparatus with high capacity. Hezbollah's activities in response to COVID-19, as well as a weak Lebanese government, indicate that Hezbollah does not lack relative capacity in its ability to respond to public health emergencies ([Barak, 2020](#)). Hezbollah maintains health, mobilization, and military resources, suggesting that the group possesses the capacity to address the crisis ("[Activity of the anti-Coronavirus committees](#)" February 3, 2021). Hezbollah has hospitals, ambulances, testing centers ("Hezbollah is investing in the Corona crisis" April 1, 2020) and made ready 25,000 of its medical staff and other volunteers ("[States within the state](#)" October 4, 2020). Additionally, its leaders have been vocal in Hezbollah's efforts to address the adverse health effects of COVID-19, and reports suggest that Hezbollah is capable of enforcing restrictions ([Arab Weekly, 2020](#)). This creates an expectation that Hezbollah could enforce movement restrictions if desired.

So why do we see areas with Hezbollah private governance decrease their movement to a lesser extent than those without Hezbollah private governance? Existing explanations such as differences in types of work and socio-economic level (e.g., [Bargain & Aminjonov, 2021](#)) are addressed by controlling for relevant sources of variation, both in the main analysis and the Appendix. Moreover, districts with Hezbollah private governance observed the greatest change in grocery store and pharmacy related movement change – not work-related movement change. As a result, we turn to some potentially less examined explanations for the differences in movement between the different areas of authority.

3.1. More economic governance activity

It is possible that more movement in areas with Hezbollah private governance is not a function of lack of governance but of increased governance in the form of economic assistance. In March 2020, Lebanon did not just face a public health crisis. Lebanon was also facing an Economic Crisis. The pandemic caused the number of Lebanese people living below the poverty line to increase dramatically ([Dal Bello, 2021](#)). While Hezbollah devoted resources to combat COVID-19, Hezbollah also devoted significant resources to combatting economic issues, which may have encouraged higher levels of movement. An economic governance explanation – specifically in the form of food assistance – is in line with the 275% relative increase in movement to grocery stores and pharmacies observed in districts with Hezbollah private governance. We note that the movement in the grocery stores and pharmacies category was the only category where districts with Hezbollah private governance observed an increase post-first COVID death as well as a rate of change of significantly larger magnitude compared to the retail and recreation and workplace movement rate of changes.

Hezbollah sought to boost its public image by improving peoples' economic situation, specifically with regard to food availability and access. Hezbollah has engaged in the provision of social services to address the poor economic conditions of vulnerable Lebanese civilians. In response to the Economic Crisis, Hezbollah quickly established a chain of supermarkets, called Al-Nour Markets, in areas under their influence. Food ration cards, loaded with 300,000 liras per month (Reports: With these measures April 17, 2021), allowed supporters, or potential supporters, access to subsidized food products, which prior to the crisis, were only available to Hezbollah operatives (Ghaddar, 2020, The Meir Amit Intelligence and Terrorism Information Congressional Research Service, 2021). The markets were stocked with cheap goods smuggled in from Syria and Iran, which were sold at prices 30–50% lower than market prices (The Meir Amit Intelligence and Terrorism Information Center, 2021).

Given Lebanon's poor economic conditions, food availability at lower prices may have provided incentives and means to access markets, which may not be feasible for Lebanese families without such assistance (UNICEF Unicef Lebanon, November 23, 2021). For instance, by May 2020, reports indicate that some Lebanese had stopped purchasing meat, fruits and vegetables (Diab May 20, 2020), partly as a result of rising food prices as well as vendors artificially inflating prices. A report from March 2021, after the temporal period of our data analysis but related to food instability in Lebanon, indicates that 30% of Lebanese children skipped a meal or went to bed hungry ("Economic Crisis Combined with COVID-19 Is Pushing Lebanon Towards a Hunger Crisis"). Reports indicate that ability to purchase food may have decreased ("More Than Half A Million Children In Beirut Are Struggling To Survive" July 28, 2020), resulting in less ability to visit markets. By contrast, Hezbollah's economic governance activities may have generated ability and access to markets, which the data suggest.

In addition to subsidized food, Hezbollah also provides financial services through their financial arm –Al-Qard al-Hasan Association (AQHA). The organization does not receive funds from the Central Bank or any other official state source, allowing AQHA to create its own rules. During the pandemic, Hezbollah facilitated people's access to loan money and cash payments without the restrictions typical of other financial institutions (Ghaddar, 2020). Additionally, AQHA was able to supply hard currency to Lebanese people after traditional banks froze accounts and shut their doors to the public (Dal Bello, 2021). However, accessing the financial services provided by Hezbollah requires movement.

Hezbollah's economic provisions stand in contrast to the Lebanese government's more limited economic response, which may have also reduced movement. The Lebanese government's economic response in terms of service provision has been minor compared to that of Hezbollah (Dal Bello, 2021). Even prior to COVID-19, the Lebanese government provided few formal programs to provide economic assistance (Khater, 2020). The national government has also relied on local government municipalities to administer economic assistance, although most municipalities lack the human, financial, and administrative capacities to provide an adequate response (Hayek, 2021). Comparing the distinctions in economic response between districts with and without Hezbollah private governance suggests that Hezbollah provided people with the means to access basic goods but that access may also require movement.

While our statistical analysis is unable to determine whether it was Hezbollah's provision of economic assistance that resulted in comparatively higher levels of movement in areas under their influence, the idea is consistent with the results of the DiD analysis, which saw time spent in grocery stores and pharmacies increase more than 225% in districts with Hezbollah private governance following the first COVID-related death. The idea is moreover consistent with a range of government, aid, and newspaper reports that Lebanon's economic and food situation had deteriorated to a point where some people were unable to purchase food, suggesting less movement to the market. Hezbollah was

active in generating food availability and access, increasing ability to purchase food and may have resulted in more market-related movement. Future studies may benefit from testing hypotheses related to public goods provision capacity and movement activity, conditional on the severity of the movement-economic activity tradeoff.

3.2. Other possible explanations

Because of the results of the DiD analysis as well as the descriptive evidence presented above, we consider the economic assistance explanation a plausible explanation. However, we address a number of alternative explanations and explain why we find them less capable of explaining differences in level of movement between areas of private Hezbollah governance and other areas.

One alternative reason that areas with Hezbollah private governance saw higher levels of movement is that Hezbollah was less willing to enforce movement restrictions to the same extent as areas without Hezbollah private governance. Evidence suggests that governing authorities with more political capital are more willing to put forth unpopular policies, such as lockdowns. In contrast, governing authorities struggling for support amongst citizens are less likely to do so (McCannon, 2021). Hezbollah's popularity has been steadily decreasing amongst Shia – its main constituency. In 2020, only 66% of Lebanese Shia indicated that they had "very positive" views towards Hezbollah, compared to 83% three years earlier (Pollock, 2020). Moreover, while recent anti-government protests have been directed toward a number of political parties across the political spectrum, Hezbollah has been singled out as a non-democratic and militarized actor within Lebanon (e.g., Ferrari & Elkatouri, 2021). With such a decrease in their popularity, Hezbollah, despite their capacity, may have been hesitant to enforce a possibly unpopular policy. The resulting differences in movement reduction along retail and recreation, workplace, and grocery stores and pharmacies dimensions may be a function of Hezbollah's reluctance to enforce policies designed to restrict movement.

Yet, data from Harb et al. (2021) show that law enforcement actions in relation to COVID-19 is higher in areas with private Hezbollah governance than other areas. Controlling for law enforcement actions does not change the main results (see Table A12 in the Appendix). Anecdotal evidence suggests that Hezbollah engaged in various activities to address the spread of COVID-19 and to treat patients (Barak, Hezbollah and the Global Corona Crisis), such as using its resources to enforce neighborhood quarantines, severely restricting movement in specific locations (Ghaddar, 2020). Its leaders have been vocal in Hezbollah's efforts to address the adverse health effects of COVID-19.

Another possible explanation is that Hezbollah's primary health-related measures (e.g., health clinics, disinfecting campaigns, increasing medical staff) may have been effective to the point that Hezbollah governing authorities were less concerned about using movement restriction policies to control the spread of COVID-19. For instance, Hezbollah mobilized hospitals, ambulances, testing centers and made ready 25,000 of its medical staff and other volunteers. Movement restrictions may have been considered a last resort. Due to their implementation of alternative COVID-19-related practices, Hezbollah may have felt sufficiently confident to not enforce movement restrictions to the same extent as governing authorities in other districts.

A related explanation is a bottom-up explanation. People living in districts with Hezbollah private governance may have responded to the crisis by reducing their movement at lower rates because they were confident in Hezbollah's capacity to control the spread of COVID-19 compared to how people in districts without Hezbollah private governance viewed their governance bodies. For instance, in Baalbak, Hezbollah set up numerous body temperature checks ("Report: What role for Hezbollah in the battle led by Lebanon against the Corona virus?" November 4, 2020), perhaps increasing people's confidence in Hezbollah capacity to limit the spread of COVID-19. People in districts with Hezbollah private governance may have then been less concerned about

the COVID-19 and decided to reduce their movement at a lower rate.

Three pieces of evidence suggest these explanations may not drive the statistical results. First, comparing districts with private Hezbollah governance to other districts of Lebanon, on average, authorities engaged in fewer instances of preventive measures (including quarantine facilities, aid and relief, and medical services) (Harb et al., 2021). Second, if we control for the total number of episodes of preventive measures in each district from March–July 2020, our main results remain robust (see Table A13 in the appendix).¹⁵ Finally, despite the fact that on average, citizens were more satisfied with local authorities' governing in areas with private Hezbollah governance than the rest of Lebanon pre-2020, controlling for average satisfaction at the district level does not change the results (see Table A14 in the Appendix).¹⁶

Another potential explanation is that Hezbollah policies to reduce movement actually resulted in lesser overall movement reduction. That is, Hezbollah may have used large amounts of personnel and vehicles to enforce movement restriction policies, but the mobilization of personnel and vehicles itself was a source of movement.

In response to this possibility, we consider our empirical results. If we only found a lesser movement reduction rate for the work-related movement measure, we might suspect that Hezbollah movement restriction policies themselves were a driver of the lower rate of movement reduction. However, we also observe movement reduction for other movement types, including retail and recreation and also for grocery stores and pharmacies purposes. The consistent findings across the diverse movement measures are suggestive that Hezbollah enforcement policies are not driving the lower rates of movement reduction.

4. Discussion and conclusions

The discussion of potential mechanisms illuminates the tradeoffs governing authorities face during public health emergencies. In addition to the health of the public, governing authorities must consider economic and political factors. In the case of Hezbollah, there is reason to believe that one or a multiple of these factors led to areas with private Hezbollah governance experiencing higher levels of movement compared to other areas of Lebanon. We note that we speculate the economic assistance explanation is the most convincing.

What is interesting is that current understandings of governments' policies regarding movement during the COVID-19 pandemic have largely assumed that higher levels of movement result from weaker governing capacity (e.g., Murray & Joshua, 2022). While districts with Hezbollah private governance observed lower reductions in movement compared to districts without Hezbollah private governance, this does not necessarily mean that governance was lacking. Quite to the contrary, Hezbollah was providing services that the Lebanese government commonly does not provide or provides at lower rates. Rather, to understand movement levels following COVID-19, a relevant question to ask is which types of governance are prioritized and why. When governing authorities face multiple crises – such as public health, economic, and political crises – it is not obvious that the public health crises will take priority.

In contrast to extant studies on Hezbollah, which lack a comparison group, our findings illustrate comparative movement levels. And in contrast to previous studies on poverty and movement levels, our explanatory variable is a political variable, focusing on distinctions in

¹⁵ We create an additive measure that includes episodes of aid and relief, medical services, quarantine facilities, and preventive measures, as measured by Harb et al., 2021. Monthly data is unavailable.

¹⁶ We aggregate to the district level a question from Wave 7 of the WVS that asks respondents how satisfied they are with the way the local authorities are solving the area's affairs, which is measured on a four-point scale from completely dissatisfied to completely satisfied. This is not in relation to COVID-19, as the data is from 2018.

governance types. Using a difference in differences design and OLS regression, we find that districts with Hezbollah private governance experienced lower changes in rates of movement related to (i) retail and recreation, (ii) workplace, and (iii) grocery stores and pharmacies, compared to other districts of Lebanon. Notably, movement related to grocery stores and pharmacies increased following the first COVID-19 related death in districts with Hezbollah private governance, in contrast to other districts of Lebanon, where it decreased. The results are robust to inclusion of multiple covariates related to economic levels, suggesting that the distinct movement rates are not driven by poverty differences.

The differences in movement rates in districts with and without Hezbollah private governance merit further analysis. While we lack the data to fully test hypotheses related to the economic governance mechanism, we suggest that future studies would benefit from consideration of movement-economic activity tradeoffs. Economic and political factors influencing the severity of the movement-economic activity tradeoff may prove useful in understanding movement variability. More data and analysis would further elucidate why Hezbollah, with high relative military strength and public good provision to the Lebanese government, saw districts where it has a large presence experience lower rates of movement reduction.

Author statement

Jori Breslawski, Brandon Ives: Conceptualization, Jori Breslawski: Investigation, Jori Breslawski, Brandon Ives: Writing - Original Draft, Jori Breslawski, Brandon Ives: Writing - Review & Editing, Jori Breslawski: Visualization.

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Appendix A. Supplementary data

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