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ARTICLE

Health shocks and the added worker effect: a life cycle approach

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ABSTRACT

This study analyzes the existence of the added worker effect (AWE) when a male partner suffers a health shock (negative health event), by using the information from the Chilean Social Protection Survey. The health shocks considered in this study are new cases of arthritis, asthma and hypertension. We find that neither asthma nor hypertension diagnosis generates an AWE. In the case of arthritis, the study shows differentiated effects by age cohorts. More specifically, we find that women's probability of labor force entry over three years increases by 50 percentage points when the husband between the ages of 18–44 is diagnosed with arthritis. This effect disappears in older age groups, which suggests that when studying the effect of health shocks, the differences between life cycle stages should be considered (chronic disabling conditions are an important source of financial risk for young households).

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Health shocks; added worker effect; life cycle; arthritis; asthma; hypertension

1. Introduction

Traditionally, the added worker effect (AWE hereafter) refers to an increase in the labor supply of married women whose husbands have become unemployed (Mincer, 1962; Spletzer, 1997; Woytinsky, 1942). This labor supply response is a way to smooth household consumption in periods when the head of the family is unemployed.

In this paper, we study whether another type of shock on household income produces an AWE. Specifically, we study women's labor supply response to health shocks (negative health events) suffered by their spouses, using data from the Chilean Social Protection Survey (Encuesta de Protección Social or EPS). Severe health shocks are likely to lead affected individuals to decrease their labor supply, resulting in a loss in lifetime income for the family (Coile, 2004). Furthermore, the increase in health-care expenditure may lead to a decline in consumption through its effect on the family's budget constraint (Mohanan, 2013). The main purpose of this research is to identify the relative importance of health shocks compared to other shocks and to explore the differential effects of health shocks on household budget constraint at different stages of the life cycle.

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We consider three types of health shocks: new cases of arthritis, asthma and hypertension. These are examples of chronic health conditions that are commonly observed in adults worldwide (Bloch, 2016; Murray et al., 2012; To et al., 2012; Vos et al., 2012). Furthermore, these chronic health conditions differ in their effect on the family's permanent income: while arthritis is a common cause of disability (Neogi, 2013), asthma and hypertension, when these are properly treated rarely affect the person's functionality (American Lung Association, 2016; Qaseem et al., 2017).

We focus on Chile because women's labor participation in Chile is low compared to other countries with similar or lower per-capita income, even among women with higher education (Contreras & Plaza, 2010; Mizala, Romaguera, & Henriquez, 1999). Similarly, Chilean female workers earn between 18% and 23% less than their male counterparts, which places the country in the 60th percentile of the gender wage gap distribution among OECD countries (Cruz & Rau, 2017; OECD, 2015; Perticara & Bueno, 2009). Therefore, one might expect that the household economy would be severely affected when the male partner suffers from a chronic disease that limits his ability to earn income. Furthermore, the EPS is the richest panel survey in Chile and constitutes a unique database for an emerging country (Huneeus, Landerretche, & Puentes, 2012; Landerretche, Lillo, & Puentes, 2013).

We find that neither asthma nor hypertension generate an AWE, which is consistent with the use of the mechanisms created by the Chilean law to protect families from income loss when a member is affected with one of these pathologies. In the case of arthritis, the paper shows differentiated effects by age cohorts. More specifically, we find that women's probability of labor force entry over three years increases by 50 percentage points when the husband between the ages of 18 and 44 is diagnosed with arthritis. This effect disappears in older age groups, which suggests that when studying the effect of chronic diseases, the differences between life cycle stages should be considered.

The literature that studies the effect of changes in husband's health status on wife's labor supply does not present a clear consensus. Parsons (1977), Charles (1999) and Reis (2007) find that women increase their labor supply in response to their husband's poor health. In contrast, Hollenbeak, Short, and Moran (2011), Nahum (2007) and Jeon and Pohl (2017) find that women reduce their labor supply in order to care for their sick partner following a health issue. Coile (2004), Garcia-Gomez, Van Kippersluis, O'Donnell, and Van Doorslaer (2013) and Braakmann (2014) find no significant effect on the wife's labor supply when the husband falls ill. We contribute to the literature by providing evidence on the importance of the differences among life cycle stages when studying the impact of health shocks on household income. In this sense, the magnitude of the AWE generated by arthritis diagnosis in young couples significantly exceeds the magnitude of both the health and unemployment-induced AWE previously found in the literature.[1]

The remainder of the paper is organized as follows. Section 2 provides background on the Chilean health-care system. Section 3 discusses the conceptual framework. Section 4 discusses the data and empirical strategy. Section 5 presents the empirical results, and, in Section 6, we present our conclusions.

[1]Mankart and Oikonomou (2017) document an AWE of about 7 percentage points for the U.S.

2. The Chilean health-care system

The Chilean health-care system has a dual character. The state-funded National Health Fund – Fondo Nacional de Salud, most commonly known as FONASA – coexists with private health insurance institutions (Instituciones de Salud Previsional or ISAPRES). Workers can choose to be covered either by FONASA or one of the ISAPRES operating in the country. All workers must contribute 7% of their gross salary to either FONASA or the selected ISAPRE.

FONASA beneficiaries pay copayments for health-care services that range from 0 to 20% depending on their earnings and the number of dependents. FONASA offers two health plans: (i) Institutional Care Model in public institutions and (ii) Free Choice Scheme, under which the beneficiary can choose a private health service registered at FONASA, but the complementary payments are higher and will depend upon the price assigned by the health provider.

The ISAPRES obtain their resources from the mandatory contribution of 7% and additional premiums paid by their affiliates. The additional premium is voluntary and buys the affiliate additional coverage. ISAPRES provide health-care services in their own facilities or sign contracts with other private providers. Typically, those with higher incomes tend to enroll with ISAPRES. According to the Chilean Ministry of Social Development, in 2015 about 77.3% of the Chilean population were enrolled in FONASA and about 15.1% were covered by ISAPRES.[2]

The Universal Access Plan with Explicit Health Guarantees (AUGE plan), which came into force in July 2005, specifies four basic guarantees of access, quality, opportunity or timeliness, and financial protection for patients diagnosed with priority diseases, which were selected based on their epidemiological prevalence and public concern (Taylor et al., 2016). Currently, there are 80 guaranteed health conditions. The AUGE guarantees apply to both FONASA and ISAPRES members. FONASA beneficiaries in the two lowest income brackets have no copayment, while those in the highest two must make a maximum copayment of 10% or 20% for AUGE covered services. ISAPRES patients pay up to a 20% copayment (Bitran, 2013; Schrepel, Tanenbaum, Paccione, & Belmar, 2014).

Additionally, Chilean formal employees are required to contribute 10% of their wages to a personal retirement account plus 2–3% of their wages for administrative fees and Disability and Survivors' insurance. Disability pensions are paid to workers who have lost at least 50% of their working capacity and have paid 2 years of contributions in the 5 years prior to the onset of the disability. The cause of the disability must be illness or accident, and not work-related. A disability pension equal to 50% of the worker's average inflation-adjusted annual earnings during the 10 years preceding the disability is payable to those who have lost between one-half and two-thirds of ability to work; those with more than a two-third loss receive a total disability pension equal to 70% of prior earnings (Kritzer, 1996). Accordingly, disabling chronic condition negatively impact household income: in a best-case scenario, the disability pension can replace about 70% of the worker's previous income, while under the worst-case scenario – informal workers – there are no disability benefits at all.

[2]The remaining 7.6% is covered by other private plans (such as the armed forces plan) or has no health coverage at all.

3. Theoretical framework

The theoretical background of this paper is the family life-cycle labor supply model developed by Stephens (2002). This model illustrates the mechanisms through which husbands' health shocks affect wives' labor supply.

The model assumes that the household utility depends on the leisure of the husband and the wife, H_t and F_t respectively, and total household consumption, C_t. The price of the consumption good is normalized to 1 for all periods, while wages for the husband, W_t^H, and the wife, W_t^W, are exogenously determined. The household's utility function is assumed to be strictly concave, H_t, and C_t are assumed to be normal goods, and capital markets are assumed to be perfect.

The household's optimization problem in period t is the following:

$$\max U_t = E_t\left[\sum_{s=t}^{T}\left(\frac{1}{1+\rho}\right)^{s-t} U(C_s, H_s, F_s)\right]$$

where ρ is the household's subjective discount rate. For simplicity, the model assumes T to be known by agents. The family maximizes utility subject to a budget constraint and a terminal condition:

$$A_{t+1} = (1+r)\left[A_t + W_t^H\left(\bar{L} - T^H(\kappa_t) - H_t\right) + W_t^F\left(\bar{L} - T^F(\kappa_t) - F_t\right) - C_t - E(\kappa_t)\right] \quad (1)$$

$$A_{T+1} = 0 \quad (2)$$

where A_t is the household's stock of assets in period t, r is a constant real interest rate, $\bar{L}$ is the constraint on the total time each household member can divide between work and leisure, κ_t is a health shock to the husband, $T^H(\kappa_t)$ is the effect of the health shock on the husband's time endowment, $T^F(\kappa_t)$ is the effect of the health shock on the wife's time endowment and $E(\kappa_t)$ are the required health expenditures.

The conditions for optimality are as follows:

$$U_C(C_t, H_t, F_t) = \lambda_t \quad (3)$$

$$U_H(C_t, H_t, F_t) \geq \lambda_t W_t^H \quad (4)$$

$$U_F(C_t, H_t, F_t) \geq \lambda_t W_t^F \quad (5)$$

$$\lambda_t = \left(\frac{1+r}{1+\rho}\right) E_t\lambda_{t+1} \quad (6)$$

where λ_t represents the marginal utility of wealth. At period t, the household chooses its consumption level so that the last unit consumed costs as much as giving up a unit of savings (Equation (3)). Equations (4) and (5) determine the utility-maximizing quantities of leisure and, consequently, the optimal labor supply decisions. The Euler equation in Equation (6) describes the evolution of λ_t over the life cycle.

These equations show that labor supply decisions depend on the form of the household utility function. For example, couples with greater leisure complementarity have lower levels of labor supply at the optimum (Coile, 2004). The marginal utility of wealth

also influences the husband's and wife's labor supply decisions. In terms of the model, a loss in lifetime wealth increases λ_t in all periods, which lead to an increase in the spouses' labor supply.

The health shocks considered in this study – new cases of hypertension, asthma and arthritis – influence the wife's labor supply by increasing leisure complementarity and/or by reducing household wealth. A health shock could strengthen complementary of leisure if the affected person requires assistance with activities of daily living (Coile, 2004). This implies that wives may reduce their labor supply in order to care for their sick partner following a health shock ("caregiver effect"). The second effect refers to the potential negative impact of a health shock on the affected individual's labor supply and/or the increase in health-care expenditures. Severe health shocks affect the household's lifetime budget constraint, which cause wives to increase their labor supply (AWE).

3.1. The effect of husband's health on wife's labor supply

3.1.1. Hypertension

Hypertension occurs when blood pressure increases to unhealthy levels (Kleinert et al., 1984). One of the most characteristic features of hypertension is that it is a silent condition: it usually has no symptoms until after it has done significant damage to the heart and arteries (World Health Organization, 2013; Zanchetti, 2017).

Even though in some cases high blood pressure causes disabling symptoms that may prevent people from working, hypertension treatment increases satisfaction with quality of life and decreases risks of fatal and non-fatal stroke, cardiac events and death (American Medical Group Association, 2006; Mulrow & Pignone, 2001). This means that $T^H(\kappa_t) = 0$ in patients who receive appropriate treatment.

Hypertension is a lifelong illness and, therefore, generates an expense $E(\kappa_t)$ in all periods. This increase in health-care expenditure reduces household disposable income, and, consequently, the wife will increase her labor supply. The magnitude of the AWE will be stronger in younger couples because of the larger number of periods in which the family spends $E(\kappa_t)$.

On the other hand, AUGE coverage – which is denoted by A – reduces the magnitude of the AWE, by making health expenditures equal to $E(\kappa_t) - A < E(\kappa_t)$ in every period.

3.1.2. Asthma

Asthma is a chronic disease of the airways that carry air to the lungs (bronchial tubes). With asthma, there is inflammation of the bronchial tubes that stimulate mucus production, which clog airways and make it hard to breathe (Bernstein, Bernstein, Chan-Yeung, & Malo, 2006).

Asthma can cause serious illness or death if not treated. According to Bang et al. (2016), patients diagnosed with active asthma had about 70% higher risk of heart attack than those without asthma. However, appropriate management can control the disease and enable people to enjoy a good quality of life (World Health Organization, 2007). Thus, $T^H(\kappa_t) = 0$ in patients who properly follow their treatments.

Asthma-related medical expenses generate an increase in wives' labor supply in the same way as hypertension-related medical expenses ($E(\kappa_t) > 0$). Again, AUGE coverage reduces the magnitude of the AWE.

3.1.3. Arthritis

There are over 100 different forms of arthritis. In what follows, we will focus our attention on the two most common types of arthritis: osteoarthritis and rheumatoid arthritis.

Osteoarthritis, the most common type of arthritis, is a painful and highly disabling chronic condition affecting roughly 630 million people worldwide (Udgata, 2014). The disease most commonly affects the joints in the knees, hands, feet and spine and is relatively common in the shoulder and hip joints (Wittenauer, Smith, & Aden, 2013).

Rheumatoid arthritis is a chronic autoimmune disorder in which the body's immune system attacks joints and other tissues. It is a disabling and painful inflammatory condition, which can result in deformed joints, loss of mobility and diminished strength (Harvard Health, 2013). Rheumatoid arthritis affects about 1% of the population worldwide.

The negative impact of arthritis on the husband's physical functioning increases spouses' leisure complementarity, which induces the wife to decrease her labor supply to provide health care for her husband.

The mechanism through which arthritis-related medical expenses generate an increase in wives' labor supply is the same as that described above for hypertension and asthma-related medical expenses. In order to have the full picture of the arthritis-related AWE, though, we have to take another factor into account. The deterioration in physical functioning leads to a reduction in husband's labor supply ($T^H(\kappa_t) > 0$) and, therefore, the arthritis-related AWE is larger than the hypertension- or asthma-driven AWE.

Furthermore, the magnitude of the arthritis-related AWE depends on the household life-cycle stage: the AWE will be stronger for younger couples because a larger share of potential lifetime earnings is lost through the health shock. In other words, the younger the couple, the larger the AWE is.

Theory is however ambiguous as to whether the added worker or the caregiver effect will predominate.

4. Data and empirical strategy

The panel data we use is the Social Protection Survey (EPS) for the years 2006, 2009, 2012, and 2015. Comparable to the U.S. Health and Retirement Study (HRS), the EPS provides a nationally representative stratified random survey covering labor history, health status, education, age and others. In contrast to the HRS, however, the EPS covers all adults, not just respondents over age 50. Thus, the EPS constitutes a unique database for an emerging country (Huneeus et al., 2012; Landerretche et al., 2013). In effect, the longitudinal nature of the EPS allows us to estimate the impact of changes in husband's health status on wife's labor supply. In what follows, we limit our attention to 5715 married women.

4.1. Estimation strategy

We run the following regression to estimate the impact of changes in husband's health status on wife's labor supply:

$$\begin{aligned}\text{entryLF}_{it} = {} & \beta_0 + \beta_1 \Delta H_{it}^{husband} + \beta_2 \text{Age45} - 54_{it}^{husband} + \beta_3 \text{Age55}\ 64_{it}^{husband} \\ & + \beta_4 \Delta H_{it}^{husband} * \text{Age45} - 54_{it}^{husband} + \beta_5 \Delta H_{it}^{husband} * \text{Age55} - 64_{it}^{husband} \\ & + \beta_6 X_{it} + \beta_7 X_{it}^{husband} + \beta_8 X_{it}^{household} + \beta_{it}\end{aligned} \tag{7}$$

where entryLF_{it} is a dummy variable for whether a woman i who was inactive at the previous wave (time t − 1) has joined the labor force by the current wave (time t). This variable is the same as that used by Mankart and Oikonomou (2017).

$\Delta H_{it}^{husband}$ is a vector of new health shocks experienced by the husband of woman i since the previous wave: new cases of arthritis, asthma and hypertension.

$\text{Age45} - 54_{it}^{husband}$ and $\text{Age55} - 64_{it}^{husband}$ are dummies for whether the age of the man is between 45 and 54 and 55–64 years old, respectively. Thus, the reference group (category) in regression Equation (7) is women whose husbands are between 18 and 44 years old. We interact the health shock variables with the ages dummies to examine the differential effects of husbands' health shocks on wives' labor supply at different stages of the life cycle. If AUGE coverage is not high enough to cover all medical expenses, we expect positive coefficient for the onset of hypertension and asthma, and negative coefficients for the interaction terms between these health shocks variables and the ages dummies because of the factors discussed in the conceptual framework. The coefficients signs for arthritis diagnosis can be either positive or negative depending on whether the AWE or caregiver effect dominates. As has already been stated, it is theoretically ambiguous which effect dominates, so we answer this question empirically.

X_{it} is a set of variables that control for woman's age and education. $X_{it}^{husband}$ is a vector that includes husband's education and an indicator variable equal to 1 if the husband was employed in the formal sector at the previous wave and 0 otherwise (as previously mentioned, disability benefits are restricted to workers in formal employment since workers in the informal sector do not contribute to social security). $X_{it}^{household}$ is a vector of household characteristics such as the number of children aged 0–4 and 5–8 years, and the number of females and males aged 18 years and older.

A concern when estimating the effect of health on labor supply is that health might be endogenously determined. If both health and labor supply are influenced simultaneously, we may not accurately capture the effect of health on labor supply.

However, the health shocks we consider can be regarded as unanticipated shocks with respect to the timing of onset, and accordingly, these health conditions can be treated as exogenous variables (Jones, Rice, & Zantomio, 2016; Lee & Kim, 2008; Smith, 1999).

Moreover, it is unlikely that one spouse's labor supply or work preferences directly or indirectly affect the other spouse's likelihood of a chronic disease diagnosis.[3]

[3]A similar argument is presented by Jeon and Pohl (2017).

Furthermore, genetic factors play a key role in the development of the health problems considered in this study, which contribute to avoid bias from reverse causation. Hypertension is 2.4 times more common in subjects who have two hypertensive parents (Wang et al., 2008). Heritability estimates indicate that, on average, genetic variation among individuals accounts for one-half of the risk of asthma (Duffy, Martin, Battistutta, Hopper, & Mathews, 1990; Ober, 2016; Ober & Yao, 2011). Moreover, the heritability of osteoarthritis is estimated to be 40–65% (Loughlin, 2005; Valdes & Spector, 2011), and, according to MacGregor et al. (2000), the heritability of rheumatoid arthritis ranges from 53% to 65%.

Table 1 shows the summary statistics for all regression variables. Over a three-year period, the typical married woman has a 14.5% chance of entering the labor force. Regarding the incidence of health shocks, over a three-year period nearly 0.8% of men are diagnosed with asthma, 6.6% are diagnosed with hypertension and 1.6% are diagnosed with arthritis. The average woman in the sample is 43 years old and has 10.6 years of education.

5. Results

Column (1) on Table 2 shows the results obtained by estimating a simplified version of the model described in Equation (7), which does not consider the interactions between the health shock variables and the husband's ages dummies. This estimation serves as a basis of comparison and to determine whether the health shocks have an effect on women's labor supply when the differences between life-cycle stages are not considered in the analysis. Under this specification, none of the health shock variables coefficients is statistically different from zero. This implies that a spouse's health shocks do not have an effect on women's labor supply when the differences between life cycle stages are not considered. This finding is similar to that of Coile (2004).

Table 1. Summary statistics.

Variable	Number of observations	Mean	Standard deviation
Dependent variable			
Labor force entry	5715	0.145	0.352
Control variables			
Health shocks			
Asthma diagnosis	5715	0.008	0.090
Hypertension diagnosis	5715	0.066	0.249
Arthritis diagnosis	5715	0.016	0.127
Husband's age dummies			
45–54	5715	0.355	0.479
55–64	5715	0.208	0.406
Husband's socio-demographic characteristics			
Education (years)	5715	9.987	4.382
Working in the formal sector at t-1	4229	0.588	0.492
Wife's socio-demographic characteristics			
Age	5715	43.142	9.184
Education (years)	5715	10.614	3.597
Number of children by age			
0–4	5715	0.329	0.594
5–8	5715	0.318	0.549
Number of adults in the household			
Males	5715	0.818	0.985
Females	5715	0.833	0.972

Table 2. Effects of spouse's health shocks on women's labor supply.

	Dependent variable: Labor force entry		
Variable	(1)	(2)	(3)
Health shocks			
Asthma diagnosis	−0.070	−0.060	0.055
	(0.052)	(0.113)	(0.154)
Hypertension diagnosis	−0.007	−0.032	0.037
	(0.019)	(0.042)	(0.052)
Arthritis diagnosis	−0.016	0.130	0.506***
	(0.037)	(0.118)	(0.173)
Husband's age dummies (reference group = 18–44)			
45–54		−0.034***	0.006
		(0.011)	(0.017)
55–64		−0.069***	0.006
		(0.013)	(0.024)
Health shocks interactions with husband's age dummies			
Asthma diagnosis × 45–54		−0.062	−0.184
		(0.139)	(0.186)
Asthma diagnosis × 55–64		0.070	0.316
		(0.141)	(0.238)
Hypertension diagnosis × 45–54		0.061	0.019
		(0.051)	(0.065)
Hypertension diagnosis × 55–64		0.041	−0.042
		(0.052)	(0.067)
Arthritis diagnosis × 45–54		−0.044	−0.437**
		(0.134)	(0.189)
Arthritis diagnosis × 55–64		−0.196	−0.576***
		(0.128)	(0.184)
Socio-demographic characteristics			
Woman's age			−0.006***
			(0.001)
Woman's education			−0.007***
			(0.002)
Number of children aged 0–4			−0.006
			(0.010)
Number of children aged 5–8			−0.025**
			(0.010)
Number of adult males in the household			0.005
			(0.006)
Number of adult females in the household			0.009
			(0.006)
Husband's education			−0.001
			(0.001)
Husband working in the formal sector at $t-1$			−0.001
			(0.012)
Constant	0.146***	0.171***	0.467***
	(0.005)	(0.007)	(0.044)
Observations	5715	5715	4229

Notes: Standard errors, in parenthesis, are robust.* significant at 10% level, ** significant at 5% level, *** significant at 1% level.

Column (2) includes the husband's ages dummies and the interaction variables. The results are similar to those in the column (1) and only suggest that women who are married to older husbands have a lower probability of entering the labor force. Column (3) includes the remaining control variables. We obtain now that spouse's arthritis diagnosis has an economically significant effect on women labor supply: women's probability of labor force entry over three years increases by 50 percentage points when the husband between the ages of 18 and 44 is diagnosed with arthritis. This result is consistent with the fact that approximately 50% of patients with arthritis

Table 3. Effects of spouse's health shocks on women's labor supply when changing the reference age group.

	Dependent variable: Labor force entry
Variable	(1)
Health shocks	
Asthma diagnosis	0.096
	(0.174)
Hypertension diagnosis	0.047
	(0.060)
Arthritis diagnosis	0.841***
	(0.214)
Husband's age dummies (reference group = 18–42)	
43–52	0.008
	(0.017)
53–64	−0.016
	(0.024)
Health Shocks interactions with husband's age dummies	
Asthma diagnosis × 43–52	−0.245
	(0.219)
Asthma diagnosis × 53–64	0.002
	(0.209)
Hypertension diagnosis × 43–52	−0.016
	(0.071)
Hypertension diagnosis × 53–64	−0.024
	(0.072)
Arthritis diagnosis × 43–52	−0.791***
	(0.234)
Arthritis diagnosis × 53–64	0.875***
	(0.221)
Socio-demographic characteristics	
Woman's age	−0.005***
	(0.001)
Woman's education	−0.007***
	(0.002)
Number of children aged 0–4	−0.006
	(0.010)
Number of children aged 5–8	−0.026**
	(0.010)
Number of adult males in the household	0.005
	(0.006)
Number of adult females in the household	0.009
	(0.006)
Husband's education	−0.001
	(0.001)
Husband working in the formal sector at $t- - 1$	−0.002
	(0.012)
Constant	0.449***
	(0.044)
Observations	4229

Notes: Standard errors, in parenthesis, are robust. * significant at 10% level, ** significant at 5% level, *** significant at 1% level.*

became work disabled during the first 10 years of the disease (Reisine & Fifield, 1992; Sokka, 2003). However, husband's arthritis diagnosis loses its relevance as an important factor for wife's labor market behavior in the advanced stages of the life cycle (the coefficient on the interaction terms between arthritis diagnosis and the husband's ages dummies are negative and statistically significant). On the other hand, we find that neither asthma nor hypertension diagnosis generate an AWE. This result suggests that

AUGE coverage is high enough to cover the medical expenses associated with these diseases and that is used by a considerable percentage of the Chilean population.

In short, only arthritis diagnosis generates an AWE, which occurs mainly in the early stages of the household life cycle. Given that arthritis treatment is guaranteed by AUGE, this AWE can mainly be explained by the decline in husbands' labor force participation due to the physical impairments associated with arthritis. Table 3 shows that the results remain unchanged when the reference age group is modified.

6. Conclusion

In this paper, we examine the existence of the AWE when a male partner suffers a health shock (negative health event), by using the information from the Chilean Social Protection Survey. We consider three types of health shocks: new cases of arthritis, asthma and hypertension. We find that neither asthma nor hypertension diagnosis generate an AWE, which is consistent with the use of the mechanisms created by the Chilean law to protect families from income loss when a member is affected with one of these pathologies (AUGE coverage). On the other hand, we find that women's probability of labor force entry over three years increases by 50 percentage points when the husband between the ages of 18 and 44 is diagnosed with arthritis. This effect loses its relevance in the advanced stages of the life cycle, which suggests that when studying the effect of chronic diseases, the differences between life cycle stages should be considered.

Overall, we provide important evidence on the effects of a spouse's health shocks on women's labor supply. Our result suggests that chronic disabling conditions are an important source of financial risk for young households and that there may be welfare gains from providing additional insurance against this risk.

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