Impacto del Covid-19 en la salud mental de mexicanos. Un estudio comparativo entre México y Estados Unidos

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Abstract

Objectives: We analyze the impacts the COVID-19 pandemic has had on mental health issues and (financial and other) concerns among Mexican immigrants in the US and Mexicans in Mexico,and establish differences in the impacts between these two groups.

Methods: We designed an online questionnaire and distributed it among Mexicans in Mexico and Mexican immigrants in the US. Propensity score matching is applied to create a sample of respondents with comparable background characteristics. This permits a comparison between the two groups, even though our respondents are not representative for the general populations.

Results: We find that a year in the pandemic, immigrants report less non-specific psychological disorders than otherwise similar respondents in Mexico. No clear differential change in mood is found, and neither are income changes different. Concerns about lack of money are less common among Mexicans in the US than in Mexico, but this has not led to differences regarding lack of money for food.

Conclusions: Despite the commonly held view that immigrants are a particularly vulnerable population, we find little to no evidence that Mexican immigrants in the US were hit harder by the COVID-19 pandemic than Mexicans with comparable backgrounds living in Mexico.

Introduction

It is known that the crisis generated by the COVID-19 has hit the most vulnerable populations in the United States and Mexico hard (Grant et al., 2020; Montes de Oca et al., 2021). In both countries, people with limited resources have been affected not only by the onslaught of the disease, but also by the economic, social, and psychological implications that it entails. In the United States, African Americans and the Hispanic population were overrepresented in hospitalizations and among the deceased in different counties (Garg et al., 2020). To the concern generated in the face of the possibility of acquiring the disease were added the anguish due to the economic insufficiency. According to this study, about 61% of Hispanics and 44% of African American adults said they or someone in their household had lost their job or salary due to the coronavirus outbreak, compared to 38% of white adults. 73% of African Americans and 70% of Adult Hispanics said they had no savings to cover their expenses for three months, compared to 47% of whites (López et al., 2020).

In the specific case of Mexican immigrants in the United States, Vilar-Compte et al. (2022) analyzed the vulnerabilities of this population in New York and Los Angeles and their relationship with COVID-19 morbidity and mortality. They collected information through consulates in these cities and found that preconditions tied to immigration, such as type of employment, food insecurity, chronic conditions, health condition, and barriers to access to health care, placed low-income Mexican immigrants at higher risk of COVID-19.

In Mexico, the poorest and indigenous people were at higher risk of becoming infected and dying from COVID-19 (UN, 2020; Jaramillo, 2021). According to Cortés-Meda and Ponciano-Rodríguez (2021), in Mexico people who reside in places where poverty is greater are less likely to receive hospital care and more likely to die. The precarious

socioeconomic conditions often result in low nutritional and health levels that, in the event of Covid-19 contagion, make their probability of dying higher than that of people in a better socioeconomic situation.

Regarding the mental health of the population in both countries, Purtle (2020) points out that, although we still know little about the effect of the pandemic on the mental health of populations, given the deep social inequalities that reign in the United States, it is expected that the ethnic and racial groups in greater socioeconomic disadvantage will be the ones who report the most damage to their mental health. Some studies, non- representative of the immigrant population in the United States, have shown how the Covid-19 pandemic has affected mental health. For example, Garcini et al. (2022), from the application of a survey and focus groups they observed stressors affecting mental health in Latino communities in South Texas during the pandemic and found that aspects such as job insecurity, undocumented status, changes in family dynamics and family environment, limited access to health care, as well as social isolation, are aspects related to the mental health of Latin American immigrants.

In Mexico, González et al. (2020) analyzed the psychological impact of COVID-19 prevention measures on a non-representative sample of the Mexican population. The authors found the presence of "intrusive thoughts," "avoidance," "hyperexcitation," and clinically significant post-traumatic stress symptoms. They identified a positive relationship between psychological distress and age, womanhood, as well as social isolation, the number of days in isolation, the number of people in the household and loss of income, among others.

In this article we seek to establish the impact of the COVID-19 health crisis on mental health in Mexican immigrants in the United States and the Mexican population residing in Mexico and establish differences between them. We start from the hypothesis that the health

crisis due to COVID-19 generated increases in the levels of psychological distress in Mexican immigrants in the United States, as well as in the population residing in Mexico, and that in the case of immigrants, the effects are greater due to the high vulnerability of many of them. Our main contribution lies in observing whether, among the Mexican population, the condition of immigrant, implied an increased risk of developing psychological discomfort in the second year of the pandemic.

In addition to this introduction, the article has five sections, in the first we present a brief background on the relationship between migration-mental health and pandemic; in the second we describe the methodology used, in the third we present the findings of the research; in the fourth a brief discussion of the results and in the fifth, some conclusions and methodological recommendations for social research of public policy for the mental health care of the Mexican population in general and of immigrants in particular.

Background

In Mexico, particularly during the first year of the pandemic, many people lost their jobs and with it their income. The number of underemployed people, that is, those with the need and availability to work longer, went from 5.1 million in March 2020 to 11 million in April and the unemployment rate increased by 1.7 percentage points (INEGI, 2020). The vast majority of Mexican immigrants in the United States and workers in Mexico who lost their jobs lack unemployment insurance and those who have it are limited to a short period of time (Desilver, 2020).

Among the multiple factors that can influence people's mental health during the health contingency, we have emphasized unemployment and economic deprivation, because in addition to the fact that these conditions in themselves constitute risks to mental health

(Williams, 2010; Caicedo and van Gameren, 2019), they make many people unable to guarantee their physical safety and that of their families. In other words, in addition to the common concern and uncertainty that the pandemic can generate, there is also the anguish due to the scarcity of economic resources to face it. In the case of many Mexican immigrants, the situation can become more complex, since the difficult economic situation that many face is compounded by the various difficulties imposed by the process of social integration (Berry, et al., 1987; Salgado, 2002; Finch, et al., 2004) while the reduction in per capita income will increase poverty levels.

The health crisis and its collateral effects have sown great uncertainty in the population in general, and in the most vulnerable in particular, to the extent that many people have seen their foresight capacity decimated, the possibility of having money, their physical security, the opportunity to use their occupational skills, have seen the fulfillment of their goals truncated, the possibility of interpersonal contact, as well as maintaining a valued social position, aspects that, although they are external to the individual, constitute essential "vitamins" for mental health (Warr, 1987).

From the stress theory, it is proposed that many of the mental disorders are not caused strictly by diseases, as defined by biomedicine, but that there are a series of psychosocial and physiological factors that give rise to their emergence. Tausig et al (2003: 23) point out that stressors that are not under control can produce physiological or chemical changes in the brain. In the words of the authors, this approach does not focus on stress-induced brain disorders, but on social conditions that can stimulate these consequences. If we consider that the sudden loss of employment is an especially stressful event in the life of any individual and if we add to this that socioeconomic disadvantages negatively influence both their physical and mental health (WHO, 2010), it is to be expected that populations in precarious

living conditions will be more affected by the onslaught of the COVID-19 coronavirus pandemic.

Method

Source

The analysis is carried out from the survey "Salud Mental de Población de Origen Mexicano en Estados Unidos y México en el Contexto del COVID-19" (ESMEX-COVID-19). It is a non-probabilistic survey for the specific purposes of the research, it was applied between the months of June and November 2021. It was administered in digital format through the *Qualtrics software* and was aimed at Mexican people – born in Mexico – aged 18 and over who during that period of time resided in Mexico or the United States. As mentioned, the idea of observing people in the two countries lies in our purpose of establishing whether immigrant status increases the risk of developing mental illness during the pandemic.

The application of the questionnaire had two strategies, the first was its circulation through "snowball" and the second had to do with its massive dissemination through social media, civil organizations and government institutions such as the Instituto de los Mexicanos en el Exterior that coordinated its application through the Mexican consulates in the United States, as well as the Ministry of Health that facilitated its dissemination throughout Mexico, the Consejo Nacional de Población that disseminated through its website. In Mexico, the survey was also disseminated among students from higher education institutions. To motivate potential respondents to answer the questionnaire, they were informed that their email would be included in a draw for 120 Amazon e-cards ($50 each) in the two countries. The winning

people were sent the cards to the email provided. [1] Answering the survey took each person between 5 and 10 minutes.

Measures and definitions

Key information collected by the questionnaire is the mental health status and the changes therein since the first implementations of restrictions in Mexico and the US on March 13, 2020, as a result of the COVID-19 pandemic. In particular, we asked respondents if any time in their life a mental health condition had ever been diagnosed, providing the options of bipolar, anxiety, and personality disorder, depression, schizophrenia, ADHD, as well as an open field in which other conditions could be specified. We consider the responses to this question as the long-term mental health condition of the respondent. Subsequently, two other questions explored how one's mood had changed in comparison with before the pandemic, and how one felt in the 30 days before the questionnaire was responded. For the latter, we apply the Kessler K6 scale; summing the scores on a five-point scale, ranging from never to always, for each of the six items asking how often one felt (1) nervous, (2) restless and uneasy, (3) that everything takes a great effort, (4) so sad that nothing makes me happy, (5) worthless, and (6) desperate, gives an indicator que se mueve entre los valores 0 y 24 of how probable it is the respondent suffers psychological distress at the moment of responding the questionnaire (Kessler et al., 2002; Kessler et al., 2003).

[1] This was an anonymous survey, so no identification data was requested from the respondents. By not establishing descriptors that give reference to the people who answer the survey, there is a risk that an individual will answer more than one questionnaire. To partially control this, an email was requested and only one questionnaire was allowed to be filled out by email. The information collected was stored on the server of one of the institutions participating in the research.

The mood change is examined using four questions each responded on a four-point scale from 'strong disagreement' to 'strong agreement'. The questions are: (1) I have felt sad, depressed, and hopeless, like I had not felt before the pandemic; (2) I have had desires to hurt myself in a way that I had not had before the pandemic; (3) I have had trouble falling asleep, more than I used to before the pandemic; and (4) I am very afraid of what might happen. This did not happen to me before the pandemic. Note that a higher value indicates a worsening in the mood since the pandemic outbreak. Moreover, questions about income and financial concerns, as well as changes therein since the pandemic outbreak are asked, as well as about governmental support received due to the economic impacts of the coronavirus, and access to health insurance. .

Statistical approach

It is important to note that, given the form of distribution of the survey, it was not possible to control a probable selection bias in the data or establish quotas - sex, age, schooling, employment status - something that we will try to correct in the analysis. After a brief descriptive analysis of the research sample and the main outcomes regarding mental health status, a propensity score matching (PSM) analysis is performed to establish differences between the two groups that we distinguish while accounting for other characteristics.

The key feature of such analysis is that it only compares respondents that are indeed similar in all pre-pandemic characteristics except the country of residence. In order to do so, we match each respondent living in the US with one or more comparable respondents in Mexico, while respondents for whom no comparable units can be found at the other location will not be used for the analysis. By implication, we can only draw conclusions for the sample

of comparable respondents, but given the non-probabilistic nature of the data collection we had already established that our results are not generalizable to the full population.

The precise matching mechanism is always a point of discussion. While exact matching would have the advantage that respondents are identical on the selected characteristics, only a small set of characteristics can be used in order to find matches. A common strategy to use more information and increase chances of matching, is to perform the matching based on summary indicator known as the propensity score. Propensity scores are obtained by a preliminary regression explaining the country of residence – US or Mexico – by a broad set of pre-pandemic characteristics. Respondents living at either location but with similar predicted values have a combination of characteristics that suggests that with their background they are comparable to respondent at the other location, and that the only remaining difference is the country where they live. As a consequence, differences in the outcome of interest – some mental health indicator – can be assigned as being caused by the location (Rosenbaum and Rubin, 1983).

Results

Table 2 shows that of the 1304 respondents who participated in our survey, 1065 resided in Mexico while 239 were living in the US. In both samples there is a clear majority of women, while the sample in the US is dominated by married respondents while in Mexico the larger group is formed by single respondents who have never lived with a partner. As we mentioned before, the clearest indicator that our samples are not representative for all Mexicans is given by the level of education that has been attained; respondents with college degrees or more are overrepresented.

Table 2 Sociodemographic characteristics by country of residence

Variables	Mexico	US
Age (average)	38.86	42.56
Female *(%)*	62.0	74.9
Marital status (%)		
Married	31.1	63.2
Living together, not married	13.0	13.0
Single; never married/together	41.9	8.8
Single; widowed or separated	14.1	15.1
	100	100
Number of under-18s in the household (average)	0.81	1.26
Number of economic dependents (average)	1.24	1.90
Education (%)		
Up to unfinished high school	2.2	16.3
High school or similar, unfinished college	17.3	38.5
College degree	48.0	27.2
Postgraduate	32.6	18.0
	100	100
Main activity before pandemic (%)		
Employee, salaried worked	62.5	59.0
Student	19.7	6.3
Self-employed	11.1	15.1
Household chores, retired, unemployed	6.7	19.7
	100	100
Ever diagnosed with a mental disorder before pandemic (%)	29.1	30.5
Number of observations	1065	239
Percentages by country	(81.7%)	(18.3%)

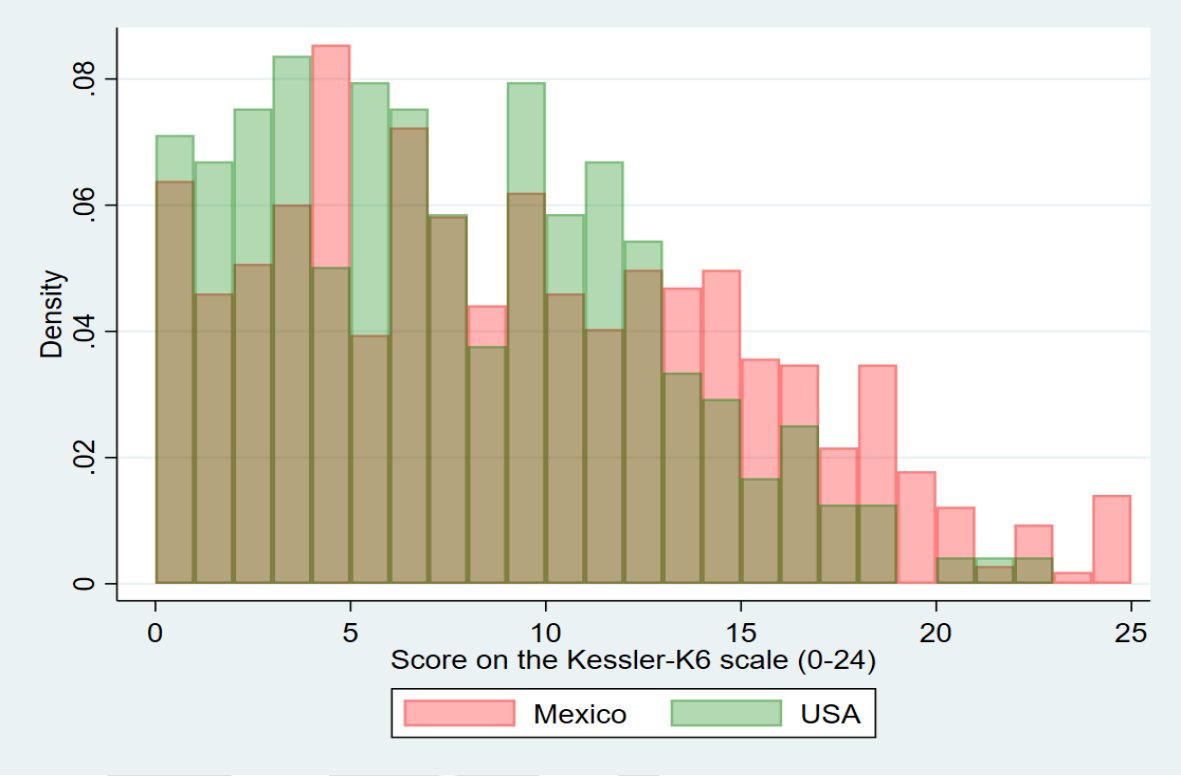
Source: ESMEX-COVID-19, 2021.

Mental health since the pandemic

Figure 1 shows the distributions of the total scores on the Kessler K6 items in the groups of Mexicans living in Mexico (red) and in the US (green). Higher scores, indicating that psychological distress more likely, is more common among our respondents living in Mexico

than in the US. Hence, at the moment of being surveyed – that is, more than a year after the pandemic outbreak – those living in the US appear to have better mental health.

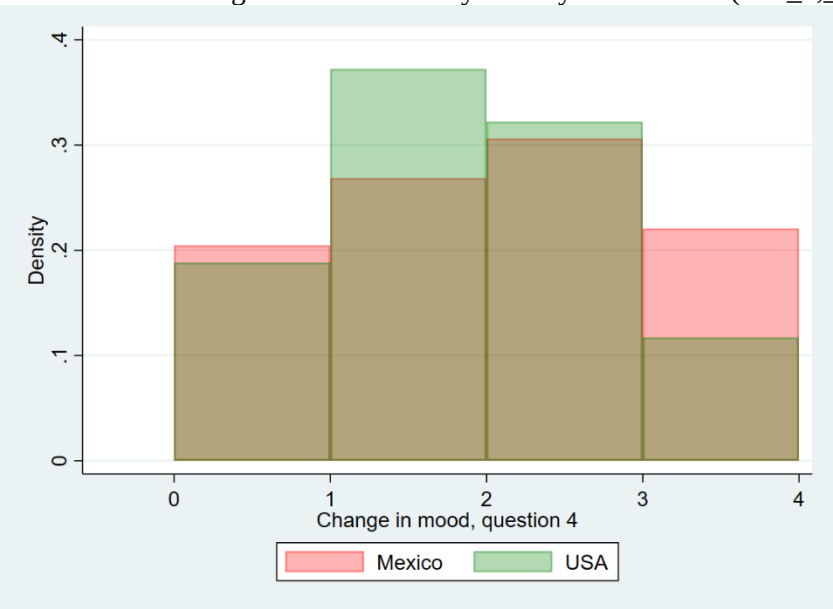
Figure 1 Scores on the Kessler K6 items by country of residence (*P33_1-P33_6*)



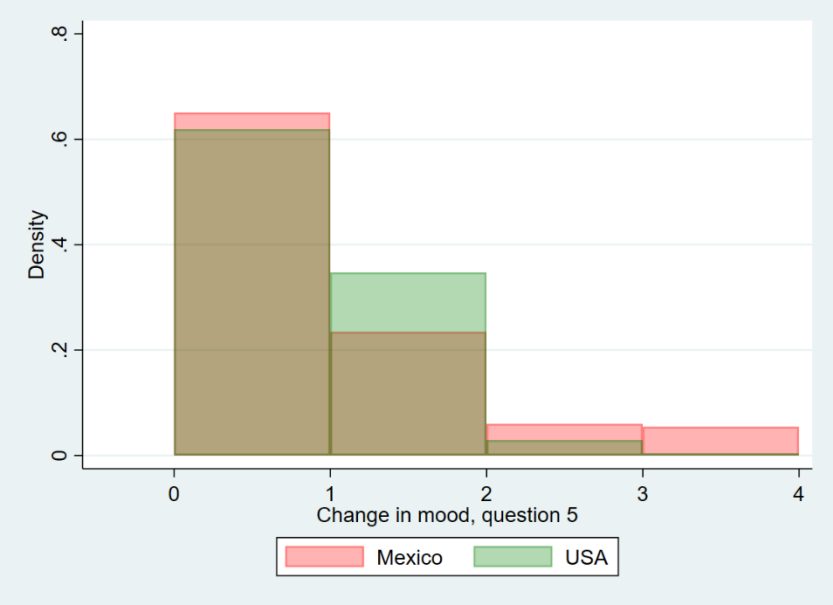
Source: ESMEX-COVID-19, 2021.

Figure 2 presents the distribution of scores on the agreement with the statements explicitly asking for comparison of the mood before and after the start of the pandemic, where a higher score indicates stronger agreement with a statement and thus a worsening of one's mood. Consistent with the worse mental health in Mexico, we now see that respondents in Mexico more frequently reported strong worsening of their moods. However, also at the lowest score – strong disagreement with the statement – we see that Mexicans in Mexico are better represented, while in the center of the distribution we find a relatively large number of Mexicans living in the US.

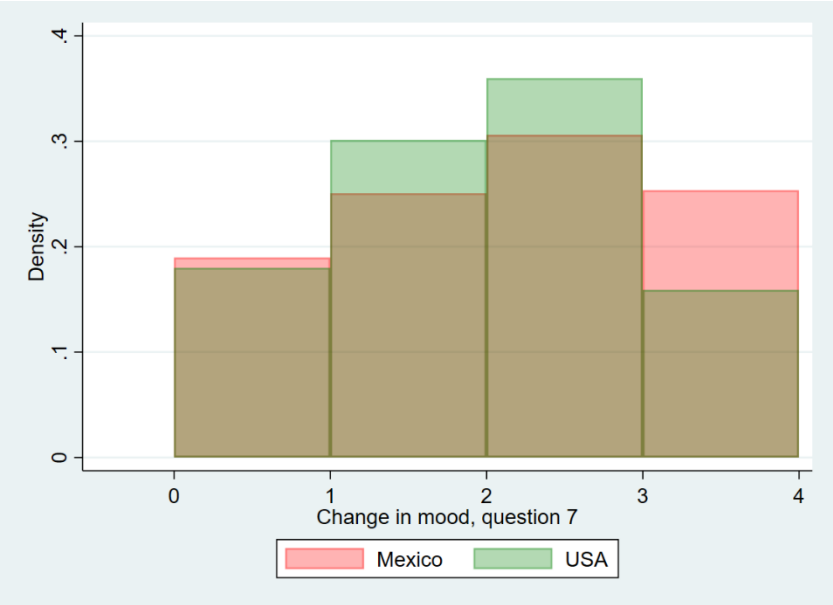
Figure 2 Scores on the change-in-mood items by country of residence (*P32_4,_6,_7,_8*)



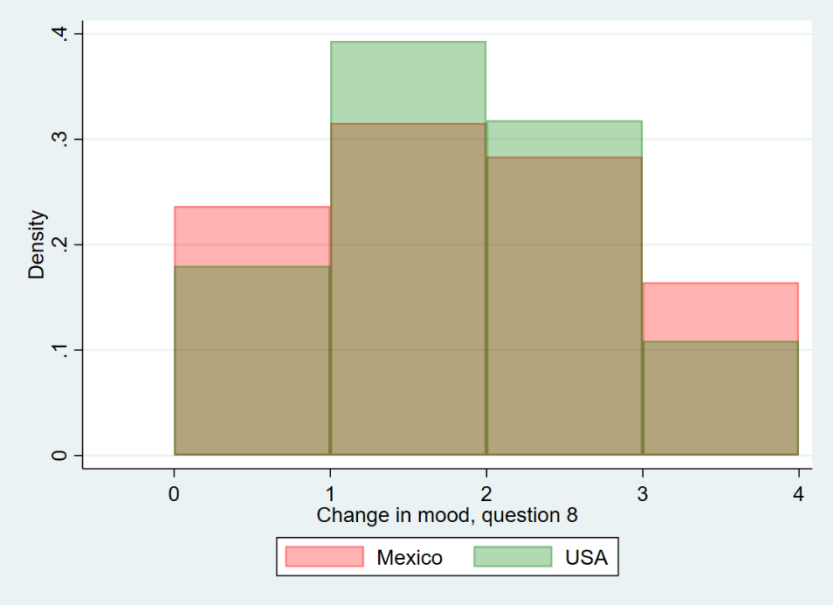
(a) Felt sad, depressed, and hopeless, more than before the pandemic



(b) Had desires to hurt myself in a way I had not had before pandemic



(c) Had trouble falling asleep, more than before the pandemic



(d) Very afraid of what might happen, unlike before the pandemic
Source: ESMEX-COVID-19, 2021.

Such differences are not visible in the share of respondents that have ever been diagnosed with a mental disorder; among the respondents in Mexico, 29.1% report having been diagnosed, rather similar to the 30.5% among those in the US. Both a higher score on the Kessler items (current distress) and a higher score on the mood change items (worsened

mood after pandemic outbreak) are more common when a respondent had been diagnosed with a mental disorder by a professional before the pandemic. That is in line with the expectations, as distress and disorders are often long-lasting phenomena (Rosas-Santiago, 2016); hence a correlation between an (earlier) diagnosis, distress at the moment of responding the questionnaire, as well as with a worsened mood compared to pre-pandemic times was to be expected.

Although the results in Figure 1 and 2 suggest that respondents in Mexico have been worse off than those in the US since the pandemic started, it is too early to draw that conclusion, not only because their point of departure may be different, but also other characteristics are not equal in the two samples, as demonstrated by Table 2. Therefore, as addressed in the methodological section, we will perform an analysis comparing only respondents that have similar characteristics.

Income and financial concerns since the pandemic

Table 3A and 3B show that our respondents in the Mexico more frequently reported an (individual) income above the nation's median income than Mexican immigrants living in the US, while moreover they less frequently indicated a reduction in the household income after the start of the pandemic. This income distribution is a direct consequence of the self-selection of rather higher educated respondents in Mexico, as addressed above; higher education generally comes with better-paid jobs with, moreover, more opportunities to maintain their income during the pandemic (Kochhar, 2020).

Table 3A Income categories in 2020, by country of residence *(P24_Mex, P24_EU)*

Income category in 2020	Research group: Mexicans	Mex. immi	Total
No income	145	47	192
	13.62	19.67	14.72
Income below median	404	135	539
	37.93	56.49	41.33
Income above median	516	57	573
	48.45	23.85	43.94
Total	1,065	239	1,304
	100.00	100.00	100.00

Table 3B Change in income after the start of the pandemic, by country of residence *(P16)*

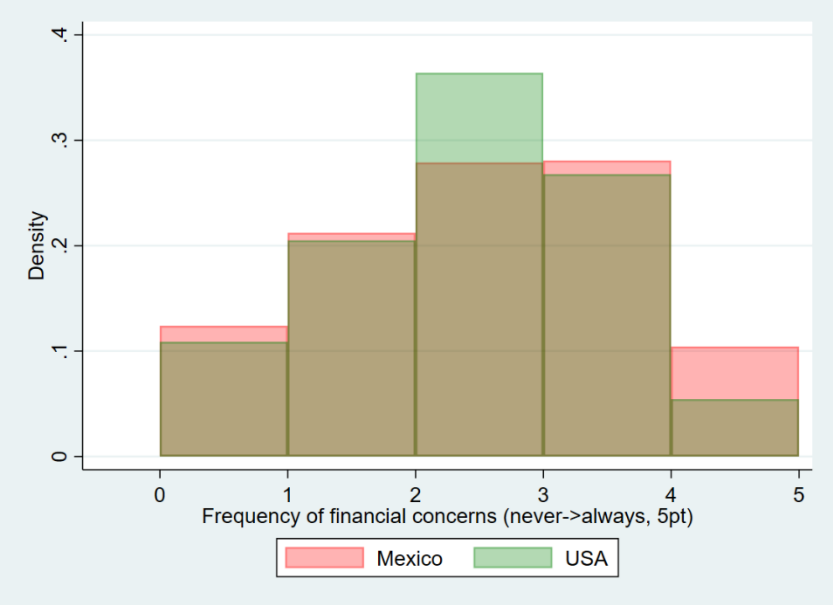
Income reduction in household	Research group: Mexicans	Mex. immi	Total
No income reduction	480	92	572
	45.07	38.49	43.87
Reduction of income	585	147	732
	54.93	61.51	56.13
Total	1,065	239	1,304
	100.00	100.00	100.00

Figure 5 shows that, since the start of the pandemic, both low and high levels of financial concerns are more frequent among respondents in Mexico, while the response in the middle, respondents 'some times' had concerns about lack of money, is more common in the US. Figure 6 indicates that, in comparison with Mexico, respondents in the US slightly more frequently responded that financial concerns were less than before the pandemic. Nevertheless, Figure 7 shows that in the US, more than in Mexico, respond to be 'somewhat sure' or 'not sure at all' regarding their certainty to have enough money for food for the four weeks following the survey response date.

Again, although the results in Table 3A-B and Figure 5, 6, and 7 suggest that there are post-pandemic differences in income and financial concerns between respondents in Mexico and in the US, it is too early to draw that conclusion, because not only their point of departure may be different, but also other characteristics are not equal in the two samples, as

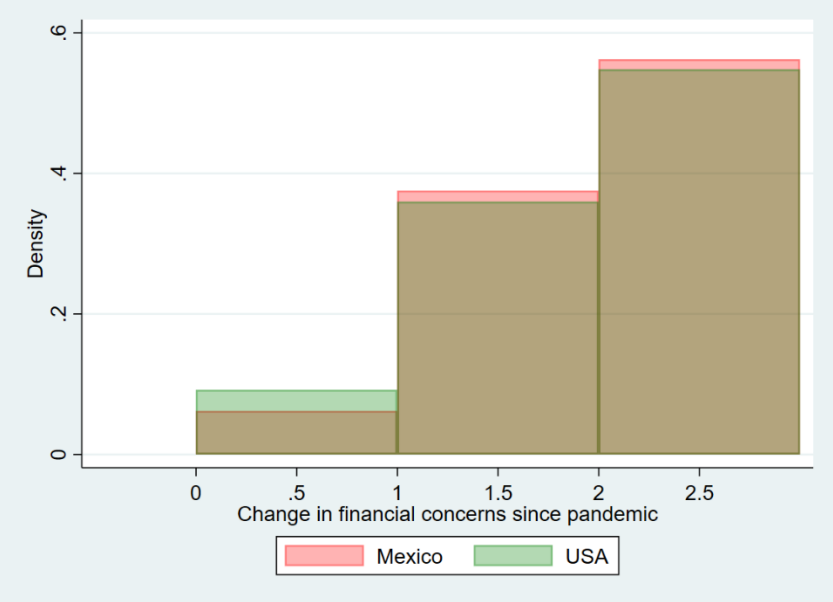
demonstrated by Table 2. Therefore, as addressed in the methodological section, we will perform an analysis comparing only respondents that have similar characteristics.

Figure 5 Financial concerns by country of residence *(P27)*



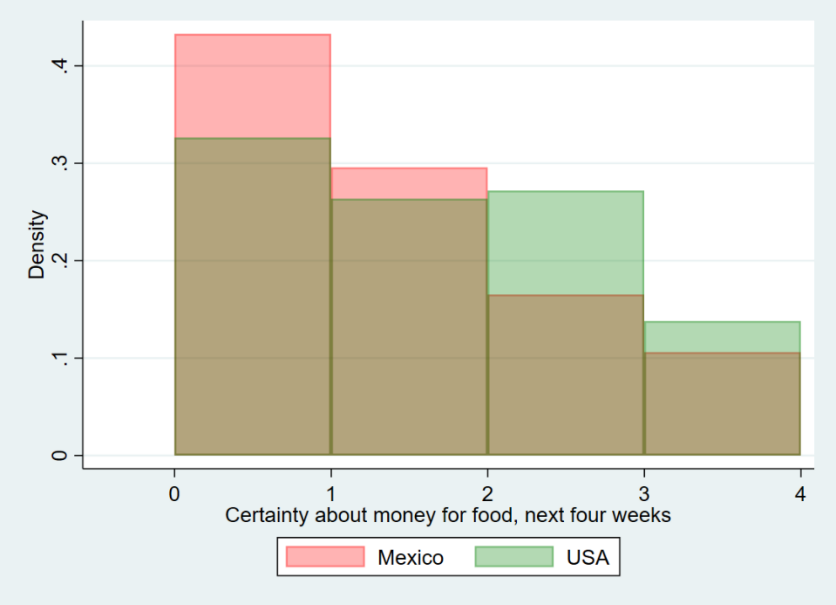
Source: ESMEX-COVID-19, 2021.

Figure 6 Change in financial concerns by country of residence *(P28)*



Source: ESMEX-COVID-19, 2021.

Figure 7 Concerns about sufficiency of money for food by country of residence *(P29)*



Source: ESMEX-COVID-19, 2021.

Comparisons in matched samples

Table 5A presents the results of the propensity score matching analysis, using sex, age, age squared, marital status, number of under 18s in the household, number of economic dependents, level of education, employment status before the pandemic started, ever having been diagnosed with a mental disorder, and whether the respondent has lost a family member or a person close to them due to the coronavirus. The latter, obviously, is not pre-pandemic, but it is certainly not affected by the respondent mental health and can thus be included as an exogenous variable; in both groups, 49.6% responded affirmative to the question.[2]

[2] The probit regression used to calculate propensity scores, that is, predicted probabilities that a respondent lives in the US instead of in Mexico, is presented in Appendix Table A.1. The balance in the original (U; unmatched) sample and in the matched samples (M) using three matching techniques is shown in Tables A.2-A.4. The t-tests show that before matching, the samples in US and Mexico are different in all aspects; in the matched samples the differences are not significant anymore, with the exception of pre-pandemic employment status for the two nearest neighbor approaches. When applying kernel matching (Table A.3), also employment before the pandemic is not significantly different anymore, although Table A.5 suggests that occurs because 5 observations could not be matched satisfactorily and have been dropped from the analysis (for the two nearest neighbor approaches, all observations in the US have been matched with their most comparable counterparts in Mexico).

The numbers show the differences in the scores on various outcome variables for Mexicans in the US, in comparison with those living in Mexico, using three different PSM techniques. The results indicate that, in the matched sample, respondents living in the US score about 1.5 points lower on the Kessler K6 score. Hence, at the moment of responding the questionnaire, respondents in the US are significantly less likely to show psychological distress than initially comparable respondents in Mexico. Regarding the indicators of the state of mind in comparison with before the pandemic, the differences tends in the same direction – less likely that mood has worsened in the US than in Mexico – but these differences are only marginally significant, with the largest and statistically strongest difference found for increased trouble to fall asleep since the start of the pandemic.

Table 5A Impact analysis. Difference in mental health and mood changes between comparable (matched) respondents in Mexico and US

	Nearest neighbor	Two nearest neighbors	Kernel matching
Scores on K6 items	-1.310	-1.634	-1.525
standard error	(0.697)	(0.594)	(0.479)
t-statistic	-1.88	-2.75	-3.18
Sad, depressed, and hopeless, more than before	-0.063	-0.109	-0.142
standard error	(0.121)	(0.103)	(0.087)
t-statistic	-0.52	-1.05	-1.63
Desire to hurt myself, more than before pandemic	-0.079	-0.136	-0.112
standard error	(0.090)	(0.079)	(0.062)
t-statistic	-0.89	-1.71	-1.80
Trouble falling asleep, more than before	-0.071	-0.195	-0.170
standard error	(0.128)	(0.110)	(0.089)
t-statistic	-0.55	-1.77	-1.91
Very afraid of what might happen, unlike before	-0.029	-0.092	-0.128
standard error	(0.123)	(0.106)	(0.085)
t-statistic	-0.24	-0.87	-1.51

Source: ESMEX-COVID-19, 2021

Table 5B does the same as Table 5A, but now for income and financial concerns. The first two lines address the income in 2020 (the first year of the pandemic) – coded as no income, income below the national median income, and income above the median. A significant negative difference in incomes is found between the matched samples of respondents in Mexico and US, suggesting that respondents with similar characteristics.in the US were more likely to be without income or earn below the median than respondents in Mexico. No significant difference in incomes is found for the change in income after the start of the pandemic; in both samples, respondents are equally likely to have witnessed a reduction in their income.

Although differences in changes in income are not significant, differences in financial concerns, and changes therein, are significant: respondents in the US were significantly less frequently concerned about lack of money than comparable respondents in Mexico. Moreover, they report (almost) significantly less often that their financial concerns have increased in comparison with before the pandemic. On the other hand, for the concerns about lack of money for food, there is no difference between the two samples.

Table 5B Impact analysis. Difference in income and financial concerns between comparable (matched) respondents in Mexico and US

		Nearest neighbor	Two nearest neighbors	Kernel matching
Income in 2020 *(no income, below, above median)*		-0.218	-0.195	-0.133
	standard error	(0.081)	(0.071)	(0.060)
	t-statistic	-2.67	-2.73	-2.21
Income change		-0.054	-0.065	-0.005
	standard error	(0.058)	(0.051)	(0.044)
	t-statistic	-0.93	-1.28	-0.12
Financial concerns		-0.276	-0.354	-0.306
	standard error	(0.144)	(0.121)	(0.099)
	t-statistic	-1.91	-2.92	-3.09
Change in financial concerns		-0.109	-0.151	-0.101
	standard error	(0.073)	(0.064)	(0.056)
	t-statistic	-1.49	-2.37	-1.79
Concerns about money for food		0.096	-0.002	-0.042
	standard error	(0.123)	(0.109)	(0.091)
	t-statistic	0.78	-0.02	-0.47

Source: ESMEX-COVID-19, 2021

COVID policies and mental health

Until here we have not addressed the role of COVID policies and their influence on mental health outcomes, partly because the measures we asked for in the questionnaire – having obtained a vaccine, and if someone in the household has received government support – are not independent (pre-pandemic) variables, but depend on decisions made by the respondent (or others in the household) during the pandemic. Hence, we can analyze them as outcome variables, and observe differences between respondents in the US and Mexico, using the same matching models as used in Table 5. We do that in Panel A of Table 6, and find that respondents in the US have had clear advantages regarding vaccine access (up to 11 percentage points, using kernel matching) and even more so, about 50 percentage points for government support.

For a selected set of outcomes we analyze differences between the two groups while including the vaccine status (Table 6, Panel B) and government support (Panel C), respectively, as control variables for the matching procedure. Hence, for respondents to be considered comparable, also vaccine status or government support must be similar in Mexico and the US. The results show that differences in vaccine policies only make a very small contribution to the differences in mental health issues and financial concerns between the two groups; the impact reported in Table 6 (Panel B) are rather similar to the findings reported in Table 5.

In contrast, Panel C of Table 6 shows larger differences between the two groups than obtained in Table 5, indicating that when we compare respondents with similar characteristics and moreover comparable levels of government support, those living in the US are even less likely to show a risk for psychological distress and for having financial concerns then when we did not control for government support. This suggests that when we take the broader availability of financial support by the government in the US out from the picture (Table 6-

Panel C), we encounter that the already favorable mental health status in the USA (Table 5A) would have been even more favorable had government support been equal. An interpretation of this finding is that the lack of government support in Mexico caused a resilience and need for self-sustainability towards the hardships that got reflected in a reduced reporting of mental health problems, perhaps because giving in to the (mental) issues would make the (economic) situation only worse. Note that for financial concerns the opposite seems to happen – although the difference is a lot smaller: with differences in government support (Table 5B), respondents in the USA report fewer concerns than in Mexico, while when we equalize also government support (Table 6) the difference between USA and Mexico is slightly smaller.

Table 6 Impact analysis. Difference between comparable (matched) respondents in Mexico and US

		Nearest neighbor	Two nearest neighbors	Kernel matching
PANEL A				
Vaccine obtained		0.122	0.093	0.117
	standard error	(0.046)	(0.037)	(0.032)
	t-statistic	2.67	2.51	3.72
Government support received in household		0.485	0.502	0.510
	standard error	(0.049)	(0.041)	(0.037)
	t-statistic	9.98	12.14	13.86
PANEL B – matching also on vaccines				
Scores on K6 items		-1.308	-1.335	-1.343
	standard error	(0.726)	(0.633)	(0.495)
	t-statistic	-1.80	-2.11	-2.71
Financial concerns		-0.321	-0.306	-0.277
	standard error	(0.139)	(0.122)	(0.103)
	t-statistic	-2.31	-2.50	-2.70
PANEL C – matching also on government support				
Scores on K6 items		-1.791	-2.795	-2.309
	standard error	(0.978)	(0.913)	(0.827)
	t-statistic	-1.83	-3.06	-2.79
Financial concerns		0.013	-0.314	-0.251
	standard error	(0.205)	(0.182)	(0.168)
	t-statistic	0.06	-1.72	-1.50

Source: ESMEX-COVID-19, 2021

Discussion

In the matched sample of comparable Mexican immigrants in the US and Mexicans in Mexico, we find that a year in the pandemic, immigrants report less non-specific psychological disorders, while no clear differential change in mood is found. Neither do we find differential developments in income but do find evidence that concerns about lack of

money are less common among Mexicans in the US than in Mexico, although these concerns have not led to differences regarding concerns about lack of money for food.

These findings son consistentes con los resultados de otras investigaciones, los inmigrantes mexicanos tienen menor probabilidad de desarrollar malestar psicológico que su contraparte en México. (Caicedo et al., 2021).

A core limitation of our research is, that no son muestras representativas, even after matching on background characteristics. The matching procedure ensures that we only compare respondents with similar (average) characteristics, but is not capable to establish representativeness for the general population. In particular, the matching procedure implies that each respondent in the US is matched with one or more (weighted) respondents in Mexico that are most comparable to the US respondent; the results reported in Table 5 are thus valid for respondents that look those in the US (that is, final column of Table 2).

Conclusions

In this article we were able to verify that immigrants had a lower risk of developing psychological distress than their counterparts in Mexico, as well as a lower probability of having worsened their mood in general, during the pandemic (although these differences were not statistically very strong). In both countries, populations were equally likely to experience reductions in their income during the observed year of the pandemic. However, Mexican immigrants were significantly less concerned about the lack of money than people residing in Mexico.

Although we try to make the two samples comparable, we must recognize that our results may be permeated by a possible selection bias of the informants. In particular, the samples are not representative for the Mexican population in the U.S. or Mexico. Since it is

a digital questionnaire, it is likely that the majority of our respondents have been people with access to a smart cell phone and with internet connection. Many immigrants in agricultural fields or people in marginal regions of Mexico may not have had access to the survey, precisely because they lack a device, or the digital connectivity needed to access these types of questionnaires.

This reveals two important aspects, on the one hand, it highlights the socio-economic gaps that exist within each country and the need to make new information technologies accessible to the population. This is not a minor aspect, to cite an example, in the first year of the pandemic, in Mexico only 39.5% of children and adolescents (of the 2019-2020 school year) had a fixed internet connection, 34.0% had at least one computer and 49.1% had two or more cell phones. These percentages decrease at thelowest socioeconomic levels (UNICEF, 2021). Connectivity also influenced the possibility of having medical care remotely and helped mitigate social isolation. The pandemic reminded us that there is a vicious circle that enlarges and perpetuates inequalities in society. On the other hand, it made evident our limitations to observe and generate greater academic knowledge about the mental health of the most vulnerable populations in contexts of health crisis such as the one we are experiencing.

Finally, our results lead us to raise the need to develop new binational research of greater scope. For example, to have both economic and political resources to apply representative surveys of the Mexican population in both countries that, firstly, allow us to account for the mental health of individuals in different socioeconomic strata and, secondly, allow us to observe with greater precision what is happening with the mental health of Mexicans abroad. Undoubtedly, these would be far-reaching projects that require the political will of the rulers of both countries.

In addition to the above, it is necessary to develop longitudinal surveys that allow us to identify in a timely manner the factors that affect the mental health of Mexicans inside and outside their country. This is a fundamental aspect that would help us to make limited public policy recommendations focused on meeting the specific needs of the population in this matter.

Future research should also try to incorporate the variable "immigration status" into their analyses, as it is the only way to establish whether, in general, immigrants, even in crisis contexts, maintain better health than their counterparts in their country of origin. It is possible that, by separating documented immigrants from undocumented immigrants, we will find differences in the likelihood of developing a mental illness.

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ONLINE APPENDIX

Table A.1 Probit estimation used to calculate propensity scores

```
Probit regression                                 Number of obs =  1,304
                                                  LR chi2(16)   = 290.13
                                                  Prob > chi2   = 0.0000
Log likelihood = -476.07636                       Pseudo R2     = 0.2335

------------------------------------------------------------------------------
                      group3 | Coefficient  Std. err.      z    P>|z|
-----------------------------+------------------------------------------------
                      female |   .2016016   .1056368     1.91   0.056
                         age |   .0715771   .0302931     2.36   0.018
                       agesq |  -.0827631    .032785    -2.52   0.012
                             |
                  marstat_be |
          Living together un |  -.5871116   .1466994    -4.00   0.000
Single; never married or li |   -1.07996   .1512718    -7.14   0.000
Single; widowed, separated, |  -.4778207   .1368494    -3.49   0.000
                             |
                  househ_unde |  -.0393527   .0511684    -0.77   0.442
                  econ_depend |   .0171853   .0425526     0.40   0.686
                             |
                   education |
High school, vocational, un |  -.4393715   .1928488    -2.28   0.023
                College degree |   -1.384628   .1922281    -7.20   0.000
                  Postgraduate |    -1.45593   .2027049    -7.18   0.000
                             |
                   empl_befor |
                       Student |    -.24113   .1849443    -1.30   0.192
                 Self-employed |   .0592985   .1373928     0.43   0.666
Household chores, unemployed, |   .4031302   .1527611     2.64   0.008
                             |
                     diagnosis |   .0199186   .1021795     0.19   0.845
                    coviddeath |  -.1619499   .0936132    -1.73   0.084
                         _cons |  -.9229979   .6987454    -1.32   0.187
------------------------------------------------------------------------------
```

Table A.2 Balancing properties, nearest neighbor matching

Variable	Unmatched / Matched	Mean Treated	Mean Control	%bias	%reduct |bias|	t-test t	t-test p>|t|	V(T)/ V(C)
female	U	.74895	.61972	28.0		3.79	0.000	.
	M	.74895	.75314	-0.9	96.8	-0.11	0.916	.
age	U	42.561	38.861	31.9		4.24	0.000	0.71*
	M	42.561	45.172	-22.5	29.4	-2.69	0.007	0.99
agesq	U	19.232	16.672	25.0		3.37	0.001	0.80
	M	19.232	21.531	-22.4	10.2	-2.57	0.010	0.96
1.marstat_before	U	.12971	.12958	0.0		0.01	0.996	.
	M	.12971	.11297	5.0	-12809.1	0.56	0.576	.
2.marstat_before	U	.08787	.41878	-82.2		-10.00	0.000	.
	M	.08787	.1046	-4.2	94.9	-0.62	0.536	.
3.marstat_before	U	.15063	.14085	2.8		0.39	0.696	.
	M	.15063	.159	-2.4	14.5	-0.25	0.801	.
househ_under18s	U	1.2636	.80563	39.0		5.76	0.000	1.41*
	M	1.2636	1.159	8.9	77.2	0.93	0.352	1.16
econ_depend	U	1.9038	1.2357	47.2		6.67	0.000	1.08
	M	1.9038	1.8368	4.7	90.0	0.49	0.623	0.89
1.education	U	.38494	.17277	48.6		7.40	0.000	.
	M	.38494	.40586	-4.8	90.1	-0.47	0.641	.
2.education	U	.27197	.47981	-43.9		-5.92	0.000	.
	M	.27197	.28452	-2.7	94.0	-0.31	0.760	.
3.education	U	.17992	.32582	-34.0		-4.48	0.000	.
	M	.17992	.16318	3.9	88.5	0.48	0.628	.
1.empl_before	U	.06276	.19718	-40.8		-5.01	0.000	.
	M	.06276	.04603	5.1	87.5	0.81	0.421	.
2.empl_before	U	.15063	.1108	11.8		1.72	0.085	.
	M	.15063	.23013	-23.6	-99.6	-2.22	0.027	.
3.empl_before	U	.19665	.06667	39.1		6.42	0.000	.
	M	.19665	.17992	5.0	87.1	0.47	0.641	.
diagnosis	U	.30544	.29108	3.1		0.44	0.660	.
	M	.30544	.33473	-6.4	-104.0	-0.69	0.494	.
coviddeath	U	.49791	.49484	0.6		0.09	0.932	.
	M	.49791	.49372	0.8	-36.2	0.09	0.927	.

* if variance ratio outside [0.78; 1.29] for U and [0.78; 1.29] for M

Sample	Ps R2	LR chi2	p>chi2	MeanBias	MedBias	B	R	%Var
Unmatched	0.234	290.13	0.000	29.9	32.9	133.1*	1.15	50
Matched	0.024	15.99	0.454	7.7	4.9	36.9*	1.06	0

* if B>25%, R outside [0.5; 2]

Table A.3 Balancing properties, matching using two nearest neighbors

Variable	Unmatched / Matched	Mean Treated	Mean Control	%bias	%reduct |bias|	t-test t	t-test p>|t|	V(T)/ V(C)
female	U	.74895	.61972	28.0		3.79	0.000	.
	M	.74895	.74268	1.4	95.1	0.16	0.875	.
age	U	42.561	38.861	31.9		4.24	0.000	0.71*
	M	42.561	43.18	-5.3	83.3	-0.64	0.526	0.98
agesq	U	19.232	16.672	25.0		3.37	0.001	0.80
	M	19.232	19.789	-5.4	78.3	-0.63	0.530	0.99
1.marstat_before	U	.12971	.12958	0.0		0.01	0.996	.
	M	.12971	.12971	0.0	100.0	-0.00	1.000	.
2.marstat_before	U	.08787	.41878	-82.2		-10.00	0.000	.
	M	.08787	.10251	-3.6	95.6	-0.54	0.586	.
3.marstat_before	U	.15063	.14085	2.8		0.39	0.696	.
	M	.15063	.17364	-6.5	-135.2	-0.68	0.496	.
househ_under18s	U	1.2636	.80563	39.0		5.76	0.000	1.41*
	M	1.2636	1.2029	5.2	86.8	0.54	0.587	1.18
econ_depend	U	1.9038	1.2357	47.2		6.67	0.000	1.08
	M	1.9038	1.9686	-4.6	90.3	-0.47	0.637	0.86
1.education	U	.38494	.17277	48.6		7.40	0.000	.
	M	.38494	.42678	-9.6	80.3	-0.93	0.353	.
2.education	U	.27197	.47981	-43.9		-5.92	0.000	.
	M	.27197	.25523	3.5	91.9	0.41	0.679	.
3.education	U	.17992	.32582	-34.0		-4.48	0.000	.
	M	.17992	.16318	3.9	88.5	0.48	0.628	.
1.empl_before	U	.06276	.19718	-40.8		-5.01	0.000	.
	M	.06276	.0523	3.2	92.2	0.49	0.624	.
2.empl_before	U	.15063	.1108	11.8		1.72	0.085	.
	M	.15063	.22594	-22.4	-89.1	-2.11	0.035	.
3.empl_before	U	.19665	.06667	39.1		6.42	0.000	.
	M	.19665	.14017	17.0	56.5	1.65	0.099	.
diagnosis	U	.30544	.29108	3.1		0.44	0.660	.
	M	.30544	.33682	-6.9	-118.5	-0.73	0.464	.
coviddeath	U	.49791	.49484	0.6		0.09	0.932	.
	M	.49791	.48954	1.7	-172.4	0.18	0.855	.

* if variance ratio outside [0.78; 1.29] for U and [0.78; 1.29] for M

Sample	Ps R2	LR chi2	p>chi2	MeanBias	MedBias	B	R	%Var
Unmatched	0.234	290.13	0.000	29.9	32.9	133.1*	1.15	50
Matched	0.015	9.66	0.884	6.3	4.9	28.5*	0.92	0

* if B>25%, R outside [0.5; 2]

Table A.4 Balancing properties, kernel matching

Variable	Unmatched / Matched	Mean Treated	Mean Control	%bias	%reduct |bias|	t-test t	t-test p>|t|	V(T)/ V(C)
female	U	.74895	.61972	28.0		3.79	0.000	.
	M	.74249	.73358	1.9	93.1	0.22	0.827	.
age	U	42.561	38.861	31.9		4.24	0.000	0.71*
	M	42.545	43.185	-5.5	82.7	-0.63	0.527	0.93
agesq	U	19.232	16.672	25.0		3.37	0.001	0.80
	M	19.238	19.877	-6.2	75.1	-0.70	0.487	0.94
1.marstat_before	U	.12971	.12958	0.0		0.01	0.996	.
	M	.13305	.14131	-2.5	-6271.0	-0.26	0.796	.
2.marstat_before	U	.08787	.41878	-82.2		-10.00	0.000	.
	M	.09013	.09953	-2.3	97.2	-0.35	0.730	.
3.marstat_before	U	.15063	.14085	2.8		0.39	0.696	.
	M	.15451	.16679	-3.5	-25.6	-0.36	0.719	.
househ_under18s	U	1.2636	.80563	39.0		5.76	0.000	1.41*
	M	1.2532	1.2403	1.1	97.2	0.11	0.909	1.20
econ_depend	U	1.9038	1.2357	47.2		6.67	0.000	1.08
	M	1.8755	1.9571	-5.8	87.8	-0.59	0.554	0.83
1.education	U	.38494	.17277	48.6		7.40	0.000	.
	M	.39485	.43476	-9.1	81.2	-0.87	0.383	.
2.education	U	.27197	.47981	-43.9		-5.92	0.000	.
	M	.27897	.27897	0.0	100.0	0.00	1.000	.
3.education	U	.17992	.32582	-34.0		-4.48	0.000	.
	M	.18455	.16536	4.5	86.8	0.54	0.587	.
1.empl_before	U	.06276	.19718	-40.8		-5.01	0.000	.
	M	.06438	.05134	4.0	90.3	0.60	0.548	.
2.empl_before	U	.15063	.1108	11.8		1.72	0.085	.
	M	.15451	.19269	-11.3	4.1	-1.09	0.277	.
3.empl_before	U	.19665	.06667	39.1		6.42	0.000	.
	M	.17597	.15599	6.0	84.6	0.58	0.563	.
diagnosis	U	.30544	.29108	3.1		0.44	0.660	.
	M	.30043	.30101	-0.1	95.9	-0.01	0.989	.
coviddeath	U	.49791	.49484	0.6		0.09	0.932	.
	M	.50215	.49751	0.9	-51.0	0.10	0.920	.

* if variance ratio outside [0.78; 1.29] for U and [0.77; 1.29] for M

Sample	Ps R2	LR chi2	p>chi2	MeanBias	MedBias	B	R	%Var
Unmatched	0.234	290.13	0.000	29.9	32.9	133.1*	1.15	50
Matched	0.007	4.58	0.997	4.0	3.7	19.8	1.27	0

* if B>25%, R outside [0.5; 2]

Table A-5 Common support properties, kernel matching

psmatch2: Treatment assignment	psmatch2: Common support Off suppo	On suppor	Total
Untreated	0	1,065	1,065
Treated	6	233	239
Total	6	1,298	1,304