

COVID19 in vulnerable populations: Reported incidence in a social housing villa in Santiago de Chile

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Introduction

In Santiago de Chile, COVID-19 cases follow the pattern of well-known urban health inequities, disproportionately affecting inhabitants of the urban peripheries. To delve deeper into the relationships that exist between factors such as labor informality, overcrowding, or poor housing conditions, it is first necessary to estimate the incidence of COVID19 in the populations of low income neighborhoods.

Based on the RUCAS study, a longitudinal study conducted in a social housing *villa* in the southern peripheries of Santiago, questions related to COVID19 were introduced to estimate its incidence, analyze its health and social impact, and the relationships with the living conditions of its inhabitants.

Objective

The purpose of this study is to estimate the incidence of COVID-19 in a social housing villa in the periphery of Santiago, based on informant-reported data, at both the individual and dwelling level.

Methods

Data come from the fourth wave of the RUCAS survey, applied by telephone to household key informants in a social housing villa in the southern periphery of Santiago in September 2020. The final sample for these analyses consisted of 1466 subjects in 452 dwellings.

We estimate medically diagnosed COVID19 cases (PCR test, medical diagnoses, or hospitalization) and undiagnosed COVID19 cases (fly-like symptoms in individuals that have been in isolation or in a dwelling with at least one diagnosed case or a subject with an indication of isolation). Indicators of COVID-19 cases were selected after sensitivity and specificity analyses using the PCR test as our gold standard. We used these to build three COVID-19 case indicators: (i) diagnosed case, (ii) undiagnosed case, and (iii) total cases. Our definitions of diagnosed and undiagnosed cases correspond to the official definitions of confirmed and probable cases.

Results

Table 1. Sensitivity, specificity, and false-positive proportion analyses for indicators of diagnosed and undiagnosed cases.

	Sensitivity	Specificity	False positive
Diagnosed COVID19			
1 Test PCR+ (gold standard)	-	-	-
2 Diagnosed by a doctor	88,4%	95,8%	10,3%
3 Hospitalized for COVID19	7,2%	100,0%	0,0%
Undiagnosed COVID19 (flue-like symptoms, *caso probable*)			
1 Symptoms and another dwelling member with PCR+	47,8%	97,6%	10,8%
2 Symptoms and another dwelling member with medical diagnosis	50,7%	97,6%	10,3%
3 Symptoms and another dwelling member with isolation	66,7%	94,1%	17,9%
4 Symptoms and isolation	81,2%	94,1%	15,2%
Undiagnosed COVID19 case (sum of cases based on criteria 1-4)	81,2%	93,5%	16,4%

1. We repeated the exercise with "emergency room attendance due COVID19 and Isolation", but the false-positive proportion was not reduced for the main indicator and no new cases were added.
2. We selected only those indicators with < 20% of the false-positive proportion.

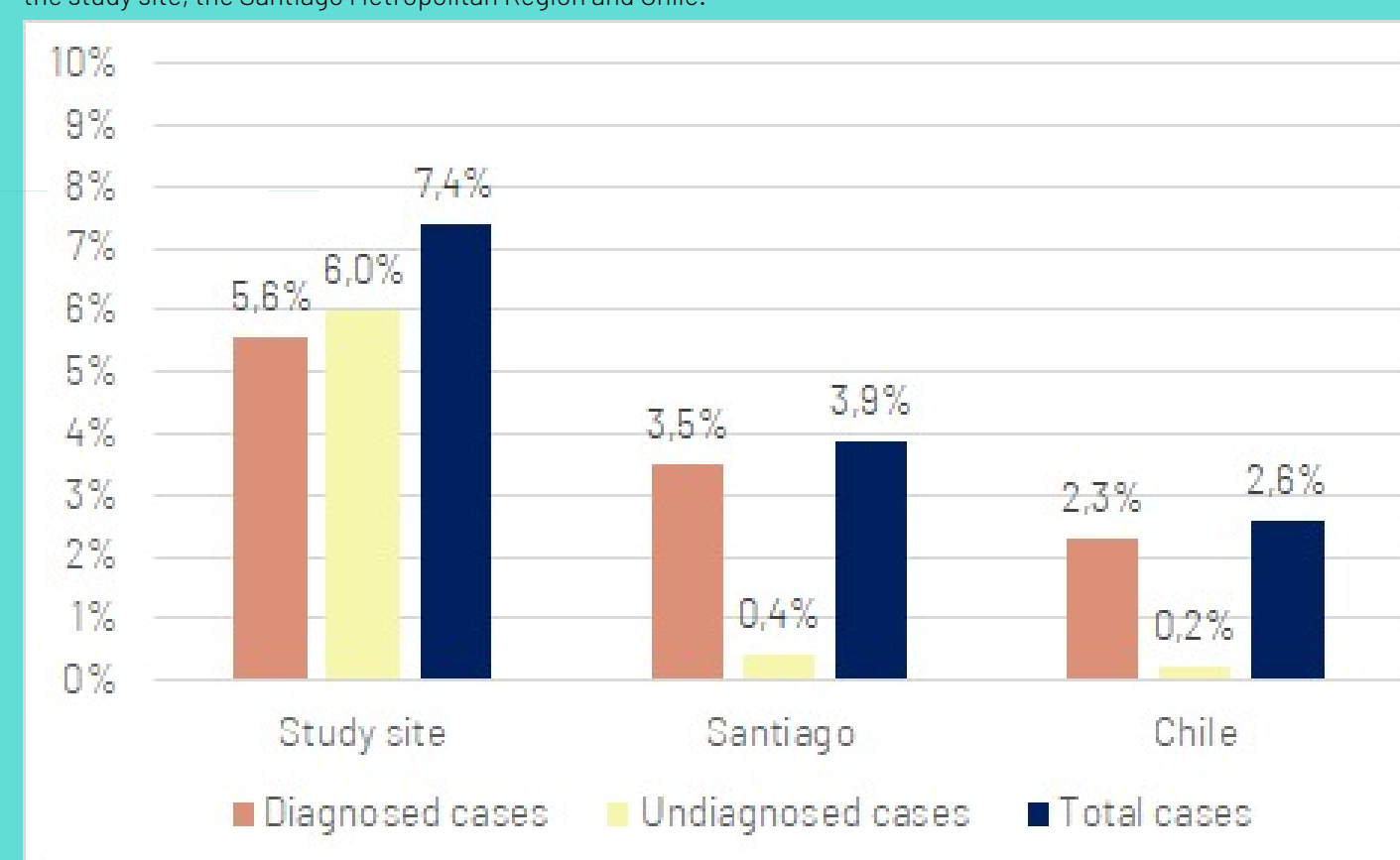
Table 2. Cumulative incidence of COVID19 (diagnosed, undiagnosed, total) in individuals and dwellings between March and September 2020.

Individuals (n=1466)	n	%	CI 95%
Diagnosed cases	81	5,6%	(4,5%-6,9%)
Undiagnosed cases	88	6,0%	(4,9%-7,3%)
Total cases	107	7,4%	(6,1%-8,8%)
Dwellings (n=452)	n	%	CI 95%
One or more diagnosed cases	52	11,5%	(8,8%-14,7%)
One or more undiagnosed cases	44	9,7%	(7,3%-12,7%)
One or more diagnosed/undiagnosed cases	53	11,8%	(9,0%-15,0%)

Table 3. Number of dwellings with clusters (>=2 cases) of COVID19 according to dwelling size and number of cases between March and September 2020.

	Total dwelling members											Total
	1	2	3	4	5	6	7	8	9	10	11	
1	1	5	9	9	3	0	0	0	0	2	0	29
2	0	4	2	6	2	1	2	0	0	0	0	17
3	0	0	2	1	1	0	0	0	0	0	0	4
4	0	0	0	4	1	0	0	0	0	0	0	5
5	0	0	0	0	0	1	0	0	0	0	0	1
8	0	0	0	0	0	0	0	1	0	0	0	1
Proportion of clusters	-	4/9	4/13	11/20	4/7	2/2	2/2	1/1	0	0/2	0	49,1%

Figure 1. Cumulative incidence of COVID19 (diagnosed, undiagnosed, total) between March and September 2020 in the study site, the Santiago Metropolitan Region and Chile.



Conclusion

The informant-reported incidence of COVID19 in this villa (7.4%) is 1.89 times higher than the cumulative incidence reported in September 2020 for the Metropolitan region (3.5%), where Santiago is located, and 2.85 times higher than the same measure for the country (2.6%). It is likely that we are underestimating the incidence of COVID19 in this villa both because of lower PCR testing in these contexts and underreporting of cases and, especially, symptoms by the key informant.

These high incidence rates and dwelling clustering are likely to be reflecting the accumulative effect of overcrowding, precarious jobs, and poor general material conditions that are exacerbated in neighborhoods affected by residential segregation such as this one.

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