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The COVID-19 lockdown: effects of material conditions and social context on self-reported health during confinement

El confinamiento por covid-19: efectos de las condiciones materiales y el contexto social en la salud percibida durante el confinamiento

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ABSTRACT

Lockdown policies implemented to defeat the spread of COVID-19 have been shown to be effective from an epidemiological perspective, but little is known about how they affect wellbeing and individual health perception. Using information from the 2020 Social Survey for Andalusia (a southern region in Spain), this paper examines how lockdown affects self-reported health. Contrary to what might be expected, perceived population health generally improved, but not in every social group, with young people and low-income groups reporting a deterioration. Moreover, perceived health became more difficult to predict in terms of the classic health, socio-demographic, socio-economic and residential determinants, with lockdown-related changes being particularly relevant. Direct contact with COVID-19, economic problems resulting from the lockdown and changes in daily activities became key explanatory factors for perceived health, particularly affecting the mental and emotional state of the population.

Keywords: Self-reported health, perceived health, lockdown, COVID-19, social determinants of health.

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RESUMEN

Los confinamientos para controlar la COVID-19 han demostrado ser efectivos desde la epidemiología, pero se sabe menos sobre cómo afectan al bienestar y a la percepción de salud de la población. Basado en la Encuesta Social 2020 para Andalucía (España), este documento tiene como objetivo averiguar cómo el encierro afecta a la salud autopercibida. Al contrario de lo que podría esperarse, la salud percibida de la población mejoró, pero no en todos los grupos sociales – empeoró en los grupos jóvenes y los de bajos ingresos -. La salud percibida se volvió más difícil de predecir con los determinantes clásicos de salud, sociodemográficos, socioeconómicos y residenciales, y los cambios relacionados con el confinamiento se volvieron más relevantes. El contacto con la enfermedad, los problemas económicos derivados del encierro y los cambios en las actividades diarias son factores explicativos clave, afectando especialmente al estado mental y emocional de la población.

Palabras clave: Salud percibida, confinamiento, COVID-19, determinantes sociales de la salud.

INTRODUCTION

Although the effects of the COVID-19 pandemic on mortality and economic activity have been the subject of steady media coverage, at the same time, the social and day-to-day aspects of this tragedy are frequently overlooked in public debates. As the pandemic spread, strict new measures and regulations were introduced in a way that was both improvised and reactive in the context of a situation out of control. Decisions had to be taken, and indeed were taken, based on insufficient knowledge about the disease and its characteristics. One year later, the time has come to investigate how societies around the world initially handled the pandemic and the extent to which it changed lives as a result. This paper focuses on the effects of the national lockdown in Spain (14 March 2020-21 June 2020) on perceived health. This initial regulation lasted only a few months and, although subsequent confinement measures were enacted, they did not affect the entire country and were generally less restrictive regarding individual and collective human rights and civil liberties. Thus, the social and individual consequences of those three months in Spring 2020 are of particular interest for three main reasons. First, the effects of the lockdown are not yet fully known, while the disease continues to evolve and spread, threatening the possibility of new closures. Therefore, the production of knowledge related to the social implications of those epidemiological decisions is essential to inform future political decisions. Second, the consequences of the lockdown were profoundly divergent. Clearly, no one was prepared for the situation, and in a sense, it was a shared experience, a hard time for everyone. A closer look, however, reveals how individual and family circumstances differed significantly, regarding both the material conditions in which the lockdown was experienced and the challenges faced by each individual. In a context of pandemic, economic crisis and restrictions on mobility, micro-level differences related to resources and limitations became even more important. This paper analyses the unequal consequences of those new routines and social conditions in the specific case of the population of Andalusia. Third, some effects of the lockdown (such as the effects on mental health) may have a longer time frame, and to treat these long-term effects we have to understand their origin and development.

The interest in perceived health lies in the capacity of this indicator to synthesize the objective circumstances of health (Shields & Shooshtari, 2001; Jindrová & Labudová, 2020). This helps to not only determine subjective perceptions, but also obtain a holistic view of an individual's situation in broader terms. Mood and context affect perceived health, as people inevitably compare themselves with others and with their own memories. Recent

research has studied the effects of the pandemic on perceived health in other countries, like France (Recchi et al., 2020), Germany (Ohlbrecht & Jellen, 2021) and Italy (Rossi et al., 2020), showing how lockdown measures not only intensified previous social inequalities related to perceived health, but also created new fractures. However, most of these authors focus on particular groups, or on specific behaviours and emotions, without providing an overall assessment of the consequences of the lockdown for physical and mental health. The results of this work, then, offer new insights for the study of perceived health and the social consequences of COVID-19.

Using data from the *2020 Social Survey. Habits and Living Conditions of the Andalusian Population during the State of Alarm* (IECA, 2020), this paper addresses three specific points: (1) how the lockdown has affected the general health perception of the Andalusian population and its differential impacts by social group; (2) how demographic, socio-economic and residential conditions explain health self-perception and whether these conditions have changed due to the pandemic; and (3) how specific lockdown situations (such as changes in household composition, contact with COVID-19 and new economic problems) have affected the self-perception of health.

A BRIEF REVIEW OF THE IMPACT OF COVID-19 ON PERCEIVED HEALTH

Perceived health (also called self-reported or self-rated health) has been a well-established topic in both public health and the sociology of health literature since the 1990s (Shields & Shooshtari, 2001). The spread of the topic in recent decades can be attributed to its ability to capture an impression of the overall objective health of people and predict mortality and illness well, in spite of its simplicity (Idler & Kasl, 1991; Idler & Kasl, 1995; Idler et al., 1990). At the same time, it can be used as a major indicator of a population's well-being in a broader sense (Ohlbrecht & Jellen, 2021). Classic studies on the topic – closer to medical approaches than sociological ones – focus on the relationship between perceived health and objective health and some demographic determinants, mainly sex and age (Idler & Kasl, 1995). However, the rapid incursion of the social sciences into health issues, along with the growing popularization of the social determinants of health approach, have led academics to reframe the topic, resulting in an understanding of perceived health (as well as health in general) in the social context in which people live (WHO, 2008). Using this new framing, perceived health has become an outcome of the macro-social context, defined as the social, economic and cultural structures and cycles in which people function. The micro-individual level was also reframed, paying greater attention to social variables that explain perceived health such as education (Ross & Mirowsky, 1999), work status, income (Jindrová & Labudová, 2020; Shields & Shooshtari, 2001) and even social capital (Carpiano, 2007; Dahl & Malmberg-Heimonen, 2010). In this theoretical context, empirical pre-pandemic studies showed how perceived (and therefore, also actual) health is socially conditioned. From a micro-social perspective, perceived health is linked to age and sex – women and the elderly generally tend to report worse health status than men and younger people – but also to work status, education and income –unemployed, with lower education and poor subjects report worse health. From a macro-social viewpoint, previous studies proved the relationship between perceived health and different structural issues, like social policies (Fornell et al., 2018), social inequality (Bobak et al., 2000), economic development (Olsen & Dahl, 2007) and economic crisis (Clair et al., 2016).

However, the outbreak of COVID-19 and the lockdown policies implemented to defeat it completely redefined the social landscape. Mobility restrictions, social distancing measures and a new fear of contagion reframed the macro-social context in which people experience their health. At the same time, the micro-context of individual resources and restrictions increased existing inequalities, producing new situations, practices and problems that affect both feelings and perceptions (Duque-Calvache et al., 2021).

Most of the literature on the global effect of the lockdown on health perception has shown a generally negative trend. Lockdown measures have been found to increase mental problems like depression, anxiety and even suicidality (Rossi et al., 2020; Fountoulakis et al., 2021). Furthermore, authors measuring self-reported health conclude that people tend to assess their health as significantly worse during lockdown than before (Ohlbrecht & Jellen, 2021). However, most of these studies do not compare 2020 data with independent data from the pre-pandemic situation, but rather retrospectively ask people about their health before and during lockdown. This type of comparison tends to create an automatic discourse in respondents, due to their exposure to a large number of opinions regarding the effects of the lockdown on their social environment. Moreover, there is not enough evidence to prove a general worsening in perceived health. In fact, the only study found that compares perceived health during the lockdown with pre-pandemic data (Recchi et al., 2020) shows the opposite: an overall improvement in perceived health and well-being. The authors call this trend the 'eye of the hurricane paradox', an overrated self-perceived health amongst the uninfected. In other words, by comparing themselves with those infected with COVID-19, people self-assess their health better than they would in a different context.

However, beyond this debate, most studies agree about the uneven effects of the lockdown on different social groups. These consequences are intertwined with classic socio-demographic (age and sex), socio-economic (work status, income and educational level) and residential (housing and residential environment) determinants of perceived health. Regarding age, the lockdown seems to have reversed the typical trend, in that young people appear to be more seriously affected, particularly in psychological terms (Fiorenzato et al., 2021; Szwarcwald et al., 2021) due to the greater impact of the lockdown on young people's daily routines (Fiorenzato et al., 2021) and their greater exposure to the virus (Mao et al., 2021). Women also appear to have experienced a decrease in perceived health, widening pre-existing gender inequalities (Broche-Pérez et al., 2021; Elran-Barak & Mozeikov, 2020). The gendered division of domestic labour, especially regarding caring duties, is the most likely cause for this trend (Brigidi et al., 2021). For socio-economic dimensions, the studies have confirmed the continuity of pre-2020 trends: respondents who are unemployed (Smith et al., 2020; Fiorenzato et al., 2021), poor (Szwarcwald et al., 2021) and/or with lower education (Elran-Barak & Mozeikov, 2020; Ohlbrecht & Jellen, 2021) feel worse in physical and mental terms in the lockdown. With regard to residential conditions, evidence is scarce, with only a few studies considering housing variables. In general, those studies observe how living in smaller dwellings (Poortinga et al., 2021) or in high-density residential environments (Recchi et al., 2020) lowers health perception, mainly the psychological aspect. It has also been found that the availability of gardens or open spaces protects against these effects (Noël et al., 2021).

Finally, evidence related to the connection between perceived health and changes in everyday life due to the lockdown is even more limited and usually focuses on physical exercise, consumption habits (drugs, alcohol and food) and direct contact with COVID-19. Exercising has been found to be a protective factor (Cheval et al., 2021), and is even highlighted in some studies as the most important determinant of perceived health during lockdown (Eder et al., 2021). However, most of the population exercised less frequently during lockdown (Mesa-Pedrazas et al., 2021). Meanwhile, significant increases in unhealthy behaviours such as smoking and drinking were detected (Niedzwiedz et al., 2021; Szwarcwald et al., 2021), with negative effects on perceived health, especially in terms of mental health. Contact with the COVID-19 disease is also a main determinant of self-reported health. The death of relatives or friends due to COVID-19, direct exposure to the disease, personally knowing infected people or even living in regions with a high incidence of the disease lowered perceived health (Rossi et al., 2020; Mao et al., 2021). Although those changes are crucial to explain perceived health, other relevant phenomena have not yet been studied, such as changes in the composition of households, distance from family networks and cohabitation conflicts. Indeed, previous studies have shown how family was one of the major concerns during the pandemic (Mesa-Pedrazas et al.,

2021), as many people decided to move to be close to their relatives (Duque-Calvache et al., 2021). Economic problems arising from the lockdown have also been found to be important. Situations such as being fired or furloughed from one's job (Smith et al., 2020), a reduction of income (Pieh et al., 2020) and non-payment of housing rent and supplies (Rogers & Power, 2020) are also relevant factors in understanding changes in self-reported health.

DATA AND METHODS

The main data source used in this paper is the *2020 Social Survey. Habits and Living Conditions of the Andalusian Population during the State of Alarm* (IECA, 2020). The fieldwork was carried out between 15 April and 29 May 2020, and responses were collected from 2,950 individuals from all 8 provinces in Andalusia. This survey was selected for three main reasons: (1) its timing, as it covers the period from the end of the strict lockdown phase to the beginning of the de-escalation phases; (2) it is the only publicly available source in Andalusia that contains information on perceived health during the most restrictive phase of the pandemic and asks separately about self-reported global health and mental health; (3) the questionnaire contains a large number and wide diversity of variables, ranging from very detailed indicators on social and housing conditions and daily activities to contact with the disease in different social circles, making it possible to construct more complex models that include different possible explanations for self-reported health.

In addition to this main source, the 2019 *European Union Statistics on Income and Living Conditions (EU-SILC)* dataset for Spain (INE, 2020) was also analysed, using only the sub-sample for Andalusia. This provided a benchmark to compare the results of the 2020 Social Survey with independent, pre-pandemic data on self-reported health. There is no doubt that this is the most valid measurement of the changes brought by the lockdown measures on overall population health perception and on the effects of socio-demographic, socio-economic and residential determinants. The *2019 EU-SILC* dataset includes a question about self-perceived health (the main dependent variable) and many questions about individual determinants that parallel the information available in the *2020 Social Survey*. Given the huge sample size of the *EU-SILC*, even the Andalusian sub-sample is statistically representative, providing a solid measurement for the situation prior to the COVID-19 outbreak.

Data analysis was done in three main stages. In the first stage, the study compared overall self-perceived health scores in the *2019 EU-SILC* and *2020 Social Survey* to assess the impact of the lockdown measures on health perceptions. In the second stage, socio-demographic, socio-economic and residential determinants of perceived health were analysed, both before and during lockdown. To do so, two logit models were developed to predict overall perceived health. The five categories of the original variable were recoded into one simple binary measure: 1 = 'Has good or very good health' and 0 = 'Has average, bad or very bad health'. This decision was taken not only to simplify the analyses, but also to reflect the common way of thinking about health amongst the population (which is closer to a good-bad binomial choice than to the scale used by the questionnaires). The model also includes a set of independent variables, including having a chronic health condition, age, sex, household composition, education, work status, income, housing type and residential environment. To compare the pre- and post-pandemic models, the study used Average Marginal Effects (AMEs), a strategy advocated by Williams (2012) to compare logit models calculated over different samples. The comparison serves two main purposes: first, to contrast the general adjustment of the models, measured as pseudo-R^2, in order to know the extent to which the independent variables selected explain perceived health in pre-pandemic and lockdown contexts; and second, to examine the significance and magnitude of the AMEs, to discover whether the effect

of each variable changed during the lockdown. Finally, the goal of the third stage is to understand how different social changes directly caused by the lockdown have affected people's overall health self-perception, and the specific effect on self-reported mental health. To this end, two stepwise logit models were developed, one for perceived overall health, and a second one for perceived mental health (in both models, the dependent variables are defined as a binary of good or bad health). In the first step, only individual determinants conventionally employed in self-rated health studies were used. In the second one, additional variables reporting social changes caused by the lockdown were added. These lockdown-specific variables include contact with the disease, increase in certain habits (particularly sleeping, drinking and smoking), frequency of physical exercise and reading during confinement, number of weekly trips, changes in household composition, emergence of cohabitation problems, economic problems (including the Spanish temporary layoff regulation known as ERTE, housing default, supply default and expected income reduction) and two variables not directly related to confinement, but which became particularly significant during the lockdown: Internet access and having sufficient natural light. The paper reports the change in the overall adjustment statistics of the model as Akaike Criterion (AIC), Bayesian Information Criterion (BIC) and Pseudo-R^2 (Escobar et al., 2009) to quantify the effect of the lockdown measures and changes. Finally, the study compares the individual determinants that explain self-rated general and mental health (again, based on the use of AMEs).

RESULTS. EFFECTS OF MATERIAL CONDITIONS AND SOCIAL CONTEXT ON SELF-REPORTED HEALTH

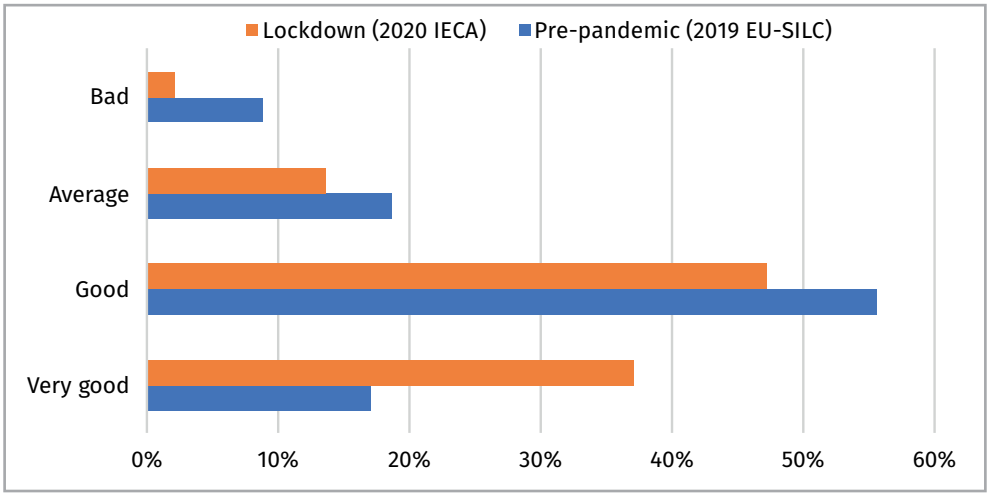
Lockdown impact on self-reported health

The predominant fact about the self-reported health of the Andalusian population as a result of the pandemic outbreak is the noticeable improvement over the 2019 situation, as seen in Figure 1. This result echoes the findings of Recchi et al., (2020) as opposed to the opinion expressed by Ohlbrecht & Jellen (2021). In a context of social alarm and general concern, people tend to feel healthier (as long as they are not suffering from the effects of the COVID-19 illness), and at both ends of the scale: fewer people report poor health; more people report a very good situation. Social discourses on the gravity of the crisis permeate the respondents' self-perception, and their assessment is built on a relative definition of health. In other words, if others are suffering more, then their health may not merit a complaint.

The sensitivity of the main variable to the context could be seen as a weakness, as it is not very closely connected to objective health conditions. However, the relative nature of the variable is a strong point, as it reflects how people feel about themselves. This self-assessment forms the basis of their behaviour: people decide to go to the doctor or to take medication, for example, based on how they feel. Of course, these decisions can be mistakes, and some reports (Woolf et al., 2021) observe an increase in mortality due to delayed care or the inadequate treatment of diseases different than COVID-19.[1] This first finding has a clear practical implication: exposure to a lot of information on a single disease clearly increases awareness on that particular threat but distracts attention on other conditions the subjects may suffer. Respondents think of themselves as healthy as long as they have no COVID-19, and the public messages about avoiding going to medical centres reinforce this wrong assumption.

1 Of course, the overall increase in mortality in Spain has much more to do with the concentration of healthcare resources to fight COVID-19, and the replacement of in-person primary healthcare by an improvised telephone service system. The point here is to underline the significance of self-perceptions, as they have objective consequences when applied to behaviours (another example of the well-known Thomas theorem).

Figure 1. Self-reported overall health before and during lockdown.



Source: 2020 Social Survey. Habits and Living Conditions of the Andalusian Population during the State of Alarm (IECA, 2020) and EU-SILC 2019 for Spain (INE, 2020).

Table 1. Percentages of respondents reporting 'good' or 'very good' overall health in different social categories before and during the lockdown.

	Pre-pandemic (2019 EU-SILC)	Lockdown (2020 IECA)	Difference
Age group			
<30	95%	93%	-3%
30-39	94%	93%	-1%
40-49	83%	89%	6%
50-65	67%	80%	14%
66-74	52%	70%	19%
>74	31%	63%	32%
Has a chronic illness			
No	93%	91%	-1%
Yes	30%	70%	40%
Sex			
Male	76%	88%	13%
Female	70%	81%	11%
Household type			
One-person household	55%	74%	19%
Family	75%	86%	10%
Other households	73%	82%	8%

Table 1. Percentages of respondents reporting 'good' or 'very good' overall health in different social categories before and during the lockdown (Continuation).

Education level			
No education	40%	65%	24%
Primary	54%	72%	18%
Secondary	77%	84%	7%
A-levels / Vocational training	84%	88%	4%
University degree	87%	91%	4%
Work status			
Worker	89%	91%	2%
Business owner / Self-employed	83%	91%	8%
Unemployed	79%	86%	6%
Inactive	55%	76%	20%
Monthly household income (in Euros)			
450 or less	78%	76%	-2%
451-900	60%	76%	16%
901-1600	64%	84%	20%
1601-2500	75%	87%	12%
2501 or more	80%	94%	14%
Housing type			
Flat or other	73%	84%	11%
Detached home	73%	85%	12%
Residential environment			
High-density	72%	84%	12%
Medium density	76%	85%	9%
Low-density	71%	82%	11%
Total	73%	84%	12%

Source: 2020 Social Survey. Habits and Living Conditions of the Andalusian Population during the State of Alarm (IECA, 2020) and EU-SILC 2019 for Spain (INE, 2020).

However, this improvement in self-reported health does not affect all social groups equally. To verify this finding, we calculated the percentages of respondents reporting 'good' or 'very good' overall health in different social categories. Table 1 shows a general upwards trend across all the social groups, but an even bigger increase in some of the categories with lower self-reported health before COVID-19: those affected by chronic conditions, people living alone, respondents with lower education and non-active individuals. On the other hand, among younger respondents, those with a low income and individuals with no existing illness, there was a downwards change in their overall self-perceived health. The results for the first two groups were predictable. Young respondents (under 40) experienced a more extreme change in their daily routines due to lockdown restrictions, while the poor (those earning less than €450) experienced

distress due to economic uncertainty, which will be further explored in the section on mental health. The negative effect on individuals with no existing illness is also connected to the limitations imposed by the lockdown on a population unaccustomed to having restrictions in their lives (unlike individuals with chronic illnesses).

With most of the variables, the differences between the categories decreased as a result of the pandemic; in other words, the restrictions had an equalizing effect. Only two variables show an increase in differences: sex (the gap between women and men widened) and income (the gap between rich and poor also grew). With regard to the latter, it is notable that, while this difference did not have a clear effect on self-perceived health before the crisis, the trend is easy to identify during the lockdown. Therefore, apart from all the lives lost and the economic mayhem, the pandemic brought an increase in the inequality of a society that was already uneven.

Changes in the determinants of perceived health in the lockdown

Regarding the second goal —to discover how demographic, socio-economic and residential conditions explain health self-perception and whether these conditions have changed due to the pandemic— two different logit regressions were used to compare the effects (before and during the lockdown) of the different variables usually included in overall self-reported health models. As the models use information from different datasets, with different variances, AMEs are included in the table instead of the usual coefficients/odds ratios. The main advantage of these models over the descriptive statistics used in the previous section is the isolation of the effect of each variable (while controlling the other variables), which makes it possible to separate and identify their individual relevance. The results, which are noteworthy in a number of ways, are presented in Table 2.

The first outstanding result is the breakdown of the explanatory power of the classic predictors of self-reported health in a pandemic context. The pseudo-R^2 plummets from explaining 48% of the variance to a meagre 15% in 2020. It is much more difficult to explain self-perception of health during the lockdown, either the feeling is connected to social variables not included in this attempt, or maybe it is explained by personal or even psychological features of the subjects. These results convinced us to create separate models for overall health and mental health (see next section), in order to study the importance of non-physical well-being and its connection with the lockdown situation.

In 2019, the link between objective and subjective health was quite strong (chronic conditions were the most powerful predictors). The rest of the variables worked as expected after reading the literature. But in the 2020 model, some variables lost explanatory power, ceased to be significant while others increased their power or began to create significant differences. The most important addition to the previous model was the sudden appearance of income as an explanatory indicator of overall health. In a publicly funded, universal healthcare society —with some exceptions related to rare conditions and treatments— money made very little difference in self-reported health before the pandemic, which undoubtedly was a success of the system. However, after the arrival of COVID-19, income became important, and its effect is linear to wellbeing. This is a very important finding with strong political implications: the pandemic has opened a new, worrisome, breach between the perceived health of the rich and the poor. To compensate these social differences will require additional resources and a determined intervention in the health system, if we want to reach pre-pandemic levels of well-being.

Table 2. Average Marginal Effects of the variables on overall self-reported health before and during lockdown.

	Pre-pandemic (2019 EU-SILC)			Lockdown (2020 IECA)		
	dy/dx	Sig	SE	dy/dx	Sig	SE
Has a chronic illness (Ref: No)	-28.3%	***	0.006	-13.8%	***	0.014
Age	-1.0%	***	0.002	-0.5%	*	0.002
Age squared	0.0%	**	0.000	0.0%		0.000
Sex (Ref: Male)						
Female	-2.4%	*	0.012	-5.9%	***	0.014
Household type (Ref: Family)						
One-person household	-1.4%		0.022	-0.6%		0.025
Other households	-3.0%	*	0.013	-2.4%		0.019
Educational level (Ref: Secondary)						
No education	-4.2%	*	0.017	-6.0%	*	0.026
Primary	-2.6%		0.017	-3.1%		0.022
A-levels / Vocational training	3.4%	*	0.017	0.2%		0.019
University degree	5.5%	**	0.020	1.9%		0.025
Work status (Ref: Inactive)						
Worker	4.6%	**	0.017	3.7%		0.021
Business owner / Self-employed	0.8%		0.025	2.5%		0.033
Unemployed	2.4%		0.017	0.3%		0.022
Monthly household income (in Euros) (Ref: 2501 or more)						
450 or less	-1.0%		0.034	-11.9%	**	0.041
451-900	-4.1%		0.023	-9.7%	**	0.030
901-1600	-2.2%		0.019	-8.0%	**	0.029
1601-2500	-0.7%		0.016	-7.7%	**	0.030
No response				-6.9%	*	0.033
Housing type (Ref: Flat or other)						
Detached home	0.9%		0.013	1.7%		0.015
Residential environment type (Ref: Medium density)						
High-density	-0.2%		0.016	0.4%		0.016
Low-density	-1.6%		0.016	-1.1%		0.023
N		4,051			2,948	
Pseudo R^2		0.48			0.15	

*p-value<0.05; **p-value<0.01; ***p-value<0.001

Source: 2020 Social Survey. Habits and Living Conditions of the Andalusian Population during the State of Alarm (IECA, 2020) and EU-SILC 2019 for Spain (INE, 2020).

Self-reported health and its connection with life in lockdown

Given that the classic predictors do not explain perceived health in a pandemic context, in the midst of severe restrictions on mobility and everyday behaviour, the next logical step was to include some of these changes as independent variables in the models. Spending the majority of their time inside their homes required a remarkable effort on the part of all individuals to adjust their routines and usual priorities. Although some people were able to withstand (and even to enjoy) the situation, for others the changes came at a price, especially in emotional terms. While the previous sections analysed overall self-reported health, this one focuses on both the general assessment of health and also specific measures of mental health, as presented in Table 3. Mental health is harder to explain by social factors, as it is related to personal experiences, personality traits and the way people interact with the environment. In fact, the variables that explained almost 50% of the variance in overall health before COVID-19 (and 15% after it appeared) are mostly unrelated to mental health (the R^2 is 0.05, a very poor model).

When the new variables are included, the models improve in all the measures (Akaike and Bayesian criteria, pseudo-R^2 and log-likelihood). However, the improvement in mental health is clearly more significant, as it doubles the explanatory power of the previous step in the model, and especially because most of the variables have significant effects on the dependant variable. It is hard to pinpoint why one person may feel better or worse in terms of mental health (thus most of the variance remains unexplained), but it is clear that the lockdown measures affected mental health in a way unparalleled with the effect on general health. This fact is coherent with some results found using different methodological approaches compiled in the book by Del Campo Tejedor (2021). Staying at home limited our physical activity, but our weak spot during the confinement period was our mind.

Although having a connection to the Internet at home was not related to the pandemic situation per se, the possibilities it opens for those staying at home (either related to communication, telework, entertainment or shopping) required its inclusion in the models. While it does not increase mental health, it positively affects general health. Having natural light at home, sleeping more and exercising more frequently are also variables with a stronger effect on general than on mental health (although they all also improve the latter). These findings are coherent with the literature. For the other variables, the effect on mental health is always stronger and more significant.

Everyday behaviours such as sleeping patterns and healthy/unhealthy habits are significant in the mental health model, although interpreting the results can be tricky. All these practices can be considered not only factors producing lower mental health, but also consequences of that state of mind. Martínez-de-Quel et al., (2021) underline how lockdown measures specially affected the sleep patterns and eating habits of young, physically active population (previously inactive respondents in their study did not show the same effect). Mental sequels appear therefore to be related to the number of changes in our daily routine introduced by the restrictions, benefiting those who had a sedentary, inactive lifestyle.

Table 3. Stepwise logit models to explain self-reported overall and mental health during lockdown (expressed in Average Marginal Effects).

	Self-reported overall health						Self-reported mental health					
	Step 1			Step 2			Step 1			Step 2		
	dy/dx	Sig	SE	dy/dx	Sig	SE	dy/dx	Sig	SE	dy/dx	Sig	SE
Has a chronic illness (Ref: No)	-13.8%	***	0.01	-13.5%	***	0.01	-5.4%	**	0.02	-5.1%	**	0.02
Age	-0.5%	*	0.00	-0.4%		0.00	0.4%		0.00	0.4%		0.00
Age squared	0.0%		0.00	0.0%		0.00	0.0%		0.00	0.0%		0.00
Sex (Ref: Male)												
Female	-5.9%	***	0.01	-5.3%	***	0.01	-8.8%	***	0.02	-8.5%	***	0.02
Household type (Ref: Family)												
One-person household	-0.6%		0.02	-0.3%		0.02	-2.9%		0.03	-3.0%		0.03
Other households	-2.4%		0.02	-2.4%		0.02	-2.8%		0.02	-2.9%		0.02
Educational level (Ref: Secondary)												
No education	-6.0%	*	0.03	-3.0%		0.03	-11.0%	***	0.03	-7.5%	*	0.03
Primary	-3.1%		0.02	-2.0%		0.02	-5.5%	*	0.02	-4.3%		0.02
A-levels / Vocational training	0.2%		0.02	-0.7%		0.02	-0.9%		0.02	-2.2%		0.02
University degree	1.9%		0.03	-0.7%		0.03	4.2%		0.03	1.0%		0.03
Work status (Ref: Inactive)												
Worker	3.7%		0.02	5.1%	*	0.02	-0.5%		0.02	2.4%		0.02
Business owner / Self-employed	2.5%		0.03	3.6%		0.03	2.5%		0.03	5.0%		0.03
Unemployed	0.3%		0.02	1.7%		0.02	-2.0%		0.02	1.1%		0.02
Monthly household income (in Euros) (Ref: 2,501 or higher)												
450 or less	-11.9%	**	0.04	-8.5%	*	0.04	-4.3%		0.04	-0.6%		0.04
451-900	-9.7%	**	0.03	-8.0%	**	0.03	-7.2%	*	0.03	-4.9%		0.03
901-1600	-8.0%	**	0.03	-7.0%	*	0.03	-6.6%	*	0.03	-5.1%		0.03
1601-2500	-7.7%	**	0.03	-7.6%	**	0.03	-2.8%		0.03	-2.7%		0.03
No response income	-6.9%	*	0.03	-6.1%		0.03	-4.0%		0.03	-3.5%		0.03

Table 3. Stepwise logit models to explain self-reported overall and mental health during lockdown (expressed in Average Marginal Effects) (Continuation).

Housing type (Ref: Flat or other)										
Detached home	1.7%	0.01	1.3%		0.01	2.0%		0.02	1.7%	0.01
Residential environment type (Ref: Medium-density)										
High-density	0.4%	0.02	0.3%		0.02	-0.6%		0.02	-0.6%	0.02
Low-density	-1.1%	0.02	-0.5%		0.02	-5.5%	*	0.02	-5.5%	* 0.02
Has internet (Ref: No)			5.0%	*	0.02				5.4%	0.03
Has enough natural light (Ref: No)			9.6%	**	0.03				9.2%	** 0.03
Personally knows people with COVID (Ref: No)			-1.2%		0.02				-3.8%	* 0.02
Increased alcohol consumption (Ref: No)			1.1%		0.03				-8.2%	** 0.03
Increased smoking habit (Ref: No)			-3.8%		0.02				-8.4%	*** 0.02
Increased sleeping time (Ref: No)			8.5%	**	0.03				8.4%	** 0.03
Weekly exercise frequency			1.0%	***	0.00				0.7%	** 0.00
Weekly reading frequency			0.4%		0.00				1.0%	*** 0.00
Number of weekly trips			0.1%		0.00				0.2%	0.00
Changes in household composition (Ref: No)			4.3%		0.03				0.4%	0.03
Cohabitation problems (Ref: No)			-0.8%		0.03				-11.3%	*** 0.03
Housing default (Ref: No)			-5.4%		0.03				-2.2%	0.03
Supply default (Ref: No)			-4.6%		0.02				-5.5%	* 0.03
Expected income reduction (Ref: No)			-1.8%		0.01				-4.6%	** 0.01
Paid leave (Ref: No)			1.0%		0.03				0.6%	0.03
N	2,948		2,948			2,938			2,938	
Pseudo R^2	0.15		0.18			0.05			0.10	
AIC	1,808		1,741			2,110			2,004	
BIC	5,306,054		5,109,207			6,176,563			5,865,836	
Log-Lik	-2,665,000		-2,566,000			-3,100,000			-2,945,000	

*p-value<0,05; **p-value<0,01; ***p-value<0,001

Source: 2020 Social Survey. Habits and Living Conditions of the Andalusian Population during the State of Alarm (IECA, 2020) and EU-SILC 2019 for Spain (INE, 2020).

Regarding the variables linked to social interaction, knowing people who suffered through COVID-19 has an effect on mental health, as observed by Rossi et al., (2021). Unexpectedly, the number of times a person left their home during a week does not have any statistical connection with overall or mental health. Again, is this a cause or a consequence? Were people staying at home because they were worried, scared or feeling unwell? Was going out a healthy activity at the time? The diversity of situations and contradictory reasons to stay or go out are probably blurring any significant effect of the variable. Changes in household composition were not affecting wellbeing, although it has been argued that most changes in the households were in reaction to housing or care needs (Duque-Calvache et al., 2021). Residential mobility may have spared some households from further problems, but that effect is diluted in this sample. Spending more time at home increased the chances for cohabitation conflicts, and the connection of these problems with a decrease in mental health is clear.

Finally, indicators of economic problems resulting from the pandemic explain a loss of self-reported mental health. It has been shown that financial hardship is connected to anxiety levels and therefore directly affects emotional wellbeing, but not physical health. Of course, given that the survey was conducted during the early stage of the pandemic, most of the mid- and long-terms effects of the social and economic crisis had yet to manifest themselves. The effects of a sudden, shocking and persistent change in all the aspects of a life will have to be studied along the next years, with special attention to children and their coping strategies (Orgilés et al., 2021).

CONCLUSION

Our results have showed first and foremost the powerful effect of COVID-19 over self-reported overall health, and the need to include new variables to study it, as the classic variables do not allow good predictions. Despite our expectations -and the media discourses-, there is a general improvement in perceived health of the Andalusian population when compared with pre-pandemic data. The international emergency created a context in which subjects could relativise their own conditions, with the problematic outcome of an increased lack of attention to any disease different than COVID-19. Retrospective studies (Williams et al., 2020) have already detected the potential impact to public health dure to undiagnosed conditions or delayed diagnosis.

Another important conclusion is the need to separate mental health from the overall indicators, as the general model explains mental condition poorly. Lockdown-related variables are much more important for mental health than for the physical one. Young, healthy respondents felt worse than before, especially in mental terms. Theirs were the lives that changed the most, and the changes exacted a toll. To pay attention to the long-term sequels of the restrictions caused by the pandemic, with special focus on children, should be a priority for future studies on public mental health. Finally, probably our most relevant finding is the opening of a new breach in self-reported health based on income, a variable that was irrelevant in our pre-pandemic sample. If ignored, this trend could open dangerous cracks in our public healthcare system, therefore compensating these social differences through investments and other measures will be a crucial duty of healthcare policies in the next years.

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