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Governance and COVID-19 in Bolivia

Calla Hummel,¹ Ximena Velasco Guachalla,²
Jami Nelson-Nuñez,³ and Carew Boulding⁴

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Abstract: On 10 March 2020, the Bolivian government identified two COVID-19 cases in Bolivians returning from Italy. The national government responded swiftly and sent the country into one of the world's strictest lockdowns on 22 March 2020. However, low state capacity and low government legitimacy snarled up the national government's response. Despite an initial centralized response to the pandemic, the national government devolved authority to the country's decentralized subnational authorities, with some following the national government's directives, most selectively complying, and some resisting. We analyse original daily data on COVID-19 cases, deaths, movements, and policies at the subnational level from Bolivia's nine departments. The data spans a year, from 10 March 2020 to 10 March 2021. We find that some departments had much higher cases and deaths per 100,000 residents than others. Our initial descriptive data suggests that local containment policies and proximity to Brazil explain some variation in cases and deaths, but surprisingly, local state and health capacity does not clearly account for the variation.

Key words: Bolivia, COVID-19, subnational, legitimacy, governance, state capacity, descriptive research

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¹ University of Miami, Miami, USA, corresponding author: chummel@miami.edu ² University of Essex, Colchester, UK
³ University of New Mexico, Albuquerque, USA ⁴ University of Colorado Boulder, Boulder, USA

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Katajanokanlaituri 6 B, 00160 Helsinki, Finland

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1 Introduction

On 10 March 2020, the Bolivian government identified two COVID-19 cases in Bolivians returning from Italy (Ministerio de Salud y Deportes 2020). The national government responded with one of the world's strictest lockdowns on 22 March 2020. However, low state capacity and low government legitimacy from a pre-existing political crisis snarled up the national government's response (Escalera-Antezana et al. 2020; Velasco Guachalla, Hummel, Nelson-Nuñez, and Boulding 2021a). After two months of centralized government response, Bolivia's national government delegated COVID-19 policy decisions to decentralized subnational governments, which responded to the pandemic in different ways, with some following the national government's directives, most selectively complying, and some resisting (Velasco Guachalla, Hummel, Nelson-Nuñez, and Boulding 2021b).

In this case study of Bolivia's pandemic experience, we analyse original daily data on COVID-19 cases, deaths, movements, and policies at the subnational level from Bolivia's nine departments. The data spans a year, from 10 March 2020 to 10 March 2021. We find important variation across departments, with some experiencing much higher cases and deaths per 100,000 residents than others. We discuss some of the variables that contributed to the country's COVID-19 experience and response, including state capacity, legitimacy, decentralization, pre-existing health resources, infrastructure, geography, partisanship, and public health policies. This paper contributes to the literature on COVID-19 policies and experiences by developing a quantitative case study that examines subnational variation in a decentralized context. Most studies of COVID-19 policies aggregate data at the national level and miss important variation in local responses and experiences (Knaul et al. 2022). In particular, national averages hide subnational inequalities in healthcare, resources, and experiences, as well as the local effects of political polarization around the pandemic.

We discuss how individual factors may have further shaped the experiences of individual citizens. Within the same department, Bolivians with different resources, identities, and jobs had very different experiences. People who were deemed essential workers by local laws and who could not work remotely were probably at much higher risk of infection than people who could work from home. Similarly, most Bolivians share small homes with several family members and could not socially distance within their household; the small percentage of Bolivians who could stay two metres away from potentially infected family members lived a different pandemic. Finally, while healthcare is a constitutional right, healthcare provision in practice is riddled with numerous problems and constraints, leaving Bolivians with limited ability to fully exercise that right during the pandemic. People who could pay for private health services probably had a higher chance of survival, but even private care was hard to find, unreliable, and much more expensive during the pandemic.

We conclude by putting Bolivia in comparative perspective and looking at the challenges that lie ahead. Over 26,000 more Bolivians died in 2020 than in 2019, probably due to a combination of COVID-19, hardship, and delayed treatment for other conditions. This is a 50 per cent increase in mortality over 2019 and potentially one of the largest COVID-19-related death tolls in the world, adjusted for population (Karlinsky and Kobak 2021; Velasco Guachalla, Hummel, Nelson-Nuñez, and Boulding 2021a). The lack of sufficient healthcare capacity is one of the factors that drove this tragedy. Still, national and subnational interventions probably curbed the spread of the virus. While Bolivians had divergent pandemic experiences on the basis of location, occupation, politics, and resources, the difference in experience and the inequality of care was not as pronounced as in other countries, such as neighbouring Brazil or the United States. The Bolivian government expanded

the national safety net and invested in health infrastructure, which may help in future crises (Blofield et al. 2020).

2 State capacity, infrastructure, and public health in Bolivia

Bolivia is a landlocked, lower middle-income country of 11 million people (World Bank 2021). A powerful executive leads the government and shapes an extensive bureaucracy that manages the state's natural resources, ambitious social policies, and relationships with one of the most organized civil societies in the world (Anria 2018; Boulding 2014; Hummel 2021; Toledo Orozco 2022). The Senate and the House of Deputies, known together as the Plurinational Legislative Assembly, legislate in the National Congress. Evo Morales's party, Movement Towards Socialism (Movimiento al Socialismo, MAS), had a supermajority in the Plurinational Legislative Assembly until 2020, allowing the party to govern without opposition votes. MAS lost its supermajority in the 2020 elections, and while the party retained a majority in both houses, it needed support from the opposition to pass legislation (Peralta 2020). Finally, while the judiciary is in theory an autonomous and independent institution, in practice the judicial system is highly politicized, with its members often representing partisan viewpoints and agendas (Human Rights Watch 2018; Saavedra Mogro 2017; Velasco Guachalla, Hummel, Nelson-Nuñez, and Boulding 2021a). Bolivia's nine departmental and over 330 municipal governments exercise considerable fiscal and political autonomy under a 1994 decentralization law. These were joined by a small number of Indigenous jurisdictions that formed local governments after the 2009 constitutional reform (Faguet 2012; Porto et al. 2018; Zuazo et al. 2012).

In this paper, we consider three key dimensions of the state established in the literature: authority, defined as the government's ability to provide order within its borders; capacity, defined as the government's ability to provide basic public services; and legitimacy, defined as the ability of the government to garner citizens' consent (Ziaja et al. 2019). In studying the Bolivian case, we primarily emphasize the role of the latter two. In this section, we elaborate on Bolivia's state capacity and more briefly on its authority; we focus on legitimacy in the next section. Overall, the Bolivian state exhibits low capacity in comparison with other countries in the Americas (Gray-Molina 2001; Gray-Molina et al. 1999; Hummel 2021). Bolivia ranks at the low end of regional indices for gross domestic product (GDP) per capita, health spending, education spending, public sector expenditures, military expenditures, industrial production, government statistical capacity, access to public sewers and electrical grids, and other measures that researchers use to measure state capacity (Hendrix 2010; Soifer 2008, 2015). The only measure of capacity on which Bolivia performs reasonably well is homicides (six per 100,000), but this is due more to neighbouring countries' high homicide rates than to any capacity or expertise from the widely derided Bolivian national police force (Zechmeister and Lupu 2019; Our World in Data 2021).

Bolivia has nine departments with their own regional governments: Beni, Chuquisaca, Cochabamba, La Paz, Oruro, Pando, Potosí, Santa Cruz, and Tarija. La Paz, Santa Cruz, and Cochabamba are the largest in population and economic output and host four large cities. The city of La Paz is the administrative and political capital of the country, and the La Paz-El Alto metropolitan area is home to two million Bolivians. The La Paz department borders Peru and has a busy international land border and an international airport. The department of Santa Cruz is a wealthy ranching and commerce hub, and its major city houses over a million Bolivians. Santa Cruz borders Brazil and has busy land borders and an international airport. Cochabamba is the only department without an international land border, and its eponymous departmental capital has a population of roughly 600,000. Cochabamba is also an agricultural department and the home district of the MAS party. The tropical border departments of Beni and Pando are poor and

sparsely populated: Pando has only 154,000 people, and Beni has fewer than half a million. Both departments border Brazil and rank last out of the departments for GDP per capita. Chuquisaca hosts the country's historic and symbolic capital Sucre, home of the judicial branch, and it is a small and conservative region with below-average GDP. Potosí and Oruro are majority Indigenous departments with a mix of agriculture, mining, and commerce, and they share land borders with Chile. Finally, Tarija is a wealthy and conservative agricultural department that cultivates the country's vineyards and borders Argentina and Paraguay.

Governance at all levels of government is characterized by bureaucratic clientelism, where the exchange of perks and privileges for personal, group, and political loyalties takes precedence over merit and efficiency (Calderon and Laserna 1995). Inertia, inefficiency, exaggerated functionary zeal, and improvisation are persistent traits of Bolivia's bureaucracy and public management (Vargas Maldonado 1998). However, national-level indicators hide important subnational variation. Some departments and municipalities are run by experienced politicians and bureaucrats. The nine departments differ significantly in their resources, infrastructure, and state capacity. La Paz and Santa Cruz have adequate hospitals, roads, airports, and other infrastructures, as well as relatively active and experienced departmental governments. Cochabamba, Chuquisaca, Potosí, Oruro, and Tarija have adequate infrastructure and governance in some areas but neglect many rural districts. Pando and Beni have some infrastructure and governance in the largest towns, but state presence is lacking or absent in most places (Acuña et al. 2020).

Bolivia's health infrastructure and public health capacity is limited at the national and subnational levels. The Bolivian Constitution of 2009 (Section II, Article 35) enshrines healthcare as a constitutional right. On paper, the Bolivian state provides free public healthcare to citizens. However, Bolivians regularly note that the few hospitals in the country have long waits and require patients to buy their own supplies and medicine, and that doctors at public hospitals routinely ask for bribes to provide care that should be free (Gray-Molina et al. 1999; Zechmeister and Lupu 2019). The Pan-American Health Organization (2017) reports that in 2016, the Bolivian government spent about US\$400 per person on public health, far below the regional average of US\$1,300. Bolivia had 47 general hospitals in the country in 2019 but only 35 functioning intensive care unit (ICU) beds with ventilators (Escalera-Antezana et al. 2020; INE 2021). The department of Pando had no ICU beds and no hospital equipped to treat complex illnesses (Ministerio de Salud y Deportes 2019).

Still, healthcare had improved notably in the decade prior to the pandemic. From 2006 to 2019, Bolivia experienced consistently positive economic growth (Our World in Data 2021). The administration of Evo Morales used surpluses and natural gas rents to fund public spending booms. Popular cash transfer programmes and a universal pension helped millions of Bolivians out of poverty and reduced inequality (Farthing 2019; Niedzwiecki and Anria 2019). This influx of cash helped Bolivia to move up regional development and poverty indices, from last place on many to third or fourth from the bottom (Our World in Data 2021). During this period, important health indicators improved: life expectancy increased from 65 in 2005 to 71.5 in 2019, and child malnutrition fell by half. Cash transfer programmes targeting extreme poverty among families and senior citizens were particularly effective at improving both economic and health indicators.

The Bolivian government repeatedly promised to invest in important but expensive and neglected infrastructures throughout the country, chiefly hospitals, roads, and schools. Between 2010 and 2020, the government started several projects and opened new roads, schools, and hospitals around the country, in some places targeting the most dangerous roads or remote communities. According to the National Institute of Statistics (Instituto Nacional de Estadística, INE), the number of general hospitals increased from 34 in 2006 to 47 in 2019, and the number of hospital beds rose from 10,422 to 14,896 over the same period (INE 2021). Moreover, the Ministry of

Health quadrupled the number of ambulances from 558 to 2,072 in 11 years. These were distributed throughout the country in order to transfer and assist patients in critical condition (Ministerio de Salud y Deportes 2017). At the beginning of 2020, Bolivians had seen GDP per capita and their real incomes nearly triple over the previous 15 years, and life expectancy had increased by six years. Despite these major improvements, there was considerable variation at the municipal level, demonstrating the inequality of economic distribution and the precariousness of local health infrastructures (Candia et al. 2020). Moreover, investment in durable infrastructure and long-term infrastructure projects such as hospitals and a modern transport system lagged behind medium-term projects that could be finished before the next election. More alarming was the large number and cost of government projects, including the construction of hospitals, that were left unfinished or never broke ground (Chambi et al. 2020).

In terms of government authority, Bolivia has been consistently ranked as a poor performer (Ziaja et al. 2019). The lack of authority to enforce its policies severely undermined the government's response to the pandemic, as its security forces were only partially able to enforce lockdown policies. Three factors help us to understand weak enforcement in Bolivia during the pandemic: lack of resources, citizens' adaptability, and corruption. Although police and military personnel were tasked with enforcing lockdown restrictions, they often lacked biosecurity equipment, which in turn led to high rates of confirmed cases and deaths among enforcement ranks (Machicao and Limachi 2020; Página Siete 2021). Additionally, even when enforcement was supplied with the necessary equipment to remain safe and patrol the streets, citizens—in a country where rates of informal work are among the highest in the region (Alaimo et al. 2015; Hummel 2021)—looked for ways to evade enforcement in order to earn a daily income. Anecdotal evidence collected by one of the authors illustrates this dynamic: street market vendors would monitor police presence by either learning patrol times or setting up communication chains to learn of approaching police; they would then adapt their behaviour accordingly, avoiding selling during patrol times, and/or picking up their merchandise before the police came by and then returning to their business after the police had gone. Finally, corruption seriously compromises enforcement mechanisms. Corruption is particularly pervasive among the police, and pandemic response is undermined when enforcement is circumvented in exchange for bribes (Orces 2008; Peredo 2019; REDLAD 2020).

3 Government legitimacy: a timeline of the pandemic in Bolivia

COVID-19 hit Bolivia in the midst of a political crisis (Velasco Guachalla, Hummel, Nelson-Nuñez, and Boulding 2021a). In November 2019, President Evo Morales resigned and fled the country. Morales and his MAS party had been in power since 2006, passed a new constitution in 2009, overseen an economic boom and popular social programmes, and easily won elections across the country for years (Anria 2018; Madrid 2012; Niedzwiecki and Anria 2019). Morales and MAS centralized power, ostracized dissidents and young leaders, eliminated term limits, and used state institutions to harass opponents and to campaign during elections (Centellas 2018; Farthing 2019; Velasco Guachalla, Hummel, Handlin, and Smith 2021). Morales stepped down after widespread protests and allegations of electoral fraud in the 2019 national elections (Wolff 2020). Supporters denounced Morales's resignation as a coup, while detractors hailed it as the result of a pro-democracy uprising (Anria and Roberts 2019; Arequipa Azurduy 2020; Derpic 2019).

Morales's sudden resignation was followed by the resignation of the rest of the constitutionally named chain of succession. This created a power vacuum that culminated in the appointment of Jeanine Áñez, second vice president of the Chamber of Senators, as interim president (Wolff 2020). The chain of events that started with allegations of electoral fraud and led to the appointment of Áñez as interim president severely damaged the legitimacy of the government and deepened

citizens' polarization between MAS supporters and detractors (Velasco Guachalla, Hummel, Nelson-Nuñez, and Boulding 2021b). The Áñez administration exacerbated the political crisis and increased distrust towards her government by sending the military into the streets, allowing the police to fire on protesters, and prosecuting dozens of former MAS officials (Anria and Roberts 2019; Velasco Guachalla, Hummel, Nelson-Nuñez, and Boulding 2021a). Moreover, despite Áñez's initial assurances that she would remain in office only to call the election, she announced her candidacy for president in the national elections that her administration was overseeing (Alanoca 2020). These events further damaged the already frail legitimacy of the government, and would later negatively affect citizen compliance with COVID-19 restriction policies.

It was in the context of a preceding political crisis, weak government legitimacy, and upcoming national and subnational elections that the first two COVID-19 cases were confirmed in the country on 10 March 2020 (Ministerio de Salud y Deportes 2020). On 12 March, the government issued National Emergency Decree 4179, which declared a 'national emergency situation' due to the presence of the novel coronavirus. The same day, the interim president announced further measures including the cancellation of schoolteaching, stricter border controls, and the interruption of all flights to and from Europe, and she also launched Bolivia Segura, a national COVID-19 information website with daily case numbers and other information. More emergency decrees came soon after. Supreme Decree 4192 on 16 March limited gatherings of more than 100 people, modified work hours, designated essential workers, and prohibited events in spaces such as bars and clubs. The initial two cases quickly became six in three different departments, and then dozens (Escalera-Antezana et al. 2020). All departments except Beni had confirmed at least one case by the end of March. Supreme Decree 4196 on 17 March instituted a curfew between 5 a.m. and 5 p.m. across Bolivia, prohibited all gatherings, and restricted work hours and public transport. All borders closed on 20 March, leaving many Bolivians stranded abroad, including many at border checkpoints in precarious conditions (Miranda 2020).

On 21 March, Supreme Decree 4199 imposed a strict quarantine. The decree stated that only one person per family could leave a living space once a week, and only to buy supplies near their residence. The decree was first extended to 30 April and later to 31 May. While the use of face masks was initially not mandatory, it became compulsory outside homes on 29 April. Despite the strict national quarantine, thousands of Bolivians left their homes to protest against national or local government decisions (Velasco Guachalla, Hummel, Nelson-Nuñez, and Boulding 2021b). In La Paz, Santa Cruz, Cochabamba, and Beni, protesters decried local and national government measures around the pandemic and demanded the loosening of quarantine restrictions. While a number of protests were motivated by disgruntled citizens unable to earn a living due to movement restrictions, politically motivated demonstrations took place early in the pandemic and throughout 2020. In most departments, at least some people protested against the decision to suspend the May national elections. Amid protests, Supreme Decree 4229 announced that after 11 May, department and municipal governments could set out their own regulations on local work hours, transport, and quarantine. The national government continued to prohibit travel, gatherings, and school attendance, as well as to enforce a nightly curfew, mask use, and social distancing.

The political crisis of 2019 aggravated pre-existing citizen polarization between MAS and anti-MAS camps and negatively impacted on generalized trust and support for the interim government. This in turn influenced COVID-19-related policy-making at the national and subnational levels as well as citizen compliance with different lockdown directives. In departments where political authorities and the majority of the electorate were in opposition to the incumbent government, the COVID-19 policy was less restrictive and citizen compliance was lower than in pro-government departments (Velasco Guachalla, Hummel, Nelson-Nuñez, and Boulding 2021a). Moreover, the relationship between the Áñez administration and the MAS-dominated legislature was characterized by conflict and lack of consensus around COVID-19 policy, which on occasion

led to health-related policy breaking down along partisan lines at different levels of government (Velasco Guachalla, Hummel, Nelson-Nuñez, and Boulding 2021a).

On 1 June, departments and municipalities allowed people to leave their houses for work, shopping, and exercise. Some departments retained a stricter set of guidelines, such as Santa Cruz, Beni, Tarija, and Potosí. Santa Cruz and Beni were in the midst of horrific first peaks that had started in May and quickly overwhelmed local health systems, leading to shut hospitals and many dead. Despite these outbreaks, departments such as La Paz and Cochabamba let people go back to work and reopened public transport.

After 1 June, COVID-19 cases skyrocketed around the country and overwhelmed the national and local health infrastructure. On 30 June, 20 of the 34 general hospitals across the country were overwhelmed by the large number of COVID-19 patients and sick staff; many hospitals temporarily closed at the height of the outbreak because too many staff were sick (Aguilar 2020). In July, people began dying in the streets in multiple departments, especially La Paz and Cochabamba. On 23 July, the national police reported collecting 86 bodies of confirmed or suspected COVID-19 victims from streets and homes in a single day (Pomacahua 2020).

In light of the escalating crisis, on 23 July the Supreme Electoral Tribunal (Tribunal Supremo Electoral, TSE) announced that presidential elections would be delayed until 18 October (Rosales Melgar 2020). This was the third time elections had been rescheduled, from 3 May to 6 September to 18 October. Subnational elections, suspended in March, had yet to be rescheduled at all. The delay was met with national protests. Protests and blockades spread across the country in the midst of the first COVID-19 peak (Trigo and Kurmanaev 2020).

On 2 August, President Áñez and the Ministry of Education suspended the rest of the school year because the government could not guarantee distance learning and Internet access to most students. All students were passed to enter the next school level, and the government put resources into updating the country's Internet connectivity (Ministerio de Educación 2020). The move caused widespread confusion and was widely criticized by parents and students (Tancara Castillo 2020). While schools across the nation abided by the early ending of the school year, protests demanding face-to-face education occurred in various parts of the country until the beginning of 2022. In the end, the decision regarding whether students should retake in-person classes was delegated to subnational governments.

Stress on the national health system appeared early on in the pandemic, when hospitals ran out of ventilators as well as technicians to operate them. The toll on healthcare workers and infrastructure worsened during the first peak, when staff in Beni, Santa Cruz, and then the rest of the country became too sick to care for patients and keep facilities open. In September, health statistics quantified the damage: the Ministry of Health reported that as of 2 September, 80 per cent of personnel in the health system had contracted COVID-19, and 125 doctors had died.

Decree 4314 loosened restrictions on 1 September. Cases declined sharply in September, despite increased transport, work, and circulation. Political parties engaged in a six-week campaign period, with former finance minister Luis Arce and former foreign minister David Choquehuanca leading the polls on the MAS ticket (Velasco Guachalla, Hummel, Nelson-Nuñez, and Boulding 2021a). On 18 October 2020 Arce, Choquehuanca, and MAS won the mandatory in-person presidential election in the first round of voting (Velasco Guachalla, Hummel, Nelson-Nuñez, and Boulding 2021a). Arce assumed the presidency in the first week of November. On 28 November, Arce released Decree 4404, which devolved most COVID-19 policy to departmental and municipal governments as long as they followed (largely unspecified) safety protocols. Masks were still mandatory nationally, and schools remained closed, but all economic activity, gatherings, and

transport resumed with safety protocols, as did international travel with polymerase chain reaction tests.

COVID-19 cases started to trend upwards again in December, increasing quickly two weeks after Arce released Decree 4404. All departments and most municipalities tried to reverse the trend by instituting travel restrictions and curfews between 24 December and 2 January, but cases continued to climb into January 2021.

Our research team noted that once the Arce administration began, the information coming out of Bolivia became more upbeat and less informative, and websites such as Bolivia Segura stopped providing regular and reliable health statistics. The first 6,000 doses of the Russian-made Sputnik vaccine arrived on 29 January 2021. Frontline healthcare workers were inoculated in Santa Cruz, La Paz, and Cochabamba over the next few weeks, but President Arce only received his first dose about four months later on 24 May, and Vice President Choquehuanca waited until January 2022 (Ministerio de Salud 2021; *Página Siete* 2022). The Arce administration secured millions of vaccine doses from five manufacturers in 2021, but the doses were slow to arrive.

Despite the vaccination campaign, Bolivia experienced two more COVID-19 peaks in the first half of 2021. The second peak started in December 2020, following the repeal of most public health restrictions, and lasted into February 2021. Numbers trended downwards in March before picking up again in April and hitting a third peak that lasted throughout June 2021. The number of confirmed cases was higher in each successive peak, but due to extreme test shortages during the first peak, it is not clear if the total number of cases actually increased. Bolivians found it somewhat easier to access tests in the second and third peaks, although positivity rates were still high at around 40 per cent in the second peak and 25 per cent in the third peak, compared with 60 per cent in the first peak (Our World in Data 2021). These positivity rates are dramatically higher than the World Health Organization guideline of five per cent for sufficient testing.

As the pandemic progressed, so did healthcare capacity. The Áñez and Arce administrations built and opened additional hospitals and clinics. The department of Pando received its first hospital, and a number of smaller towns received their first hospitals or clinics. Larger cities such as El Alto and Cochabamba also opened new hospitals to address excess demand on existing infrastructure. The state expanded social assistance programmes, using the data and delivery methods of existing programmes to target vulnerable households and people out of work (Blofield and Filgueira 2020). These measures were imperfect but addressed large gaps in capacity and helped many Bolivians to cope with the pandemic while building future capacity.

4 Three hundred and sixty-five days of COVID-19

Our team collected daily data on COVID-19 cases, deaths, policies, and mobile phone mobility for Bolivia's nine departments from 10 March 2020 to 10 March 2021. We collected data from the Ministry of Health, Bolivia Segura, the departmental health services, the departmental governments, and Google Mobility Reports. We added information from governments', non-governmental organizations', and journalists' reports. We collected background demographic, health, and economic data from the INE and election returns from the TSE. Our data come from these sources unless otherwise specified. In this section we describe patterns of COVID-19 cases and deaths across Bolivia's nine departments. We examine the differences across departments.

Departments entered the pandemic with unequal resources as well as varying institutions and alliances. La Paz, Santa Cruz, and Cochabamba are larger departments whose governments had

more resources, experience, and critical healthcare infrastructure than others, while Pando and Beni were especially lacking in resources and infrastructure. The 2019 political crisis had further complicated governance by deepening citizen polarization and eroding government legitimacy. The departmental governments of Santa Cruz and Tarija were allied with the interim government while most were not, and some departments had relatively politically homogeneous populations while others were deeply divided (Velasco Guachalla, Hummel, Nelson-Nuñez, and Boulding 2021b). Table 1 describes demographic, public health, and political statistics from the nine departments before and during the pandemic.

Table 1: Demographic, public health, and political statistics from Bolivia's nine departments, 2019–21

Department	Population 2019	GDP per capita 2019	Hospital beds 2019	People per hospital bed	Governor's party 2020	MAS vote share 2019	Cases per 100,000	Confirmed COVID-19 deaths per 100,000
Country totals	11,513,100	3,552	14,481	795		55%	2,192	102
Beni	480,308	2,403	449	1,043	MAS*	34%	2,353	104
Chuquisaca	637,013	3,276	1,388	451	MAS	49%	2,445	114
Cochabamba	2,028,639	3,109	2,463	800	MAS	66%	1,230	78
La Paz	2,926,996	3,988	3,775	764	Sol.bo	68%	2,084	63
Oruro	551,116	3,793	548	982	MAS*	63%	2,133	102
Pando	154,355	2,449	120	1,201	MAS	46%	2,522	143
Potosí	901,555	2,802	788	1,126	MAS	58%	1,533	45
Santa Cruz	3,370,059	3,695	4,166	774	MDS	36%	2,636	158
Tarija	583,330	5,329	784	719	UDA	42%	3,637	93

Note: * the governor changed during the pandemic following protests, but both the former and the new governor were from the MAS party. UDA: Unidad Departamental Autonomista.

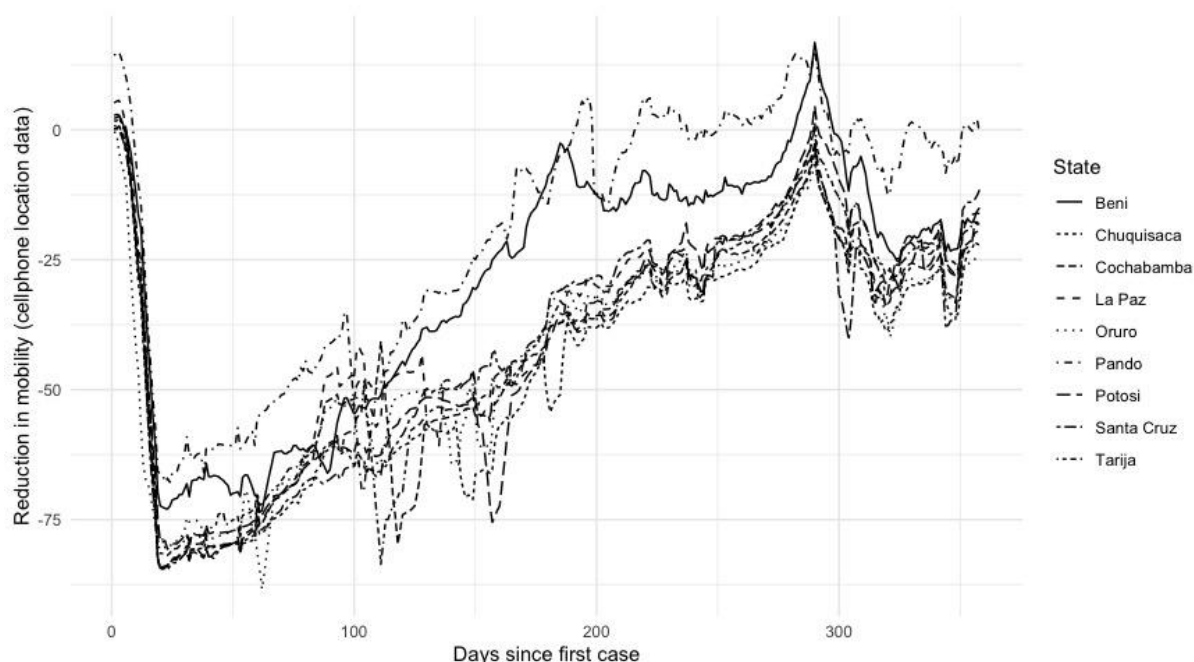
Source: authors' calculations based on data from INE, TSE, and Bolivia Segura.

When the pandemic began to unfold across Bolivia, officials and ordinary Bolivians reacted quickly. Figure 1 charts daily mobile phone mobility across the nine departments and demonstrates that people listened to the government—at first. The initial drop in movement across Bolivia was one of the largest drops in the Americas (Hummel et al. 2020; Knaul et al. 2022). However, as the lockdown dragged on, people started to move around, albeit slowly. When local governments reimposed quarantines in response to outbreaks or limited movement at weekends, people obeyed, as we can see in the departmental peaks and troughs over the year.

We witnessed and received anecdotal reports of uneven enforcement across neighbourhoods and cities, and newspapers covered stories of non-compliance. Newspaper stories of non-compliance were often about protests, small parties, or food markets. We do not have enforcement data that would enable us to identify more general patterns. The mobile phone data and newspaper reports suggest that compliance and enforcement were not universal, but that most people followed pandemic regulations most of the time during the first months of the pandemic.

Movement in all departments trended upwards over the year. The increases were especially pronounced in the rural departments of Beni and Pando. Pando and Beni, the top two lines in Figure 1, had high movement throughout the year relative to other places. As Figures 2 and 3 show, these two rural departments also had higher cases and deaths per capita than most other departments.

Figure 1: Mobile phone mobility index from Bolivia's nine departments, 10 March 2020 – 10 March 2021



Source: authors' illustration based on data from Google Community Mobility Reports.

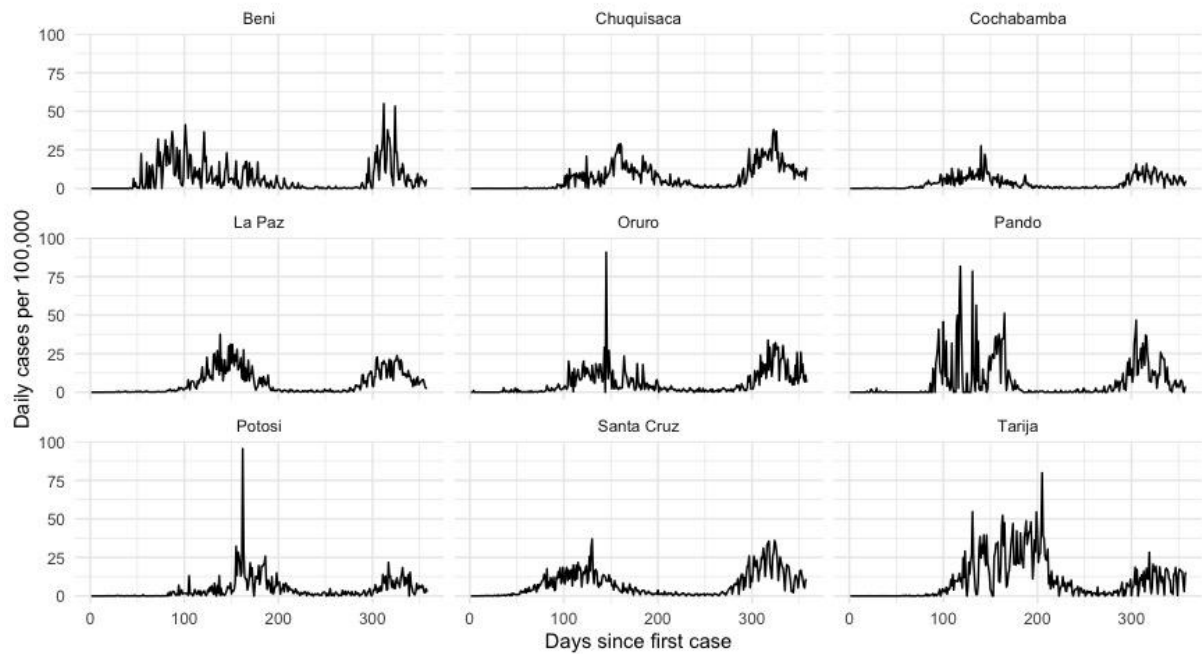
By chance, the first COVID-19 cases were in Oruro, and the first cluster spanned Oruro, Cochabamba, and Santa Cruz. Despite its resources and relatively high local state capacity, Santa Cruz could not assert control over the virus and became the epicentre of the country's pandemic: Santa Cruz accounted for 35 per cent of the country's total case count on 10 March 2021. Conversely, Oruro and Cochabamba contained the initial outbreaks and registered below-average cases and deaths during subsequent outbreaks, despite relatively low local state and healthcare capacity. As the virus spread across the country in the first peak and then in later waves, all departments suffered huge tolls and overloaded their healthcare systems. Still, some departments reported much higher cases and deaths relative to others.

Figure 2 charts confirmed COVID-19 cases per 100,000 residents in the nine departments from 10 March 2020 to 10 March 2021. We use cases per 100,000 residents because the overall case tallies simply show the departments with high populations recording more cases; the adjusted numbers demonstrate the risk to a given individual in one department compared with another.

Figure 2 shows that Tarija, Santa Cruz, and Pando had the highest case numbers, adjusted for population, over the first year of the pandemic. At the national level, Bolivia recorded 2,192 cases per 100,000 people (Table 1). Tarija had 3,637 cases per 100,000 people, Santa Cruz had 2,636, and Pando had 2,522. In contrast, Cochabamba recorded the lowest caseload at 1,230 confirmed cases per 100,000 people, or one third of Tarija's caseload.

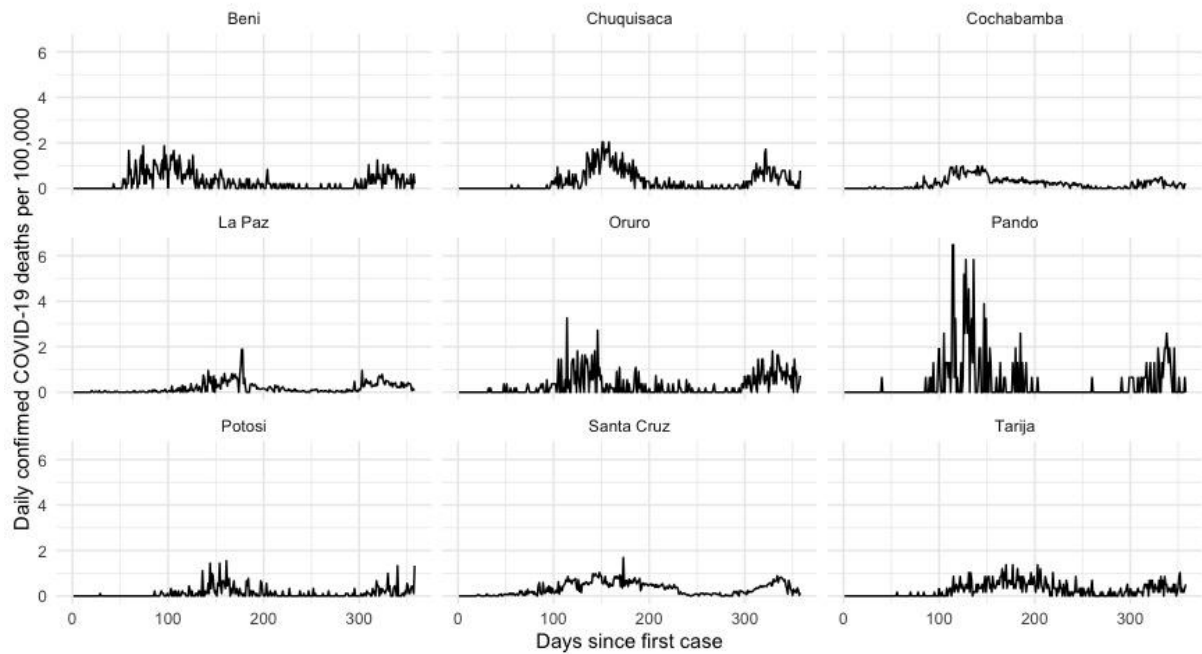
Figure 3 plots confirmed deaths from COVID-19 per 100,000 people across Bolivia and tells a story similar to Figure 2. Santa Cruz, the epicentre of overall cases, recorded the most deaths overall and per capita: 45 per cent of the Bolivians who tested positive for COVID-19 and died were *cruceños*. Nationally, Bolivia recorded 104 COVID-19 deaths per 100,000 people in the first year of the pandemic. Santa Cruz recorded 158 deaths per 100,000. The much smaller Pando recorded 144 deaths per 100,000 people, and Chuquisaca reported 114 deaths per 100,000. In comparison, some departments had much lower tolls. Potosí recorded 45 deaths per 100,000 people, less than one third of Santa Cruz's rate, while La Paz recorded 64 deaths per 100,000, and Cochabamba reported 78 per 100,000.

Figure 2: Confirmed daily COVID-19 cases per 100,000 residents in Bolivia's nine departments, 10 March 2020 – 10 March 2021



Source: authors' illustration based on data from the Bolivian Ministry of Health.

Figure 3: Confirmed daily deaths from COVID-19 per 100,000 residents in Bolivia's nine departments, 10 March 2020 – 10 March 2021



Source: authors' illustration based on data from the Bolivian Ministry of Health.

Sadly, the numbers recorded here are an undercount of the true toll. No department had sufficient tests to meet demand during the pandemic, and thus confirmed cases are a significant undercount of actual COVID-19 infections. The Bolivian government only attributed a death to COVID-19 if a person received a positive test result before they passed away. Amidst a test shortage and delays, these staggering numbers undercount Bolivia's true COVID-19 death toll.

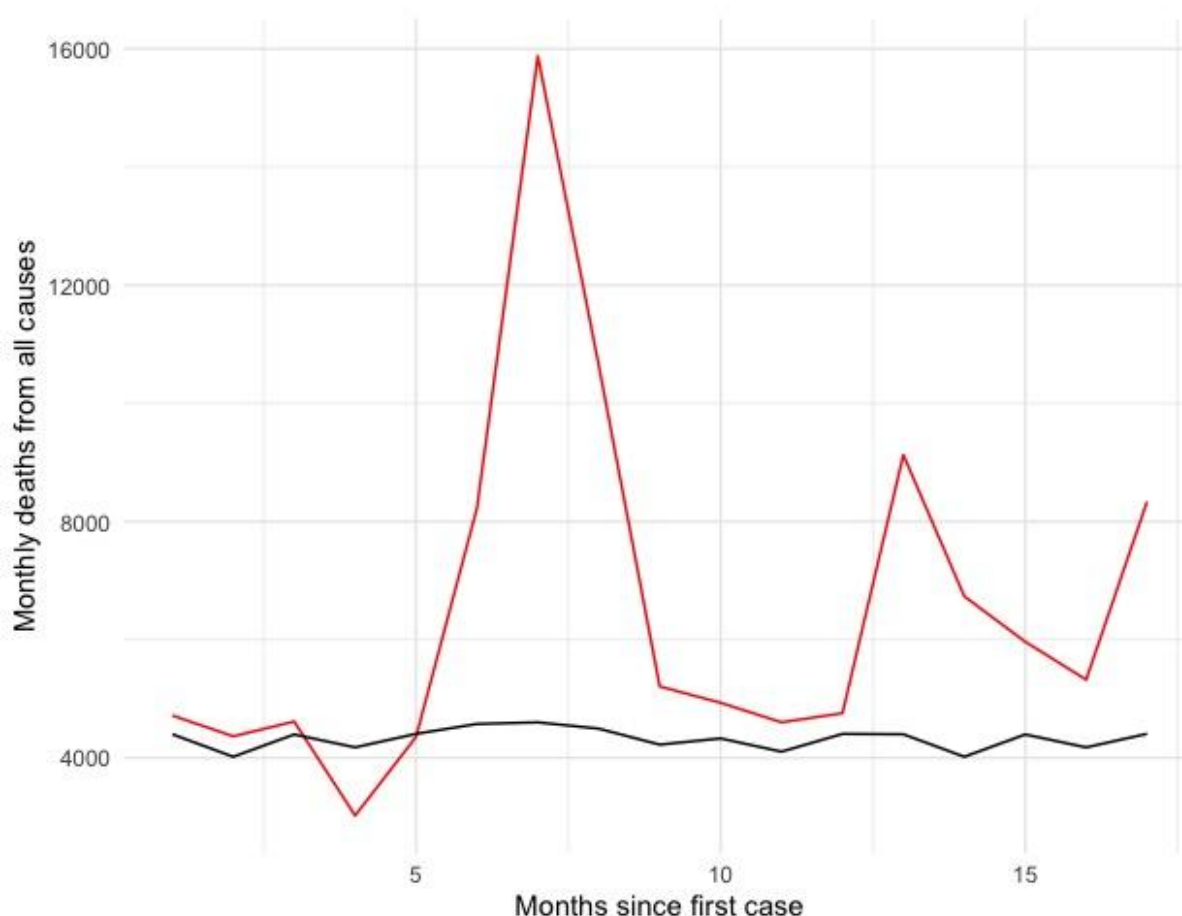
Some might wonder whether the patterns in Figures 2 and 3 are artefacts of testing and reporting capacity, rather than approximate measures of the true distribution of cases and deaths across Bolivia. A few trends suggest that the numbers reflect underlying caseloads rather than testing or reporting capacity. First, La Paz, Santa Cruz, and Cochabamba had the most access to tests and clinics that could analyse the tests, and also had local health departments that were relatively experienced at tracking and reporting infectious diseases. Santa Cruz reported the most cases and deaths, but La Paz and Cochabamba are towards the bottom when we adjust for population; therefore, the higher-capacity departments do not dominate the reported cases or deaths, adjusted for population. Similarly, Pando and Beni had the least access to diagnostic materials and low local statistical and reporting capacity; Tarija and Oruro also had less access and capacity than other departments. Yet Pando and Tarija reported high numbers of cases and deaths. Thus, we know that the reported numbers are lower than the true numbers, but we believe that they reflect the underlying distribution of cases and deaths across the country.

Overall deaths increased dramatically across Bolivia in 2020 and 2021, from COVID-19 as well as other causes. The Ministry of Health has not published data on deaths across the country and has stopped publicly releasing deaths by department: the departmental mortality data set on the INE website has not been updated since before the pandemic. Some researchers and journalists have been able to get mortality data directly from the Civil Registry (Servicio de Registro Civil, SERECI), which records births and deaths.

Figure 4 uses INE data to calculate the average number of deaths per month from all causes in Bolivia from 2016 to 2019, and uses data from Karlinsky and Kobak (2021) to track overall deaths across Bolivia each month from January 2020 to May 2021. The black line represents the average number of deaths per month between 2016 and 2019, while the red line tracks deaths per month since January 2020.

Figure 4 shows a dramatic increase in deaths since the beginning of the COVID-19 pandemic. The difference between the pre-pandemic average tracked in the black line and the monthly deaths during the pandemic is called 'excess mortality'—deaths in excess of what one would expect under normal conditions. The excess mortality for Bolivia during the COVID-19 pandemic was astronomical. Bolivia reported over 26,000 more deaths in 2020 than in 2019, an increase of 50 per cent and one of the highest increases in the world (Karlinsky and Kobak 2021). Despite a vaccination campaign, the numbers may be even worse for 2021: Bolivia recorded 35,484 deaths in the first five months of 2021, a 60 per cent increase or 14,087 more deaths than in the same period in 2016 to 2019.

Figure 4: Monthly deaths from all causes in Bolivia for January 2020 – May 2021, compared with average monthly deaths from all causes for 2016–19



Source: authors' illustration based on data from the World Mortality Data Set.

5 Discussion

Why were cases and deaths three times higher in some departments than in others? No single variable appears to explain the patterns that we see across Bolivia. We discuss possible political, economic, social, and geographical factors that might account for some of the variation.

5.1 Decentralization

Observers have noted that countries with federal structures, such as the United States, Mexico, and Brazil, appear to have fared worse than countries with unitary structures (Knaul et al. 2022). Bolivia's decentralized governance structure is between these two types. The executive has significant autonomy and power to rule through emergency decrees during crises, and the national government supersedes local governments in most instances. However, it is the local governments that implement most policies and projects within their jurisdictions.

Bolivia's decentralized structure appears to have helped the country to respond to COVID-19. The national government swiftly implemented a comprehensive national prevention plan that probably avoided the catastrophic scenarios that unfolded in neighbouring Brazil. Decentralized local governments did not and could not block the central government's policies in the way that federal units did in the United States and Brazil. At most, local governments could protest against

national policy, obstruct some implementation, or promote competing local policies. Some local governments did this through initiatives such as distributing chlorine dioxide through pharmacies, but these efforts did not derail the national strategy. Local governments could also respond to outbreaks with their own prevention policies, which many did by imposing mask mandates earlier than the national government, or by locking down cities and towns in response to local outbreaks. It appears that Bolivia's decentralized governance allowed local governments to respond to outbreaks without derailing a comprehensive national response.

5.2 Subnational factors

The government was well aware in March 2020 that the country's health system was not prepared for a pandemic. When the government confirmed the first cases, the president, departmental governments, and municipal governments responded immediately with non-pharmaceutical interventions designed to stop transmission, prevent community spread, and contain the initial cases (Hummel et al. 2020; Velasco Guachalla, Hummel, Nelson-Nuñez, and Boulding 2021b). While COVID-19 restrictions did not prevent community spread in Bolivia, they may have slowed and reduced it (Knaul et al. 2022). The per capita case data suggests that strict policies may have reduced infections: we see peaks in June and December after restrictions loosened, suggesting that policies in prior periods had worked to reduce transmission. Bolivia also recorded fewer cases and deaths per 100,000 people than neighbouring Brazil, which had few restrictions. The departments bordering Brazil—Pando, Beni, and Santa Cruz—had much higher restrictions and much lower cases throughout the pandemic than the Brazilian states they bordered (Touhcton et al. 2021). Thus, we would expect departments that maintained strict restrictions throughout the year to have lower cases and deaths per capita than those that did not.

Departmental COVID-19 policies reflected political fault lines (Hummel et al. 2021). With the controversial and unpopular Áñez administration instituting strict quarantine, some people and politicians who opposed Áñez obstructed the administration's COVID-19 response by spreading misinformation or refusing to comply (Velasco Guachalla, Hummel, Nelson-Nuñez, and Boulding 2021b). Conversely, we found in our earlier research that departments whose governors and electorates were aligned with the administration implemented stricter policies and for a longer period of time than departments that opposed the administration (Velasco Guachalla, Hummel, Nelson-Nuñez, and Boulding 2021b). This politicking and low government legitimacy may have increased transmission in some areas.

We and many others expect pre-existing health infrastructure and capacity to have shaped mortality rates. Where people could access tests, oxygen, assistance, steroids, and ventilators, more people probably survived severe cases and went on to infect fewer other people. We have a pre-pandemic measure of local health capacity in hospital bed numbers from the INE. We can use this measure to approximate local health infrastructure. Thus, we would expect departments with more hospital beds and other health infrastructure to have had fewer deaths than departments with fewer beds and less infrastructure. We can initially evaluate this expectation by comparing mortality rates and hospital beds across departments. Surprisingly, we do not see a clear relationship in the descriptive data that we have. Pando, the department with the weakest health infrastructure before the pandemic, did experience one of the highest case and mortality rates. However, so did Santa Cruz and Chuquisaca, which had more per capita hospital beds and other health infrastructures than most departments.

Additionally, health capacity shifted throughout the pandemic as cases rose and fell, supplies arrived or did not, and health workers fell ill, in ways our data does not capture. For example, Santa Cruz entered the pandemic with better health infrastructure than most of the country. However, that infrastructure repeatedly collapsed when too many health workers fell ill at once and facilities

shut down due to lack of personnel, sending patients to nearby facilities that in turn became overburdened and shut down. We expect that more fine-grained data and sensitive statistical analyses will uncover clearer relationships between health capacity and COVID-19 outcomes.

We expect geography to have influenced the spread of the virus as well. Departments that border Brazil had higher per capita and overall cases than other departments. Brazil was battered by the pandemic, and state governments were largely on their own in trying to prevent and then treat COVID-19 (Touchton et al. 2021). Beni, Pando, and Santa Cruz share important border crossings with the Brazilian border states of Acre, Rondonia, Mato Grosso, and Mato Grosso do Sul. Acre, Mato Grosso, and Mato Grosso do Sul had the lowest restrictions of Brazil's states, which were already much lower on average than any department in Bolivia (Knaul et al. 2022; Touchton et al. 2021). While border closures helped to insulate Bolivia, shared borders with lax Brazilian states may have increased transmission in Beni, Pando, and Santa Cruz, especially the transmission of more contagious variants. Furthermore, the only department without an international border, Cochabamba, had the lowest caseload per capita of any department and one of the lowest mortality rates. We suspect that Cochabamba's geography may have slowed the spread of the virus.

5.3 Individual factors

Within a given department, Bolivians with differing resources, jobs, and families experienced the pandemic in dramatically different ways. The pandemic brought 15 years of economic growth to a halt and unleashed an economic crisis across the country. Unemployment soared (Agencia EFE 2020; Instituto Boliviano de Comercio Exterior 2021; Mamani 2021). The government used the social assistance infrastructure developed during the Morales administration to deliver cash and food assistance to families in need, and developed new programmes to send cash to unemployed Bolivians (Blofield et al. 2020, 2021; Velasco Guachalla, Hummel, Nelson-Nuñez, and Boulding 2021b). Social assistance probably prevented a deeper public health and economic crisis, but it was not enough for many Bolivians.

We expect wealthier Bolivians to have lived a different pandemic than most Bolivians. We do not have detailed individual-level data on pandemic experiences yet, but we expect such data will show that wealthier Bolivians had lower rates of infection and lower mortality rates than other Bolivians. We have several reasons for this expectation. First, personal protective equipment, medical attention, and medicines cost money that most Bolivians did not have to hand, despite the government's assurances and the constitutional right to healthcare. Only the wealthiest Bolivians could afford private medical care if beds in public hospitals were not available, although in some places and points in the pandemic even private care was scarce or non-existent. Second, most Bolivians live in homes that are not big enough for family members to socially distance from one another if one person is exposed (Zechmeister and Lupu 2019). Only the wealthiest Bolivians have enough space in their homes to distance themselves from an exposed housemate or family member. Finally, only a few Bolivians have adequate savings to live on during prolonged periods of unemployment, or the financial ability to turn down jobs where they may be exposed to COVID-19.

Similarly, occupation probably influenced how often a person was exposed to COVID-19 (Hummel et al. 2021). Only a minority of jobs in Bolivia can be performed remotely, largely in government, education, and some services. Most people work in agriculture, manufacturing, transport, mining, domestic work, retail, and other services that require in-person work. In 2019, 39 per cent of active workers surveyed categorized themselves as part of service provision and as shop and market vendors (Zechmeister and Lupu 2019). Furthermore, national and local laws declared large swaths of the labour force to be essential workers who could keep working during lockdown; this included people working in agriculture, transport, and many retail and government

jobs as well as healthcare. Many of these workers, particularly in agriculture, transport, and food retail, worked informally and were expected to source and pay for personal protective equipment, as well as to follow social distancing and sanitation protocols; many did not or were not able to do so.

We know that 80 per cent of healthcare workers were diagnosed with COVID-19 in the first six months of the pandemic (Ministerio de Salud y Deportes 2020). Initial reports from SERECI and departmental news coverage suggested that people working in marketplaces and transport contracted COVID-19 at extremely high rates, and that many continued to work while sick, probably passing the virus to co-workers, clients, and their families. For example, research from Universidad Autónoma Gabriel René Moreno in Santa Cruz in June 2020 found that half of the recorded infections in the department's capital were among market and transport workers and their households; this finding was consistent across departments (IIES-JOM 2020; Ministerio de Salud y Deportes 2020). As a result, we expect that people who worked in markets, retail, transport, food production, and health, as well as their families, were particularly likely to be infected. Conversely, we expect that people who could work remotely had lower risks of infection than people who could not.

6 Conclusion

In Bolivia, the COVID-19 pandemic unfolded quickly and with little information. The country entered the pandemic with insufficient hospital beds, ventilators, medical personnel, and other key public health resources. Additionally, Bolivia was reeling from a political crisis that had started in 2019, and an unelected interim president was in charge of the country. Despite or perhaps because of these challenges, the government responded quickly and drastically to the first cases by closing borders and sending the country into lockdown within two weeks.

The data presented in this case study suggests that the response was effective in that it slowed and may have reduced COVID-19 transmission. Bolivians generally obeyed national and local COVID-19 containment laws, particularly in the first few months. However, the response did not prevent the pandemic from taking hold in Bolivia, and by June 2020 thousands of Bolivians were contracting COVID-19, and hundreds were dying from the disease. In an especially grim statistic, the number of people who died in Bolivia increased by 50 per cent in 2020 compared with 2019.

Bolivia started a vaccination campaign in January 2021 with several thousand doses of the Sputnik vaccine. The newly elected Arce government, which assumed power in November 2020 after winning the October 2020 elections, secured millions of doses from five manufacturers in 2021. Bolivia's COVID-19 vaccination rates are similar to its regional peers.

One positive development during the COVID-19 pandemic was that the government made huge investments in the country's healthcare sector and in infrastructure, including Internet connectivity. The Morales administration had promised many of these investments for years but under-delivered, in large part because of the necessary time and expense. The pandemic revealed stark deficiencies and pushed both the Áñez and the Arce administrations to pump financial and human resources into these areas. Additionally, the government used the impressive social assistance programmes that the Morales administration had developed to reach more Bolivians quickly with cash and food assistance. These were important developments that will help Bolivians now and in the future and can help Bolivia return to sustainable economic growth.

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