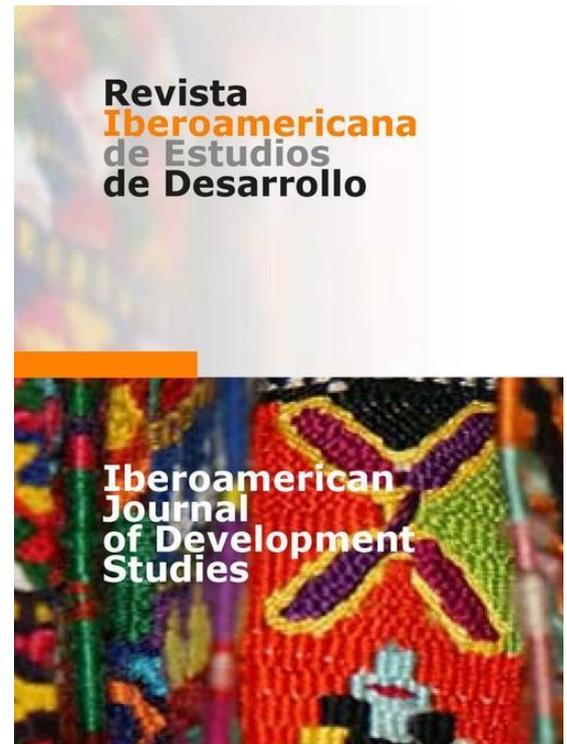

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The impact of COVID-19 on households with children: a comprehensive approach

El impacto del COVID-19 en los hogares con niños: un enfoque integral



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The impact of COVID-19 on households with children: a comprehensive approach

El impacto del COVID-19 en los hogares con niños: un enfoque integral

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Abstract/Resumen

1. Introduction

2. Background

2.1. Food

2.2. Education

2.3. Dwelling

2.4. Social relations

2.5. Health

3. Methodological issues

3.1. Fieldwork

3.2. Assessment of the impact of COVID-19 on children's standard of living

3.3. Identifying households with children at risk of social exclusion

3.4. Sample

3.5. Statistical analysis

4. Results and discussion

4.1. Incidence of COVID-19 on the standard of living of households with minors

4.2. Intensity of deprivation caused by COVID-19 by risk of exclusion

5. Conclusions

6. References

Abstract

The COVID-19 pandemic has lowered the standard of living for millions of people, especially children. The aim of this research is to assess the impact of COVID-19 on children's standard of living. Specifically, this study focuses on children residing in the Region of Murcia (Spain). The hypothesis of the study is that children living in households at risk of social exclusion have suffered the social consequences of the pandemic to a greater extent. A scale has been developed to determine the degree of the impact of COVID-19 on five basic functionings: food, education, dwelling, social relations, and health. Among the most noteworthy results, we found that children in households at risk of social exclusion were more impacted by COVID-19 in three of the five functionings. Deprivation was more intense in social relations and health, with higher levels observed in households at risk of social exclusion in all the functionings, except social relations.

Keywords: COVID-19, social exclusion, childhood, standard of living, functionings.

Resumen

La pandemia de COVID-19 ha reducido el nivel de vida de millones de personas, especialmente niños. El objetivo de esta investigación es evaluar el impacto de la COVID-19 en el nivel de vida infantil. Específicamente, este estudio se centra en los niños que residen en la Región de Murcia (España). La hipótesis del estudio es que los niños que viven en hogares en riesgo de exclusión social han sufrido en mayor medida las consecuencias sociales de la pandemia. Se ha desarrollado una escala para determinar el grado de impacto del COVID-19 en cinco funcionamientos básicos: alimentación, educación, vivienda, relaciones sociales y salud. Entre los resultados más destacables, encontramos que los niños en hogares en riesgo de exclusión social se vieron más afectados por el COVID-19 en tres de los cinco funcionamientos. La privación fue más intensa en las relaciones sociales y la salud, con niveles más altos observados en los hogares en riesgo de exclusión social en todos los funcionamientos, excepto en las relaciones sociales.

Palabras clave: COVID-19, exclusión social, infancia, nivel de vida, funcionamientos.

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Introduction

On 11 March, 2020, the World Health Organisation declared a COVID-19 pandemic. On 14 March, in view of the large increase in deaths from this disease, the Spanish Government declared a state of emergency. Royal Decree 463/2020 imposed a strict lockdown on the entire population, including minors. This mandated the closure of educational, sports, and cultural centres, certain businesses, and the hotel and catering trade, among other sectors. The lockdown was even more restrictive between 30 March and 9 April, when all non-essential economic activity had to cease. However, on 26 April, the measures for minors were relaxed, allowing them to leave their homes under certain conditions and with adult supervision.¹ The state of emergency remained in effect until 21 June. However, after the summer, COVID-19 infections increased again exponentially. In response, on 25 October, the government declared a new national state of emergency by Royal Decree 962/2020. This new order was more lenient than the previous one, but a curfew was established, and the number of people allowed to gather was limited. This state of emergency ended on 9 May 2021.

Families with children have experienced the highest levels of stress and depression, due to lockdown. Households with children have also suffered an additional burden, especially those families in unfavourable socio-economic situations (Cáritas 2020). However, the literature on the impact of COVID-19 on children is limited, mainly due to insufficient data, since sampling strategies have been based on questionnaires targeting adults, rather than families with children.

Most research on the effect of COVID-19 on children covers a small number of life domains like education (Ferrerías *et al.* 2021, Haelermans *et al.* 2022), nutrition (Borger *et al.* 2021, Aguilar *et al.* 2021, Higgins *et al.* 2021), housing (Cuerdo & Navas 2021), social relations (Navas *et al.* 2021), and physical and mental health (Idoiaga *et al.* 2021, Codagnone *et al.* 2020, Pizarro & Ordoñez 2021). Studies on how COVID-19 has affected children's general standard of living, not specific domains, are very scarce. Among the research with a global approach is the work by Berasategi *et al.* (2021), which evaluates the impact of COVID-19 on several dimensions of children's well-being (physical, emotional, social, and academic).

In the Region of Murcia, we find the study by Hidalgo *et al.* (2021), focused more on psychological and educational aspects, and that by Losa *et al.* (2021), from a more global perspective, with multiple dimensions. Social exclusion, absolute poverty, and relative poverty explain social

¹ Ministry of Health, Order SND/370/2020, of 25 April, on the conditions under which children must travel during the health crisis caused by COVID-19. *BOE* of 25 April 2020.

inequalities in health (Wilkinson & Marmot 2003). Research carried out in the city of Barcelona found evidence that residents in disadvantaged areas had a higher incidence of COVID-19 infection (Baena-Díez *et al.* 2020). The study by Codagnone *et al.* (2020) showed that economically vulnerable adults had a higher risk of experiencing lockdown stress. The same can be applied to children living in these households. However, no references have been found that assess the impact of COVID-19 on the living standards of children in socially excluded households.

Therefore, the objective of this research is to assess whether the impact of COVID-19 on the standard of living of minors has had a greater incidence and intensity when they live in households at risk of exclusion. The hypothesis is that the standard of living of minors living in households at risk of social exclusion has been more severely affected by COVID-19. To test this hypothesis, several tasks must be carried out: specifying the areas or dimensions of living standards that may be directly affected by the pandemic, establishing criteria for identifying households at risk of exclusion, and, finally, developing measures to assess the incidence and intensity of the deprivation caused by COVID-19. Logically, an additional requirement is to have a sufficiently large sample to obtain statistically significant results.

This article is structured into five sections. After this introduction, the dimensions of food, education, dwelling, social relations, and health used to assess living standards are defined. The literature on the impact of COVID-19 on each of the dimensions is also reviewed. Next, the fieldwork is detailed, the methodology for identifying socially excluded households is described, and the method for determining the degree of impact of COVID-19 on living standards is established. The following section details the statistical analyses carried out and analyses the results obtained. Finally, the conclusions are summarized.

2

Background

Article 27.1 of the 1989 Convention on the Rights of the Child recognizes «the right of every child to a standard of living adequate for the child's physical, mental, spiritual, moral, and social development».

Standard of living can be seen as an assessment of living conditions comprised of a set of functionings (Sen 1987). Thus, the normative framework on which this research focuses is Amartya Sen's capability approach, so the evaluative space for analysing living standards is a set of capabilities and functionings.

Functionings are the primary unit of information in the capabilities approach, and they refer to people's achievements, *i.e.*, the various beings and activities of an individual (Sen 1999a). Capabilities, on the other hand, are the freedoms or possibilities of an individual to accomplish these achievements. However, due to the difficulty of fully applying the capability approach, we focus on functionings rather than capabilities, since centering on capabilities could be a less accurate way of assessing standards of living.

We have opted to choose certain valuable functionings (Sen 1999b), which are called «basic functionings». These functionings have been identified from a rights-based approach, specifically, from the Convention on the Rights of the Child: having a healthy and varied diet (food), acquiring adequate knowledge to function in society (education), living in a decent dwelling (housing), relating to others and playing (social relations), and living a long and healthy life (health).

2.1. Food

The functioning of food is the most essential of all. This functioning is included in Articles 27.3 and 27.4 of the Convention on the Rights of the Child, which declare that States must provide special nutritional support and ensure maintenance payments, respectively.

Children's food functioning depends largely on their parents' income. The lockdown and state of emergency profoundly changed the labour market, causing a significant increase in unemployment and families with no income (Cáritas 2020). In addition, school closings resulted in the elimination of free school lunches in some cases, contributing to increasing the risk of food deprivation.

The economic impact of the lockdown mostly affected vulnerable populations. Indeed, workers with lower educational levels teleworked less and therefore increased their exposure to infection. Moreover, the sectors that had to close were those paying the lowest average incomes (Fana *et al.* 2020). The work of Salas-Nicás *et al.* (2021) showed that manual workers have been more affected by temporary layoffs, have teleworked less, and have a higher incidence of COVID-19 than non-manual workers. Therefore, children in vulnerable households have suffered more food deprivation than their non-vulnerable counterparts.

On the other hand, several authors have highlighted other aspects, such as the difficulty of accessing certain food services (Higgins *et al.* 2021), the need for action on food needs to mitigate the effects of the pandemic on schoolchildren's nutrition (Borger *et al.* 2021), and changes in diet or food routines during lockdown and its consequences (Aguilar-Martínez *et al.* 2021, Ventura *et al.* 2021, Ramos-Álvarez *et al.* 2021).

2.2. Education

Educational functioning is protected by Article 28 of the Convention on the Rights of the Child, which states that every child has the right to education, and it is the duty of the State to ensure at least free and compulsory primary education. The application of school discipline should respect the dignity of the child. Article 29 also details the aims of education.

The COVID-19 pandemic has had a major impact on various aspects of education, most of which are related to virtual or blended learning. This issue has had an impact on several fronts: home equipment, digitalization, parental support, class attendance, curriculum development, and so on. This involves different areas of analysis, each of which has an incidence on the development of educational functioning and a potential increase in inequalities.

One of the aspects considered «key» by many authors in the field of education is the digital gap. Cabero and Ruiz (2017) highlighted the role that Information and Communication Technologies (ICT) can play in specific social contexts as factors of discrimination and social exclusion, creating a so-called «digital gap», which refers to both the lack of access to and knowledge about how to use ICT.

Many authors have studied the impact of the pandemic on the digital gap; for example, Montenegro *et al.* (2020) focused their research on the effect of the digital gap on learning outcomes, noting the role of access to ICT; the importance of other factors, such as motivation, student autonomy, and the digital competence of the agents involved (students, family, teachers, etc.), and appropriate action by educational administrations.

Other authors, such as Hortigüela-Alcalá *et al.* (2020), Sanz *et al.* (2020), Bonal and González (2020), and Ferreras-Listán *et al.* (2021), among others, emphasized the role of parents in supporting their children's learning process and the importance of their academic and digital skills to achieve results. These factors explain the increase in inequalities, which are combined with a lack of adequate equipment and infrastructure in the most vulnerable households.

Studies such as those by Maldonado and De Witte (2022) or Haelermans *et al.* (2022) focused on analysing academic outcomes and increased inequalities in Flemish schools in Belgium, the former, and in the Netherlands, the latter. Both works found higher learning loss in vulnerable households, because of parental education and income.

2.3. Dwelling

The functioning of dwelling is also reflected in Article 27.3 of the Convention on the Rights of the Child, which specifies that States Parties shall, where necessary, «provide material assistance and support programmes, particularly with regard to nutrition, clothing, and housing».

In this domain, there are several aspects in which the pandemic and lockdown may have had special relevance. One of these aspects could be the facilities available in the home and access to certain services, such as the internet, which is a determining factor not only for the adequate monitoring of classes in a virtual or blended learning context but also in terms of leisure time and social relations. Another question to consider is whether the dwelling has sufficient and adequate space for study, interaction among members of the household, rest, and leisure. Studies such as that by Cuerdo and Navas (2021) showed how the resilience of households in complex scenarios such as lockdown is largely determined by the characteristics of their dwelling and family cohesion.

Dwellings have a direct effect on the physical and mental health of their inhabitants, whether due to structural problems, such as dampness, which can lead to respiratory problems, or the stress of facing lockdown in a very small space (González-Rábago *et al.* 2021).

Dwelling is one of the intermediate factors determining social inequalities in health. In the case of vulnerable populations, the study by Morante *et al.* (2022) found that not only is low income a factor that makes a significant difference in COVID-19 infection, but also basic services in the dwelling, such as water. Moreover, according to the study by Matalí and Camprodon (2022), children living in houses with limited space — as a proxy for the economic situation of the parents — have suffered greater psychological impact than children living in larger dwellings.

2.4. Social relations

The functioning of social relations is found in Article 31 of the Convention on the Rights of the Child, which states that «States Parties recognize the right of the child to rest and leisure, to engage in play and recreational activities appropriate to the age of the child and to participate freely in cultural life and the arts».

The COVID-19 pandemic has changed, to a greater or lesser extent, the social relationships and living habits of the population (Navas *et al.* 2021), including children, both inside and outside the home. Children's social relationships outside the family have been limited or completely cut off. This includes the loss of extracurricular activities and activities with classmates, leisure and outdoor activities, and gatherings with family and friends. Idoiaga *et al.* (2021) and Berasategi *et al.* (2021) found that children have experienced loneliness and depression, from not being able to meet friends, classmates, and family. Regarding social relations inside the home, research shows different effects. There is a positive effect, due to shared family time (Giménez *et al.* 2021) but also evidence of increased household conflicts, caused by the pandemic (Hidalgo *et al.* 2021).

Extracurricular activities, leisure activities, and gatherings with friends and family are essential for children's proper physical, educational, social, and emotional development. However,

there are significant differences in how these activities are carried out, depending on the vulnerability of the household. Thus, children who belong to households whose parents suffer financial difficulties or have low levels of education were less likely to continue with extracurricular activities during lockdown (Bonal & González 2020). According to the research by González-Rábago *et al.* (2021), children in vulnerable households were less likely to maintain social relationships with friends and family; they substituted these social relationships for sedentary screen-based activities. This increased use of screens not only has an impact on health (Medrano *et al.* 2020) but can also lead to sleep disturbances and poorer school achievement (Lavigne-Cerván *et al.* 2021).

2.5. Health

Health functioning is reflected in Article 6 of the Convention on the Rights of the Child, which says that «States Parties recognise that every child has the inherent right to life. States Parties shall ensure to the maximum extent possible the survival and development of the child». Article 24 again emphasizes the right to health and medical attention, while Article 26 states that every child has the right to benefit from social security.

As might be expected, most of the research on the impact of COVID-19 has been focused on health. Initially, research was directed at examining the effects of COVID-19 on infected children. COVID-19 can be severe or fatal and leave physical sequelae, that prevent a child from performing everyday activities (Bergia 2022, Izquierdo-Pujol 2022). Subsequently, with the lockdown measures adopted by governments, studies focused on the consequences of these measures. There is evidence, some already mentioned in the previous paragraphs, that lockdown has influenced health in general and changed children's routines, and habits, resulting in a drastic reduction of physical activity, poorer sleep quality, and more sedentary activities (Alonso-Martínez *et al.* 2021, Cachón-Zagalaz *et al.* 2021, Wunsch *et al.* 2022). In addition, mental health has been affected, as children have experienced increased anxiety, due to lockdown (Lavigne-Cerbán *et al.* 2021, Orgilés Amorós *et al.* 2021), as well as behavioural changes, depression, and problems regulating their emotions (Pizarro & Ordoñez 2021).

The impact on physical and mental health has not been equal for all children. The work of Medrano *et al.* (2020) indicated that children living in households where parents have low levels of education have suffered a greater impairment in their lifestyle. This is confirmed by the research by Bonal and González (2020), who found that children in households with higher levels of education did more sports activities than children in households with lower education levels, which impacted their general health.

Methodological issues

3.1. Fieldwork

Under normal conditions, the fieldwork would have been carried out by interviewing households in their homes. However, the health situation prevented this procedure from being carried out. Therefore, the questionnaires were given online to the selected groups during the month of March 2021. Given the approach of this study, the universe was made up of households with children aged 0 to 15 living in the Region of Murcia. The questionnaire consisted of basic sociodemographic questions to generate profiles, socioeconomic questions to identify a household's risk of social exclusion, and questions about the impact of COVID-19 on five basic functionings.

To access these households, we collaborated with schools and other institutions to disseminate the questionnaires to parents. The process began with a preliminary distribution of the surveys, according to the population size of each county in the Region of Murcia. Subsequently, schools were randomly selected in each county. The schools were distributed according to educational levels: nursery school, primary, secondary, and special education, depending on the age structure of each county. In total, 84 educational centres were contacted; however, 69 schools distributed surveys to families to be completed online.

To receive responses from households without internet access or computers, four schools were selected in particularly vulnerable areas, where ten households were surveyed in each. This task was carried out in collaboration with a mediator-surveyor.

For a higher response rate, the project collaborated with Parents' Associations in different parts of the Region of Murcia. Additionally, European Anti-Poverty Network in the Region of Murcia supported the dissemination of the project and collaborated in collecting the questionnaires in some parts of the region.

A total of 667 questionnaires were collected. However, after removing duplicate questionnaires and those with missing answers, the sample consisted of 638 households, in which a total of 1,204 children resided. Thus, the sample error is approximately 3.88 %, at a confidence level of 95 %. To calculate the sampling error, given that the universe was 175,455 households, a formula for infinite populations was used: $Z * \sqrt{\frac{P(1-P)}{n}}$, where Z is the 95 % confidence level (1.96), P is the conservative proportion that maximises variance (0.5), and n is the sample size (638) (Rodríguez 1991).

3.2. Assessment of the impact of COVID-19 on children’s standard of living

Given the difficulty of directly measuring the capabilities and basic functionings that define standards of living, an approximation was made using indicators that reflect certain objective circumstances of the deprivation of a functioning. The indicators selected provide information on how COVID-19 has impacted children’s standard of living. Table 1 details the different indicators for each basic functioning. All indicators are binary.

Basic functionings	Indicators
Food	You have lost your free school lunch
	All household members have temporarily or permanently lost their income
	All household members have temporarily or permanently lost their jobs
Education	Low technological skills of minors
	Low technological skills of adults
	No parental support for schoolwork
Dwelling	No internet access
	No place to do homework
	Poor or very poor housing conditions to face a new lockdown
Social relations	They have stopped doing activities outside of school
	They have stopped playing games and leisure activities outside the home
	They have stopped holding celebrations and gatherings
	Conflicts have arisen in the household
Health	Overall health has been affected
	Emotional wellbeing has been affected
	Daily activities have been limited due to COVID-19

Table 1

Basic functionings and indicators

Source: own elaboration.

To assess the impact of COVID-19 on children’s standard of living, its incidence on each basic functioning was initially calculated. For a basic functioning to be identified as affected by COVID-19, it was necessary for it to have at least one deprivation. In the case of social relations, which has four indicators, two deprivations were necessary for this functioning, to be considered affected.

According to the number of basic functionings affected, the degree of impact of COVID-19 on living standards was established. Thus, impact was considered «mild», if only one basic functioning was affected; «moderate», if two basic functionings were affected, and «high» if COVID-19 had impacted three or more basic functionings.

However, this analysis can be supplemented to account for the number of deprivations in each basic functioning, since the impact on an individual of being affected by one health indicator is different to the impact of being affected by all three indicators. To address this, the intensity of deprivation was calculated. For the calculation, each functioning had the same weighting (1/5), divided by the number of indicators comprising it. This procedure is like the proposal of Alkire and Foster (2011) to calculate the Multidimensional Poverty Index. Thus, each indicator had a weighting of 1/15, except the social relations functioning, which had a weighting of 1/20. With this procedure, the maximum intensity of deprivation in a functioning — that is, when deprivation was observed in all the indicators —, is 0.2. Aggregating the five functionings gives the overall intensity of deprivation, with a maximum value of 1.

3.3. Identifying households with children at risk of social exclusion

Households at risk of social exclusion had to be identified to test the proposed hypothesis. «Social exclusion» is understood as people's inability to participate in the basic political, economic, and social functionings of their social environment (Losa *et al.* 2021). Social exclusion occurs when deprivations accumulate, especially when they begin to interact with each other.

We identified vulnerable households based on the social exclusion index used by Losa *et al.* (2021), which was drawn up to include the functionings shared by resident households. All variables are considered binary and are characterized by the following deprivations:

- The household makes ends meet with great difficulty.
- Arrears (mortgage or rent, utility bills, or hire purchase).
- Inability to afford paying for one-week annual holiday away from home.
- Inability to afford a meal with meat, chicken, or fish (or vegetarian equivalent) every second day.
- Inability to buy toys for use inside the dwelling.
- Inability to face unexpected financial expenses.
- There is no personal computer in the household.
- The household does not have a car.
- The dwelling has leaks, dampness, or rotting problems.

- Inability to keep home adequately warm.
- The dwelling is overcrowded («overcrowding» is defined as households in which the number of members per room exceeds 1.5).
- More than half of the active members of the household experience long-term unemployment.
- More than half of the active household members have temporary jobs.
- More than half of the adult members of the household have only, at most, a basic level of education; in other words, primary or compulsory secondary education.
- In case of need, the household does not have relatives, friends, or neighbours to turn to for help.

Given that not all the situations or circumstances above have the same importance, it is necessary to weight each of the deprivations. The weighting criterion assigns greater relative importance to the deprivations that are less frequent in Murcian society. Thus, the weighting system is based on the inverse of the incidence of each deprivation, a similar method applied in Fundación Fomento de Estudios Sociales y Sociología Aplicada (2008). The social exclusion index is calculated as the sum of the weighted deprivations. A household is considered at risk of social exclusion if its index exceeds 150 % of the average social exclusion index for the Region of Murcia (Losa *et al.* 2021), in line with another research that uses this threshold, such as Ministerio de Fomento and Instituto Juan de Herrera (2016).

After applying the above, the sample was divided into 291 households at risk of social exclusion and 347 households not at risk of social exclusion. This translates into sample errors of 5.7 % and 5.3 %, respectively.

3.4. Sample

As indicated above, the total sample, 638 households, comprised 2,639 people, of whom 1,204 were under sixteen years of age. Once the criteria for identifying households at risk of social exclusion had been applied, the sample was divided into two groups. The group of households at risk of social exclusion numbered 291, representing 45.6 % of the sample, which can be considered high, when compared to other sources. Households at risk of exclusion are overrepresented in the sample, because the aim is for both subsamples (without and at risk of exclusion) to have many households, to ensure the comparability of the groups.

Table 2 gives the average size of the households, showing that households at risk of exclusion are larger than those not at risk of exclusion, both in terms of the number of adults and, especially, in terms of the number of children. This must be considered when assessing the results since, when we

refer to households at risk of exclusion with minors, we are referring to a relatively larger number of minors than households that are not at risk of exclusion.

	Total	Minors	Adults
Not at risk of exclusion	3.97	1.76	2.21
At risk of exclusion	4.34	2.04	2.30
Total	4.14	1.89	2.25

Table 2

Average size of households (people)

Source: own elaboration.

3.5. Statistical analysis

To complement the results, a series of hypothesis tests based on the risk of social exclusion of households were carried out. The aim was to determine whether there were any statistically significant differences in the mean values of deprivation incidence or intensity in each basic function between the two population groups. The two dependent variables are different in nature. The incidence variable is categorical, so the chi-square test was used. The intensity variable is quantitative, so a t-test for two independent samples was applied.

To conduct a t-test, the data must follow a normal distribution, and there must be homogeneity in the variances. However, the first requirement is not very relevant when the sample size is large. The Kolmogorov-Smirnov test has been used to confirm normality. In all the cases — the five functionings and the overall intensity —, there is an absence of normality, so the Mann-Whitney U test has also been calculated. However, given the size of the sample, this question is less relevant. When applying Levene’s test, the absence of homogeneity in the variances has been observed in all the cases, so a more robust test has been used: Welch’s t-test.

Additionally, the effect size of each test is presented. For the Mann-Whitney test, the biserial point correlation (r_{bp}) was used. When the effect size is analysed with the biserial-point correlation (r_{bp}), the effect size is null, when it is below 0.10; low, if it is between 0.10 and 0.29; medium, from 0.30 to 0.49, and high, when it is equal or greater than 0.50. For the t-test and Welch’s t-test, Cohen’s d statistic was used. From Cohen’s d , the effect size is very low, when the statistic is less than 0.2; low, when it is equal to or greater than 0.2 but less than 0.5; medium, when it is greater than or equal to 0.5 but less than 0.8, and high, when it takes a value of 0.8 or more.

Results and discussion

4.1. Incidence of COVID-19 on the standard of living of households with minors

The first question to be answered in this study is whether there are significant differences in the impact of COVID-19 on households with children, if they are at risk of exclusion. To this end, three levels of impact have been established, depending on the number of constitutive standards of living functionings the pandemic has affected by causing some type of deprivation: mild, moderate, or high, and a fourth category of unaffected. Therefore, the question is whether there are statistically significant differences in the distribution of households with children, according to degrees of impact, when comparing households at risk of social exclusion with those that are not. We have constructed a contingency table, where the two distributions are compared.

Table 3 shows the contingency table contrasting the impact of the pandemic on the two groups of households. The table presents the distribution by rows and columns of degrees of impact.

The null hypothesis of the chi-square test is that there are no statistically significant differences in the distribution of the degree of impact, according to the risk of exclusion of households with minors. The results ($\chi^2_3=76.6$; $p\text{-value} < 0.001$) indicate rejecting the null hypothesis and accepting that there are statistically significant differences.

		Unaffected	Affected			Total
			Mild	Moderate	High	
Not at risk of exclusion	Observed	31	103	148	65	345
	Row %	8.9 %	29.7 %	42.7 %	18.7 %	100 %
	Column %	72.1 %	72.0 %	61.7 %	30.7 %	54.4 %
At risk of exclusion	Observed	12	40	92	147	291
	Row %	4.1 %	13.7 %	31.6 %	50.5 %	100 %
	Column %	27.9 %	28.0 %	38.3 %	69.3 %	45.6 %
Total	Observed	43	143	240	212	638
	Row %	6.7 %	22.4 %	37.6 %	33.2 %	100 %
	Column %	100 %	100 %	100 %	100 %	100 %

Table 3

Contingency table of COVID-19 impact on households with minors according to risk of exclusion

Source: own elaboration.

The data show the high impact of the pandemic, with 93.3 % of all households having experienced its effects (6.7 % of those not affected). Moreover, one in three households has been highly affected. However, the distribution of the households is quite different in terms of levels of impact.

As can be seen in Table 3, households that are not at risk of exclusion have higher percentages in the unaffected, mild, and moderately affected columns, while only 18.7 % of these households have been highly affected. This percentage, however, rises to 50.5 % in households that are at risk of exclusion.

Table 3 shows notable differences, when interpreted by columns. Most households with children whose standard of living have not been affected by the pandemic, 72.1 %, are not at risk of exclusion. In contrast, more than two-thirds of the highly affected households are identified as at risk of exclusion.

Concerning the impact of the pandemic on different population groups, it is also worth considering whether the presence or absence of deprivation in each functioning is distributed homogeneously, or significant differences are observed, depending on whether the household is at risk of exclusion. We constructed a contingency table for each of the five functionings (Table 4), while Table 5 shows the statistics of the chi-square tests.

The functioning of food has been the least affected by the pandemic, with only 17.6 % of all households with children experiencing deprivations in this domain, although there are notable differences, depending on the risk of exclusion. However, almost 75 % of all households have experienced some health-related deprivation, which is consistent with the fact that this is a health crisis. However, in this functioning, the percentages of households experiencing deprivation do not show great differences between households at risk and those not at risk of social exclusion.

In the rest of the functionings, there are also very different situations. Deprivations in education have affected 29 % of families with children. However, the impact has been very different, depending on the risk of exclusion, as almost 42 % of households at risk of social exclusion have been affected, while in households not at risk this deprivation has affected 18.4 %.

The incidence in the functioning of dwelling has been lower than in education, since deprivations have affected 27.1 % of households. Nevertheless, this is the domain where the absolute and relative gaps between households at risk of exclusion and the rest of the households is the greatest. Deprivation in dwelling has affected 46.7 % of households at risk of exclusion, *i.e.*, 36 percentage points more than households not at risk. This implies that the incidence of dwelling deprivation in

households with children at risk of exclusion is more than four times higher than that in households without this risk.

In the domain of deprivations in social relations, due to lockdown and restrictions on mobility and meetings, the overall incidence has been very high, with almost 64 % of all households, showing some deprivation in this functioning. However, this is the only functioning where the incidence of deprivations has been lower in households at risk (62.2 %) than in those not at risk of exclusion (65.1 %). This may be, due to the poorer housing conditions of the households at risk, which in turn could have a negative impact on mobility restrictions, although this requires further investigation.

Food		Without deprivation	With deprivation	Total
Not at risk of exclusion	Observed	317	30	347
	Row %	91.4 %	8.6 %	100.0 %
At risk of exclusion	Observed	209	82	291
	Row %	71.8 %	28.2 %	100.0 %
Total	Observed	526	112	638
	Row %	82.4 %	17.6 %	100.0 %
Education		Without deprivation	With deprivation	Total
Not at risk of exclusion	Observed	283	64	347
	Row %	81.6 %	18.4 %	100.0 %
At risk of exclusion	Observed	170	121	291
	Row %	58.4 %	41.6 %	100.0 %
Total	Observed	453	185	638
	Row %	71.0 %	29.0 %	100.0 %
Dwelling		Without deprivation	With deprivation	Total
Not at risk of exclusion	Observed	310	37	347
	Row %	89.3 %	10.7 %	100.0 %
At risk of exclusion	Observed	155	136	291
	Row %	53.3 %	46.7 %	100.0 %
Total	Observed	465	173	638
	Row %	72.9 %	27.1 %	100.0 %
Social relations		Without deprivation	With deprivation	Total
	Observed	121	226	347

Not at risk of exclusion	Row %	34.9 %	65.1 %	100.0 %
At risk of exclusion	Observed	110	181	291
	Row %	37.8 %	62.2 %	100.0 %
Total	Observed	231	407	638
	Row %	36.2 %	63.8 %	100.0 %
Health		Without deprivation	With deprivation	Total
Not at risk of exclusion	Observed	96	251	347
	Row %	27.7 %	72.3 %	100.0 %
At risk of exclusion	Observed	67	224	291
	Row %	23.0 %	77.0 %	100.0 %
Total	Observed	163	475	638
	Row %	25.5 %	74.5 %	100.0 %

Table 4

Incidence of COVID-19 deprivation by functionings, total households and percentages by rows

Source: own elaboration.

As can be seen in Table 5, where the equality of distributions is tested using the chi-square test, the null hypothesis is only rejected in the first three functionings. We can therefore state that the risk of exclusion is a determinant of deprivation in food, education, and dwelling. However, in the functionings of health and social relations, we cannot conclude that there are statistically significant differences in the incidence of deprivations associated with the risk of social exclusion. This is especially true for the functioning of social relations.

	Value	p-value
Food	41.7	< 0.001
Education	41.2	< 0.001
Dwelling	104	< 0.001
Social relations	0.588	0,443
Health	1.79	0.181

N = 638

Table 5

4.2. Intensity of deprivation caused by COVID-19 by risk of exclusion

After analysing the incidence of the pandemic on the different functionings considered constitutive elements of the standard of living for households with children, the second question to be addressed is whether the intensity of the deprivations that comprise the basic functionings is similar in households, according to their risk of social exclusion. As described above, the intensity of deprivation is defined in terms of the number of indicators affected. To this end, an overall indicator of the intensity of the five functionings has been constructed, applying similar weights to them all and distributing these weights among the deprivation indicators of the five functionings.

Table 6 shows the average intensity of deprivations, by functionings and on an aggregate basis, for the total households with children, households at risk of exclusion, and those not at risk of exclusion. In addition, the intensity of the deprivations has been calculated for all the households — including households not affected by any deprivation and those affected in the calculation of the mean — and for only those households suffering deprivation in the corresponding functioning.

The first surprising result is the similarity in the average total intensity when comparing all the households with only those affected by some type of deprivation. When looking at the overall intensity of deprivations for all the households, it coincides with the sum of the intensities of the different functionings, since there is an accumulation of deprivations in the same population group. However, the overall average intensity, when considering only the households affected by some deprivation, is not the sum of the intensities of the deprivations by functionings, since different population groups are involved. Therefore, although many households may coincide in having, for example, deprivation in food and education, they do not necessarily all coincide since the population groups are different. However, when calculating the average for the entire population, only the households that have not experienced any deprivation are left out of the calculation, which are very few (13 households), in the whole sample. The discrepancy of this figure with that given in Table 3 is since there are 30 cases in the sample that are only affected by one deprivation in the domain of social relations.

		Total households			
Functionings:	All households	Households at Risk of Exclusion	at	Households not at Risk of Exclusion	

Food	1.5	2.5	0.7
Education	2.5	3.7	1.5
Dwelling	2.6	4.6	0.9
Social relations	9.8	9.6	10.0
Health	8.8	9.7	8.0
Total intensity	25.2	30.0	21.1
Households affected by some deprivation			
Functionings:	All households	Households at Risk of Exclusion	Households not at Risk of Exclusion
Food	8.7	8.8	8.4
Education	8.7	9.0	8.1
Dwelling	9.5	9.8	8.3
Social relations	11.0	10.9	11.1
Health	11.8	12.6	11.0
Total intensity	25.7	30.3	21.8

Table 6

Intensity of deprivation

Source: own elaboration.

The average intensity of deprivation, or decline in the functioning determinants of living standards, caused by the COVID-19 pandemic in households with children is 25.2 out of a maximum of 100. There are notable differences, depending on the households' risk of exclusion, with almost a nine-point difference between households at risk of exclusion and those that are not. The highest intensity of deprivation is observed in the functionings of health, with a value of 8.8, and social relations, with a value of 9.8, out of a maximum value of 20 in both cases. In the remaining three functionings, the values are significantly lower, between 1.5 and 2.6.

In almost all cases, the intensity of deprivation is higher for households at risk of exclusion, especially in the dwelling dimension, where there is almost a four-point difference between the two groups of households. The exception is the functioning of social relations, where the intensity of deprivation, as with incidence, is higher in the group of households not at risk of exclusion.

When looking at households suffering some deprivation in each of the functionings, the intensity of deprivation rises significantly, especially in the three functionings, with the lowest intensities: food, education, and dwelling. However, the functionings of social relations and health show the highest intensity of deprivation, with values of 11.0 and 11.8, respectively; that is, above

50 % of their maximum value. We again observe that in social relations, the intensity of deprivation is greater in households that are not at risk of exclusion.

Considering these results, the question is whether the differences in the intensities of deprivation vary by type of household. In other words, our aim is to see whether, once deprivations appear in a functioning, the fact that a household is at risk of exclusion affects the intensity of the deprivation. To this end, a t-test has been conducted on the independent samples, to determine whether the mean intensity in households at risk of exclusion show statistically significant differences from households that are not at risk.

Table 7 presents the results of these statistics, to which a measure of effect size, or practical significance, has been added. The results from these tests confirm that there are statistically significant differences in the total intensity of deprivation, according to the risk of exclusion of the households. In other words, the risk of exclusion of a household with children influences the overall intensity of deprivation. Moreover, the effect size of this relationship is medium, since the biserial-point correlation is higher than 0.29, namely 0.358, and the absolute value of Cohen’s *d* (0.678) is between 0.5 and 0.8.

Nonetheless, there are important differences among functionings. In the cases of food and education, the difference in intensities is confirmed to be statistically significant. In both cases, there is a low effect size derived from the risk of exclusion according to the r_{bp} and a medium effect size, if Cohen’s *d* is considered. In the functioning of dwelling, in addition to the difference in the intensities of deprivation between the two groups, a moderate ($r_{bp} = 0.370$) or high ($d = -0.833$) effect size is observed. Nevertheless, in health, although it could also be argued that there are significant differences between the two types of households, the magnitude of the differences, or effect size, is small. Finally, based on our results, there are no statistically significant differences between households, according to the risk of exclusion in the functioning of social relations.

Functioning	Statistical		gl	p-value	Effect size
Food	t-test	-6.37	636	< .001	Cohen’s <i>d</i> -0.506
	Welch’s t-test	-6.11	452	< .001	Cohen’s <i>d</i> -0.496
	Mann-Whitney U	40565		< .001	r_{bp} 0.197
Education	t-test	-6.70	636	< .001	Cohen’s <i>d</i> -0.533
	Welch’s t-test	-6.48	493	< .001	Cohen’s <i>d</i> -0.524
	Mann-Whitney U	38410		< .001	r_{bp} 0.239
Dwelling	t-test	-10.8	636	< .001	Cohen’s <i>d</i> -0.857
	Welch’s t-test	-10.2	401	< .001	Cohen’s <i>d</i> -0.833

	Mann-Whitney U	31830		< .001	r_{bp}	0.370
Social relations	t-test	1.00	636	0.316	Cohen's d	0.0798
	Welch's t-test	1.00	613	0.316	Cohen's d	0.0798
	Mann-Whitney U	48205		0.310	r_{bp}	0.0452
Health	t-test	-3.21	636	0.001	Cohen's d	-0.255
	Welch's t-test	-3.18	591	0.002	Cohen's d	-0.254
	Mann-Whitney U	43730		0.002	r_{bp}	0.134
Total intensity	t-test	-8.61	636	< .001	Cohen's d	-0.684
	Welch's t-test	-8.40	530	< .001	Cohen's d	-0.676
	Mann-Whitney U	32436		< .001	r_{bp}	0.358

Table 7

Independent sample t-test

Source: own elaboration.

5

Conclusions

The consequences of the COVID-19 pandemic were felt in many different domains and dimensions of people's lives. This work has focused on the differences in the impact of the pandemic on households with children, according to their risk of social exclusion.

Five basic functionings (food, education, dwelling, social relations, and health) have been selected to analyse the incidence and intensity of deprivation, when comparing households at risk of social exclusion with those that are not.

Some studies have highlighted the influence of the pandemic on several of the basic functionings mentioned, analysing various aspects and providing different approaches to identify how the pandemic has affected people's lives; for example, concerning food, lockdown has led to reduced incomes. Moreover, not having access to school canteens or having difficulty accessing food services has affected the functioning of food and has led to a change in eating routines. Numerous studies have also focused on education, dwelling, social relations, and especially on the effects on citizens' physical and mental health. In this context, the present study provides an integral vision, proposing a metric for evaluating both the global consequences and those of each of the functionings separately.

Many of the studies highlight increased inequalities, as the impact of the pandemic has generally been more intense in the most vulnerable households. This work concerns this area, since

it aims to comprehensively analyse the effects of the pandemic and the differences of this effect, depending on the risk of social exclusion in households with children.

To do this, firstly, households at risk of exclusion have been identified, and a social exclusion index has been constructed from a series of deprivations. Secondly, once the households at risk of exclusion have been identified, a series of indicators representative of the effects of the pandemic on each of the five basic functionings have been selected. In this case, three levels of impact have been defined: mild, moderate, and high.

Our first objective has been to check whether the level of impact is distributed equally between households at risk of exclusion and those that are not. By carrying out the appropriate statistical tests, we corroborated that there are significant differences in the distribution of the degrees of impact in households with minors, according to their risk of exclusion. Thus, we conclude that the risk of exclusion determines the degree of impact. Fewer households are not at risk of exclusion than those that have been moderately affected, and in many households the effects have been mild. On the other hand, more than half of the households at risk of exclusion have been highly impacted, indicating that three or more functionings have been affected.

We have also examined whether the percentage of households affected by deprivations in their basic functionings is similar in both groups of households. On this point, statistically significant differences have been observed in the functionings of food, education, and dwelling, always with a higher incidence in households at risk of exclusion. However, we cannot affirm that there are differences in the percentages of households with deprivations in the functionings of social relations and health. In fact, according to the results obtained, the percentage of deprived households is slightly higher — although with a difference that is not statistically significant — in households that are not at risk of exclusion in the domain of social relations. This issue requires further research.

After analysing the incidence of deprivations in households with children, their intensity has been contrasted based on the number of indicators affected. As a result, we have found that the overall intensity of the deprivations is around 25 % of the maximum value; in other words, a quarter of the indicators comprising the functionings have been affected. This overall intensity increases to 30 % in households with children at risk of exclusion and is around 21 % when they are not at risk of exclusion.

When analysing each of the functionings separately, either considering only households that have been affected by deprivation or all the households, the functionings of social relations and health show the highest intensities, in some cases above 50 % of their maximum values.

As a result of the tests conducted to check whether the intensities observed are different according to households' risk of exclusion, we have found that there are statistically significant differences in food, education, dwelling — with considerable effect sizes — and health, although the

effect is much smaller. However, in the functionings of social relations, no significant differences can be affirmed, with greater intensity in households that are not at risk of exclusion.

Thus, it is clear that, in order to reduce vulnerability and the risk of exclusion, it is necessary to influence public policies that affect food, education and, especially, dwelling, as this is the functioning with the greatest gap (both absolute and relative, in terms of incidence and intensity) between households at risk of exclusion and the rest. In addition, it is an element that has had a significant impact on other areas, such as education, social relations and health. However, the greater intensity of health deprivation in households at risk of exclusion should not be overlooked, highlighting the need to plan measures that will improve the health status of the entire population.

In short, this study has revealed the influence of the risk of exclusion on the incidence and intensity of deprivation in households with children, quantifying the effects. From this point, different lines of research are suggested, such as delving deeper into the social relations results. A study of the cross-effects, or interactions, of the deprivations of the different functionings, due to the risk of social exclusion could be beneficial. All of this could be useful for public policy development, especially those measures aimed at the most vulnerable populations.

6

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