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SOCIAL DETERMINANTS OF THE INCIDENCE OF Covid-19 IN BARCELONA: A PRELIMINARY ECOLOGICAL STUDY USING PUBLIC DATA

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ABSTRACT

Background: Social determinants and health inequalities have a huge impact on health of populations. It is important to study their role in the management of the Covid-19 epidemic, especially in cities, as certain variables like the number of tests and the access to health system cannot be assumed as equal. The aim of this work was to determine the relation of social determinants in the incidence of Covid-19 in the city of Barcelona.

Methods: An observational retrospective ecological study was performed, with the neighbourhood as the population unit, based on data of cumulative incidence published at May 14th, 2020 by the Public Health Agency of Barcelona. Covid-19 incidence disparities depending on the income of the neighbourhoods, the Pearson linear correlation of the variables selected (age, sex, net density, immigrants, comorbidities, smokers, Body Mass Index [BMI] and Available Income per Family Index [AIFI]) with the incidence and the correlation with a multivariate Generalized Linear Model (GLM) were estimated.

Results: It was found that neighbourhoods belonging to the lowest quintile of income had a 42% more incidence than those belonging to the highest quintile: 942 cases per 100,000 inhabitants versus 545 per 100,000 inhabitants of the highest quintile. The Pearson correlation was statistically significant between the incidence of Covid-19 and the percentage of population over 75 ($r=0.487$), the percentage of immigration of the neighbourhood and the origin of the immigrants ($r=-0.257$), the AIFI ($r=-0.462$), the percentage of smokers ($r=0.243$) and the percentage of people with BMI over 25 ($r=0.483$). The GLM showed that the most correlated variables with the incidence are the percentage of people over 75 ($Z\text{-score}=0.258$), the percentage of people from Maghreb ($Z\text{-score}=-0.206$) and Latin America ($Z\text{-score}=-0.19$) and the percentage of people with BMI over 25 ($Z\text{-score}=0.334$). The results of the GLM were significative.

Conclusions: Social determinants are correlated with the modification of the incidence of Covid-19 in the neighbourhoods of Barcelona, with special relevance of the prevalence of BMI over 25 and the percentage of immigrants and their origin.

Key words: Covid-19, Pandemic, Social determinants of health, Incidence, Barcelona.

RESUMEN

Determinantes sociales de la incidencia de la Covid-19 en Barcelona: un estudio ecológico preliminar usando datos públicos.

Fundamentos: Los determinantes sociales tienen un gran impacto en la salud de las poblaciones. Es relevante estudiar su papel en la gestión de la epidemia de la Covid-19, especialmente en las ciudades, pues ciertas variables como el número de tests realizados o la disponibilidad de recursos sanitarios no se pueden asumir por igual. El objetivo de este trabajo fue estimar la relación de los determinantes sociales en la incidencia de la Covid-19 en Barcelona.

Métodos: Se realizó un estudio ecológico, observacional retrospectivo, con el barrio como unidad de población, basado en los datos publicados a fecha de 14 de mayo de 2020 sobre incidencia acumulada de Covid-19 confirmada por PCR. Se estimó la diferencia de incidencia de la Covid-19 en función de la renta de los barrios, la correlación lineal de Pearson de las distintas variables seleccionadas (edad, sexo, densidad neta, inmigrantes, comorbilidades, tabaquismo, Índice de Masa Corporal [IMC] e Índice de Renta Familiar Disponible [IRFD]) con la incidencia acumulada y se llevó a cabo un análisis multivariante mediante un Modelo Lineal Generalizado (GLM).

Resultados: Los barrios del quintil de menor renta presentaban un 42% más de incidencia que aquellos del quintil con más renta: 942 casos por cada 100.000 habitantes frente a los 545 casos por cada 100.000 habitantes. La correlación de Pearson se mostró estadísticamente significativa entre la incidencia de la Covid-19 y el porcentaje de población mayor de 75 años ($r=0.487$), el porcentaje de inmigrantes ($r=-0.257$) y el origen de dichos inmigrantes, el IRFD ($r=-0.462$), el porcentaje de fumadores ($r=0.243$) y de personas con un IMC mayor de 25 ($r=0.483$). En GLM las variables que más correlación tenían con la incidencia entre barrios eran el porcentaje de población mayor de 75 años ($Z\text{-score}=0.258$), el porcentaje de inmigrantes latinoamericanos ($Z\text{-score}=-0.19$) y magrebíes ($Z\text{-score}=-0.206$), y el porcentaje de personas con $\text{IMC}>25$ ($Z\text{-score}=0.334$). Los resultados del GLM fueron estadísticamente significativos.

Conclusiones: Los determinantes sociales se correlacionan con una modificación de la incidencia de la Covid-19 en los barrios de Barcelona, con especial relevancia de la prevalencia de $\text{IMC}>25$ y del porcentaje de inmigrantes y de su origen.

Palabras clave: Covid-19, Pandemia, Determinantes sociales de la salud, Incidencia, Barcelona.

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INTRODUCTION

In December 2019, a new virus called SARS-CoV-2, which causes Covid-19, emerged in the Chinese city of Wuhan, since then it has expanded across the world creating a pandemic that has resulted in a challenge without precedents both for Healthcare and Public Health systems.

Scientific evidence has shown the significant impact of social determinants of health and of the inequalities that exist in the access to healthcare resources as relevant variables for the populations' health⁽¹⁾. Additionally, scientific literature has described the importance of social and economic determinants in the modification of incidence and of mortality in epidemics^(2,3). Therefore, these can define potential determinants in the evolution of epidemics that can be used to direct in a more specific way Public Health policies to certain groups of the population.

In the case of the city of Barcelona there is historic data gathered in the Health Surveys of the Public Health Agency of Barcelona (ASPB)⁽⁴⁾ that show significant differences between neighbourhoods regarding social, economic and demographic variables. The causal model of the work was based on the idea that those differences between neighbourhoods regarding these variables could have influenced the way Covid-19 affected the city, modifying either the virus' transmission or the susceptibility to it.

The goal of the work was to determine the influence of the socioeconomic determinants in the modification of the Covid-19 incidence in Barcelona, performing an observational retrospective ecological study with the neighbourhood as the population unit.

MATERIALS AND METHODS

Initial selection of the variables. In order to develop the study, a series of variables were selected as indicative of the different circumstances and social determinants that could be correlated to the Covid-19 incidence.

In the field of demography, the percentages of population between 65 and 74 years and older than 75 years old were selected, as they represent the ageing of the population in the neighbourhoods. In order to characterize the overcrowding of the housings, or the quantity of people living in the same space, the net density was selected, which corresponds to the quotient between habitants per habitable surface in hectares. Regarding the socioeconomic level, the Available Income per Family Index (AIFI) was selected, since it is a value calculated using different parameters indicative of the social class (explained in the point 4 in **table 1**). Concerning immigration, the total percentage of immigrants, together with the percentages broken down by origin, was used, since this could have an implication in the correlation with the Covid-19 incidence. Lastly, in order to characterize the prevalence of comorbidities in neighbourhoods, three indicators were selected: the percentage of people with one or more comorbidities, since it results in a good estimation of the prevalence of them; the percentage of smokers, since it is an indicator of toxic habits; and the percentage of people with Body Mass Index (BMI) higher than 25, since this value is associated to the presence of other comorbidities and it is an important risk factor in hospitalizations of Covid-19 infections.

Data obtention. They were obtained through different sources (**table 1**): the 2019 census of the Statistics Department of the City Council of Barcelona⁽⁵⁾ referring the population and

distribution of the age group in it, and the Available Income per Family Index (AIFI); the 2016-2017 Health Survey of Barcelona⁽⁴⁾ of the ASPB referring to the prevalence of comorbidities; the platform *InfoBarri*⁽⁶⁾ of the ASPB referring to the percentage of immigrants, and the platform *Covid-19alDiaBCN*⁽⁷⁾ of the ASPB referring to the cumulative incidence of Covid-19. All the data was available at the level

of neighbourhoods, excepting those referred to the prevalence of comorbidities that were at the level of districts. In the latter case, and for the 10 different districts, the same prevalence was assumed for the neighbourhoods that belonged to the same district. The same number of PCR tests and the same public health measures applied were assumed for the whole city, this was also done for the sex of the population, since

Table 1
Sources of the data.

Data	Source	Year/s	Method
1. Covid-19 CUMULATIVE INCIDENCE	ASPB. Platform #COVID19alDiaBCN ⁽⁷⁾	2020	Confirmed cases by PCR at May 14 th , 2020, excluding residences.
2. NEIGHBOURHOODS DEMOGRAPHY	Barcelona City Council. Department of Statistics. 2019 census. ⁽¹²⁾	2019	Official population data at 01/01/2019.
3. NET DENSITY	Barcelona City Council. Department of Statistics ⁽¹³⁾	2018	Population at January 1 st , 2018 / sup. of living places (Mpal. Inst. Informatics) The net density measures the population or the number of living places units in the area which have exclusively a residential use.
4. SOCIOECONOMIC DEPRIVATION	Barcelona City Council. Statistics Department ⁽¹⁴⁾	2017	“From the calculus of the macromagnitudes of the Available Gross Family Income and the Available Gross Family Income per capita by the <i>Idescat</i> (Catalonia’s Statistics Institute), a micromunicipal model is constructed based in the combination of variables related to the level of studies of the resident population, the work- ing status, the characteristics of the vehicle park and the prices of the residential market.”
5. IMMIGRATION	ASPB. InfoBarri platform ⁽⁶⁾	2018	Data from the Municipal Census of inhabitants. Inhabitants depending on its region of origin.
6. COMORBIDITIES AND TOXIC HABITS	ASPB. Heath Surveys of Barcelona ⁽⁶⁾	2016- 2017	Population survey of non-institutionalised inhabitants.

(*) Sample size only referred to comorbidities and toxic habits data, 4,000 inhabitants;

(**) ASPB: Public Health Agency of Barcelona; INE: Spain’s National Institute of Statistics;
Mpal. Inst: Municipal Institute.

the differences between the neighbourhoods were small.

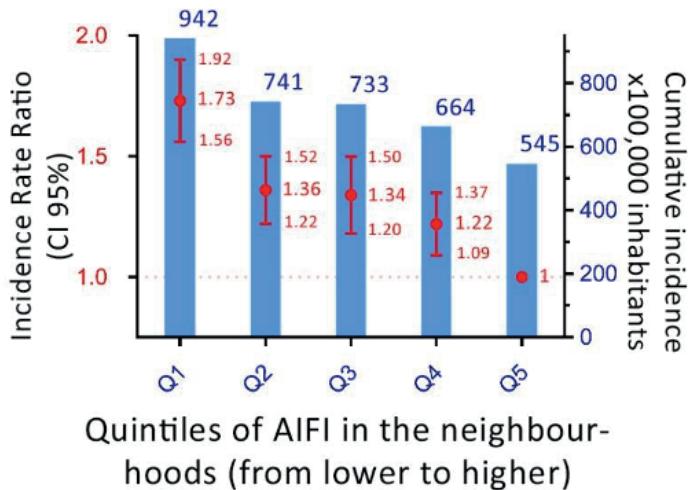
Statistical analysis. The statistical analysis, carried out using SPSS®, consisted of two parts. The first one, a descriptive analysis and of risk: the mean, minimum and maximum and

standard deviation of every variable were calculated (**table 2**). The incidence of Covid-19 until May 14th, 2020 in the neighbourhoods depending on the quintile of Available Income per Family Index and the Incidence Rate Ratio (IRR) were also calculated to estimate the risk (**figure 1**). In order to calculate the

Table 2
Descriptive analysis of the selected variables for the neighbourhoods of Barcelona (n=73).

	Variables (units)	Average	Min-Max	Standard deviation
Demography and immigration	2019 population (n)	22,905	686-5,642	14,635.50
	Men (%)	47.7	45.1-56.3	1.91
	Women (%)	52.3	43.7-54.9	1.91
	Population between 65-74 years old (%)	9.7	5.3-14.8	0.02
	Population > 75 years old (%)	11	5.1-21.5	0.03
	Net density (population/ha. living places)	711.5	19-1,308	286.93
	Immigrant inhabitants (%)(**)	24.5	8.6-59.7	0.10
	Maghreb inhabitants (%)	1.4	0.34-6.3	0.04
	Latin America inhabitants (%)	12.1	5.1-25	0.04
	Asia and Oceania inhabitants (%)	3.9	0.6-31.52	0.04
	Inhabitants from the rest of Africa (%)	0.5	0-3.3	0.004
Socioeconomic deprivation indexes	Available Income per Family Index (Index) ^(*)	94.2	38.6-248.8	42.53
Covid-19 data in the neighbourhoods^(*)	Total cases of Covid-19 by PCR (n)	159.29	5-429	100.63
	Cumulative incidence (x100,000 inhabitants)	739	355-2,168	191.29
Comorbidities and toxic habits	Smokers (%)	20.2	14.6-26.3	2.48
	People with BMI>25 (%)	47.7	30.8-56.3	7.70
	People with one or more comorbidities (%)	78.3	66.7-80.2	4.45
It shows the average, the minimum-maximum and the standard deviation for each variable. The total population of the city was of 1.6 million inhabitants. (*) Confirmed cases by PCR at May 14 th , 2020.				

Figure 1
Cumulative incidence and Incidence Rate Ratio (IRR) (Confidence Interval 95%) depending on quintiles of AIFI (Available Income per Family Index) in the neighbourhoods.



CI: Confidence interval; AIFI: Available Income per Family Index.

incidence in every income bracket all neighbourhoods in the same level were considered as a population unit, and the corresponding cases were added, dividing by the sum of its populations. The IRR was calculated considering those neighbourhoods in the higher bracket of the AIFI (Q5) as the non-exposed group and dividing the incidence in each income bracket by the incidence in Q5. The confidence interval was calculated using the formula $e^{\{\log(\text{IRR}) \pm [1.96 \times \text{SE}(\log(\text{IRR}))]\}}$, where SE was the standard error.

The Pearson correlation was also calculated between the selected variables and the cumulative incidence of Covid-19 until May 14th, 2020.

The second part consisted of a multivariate analysis of the association between the socioeconomic and demographic determinants and the Covid-19 incidence (dependent variable) using a Generalized Linear Model

(GLM), in which the following variables were included as independent variables: percentage of population from Maghreb and Latin America, percentage of population older than 75 years old and percentage of population with a BMI higher than 25. The variables were standardized.

In order to determine if a variable should be included, considering that the independence between them is a basic assumption of the model, a multicollinearity analysis was carried out, and the variables with a Variance Inflation Factor (VIF) higher than 5 were excluded. All the variables had a VIF smaller than 1.8 (table 3).

To estimate the effect of the health conditions in the differences in the incidence, the percentage of people with a BMI higher than 25 was selected, since it strongly represents the prevalence of chronic illnesses and a lifestyle that interferes in the

Table 3
**Correlation of the cumulative incidence confirmed by PCR at May 14th, 2020
with the independent variables in the neighbourhoods of Barcelona.**

Variables	Pearson linear correlation	GLM correlation (Z-score)	CI 95% for the Z-score	Variation Inflation Factor
Demography	% of the population between 65 – 74 years old	0.199	-	-
	% of the population > 75 years old	0.487(**)	0.258(**)	0.116-0.401
	Net density (population/ha of living places)	-0.001	-	-
	% foreign inhabitants	-0.257(*)	-	-
	% inhabitants from Maghreb	-0.197	-0.206(**)	-0.364 – -0.048
	% inhabitants from Latin America	0.322(**)	0.190(**)	0.048-0.333
	% inhabitants from Asia and Oceania	-0.275(*)	-	-
	% inhabitants from the rest of Africa	0.034	-	-
Socioeconomic deprivation indexes	Available Income per Family Index	-0.462(**)	-	-
Comorbidities and toxic habits	% smokers	0.243(*)	-	-
	% people with BMI>25	0.483(**)	0.334(**)	0.194-0.473
		0.223	-	-

Data extracted from the same sources of **table 1**; (*) The correlation is significant at the level 0.05 (bilateral); (**) The correlation is significant at the level 0.01 (bilateral).

population's susceptibility to Covid-19. The percentage of citizens from Maghreb and Latin America were selected as indicators of how immigration on itself and its origin could have an impact, since it can affect both the susceptibility to suffer the diseases as well as on the transmission of it through specific lifestyles, or for the demographic structure of these communities. The rest of migrant groups

were excluded since they showed correlation between themselves and were not significant in the model. The AIFI was excluded as well because it did not show statistical significance in the model.

A model of normal distribution and an identity link function for the GLM were configured, since the Sapiro-Wilk test and

the Q-Q graph showed normal distribution for the dependent variable ($p=0.103$).

One neighbourhood (code 12, Marina del Prat Vermell-AEI Zona Franca) was excluded from the statistical analysis since it showed an outlying value that altered the tendencies that the other neighbourhoods followed. This is probably due to singular characteristics within this population unit, since it is a big industrial area with little population. Likewise, the cases in retirement homes were excluded because they could significantly modify the distribution of cases between neighbourhoods, creating differences that were not really a consequence of the characteristics of the population unit and overestimating the incidence. Furthermore, the health questionnaires, in which some variables were based, excluded those that were institutionalized.

Validity of the model. In order to select the model that better explained the variations between neighbourhoods, the Akaike Information Criterion (AIC) was used and the model with the lowest value (AIC=120) was selected, corresponding to the model with the variables previously exposed.

Another basic assumption in the model was the homoscedasticity. To determine if the model violated or not the assumption of homoscedasticity a dispersion diagram of the predicted value for the model against the residual deviation was done, which showed a pattern of random deviation, just as it would be expected from a homoscedastic model. The residual deviation showed normality in its distribution ($p>0.05$ in Sapiro-Wilk's test) and, in consequence, an estimator based on the model was configured in order to test the statistical significance for each variable.

RESULTS

The descriptive analysis of the variables (mean, minimum and maximum and standard deviation) showed differences in their distribution amongst the neighbourhoods (table 2). The study of the incidence in the neighbourhoods depending on their quintile of AIFI (figure 1) showed clear differences between them. The neighbourhoods with a lower income showed a 42% higher incidence, 942 cases for every 100,000 citizens, than those with a higher income, which had an incidence of 545 cases for every 100,000 citizens. In the risk estimation through the IRR, the neighbourhoods with a lower income showed an IRR of 1.73 (IC 95% 1.56; 1.92), taking as reference those with a higher income.

The analysis of the Pearson linear correlation (table 3) showed that there was a statistically significant difference between the cumulative incidence of Covid-19 until May 14th 2020 and the following variables: percentage of people older than 75 years old ($r=0.487$; $p<0.01$), percentage of immigrants ($r=-0.257$; $p<0.05$), the Available Income per Family Index (AIFI) ($r=0.462$; $p<0.01$), the percentage of people with $BMI>25$ ($r=0.483$; $p<0.01$) and the smokers ($r=0.243$; $p<0.05$).

Analysing the percentage of immigrants according to their origin, differences were observed: while the percentages of population from Asia and Oceania ($r=-0.275$; $p<0.05$) and Maghreb ($r=-0.197$; $p>0.05$) showed a statistically significant and non-significant negative correlation, respectively; the percentage of population from Latin America showed a statistically significant positive correlation ($r=0.322$; $p<0.01$). The percentage of population from the

rest of Africa showed a weak correlation which was non-significant ($r=0.034$; $p>0.05$).

In the GLM (table 3), the following variables showed a statistical significance: the percentage of population older than 75 years old ($Z\text{-score}=0.258$; $p<0.01$), the percentage of population from Maghreb ($Z\text{-score}=-0.206$; $p<0.01$), the percentage of population from Latin America ($Z\text{-score}=0.190$; $p<0.01$) and the percentage of people with $\text{BMI}>25$ ($Z\text{-score}=0.334$; $p<0.01$).

The D^2 parameter, which shows the variation explained by the model, obtained a value of 0.52 (52% of the variance is being explained by this model).

DISCUSSION

Even though from this ecological study it cannot be inferred that the variables are a direct cause of the difference in the cumulative incidence of Covid-19 in the neighbourhoods of Barcelona, it does offer a good perspective of its relation and a preliminary assessment of how social determinants could have modified the incidence of the disease.

The study shows that there is a correlation between the cumulative incidence of Covid-19 until the May 14th, 2020 and the different socioeconomic variables, and that the population units more socioeconomically deprived have a higher incidence of Covid-19 -a 42% more in those with the lowest AIFI when compared with those with the highest- as well as a higher risk of incidence -with an IRR of 1.73 in the neighbourhoods with lower IRFD in relation to those with a higher one-. This suggests that there is a correlation between the income of the neighbourhoods and the cumulative incidence, and that there exists a higher risk to contract the diseases in the neighbourhoods that are more economically limited.

In the Pearson correlation, even though the net density does not show significance and presents a weak intensity ($r=-0.01$; $p>0.05$), the role of transmission in homes cannot be discarded as a variable that could have modified the incidence between neighbourhoods, since the official statistics probably do not reflect specific overcrowding situations in housings.

The GLM is a useful tool to understand what variables have a stronger effect in the modification of incidence of Covid-19. The percentage of people with a $\text{BMI}>25$ seems to be the variable with the higher effect in the differences between neighbourhoods ($Z\text{-score}=0.334$; $p<0.01$). The BMI does not only represent an individual condition, but the prevalence of toxic habits and other health determinants. Furthermore, obesity has been correlated with a worse prognosis of the disease, according to a study by Tamara A and Tahapary DL⁽⁸⁾. This could explain why the neighbourhoods with higher obesity prevalence show a higher incidence of Covid-19 and why it is the variable that reflects more intensity in the correlation. The studies of risk factors of mortality in hospitalized patients in Catalonia⁽⁹⁾ also show a worse prognosis for the patients with obesity. The obesity prevalence is additionally associated with a lower AIFI ($r=-0.767$; $p<0.01$).

The percentage of people older than 75 years old also appears to be a relevant variable ($Z\text{-score}=0.258$; $p<0.01$), since it increases the susceptibility of the disease. It is a variable that does not show a correlation with the income, which could explain an important part of the observed differences.

The immigration appears to be significant both in the Pearson correlation and the GLM. The percentage of Asian population reflexes a negative correlation with the incidence ($r=-0.275$; $p<0.01$), which could be explained by cultural difference or a higher awareness of the situation caused by the previous affectation in

their home countries, which may have lead them to take measures of social distancing and closure of their establishments before it was recommended to the general public.

The Maghreb immigration is correlated with a lower incidence. The cause of this correlation might be the age of this population, younger than the mean⁽¹⁰⁾, as well as language and cultural barriers that could have caused an underdiagnosis of the disease.

On the other hand, the immigration from Latin America has been correlated with a higher incidence. There is no relationship with this group and the age, so the differences could be due to poorer hygiene and housing conditions, lower education rates or individual susceptibility differences.

All the studied variables do not represent solely a specific condition of the population unit, but they represent as well lifestyles that are a consequence of a higher socioeconomic deprivation. Furthermore, to discern which are the mechanisms that can cause the differences in the cumulative incidence of Covid-19, it is of special relevance to comprehend how social determinants affect the behaviour of epidemics upon the more deprived groups and on the population's health.

There seems to be a clear correlation amongst the social determinants against the incidence and, therefore, this epidemic could be an important catalyst for poverty and, accordingly, worse health conditions. In fact, previous studies such as the one done by Bambra C *et al*⁽¹¹⁾ on the flu epidemic of 1918, the epidemic of the virus H1N1 and the present SARS-CoV2 also show that the neighbourhoods or countries more economically deprived, with a lower income, have higher incidence of said viruses. For this reason, specific programs with a universal character aimed at reducing and easing the

inequalities both in health and the access to the health system are of vital importance, since they could as well reduce the impact of the epidemics. Moreover, it is suggested that programs and specific community interventions targeted at specific immigrant groups should be implemented.

As for the limitations of the study, because it is an ecological study, it can solely identify variables that have modified the incidence at a level of population unit and establish hypotheses as to why, but no causalities can be inferred, since only the differences between neighbourhoods have been studied instead of those at an individual level.

Another limitation is the external validity of the results. The study shows clear correlations between the incidence and different socioeconomic variables. However, this should be extrapolated to other populations with caution. The exclusion of retirement homes cases can be another important limitation and specific studies on the impact on these centres should be carried out.

Data is also a major limitation, especially in those acquired in the health questionnaires, since they are done with samples of the city's population and cannot reflect in a completely reliable way the prevalence of a disease or described condition. It also cannot be ignored that the data on cumulative incidence of Covid-19 has been affected by a lack of quality. Therefore, it must be considered that the subsequent evolution of the epidemic can modify the correlations described in this preliminary study.

Finally, an important point to consider is that, because of the saturation of the healthcare system caused by the epidemic, most part of the PCR tests, which data this study relies on, were made to the cases with a worse clinical presentation. So, probably, this study is estimating the differences in the worsening of the clinical

presentation of Covid-19, and not so much the real differences in the incidence. This proves that more studies with consolidated data on the impact of the socioeconomic variables on the incidence of Covid-19 are needed, as well as on the mortality. Regardless, said variables show a correlation and, therefore, can have influences, both in the incidence and in the worsening of the clinical profile, and they should be considered when facing and managing an epidemic.

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BIBLIOGRAPHY

1. Braveman P, Gottlieb L. The Social Determinants of Health: It's Time to Consider the Causes of the Causes. *Public Health Rep.* 2014;129(Suppl 2):19-31.
2. Mamelund SE. A socially neutral disease? Individual social class, household wealth and mortality from Spanish influenza in two socially contrasting parishes in Kristiania 1918–19. *Soc Sci Med.* February 1st, 2006;62(4):923-40.
3. Soyemi K, Medina-Marino A, Sinkowitz-Cochran R, Schneider A, Njai R, McDonald M *et al.* Disparities among 2009 Pandemic Influenza A (H1N1) Hospital Admissions: A Mixed Methods Analysis – Illinois, April–December 2009. *PLOS ONE.* April 28th, 2014;9(4):e84380.
4. Agència de Salut Pública de Barcelona. Enquesta de salut de Barcelona 2016/17 [Internet]. [cited May 3rd, 2020]. Available from: <https://www.asp.cat/docs/enquestasalutbcn/>
5. Ajuntament de Barcelona. Departament d'Estadística i Difusió de Dades [Internet]. 2001 [cited May 26th, 2020]. Available from: <https://www.bcn.cat/estadistica/catala/index.htm>
6. Infobarris [Internet]. [cited May 26th, 2020]. Available from: <https://www.asp.cat/docs/infobarris/>
7. Agència de Salut Pública de Barcelona. #COVID19aldiaBCN [Internet]. [cited May 18th, 2020]. Available from: https://aspb.shinyapps.io/COVID19_BCN/
8. Tamara A, Tahapary DL. Obesity as a predictor for a poor prognosis of COVID-19: A systematic review. *Diabetes Metab Syndr Clin Res Rev.* July 1st, 2020;14(4):655-9.
9. Agència de Qualitat i Evaluació Sanitàries de Catalunya. Factors de risc de mortalitat dels pacients hospitalitzats per COVID-19 [Internet]. [cited May 30th, 2020]. Available from: <http://aquas.gencat.cat/.content/Enllac/factors-risc-mortalitat-covid19-hospitalitzats.html>
10. Departament d'Estadística A de B. Immigrants per edats quinquennals [Internet]. [cited May 30th, 2020]. Available from: <https://www.bcn.cat/estadistica/angles/dades/tdemo/imis/2018/t54.htm>
11. Bambra C, Riordan R, Ford J, Matthews F. The COVID-19 pandemic and health inequalities. *J Epidemiol Community Health* [Internet]. June 12th, 2020 [cited July 25th, 2020]; Available from: <https://jech.bmjjournals.org/content/early/2020/06/13/jech-2020-214401>
12. Índex dades per barris [Internet]. [cited June 29th, 2020]. Available from: <https://www.bcn.cat/estadistica/catala/dades/barris/index.htm>
13. Superficie i densitat dels districtes i barris. 2018 [Internet]. [cited July 17th, 2020]. Available from: <https://www.bcn.cat/estadistica/catala/dades/anuari/cap01/C0101050.htm>
14. Renda familiar disponible 2017 [Internet]. [cited July 17th, 2020]. Available from: <https://www.bcn.cat/estadistica/catala/dades/economia/renda/rdfamiliar/a2017/rfbarris.htm>

Annex I Data tables.

DISTRICT	NEIGHBOURHOOD	1. Covid-19 CUMULATIVE INCIDENCE DATA AT MAY 14 th , 2020 (excludes retirement homes)																				
		WOMEN 0-14	WOMEN 15-34	WOMEN 35-64	WOMEN 65-74	WOMEN 75+	TOTAL WOMEN	INCIDENCE WOMEN x100,000	MEN 0-14	MEN 15-34	MEN 35-64	MEN 65-74	MEN +75	TOTAL MEN	INCIDENCE MEN x100,000	MEN 0-14	MEN 15-34	MEN 35-64	MEN 65-74	TOTAL MEN DISTRICT	TOTAL CASES DISTRICT	CUMULATIVE INCIDENCE
1 1, el Raval	1	33	62	8	19	123	-	553.95	0	22	86	11	17	136	-	521.21	259	-	536			
1 2, el Barri Gòtic	0	7	10	4	8	29	-	345.65	0	7	21	7	5	40	-	370.71	69	-	360			
1 3, la Barceloneta	0	10	20	3	11	44	-	580.55	0	6	18	6	7	37	-	487.23	81	-	534			
1 4, Sant Pere, Santa Caterina i la Ribera	0	4	22	1	22	49	245	424.61	2	8	23	7	9	49	262	421.32	98	507	423			
2 5, el Fort Pienc	0	21	46	11	33	111	-	646.55	0	10	38	17	15	80	-	516.76	191	-	585			
2 6, la Sagrada Família	0	35	124	22	49	230	-	817.75	1	18	86	23	52	180	-	756.78	410	-	790			
2 7, la Dreta de l'Eixample	0	18	61	11	24	114	-	483.21	0	13	60	27	17	117	-	567.33	231	-	522			
2 8, l'Antiga Esquerra de l'Eixample	0	20	52	13	22	107	-	466.19	0	10	64	12	16	102	-	505.95	209	-	485			
2 9, la Nova Esquerra de l'Eixample	1	40	101	30	45	217	-	690.86	0	27	86	40	43	196	-	719.74	413	-	704			
2 10, Sant Antoni	0	30	73	13	41	157	936	775.88	0	17	71	21	37	146	821	796.47	303	1757	786			
3 11, el Poble Sec - AEI Parc de Montjuïc	0	16	48	6	27	97	-	472.02	1	14	48	24	27	114	-	574.05	211	-	522			
3 13, la Marina de Port	0	21	49	12	36	118	-	728.44	0	11	51	16	28	106	-	711.98	224	-	721			
3 14, la Font de la Guatlla	0	2	23	3	10	38	-	695.59	0	1	14	1	8	24	-	488.80	62	-	598			
3 15, Hostalfrancs	0	21	37	7	17	82	-	978.40	0	8	26	7	13	54	-	694.62	136	-	842			
3 16, la Bordeta	0	7	35	11	24	77	-	754.16	0	2	21	9	19	51	-	552.37	128	-	658			
3 17, Sants - Badal	1	16	57	16	11	101	-	775.61	2	13	42	9	20	86	-	750.96	187	-	764			
3 18, Sants	1	25	83	13	28	150	663	675.80	2	10	65	13	32	122	435	606.54	272	1,220	643			
4 19, les Corts	0	15	70	14	35	134	-	536.06	0	8	67	21	30	126	-	583.28	260	-	558			
4 20, la Maternitat i Sant Ramon	0	12	31	4	17	64	-	498.02	0	7	22	16	26	71	-	637.29	135	-	563			
4 21, Pedralbes	1	3	12	3	5	24	222	376.41	1	3	12	12	2	30	227	533.43	54	449	450			
5 22, Valvidriera, el Tibidabo, les Planes	0	0	2	0	9	11	-	464.33	0	1	4	5	11	21	-	890.59	32	-	677			
5 23, Sarrià	1	12	31	5	34	83	-	619.17	1	7	25	8	16	57	-	485.85	140	-	557			
5 24, les Tres Torres	0	6	22	7	30	65	-	731.65	1	2	23	7	10	43	-	552.20	108	-	648			
5 25, Sant Gervasi - la Bonanova	1	6	26	12	44	89	-	629.29	0	4	35	11	18	68	-	568.32	157	-	601			
5 26, Sant Gervasi - Galvany	0	20	52	17	38	127	-	482.56	0	6	62	15	29	112	-	518.28	239	-	499			

Annex I (continuation)

Data tables.

1. Covid-19 CUMULATIVE INCIDENCE DATA AT MAY 14TH, 2020 (excludes retirement homes)

DISTRICT	EIGBORHOOD	1. Covid-19 CUMULATIVE INCIDENCE DATA AT MAY 14 TH , 2020 (excludes retirement homes)																	
		TOTAL WOMEN	WOMEN 0-14	WOMEN 15-34	WOMEN 35-64	WOMEN 65-74	WOMEN +75	TOTAL MEN	MEN +75	MEN 15-34	MEN 35-64	MEN 65-74	TOTAL CASES	TOTAL DISTRICT	CUMULATIVE INCIDENCE				
5, 27, el Putxet i el Farró	0	17	38	13	21	89	464	546.62	0	10	33	12	21	76	377	559.11	165	841	552
6, 28, Vallcarca i els Penitents	1	13	29	6	15	64	-	753.30	0	10	16	8	6	40	-	540.10	104	-	654
6, 29, el Coll	0	4	13	1	3	21	-	521.35	0	2	7	2	7	18	-	515.76	39	-	519
6, 30, la Salut	0	11	23	3	10	47	-	651.06	0	6	16	3	12	37	-	595.62	84	-	625
6, 31, la Vila de Gràcia	0	28	84	18	51	181	-	653.67	1	19	63	15	29	127	-	549.47	308	-	606
6, 32, el Camp d'en Grassot i Gràcia Nova	0	22	72	15	35	144	457	757.26	0	11	45	18	37	111	333	685.90	255	790	724
7, 33, el Baix Guinardó	0	19	61	9	69	158	-	1,128.09	0	10	40	9	36	95	-	792.72	253	-	973
7, 34, Can Baró	0	5	18	3	6	32	-	654.00	0	2	12	5	9	28	-	643.09	60	-	649
7, 35, el Guinardó	2	25	114	23	29	193	-	975.54	2	21	74	23	39	159	-	912.12	352	-	946
7, 36, la Font d'en Fargues	0	6	32	4	6	48	-	957.70	0	2	17	1	8	28	-	623.05	76	-	799
7, 37, el Carmel	1	31	79	15	23	149	-	881.87	0	12	53	27	34	126	-	824.66	275	-	855
7, 38, la Teixonera	0	9	24	6	6	45	-	734.57	0	10	21	5	4	40	-	706.34	85	-	721
7, 39, Sant Gervasi dels Agudells	0	9	21	3	8	41	-	1,045.12	0	3	10	3	8	24	-	691.44	65	-	879
7, 40, Montbau	0	4	18	3	10	35	-	1,228.93	0	2	15	2	12	31	-	1,326.49	66	-	1,273
7, 41, la Vall d'Hebron	0	4	18	0	3	25	-	816.46	0	3	20	3	16	42	-	1,532.29	67	-	1,155
7, 42, la Clota	0	0	0	4	1	5	-	1,510.57	0	0	1	0	0	1	-	281.69	6	-	875
7, 43, Horta	0	18	68	14	28	128	859	873.42	1	11	54	12	39	117	691	912.14	245	1,550	891
8, 44, Vilapicina i la Torre Llobeta	1	22	47	18	26	114	-	815.57	2	8	52	21	29	112	-	939.83	226	-	873
8, 45, Porta	0	21	70	13	34	138	-	970.87	1	7	50	13	47	118	-	956.01	256	-	964
8, 46, el Turó de la Peira	0	14	39	5	19	77	-	905.46	1	8	28	4	28	69	-	942.49	146	-	923
8, 47, Can Peguera	0	2	6	1	4	13	-	1,094.28	0	2	1	0	1	4	-	377.71	17	-	757
8, 48, la Guineueta	0	11	42	10	30	93	-	1,116.85	0	8	29	11	34	82	-	1,159.67	175	-	1,137
8, 49, Canyelles	0	3	19	6	7	35	-	968.46	0	3	8	5	12	28	-	856.27	63	-	915
8, 50, les Roquetes	0	19	56	11	15	101	-	1,196.82	0	7	44	12	17	80	-	1,024.20	181	-	1,114
8, 51, Verdú	1	6	44	8	13	72	-	1,072.55	0	6	30	11	13	60	-	1,023.02	132	-	1,049
8, 52, la Prosperitat	0	19	68	19	28	134	-	942.60	0	9	45	15	50	119	-	943.10	253	-	943
8, 53, la Trinitat Nova	0	8	21	5	4	38	-	957.66	1	4	17	6	5	33	-	903.61	71	-	932
8, 54, Torre Baró	0	3	3	1	2	9	-	617.71	0	3	4	0	2	9	-	610.58	18	-	614

Annex I (continuation)
Data tables.

DISTRICT	NEIGHBOURHOOD	1. Covid-19 CUMULATIVE INCIDENCE DATA AT MAY 14 TH , 2020 (excludes retirement homes)												
		WOMEN 0-14	WOMEN 15-34	WOMEN 35-64	WOMEN 65-74	WOMEN 75+	TOTAL WOMEN	MEN 0-14	MEN 15-34	MEN 35-64	MEN 65-74	MEN 75+	TOTAL MEN	TOTAL DISTRICT
8 55, Ciutat Meridiana	1 8 27 2 6 44 -	788.95	1	5	23	8	11	48	-	907.89	92	-	847	
8 56, Vallbona	0 0 3 0 0 3 871	414.36	0	1	1	0	0	2	764	292.83	5	1,635	355	
9 57, la Trinitat Vella	0 3 29 5 13 50 -	988.14	0	4	23	8	7	42	-	795.91	92	-	890	
9 58, Baró de Viver	0 0 3 1 1 5 -	373.41	0	2	3	1	2	8	-	632.41	13	-	499	
9 59, el Bon Pastor	0 10 28 5 6 49 -	735.74	0	5	25	10	9	49	-	757.81	98	-	747	
9 60, Sant Andreu	0 30 119 36 48 233 -	761.89	1	12	93	48	42	196	-	715.88	429	-	740	
9 61, la Sagrera	0 22 73 14 23 132 -	844.21	0	14	37	15	20	86	-	624.82	218	-	741	
9 62, el Congrés i els Indians	0 8 25 6 11 50 -	640.94	0	6	33	10	19	68	-	1,006.51	118	-	811	
9 63, Navas	0 11 47 13 23 94 613	793.18	0	17	46	14	19	96	545	920.60	190	1,158	853	
10 64, el Camp de l'Arpa del Clot	3 33 69 13 35 153 -	738.10	0	9	72	19	33	133	-	726.58	286	-	733	
10 65, el Clot	0 13 45 15 20 93 -	656.22	0	4	36	12	21	73	-	561.34	166	-	611	
10 66, el Parc i la Llacuna del Poblenou	0 1 24 5 26 56 -	689.49	0	6	17	10	14	47	-	619.15	103	-	656	
10 67, la Vila Olímpica del Poblenou	0 3 18 3 0 24 -	502.93	3	2	10	7	4	26	-	568.18	50	-	535	
10 68, el Poblenou	0 9 59 9 35 112 -	634.99	0	6	50	12	25	93	-	562.55	205	-	600	
10 69, Diagonal Mar i el Front Marítim del Poblenou	0 3 27 2 7 39 -	561.64	1	2	14	4	15	36	-	538.84	75	-	550	
10 70, el Besòs i el Maresme	1 9 41 9 21 81 -	671.59	1	11	31	10	15	68	-	539.73	149	-	604	
10 71, Provençals del Poblenou	1 7 50 9 15 82 -	739.01	0	2	37	6	8	53	-	519.25	135	-	634	
10 72, Sant Martí de Provençals	0 15 58 9 23 105 -	755.56	1	7	37	9	22	76	-	619.35	181	-	692	
10 73, la Verneda i la Pau	0 16 61 22 24 123 868	813.44	0	5	35	16	33	89	694	646.71	212	1,562	734	

Annex I (continuation)

Data tables.

DISTRICT	NEIGHBOURHOOD	2. NEIGHBOURHOODS' DEMOGRAPHY DATA						3. NET DENSITY (inhabitants/pop)				
		2019 CENSUS POPULATION	MALE POPULATION 2019	FEMALE POPULATION 2019	15 to 29 years		>65 years					
					0 to 14 years	30 to 44 years						
1	1, el Raval	48,297.00	26,093.00	22,204.00	12,60%	21,90%	31,00%	23,10%	5,50%	5,80%	11,30%	9,46 00
1	2, el Barri Gòtic	19,180.00	10,790.00	8,390.00	7,90%	24,70%	32,80%	22,50%	5,90%	6,20%	12,10%	492,00
1	3, la Barceloneta	15,173.00	7,594.00	7,579.00	7,90%	21,10%	30,40%	23,20%	7,40%	9,90%	17,30%	1,088,00
1	4, Sant Pere, Santa Caterina i la Ribera	23,170.00	11,630.00	11,540.00	9,40%	21,60%	32,10%	22,80%	6,50%	7,50%	14,00%	686,00
2	5, el Fort Pienc	32,649.00	15,481.00	17,168.00	11,50%	16,70%	25,00%	25,60%	10,10%	11,00%	21,10%	953,00
2	6, la Sagrada Família	51,911.00	23,785.00	28,126.00	12,60%	21,90%	31,00%	23,10%	5,50%	5,80%	11,30%	1,002,00
2	7, la Dreta de l'Eixample	44,215.00	20,623.00	23,592.00	11,80%	16,90%	23,90%	26,10%	9,80%	11,50%	21,30%	382,00
2	8, l'Antiga Esquerra de l'Eixample	43,112.00	20,160.00	22,952.00	10,90%	17,40%	25,00%	25,50%	9,60%	11,70%	21,30%	630,00
2	9, la Nova Esquerra de l'Eixample	58,642.00	27,232.00	31,410.00	10,60%	16,30%	24,20%	25,60%	11,30%	11,90%	23,20%	889,00
2	10, Sant Antoni	38,566.00	18,331.00	20,235.00	10,40%	15,60%	25,70%	26,00%	9,80%	12,50%	22,30%	924,00
3	11, el Poble Sec - AEL Parc de Montjuïc	40,409.00	19,859.00	20,550.00	11,40%	16,90%	29,60%	25,30%	7,70%	9,10%	16,80%	1,045,00
3	13, la Marina de Port	31,087.00	14,888.00	16,199.00	13,40%	16,50%	20,70%	29,60%	9,20%	10,50%	19,70%	898,00
3	14, la Font de la Guatlla	10,373.00	4,910.00	5,463.00	10,10%	16,00%	23,90%	27,10%	11,30%	11,50%	22,80%	718,00
3	15, Hostalfrancs	16,155.00	7,774.00	8,381.00	11,20%	16,70%	27,20%	25,70%	9,90%	9,20%	19,10%	905,00
3	16, la Bordeta	19,443.00	9,233.00	10,210.00	11,70%	14,50%	23,20%	28,20%	10,90%	11,60%	22,50%	954,00
3	17, Sants - Badal	24,474.00	11,452.00	13,022.00	11,00%	15,60%	24,00%	27,20%	11,40%	10,80%	22,20%	693,00
3	18, Sants	42,310.00	20,114.00	22,196.00	11,50%	15,60%	25,60%	26,30%	9,70%	11,20%	20,90%	710,00
4	19, les Corts	46,599.00	21,602.00	24,997.00	12,00%	14,70%	21,10%	26,10%	13,40%	12,70%	26,10%	749,00
4	20, la Maternitat i Sant Ramon	23,992.00	11,141.00	12,851.00	12,10%	14,80%	21,10%	25,40%	13,70%	12,90%	26,60%	146,00
4	21, Pedralbes	12,000.00	5,624.00	6,376.00	15,80%	16,70%	17,90%	25,30%	11,20%	13,10%	24,30%	19,00
5	22, Vallvidrera, el Tibidabo i les Planes	4,727.00	2,358.00	2,369.00	18,40%	15,70%	19,70%	31,40%	8,00%	6,70%	14,70%	260,00
5	23, Sarrià	25,137.00	11,732.00	13,405.00	17,90%	16,10%	18,70%	26,10%	9,40%	11,80%	21,20%	392,00
5	24, les Tres Torres	16,671.00	7,787.00	8,884.00	17,30%	18,00%	17,30%	26,30%	9,80%	11,30%	21,10%	313,00
5	25, Sant Gervasi - la Bonanova	26,108.00	11,965.00	14,143.00	15,80%	17,40%	18,30%	26,30%	10,10%	12,10%	22,20%	499,00
5	26, Sant Gervasi - Galvany	47,928.00	21,610.00	26,348.00	14,60%	17,40%	18,50%	27,10%	9,80%	12,50%	22,30%	555,00
5	27, el Putxet i el Farró	29,875.00	13,593.00	16,232.00	14,20%	16,70%	21,80%	26,10%	10,50%	10,70%	21,20%	337,00
6	28, Vallcarca i els Penitents	15,902.00	7,406.00	8,496.00	13,80%	14,60%	22,70%	26,30%	10,90%	11,70%	22,60%	597,00
6	29, el Coll	7,518.00	3,490.00	4,028.00	13,00%	15,50%	23,50%	27,50%	10,30%	10,20%	20,50%	679,00
6	30, la Salut	13,431.00	6,212.00	7,219.00	12,80%	14,70%	25,50%	24,60%	12,10%	12,40%	24,50%	598,00
6	31, la Vila de Gràcia	50,803.00	23,113.00	27,690.00	11,60%	15,60%	29,40%	24,20%	8,50%	10,60%	19,10%	894,00
6	32, el Camp d'en Grassot i Gràcia Nova	35,199.00	16,183.00	19,016.00	11,60%	14,70%	24,30%	25,70%	11,60%	12,00%	23,60%	1,083,00

Annex I (continuation)

Data tables.

DISTRICT	NEIGHBOURHOOD	2. NEIGHBOURHOODS' DEMOGRAPHY DATA						3. NET DENSITY	
		2019 CENSUS POPULATION	MALE POPULATION 2019	FEMALE POPULATION 2019	0 to 14 years	15 to 29 years	30 to 44 years	45 to 64 years	>65 years
3. NET DENSITY									
7	33, el Baix Guinardó	25,990,00	11,984,00	14,006,00	10,90%	14,70%	23,10%	26,70%	10,60%
7	34, Can Baró	9,247,00	4,354,00	4,893,00	11,90%	15,40%	23,60%	26,70%	10,80%
7	35, el Guinardó	37,216,00	17,432,00	19,784,00	12,40%	14,80%	23,80%	26,90%	10,30%
7	36, la Font d'en Fargues	9,506,00	4,494,00	5,012,00	14,00%	14,20%	19,50%	28,40%	12,60%
7	37, el Carmel	32,175,00	15,279,00	16,896,00	12,90%	15,30%	23,20%	26,20%	11,00%
7	38, la Teixonera	11,789,00	5,663,00	6,126,00	12,20%	15,70%	23,00%	27,70%	10,30%
7	39, Sant Genís dels Àngels	7,394,00	3,471,00	3,923,00	11,80%	16,00%	20,50%	26,20%	9,70%
7	40, Montbau	5,185,00	2,337,00	2,848,00	11,50%	14,40%	18,90%	26,70%	7,00%
7	41, la Vall d'Hebron	5,803,00	2,741,00	3,062,00	12,10%	13,70%	19,10%	28,60%	12,80%
7	42, la Clota	686,00	355,00	331,00	16,30%	13,60%	34,10%	22,40%	5,30%
7	43, Horta	27,482,00	12,827,00	14,655,00	12,60%	14,20%	21,00%	27,40%	11,10%
8	44, Vilapicina i la Torre Llobeta	25,895,00	11,917,00	13,978,00	12,00%	14,50%	21,20%	27,60%	11,40%
8	45, Porta	26,557,00	12,343,00	14,214,00	12,40%	14,30%	23,10%	26,10%	10,40%
8	46, el Turó de la Peira	15,825,00	7,321,00	8,504,00	13,90%	16,10%	21,80%	26,90%	6,50%
8	47, Can Peguera	2,247,00	1,059,00	1,188,00	13,40%	16,00%	19,40%	28,60%	8,80%
8	48, la Guineueta	15,398,00	7,071,00	8,327,00	12,40%	13,20%	19,10%	26,70%	12,90%
8	49, Canyelles	6,884,00	3,270,00	3,614,00	11,20%	13,40%	18,10%	30,00%	14,80%
8	50, les Roquetes	16,250,00	7,811,00	8,439,00	15,10%	17,60%	23,90%	25,50%	9,20%
8	51, Verdún	12,578,00	5,865,00	6,713,00	13,00%	15,90%	22,80%	26,60%	9,60%
8	52, la Prosperitat	26,834,00	12,618,00	14,216,00	12,60%	15,00%	21,70%	25,70%	11,10%
8	53, la Trinitat Nova	7,620,00	3,652,00	3,968,00	14,30%	17,20%	22,80%	27,60%	8,10%
8	54, Torre Baró	2,931,00	1,474,00	1,457,00	18,00%	18,50%	22,90%	27,90%	6,80%
8	55, Ciutat Meridiana	10,864,00	5,287,00	5,577,00	16,70%	18,90%	23,70%	23,50%	8,40%
8	56, Valbona	1,407,00	683,00	724,00	17,90%	14,30%	24,30%	24,40%	7,30%
9	57, la Trinitat Vella	10,337,00	5,277,00	5,060,00	17,10%	18,20%	24,40%	25,30%	8,00%
9	58, Baró de Viver	2,604,00	1,265,00	1,339,00	16,50%	17,60%	22,40%	27,60%	7,70%
9	59, el Bon Pastor	13,126,00	6,466,00	6,660,00	17,50%	15,40%	23,30%	26,70%	8,30%
9	60, Sant Andreu	57,961,00	27,379,00	30,582,00	13,40%	13,50%	22,70%	28,30%	11,80%
9	61, la Sagrera	29,400,00	13,764,00	15,636,00	11,90%	14,30%	22,60%	27,10%	12,70%
9	62, el Congrés i els Indians	14,557,00	6,756,00	7,801,00	12,40%	15,00%	22,20%	28,00%	8,80%
9	63, Navas	22,279,00	10,428,00	11,851,00	11,50%	14,90%	21,90%	27,70%	11,60%

Annex I (continuation)

Data tables.

DISTRICT	NEIGHBOURHOOD	2. NEIGHBOURHOODS' DEMOGRAPHY DATA						3. NET DENSITY	
		2019 CENSUS POPULATION	MALE POPULATION 2019	FEMALE POPULATION 2019	0 to 14 years	15 to 29 years	30 to 44 years	45 to 64 years	75 + years
4. SOCIOECONOMIC DEPRIVATION DATA									
DISTRICT	NEIGHBOURHOOD	AVAILABLE FAMILY INCOME PER QUINTILES	% GRANTS IMMEDIATELY	% GRANTS LATIN AMERICA	% POPULATION IMMEDIATELY	% MAGNA GRANDEUR	% POPULATION OF AFRICA	% GRANTS IMMEDIATELY	% POPULATION OF ASIA
1	1, el Raval	71.2	2	59.70%	20.10%	12.00%	6.40%	3.82%	1.10%
1	2, el Barri Gòtic	106.1	4	58.90%	26.40%	15.55%	5.80%	3.42%	2.10%
1	3, la Barceloneta	79.6	3	43.70%	34.70%	15.6%	7.40%	3.23%	1.30%
1	4, Sant Pere, Santa Caterina i la Ribera	99.4	4	50.50%	33.10%	16.72%	9.00%	4.55%	1.90%
2	5, el Fort Pienc	106.5	4	29.00%	45.20%	13.11%	3.30%	0.96%	1.50%
2	6, la Sagrada Família	101.8	4	28.10%	55.70%	15.65%	3.00%	0.84%	1.20%
2	7, la Dreta de l'Eixample	175.9	5	28.20%	40.00%	11.28%	2.10%	0.59%	1.90%
2	8, l'Antiga Esquerra de l'Eixample	137.2	5	29.00%	47.50%	13.78%	2.10%	0.61%	1.10%
2	9, la Nova Esquerra de l'Eixample	110.2	4	25.80%	53.00%	13.67%	2.70%	0.70%	1.20%
2	10, Sant Antoni	104.2	4	29.20%	41.30%	12.06%	2.80%	0.82%	1.20%
3	11, el Poble Sec - AEI Parc del Montjuïc	82.2	3	40.70%	35.90%	14.61%	6.40%	2.60%	1.10%
3	13, la Marina de Port	69.3	2	22.80%	51.20%	11.67%	6.90%	1.57%	1.60%
3	14, la Font de la Guatlla	82.9	3	26.90%	49.50%	13.32%	3.70%	1.00%	1.70%
3	15, Hostafrancs	99.0	4	30.50%	47.50%	14.49%	5.60%	1.71%	1.30%

DISTRICT	NEIGHBOURHOOD	5. IMMIGRATION DATA						% REST OF ASIA	
		% IMMEDIATELY REST OF ASIA	% POPULATION OF ASIA	% GRANTS IMMEDIATELY REST OF ASIA	% POPULATION OF AFRICA	% GRANTS IMMEDIATELY REST OF AFRICA	% POPULATION OF REST OF AFRICA	% GRANTS IMMEDIATELY REST OF REST OF AFRICA	% POPULATION OF REST OF REST OF ASIA
6. NET MIGRATION DATA									
1	1, el Raval	-1.10%	0.66%	0.66%	0.66%	0.66%	0.66%	0.66%	0.66%
1	2, el Barri Gòtic	-1.24%	1.24%	1.24%	1.24%	1.24%	1.24%	1.24%	1.24%
1	3, la Barceloneta	-1.30%	0.57%	0.57%	0.57%	0.57%	0.57%	0.57%	0.57%
1	4, Sant Pere, Santa Caterina i la Ribera	-1.90%	0.96%	0.96%	0.96%	0.96%	0.96%	0.96%	0.96%
2	5, el Fort Pienc	-1.50%	0.44%	0.44%	0.44%	0.44%	0.44%	0.44%	0.44%
2	6, la Sagrada Família	-1.20%	0.34%	0.34%	0.34%	0.34%	0.34%	0.34%	0.34%
2	7, la Dreta de l'Eixample	-1.30%	0.54%	0.54%	0.54%	0.54%	0.54%	0.54%	0.54%
2	8, l'Antiga Esquerra de l'Eixample	-1.10%	0.32%	0.32%	0.32%	0.32%	0.32%	0.32%	0.32%
2	9, la Nova Esquerra de l'Eixample	-1.20%	0.31%	0.31%	0.31%	0.31%	0.31%	0.31%	0.31%
2	10, Sant Antoni	-1.20%	0.35%	0.35%	0.35%	0.35%	0.35%	0.35%	0.35%
3	11, el Poble Sec - AEI Parc del Montjuïc	-1.60%	0.45%	0.45%	0.45%	0.45%	0.45%	0.45%	0.45%
3	13, la Marina de Port	-1.60%	0.36%	0.36%	0.36%	0.36%	0.36%	0.36%	0.36%
3	14, la Font de la Guatlla	-1.70%	0.46%	0.46%	0.46%	0.46%	0.46%	0.46%	0.46%
3	15, Hostafrancs	-1.30%	0.48%	0.48%	0.48%	0.48%	0.48%	0.48%	0.48%

Annex I (continuation)

Data tables.

DISTRICT	NEIGHBOURHOOD	4. SOCIOECONOMIC DEPRIVATION DATA				5. IMMIGRATION DATA			
		AVAILABLERE INCOME PER FAMILIY INDEX	% GRANTS LATINI AMERICA	% POPULATION LATINI AMERICA	% IMMIGRANTS MAGHREB	% GRANTS REST OF AFRICA	% POPULATION REST OF AFRICA	% IMMIGRANTS REST OF ASIA	% POPULATION REST OF ASIA
3	16, la Bordeta	79.0	2	20.30%	54.40%	11.04%	7.50%	1.52%	16.90%
3	17, Sants - Badal	81.0	3	26.00%	60.50%	15.73%	4.10%	1.07%	16.0%
3	18, Sants	99.0	4	25.10%	52.20%	13.10%	5.00%	1.26%	18.0%
4	19, les Corts	120.0	5	16.70%	50.10%	8.37%	3.40%	0.57%	14.0%
4	20, la Maternitat i Sant Ramon	114.2	5	17.40%	57.60%	10.02%	3.90%	0.68%	14.0%
4	21, Pedralbes	248.8	5	22.90%	32.70%	7.49%	4.20%	0.96%	1.80%
5	22, Vallvidretra, el Tibidabo i les Planes	144.1	5	18.70%	31.20%	5.83%	2.50%	0.47%	1.10%
5	23, Sarrià	193.6	5	17.10%	30.20%	5.16%	4.10%	0.70%	2.10%
5	24, les Tres Torres	215.8	5	13.70%	37.10%	5.08%	3.70%	0.51%	1.50%
5	25, Sant Gervasi - la Bonanova	184.6	5	16.00%	43.30%	6.93%	3.00%	0.48%	1.90%
5	26, Sant Gervasi - Galvany	192.1	5	18.00%	42.40%	7.63%	3.00%	0.54%	1.80%
5	27, el Putxet i el Farró	144.6	5	19.40%	48.80%	9.47%	2.50%	0.49%	2.00%
6	28, Vallcarca i els Penitents	112.5	5	20.10%	50.30%	10.11%	2.70%	0.54%	1.30%
6	29, el Coll	87.0	3	21.80%	56.30%	12.27%	4.70%	1.02%	1.80%
6	30, la Salut	109.9	4	19.30%	48.60%	9.38%	5.40%	1.04%	1.80%
6	31, la Vila de Gràcia	104.4	4	26.40%	42.50%	11.22%	2.50%	0.66%	1.50%
6	32, el Camp d'en Grassot i Gràcia Nova	105.7	4	20.20%	49.30%	9.96%	2.60%	0.53%	1.50%
7	33, el Baix Guinardó	92.0	3	21.60%	60.90%	13.15%	3.00%	0.65%	1.30%
7	34, Can Baró	83.3	3	20.50%	54.40%	11.15%	3.00%	0.62%	2.40%
7	35, el Guinardó	79.1	2	22.70%	63.00%	14.30%	3.40%	0.77%	1.60%
7	36, la Font d'en Fargues	92.5	3	10.40%	52.40%	5.45%	3.30%	0.34%	1.60%
7	37, el Carmel	54.2	1	22.30%	65.70%	14.65%	5.20%	1.16%	1.60%
7	38, la Teixonera	73.7	2	22.10%	63.80%	14.10%	4.60%	1.02%	2.10%
7	39, Sant Genís dels Agudells	84.1	3	23.90%	65.20%	15.58%	4.70%	1.12%	1.70%
7	40, Montbau	79.8	3	18.50%	66.60%	12.32%	4.80%	0.89%	1.90%
7	41, la Vall d'Hebron	95.8	4	14.70%	63.30%	9.31%	2.50%	0.37%	1.60%
7	42, la Clota	93.5	3	19.10%	55.20%	10.54%	3.20%	0.61%	0.00%
7	43, Horta	79.8	3	17.00%	59.80%	10.17%	6.00%	1.02%	1.90%
8	44, Vilapicina i la Torre Llobeta	63.8	2	21.40%	67.20%	14.38%	3.10%	0.66%	1.10%
8	45, Porta	64.4	2	25.80%	64.80%	16.72%	5.60%	1.44%	2.10%

Annex I (continuation)
Data tables.

DISTRICT	NEIGHBOURHOOD	4. SOCIOECONOMIC DEPRIVATION DATA				5. IMMIGRATION DATA			
		% AVAILABLE INCOME PER FAMILY INDEX	AIFI QUINTILES	% GRANTS IMMIL-AMERICA	% POPULATION LATIN AMERICA	% POPULATION MAGHREB GRANTS REST OF AFRICA	% IMMIL-GRANTS REST OF ASIA	% REST OF ASIA POPULATION	% REST OF ASIA
8	46, el Turó de la Peira	51.9	1	33.40%	70.70%	23.61%	4.50%	1.50%	0.50%
8	47, Can Peguera	51.5	1	14.90%	57.20%	8.52%	2.28%	4.40%	0.66%
8	48, la Guineueta	53.8	1	14.10%	65.90%	9.29%	4.50%	0.63%	1.40%
8	49, Canyelles	52.2	1	8.60%	60.10%	5.17%	6.00%	0.52%	4.40%
8	50, les Roquetes	49.7	1	29.60%	66.40%	19.65%	6.40%	1.89%	2.90%
8	51, Verdun	51.3	1	28.30%	68.20%	19.30%	4.40%	1.25%	2.30%
8	52, la Prosperitat	56.0	1	22.70%	67.20%	15.25%	4.10%	0.93%	2.80%
8	53, la Trinitat Nova	48.2	1	29.40%	57.60%	16.32%	6.90%	2.03%	5.10%
8	54, Torre Baró	46.5	1	26.00%	55.50%	14.43%	19.40%	5.04%	5.50%
8	55, Ciutat Meridiana	38.6	1	41.60%	60.20%	25.04%	9.70%	4.04%	7.90%
8	56, Vallbona	40.9	1	20.10%	44.10%	8.86%	15.10%	3.04%	1.10%
9	57, la Trinitat Vella	47.1	1	38.90%	43.70%	17.00%	16.20%	6.30%	3.60%
9	58, Baró de Viver	68.9	2	19.60%	47.90%	9.39%	22.70%	4.45%	2.20%
9	59, el Bon Pastor	65.1	2	21.60%	56.60%	12.23%	7.30%	1.58%	3.00%
9	60, Sant Andreu	77.7	2	13.00%	59.30%	7.71%	6.00%	0.78%	2.40%
9	61, la Sagrera	77.1	2	21.70%	66.20%	14.37%	3.30%	0.72%	1.40%
9	62, el Congrés i els Indians	75.1	2	21.40%	62.70%	13.42%	3.60%	0.77%	1.30%
9	63, Navas	81.6	3	22.70%	60.70%	13.78%	3.70%	0.84%	2.30%
10	64, el Camp de l'Arpa del Clot	81.7	3	25.50%	58.80%	14.99%	4.20%	1.07%	1.30%
10	65, el Clot	83.6	3	21.50%	53.20%	11.44%	5.90%	1.27%	1.80%
10	66, el Parc i la Llacuna del Poblenou	100.4	4	28.10%	42.00%	11.80%	6.10%	1.71%	2.30%
10	67, la Vila Olímpica del Poblenou	164.2	5	22.80%	35.50%	8.09%	3.10%	0.71%	1.10%
10	68, el Poblenou	99.9	4	23.30%	40.70%	9.48%	3.40%	0.79%	1.60%
10	69, Diagonal Mar i el Front Marítim del Poblenou	150.1	5	23.40%	35.30%	8.26%	4.60%	1.08%	1.60%
10	70, el Besòs i el Maresme	60.4	2	35.60%	33.70%	12.00%	8.00%	2.85%	4.00%
10	71, Provençals del Poblenou	102.3	4	20.70%	47.30%	9.79%	7.70%	1.59%	1.90%
10	72, Sant Martí de Provençals	67.4	2	18.80%	57.60%	10.83%	3.20%	0.60%	1.30%
10	73, la Verneda i la Pau	57.0	2	18.40%	55.60%	10.23%	5.00%	0.92%	2.60%

Annex I (continuation)
Data tables.

DISTRICT	% SMOKERS	6. COMORBIDITIES AND TOXIC HABITS DATA	
		% POPULATION WITH ONE OR MORE COMORBIDITIES	IMC > 25 (%)
1	26.3	80.2	45.9
2	19.1	73.3	42.6
3	19.9	73.9	47.1
4	14.6	72.5	40
5	17.7	70.9	30.8
6	17.9	72.5	36.8
7	23.4	78.3	50.7
8	20.2	80.2	56.3
9	20.1	66.7	55.3
10	19.2	79.5	50.7