THE IMPACT OF IN-LAW MORTALITY ON WOMEN'S LABOR SUPPLY IN INDIA

RAJSHRI JAYARAMAN AND P. SNEHA

ABSTRACT. We investigate how the death of co-residing fathers- and mothers-in-law affects the labor force participation of married women in India. Simple and dynamic difference-in-differences estimates indicate that, relative to those who co-reside with both parents-in-law, women's labor force participation increases following the death of a co-residing father-in-law, but is unresponsive to the death of a mother-in-law. This result is consistent across three different Indian household surveys. We explore three classes of mechanisms that may account for this. First, we do not find compelling evidence in support of an income effect. Second, domestic responsibilities seem pertinent. Time use data suggest that women co-residing with widowed fathers-in-law have a larger domestic and care work burden; and while those who live with a widowed mother-in-law spend more time in employment, they also devote less time to leisure and sleep. Finally, with the demise of parents-in-law, authority within the household shifts to the husband, and women have slightly more decision-making power and financial autonomy, but no increased mobility outside the household.

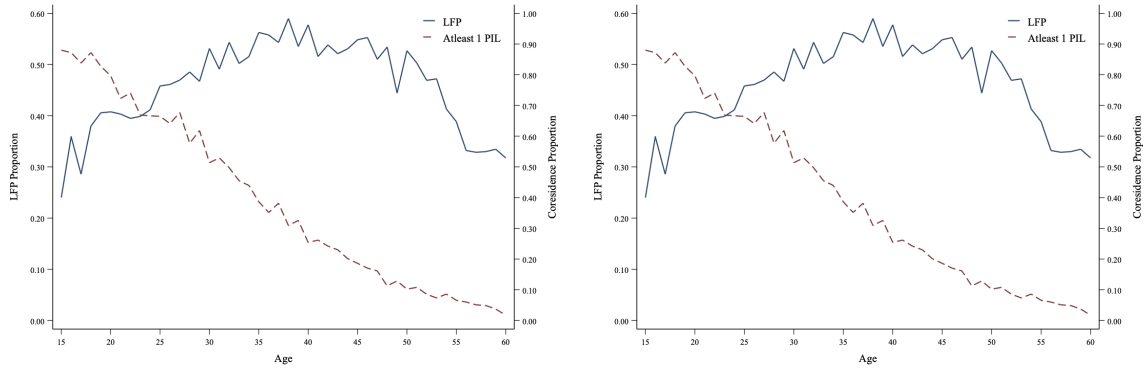
JEL Classification: J16, J22, J12, O12, Z13 *Keywords*: female labor force participation, family structure, employment, parents-in-law

Date: November 22, 2024.

Jayaraman: ESMT Berlin & University of Toronto; rajshri.jayaraman@esmt.org. Sneha: Berlin School of Economics. This paper supersedes a previous version entitled, "Does Co-residence with Parents-in-law Reduce Women's Employment in India?" We are grateful to Gustavo Bobonis, Ashwini Deshpande, Marcel Fafchamps, Parikshit Ghosh, Nick Li, Rohini Somanathan, Michael Stepner, and seminar participants at Cornell University, the University of Toronto, CMIE, the Delhi School of Economics, IIM-Calcutta, FSU, and the Canadian Economics Association for useful comments and suggestions. Also to Bisma Khan for her valuable contributions to the previous version of this paper. Jayaraman gratefully acknowledges financial support from SSHRC under Grant No. 430-2020-00076.

1. INTRODUCTION

India's female labor force participation is stubbornly low, both absolute terms and relative to other countries at comparable levels of development (Fletcher et al., 2017). At the same time, the incidence of co-residence of married women with their parents-in-law is persistently high, even relative to other Asian countries (Esteve and Liu, 2017; Breton, 2019). As Figure 1 shows using two different Indian household surveys, co-residence and married women's labor force participation are negatively correlated during much of their working lives.[1] Labor force participation (LFP) among married women in India has an inverted-U shape over a woman's life cycle, rising until roughly age 40 and declining thereafter.[2] Directly upon marriage, over 80% of married women co-reside with parents-in-law. This follows from the enduring tradition of patrilocality. As LFP rises, co-residence with one or more parents-in-law (PIL)—a father-in-law (FIL), a mother-in-law (MIL), or both—declines, usually replaced by nuclear or fraternal households.[3] Overall, married women who co-reside with PILs have substantially lower LFP than those who reside in nuclear or fraternal households.



(A) IHDS (B) CPHS

FIGURE 1. Labor force participation and co-residence with parents-in-law over the lifecycle. *Notes*. This figure depicts the relationship between co-residence with parents-in-law and labor force participation (LFP) over the lifecycle. LFP is shown on the left y-axes, and the proportion residing with at least 1 parent-in-law (PIL)—a father-in-law, a mother-in-law, or both—on the right y-axes. Panel (A) uses pooled IHDS 2005-12 data and panel (B) uses pooled CPHS 2016-21 data. Both samples comprise married women aged 15-60, not in education. In IHDS, a woman is categorized as participating in the labor force if she worked in an income generating activity for at least 240 hours in the past year. In CPHS, a woman is categorized as such if she is employed or willing to work as on the day of the survey.

This paper investigates whether this negative correlation reflects a causal relationship by asking whether co-residence with PILs reduces married women's LFP in India and, if so, what types of mechanisms might account for this. Conceptually, the causal effect of co-residence on LFP may be

[1]We use both these datasets in our analysis. The lifecycle pattern of LFP in Figure 1 is mirrored in our third data source, the Indian Time Use Survey (TUS); see Appendix Figure A1.

[2]The pattern bears a striking similarity to that of American women born before the 1950s (Goldin and Mitchell, 2017).

[3]On average, across all women in this age group, approximately 15% of married women co-reside with parents-in-law. Although the precise ratio varies depending on the data source, the high incidence of co-residence is a statistical regularity, found in all extant data sources including the three nation-wide household surveys we use in this paper (see Figure 1), and international surveys including IPUMS and DHS.

positive or negative, and is likely to depend on the gender of the co-residing PIL. The first causal channel is a standard *income effect*. Co-residence allows for potential sharing of income and other household assets, and this may exert a negative effect on women's LFP (e.g. Rosenzweig (1988) and Strauss and Thomas (1995)). Since employment rates and asset ownership in India are considerably higher for men than for women, income effects are more likely to be at play with a co-residing FIL than a co-residing MIL.

The second possible channel is *domestic responsibilities* which in India, as in much of the rest of the world, tend to be gendered: women in the household often do the heavy lifting in terms of domestic and care work (e.g. Rubiano Matulevich and Viollaz (2019), Li (2023)). The effect of this channel on LFP is ambiguous. On the one hand, the presence of elderly family members may reduce a daughter-in-law's LFP because of the additional burden they place on her in terms of elder care or housework more broadly. On the other hand, as a woman, MILs are more likely than FILs to share in domestic responsibilities. This means that in contrast to a FIL, a MIL's presence in the household may "free" a woman from household obligations, enabling her to work in the labor market. Indeed, studies from a wide range of countries have found that women who live with, or near, parents or parents-in-law are more likely to work in the labor market since parents—often maternal grandmothers—step in to help with childcare and housework.[4]

The third related channel pertains to their *agency*. India has famously restrictive gender-based norms, which may constrain women's autonomy in general and their LFP in particular (e.g. Jayachandran (2015, 2021)). It is also characterized by patriarchal norms which often places decision-making authority in the hands of men (e.g. Béteille (1965) and Srinivas (1977)), and less-widely studied norms of filial piety, which prescribe deference to older, often male, family members (e.g. Uberoi (1993)). Since gender norms tend to be more conservative in older cohorts, gender and generational divides may combine to impose larger constraints on women's agency, and by extension her employment, when they co-reside with a PIL.

Determining the causal effect of co-residence with PILs on women's LFP is challenging because co-residence is endogenous. Living with their own parents may be taboo for married women in India (only a handful of women in our data do so). But living with a PIL is a matter of choice, and the reasons for this choice may be negatively correlated with a woman's LFP. For example, women from socially conservative families may choose to co-reside with PILs and choose not to participate in the labor market. Alternatively, the need for childcare support may induce young mothers to move in with in-laws and withdraw from the labor market.

We address this potential endogeneity by restricting our attention to women who initially live with both PILs, and investigate their (within) LFP response to the death of one or both PILs by estimating a difference-in-differences (DiD) model.[5] This allows us to separately explore the effect of co-residence with a FIL or MIL, relative to co-residence with both PILs. With this sample restriction in

[4]This includes evidence from the U.S., (Compton and Pollak, 2014; Posadas and Vidal-Fernandez, 2013; García-Morán and Kuehn, 2017; Ho, 2015)), China (Maurer-Fazio et al., 2011; Shen et al., 2016)), Italy (Arpino et al., 2014; Bratti et al., 2018), Japan (Ogawa and Ermisch, 1996; Sasaki, 2002; Mano and Yamamura, 2011), Turkey (Akyol and Yılmaz, 2024), Argentina (Arpino et al., 2014), and Mexico (Marcos, 2023).

[5]An alternative strategy, is to use death as an instrument for co-residence. This strategy, which we used previously in the previous version of this paper, is unsatisfactory because it likely fails the (untestable) exclusion restriction: the death of a PIL is likely to have a direct effect on co-residence, for example due to a potential inheritance effect. That said, the results of this paper are broadly consistent with those IV results.

place, the death of a FIL corresponds to co-residence with only a MIL; the death of a MIL, to co-residence with only a FIL; and the death of both to co-residence with neither PIL. The key identifying assumptions, for which we provide supportive evidence, are no confounding changes; no anticipation (of impending death); and parallel trends in outcomes between women whose FIL (MIL) did or did not die.

In our main analysis, we use two different household panel surveys: The Indian Human Development Survey (IHDS) and the Consumer Pyramids Household Survey (CPHS). We describe them as well as our third data source, the Indian Time Use Survey (TUS), in more detail in Section 3. Each has its advantages and disadvantages, but together they permit us to furnish a more complete answer to our research questions.

Briefly, IHDS comprises a two-round panel, conducted in 2004-05 and 2011-12. Its main advantages are its well-established and widely used measure of LFP, as well as unique data on decision-making authority in the household and women's autonomy. The latter allows us to explore whether social norms may account for our main results. Its key disadvantage is that it is a two-period panel, separated by 7 years. This means that we cannot check for parallel trends; and it leaves us vulnerable to the possibility of confounding changes that coincide with a PIL's death in the inter-panel years.

The main advantage of CPHS is that it is a long, high-frequency panel. It is conducted on a quadrimester basis (every four months) and we use 18 recent rounds, from 2016 to 2021. (We show in robustness checks that our results go through when we account for the COVID-19 period.) CPHS's high-frequency makes it more plausible that the timing of a PIL's death is exogenous. Importantly, the length of the panel allows us to estimate a dynamic DiD model, using a number of recently developed heterogeneity-robust estimators including Callaway and Sant'Anna (2021), de Chaisemartin and D'Haultfœuille (2020) Sun and Abraham (2021), and Borusyak et al. (2024). In addition we check for, and confirm, that parallel trends prior to the event of a PIL's death are satisfied. We also furnish supportive evidence that the no anticipation assumption is satisfied. The main disadvantage of CPHS is that its measure of LFP is unconventional and somewhat restrictive.

In addition to addressing the main research question of whether co-residence has a negative effect on women's LFP, we explore to what extent the three mechanisms alluded to earlier are at play. First, the income effect can operate in two ways following the death of a FIL: the loss of earned income may exert a positive effect on LFP, and an inheritance may exert a negative effect.[6] To interrogate the former, we explore heterogeneity in the LFP response by the FIL's employment status; here, an income effect would be consistent with a more positive response following the death of a employed (earning), as opposed to a not employed (not earning) FIL. We explore the latter by conducting a similar exercise by pre-determined wealth status, the premise being that women should experience a higher LFP response following the death of non-wealthy FIL compared to a wealthy FIL.

Second, to see whether domestic responsibilities may matter, we use rich data from the TUS 2019. With only a single cross-section to work with, the results here are only suggestive. Nevertheless, these data allow us to corroborate the findings from our DiD estimates regarding LFP, while exploring whether domestic time use patterns are systematically different in households where a widowed FIL or widowed MIL are present, relative to households where both co-reside.

[6]MILs tend not to have ownership over household assets and very few are employed.

Third, to investigate the role of social norms, we take advantage of data from the IHDS Eligible Women's Questionnaire. It poses a series of questions pertaining to decision making authority in the household, women's mobility, and their financial independence. We investigate how these measures of agency and autonomy change with the death of a PIL.

Turning to our results we find that the death of a FIL increases married women's LFP. The death of a MIL does not. In other words, when a woman lives with only her (widowed) MIL, her LFP increases relative to when she lives with both PILs. Her LFP is, however, (statistically) the same whether she lives with only her (widowed) FIL or with both PILs. Our simple (before and after) DiD estimates show that the treatment effect translates into an economically meaningful 8.7% increase in LFP according to the IHDS definition, and a 17% increase in LFP according to the CPHS definition, following the death of a FIL. The corresponding point estimates for the death of a MIL are small and statistically insignificant. Rudimentary heterogeneity analysis suggests that, on average, this general pattern holds across caste, religion, northern/southern states, and urban/rural areas.

The dynamic DiD results from CPHS confirm this basic result: LFP increases following the death of a FIL and does not respond to the death of a MIL. This finding holds up in all four heterogeneity-robust estimators alluded to earlier. The dynamic estimates also shed light on when this increase transpires—largely in the second year following the death of a FIL. We subject our simple and dynamic DiD estimates to a series of robustness checks. These include alternative age specifications, exclusion of pandemic deaths, use of alternative control groups, and different estimation windows.

In terms of mechanisms, our results are not inconsistent with the income effect. However, partly due to data limitations, we don't find compelling evidence in support of it. Lower potential loss of earned income from the death of an employed (vs. not employed) FIL seems to prompt a slightly larger increase in LFP. But lower potential inheritance from a less wealthy (vs. more wealthy) FIL following his death prompts a counterintuitively smaller increase in LFP in IHDS, though not in CPHS. Regardless, in both cases differences between the groups are small and statistically insignificant.

Descriptive evidence from the TUS cross-section confirms that time spent in employment is significantly higher in households when only a widowed MIL is present (i.e. the FIL has died), but no different in households where only a widowed FIL is present (i.e. the MIL has died), relative to families where both PILs are present. The increase in employment with a widowed MIL does not, however, seem to come from a lower burden of domestic and care work. Rather, it comes from less time spent in leisure and sleep. With a widowed FIL, the married woman (his daughter-in-law) spends more time cooking and cleaning. Our findings indicate that while the number of additional minutes spent on these activities is small in absolute terms, their timing coincides with typical working hours, suggesting that these quotidian obligations may be incompatible with participation in the labor market.

Finally, we find that with the death of PILs, decision-making authority over some key household matters shifts to the husband: he now has "most say" when it comes to things like making an expensive purchase, or a child's marriage. A MIL's, but not a FIL's, death also marginally increases women's decision-making authority in the household. Her mobility outside the home does not increase although the death of a FIL, but not a MIL, does seem to improve her financial autonomy.

2. Related Literature

This paper is situated within a large literature on supply-side factors contributing to India's low female LFP rate.[7] Studies have examined factors such as changes in household members' income (Desai and Joshi, 2019; Mehrotra and Parida, 2017; Sarkar et al., 2019; Klasen and Pieters, 2015); increases in women's education (Afridi et al., 2018); safety concerns; (Siddique, 2022; Chakraborty et al., 2018, 2021; Borker, 2021); work environment (Subramanian, 2019); the motherhood penalty (Das and Zumbyte, 2017; Kleven et al., 2019; Deshpande and Kabeer, 2021); caste identity (Oh, 2023; Agte and Bernhardt, 2023); and social status (Munshi and Singh, 2024).

Within this literature, we focus on the role of co-residing adult family members on married women's LFP. A number of studies have compellingly documented the constraining role of husbands on their wives' autonomy and LFP in India (e.g., Bernhardt et al. (2018), Heath and Tan (2020), Field et al. (2021), and Lowe and McKelway (2023)). Given the ubiquity of inter-generational joint families in India, we turn our attention to co-residing PILs.

As such, we build on the work Debnath (2015), Dhanaraj and Mahambare (2019) and Mukherjee et al. (2023), all of whom use IHDS data to show that married women living in joint households—where one or more married couples live together typically also with one or both PILs—have lower autonomy and employment than those living in nuclear families. Our findings broadly confirm theirs, for a wider range of datasets; using a different approach to identification and estimation; and exploring a wider range of potential mechanisms. Our time use results are also consistent with recent experimental evidence showing that when women's husbands and PILs are shown a promotional training and employment video, the positive effect on their time spent in employment comes in large part at the expense of their leisure time (McKelway, 2023).

Our focus is more pointedly on the effect of co-residing PILs rather than joint families in general. Only a handful of studies have explored this. Using cross-sectional data from the DHS and a rich network survey in an Uttar Pradesh district, respectively, Khalil and Mookerjee (2019) and Anukriti et al. (2020) find that women living in households with their MILs have lower autonomy than those living in households without them. Although our interest in LFP is distinct from their focus, their finding that decision-making authority is negatively associated with the presence of a MIL is consistent with our finding that the decision making authority of the married woman weakly increases upon her death.

The IHDS part of our analysis builds on two thoughtful recent studies by Khanna and Pandey (2024) and Batheja et al. (2023), both of whom exploit similar within-variation generated by the death of a PIL to investigate the effect of co-residence on LFP. Our main analysis departs from both studies in two ways. First, we are interested in contrasting the effect of co-residence with a FIL and MIL, and we accomplish this by accounting for both of these events in the same regression model. By contrast, Khanna and Pandey's main analysis focuses on the death of MILs, and while Batheja et al. consider both PILs they so in separate regression specifications, with different sample restrictions, making a direct comparison difficult.

[7]This is distinct from demand-side explanations, including the availability of job opportunities (Jensen, 2012), compatibility of work with domestic responsibilities (Sivasankaran, 2014; Chatterjee et al., 2015; Das and Desai, 2003; Chowdhury, 2011; Kapsos et al., 2014; Desai, 2017; Deshpande, 2022; Ho et al., 2024), lack of (knowledge of) employment growth for women (Klasen and Pieters, 2015; Afridi et al., 2020).

Second, we believe that using two additional data sources adds credibility and additional insight to the IHDS analysis. More specifically, the CPHS data allow corroboration of the IHDS two-period approach that our papers share in common, thereby verifying the robustness of the IHDS findings. The identification strategy is also arguably more plausible in the CPHS since the no confounding changes assumption is more likely to be satisfied with high-frequency data. Moreover, the multi-period panel allows us to furnish corroborating evidence of no anticipation; test for parallel trends; and estimate dynamic responses to treatment with considerable granularity. Finally, TUS allows us to conduct a more detailed (albeit descriptive) analysis of domestic and care work than IHDS permits, since the latter does not record detailed time use.

That said, our IHDS results pertaining to the effect of a FIL's and a MIL's death on LFP as well as autonomy are broadly consistent with those of Batheja et al. (2023), who delve into heterogeneous treatment effects in much more detail than we do. Our results are not consistent with Khanna and Pandey (2024): they find that the death of a MIL reduces employment whereas we find that it has no significant effect. As Batheja et al. (2023) note, the source of this discrepancy is time-varying heterogeneity that is not captured in individual fixed effects: older women tend to have lower employment and are more likely to experience the death of a co-residing MIL. By including age in our controls, we account for this potential downward bias.

3. DATA

1. **Data sources.** We use three data sources: IHDS, CPHS, and TUS. All three claim to be representative of major Indian states, but they have major differences including regional coverage; frequencies and periods of observation (CPHS is more frequent and more recent); variable definitions (e.g. LFP); urban versus rural coverage (CPHS over-samples urban areas); and panel structure (TUS is a single cross section, while the other two are panel datasets). Each has its strengths and weaknesses, discussed in this section, but together they allow us to address our main research question and explore potential mechanisms from different angles.

IHDS, our first data source, is a household panel survey and we use its two available recent rounds from 2004-05 and 2011-12 (referred to as 2005 and 2012 in what follows). The survey is conducted across thirty-four Indian states and union territories, covering over 40,000 households in each survey round. In addition to a rich set of demographics captured in its household questionnaire, a major strength of IHDS is its women's questionnaire administered to ever-married women who were 15-49 at baseline. We use data from this subset of our main sample to explore potential mechanisms pertaining to how decision-making authority and autonomy of married women varies depending on co-residence.

CPHS, our second data source, is also a household panel survey. Conducted by the Centre for Monitoring the Indian Economy, it is representative of all major Indian states, covering over 150,000 households in each survey round. The main strength of this dataset is its large sample size and high-frequency which, as we explain in Section 4, allows us to estimate a dynamic DiD model. The survey is conducted each quadrimester: each household is visited three times a year in four-month intervals, between January-April, May-August, and again between September-December. Although the first round of the survey was initially conducted in January, 2014, LFP data were not recorded until January, 2016 so this marks the beginning of our observation period. Our data therefore comprises eighteen rounds—three surveys a year for six years from January, 2016 to September, 2021.

TUS, our third data source, records time use in a single 2019 cross section comprising over 130,000 households.[8] In TUS, respondents were asked to report which of 165 possible activities (defined according to the United Nations International Classification of Activities for Time-Use Statistics) they conducted between 4:00 a.m. on the day prior to the interview and 4:00 a.m. on the day of. This permits us to investigate how time use patterns of married women correlates with co-residence, thereby shedding light on the domestic responsibilities mechanism.

2. **Sample restrictions.** In all three datasets, we focus on married women aged 15-60 (i.e. of working age) and not in education. We impose two restrictions on this sample to ensure that any change in co-residence status is generated by PIL mortality rather than other, potentially endogenous, reasons.

First, we restrict our panel datasets to married women who live with both PILs upon first observation. In IHDS this corresponds to the 2005 round, and in CPHS it is the earliest available round for any given married woman. Starting from this baseline, co-residence status can change for at least two reasons: PIL emigration or immigration to or from the household, or PIL death. The second sample restriction rules out the former possibility by excluding women whose co-residence status changes for any reason other than death. Hence, the married women in our main sample fall in to one of four mutually exclusive and collectively exhaustive categories: co-residence with "Both PIL", "Only FIL (MIL dead)", "Only MIL (FIL dead)" and "No PIL (Both PIL dead)"; see Appendix Figure A2 for a graphical depiction of the sample construction.

Our final IHDS sample contains a balanced panel of 6,600 women, of whom 1,484 experienced a FIL's death; 663 experienced a MIL's death; and 279 experienced the death of both. The final CPHS sample containing 34,658 unique individuals, comprises an unbalanced panel of 12,000-16,000 women in each year. Over the observation period, 2,404 experienced the death of a FIL; 1,048 the death of a MIL; and 401 the death of both. The fact that in both datasets FIL mortality is consistently just over twice as large as that of MIL mortality reflects (at least in part) higher life expectancy of women than men. It also means that the death of both PILs is more strongly correlated with the death of the MIL (Pearson's correlation coefficient $r = .64$ in IHDS and 0.54 in CPHS) than the death of a FIL ($r = 0.41$ in IHDS and 0.34 in CPHS). To explore the role of agency, we exploit a subset of our main IHDS sample containing 3,927 women who were also eligible for inclusion in the women's questionnaire.

Finally, to investigate the role of domestic responsibilities, we use a main sample of 24,925 women from the 2019 TUS cross-section, comprising women who were either co-residing with both PILs or with a widowed PIL. Hence, the three possible co-residence statuses here are "Both PIL", "Only MIL (FIL dead)" and "Only FIL (MIL dead)". This sample restriction facilitates some degree of comparability with the other two data sources. In the main TUS sample, 13,133 women live with both PILs; 9,164 women live with a widowed MIL; and 2,628 live with a widowed FIL.

Appendix Tables B1, B2 and B3 report summary statistics for our main samples in IHDS, CPHS, and TUS, respectively. All three datasets have similar age distributions. The majority (71% - 88%) of women are below the age of 35, with spouses largely below the age of 45. The samples are also comparable in terms of religious and caste composition. A key demographic difference between the surveys is that while 24% of women in the IHDS, and 38% of women in TUS reside in urban areas,

[8]We are grateful to Nicholas Li for sharing the raw data with us.

the CPHS sample is much more skewed to urban areas (64%). Average educational attainment of women and their spouses is correspondingly higher in CPHS compared to IHDS and TUS. Household composition in terms of age is broadly similar.

It is worth noting that married women in our main sample are systematically different from those in the (unrestricted) full sample. In particular, the women in our sample tend to be younger, have more young children, and are more educated.

3. **Co-residence, parent-in-law death, and labor force participation.** Co-residence status is garnered from the household roster, which defines the relationship of each respondent to the head of household. There are four possibilities. First, a married woman is listed as the daughter-in-law of the head of household and their spouse. Second, a married woman is listed as the spouse of the head of household, and the roster includes both his parents. Third, a married woman is listed as the head of household and the roster includes both her PILs. While CPHS and IHDS household rosters distinguish between parents and PILs of the head of household, TUS codes both of these as the same. Therefore in TUS, given the preponderance of patrilocal exogamy in India, we assume that if the head of household is male, then the listed persons are parents and not PILs. A fourth possibility, only in the case of IHDS 2012, is that the FIL and MIL continue to live in a nearby household unit.[9]

Our main explanatory variables are the death of initially co-residing PILs. This event is ascertained differently in each dataset. IHDS records spousal and parental relationships between all household members, and also indicates if the parent of each household member is dead. Therefore for each daughter-in-law, we check if the parents of her spouse are dead and verify this against their absence in the household. CPHS, more simply, records if any household member has died between waves of the survey. In TUS, we gauge whether a PIL is dead by observing the widowed status of their living spouse.

Our main outcome of interest is LFP. Different surveys measure this differently, so magnitudes of summary statistics and estimates in this paper are not comparable across different data sources. Our interest however lies not in comparing the magnitude of our estimates, but in exploring the (qualitative) robustness of our findings across different data sources as well as investigating a range of potential mechanisms.

In IHDS, a woman is categorized as participating in the labor force if she works at least 240 hours in an income generating activity. (Shariff et al. (2010), Batheja et al. (2023), and Khanna and Pandey (2024), among others, also use this definition.) These activities include work on an own farm, a family business, agricultural labor, non-agricultural labor, and salaried work. Table 1 shows that in 2005, according to the IHDS definition, 45% of women in our main sample participated in the labor force (Column 1). Column 2 shows that by 2012, the LFP rate for this group decreased to 42%. When the MIL had died and only the FIL is present, LFP was 47%. When the FIL has died and only the MIL was present, LFP was to 51%. When No PILs remained LFP stayed at 45%.

[9]The IHDS panel follows households that have "split" into one or more units between 2005 and 2012, but remain within the same community or village, where a unit is all those who live under the same roof and share the same kitchen for 6+ months during last year. We consider women in such cases as co-residing with their (living) PILs since the causal channels described earlier are likely to operate when PILs live close by. Dropping these split households results in a loss of statistical power, but our results are qualitatively similar when we restrict our sample to households that do not split.

	IHDS		CPHS						TUS
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Coresides with	2005	2012	2016	2017	2018	2019	2020	2021	2019
Both PIL	0.45	0.42	0.18	0.11	0.11	0.11	0.10	0.06	0.18
Only FIL (MIL dead)		0.47		0.09	0.08	0.08	0.06	0.05	0.20
Only MIL (FIL dead)		0.51		0.11	0.15	0.13	0.11	0.08	0.26
No PIL (Both PIL dead)		0.45		0.08	0.07	0.13	0.08	0.07	
No. Ind	6,600	6,600	15,165	14,762	15,336	16,021	12,020	13,788	24,925

TABLE 1. Labor force participation by co-residence status. *Notes*. This table presents average labor force participation rates for four mutually exclusive co-residence configurations with parents-in-law (PIL) for our main IHDS, CPHS, and TUS samples comprising married women aged 15-60, not engaged in education, who co-reside with both parents-in-law on first observation. Changes in co-residence status in the IHDS and CPHS panels come from the death of one or both PILs. In TUS, the sample is restricted to women who were either co-residing with both PILs or with a widowed PIL. In IHDS, a woman is categorized as participating in the labor force if she worked in an income generating activity for at least 240 hours in the past year. In CPHS, a woman is categorized as such if she is employed or willing to work as on the day of the survey, and in TUS, if she has been employed or looked for work in the past year. In CPHS, the table displays the sample size and means for the first quadrimester of the each year. Hence, the number of individuals in the bottom row is equal to the number of observations.

In CPHS, LFP is recorded as on the date of the survey, as opposed to a less restrictive and more conventional annual definition (Kumar, 2021). More specifically, a woman is categorized as participating in the labor force if on the day of the survey she is either employed, or unemployed but willing to work. The columns in the middle of Table 1 provide LFP rates across different co-residence configurations using data from the first quadrimester of each year. According to the CHPS definition, in 2016 first quadrimester, 18% of women co-residing with both PILs were in the labor force (Column 3). Columns 4-8 show that in this group (row 1), LFP declined over the years, reaching 6% by 2021. When only the FIL was present (row 2), LFP rates were generally lower, ranging from 5% to 9%. With only the MIL present (row 3), LFP rates were generally higher, between 8% and 15%. When neither PIL was present (row 4), LFP rates ranged between 7% and 13%.

Finally, in TUS, LFP is defined as being employed or looking for work using the "usual principal activity" status with reference to the past year (NSO, 2020).[10] As the last column of Table 1 indicates, in TUS, women co-residing with both PILs had an 18% LFP rate. Those living with only their FIL had a 20% rate, while those with only their MIL had a higher rate of 26%. Together, these descriptive statistics suggest that, relative to living with both PILs, women living with only a MIL have higher LFP. Those living with only a FIL have lower LFP in CPHS, but not in IHDS or TUS.[11]

The variation in LFP by co-residence status is at least partially a reflection of heterogeneity across these groups. Appendix Tables B5 and B6 present summary statistics for our main IHDS and CPHS samples at the time of first observation, by whether or not their co-residing FIL and MIL has subsequently died. The most marked difference between the groups is age: as can be expected from age-related mortality of PILs (see Figure 1) women whose PILs die tend to be substantially older than whose whose PILs survive, with correspondingly older spouses and fewer young children. They also tend to be marginally less educated, as do their spouses. We account for this and more in our empirical strategy, described in the next section.

[10]This definition is also used by all other national surveys by the National Statistical Office (NSO) where usual principal activity is the one where a person has spent a relatively longer time (by a major time criterion) in the 365 days preceding the survey.

[11]The LFP pattern by co-residence status for the main sample in Table 1 is completely consistent with that for the full sample in Appendix Table B4, although LFP is generally higher in the latter.

4. EMPIRICAL STRATEGY

In this section, we describe the empirical strategy used to estimate our main treatment effects pertaining to the LFP response to the death of a PIL. A discussion of the empirical strategy used to explore potential mechanisms underlying these treatment effects is deferred to Section 6.

1. **Baseline model and identification.** We begin by estimating the following simple DiD model using IHDS and CPHS panel data, to investigate the relationship between the death of a FIL, a MIL, or both PILs on married women's LFP:

$$y_{it} = \alpha_i + \gamma_t + \delta' X_{it} + \beta_F FILdead_{it} + \beta_M MILdead_{it} + \beta_P PILdead_{it} + \varepsilon_{it} \tag{1}$$

where y_{it} is a binary variable capturing whether (=1) or not (=0) a married woman i participates in the labor force in time period t. Time periods correspond to survey rounds, so in IHDS, $t = \{1, 2\}$ and in CPHS, $t = \{1, 2, ..., 18\}$. The parameters α_i and γ_t capture individual and time fixed effects, respectively. The vector X_{it} contains time-varying individual and household characteristics including dummy variables of the age categories of the woman and her spouse (separately); the number of children across multiple age categories; the number of other adults aged 15-60; and the number adults above age 60. Age is particularly important given women's life cycle changes in LFP and co-residence evident in Figure 1. In our main specifications, we include dummies for 10-year age intervals, but show in specification checks that our results are robust to finer age gradations (see Appendix Table B8).

The variable $FILdead_{it}$ is a binary indicator of whether i's FIL is dead (=1) or still alive (=0) in period t; $MILdead_{it}$ and $PILdead_{it}$ are defined accordingly for death of a MIL and the death of both PILs, respectively. The last is essentially an interaction term between $FILdead_{it}$ and $MILdead_{it}$. Since the sample with which we estimate model (1) is restricted to individuals who initially co-resided with both PILs, $FILdead_{it} = 1$ corresponds to living with only a MIL; $MILdead_{it} = 1$ to living with only a FIL; and $PILdead_{it} = 1$ to living with no PILs. These are mutually exclusive co-residence configurations, where the exclusion is living with both PILs.

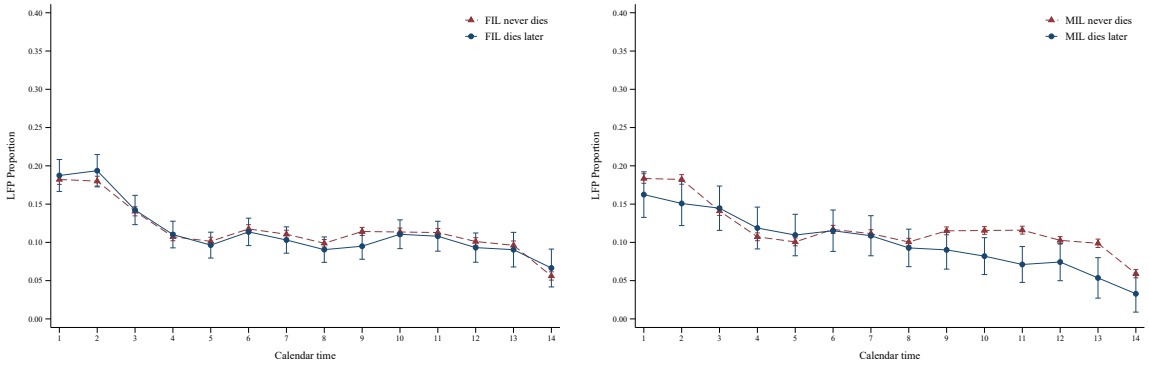
The estimates β_F, β_M, and β_P, constitute our parameters of interest. They capture the relationship between the death of a FIL, MIL, or both PILs, and individual i's LFP. To the extent that they have a causal interpretation, their signs depend on the net effect of a PIL's death on the married woman's income, domestic responsibilities, as well as autonomy and agency. We estimate equation (1) using a linear probability model (LPM), with standard errors clustered at the household level.[12]

Identification of the βs rests on three key assumptions. The first is that there were no confounding changes that coincided with the timing of a PIL's death. With individual and time FEs, this assumption seems more plausible between consecutive quadrimesters (or even consecutive years) in the CPHS data than it does for the seven-year interval between survey rounds in the IHDS data.

[12]Given that we have a binary dependent variable, an alternative to the LPM would be a conditional logit. Unfortunately in our setting, with "small T", maximum likelihood estimates are likely to be inconsistent due to an incidental parameter problem (Lancaster, 2000).

The second identifying assumption is parallel trends in outcomes between women whose in-law(s) did and didn't die. The CPHS's multiple survey rounds allow us to check for pre-trends whereas, with only two survey rounds, this is not feasible with IHDS. We show in Section 5, applying heterogeneity-robust estimators to CPHS data, that conditional parallel trends in the periods before an in-law's death seem to hold.

Figure 2 provides additional descriptive evidence in support of the more demanding assumption of unconditional parallel trends. Each point in the time series plots the mean value of LFP for two different sub-samples of women by calendar time in quadrimesters denoted on the x-axes, where the first time period is the first quadrimester of 2016. The dashed line ("never dies") presents means for the subsample of women whose FIL (Panel A) or MIL (Panel B) does not die over the entire observation period. The solid line ("dies later") presents means for sub-samples of women whose FIL (MIL) is still alive as of that time period, but dies in a subsequent period of observation.[13] Thus, the graph compares an "eventually treated" group in time periods prior to the in-law's death to the "never treated" group in the corresponding time periods. As Figure 2(A) shows, LFP evolves in a parallel manner for a FIL's death. Figure 2(B) indicates that this is not as compelling in the case of a MIL's death but, as we show later on, conditioning on individual characteristics appears to resolve the issue.



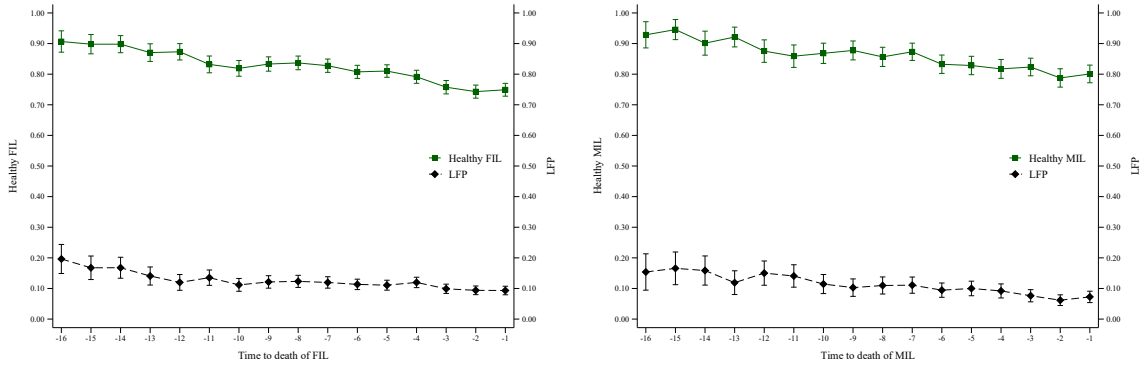
(A) FIL (B) MIL

FIGURE 2. Corroboratory evidence: unconditional parallel trends. *Notes.* This graph depicts trends in labor force participation (LFP) for our main CPHS sample from the first quadrimester of 2016 to the second quadrimester of 2020, by women whose FIL (Panel A) or MIL (Panel B) do not die (dashed line) over the entire observation period; and whose FIL (MIL) are still alive (solid line) as of the time period denoted in the x-axes, but die in a subsequent period. Each point in the time series plots the mean value (and 95% confidence interval) of LFP in the relevant sub-sample of women by calendar time in quadrimesters. A woman is categorized as participating in the labor force if she is employed or willing to work as on the day of the survey.

The third identifying assumption is "no anticipation", which precludes the possibility that any response to a PIL's death reflects anticipation of their demise. It is relevant in our context because if a death is preceded by a decline in health, then care needs may compel a daughter-in-law to stay home and care for her PIL (Batheja et al., 2023).

[13] We exclude the last three quadrimesters in this graph, because of lack of precision in due to small sample sizes in the "dies later" group over this period of time. In robustness checks in Section 5 we show that our results go through with and without the inclusion of women whose PILs died during these time periods.

Figure 3 indicates that this does not seem to be happening. The figure displays, for the sub-sample of women whose FIL or MIL eventually dies, how LFP (left axes) and the health status (right axes) of a FIL (Panel A) or MIL (Panel B) evolved in the time periods leading up to their (respective) demise. LFP is defined as before, and health status is a dummy variable equal to 1 if the FIL (MIL) is in good health and 0 if he (she) is not. Each point in the time series plots the mean value of the respective variable in the time period relative to that PIL's death, as denoted on the x-axes. Note that the sample changes for each point in these series, depending on the time of in-law's death and how many (or which) pre-periods the individual was observed for. The figure shows that LPF decreases and PILs' health deteriorates in the time periods leading up to their death. However, there is no indication of an unusual dip in either LFP or health in the time period(s) immediately preceding either a FIL's or a MIL's death.



(A) FIL (B) MIL

FIGURE 3. Corroboratory evidence: No anticipation. *Notes*. This figure depicts the proportion of healthy in-laws, and average labor force participation (LFP), for the sub-sample of women from our main CPHS sample whose FIL (Panel A) or MIL (Panel B) eventually dies, in the time periods leading up to their respective demise. A woman is categorized as participating in the labor force if she is employed or willing to work as on the day of the survey and "Healthy" is a dummy variable equal to 1 if the FIL (MIL) is in good health and 0 if he (she) is not. Each point in the time series plots the mean value (and 95% confidence interval) of the respective variable in the time period relative to that PIL's death, as denoted on the x-axes.

2. **Dynamic Difference-in-Differences.** The next step of our empirical strategy is to estimate a dynamic DiD model using CPHS data. This allows us to assess how women's LFP responds in the time periods following their FIL's or (separately) MIL's death. Concretely, we estimate the following model:

$$y_{it} = \alpha_i + \gamma_t + \delta' X_{it} + \sum_{l=-K}^{-2} \mu^l_{j(i)} D^l_{it} + \sum_{l=0}^{L} \mu^l_{j(i)} D^l_{it} + \nu_{it} \tag{2}$$

where y_{it} measures LFP of woman i in time period (i.e. quadrimester) t. The dummy variables D^l_{it} denote $l = \{-2, ..., -K\}$ leads and $l = \{0, ..., L\}$ lags relative to the time period directly preceding ($l = -1$) the death of i's PIL. In separate specifications, this pertains to the death of a FIL ($j = F$), and the death of a MIL ($j = M$). In addition to the controls in model (1), X_{it} contains a vector of

dummy variables indicating whether or not i's *other* PIL was dead in time period t. In other words, when investigating the effect of a FIL's (MIL's) death, we control for whether or not the MIL (FIL) is alive. The remaining parameters are defined as before and robust standard errors are clustered at the household level.

The parameters μ_F^l and μ_M^l capture trends in LFP in the time periods prior to a FIL and MIL's death, respectively, and the LFP response in the time periods thereafter. The former allows us to check for conditional parallel trends. The latter constitute our main parameters of interest.

A large body of recent evidence, surveyed in Roth et al. (2023), has pointed out that in settings such as ours—with multiple time periods where units are treated at different points in time—heterogeneous treatment effects based on the timing of a PIL's death may compromise the validity of standard (OLS) estimates for μ due to "forbidden comparisons", which create a potential "negative weighting" problem. As is by now standard in the dynamic DiD literature, we account for this possibility by deploying four different heterogeneity-robust estimators put forward by Callaway and Sant'Anna (2021); de Chaisemartin and D'Haultfœuille (2020); Sun and Abraham (2021); and Borusyak et al. (2024). These estimators can differ in their choice of control group, identifying assumptions, and weighting strategies of group treatment effects. Our motivation for using all four is to show that our headline results are robust to these alternative estimation approaches.

5. Does the death of a PIL increase married women's labor force participation?

In this section we address our first research question of whether co-residence exerts a negative effect on married women's LFP. Concretely, we examine how married women's LFP changes upon the demise of a co-residing PIL. We begin in Table 2 by presenting LPM DiD estimates for β_F, β_M and β_P from equation (1) using both IHDS and CPHS data.

	Labor-force participation			
	IHDS		CPHS	
	(1)	(2)	(3)	(4)
FIL dead (β_F)	0.038**	0.038*	0.016**	0.017***
	(0.018)	(0.020)	(0.006)	(0.007)
MIL dead (β_M)	-0.012	-0.013	-0.006	-0.002
	(0.024)	(0.031)	(0.008)	(0.009)
Both PIL dead (β_P)		0.001		-0.014
		(0.049)		(0.015)
Baseline mean (Both PIL)	0.436	0.436	0.094	0.094
No. Obs	13,200	13,200	255,979	255,979
No. Ind	6,600	6,600	34,658	34,658
F-test: Prob > F				
$\beta_F = \beta_M$	0.117	0.138	0.031	0.079
$\beta_F = \beta_P$		0.54		0.079
$\beta_M = \beta_P$		0.847		0.559

TABLE 2. Simple difference-in-differences estimates: death of parents-in-law and women's labor force participation. *Notes*. This table presents simple difference-in-differences estimates for β_F and β_M in equation (1) for our main sample of married women of working age, not engaged in education, who were co-residing with both PILs on first observation. Any changes in co-residence status in subsequent time periods is due solely to the death of a FIL, a MIL, or both. Each column presents estimates from a different regression. The dependent variable, labor force participation (LFP) is equal to 1 if the woman participated in the labor force and zero otherwise. In IHDS (columns 1-2) LFP = 1 if the woman has worked in an income generating activity for at least 240 hours in the past year. In CPHS (Columns 3-4) a woman is categorized as such if she is employed or willing to work as on the day of the survey. FIL, MIL, Both PIL dead are three different binary variables equal to 1 if the FIL, MIL, Both PIL, respectively, are dead and 0 if they are still alive. Each column includes individual fixed effects, time fixed effects, and time varying controls including age categories of the woman and her spouse; number of children across multiple age categories; number of other working age adults; and number of other seniors. The bottom rows contain p-values of F-tests for $\beta_F = \beta_M$, $\beta_F = \beta_P$ and $\beta_M = \beta_P$. Robust standard errors in parentheses are clustered at the household level. *** p<0.01, ** p<0.05, * p<0.1.

Columns 1-2 present DiD estimates using IHDS data, where the dependent variable is LFP. The estimates for β_F in row 1 of column 1 shows that married women's LFP increases by 3.8 percentage points upon the death of a FIL, amounting to an 8.7% increase in LFP when only a MIL co-resides relative to the baseline where both PILs are present. By contrast, the death of a MIL does not alter LFP: the coefficient estimate for β_M are small and statistically insignificant (row 2), indicating that it makes no difference if only the FIL co-resides or both PILs are present. Separately allowing for the death of both PILs (column 2) does not substantively change our coefficient estimates for β_M and β_F. Given this, we eschew the *PILdead* variable in the IHDS analysis when exploring potential mechanisms in Section 6.

Columns 3-4 present analogous estimates for LFP using CPHS data. The point estimates are obviously different given that the dependent variable is differently defined, and has a much lower baseline average. Qualitatively, however, the results are similar. The point estimate in row 1 of column 3 indicates that LFP increases by 1.6 percentage points following the death of a FIL, corresponding to a 17% increase relative to the baseline. Disaggregation of β_F by time periods following the death of a FIL shows that most of this increase comes two or more years following his death. LFP increases by only 1.1 percentage point (statistically significant at the 10% level) in the year following a FIL's death, but by 2.9 percentage points in the 2 or more years thereafter (statistically

significant at the 1% level); see Appendix Table B7. We investigate this in a more granular fashion shortly, in our dynamic DiD model. Consistent with the IHDS results in columns 1-2, the death of a MIL has no effect on LFP: the estimate for β_M is close to zero and statistically insignificant. We also reject the null that $\beta_F = \beta_M$ ($p = 0.03$). Neither result changes substantively when correcting for the death of both PILs in column 4, and we continue to reject the null that $\beta_F = \beta_M$ at the 10% level.

In order to ensure that these estimates are not capturing natural variation of LFP and co-residence over a woman's life cycle, we examine whether the results are robust to alternative age specifications, including (separately) a quadratic age term, and dummy variables for 2-, 5-, 10-, and 15-year age intervals. Appendix Table B8 confirms that they are. For the CPHS sample, we also show that excluding deaths that occurred during the COVID-19 pandemic does not change these baseline results; see Appendix Table B9.

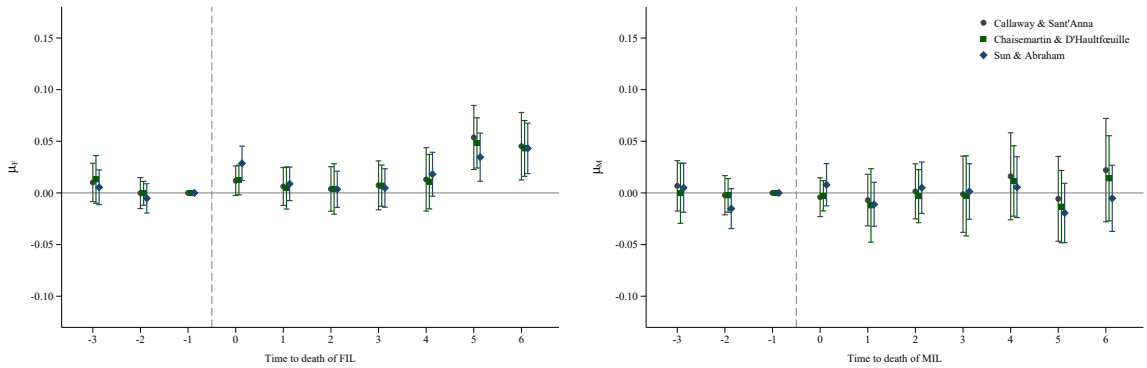
Lack of statistical power limits our ability to explore heterogeneous treatment effects. However, sample splits along the lines of dominant vs marginalized castes, Hindus vs non-Hindus, Northern vs Southern states, and urban vs rural areas indicates that the general pattern of a positive LFP response following the death of a FIL and an (always) insignificant response following a MIL's death holds across each of these groupings; See Appendix Table B10.

Taken together the estimates in Table 2, along with these robustness checks, suggest that when a woman's FIL dies and she is co-residing with only her MIL, her LFP increases relative to when both PILs are present. By contrast, LFP is (statistically) the same whether a woman co-resides with only a FIL, or lives with both him and her MIL. Put differently, a FIL's presence in the household appears to lower married women's LFP.

Our next step is to unpack the results in Table 2 by leveraging the CPHS data to estimate the dynamic DiD model stipulated in equation (2). This serves three purposes. First, in terms of estimation, it allows us to address the concern that the standard DiD estimates used in Table 2 may be inaccurate in the presence of heterogeneous treatment effects in staggered event-time settings such as ours. Second, it allows us to check for (and rule out) pre-trends. Third, and most substantively, it allows us to explore the dynamic responses to changes in co-residence.

To account for potential heterogeneity based on treatment timing we estimate equation (2) using four different approaches suggested by Callaway and Sant'Anna (2021), de Chaisemartin and D'Haultfœuille (2020), Sun and Abraham (2021) and Borusyak et al. (2024). Figure 4 presents coefficient estimates for μ^l from equation (2) using the first three estimators. We use the main CPHS sample to calculate these estimates and the figure presents those for the periods around the event, namely for the year (3 quadrimesters) prior, and two years (6 quadrimesters) following the death of a FIL (Panel A) and a MIL (Panel B). As Borusyak et al. (2024) estimates are not directly comparable to these approaches (Roth, Research Note. 2024), we present those estimates separately in Appendix Figure A3. The results are qualitatively identical.

For each of the estimators, the control group comprises "never treated" individuals. This corresponds to women whose FIL did not die over the observation period in Panel 4(A), and to those whose MIL did not die in Panel 4(B). Recall that in each case we include a control for whether or not the other PIL was alive.



(A) Death of FIL (B) Death of MIL

FIGURE 4. Dynamic difference-in-differences estimates: death of parents-in-law and women's labor force participation. *Notes*. Panel A (B) presents coefficient estimates for μ_F^l (μ_M^l) in equation (2), with 95% CIs, for our main sample of married women. The dependent variable is labor force participation (LFP), where a woman is categorized as participating in the labor force if she is employed or willing to work as on the day of the survey. The estimators presented include Callaway and Sant'Anna (2021) (circle), de Chaisemartin and D'Haultfœuille (2020) (square) and Sun and Abraham (2021) (diamond). The control is the "never treated" group. The models include individual fixed effects, time fixed effects, and time varying controls including, death of the other PIL, age categories of the woman and her spouse; number of children across multiple age categories; number of other working age adults; and number of other seniors. The x-axes measure relative time in quadrimesters to/since the death of the FIL (Panel A) and MIL (Panel B). Robust standard errors are clustered at the household level.

We begin by noting that estimates for the pre-period are not significantly different from zero in either graph of Figure 4, suggesting that there is no discernible pre-trend in LFP in the year prior to a PIL's death. Panel 4(A) indicates that LFP is generally positive but statistically insignificant in the first year following the death of a FIL. Approaching the middle of year two, however, LFP increases by a statistically significant, 4-5 percentage points. The overall treatment effect during this entire two-year period (depending on the estimator) is a statistically significant 1.4-1.7 percentage points, which is in line with the simple DiD estimates in Table 2. Also consistent with our earlier results, Panel 4(B) shows there is no increase in women's LFP following a MIL's death. None of the post-period estimates are significantly different from zero, and the overall treatment effect lies between -0.1 and 0.3 percentage points.

In addition to showing that these results are qualitatively and quantitatively similar when applying the Borusyak et al. (2024) estimator (see Appendix Figure A3), we run these results through several robustness checks. First, in Appendix Figure A5, we use individuals who are "not yet treated". Second, in Appendix Figure A4, we use individuals last to be treated (in year 2021). Because the "not yet treated" and "last treated" group are smaller than the "never treated" group, standard errors of the estimates are considerably larger. However, the results are qualitatively similar.

Third, because the COVID-19 pandemic affected mortality and caused labor market disruptions, we exclude those women whose PILs died during the pandemic from the analysis. The results, presented in Appendix Figure A6 are consistent. Fourth, in Appendix Figure A7, we restrict the sample to a year before PIL death and two years after PIL death and find similar results.

Together, these results in this section indicate that the death of a co-residing FIL increases married women's LFP after a year has passed, while the death of a co-residing MIL has no effect on LFP. Put differently, co-residing with a FIL appears to depress the daughter-in-law's LFP, while there is no corresponding effect of co-residing with a MIL. In the next section, we explore potential mechanisms that may account for this.

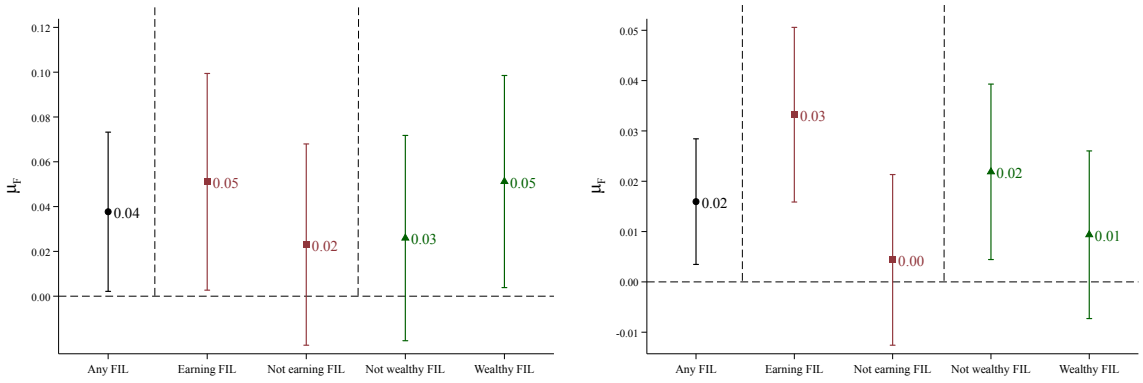
6. MECHANISMS

In this section, we explore three classes of mechanisms alluded to in the introduction, which could account for the results in Section 5: income effects, domestic responsibilities, and agency.

1. **Income Effect.** In India men, rather than women, tend to generate household income and have ownership over assets. They are also more likely to be employed at all age groups. Income effects are therefore likely to operate via a FIL, whose death may affect income in two ways. First, if the father-in-law was employed, it can lead to a loss in earned income. Second, it can result in an inheritance. The "earned income effect" may exert a positive effect on the co-residing daughter-in-law's labor supply, whereas the "inheritance effect" may be negative. Since pre-determined wealth and employment status of FILs are negatively correlated, these two effects tend to move in the same direction following the FIL's death. That is, if the data are consistent with an income effect, we would expect the response in a woman's LFP to be larger if the FIL had earned income (vs no earned income) and was not wealthy (vs wealthy).

We investigate the inheritance effect by disaggregating the estimate for β_F in equation (1) by whether, prior to a FIL's death, (i) he had earned income or not, and (ii) predetermined wealth was low or high (median split).[14] While we do our best to get at both effects using both our panel data sources, it is worth emphasizing that the earned income measure is arguably more compelling in CPHS than IHDS, and the wealth measure is less imperfect in IHDS than CPHS. In IHDS, we classify a FIL as having had an earned income if he worked in an income generating activity for at least 240 hours in 2005. Wealth is measured using IHDS's recommended asset count variable, which sums up how many assets a household owns. It ranges from 0 (no assets) to 30 (all 30 different assets measured). In CPHS, we classify a FIL as having earned income if he was employed in the two years prior to death. CPHS does not measure wealth. We therefore use average household income in the two years before death as a proxy.

[14]Note that the inclusion of individual fixed effects absorb differences in predetermined wealth in (i) and earned income in (ii).



(A) IHDS (B) CPHS

FIGURE 5. Income Effects. *Notes*. Each panel plots coefficients from three regressions. The first coefficient (circle) presented in each panel is β_F ("Any FIL dies") from equation (1). The following two pairs of coefficients, are estimates from two regressions, respectively, which use a modified version of equation (1) where the variable *FILdead* is replaced with two binary variables. These are either *Earning_FILdead* and *Notearning_FILdead* (square), or *Wealthy_FILdead* and *Notwealthy_FILdead* (triangle). In both cases, the exclusion is $FILdead = 0$. Panel A uses the the main sample in IHDS 2005-12 and Panel B uses the main sample in CPHS 2016-21. In IHDS, a FIL is considered to be earning if he was in an income generating activity for least 240 hours in 2005. In CPHS, a FIL is considered to be earning if he was employed anytime during the observation period (if he never dies) and two years before death (if he dies). In IHDS, a FIL is considered to be wealthy if his households assets are above median in 2005. In CPHS, households are classified into above or below median wealth, based on mean household income during the observation period (if he never dies) and two years before death (if he dies). For FILs who die, we consider the values of household income in the two year period before death. Each regression includes individual fixed effects with time varying controls (death of both PIL, age categories of the woman and her spouse, number of children across multiple age categories, number of other working age adults, and number of other seniors). Robust standard errors are clustered at the household level and error bars represent 95% CIs.

The results of this exercise are presented in Figure 5. For both IHDS (Panel A) and CPHS (Panel B), we find that the point estimates for women's LFP response to the death of a FIL with earned income ("earning FIL") is higher than that of not earning FILs. In comparing not wealthy to wealthy FILs, the CPHS point estimates are consistent with an income effect but the IHDS ones are not. (These results are similar when we do a sample split; results not shown.) And with the exception of earning versus not earning FILs in CPHS, differences between groups are not statistically significant. This suggests that while directions of some of the point estimates are consistent with an income effect, the overall evidence in support of it—partly due to data limitations—is not particularly compelling.

2. **Domestic responsibilities.** Co-residence with PILs may affect women's LFP by influencing the time they devote to domestic activities within the household. Here, a PIL's presence may have two countervailing effects. A woman may have less time for LFP if a PIL's presence adds to her domestic responsibilities, either because she must cater to their domestic needs, or because the PIL enforces gender-based norms requiring women to engage in domestic activities instead of participating in the labor market. By contrast, if PILs share in domestic responsibilities, their presence may free the woman to participate in the labor market. Here again, the gender of the co-residing parent may matter because MILs are more likely to help their daughter-in-law's domestic responsibilities.

In this section, we use data from TUS 2019 to see if time use varies by co-residence status. With a single survey round, we cannot exploit plausibly exogenous within variation in a PIL's death or

the timing thereof. We therefore present descriptive evidence that exploits cross-sectional variation. Concretely, to facilitate comparison with the panel data estimates, we restrict our cross-section to three configurations: co-residence with a widowed MIL (FIL dead), a widowed FIL (MIL dead), or co-residence with both PILs. The last category serves as the exclusion in the following regression:

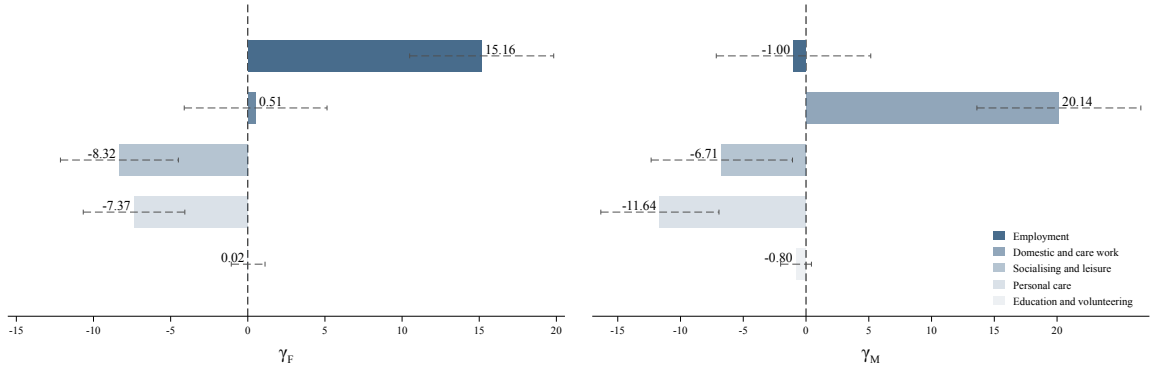
$$y_i = \alpha + \gamma_F FILdead_i + \gamma_M MILdead + \delta' X_i + \phi_d + \epsilon_i \tag{3}$$

where y_i denotes the number of minutes i spent on a given activity. $FILdead_i$ is a dummy variable equal to 1 if woman i resides with a widowed MIL, and $MILdead_i$ is defined similarly if she resides with a widowed FIL. These variables therefore resemble, as closely as possible, the corresponding variables from our baseline simple DiD specification in equation (1) for IHDS and CPHS. Similarly, the exclusion comprises women who live with both PILs. That said, since variation comes from the cross-section, selection into co-residence is a real possibility, so our coefficients of interest, γ_F and γ_M, represent correlations and not causal estimates. They capture the average difference in time devoted to activity y between married women who co-reside with a widowed MIL and widowed FIL, respectively, relative to women who live with both PILs. The vector X_i contains the standard controls described in Table B3; ϕ_d are district fixed effects; α is the intercept; and ϵ_i is the error term.

Time use in TUS is divided across 165 possible activities (defined according to the United Nations International Classification of Activities for Time-Use Statistics) individual i conducted between 4:00 a.m. the previous day and 4:00 a.m. on the day of the interview. Activities within this 24-hour recall window were recorded in 30-minute slots. When multiple activities were recorded within a time slot, the "major activity" was noted. We allocate all the minutes in a slot to this major activity, so that total time use sums to 24 hours.

We begin by examining how time use varies by co-residence across five mutually exclusive and collectively exhaustive categories within the 24-hour recall window: (1) employment, (2) domestic and care work, (3) socializing and leisure, (4) personal care, and (5) education and volunteering. This is an aggregation of the one digit activity classification of the respondent's major activity, where (1) employment includes "employment and related activities" and "production of goods for own final use"; (2) unpaid domestic and care work includes "unpaid domestic services for household members" and "unpaid caregiving services for household members"; (3) socializing and leisure includes "socializing and communication, community participation and religious practice" and "culture, leisure, mass-media and sports practices"; (4) personal care includes "self-care and maintenance (e.g. eating and sleep)"; finally, (5) education and volunteering includes "unpaid volunteer, trainee and other unpaid work" and "learning" [15].

[15]Note that while our sample excludes women who identify their primary occupational status as education, this variable denotes time spent by women in other occupational statuses toward learning



(A) FIL dead (widowed MIL) (B) MIL dead (widowed FIL)

FIGURE 6. Differences in average time spent by co-residence status: aggregate categories. *Notes*. This figure presents Tobit estimates for γ_F (Panel A) and γ_M (Panel B) in equation (3) using TUS 2019, where each row presents estimates (and 95% CIs) from a different regression. The sample is restricted to women who were either co-residing with both PILs or co-residing with a widowed PIL. The dependent variables are, from top to bottom, time spent in minutes on (i) employment, (ii) unpaid domestic and care work, (iii) socializing and leisure, (iv) personal care, and (v) education and volunteering. The bars indicate how average time use differs for married women living in households with only a widowed MIL i.e. FIL is dead (Panel A) or only a widowed FIL i.e. MIL is dead (Panel B) relative to those living with both PILs. The coefficients in each panel add up to zero, since there are only 24 hours in a day. The day of reference is 4:00 a.m. of the day prior to the interview to 4:00 a.m. of the day of the interview. Each regression includes controls for residence in urban areas, caste and religious group, age categories of the woman and her spouse, education categories of the woman and her spouse, number of children across multiple age categories, number of other working age adults, and number of other seniors. Robust standard errors are clustered at the household level.

Figure 6 presents Tobit estimates for γ_F (Panel A) and γ_M (Panel B) in equation (3) along with 95% CIs for 5 different regressions whose dependent variables are, from top to bottom, time spent on (i) employment, (ii) unpaid domestic and care work, (iii) socializing and leisure, (iv) personal care, and (v) education and volunteering. The bars indicate how average time use differs for married women living in households with a widowed MIL (Panel A) or widowed FIL (Panel B) relative to those living with both PILs. The coefficients in each panel add up to zero, since there are only 24 hours in a day.

We begin with 6(A), whose first bar indicates that, consistent with our previous results, women spend on average an additional 15 minutes on employment when a FIL is dead relative to both PILs being present. The additional 15-minutes devoted to employment when a widowed MIL is present may seem small, but this is largely a reflection of the fact that only 17.4 percent of women in our sample have their annual principal status as being employed and only 31 percent of women have spent any time in paid employment during the 24-hour recall period. On the extensive margin, employment—as measured by any time spent in paid employment—is 4.9 percentage points higher when a FIL is dead; see Appendix Table B11.

More time devoted to employment does not seem to be coming from less time spent in unpaid domestic and care work: this burden remains the same whether only a widowed MIL is present or both PILs are present (second bar). Rather, it comes primarily at the expense of time spent on socializing and leisure (8 minutes), and also personal care (7 minutes).

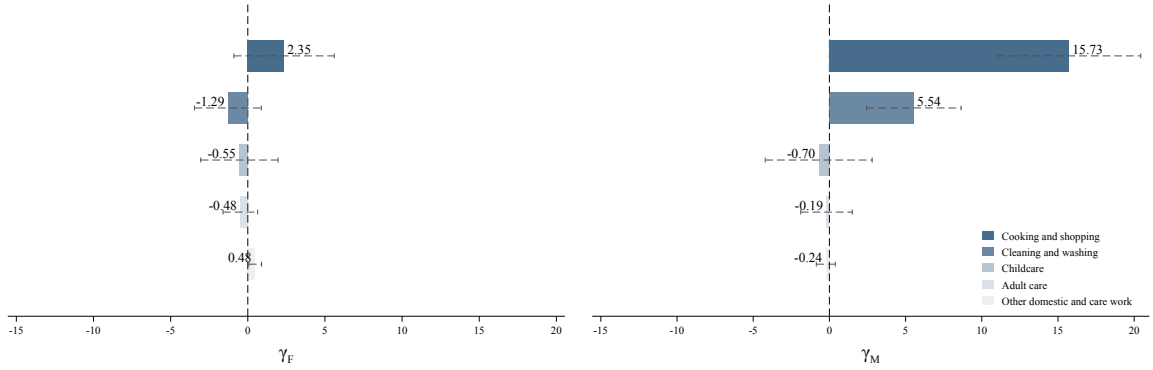
Panel 6(B) indicates that when the MIL is dead, employment is (statistically) no different than in households where both PILs are present. This too is consistent with our main results in Section 5.

However the unpaid care work burden is 20 minutes higher with a widowed FIL, and this comes mostly from less time spent in socializing and leisure (6 minutes) and personal care (11 minutes).

Differences in time spent on personal care, education and volunteering, and socializing and leisure in the presence of a widowed FIL versus a widowed MIL are not significantly different at the 5% level, and are quantitatively similar. What is significantly different (at the 1% level) is time spent on employment and unpaid care work. The former is significantly higher when a FIL is dead, and the latter significantly higher when the MIL is dead. This is consistent with a MIL facilitating employment by helping with FIL-related unpaid care work, and a FIL detracting from employment.

Figure 7 lends credence to this possibility. It shows estimates for γ_F and γ_M broken down across five mutually exclusive and collectively exhaustive types of the care work from row 2 of Figure 6: (1) cooking and shopping, (2) cleaning and washing, (3) childcare, (4) adult care, and (5) other domestic and care work.[16] Panel 7(A) indicates that the time the daughter-in-law spends in each of these activities is not substantially different when only a widowed MIL is present compared to when both PIL are present. Panel 7(B) shows that when the MIL is absent and only a widowed FIL is present, the married woman spends substantially more time on food preparation and cleaning. Since housework is highly gendered, these are likely to be activities that a MIL may have helped with, were she present.

[16]This is an aggregation of the two digit activity classification of the respondent's major activities under the previously defined category of domestic and care work, where (1) cooking and shopping includes "food and meals management and preparation" and "shopping for own household members"; (2) cleaning and washing includes "washing and cleaning and maintaining of own dwelling and surroundings", "do-it-yourself decoration, maintenance and repair" and "care and maintenance of textiles and footwear"; (3) childcare includes "childcare and instruction" ; (4) adult care includes "care for dependent adults" and "help to non-dependent adult household members"; and finally, (5) other domestic and care work includes "pet care", "traveling, moving, transporting or accompanying goods or persons related to unpaid domestic services for household members", "household management for own final use" and "other unpaid domestic services for household members".



(A) FIL dead (widowed MIL) (B) MIL dead (widowed FIL)

FIGURE 7. Differences in average time spent by co-residence status:: domestic and care work categories *Notes*. This figure presents Tobit estimates for γ_F (Panel A) and γ_M (Panel B) in equation (3) using TUS 2019, where each row presents estimates (and 95% CIs) from a different regression. The sample is restricted to women who were either co-residing with both PILs or co-residing with a widowed PIL. The dependent variables are, from top to bottom, time spent in minutes on (1) cooking and shopping, (2) cleaning and washing, (3) childcare, (4) adult care, and (5) other domestic and care work. The bars indicate how average time use differs for married women living in households with only a widowed MIL i.e. FIL is dead (Panel A) or only a widowed FIL i.e. MIL is dead (Panel B) relative to those living with both PILs. The coefficients in each panel add up to zero, since there are only 24 hours in a day. The day of reference is from 4:00 a.m. on the day prior to the interview to 4:00 a.m. on the day of the interview. Each regression includes controls for residence in urban areas, caste and religious group, age categories of the woman and her spouse, education categories of the woman and her spouse, number of children across multiple age categories, number of other working age adults, and number of other seniors. Robust standard errors are clustered at the household level.

Still, the additional time spent on these care activities seems small in absolute terms, so why should they detract from employment? The data suggest that time may be less revealing than timing.[17] We find that increased domestic and care workload is distributed across various times of the day. Over half of this is spent between 7am and 7pm, which coincides with typical working hours and may therefore be incompatible with employment (see Appendix Table B12).

As for the MIL, relative to when husbands are alive and co-residing, widows spend on average 13 fewer minutes on employment and 77 fewer minutes on domestic and care work than their married counterparts. The latter comes mostly from 53 fewer minutes spent cooking and shopping, and 23 fewer minutes cleaning and washing. By contrast, widowed MILs spend 40 more minutes on personal care and 51 more on education and volunteering. See Appendix Figure A9. This is broadly in keeping with ethnographic accounts of widows in India (e.g., Chen, ed (1998); Chen (2000)). Often relegated to the bottom of the social hierarchy, socially isolated, and expected to live a life of austerity, it is perhaps not surprising that in these data, they engage less in domestic work and their daughters-in-law, more.

In sum, we find that the distribution of women's time use is different when a widowed MIL or widowed FIL is present, relative to both co-residing. Consistent with our findings in Section 5, when the father-in-law is dead, more time is spent in employment. This time comes not from a lower care burden, but from less time a woman has for socializing and leisure as well as personal care. Also

[17]We are grateful to Rohini Somanathan for suggesting this.

consistent with our previous results, a MIL's death is not associated with any change in employment. It is, however, associated with more time spent on domestic work, especially cooking and cleaning.

In the next section, we investigate our third and final class of mechanisms, namely agency.

3. **Agency.** Conservative gender norms in India often limit women's agency and many such norms are internalized by, and enforced within, families. Household surveys show that in patriarchal nuclear families, the husband is typically the head of the household, so it is natural that much of the literature has focused on the constraining role of husbands on their wives' agency (e.g. Field et al. (2021) and Bernhardt et al. (2018)). Intra-household power dynamics may, however, be different when PILs are present. In this case the FIL is typically the household head and his wife, the MIL, the highest ranked woman.

IHDS data indicate that when a FIL dies, the husband often moves to the top position on the household roster and his wife to second place. The MIL slips down one or more notches, while the daughter-in-law moves towards the head of household by one position. A similar effect is at play when the MIL dies, but the magnitudes are significantly smaller (half a position). See Appendix Figure A8. While this shift in rank ordering may be mechanical or driven by surveyor effects, it is indicative of a potential change in power dynamics in inter-generational households following the death of FILs or MILs.

As such, PIL deaths may have ramifications for women's agency. To the extent that her husband (being, if nothing else, younger) is more socially liberal than his father, it is possible that a PIL's death allows the woman more decision-making power and autonomy.

We investigate this by taking advantage of IHDS's Eligible Women questionnaire described in Section 3. Since this subsample is smaller than the main sample used in our earlier analysis, we have less statistical power. Nevertheless, the survey has a number of useful questions. In terms of decision-making power, it asks the respondent who in the family has the "most say" regarding (i) whether to buy an expensive item such as a TV or a fridge; (ii) whom [their] child should marry; (ii) what to do if [their] child falls sick; (iv) the number of children [they] should have; and (v) what to cook on a daily basis. Two out of five possible responses to these questions are: the woman (i.e. the respondent), or her husband.[18] Note that one person having the "most say" does not disallow joint decision-making in the family. Rather, it highlights that some family members may hold more sway than others in household decision making.

Autonomy is captured in two ways: mobility, and financial independence. Mobility is captured in six variables, the first three pertaining to whether or not a woman needs permission from her husband or a senior household member to visit (i) a local shop, (ii) her relatives, or (iii) a health center; and the second three to whether or not can visit these places alone. Financial autonomy is measured via two binary variables: (i) whether or not she has her name on a bank account, and (ii) whether she has cash in hand for household expenditures.

To understand how the death of a PIL affects women's agency, we construct five different standardized weighted indices using the generalized least-squares method of weighting proposed by Anderson

[18]The other possible responses are senior male, senior female or others.

(2008).[19] The decision-making authority index comprises binary decisions along the five dimensions mentioned above, and we construct two such indices corresponding to whether the woman or her husband has the most say regarding these decisions. Two mobility indices correspond to whether a woman needs permission to visit the three places described earlier; and whether she can visit these places alone. Finally, the financial autonomy index contains the two dimensions mentioned earlier.

Index:	Decision-making authority		Mobility		Finance
	(1)	(2)	(3)	(4)	(5)
	Woman	Husband	Permission	Visit alone	Financial autonomy
FIL dead	0.023	0.095*	0.021	-0.084*	0.118**
	(0.055)	(0.052)	(0.056)	(0.046)	(0.047)
MIL dead	0.147*	0.136*	0.010	-0.015	0.080
	(0.078)	(0.073)	(0.072)	(0.064)	(0.061)
Both PIL dead	-0.043	-0.244	0.062	-0.046	-0.057
	(0.165)	(0.149)	(0.148)	(0.127)	(0.120)
No. Obs	7,831	7,831	7,741	7,759	7,848
No. Ind	3,927	3,927	3,927	3,926	3,927

TABLE 3. Death of parents-in-law and women's agency: simple difference-in-differences estimates.
*Notes.*This table presents coefficient estimates for β_F, and β_M in equation (1). The sample used is the IHDS 2005-12 main sample, further restricted to those who have been administered the Women's Questionnaire. The dependent variables, listed in the column headings, are standardized weighted indices. In columns 1-2, this index captures who in the household has the "most say" regarding making an expensive purchase, their child's marriage, how to treat a sick child, the number of children they should have, and what to cook: the woman (column 1) or her husband (column 2). In column 3, the index pertains to mobility outside the house, capturing whether the woman needs permission to visit the local shop, a relative's home, or a health center. In column 4, the analogous mobility index pertains to whether she is allowed to visit these three places alone. The dependent variable in column 5 is an index capturing financial autonomy in terms of having her name on a bank account and cash in hand. Each regression includes individual fixed effects with time varying controls (death of both PIL, age categories of the woman and her spouse, number of children across multiple age categories, number of other working age adults, and number of other seniors). Robust standard errors in parentheses are clustered at the household level. *** p<0.01, ** p<0.05, * p<0.1.

Table 3 summarizes the results from this subsection by presenting DiD estimates for β_F and β_M from equation (1), with each column corresponding to the standardized weighted index mentioned in the column headings. Appendix Figures A10 and A11 provide a breakdown of how each component of the indices change. Column 1 presents weak evidence that, upon MIL's death, the woman has more decision-making authority. This increase comes from all 5 dimensions along which this index is constructed, and is only marginally significant. By contrast, the death of a FIL instigates no such change, with a much smaller and statistically insignificant point estimate. Column 2 indicates that a husband's decision-making authority marginally increases following the death of both his father and mother. This comes mostly from having more say in expensive purchases and a child's marriage and, when his mother dies, also more authority regarding what to cook. Column 3 shows that the woman's need for permission regarding mobility outside the house is largely unchanged: if anything, in column 4, her ability to leave the house alone falls following a FIL's death. Finally, column 5

[19]The summary index is created by using the user written STATA command SWINDEX, which puts greater weight on uncorrelated indicators and lower weight on correlated indicators. Intuitively, this means that uncorrelated indicators, which represent "new" information, receive more weight (Schwab et al., 2020). The weighting explains why the coefficients on the index are generally larger than the coefficients on individual binary variables.

indicates that her financial independence increases following the death of a FIL but not a MIL. The former is driven mostly by being significantly more likely to have cash on hand, suggesting that the death of a FIL may improve her *de facto* financial independence.

In summary, the data suggest that the death of PILs sees a realignment of intra-household power dynamics, with authority shifting towards the woman's husband. This seems to translate into the woman having slightly more agency in terms of decision-making authority and financial autonomy, but not necessarily more mobility outside the household.

7. Conclusion

This paper investigates whether co-residence with parents-in-law affects married women's LFP in India and, if so, what mechanisms might account for this. Simple DiD estimates from two different panel datasets suggest that relative to women living with both PILs, women's LFP increases by 9-17% following the death of a FIL, and remains unchanged after a MIL's death. In other words, when a woman lives with only her MIL, her LFP increases relative to when she lives with both PILs. Her LFP is, however, (statistically) the same whether she lives with only her FIL or with both PILs. Dynamic DiD estimates indicate the increase in LFP upon the FIL's death materializes primarily in the second year thereafter, whereas LFP is unchanged in the two years following a MIL's death.

We explore three potential mechanisms that may account for these findings. First, while some point estimates are directionally consistent with income effects from either lost earnings or inheritance following a FIL's death, the evidence is not particularly compelling. Second, descriptive evidence from time use data suggests that domestic responsibilities are pertinent. Relative to those living with both PILs, women living with widowed MILs spend more time in employment but less in leisure and sleep. Those living with widowed FILs face a higher unpaid domestic work burden, particularly during standard working hours. Finally, upon a PIL's death, decision-making authority shifts toward the husband, and married women experience slightly greater financial autonomy but no increased mobility outside the home.

Our findings suggest that in India, where patrilocality is common (and life expectancy is increasing), co-residing FILs may be one factor contributing to persistently low female LFP. This, in turn, implies that alleviating constraints on women's agency and employment may require attention not just to the oft-studied role of husbands in the family, but also to power structures and domestic responsibilities in intergenerational households.

REFERENCES

Afridi, Farzana, Monisankar Bishnu, and Kanika Mahajan, "Gendering technological change: Evidence from agricultural mechanization," *IZA Discussion Paper No. 13712*, 2020.

_____, Taryn Dinkelman, and Kanika Mahajan, "Why are fewer married women joining the work force in rural India? A decomposition analysis over two decades," *Journal of Population Economics*, 2018, *31* (3), 783–818.

Agte, Patrick and Arielle Bernhardt, "The economics of caste norms: Purity, status, and women's work in India," *Job Market Paper*, 2023.

Akyol, Pelin and Zeynep Yılmaz, "Effects of Grandmothers' Proximity on Mothers' Labour Force Participation," *Oxford Bulletin of Economics and Statistics*, 2024, *86* (5), 1122–1162.

Anderson, Michael L, "Multiple inference and gender differences in the effects of early intervention: A reevaluation of the Abecedarian, Perry Preschool, and Early Training Projects," *Journal of the American Statistical Association*, 2008, *103* (484), 1481–1495.

Anukriti, S, Catalina Herrera-Almanza, Praveen K Pathak, and Mahesh Karra, "Curse of the Mummy-ji: the influence of mothers-in-law on women in India," *American Journal of Agricultural Economics*, 2020, *102* (5), 1328–1351.

Arpino, Bruno, Chiara D Pronzato, and Lara P Tavares, "The effect of grandparental support on mothers' labour market participation: An instrumental variable approach," *European Journal of Population*, 2014, *30*, 369–390.

Batheja, Deepshikha, Abhik Banerji, and Anil Deolalikar, "Co-residence with Parents-in-law, Female Labor Force Participation, and Autonomy," 2023. Unpublished manuscript.

Bernhardt, Arielle, Erica Field, Rohini Pande, Natalia Rigol, Simone Schaner, and Charity Troyer-Moore, "Male Social Status and Women's Work," *AEA Papers and Proceedings*, 2018, *108*, 363–367.

Béteille, André, *Caste, Class, and Power: Changing Patterns of Stratification in a Tanjore Village*, Berkeley: University of California Press, 1965.

Borker, Girija, "Safety first: Perceived risk of street harassment and educational choices of women," *World Bank Policy Research Working Paper No. 9731*, 2021.

Borusyak, Kirill, Xavier Jaravel, and Jann Spiess, "Revisiting event-study designs: robust and efficient estimation," *Review of Economic Studies*, 2024, *91*, 3253–3285.

Bratti, Massimiliano, Tommaso Frattini, and Francesco Scervini, "Grandparental availability for child care and maternal labor force participation: pension reform evidence from Italy," *Journal of Population Economics*, 2018, *31*, 1239–1277.

Breton, Etienne, "Modernization and Household Composition in India, 1983–2009," *Population and Development Review*, 12 2019, *45*, 739–766.

Callaway, Brantly and Pedro H.C. Sant'Anna, "Difference-in-Differences with multiple time periods," *Journal of Econometrics*, 2021, *225* (2), 200–230.

Chakraborty, Tanika, Anirban Mukherjee, Swapnika Reddy Rachapalli, and Sarani Saha, "Stigma of sexual violence and women's decision to work," *World Development*, 2018, *103*, 226–238.

_____, Nafisa Lohawala et al., "Women, Violence and Work: Threat of Sexual Violence and Women's Decision to Work," *IZA Discussion Paper No. 14372*, 2021.

Chatterjee, Urmila, Rinku Murgai, and Martin Rama, "Job opportunities along the rural-urban gradation and female labor force participation in India," *World Bank Policy Research Working Paper No. 7412*, 2015.

Chen, Martha Alter, *Perpetual mourning: Widowhood in rural India*, Oxford University Press, 2000.

_____, ed., *Widows in India: Social Neglect and Public Action*, New Delhi: Sage Publications, 1998.

Chowdhury, Subhanil, "Employment in India: What does the latest data show?," *Economic and Political Weekly*, 2011, *46* (32), 23–26.

Compton, Janice and Robert A. Pollak, "Family proximity, childcare, and women's labor force attachment," *Journal of Urban Economics*, 1 2014, *79*, 72–90.

Das, Maitreyi and Sonalde Desai, "Why are educated women less likely to be employed in India? Testing competing hypotheses," *Social Protection Discussion Paper No. 0313, World Bank*, 2003.

Das, Maitreyi Bordia and Ieva Zumbyte, "The motherhood penalty and female employment in urban India," *Policy Research Working Paper No. 8004, World Bank*, 2017.

de Chaisemartin, Clément and Xavier D'Haultfœuille, "Two-Way Fixed Effects Estimators with Heterogeneous Treatment Effects," *American Economic Review*, September 2020, *110* (9), 2964–96.

Debnath, Sisir, "The Impact of Household Structure on Female Autonomy in Developing Countries," *Journal of Development Studies*, 5 2015, *51*, 485–502.

Desai, Sonalde, "Declining female labour force participation in rural India: The demand side," *Ideas for India*, 2017.

_____ and Omkar Joshi, "The paradox of declining female work participation in an era of economic growth," *The Indian Journal of Labour Economics*, 2019, *62* (1), 55–71.

Deshpande, Ashwini, "The Covid-19 pandemic and gendered division of paid work, domestic chores and leisure: evidence from India's first wave," *Economia Politica*, 2022, *39* (1), 75–100.

_____ and Naila Kabeer, "Norms that matter: Exploring the distribution of women's work between income generation, expenditure-saving, and unpaid domestic responsibilities in India," *WIDER Working Paper 2021/130*, 2021.

Dhanaraj, Sowmya and Vidya Mahambare, "Family structure, education and women's employment in rural India," *World Development*, 3 2019, *115*, 17–29.

Esteve, Albert and Chia Liu, "Family and household composition in Asia," in "Routledge Handbook of Asian Demography," Routledge, 2017, pp. 370–393.

Field, Erica, Rohini Pande, Natalia Rigol, Simone Schaner, and Charity Troyer Moore, "On her own account: How strengthening women's financial control impacts labor supply and gender norms," *American Economic Review*, 7 2021, *111*, 2342–2375.

Fletcher, Erin K, Rohini Pande, and Charity Troyer Moore, "Women and Work in India: Descriptive Evidence and a Review of Potential Policies," 2017.

García-Morán, Eva and Zoë Kuehn, "With strings attached: Grandparent-provided child care and female labor market outcomes," *Review of Economic Dynamics*, 1 2017, *23*, 80–98.

Goldin, Claudia and Joshua Mitchell, "The new life cycle of women's employment: Disappearing humps, sagging middles, expanding tops," *Journal of Economic Perspectives*, 12 2017, *31*, 161–182.

Heath, Rachel and Xu Tan, "Intrahousehold Bargaining, Female Autonomy, and Labor Supply: Theory and Evidence from India," *Journal of the European Economic Association*, 8 2020, *18*, 1928–1968.

Ho, Christine, "Grandchild care, intergenerational transfers, and grandparents' labor supply," *Review of Economics of the Household*, 6 2015, *13*, 359–384.

Ho, Lisa, Suhani Jalota, and Anahita Karandikar, "Bringing work home: Flexible arrangements

as gateway jobs for women in West Bengal," *STEG Working Paper WP080*, 2024.

Jayachandran, Seema, "The Roots of Gender Inequality in Developing Countries," *Annual Review of Economics*, 8 2015, *7*, 63–88.

_____, "Social Norms as a Barrier to Women's Employment in Developing Countries," *IMF Economic Review*, 9 2021, *69*, 576–595.

Jensen, Robert, "Do labor market opportunities affect young women's work and family decisions? Experimental evidence from India," *The Quarterly Journal of Economics*, 2012, *127* (2), 753–792.

Kapsos, Steven, Andrea Silbermann, and Evangelia Bourmpoula, "Why is female labour force participation declining so sharply in India?," *ILO Research paper No. 10*, 2014.

Khalil, Umair and Sulagna Mookerjee, "Patrilocal residence and women's social status: evidence from South Asia," *Economic Development and Cultural Change*, 2019, *67* (2), 401–438.

Khanna, Madhulika and Divya Pandey, "The Role of Mothers-in-Law in Determining Women's Work: Evidence from India," *Economic Development and Cultural Change*, 4 2024, *72*, 1465–1492.

Klasen, Stephan and Janneke Pieters, "What explains the stagnation of female labor force participation in urban India?," *The World Bank Economic Review*, 2015, *29* (3), 449–478.

Kleven, Henrik, Camille Landais, Johanna Posch, Andreas Steinhauer, and Josef Zweimueller, "Child penalties across countries: Evidence and explanations," *AEA Papers and Proceedings*, 2019, *109*, 122–26.

Kumar, Vijeta, "8 Employment Indicators in CPHS," *28 October Consumer Pyramids Announcements*, 2021.

Lancaster, Tony, "The incidental parameter problem since 1948," *Journal of econometrics*, 2000, *95* (2), 391–413.

Li, Nicholas, "Women's work in India: Evidence from changes in time use between 1998 and 2019," *World Development*, 2023, *161*, 106107.

Lowe, Matt and Madeline McKelway, "Coupling Labor Supply Decisions: An Experiment in India," *Working Paper*, 2023.

Mano, Yukichi and Eiji Yamamura, "Effects of Husband's Education and Family Structure on Labor Force Participation and Married Japanese Women's Earnings," *Japanese Economy*, 10 2011, *38*, 71–91.

Marcos, Miguel Angel Talamas, "Grandmothers and the gender gap in the Mexican labor market," *Journal of Development Economics*, 5 2023, *162*.

Matulevich, Eliana Carolina Rubiano and Mariana Viollaz, "Gender differences in time use: Allocating time between the market and the household," *World Bank Policy Research Working Paper*, 2019, (8981).

Maurer-Fazio, Margaret, Rachel Connelly, Lan Chen, and Lixin Tang, "Childcare, eldercare, and labor force participation of married women in urban China, 1982–2000," *Journal of human resources*, 2011, *46* (2), 261–294.

McKelway, Madeline, "How Does Women's Employment Affect Their Time Use? Evidence from a Randomized Encouragement Design in India," *Working Paper*, 2023.

Mehrotra, Santosh and Jajati K. Parida, "Why is the Labour Force Participation of Women Declining in India?," *World Development*, 10 2017, *98*, 360–380.

Mukherjee, Tista, Ishita Mukhopadhyay, and Sukanta Bhattacharya, "Intergenerational Coresidence and Women's Employment in Urban India," *Indian Journal of Labour Economics*, 9 2023, *66*, 911–931.

Munshi, Kaivan and Swapnil Singh, "Social Status, Economic Development and Female Labor

Force (Non) Participation," Working Paper 32946, National Bureau of Economic Research September 2024.

NSO, "Time Use in India - 2019," 2020.

Ogawa, Naohiro and John F Ermisch, "Family structure, home time demands, and the employment patterns of Japanese married women," *Journal of Labor Economics*, 1996, *14* (4), 677–702.

Oh, Suanna, "Does identity affect labor supply?," *American Economic Review*, 2023, *113* (8), 2055–2083.

Posadas, Josefina and Marian Vidal-Fernandez, "Grandparents' childcare and female labor force participation," *IZA Journal of Labor Policy*, 2013, *2*, 1–20.

Rosenzweig, Mark R., "Risk, Implicit Contracts and the Family in Rural Areas of Low-Income Countries," *The Economic Journal*, 12 1988, *98* (393), 1148–1170.

Roth, Jonathan, "Interpreting Event-Studies from Recent Difference-in-Differences Methods," Research Note. 2024.

_____**, Pedro HC Sant'Anna, Alyssa Bilinski, and John Poe**, "What's trending in difference-in-differences? A synthesis of the recent econometrics literature," *Journal of Econometrics*, 2023, *235* (2), 2218–2244.

Sarkar, Sudipa, Soham Sahoo, and Stephan Klasen, "Employment transitions of women in India: A panel analysis," *World Development*, 2019, *115*, 291–309.

Sasaki, Masaru, "The Causal Effect of Family Structure on Labor Force Participation among Japanese Married Women," *The Journal of Human Resources*, 2002, *37*, 429–440.

Schwab, Benjamin, Sarah Janzen, Nicholas P Magnan, and William M Thompson, "Constructing a summary index using the standardized inverse-covariance weighted average of indicators," *The Stata Journal*, 2020, *20* (4), 952–964.

Shariff, Abusaleh, Sonalde Desai, Amaresh Dubey, Brij Joshi, Mitali Sen, and Reeve Vanneman, *Human Development in India: Challenges for a Society in Transition* 10 2010.

Shen, Ke, Ping Yan, and Yi Zeng, "Coresidence with elderly parents and female labor supply in China," *Demographic Research*, 2016, *35*, 645–670.

Siddique, Zahra, "Media-reported violence and female labor supply," *Economic Development and Cultural Change*, 2022, *70* (4), 1337–1365.

Sivasankaran, Anitha, "Work and women's marriage, fertility and empowerment: Evidence from textile mill employment in India," *Job Market Paper, Harvard University, Cambridge, MA*, 2014.

Srinivas, M. N., "The changing position of Indian women," *Man*, 1977, pp. 221–238.

Strauss, John and Duncan Thomas, "Human resources: Empirical modeling of household and family decisions," *Handbook of Development Economics*, 1995, *3*, 1883–2023.

Subramanian, Nivedhitha, "Workplace attributes and women's labor supply decisions: Evidence from a randomized experiment," *Unpublished Manuscript*, 2019.

Sun, Liyang and Sarah Abraham, "Estimating dynamic treatment effects in event studies with heterogeneous treatment effects," *Journal of Econometrics*, 2021, *225* (2), 175–199. Themed Issue: Treatment Effect 1.

Uberoi, Patricia, *Family, Kinship and Marriage in India*, New Delhi: Oxford University Press, 1993.

8. Appendix A: Additional Figures

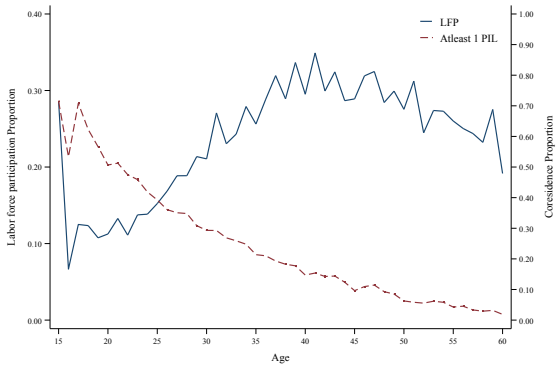


FIGURE A1. Labor force participation and co-residence with parents-in-law over the lifecycle: TUS 2019 *Notes*. This figure depicts a relationship between co-residence with parents-in-law and labor force participation (LFP) over a women's lifecycle. LFP is shown on the left y-axes, and the proportion residing with at least 1 parent-in-law (PIL)—a father-in-law, a mother-in-law, or both—on the right y-axes. The figure uses TUS 2019 data, on a sample of married women aged 15-60, not engaged in education. In TUS, a woman is categorized as participating in the labor force if she has been employed or looked for work in the past year.

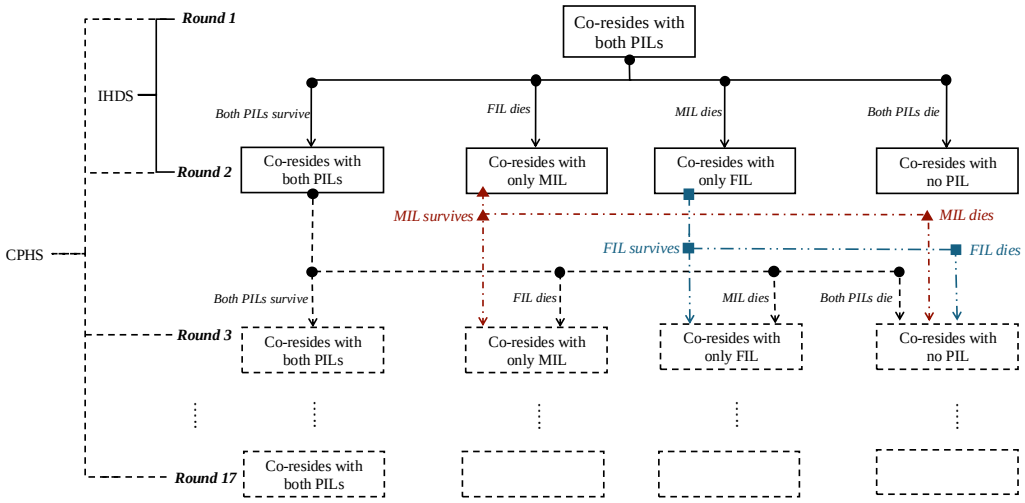
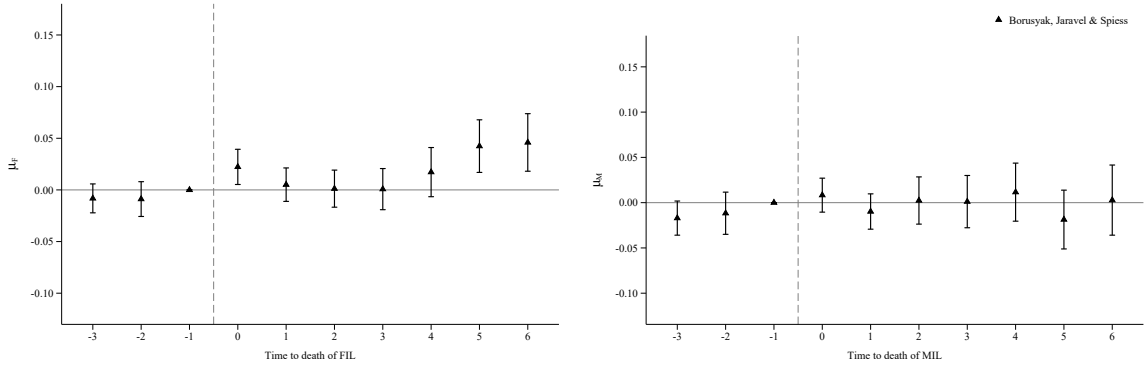
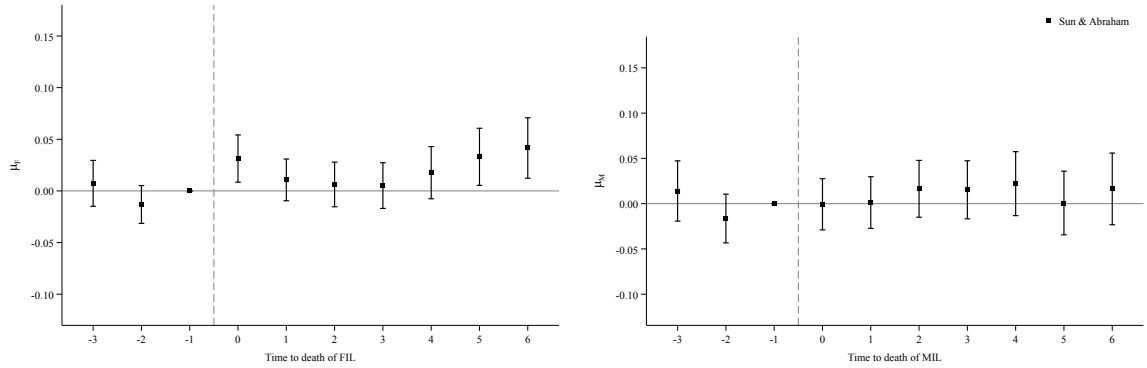


FIGURE A2. Sample Restrictions *Notes*. This figure demonstrates the sample restrictions applied to IHDS and CPHS and the correspondence between PIL death and the four mutually exclusive co-residence configurations used in the empirical analysis. The sample is restricted to married women aged 15-60, not engaged in education, who co-reside with both parents-in-law on first observation. They may experience changes in co-residence status in subsequent observations, but only owing to death of one or both parents-in-laws.



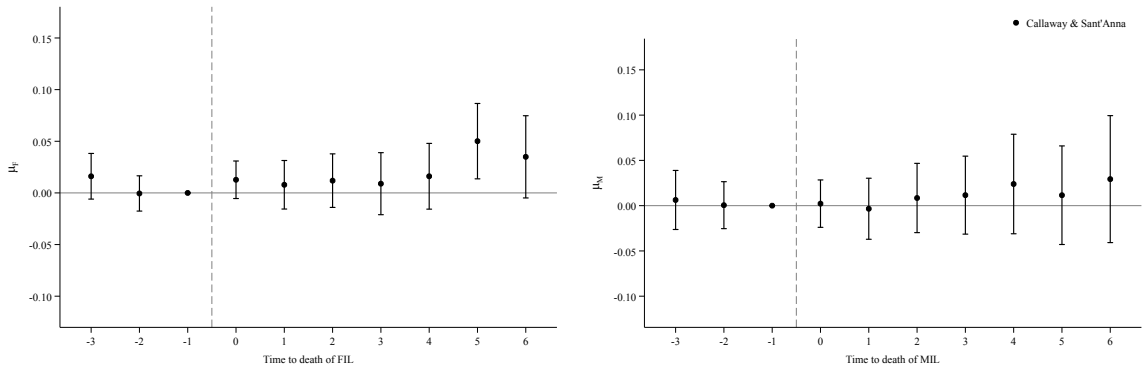
(A) Death of FIL (B) Death of MIL

FIGURE A3. Dynamic difference-in-differences estimates: Borusyak et al. (2024). *Notes*. The figures in panel A (B) presents coefficient estimates for μ_F^k (μ_M^k) in equation (2), with 95% CIs, for our main sample in CPHS 2016-21. The dependent variable is labor force participation (LFP), where a woman is categorized as participating in the labor force if she is employed or willing to work as on the day of the survey. The estimator presented is Borusyak et al. (2024). The control group is imputed from "non-treated observations", which includes never treated and not-yet-treated. The model includes individual fixed effects, time fixed effects, and time varying controls including, death of the other PIL, age categories of the woman and her spouse; number of children across multiple age categories; number of other working age adults; and number of other seniors. The x-axes measure relative time in quadrimesters to/since the death of the FIL (Panel A) and MIL (Panel B). Robust standard errors are clustered at the household level.



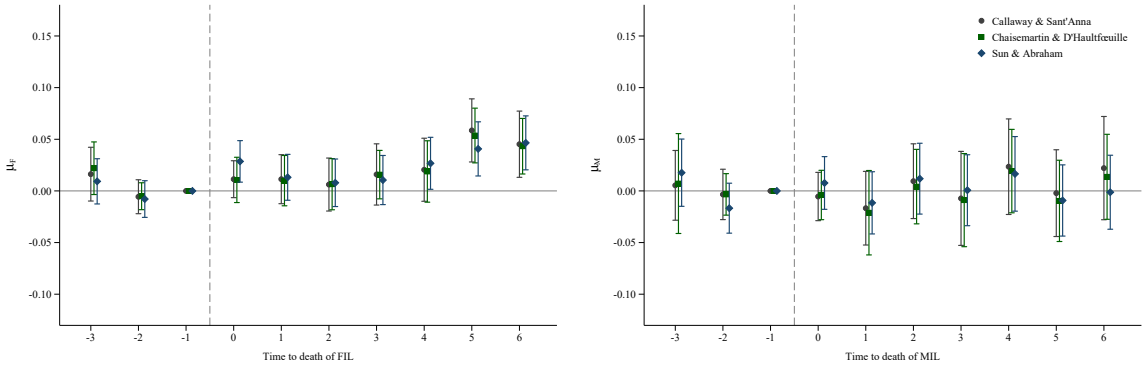
(A) Death of FIL (B) Death of MIL

FIGURE A4. Dynamic difference-in-differences estimates: last treated as control group. *Notes*. The figures in panel A (B) presents coefficient estimates for μ_F^k (μ_M^k) in equation (2), with 95% CIs, for our main sample in CPHS 2016-21, further restricted to those women who experience a death of FIL (Panel A) or MIL (Panel B). The dependent variable is labor force participation (LFP), where a woman is categorized as participating in the labor force if she is employed or willing to work as on the day of the survey. The estimator is Sun and Abraham (2021). The control group is last to be treated (in 2021). The model includes individual fixed effects, time fixed effects, and time varying controls including, death of the other PIL, age categories of the woman and her spouse; number of children across multiple age categories; number of other working age adults; and number of other seniors. The x-axes measure relative time in quadrimesters to/since the death of the FIL (Panel A) and MIL (Panel B). Robust standard errors are clustered at the household level.



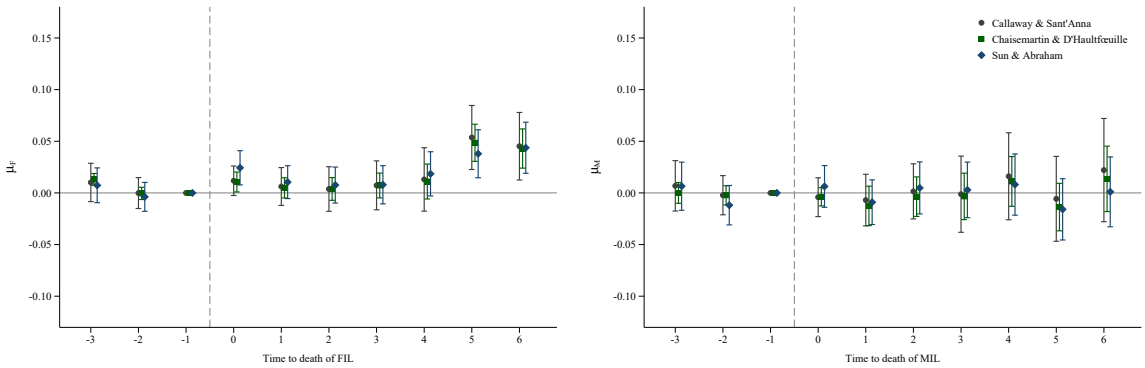
(A) Death of FIL (B) Death of MIL

FIGURE A5. Dynamic difference-in-differences estimates: not yet treated as control group. *Notes*. The figures in panel A (B) presents coefficient estimates for μ_F^k (μ_M^k) in equation (2), with 95% CIs, for our main sample in CPHS 2016-21, further restricted to those women who experience a death of FIL (Panel A) or MIL (Panel B). The dependent variable is labor force participation (LFP), where a woman is categorized as participating in the labor force if she is employed or willing to work as on the day of the survey. The estimator presented is Callaway and Sant'Anna (2021). The control group is "not yet treated". The model includes individual fixed effects, time fixed effects, and time varying controls including, death of the other PIL, age categories of the woman and her spouse; number of children across multiple age categories; number of other working age adults; and number of other seniors. The x-axes measures relative time in quadrimesters to/since the death of the FIL (Panel A) or MIL (Panel B). Robust standard errors are clustered at the household level.



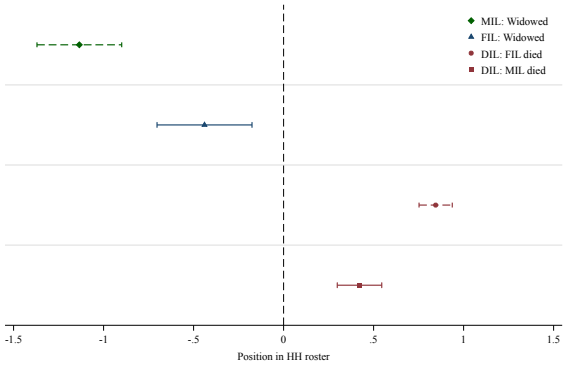
(A) Death of FIL (B) Death of MIL

FIGURE A6. Dynamic difference-in-differences estimates: excluding COVID-19 deaths. *Notes*. The figures in panel A (B) presents coefficient estimates for μ_F^k (μ_M^k) in equation (2), with 95% CIs, for our main sample in CPHS 2016-21, excluding women whose FIL (MIL) die during the COVID-19 pandemic. The dependent variable is labor force participation (LFP), where a woman is categorized as participating in the labor force if she is employed or willing to work as on the day of the survey. The estimators presented include Callaway and Sant'Anna (2021) (circle), de Chaisemartin and D'Haultfœuille (2020) (square) and Sun and Abraham (2021) (diamond). The control group is the "never treated". The models include individual fixed effects, time fixed effects, and time varying controls including, death of the other PIL, age categories of the woman and her spouse; number of children across multiple age categories; number of other working age adults; and number of other seniors. The x-axes measures relative time in quadrimesters to/since the death of the FIL (Panel A) and MIL (Panel B). Robust standard errors are clustered at the household level.



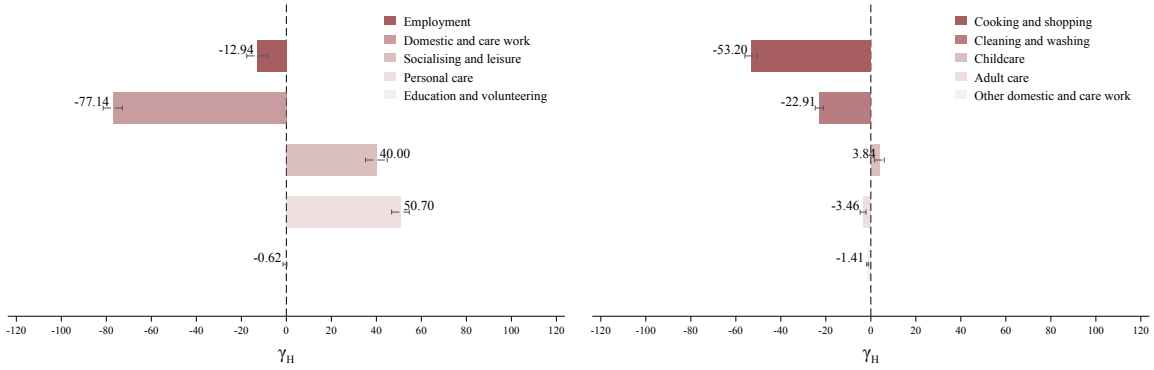
(A) Death of FIL (B) Death of MIL

FIGURE A7. Dynamic difference-in-differences estimates: restricted observation window. *Notes*. The figures in panel A (B) presents coefficient estimates for μ_F^k (μ_M^k) in (2), with 95% CIs, for our main sample in CPHS 2016-21. In addition, the sample is restricted to observations that lie within one year before death of FIL (MIL) to two years after death of FIL (MIL). The dependent variable is labor force participation (LFP), where a woman is categorized as participating in the labor force if she is employed or willing to work as on the day of the survey. The estimators presented include Callaway and Sant'Anna (2021) (circle), de Chaisemartin and D'Haultfœuille (2020) (square) and Sun and Abraham (2021) (diamond). The control group is the "never treated". The models include individual fixed effects, time fixed effects, and time varying controls including, death of the other PIL, age categories of the woman and her spouse; number of children across multiple age categories; number of other working age adults; and number of other seniors. The x-axes measure relative time in quadrimesters to/since the death of the FIL (Panel A) and MIL (Panel B). Robust standard errors are clustered at the household level.



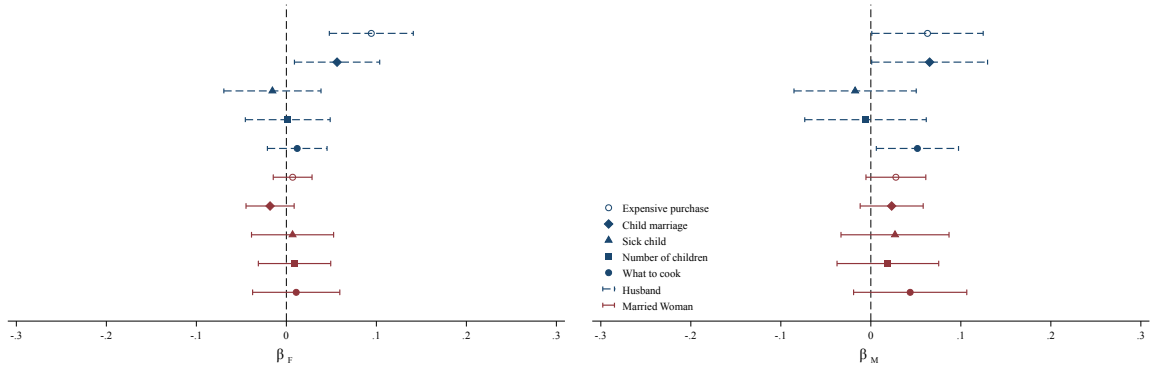
(A) IHDS

FIGURE A8. Roster position. *Notes*. This figure represents coefficients of four different regression specifications, using three sub-samples from IHDS 2005-12, a sample of mothers-in-law, a sample of fathers-in-law and the main sample of daughters-in-law. The data is further restricted to households that do not split between 2005 and 2012. The dependent variable is distance from the head of household which is measured as 1 - position in the household roster. The explanatory variables are death of spouse, for MIL (diamond, dashed), for FIL (triangle, solid), death of FIL (circle, dashed) and MIL (square, solid) for daughter-in-law. Controls include individual fixed effects, year fixed effect, age category fixed effects and total household size. Robust standard errors in parentheses are clustered at the household level.



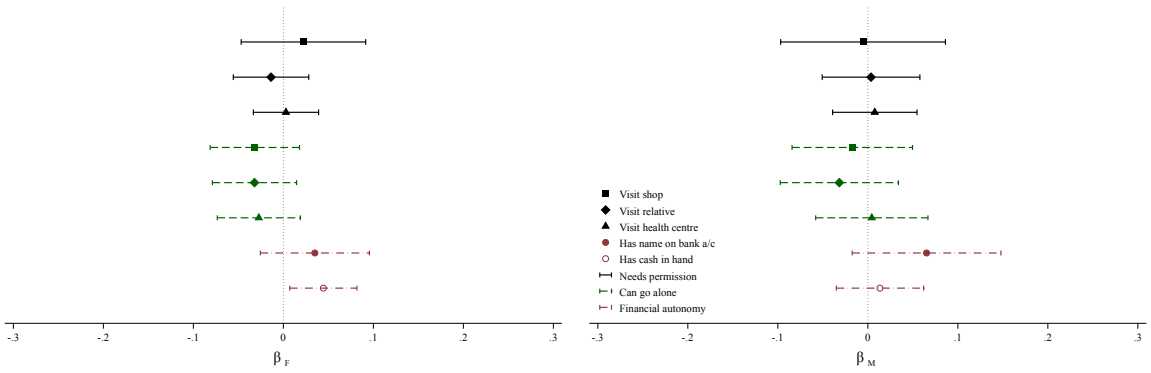
(A) Aggregate categories (Husband dead) (B) Domestic and care work categories (Husband dead)

FIGURE A9. Time spent: domestic and care work categories. *Notes*. This figure presents Tobit estimates for an amended version of equation (3), where in the place of γ_F γ_M, we have γ_H, a binary variable, which takes value 1 if the individual's husband is dead. The sample is restricted to women who are mothers-in-law (co-residing with daughters-in-law), who are either co-residing with their husband or are widowed. The dependent variables in panel A, from top to bottom, time spent in minutes on (i) employment, (ii) unpaid domestic and care work, (iii) socializing and leisure, (iv) personal care, and (v) education and volunteering. The dependent variables in panel B are, from top to bottom, time spent in minutes on (1) cooking and shopping, (2) cleaning and washing, (3) childcare, (4) adult care, and (5) other domestic and care work. The bars indicate how average time use differs for mothers-in-law who co-reside with their husband compared to to those who are widowed. The coefficients in each panel add up to zero, since there are only 24 hours in a day. The day of reference is from 4:00 a.m. on the day prior to the interview to 4:00 a.m. on the day of the interview. Each regression includes controls for residence in urban areas, caste and religious group, age categories of the woman, education categories of the woman, number of children across multiple age categories, number of other working age adults, and number of other seniors.



(A) FIL dead (B) MIL dead

FIGURE A10. Decision making authority. *Notes*. This figure presents estimates of β_F (Panel A) and β_M (Panel B), along with their 95% CIs, from 10 different regressions based on equation (1). The sample used is the IHDS 2005-12 main sample, further restricted to those who have been administered the Women's Questionnaire. There are two sets of binary dependent variables, whether (=1) or not (=0) the husband (top half) or whether (=1) or not (=0) the woman (bottom half) has most say on household decisions like expensive purchases (solid circle), child's marriage (diamond), sick child (triangle), number of children (square) and what to cook (hollow circle). There are two explanatory variables, is the death of a co-residing FIL (Panel A) and death of a co-residing MIL (Panel B), relative to when both PILs were present. Each regression includes individual fixed effects with time varying controls. These controls include death of both PIL, fixed effects for age categories of the woman and her spouse, number of children across multiple age categories, number of other working age adults and number of other seniors. Robust standard errors are clustered at the household level.



(A) FIL dead (B) MIL dead

FIGURE A11. Mobility and Financial independence. *Notes.* This figure represents estimates of β_F (Panel A) and β_M (Panel B), along with their 95% CIs, from 8 different regressions based on equation (1). The sample used is the IHDS 2005-12 main sample, further restricted to those who have been administered the Women's Questionnaire. There are three groups of binary dependent variables. The first two groups are whether (=1) or not (=0) the woman needs permission (top three), or whether or not the woman can go alone (middle three) to visit a shop (square), visit a relative (diamond) and visit a health care center (triangle). The dependent variables in the bottom two regressions are whether or not the woman has her name on the bank account (solid circle), and whether she has cash in hand (hollow circle). Each regression includes individual fixed effects with time varying controls (death of both PIL, age categories of the woman and her spouse, number of children across multiple age categories, number of other working age adults, and number of other seniors). Robust standard errors are clustered at the household level.

9. APPENDIX B: ADDITIONAL TABLES

	Main Sample		Eligible Women	
	2005	2012	2005	2012
LFP	0.45	0.44	0.48	0.44
Woman's Age				
15 -24	0.45	0.02	0.38	0.02
25 - 34	0.42	0.61	0.47	0.56
35 - 44	0.11	0.29	0.14	0.34
45 - 54	0.01	0.07	0.01	0.08
55 - 60	0.00	0.01	0.00	0.00
Spouse Age				
15 - 24	0.20	0.00	0.14	0.00
25 - 34	0.53	0.37	0.53	0.30
35 - 44	0.22	0.46	0.27	0.51
45 - 54	0.05	0.14	0.06	0.17
55 - 64	0.00	0.02	0.00	0.02
65+	0.00	0.00	0.00	0.00
Woman's Education				
No Education	0.36	0.33	0.34	0.31
Primary or below	0.24	0.26	0.24	0.26
Secondary or below	0.27	0.27	0.28	0.28
High School	0.08	0.08	0.08	0.09
Bachelors and above	0.05	0.06	0.06	0.06
Spouse Education				
No Education	0.15	0.15	0.15	0.14
Primary or below	0.23	0.23	0.23	0.23
Secondary or below	0.37	0.36	0.37	0.36
High School	0.13	0.14	0.15	0.14
Bachelors and above	0.11	0.12	0.12	0.13
Urban	0.24	0.26	0.24	0.26
Hindu, Brahmin	0.05	0.05	0.06	0.06
Hindu, Other dominant castes	0.19	0.19	0.20	0.20
Hindu, Other backward castes	0.37	0.37	0.36	0.36
Scheduled castes	0.18	0.18	0.18	0.18
Scheduled tribes	0.07	0.07	0.07	0.07
Muslim	0.10	0.10	0.09	0.09
Other religions	0.04	0.04	0.04	0.04
Household Composition				
Children under 6 yrs	1.35	0.84	1.17	0.71
Children 6-10 yrs	0.64	0.77	0.59	0.71
Children 10-15 yrs	0.67	0.76	0.60	0.75
Other adults below 60 yrs	4.02	3.40	3.50	3.27
Other adults above 60 yrs	0.09	0.05	0.07	0.04
No. Obs	6,600	6,600	3,927	3,927
No. Ind	6,600	6,600	3,927	3,927

TABLE B1. IHDS 2005-12 main sample and eligible women sub-sample: summary statistics by year. *Notes*. This table presents summary statistics for in IHDS 2004-5 and 2011-12 for the main sample, and for the sub-sample of eligible women. The main sample includes married women aged 15-60, not engaged in education, who co-reside with both parents-in-law in 2005. Eligible women were administered the women's questionnaire comprises a subset of women the main sample who were 15- 49 in 2004-5.

	2016	2017	2018	2019	2020	2021
LFP	0.18	0.11	0.11	0.11	0.10	0.06
Women's Age						
15 - 24	0.37	0.33	0.29	0.25	0.22	0.20
25 - 34	0.51	0.53	0.55	0.57	0.57	0.57
35 - 44	0.11	0.12	0.15	0.16	0.19	0.20
45 - 54	0.01	0.01	0.02	0.02	0.02	0.02
55 - 64	0.00	0.00	0.00	0.00	0.00	0.00
Spouse Age						
15 - 24	0.12	0.10	0.08	0.07	0.06	0.06
25 - 34	0.56	0.55	0.54	0.51	0.50	0.49
35- 44	0.24	0.26	0.29	0.31	0.33	0.34
45 - 54	0.05	0.06	0.06	0.07	0.08	0.08
55 - 64	0.02	0.02	0.02	0.02	0.02	0.03
65+	0.01	0.01	0.01	0.01	0.01	0.01
Women's Education						
No education	0.08	0.04	0.02	0.01	0.01	0.00
Primary and below	0.12	0.13	0.15	0.15	0.15	0.11
Secondary and below	0.34	0.37	0.39	0.39	0.40	0.51
High school	0.20	0.22	0.20	0.21	0.21	0.22
Bachelors and above	0.25	0.24	0.24	0.24	0.23	0.16
Spouse Education						
No education	0.03	0.01	0.01	0.00	0.00	0.00
Primary and below	0.10	0.10	0.10	0.10	0.08	0.04
Secondary and below	0.36	0.37	0.39	0.38	0.38	0.41
High school	0.22	0.23	0.21	0.22	0.22	0.26
Bachelors and above	0.29	0.29	0.30	0.30	0.31	0.28
Urban	0.64	0.61	0.57	0.58	0.60	0.62
Hindu, Dominant castes	0.21	0.19	0.20	0.21	0.21	0.21
Hindu, Intermediate castes	0.10	0.10	0.10	0.09	0.09	0.09
Hindu, Other backward castes	0.33	0.34	0.34	0.33	0.34	0.34
Scheduled castes	0.17	0.18	0.18	0.18	0.18	0.18
Scheduled tribes	0.05	0.05	0.05	0.05	0.04	0.05
Muslim	0.10	0.09	0.09	0.09	0.08	0.09
Other religions	0.04	0.03	0.05	0.05	0.05	0.05
Household composition						
Children under 6 yrs	0.70	0.67	0.60	0.52	0.44	0.43
Children 6-10 yrs	0.40	0.43	0.43	0.42	0.38	0.38
Children 10-15 yrs	0.32	0.36	0.41	0.45	0.49	0.50
Other adults under 60 yrs	3.34	3.48	3.54	3.59	3.67	3.70
Other adults above 60 yrs	0.04	0.04	0.04	0.04	0.05	0.05
No. Obs	15,165	14,762	15,336	16,021	12,020	13,788
No. Ind	15,165	14,762	15,336	16,021	12,020	13,788

TABLE B2. CPHS 2016-21 main sample: summary statistics by year. *Notes*. This table presents summary statistics for the main CPHS sample, comprising married women aged 15-60, not engaged in education, who co-reside with both parents-in-law on first observation (earliest possible being 2016, quadrimester 1). The table displays means and sample sizes for the first quadrimester of each year.

	2019
LFP	0.21
Women's Age	
15 - 24	0.24
25 - 34	0.47
35 - 44	0.21
45 - 54	0.07
55 - 60	0.01
Spouse Age	
15 -24	0.08
25 - 34	0.45
35 - 44	0.30
45 - 54	0.13
55 - 64	0.04
65+	0.00
Women's education	
No Education	0.20
Primary and below	0.12
Secondary or below	0.36
High School	0.14
Bachelors and above	0.19
Spouse Education	
No Education	0.13
Primary and below	0.11
Secondary or below	0.39
High School	0.16
Bachelors and above	0.21
Urban	0.38
Hindu, Dominant castes	0.25
Hindu, Other backward castes	0.33
Scheduled castes	0.14
Scheduled tribes	0.08
Muslim	0.10
Other religions	0.08
Household composition	
No. of children below 6yrs living in the house	0.90
No. of children b/w 6 and 10	0.21
No. of children b/w 11 and 15	0.30
Other adults in hhld below the age of 60	2.92
Other adults in hhld above the age of 60	0.04
No. Obs	24,925
No. Ind	24,925

TABLE B3. TUS 2019 main sample: summary statistics. *Notes.* This table presents summary statistics for the main TUS 2019 sample, comprising married women aged 15-60, not engaged in education, who co-reside with either both parents-in-law or one widowed parent-in-law in 2019.

	IHDS		CPHS						TUS
Co-resides with	2005	2012	2016	2017	2018	2019	2020	2021	2019
Both PIL	0.45	0.42	0.19	0.11	0.11	0.11	0.09	0.06	0.18
Only FIL (MIL dead)	0.56	0.44	0.19	0.11	0.10	0.10	0.09	0.07	0.20
Only MIL (FIL dead)	0.55	0.49	0.24	0.17	0.17	0.16	0.14	0.11	0.26
No PIL (Both PIL dead)	0.57	0.46	0.21	0.15	0.13	0.12	0.12	0.09	0.25
No. Obs	30,884	30,884	141,567	145,500	152,664	155,164	117,322	133,873	1,24,556
No. Ind	30,884	30,884	141,567	145,500	152,664	155,164	117,322	133,873	1,24,556

TABLE B4. Labor force participation by co-residence status: full sample. *Notes*. This table presents summary statistics on labor force participation (LFP) for four mutually exclusive co-residence configurations with parents-in-law (PIL) for the full sample of married women aged 15-60, not engaged in education in IHDS, CPHS and TUS. In IHDS, a woman is categorized as participating in the labor force if she worked in an income generating activity for at least 240 hours in the past year. In CPHS, a woman is categorized as such if she is employed or willing to work as on the day of the survey. In TUS, a woman is categorized as participating in the labor force if she has been employed or looked for work in the past year. For CPHS, the table only displays the sample size and means for the first quadrimester of each year.

	FIL		MIL	
	Does not die	Dies	Does not die	Dies
LFP	0.43	0.51	0.44	0.52
Woman's Age				
15 -24	0.50	0.30	0.48	0.24
25 - 34	0.41	0.46	0.42	0.44
35 - 44	0.09	0.21	0.1	0.27
45 - 54	0.01	0.03	0.01	0.05
Spouse Age				
15 - 24	0.22	0.11	0.21	0.09
25 - 34	0.55	0.43	0.54	0.37
35 - 44	0.19	0.34	0.21	0.37
45 - 54	0.03	0.11	0.04	0.16
55 - 64	0.00	0.01	0	0.02
Woman's Education				
No Education	0.35	0.38	0.35	0.41
Primary or below	0.24	0.25	0.24	0.22
Secondary or below	0.28	0.26	0.28	0.24
High School	0.08	0.07	0.08	0.08
Bachelors and above	0.06	0.04	0.05	0.05
Spouse Education				
No Education	0.14	0.16	0.14	0.16
Primary or below	0.23	0.25	0.23	0.23
Secondary or below	0.37	0.37	0.37	0.36
High School	0.14	0.12	0.14	0.12
Bachelors and above	0.12	0.10	0.11	0.13
Urban	0.23	0.25	0.24	0.23
Hindu, Brahmin	0.05	0.06	0.05	0.07
Hindu, Other dominant castes	0.19	0.20	0.19	0.20
Hindu, Other backward castes	0.37	0.37	0.38	0.35
Scheduled castes	0.17	0.19	0.18	0.19
Scheduled tribes	0.07	0.07	0.07	0.08
Muslim	0.10	0.09	0.1	0.09
Other religions	0.04	0.03	0.04	0.03
Household Composition				
Children under 6 yrs	1.40	1.19	1.38	1.05
Children 6-10 yrs	0.63	0.68	0.64	0.69
Children 10-15 yrs	0.64	0.78	0.65	0.84
Other adults below 60 yrs	4.04	3.94	4.02	4.00
Other adults above 60 yrs	0.10	0.04	0.1	0.05
No. Obs	5,116	1,484	5,937	663
No. Ind	5,116	1,484	5,937	663

TABLE B5. IHDS 2005 summary statistics by parent-in-law death. *Notes*. This table shows 2005 means of variables the main IHDS sample, disaggregated accor whether, by 2012, the father-in-law (FIL) and mother-in-law (MIL) did or did not die by 2012, along with the respective sample sizes. The sample is restricted to married women aged 15-60, not engaged in education, who co-reside with both parents-in-law in 2005.

	FIL		MIL	
	Does not die	Dies	Does not die	Dies
LFP	0.14	0.16	0.14	0.14
Woman's Age				
15 -24	0.44	0.26	0.43	0.22
25 - 34	0.46	0.49	0.46	0.49
35 - 44	0.09	0.21	0.09	0.24
45 - 54	0.01	0.03	0.01	0.05
Spouse Age				
15 - 24	0.17	0.07	0.16	0.07
25 - 34	0.57	0.46	0.56	0.41
35 - 44	0.19	0.33	0.2	0.36
45 - 54	0.05	0.10	0.05	0.12
55 - 64	0.02	0.03	0.02	0.03
65+	0.01	0.01	0.01	0.01
Woman's Education				
No Education	0.06	0.09	0.06	0.09
Primary or below	0.12	0.14	0.12	0.15
Secondary or below	0.37	0.36	0.37	0.37
High School	0.21	0.19	0.21	0.17
Bachelors and above	0.24	0.22	0.24	0.22
Spouse Education				
No Education	0.02	0.04	0.02	0.04
Primary or below	0.09	0.12	0.09	0.13
Secondary or below	0.36	0.35	0.36	0.33
High School	0.23	0.21	0.23	0.23
Bachelors and above	0.30	0.28	0.3	0.28
Urban	0.60	0.64	0.6	0.64
Hindu, Dominant castes	0.20	0.22	0.2	0.23
Hindu, Intermediate	0.09	0.09	0.09	0.10
Hindu, Other backward castes	0.34	0.33	0.34	0.32
Scheduled castes	0.19	0.17	0.19	0.17
Scheduled tribes	0.05	0.04	0.05	0.04
Muslim	0.10	0.10	0.10	0.09
Other religions	0.04	0.04	0.04	0.05
Household Composition				
Children under 6 yrs	0.66	0.53	0.65	0.56
Children 6-10 yrs	0.34	0.39	0.35	0.41
Children 10-15 yrs	0.31	0.38	0.31	0.42
Other adults below 60 yrs	3.67	3.39	3.65	3.54
Other adults above 60 yrs	0.05	0.04	0.05	0.04
No. Obs	32,219	2,404	33,575	1,048
No. Ind	32,219	2,404	33,575	1,048

TABLE B6. CPHS 2016-12 summary statistics by parent-in-law death. *Notes*. This table shows baseline means of variables from the main CPHS sample, disaggregated by whether or not the father-in-law (FIL) or mother-in-law (MIL) is dead, along with the respective sample sizes. The sample is restricted to married women aged 15-60, not engaged in education, who co-reside with both parents-in-law on first observation (earliest possible being 2016, quadrimester 1). Baseline means are calculated based on first period in which each respondent is observed, prior to the death(s).

Labor force participation	(1)	(2)
FIL dead less than 2 years	0.011*	0.013*
	(0.006)	(0.006)
FIL dead 2 or more years	0.029***	0.032***
	(0.010)	(0.011)
MIL dead less than 2 years	-0.005	-0.001
	(0.008)	(0.009)
MIL dead 2 or more years	-0.014	-0.005
	(0.011)	(0.012)
Both PIL dead less than 2 years		-0.015
		(0.014)
Both PIL dead 2 or more years		-0.034
		(0.033)
Baseline mean (Both PIL)	0.109	0.109
No. Obs	255,979	255,979
No. Ind	34,658	34,658
F-test: Prob > F		
$\beta_F = \beta_M$	0.007	0.016
$\beta_F = \beta_P$		0.083
$\beta_M = \beta_P$		0.470

TABLE B7. Difference-in-differences estimates in the short- and medium-term. *Notes*. This table presents DiD, LPM estimates for β_F, β_M and β_P in equation (1) for the CPHS main sample, comprising married women of working age, not engaged in education, who were co-residing with both PILs on first observation (earliest possible being 2016, quadrimester 1). They may experience changes in co-residence status in subsequent observations, but only owing to death of one/both parents-in-law. Each column presents estimates from a different regression. The dependent variable is labor force participation (LFP). In CPHS, a woman is categorized as such if she is employed or willing to work as on the day of the survey. In column 1, a pair of dummies are included for each PIL. FIL (MIL) dead less than 2 years assumes value 1 if the FIL (MIL) died less than 2 years ago and 0 otherwise. FIL (MIL) dead 2 or more years assumes value 1 if the FIL (MIL) died 2 or more years ago and 0 otherwise. Column 2 includes another dummy variable for Both PIL dead. Each column includes individual fixed effects, time fixed effects, and time varying controls including include fixed effects for age categories of the woman's spouse, number of children across multiple age categories, number of other working age adults and number of other senior adults. Robust standard errors in parentheses are clustered at the household level. *** p<0.01, ** p<0.05, * p<0.1.

Age control	(1) Quadratic	(2) 2	(3) 5	(4) 10	(5) 15
Panel A: IHDS					
FIL dead	0.041**	0.039**	0.039**	0.038**	0.033*
	(0.018)	(0.018)	(0.018)	(0.018)	(0.018)
MIL dead	-0.007	-0.009	-0.010	-0.012	-0.017
	(0.024)	(0.025)	(0.024)	(0.024)	(0.024)
Baseline age	36.037	36.037	36.037	36.037	36.037
No. Obs.	13,200	13,200	13,200	13,200	13,200
No. Ind	6,600	6,600	6,600	6,600	6,600
Panel B: CPHS					
FIL dead	0.017***	0.017***	0.017***	0.016**	0.016**
	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)
MIL dead	-0.0015	-0.005	-0.006	-0.006	-0.006
	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)
Baseline age	33.570	33.570	33.570	33.570	33.570
No. Obs	255,979	255,979	255,979	255,979	255,979
No. Ind	34,658	34,658	34,658	34,658	34,658

TABLE B8. Simple difference-in-differences estimates: Alternative age specifications. *Notes*. This table presents DiD, LPM estimates for β_F, β_M and β_P in equation (1) for the main IHDS (Panel A) and CPHS (Panel B) samples comprising married women of working age, not engaged in education, who were co-residing with both PILs on first observation They may experience changes in co-residence status in subsequent observations, but only owing to death of one/both parents-in-law(/s) only and not because of immigration or emigration of the in-law(/s). Each column presents estimates from a different regression. In column 1, age is controlled for quadratically, in column 2-5, age controls enter as dummy variables for 2-, 5-, 10-, and 15-year age intervals. The dependent variable is labor force participation (LFP). In IHDS, a woman is categorized as participating in the labor force if she worked in an income generating activity for at least 240 hours in the past year. In CPHS, a woman is categorized as such if she is employed or willing to work as on the day of the survey. FIL/ MIL/Both PIL dead are three different binary variables equal to 1 if the FIL/MIL/Both PIL die in the observation period. Each column includes individual fixed effects, time fixed effects, and time varying controls including fixed effects for age categories of the woman's spouse, number of children across multiple age categories, number of other working age adults and number of other senior adults. Robust standard errors in parentheses are clustered at the household level. *** p<0.01, ** p<0.05, * p<0.1.

Labor force participation	(1)	(2)
FIL dead	0.025***	0.027***
	(0.009)	(0.009)
MIL dead	-0.008	-0.002
	(0.010)	(0.011)
Both PIL		-0.026
		(0.025)
Baseline mean (Both PIL)	0.101	0.101
No. Obs	242,361	242,361
No. Ind	33,466	33,466
F-test: Prob > F		
$\beta_F = \beta_M$	0.016	0.035
$\beta_F = \beta_P$		0.067
$\beta_M = \beta_P$		0.443

TABLE B9. Simple difference-in-differences estimates, excluding pandemic deaths. *Notes.* This table presents DiD estimates for β_F, β_M and β_P in equation (1) for our main sample of married women of working age, not engaged in education, who were co-residing with both PILs on first observation. An additional restriction is the exclusion of women whose FIL or MIL dies during the COVID-19 pandemic. Any changes in co-residence status in subsequent time periods is due solely to the death of a FIL, a MIL, or both. Each column presents estimates from a different regression. The dependent variable, labor force participation (LFP) is equal to 1 if the woman participated in the labor force and zero otherwise. A woman is categorized as such if she is employed or willing to work as on the day of the survey. FIL, MIL, Both PIL dead are three different binary variables equal to 1 if the FIL, MIL, Both PIL, respectively, are dead and 0 if they are still alive. Each column includes individual fixed effects, time fixed effects, and time varying controls including age categories of the woman and her spouse; number of children across multiple age categories; number of other working age adults; and number of other seniors. The bottom rows contain p-values of F-tests for $\beta_F = \beta_M$, $\beta_F = \beta_P$ and $\beta_M = \beta_P$. Robust standard errors in parentheses are clustered at the household level. *** p<0.01, ** p<0.05, * p<0.1.

Sub-sample	(1) All	(2) Dominant caste	(3) Marginalized Caste	(4) Hindu	(5) Other religions	(6) North states	(7) South states	(8) Urban regions	(9) Rural regions
Panel A: IHDS									
FIL dead	0.038**	0.022	0.037	0.039*	0.063	0.030	0.025	0.052*	0.038*
	(0.018)	(0.035)	(0.023)	(0.020)	(0.051)	(0.020)	(0.040)	(0.031)	(0.022)
MIL dead	-0.012	-0.034	0.008	-0.018	-0.061	-0.014	-0.006	-0.033	-0.010
	(0.024)	(0.045)	(0.032)	(0.028)	(0.069)	(0.028)	(0.048)	(0.042)	(0.029)
Baseline mean	0.436	0.41	0.484	0.444	0.268	0.434	0.444	0.161	0.525
No. Obs	13,200	3,244	8,166	10,514	1,790	11,074	2,126	3,283	9,917
No. Ind	6,600	1,622	4,083	5,257	895	5,537	1,063	1,717	5,034
Panel B: CPHS									
FIL dead	0.016**	0.016	0.017*	0.017**	0.014	0.018***	0.023	0.016**	0.018*
	(0.006)	(0.012)	(0.009)	(0.007)	(0.014)	(0.007)	(0.025)	(0.008)	(0.011)
MIL dead	-0.006	0.001	-0.013	-0.004	-0.004	-0.005	-0.029	-0.007	-0.001
	(0.008)	(0.012)	(0.011)	(0.008)	(0.021)	(0.008)	(0.036)	(0.009)	(0.014)
Baseline mean	0.109	0.118	0.106	0.107	0.094	0.104	0.164	0.104	0.115
No. Obs	255,979	76,869	143,891	208,739	34,308	237,429	18,550	154,545	101,434
No. Ind	34,658	10,326	20,210	28,211	4,921	32,043	2,615	20,769	13,889

TABLE B10. Simple difference-in-difference estimates: By caste, religion, region and urban/rural.

Notes. This table presents DiD estimates for β_F, β_M in equation (1) for IHDS 2005-12 (Panel A) and CPHS 2016-21 (Panel B) main sample of married women of working age, not engaged in education, who were co-residing with both PILs on first observation. They may experience changes in co-residence status in subsequent observations, but only owing to death of one/both parents-in-law(/s) only and not because of immigration or emigration of the in-law(/s). Each column presents estimates from a different regression. Column 1 replicates the results from 2, while column 2-9 presents results for sub-samples as labeled in row 1, viz. dominant/marginalized caste, hindu/other religion, north/south indian states and urban/rural regions. In IHDS, a woman is categorized as participating in the labor force if she worked in an income generating activity for at least 240 hours in the past year. In CPHS, a woman is categorized as such if she is employed or willing to work as on the day of the survey. FIL/ MIL/ dead" are three different binary variables equal to 1 if the FIL/MIL die(s) in the observation period. Each column includes individual fixed effects, time fixed effects, and time varying controls. These controls include fixed effects for age categories of the woman and her spouse, number of children across multiple age categories, number of other working age adults and number of other seniors. Robust standard errors in parentheses are clustered at the household level. *** p<0.01, ** p<0.05, * p<0.1.

	(1) LFP	(2) Employed	(3) Any time in employment
FIL dead/Only MIL	0.038***	0.038***	0.049***
	(0.006)	(0.006)	(0.007)
MIL dead/Only FIL	-0.006	-0.005	0.018*
	(0.008)	(0.008)	(0.010)
No. Obs	24,918	24,918	24,918
Baseline mean:	0.181	0.174	0.318
$\beta_F = \beta_M$:	0	0	.001

TABLE B11. OLS estimates, death of parents-in-law and women's labor force participation and employment: TUS 2019 *Notes*. This table presents LPM estimates for γ_F (Panel A) and γ_M (Panel B) in equation (3) using TUS 2019. The sample is restricted to women who were either co-residing with both PILs or co-residing with a widowed PIL. Each column represents a different regression. The dependent variables are labor force participation (LFP) (column 1), employment (column 2) and any time spent in employment (column 3). A woman is categorized as participating in the labor force if she has been employed or looked for work in the past year. Any time in employment is a binary variable that takes a value of one if a woman has spent non-zero hours in employment related activities during the 24HR period in the day of reference. The day of reference is from 4:00 a.m. on the day prior to the interview to 4:00 a.m. of the day of the interview. Each regression includes controls for residence in urban areas, caste and religious group, age categories of the woman and her spouse, education categories of the woman and her spouse, number of children across multiple age categories, number of other working age adults, and number of other seniors. Robust standard errors in parentheses are clustered at the household level. *** p<0.01, ** p<0.05, * p<0.1.

Domestic services and Care work	(1) 24H	(2) 7AM – 7PM	(3) 7AM – 11AM	(4) 11AM – 3PM	(5) 3PM – 7PM
FIL dead/Only MIL	0.508	-2.115	0.009	-1.886**	-0.239
	(2.361)	(1.981)	(0.914)	(0.931)	(0.891)
MIL dead/Only FIL	20.144***	11.318***	5.414***	2.505*	3.399***
	(3.332)	(2.785)	(1.268)	(1.370)	(1.290)
Observations	24,925	24,925	24,925	24,925	24,925
Baseline mean:	441.564	321.895	144.344	84.959	92.593
$\beta_F = \beta_M$:	0.000	0.000	0.000	0.001	0.005

TABLE B12. OLS estimates, domestic and care work by time of day: TUS 2019 *Notes*. This table presents Tobit estimates for γ_F (Panel A) and γ_M (Panel B) in equation (3) using TUS 2019. The sample is restricted to women who were either co-residing with both PILs or co-residing with a widowed PIL. Each column represents a different regression. The dependent variables are time spent in minutes on domestic and care work. Column 1 refers to time spent in the total 24HR period, Column 2 refers to time spent between 7:00 a.m. and 7:00 p.m. and so on. The day of reference is from 4:00 a.m. on the day prior to the interview to 4:00 a.m. on the day of the interview. Each regression includes controls for residence in urban areas, caste and religious group, age categories of the woman and her spouse, education categories of the woman and her spouse, number of children across multiple age categories, number of other working age adults, and number of other seniors. Robust standard errors in parentheses are clustered at the household level. *** p<0.01, ** p<0.05, * p<0.1.