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AIR POLLUTION AND SICK LEAVES: THE CHILD HEALTH LINK*

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Abstract

We examine the effect of air pollution (particulate matter under 10 $\mu g/m^3$, or mp10 concentrations) on sick leaves due to the child's health being affected. Our dataset is a large panel of Chilean parent-child pairs observed during the 52 weeks of 2007. Two main findings are reported. First, mp10 concentrations have a strong effect on child hospitalizations, and in particular hospitalizations for respiratory conditions. Second, mp10 concentrations also have an important effect on parental sick leaves when the underlying diagnosis is related to a respiratory condition, but no effects are observed in aggregate parental sick leaves.

Keywords: pollution, sick, leaves, child health
JEL Classification Codes: I12, J22

I. *Introduction*

A strong link has been found between both, atmospheric pollution and morbidity on one hand, and pollution and work absences on the other hand. These findings have mostly focused on the direct effects of pollution on worker's health and work absences. However, a large proportion of workers are also in charge of their families, and work time lost might be due to the need to care for family members who have suffered the health effects of pollution, as opposed to the worker's health having been affected.

Disentangling these two channels in the relationship between pollution and work absences is important for policy purposes. Indeed, the two types of sick leave: due to the worker's vs the child's ill health, have rather different policy prescriptions. While the main tool to mitigate child related sick leaves, at least in Chile, is to limit exposure to contaminants by closing schools and preschools on heavily polluted days, the policy tools used to address sick leaves due to worker illness, such a traffic restrictions, all aim to reduce the level of contamination.

In this paper, we use a large weekly panel of Chilean workers with young children covered by a private health insurance plan, which in Chile must also cover sick leaves

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associated to the child's health[1]. We use it to examine the effects that atmospheric pollution, measured by concentrations of particulate matter under 10 μg (pm10), have both on child health and on this type of sick leaves. We observe the precise diagnose of the child's condition, which allows us to isolate the effects of pollution on sick leaves associated to air quality-sensitive conditions, and in particular conditions of the respiratory system. In so doing, we are able to precisely identify an important mechanism linking air pollution, child health, and work days lost.

This paper has four other sections. In the next section we provide a discussion of the relevant literature. Section III presents the data used. Section IV discusses the model specification and the results, and section V concludes.

II. *Literature*

This paper is related to three bodies of literature. First, the literature documenting the relationship between different types of air pollution and child health, second, a literature linking air pollution and lost worktime and, finally, the literature on child health and parental labor supply.

On air pollution and child health, there is consensus that mp10 concentrations increase the incidence of respiratory conditions (see, e.g, Roemer and Brunekreef(1993) and Timonen and Pekkanen (1997)). The effect on other conditions is not as well documented. In a widely cited paper, Dockery and Pope III (1994) conduct a review of studies documenting the health effects of mp10 concentration in the US. The authors find consistent results across studies pointing to a 1% increase in mortality rate resulting from a 10 $\mu g/m^3$ increase in mp10.

Regarding the effects of air pollution on lost worktime, Hausman and Wise (1984) and Ostro (1983) conduct early studies of the effects of Total Suspended Particulates (TSP) on lost work, using repeated cross sections of individuals from the Health Interview Survey (HIS) of 1976. The findings point to a 10 $\mu g/m^3$ increase in TSP causing a 7% increase in work days lost. These studies cannot address the problems associated to unobserved heterogeneity. Poor individuals, for instance, might both live in higher pollution neighborhoods, and have a lower baseline health status. Among the papers that address these identification problems, Hanna and Oliva (2011) use a panel containing the closing of a large petrochemical plant in Mexico City to examine the effects of Sulfur Dioxide concentrations on hours worked, and find a significant effect with an elasticity of .6. They also report differential effects in mothers of children under 5 years of age, but are unable to further examine the causes, as we do. In Ostro (1987), the author use a panel of individuals from the 1976-1981 waves of the HIS to assess the effects of pollution, measured by pm 2.5 concentrations, on health and loss work days. The findings point to a significant, but small effect of pollution on lost work days. We are not aware of any contribution that examines the child health channel in the relationship between pollution and lost work.

Finally, there is an important literature documenting reduced labor supply by parents as a consequence of children's poor health. The focus of this literature is in documenting long term reduced labor supply as a consequence of children experiencing chronic health conditions. Most

[1] In what follows, we use "sick leaves" as shorthand for "sick leaves associated to a child's illness".

papers find evidence of reduced labor supply by mothers. This is the case in the contribution by Yamauchi (2012), using a logitudinal study of Australian families; in the pioneering study by Salkever (1982) in the US; and in most of the studies reviewed by Powers (2003) that focuses of disabled children. By contrast, our study is interested in a "high frequency" phenomenon, where both the child's illness and the reduced labor supply of parents are short term phenomena.

III. *Data*

Chilean Law stipulates that parents with children under one year old may request sick leave to care for the child. The number of days is determined by a physician, and must be approved by the health insurer. The first three days of leave are paid by the worker, with subsequent days being paid by the health insurance company. Insurers then keep high quality data on such episodes, including the diagnosis, extent of the sick leave episode, as well as child characteristics. At the same time, mothers had the right to take about 3 months (84 days) of paid maternity leave, at birth, at the time this data was collected. Since we cannot identify who did take maternity leave, we eliminate from the dataset all observations with children younger than 4 months.[2]

Our data comprises then all individuals with a private health insurance plan covering a child between 5 and 11 months old at some point in the year 2007. Given that the pollution measure has seemingly random gaps at a number of measuring stations, we chose to aggregate the data by week, yielding 240, 455 individual-week observations on 19, 538 individuals spanning the 52 weeks of 2007.

According to the 2006 wave of the official household survey, CASEN, 15.8% of Chileans were affiliated to a private insurer (ISAPRE) in that year, just before the period covered by our data. Relative to those affiliated with the public insurer (FONASA), this group is wealthier, with a mean earnings of 734,000 vs. 210,000 Chilean pesos; and younger, with a mean age of 30 vs. 33 years old. While there are reasons to think that ISAPRE affiliates are also healthier, in average, than their FONASA counterparts, the law on sick leaves applies to all workers, regardless of their health insurer. It is unlikely, therefore, that risk selection across insurers occurs on the basis of eligibility for sick leave coverage.

Our health data was provided by the Chilean health regulatory agency, the Superintendencia de Salud, which in turn obtained it from the insurers. The main explanatory variables used in this study are weekly maxima and average concentrations of mp10 by municipality, *mean mp10* and *max mp10* respectively. These variables were constructed from daily data obtained from the Chilean National Weather Service, which measures mp10 levels through a system of 118 stations across the country. We also construct lagged variables spanning the 2 previous weeks. These variables represent the average concentration over this period (*lagged mean mp10*), and the maximum daily concentration over the period (*lagged max mp10*).

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[2] Note that workers have access to a different type of sick leaves in cases where they become ill. There is no scope in our data for sick leaves due to a child illness masking an interest of the parent to stay at home due to health problems.

TABLE 1. SUMMARY STATISTICS

Variable	Mean	Std. Dev.	Min.	Max.	N
sick leave dummy	0.04	0.2	0	1	243986
sick leave days	0.67	3.87	0	90	243986
dummy for hospitalization	0	0.03	0	1	243986
max mp10	84.5	44.63	1	600	243986
mean mp10	57.6	26.65	1	366.5	243986
worker age	33.63	5.60	15	67	240455
earnings	7.29	4.36	0	57.5	240455
partner covered	0.3	0.46	0	1	240455
female policyholder	0.43	0.49	0	1	240455
female	0.48	0.5	0	1	240455
child age	8.09	2.01	5	11	240455

TABLE 2. SICK LEAVE INCIDENCES, BY DIAGNOSIS GROUP

ICD 10 diagnosis group	cases	percentage
F: Mental and behavioral	1,075	7.80
J: Respiratory system	4,445	32.24
K: Digestive system	5,634	40.86
M: Muscoskeletal system	305	2.21
P: Perinatal cond.	384	2.79
Other diagnoses	3,456	14.10

Two main dependent variables are used. Our measure of parental sick leaves is the number of days of sick leave due to a child's health approved in a given week, a measure that goes from 0 to 90. If the measure is larger than 7 times x, we assign a missing value to the following x weeks for that individual, as she would be unable to request further sick leave days in those weeks. Our measure of child health is an indicator of whether the child was admitted to hospital for at least one day in the week, and was obtained from a hospital discharge dataset, also obtained from the health regulator. Our set of control variables is formed by earnings, in hundreds of thousands of 2007 Chilean pesos; month (1 to 12); proportion of urban dwellers in the municipality (*urban*); a dummy for the worker being female (*female policyholder*); a dummy for the child being female (*female*), the measure being randomized in the case of twins; and the number of children under 1 year of age.

Table 1 presents descriptive statistics for the main variables. In our data, individuals obtain sick leaves on 4% of the weeks, and each sick leave lasts in average 4.1 days. Average concentrations of pm10, in turn, are 57.6 $\mu g/m^3$, while weekly maxima are, in average, 84.5 $\mu g/m^3$. As a benchmark, Dockery and Pope III (1994) survey eight papers that use pm10 concentrations to examine the links between pollution and morbidity for different US cities. Mean concentrations in these studies are in a range of 28 to 48 $\mu g/m^3$. The data also shows that an average parent is 34 years old, the average child is 8.1 months old, and 48 % of children are females.

Table 2 shows the distribution of parental sick leaves by underlying diagnosis. Note that the main diagnosis group is digestive system conditions, with 40.86% of incidences, followed by respiratory system conditions, with 32.24% of incidences.

Requested sick leave days may be reduced or altoghether rejected by the insurer, after which the worker may appeal to a government body. To our knowledge, the criteria for rejection are not clear, with at least one media account reporting that rejection is a cost cutting policy which is randomly implemented by insurers. The same report also states that 90% of the appeals are successful (CIPER (2010)).

We have then a case for treating at least some rejected sick leave requests as legitimate and incorporating them in the analysis. We choose to use the actual sick leave days approved, including those approved after an appeal, in our baseline regressions. Some sensitivity analysis is performed with an indicator variable for all sick leaves requested.

In our data, 10.8% of sick leave requests are rejected, and a further 5.4% have the requested days reduced. A simple regression of an indicator of reduced/rejected sick leave on pollution measures and individual controls shows that this indicator is correlated to lagged pm10 concentrations (coef. = -.0004, p = .053), as well as age (coef. = .004, p = .00), child age (coef. = .02, p = .00), and earnings (coef. = -.02, p = .00). As we will see in what follows, the magnitude of these correlations, and in particular that with pm 10 concentrations, is small enough that no significant differences emerge in our results when using the restricted (without the reduced/rejected sick leaves), and the unrestricted datasets.

IV. *Model Specification and Results*

Before defining the statistical model, it is worth defining the mechanisms at play in both the decision to take a sick leave, and that of hospitalizing a child. Child health is affected by both, pollution at home and outside. Pollution at home depends on whether parents smoke, and on the type of heating technology used, among other factors. Cleaner heating (eg: natural gas vs wood) is clearly correlated to higher incomes. The lack of smoking is also typically found to be positively correlated to income, but causality is not as clear cut (see, e.g, Kenkel and Urban (2012)). Facing a polluted environment, parents have the choice to keep children at home, or sending them to childcare. Sending children to childcare is risky, as it involves the possibility of contagion. An important question is then, what is the capacity of households to substitute the child's time at home for time outside.

For a two parent, one worker household, keeping the child at home on heavily polluted days is clearly much easier than in the case where both parents work. In our data, the presence of a partner covered by the same insurance contract indicates that the partner is not a salaried worker, in which case she would be legally required to contribute and purchase her own insurance policy. We use the variable *Partner covered*, a dummy variable for the other parent being covered by the same policy, as an indicator that at least one person is not working. This measure is not perfectly informative of an adult staying at home, as it could be the case that the partner works in an informal or temporary job, where purchasing her own insurance policy is not mandatory. At the same time, among higher income families it is common to have a full time nanny at home, which also makes it easier to substitute children's time at home for time outside, and in particular at school.[3]

[3] To be granted a parental sick leave, parents of a sick child must first go to a doctor to obtain a sick leave prescription. They then have three days to give this prescription to their employer, who submits it to the health insurer. If the health insurer ends up not awarding the sick leave, the parent's absentee days will be discounted from the payroll.

In the case of sick leaves then, having a partner covered by the same insurance policy should predict a lower incidence of sick leaves. Higher income, in principle, should also predict lower incidence of sick leaves, as it is correlated to both cleaner air at home, and to extended opportunities for keeping the child cared for by a third party. Higher income, however, is also correlated to a higher valuation of the child's health, and with higher quality jobs where taking this type of sick leave is not penalized. The ultimate sign of the coefficient on earnings remains then an empirical question.

Regarding hospitalizations, it is harder -we believe- to make the health valuation argument. Higher income families will, for the reasons discussed above, have healthier kids who will most likely need to be hospitalized less often. In this case, the coefficient on income should be negative.

We estimate a linear model of sick leave days awarded in a given week, as well as child hospitalizations, as a function of *mean pm10*, *max pm10*, as well as a set of individual controls, including *earnings* and *Partner covered*. We also add our lagged measures of mean and maximum pm10. Our baseline model, using sick leave days, is

$$sick\ leave\ days_{i,t}=\beta_0+\beta_1 mean\ pm10_{i,t}+\beta_2 earnings_{i,t}+\beta_3 partner\ covered_{i,t}+\epsilon_{i,t} \qquad (1)$$

Families with children prone to becoming ill may select themselves into less polluted municipalities. At the same time, as already noted, lower earnings households tend to live in high pollution municipalities, and low earnings is also associated to a host of unobserved characteristics that likely also affect child health. In an OLS framework, while the first type of selection would imply that β_1 is biased towards zero, the second type of selection would have the opposite effect. We attempt to address these important identification issues by using individual fixed effects in our regressions.

Given that we focus on privately insured individuals, sample selection may occur along several other dimensions, which are worth discussing. First, individuals that are more health concerned will possibly both be more likely to choose private health insurance and will be more prone to to ask for sick leave. The effect of pollution in this case would be upward biased. However, individuals with private health insurance are also healthier in average, and their higher baseline health makes it less likely thatpollution will have a detrimental effect on children's health. This effect would make the coefficient on pollution biased towards zero.

Our fixed effect approach cannot completely eliminate the above discussed sources of bias. In both cases, the unobserved heterogeneity takes place at the level of the responses to pollutant concentrations, that is, of the coefficients, as opposed to the individual characteristics. One way to interpret our results then is to take the estimates as those of the population of private insured individuals, of which our sample comprises the entire set for the year 2007. We would argue that this subset is so large -effectively comprising 15% of the chilean population- that the coefficients are of interest by themselves.

The mechanism we examine here links pollution to child health, and child health to parent work absences. We begin by presenting, in table 3, the results on child hospitalizations and mp10 concentrations.

Columns 1 to 3 use an indicator of hospitalizations regardless of diagnosis as a dependent variable. Column 1 shows Logit results, and is presented as a benchmark. Here, mean mp10 concentrations are positively correlated to hospitalizations, as are earnings. neither the child's age, nor the worker's age or child gender have a significant correlation with the outcome.

TABLE 3. HOSPITALIZATION INCIDENCE

	Pooled	FE1	FE2	FE3	FE4
	(1)	(2)	(3)	(4)	(5)
mean mp10	.005	.007		-.003	
	(.002)**	(.004)		(.007)	
lagged mean mp10		.002		.02	
		(.005)		(.007)**	
max mp10			.004		.001
			(.003)		(.004)
lagged max mp10			.003		.01
			(.002)		(.004)**
earnings	.04	.006	.006	.10	.09
	(.02)**	(.04)	(.04)	(.07)	(.07)
partner covered	-.07	1.75	1.74	12.76	12.70
	(.15)	(1.21)	(1.21)	(640.24)	(607.74)
worker age	-.0004				
	(.01)				
female	-.12				
	(.13)				
child age	-.02				
	(.03)				
Obs.	240455	4130	4130	1663	1663

Note: *** significant at 1%, ** significant at 5%, * significant at 10%
Dependent variables: *Hospitalizations of under 1 year olds* (cols. 1 to 3); *Hospitalizations of under 1 year olds associated to a respiratory system diagnosis* (cols. 4 and 5).
Vars. not shown: *month*

In columns 2 and 3 we estimate the model by Conditional Logit. We use our two measures of concentration and their (two week) lags, and find no effect for either lagged or contemporaneous exposure.

In columns 4 and 5 we use an indicator of hospitalizations associated to respiratory system diagnoses (Diagnoses starting with the letter J in the International Classification of Diseases v. 10). Here, we find that only lagged measures of mp10 concentrations are associated to higher hospital admissions.[4]

Note that in all the conditional logit specifications of columns 2 to 4, the coefficient for earnings is positive, but insignificant. Similarly, having a partner covered under the same policy is not significant in any of the models in this table.

Our preferred specification, in column 4, implies that a 1 unit increase in lagged mean mp10 concentrations lead to an increase of 2 percent in the odds of the child being admitted to hospital due to a respiratory condition. The effect is then quantitatively important, taking into account that the average lagged mp10 concentration is 58.

We now turn to estimating the effects of pollution on parental sick leave days. The results are shown in table 4. As in the previous table, the first three columns show results on all sick leaves, regardless of the underlying diagnose. The first column show standard OLS estimates, and is presented as a benchmark. Here, sick leave days are positively correlated to mean mp10

[4] Note that the diagnoses contained in the sick leave forms and the hospital discharge data are independently recorded.

TABLE 4. SICK LEAVE DAYS

	Pooled	FE1	FE2	FE3	FE4
	(1)	(2)	(3)	(4)	(5)
mean mp10	.005	-.0002		-9.13e-06	
	(.0003)***	(.0004)		(.0002)	
lagged mean mp10		.002		.001	
		(.0005)***		(.0002)***	
max mp10			-.0005		.0002
			(.0003)*		(.0001)
lagged max mp10			.002		.0006
			(.0003)***		(.0001)***
earnings	.01	.03	.03	.006	.006
	(.002)***	(.005)***	(.005)***	(.002)**	(.002)**
partner covered	-.91	.06	.06	.008	.009
	(.02)***	(.05)	(.05)	(.01)	(.01)
worker age	-.01				
	(.001)***				
female	.06				
	(.02)***				
child age	-.20				
	(.004)***				
Obs.	240455	213638	213638	213638	213638

Note: *** significant at 1%, ** significant at 5%, * significant at 10%
Dependent variables: *Sick leave days* (cols. 1 to 3); *Sick leave days associated to a respiratory system diagnosis* (cols. 4 and 5)
Vars. not shown: *month*

concentrations, with an elasticity of .42 at the mean. The estimates of earnings are positive and significant in all specifications. Worker age, the child being a boy and the child's age, are all negatively associated to sick leave days, and the results also hold when using incidence.

In columns 2 and 3 we estimate the model with individual fixed effects. Only the measure of lagged exposure is positive and significant in column 2. When using *max mp10*, in column 3, the measure of lagged exposure remains significant, while the measure of contemporaneous exposure appears weakly significant with a puzzling negative sign. Columns 4 and 5 restrict sick leaves to those originating in a respiratory system diagnosis. Column 4 uses *mean mp10* and its lag, while column 5 uses *max mp10* and its lag as the exposure variables. In both cases, lagged exposure has a significant positive effect on sick leaves.[5]

The results in table 4 indicate that a one standard deviation increase in lagged mp10 concentrations imply an increase of 0.025 sick leave days associated to a respiratory condition of the child. Since the average sick leave days is 0.67, this represents a 3.7% increase in days. A similar magnitude is obtained when using the results of column 5, with lagged max mp10. The effect of pollution on labor effort through sick leave days of the type studied here does not seem particularly large, and note that it is very precisely estimated.

Only in the pooled regression of column 1 is the coefficient on *Partner covered* negative and significant, as expected. Earnings, by contrast, has a positive and significant effect in all specifications, suggesting that, as families become wealthier, parents are more inclined to care

[5] The errors are clustered at the worker level. Recall that in our data each child is associated to one worker.

Table 5. Male vs Female Policyholders

	LeaveF	LeaveM	HospF	HospM
	(1)	(2)	(3)	(4)
mean mp10	-.0004	-3.26e-06	-.005	.0004
	(.001)	(6.73e-06)	(.009)	(.01)
lagged mean mp10	.005	-3.00e-06	.02	.01
	(.001)***	(2.15e-06)	(.01)*	(.01)
earnings	.05	.0000415	.10	.11
	(.01)***	(.0000412)	(.10)	(.09)
partner covered	-.91	7.75e-06		14.28
	(.86)	(.0000467)		(1286.91)
Obs.	92060	121578	779	884

Note: *** significant at 1%, ** significant at 5%, * significant at 10%
Dependent variables:*Sick leave days* (cols. 1 and 2);
Hospitalization assoc. to a respiratory system diagnosis (cols. 3 and 4)
Vars. not shown: month

Table 6. Interactions with Child Gender

	Inter1	Inter2	Inter3	Inter4
	(1)	(2)	(3)	(4)
mean mp10	-.0003	-.0006		
	(.0005)	(.0005)		
lagged mean mp10	.002	.002		
	(.0005)***	(.0006)***		
max mp10			-.0005	-.0004
			(.0003)	(.0003)
lagged max mp10			.002	.002
			(.0003)***	(.0003)***
earnings	.03	.03	.03	.03
	(.005)***	(.005)***	(.005)***	(.005)***
partner covered	.05	.06	.06	.06
	(.05)	(.05)	(.05)	(.05)
female-meanmp10	.0003	.0008		
	(.0008)	(.0009)		
female-maxmp10			5.65e-06	-.0001
			(.0005)	(.0005)
female-expmean		-.001		
		(.001)		
female-expmax				.0002
				(.0005)
Obs.	213638	213638	213638	213638

Note: *** significant at 1%, ** significant at 5%, * significant at 10%
Dependent variables: *Sick leave days*
Vars. not shown: month

personally for their kids, even if the cost of forgone wages is higher.

In the next four tables we provide a sensitivity analysis of the main results. Table 5 presents results on sick leaves and child hospitalizations for male and female policyholders separately. These results suggest that all the previous results in both sick leaves and child

Table 7. Days in Hospital

	Pooled	FE1	FE2	FE3	FE4
	(1)	(2)	(3)	(4)	(5)
mean mp10	.0000138	-.000014		-5.30e-06	
	(.0000168)	(.0000221)		(.0000126)	
lagged mean mp10		.0000198		.0000307	
		(.0000377)		(.0000152)**	
max mp10			-.0000198		4.91e-06
			(.0000169)		(7.60e-06)
lagged max mp10			.0000229		.0000152
			(.0000183)		(6.85e-06)**
earnings	-.0000149	-.0000349	-.0000347	.0002	.0002
	(.0001)	(.0002)	(.0002)	(.0001)*	(.0001)*
partner covered	.0006	.007	.007	.004	.004
	(.001)	(.005)	(.005)	(.004)	(.004)
worker age	.0001				
	(.0000832)				
female	-.001				
	(.0009)				
child age	.0000533				
	(.0002)				
Obs.	240455	213638	213638	213638	213638

Note: *** significant at 1%,** significant at 5%,* significant at 10%
Dependent variables: *days in hospital of under 1 year olds* (cols. 1 to 3); *days in hospital of under 1 year olds associated to a respiratory system diagnosis* (cols. 4 and 5).
Vars. not shown: *month*

hospitalizations can be accounted for by the behavior of women policyholders. Column 1 shows results for sick leaves in the female subsample. The coefficient for lagged mp10 concentrations is positive and significant in this case. In column 3, the model for child hospitalizations due to a respiratory condition is run on the female sample as well, and we obtain positive and (marginally) significant effects for lagged mp10 concentrations. By contrast, no effects are found in the case of male policyholders both for sick leaves (column 2), and for hospitalizations (column 4).

In table 6 we explore whether the effects of mp10 concentrations on sick leaves vary by child gender. The dummy for the child being a female is interacted with the contemporaneous (and lagged, in cols 2 and 4) measures of mp10. We fail to find any robust pattern associated to child gender across specifications.

Table 7 reproduces the results of table 3, but using days in hospital as opposed to incidence. In our sample, the average days in hospital are 0.004 per week. Note that the pattern of results in this table is the same as in table 3, that is, we obtain results for hospitalizations due to respiratory conditions only, in columns 4 and 5, and only lagged, not contemporaneous, measures of mp10 concentrations are positive and significantly associated to days in hospital.

In contrast with table 3, earnings has a positive and significant effect on *days in hospital* in columns 4 and 5. Income then does not affect the extensive margin -whether to hospitalize or not- but it does affect the intensive margin, increasing the number of days the child stays in hospital.

Finally, in table 8 we reproduce the baseline results on sick leave days (table 4), this time

TABLE 8. SICK LEAVE DUMMY

	Pooled	FE1	FE2	FE3	FE4
	(1)	(2)	(3)	(4)	(5)
mean mp10	.008	.001		.001	
	(.0003)***	(.0007)*		(.001)	
lagged mean mp10		.006		.01	
		(.0007)***		(.001)***	
max mp10			.0009		.002
			(.0004)**		(.0006)***
lagged max mp10			.003		.005
			(.0004)***		(.0006)***
earnings	-.01	.03	.03	.03	.03
	(.002)***	(.007)***	(.007)***	(.01)**	(.01)**
partner covered	-2.22	-.26	-.23	-1.26	-1.24
	(.04)***	(.36)	(.36)	(.70)*	(.71)*
worker age	-.02				
	(.002)***				
female	.04				
	(.02)**				
child age	-.18				
	(.005)***				
Obs.	240455	59907	59907	32205	32205

Note: *** significant at 1%,** significant at 5%,* significant at 10%
Dependent variables: *Sick leave dummy* (cols. 1 to 3); *Sick leave dummy associated to a respiratory system diagnosis* (cols. 4 and 5)
Vars. not shown: *month*

using a dummy for requested sick leaves as our dependent variable. We effectively include here all sick leaves prescribed by physicians, regardless of whether they are subsequently reduced in their extension or downright rejected by the insurer. This table, and its comparison to table 4, addresses the question of how important the reduced/rejected requests are for our results. The results in this table are virtually identical to those in table 4, with one difference: the negative signs on mean mp10 (FE1), and max mp10 (FE2) in the original table, which we considered puzzling, are now reversed and their significance is improved.

V. *Conclusion*

We construct a large dataset of Chilean workers with under one year old children covered by a private health insurance plan. The dataset is used to examine the effects of air pollution on both, child health, and sick leaves that are due to the child beingsick. Our findings point to negative effects of mean and maximal concentrations of mp10 on child health, measured by hospitalizations. This effect is present only when respiratory system-related hospital admissions is used as the child health measure. At the same time, we find no effects of mp10 concentrations on aggregate parental sick leaves, but positive effects of lagged concentrations when only sick leaves associated to respiratory system diagnoses are used.

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