

Health consequences of patriarchal kinship system for the elderly: Evidence from India

Table 1S: Logit and LPM models for Chronic illness on standardized number of daughters

	(1) Logistic b/se	(2) OLS b/se	(3) Logistic b/se	(4) OLS b/se	(5) Logistic b/se	(6) OLS b/se	(7) Logistic b/se	(8) OLS b/se
Standardized number of daughters (Z-score)	0.062** (0.025)	0.009** (0.004)	0.059** (0.025)	0.009** (0.004)	0.060** (0.025)	0.009** (0.004)	0.054** (0.025)	0.008** (0.004)
Average Marginal Effects (for Logistic models)	0.0102** (0.004)		0.0096** (0.004)		0.0097** (0.004)		0.0088** (0.004)	
Total children alive	0.024* (0.014)	0.004* (0.002)	0.017 (0.014)	0.003 (0.002)	0.022 (0.015)	0.004 (0.002)	0.029* (0.015)	0.005* (0.002)
Gender (Base- Female): Male			0.016 (0.035)	0.002 (0.005)	0.008 (0.039)	0.001 (0.006)	0.085** (0.041)	0.013** (0.006)
Age			0.167*** (0.032)	0.025*** (0.005)	0.170*** (0.033)	0.025*** (0.005)	0.148*** (0.033)	0.022*** (0.005)
Age ²			-0.001*** (0.000)	-0.000*** (0.000)	-0.001*** (0.000)	-0.000*** (0.000)	-0.001*** (0.000)	-0.000*** (0.000)
Marital status (Base- Never/Widowed/Divorced/Separated): Currently Married			0.016 (0.042)	0.003 (0.006)	0.045 (0.056)	0.007 (0.009)	0.006 (0.095)	0.002 (0.014)
Social group (Base- Others/Upper Caste): Scheduled Tribe					-0.608*** (0.113)	-0.076*** (0.014)	-0.627*** (0.113)	-0.078*** (0.014)
Scheduled Caste					-0.253*** (0.061)	-0.041*** (0.009)	-0.259*** (0.061)	-0.043*** (0.009)
Other Backward Caste					-0.155*** (0.047)	-0.024*** (0.007)	-0.156*** (0.047)	-0.024*** (0.007)
Religion (Base-Hindu): Muslim					0.131* (0.071)	0.022* (0.012)	0.137** (0.070)	0.023* (0.012)
Others					0.192** (0.081)	0.034** (0.015)	0.193** (0.083)	0.034** (0.015)
Region (Base-Urban): Rural					-0.347*** (0.044)	-0.054*** (0.007)	-0.370*** (0.045)	-0.057*** (0.007)
Type of household (Base-Regular wage/salaried): Non-Regular wage/salaried					-0.032 (0.047)	-0.005 (0.008)	-0.070 (0.047)	-0.010 (0.008)
Source of water (Base-Tap/tubewell/handpump): Others					0.156** (0.073)	0.029** (0.012)	0.165** (0.072)	0.030** (0.012)
Multiple elderly respondents from same household (Base-No): Yes					-0.066 (0.052)	-0.009 (0.008)	-0.080 (0.052)	-0.012 (0.008)
Economic independence (Base-Independent): Dependent							0.227*** (0.043)	0.035*** (0.007)
Health insurance (Base-any Govt. scheme) Any non govt. insurance							-0.174 (0.108)	-0.026 (0.020)
Not covered							-0.395*** (0.056)	-0.068*** (0.010)
Living arrangement (Base- Alone or only with spouse): Spouse & other members							-0.464*** (0.054)	-0.077*** (0.009)
W/O spouse but with children and/or others							-0.453*** (0.089)	-0.075*** (0.014)
Constant	-2.618*** (0.029)	0.064*** (0.005)	-9.170*** (1.142)	-0.921*** (0.178)	-9.160*** (1.187)	-0.901*** (0.183)	-7.717*** (1.198)	-0.675*** (0.185)
District Fixed Effects	✓	✓	✓	✓	✓	✓	✓	✓
R ² / Pseudo R ²	0.1620	0.2049	0.1657	0.2082	0.1731	0.2147	0.1786	0.2199
Observations	25313	27228	25313	27228	25313	27228	25306	27217

Notes: Author's calculations using NSSO's 71st round; Clustered standard errors at district level, *** p<0.01, ** p<0.05, * p<0.10.

Table 2S: Logit and LPM models: Own perception of health on standardized number of daughters with chronic, short term ailment, hospitalization and physical mobility in control

	(1) Without physical wellbeing measures as controls	(2) Without physical wellbeing measures as controls	(3) With physical wellbeing measures as controls	(4) With physical wellbeing measures as controls
	1 Logistical b/se	2 OLS b/se	3 Logistical b/se	4 OLS b/se
Standardized share of girls in total children (Z-score)	0.066** (0.027)	0.012*** (0.004)	0.064** (0.030)	0.010** (0.004)
Average Marginal Effects (for Logistic models)	0.0107** (0.004)		0.0085** (0.004)	
Total children alive	-0.003 (0.015)	-0.001 (0.003)	-0.015 (0.017)	-0.003 (0.002)
<i>Gender</i> (Base- Female): Male	-0.025 (0.036)	-0.004 (0.006)	-0.055 (0.039)	-0.006 (0.005)
<i>Age</i>	0.134*** (0.034)	0.009 (0.006)	0.138*** (0.040)	0.013** (0.006)
<i>Age</i> ²	-0.000** (0.000)	0.000 (0.000)	-0.001** (0.000)	-0.000 (0.000)
<i>Marital status</i> (Base-Never/Widowed/Divorced/Separated): Currently Married	-0.170* (0.089)	-0.029* (0.015)	-0.138 (0.107)	-0.018 (0.015)
<i>Social group</i> (Base- Others/Upper Caste): Scheduled Tribe	0.119 (0.109)	0.017 (0.018)	0.262** (0.123)	0.033* (0.017)
Scheduled Caste	0.164*** (0.059)	0.028*** (0.010)	0.306*** (0.068)	0.041*** (0.009)
Other Backward Caste	0.123** (0.049)	0.021*** (0.008)	0.195*** (0.057)	0.027*** (0.008)
<i>Religion</i> (Base-Hindu): Muslim	0.315*** (0.064)	0.056*** (0.012)	0.309*** (0.077)	0.046*** (0.012)
Others	-0.027 (0.093)	-0.005 (0.015)	-0.117 (0.100)	-0.017 (0.013)
<i>Region</i> (Base-Urban): Rural	-0.006 (0.048)	0.001 (0.008)	0.092* (0.055)	0.014* (0.007)
<i>Type of household</i> (Base-Regular wage/salaried): Non- Regular wage/salaried	-0.015 (0.046)	-0.002 (0.007)	0.024 (0.051)	0.005 (0.007)
<i>Source of water</i> (Base-Tap/tubewell/handpump): Others	-0.026 (0.066)	-0.005 (0.011)	-0.108 (0.076)	-0.014 (0.011)
<i>Multiple elderly members in same household</i> (Base-No): Yes	-0.060 (0.051)	-0.015* (0.008)	0.015 (0.058)	-0.002 (0.007)
<i>Economic independence</i> (Base-Independent): Dependent	0.827*** (0.050)	0.121*** (0.007)	0.709*** (0.053)	0.087*** (0.006)
<i>Health insurance</i> (Base-any Govt. scheme) Any non govt. insurance	-0.277** (0.129)	-0.042** (0.019)	-0.287** (0.139)	-0.035** (0.017)
Not covered	-0.110* (0.064)	-0.019* (0.011)	0.007 (0.070)	-0.001 (0.010)
<i>Living arrangement</i> (Base- Alone or only with spouse): Spouse & other members	-0.356*** (0.062)	-0.051*** (0.010)	-0.135* (0.073)	-0.014 (0.009)
W/O spouse but with children and/or others	-0.349*** (0.062)	-0.054*** (0.010)	-0.126 (0.073)	-0.017 (0.009)

	(0.085)	(0.015)	(0.103)	(0.015)
<i>Chronic Illness</i> (Base-No): Yes			1.144***	0.167***
			(0.052)	(0.008)
<i>Short term Illness in past 15 days</i> (Base-No): Yes			0.797***	0.120***
			(0.071)	(0.012)
<i>Hospitalization in past 12 months</i> (Base-Yes): No			-0.874***	-0.128***
			(0.039)	(0.006)
<i>Physical mobility (Base-Mobile):</i> Partially/fully Immobile			2.347***	0.433***
			(0.083)	(0.012)
District Fixed Effects	✓	✓	✓	✓
Constant	-6.774***	-0.181	-6.147***	-0.191
	(1.217)	(0.216)	(1.447)	(0.205)
Observations	26905	27217	26905	27217

Notes: Author's calculations using NSSO's 71st round; Clustered standard errors at district level, *** p<0.01, ** p<0.05, * p <0.10.

Table 3S: Logit and LPM models for chronic ailments among different age cohorts of elderly

	(1) Logistic: ≥62 years b/se	(2) OLS: ≥62 years b/se	(3) Logistic: ≥65 years b/se	(4) OLS: ≥65 years b/se	(5) Logistic: ≥71 years b/se	(6) OLS: ≥71 years b/se
Coefficients (Standardized number of daughters)	0.056** (0.028)	0.009** (0.004)	0.070** (0.031)	0.011** (0.005)	0.084* (0.049)	0.014 (0.009)
Average Marginal Effects (for Logistic models)	0.009** (0.005)		0.0117** (0.005)		0.0154* (0.0090)	
Individual level characteristics	✓	✓	✓	✓	✓	✓
Availability of old-age support	✓	✓	✓	✓	✓	✓
HH level controls	✓	✓	✓	✓	✓	✓
District Fixed Effects	✓	✓	✓	✓	✓	✓
Constant	-8.495*** (1.544)	-0.820*** (0.234)	-11.034*** (1.968)	-1.213*** (0.289)	-3.593 (4.720)	-0.516 (0.698)
Observations	20568	22350	15945	17648	6002	7067

Notes: Author's calculations using NSSO's 71st round; Clustered standard errors at district level, *** p<0.01, ** p<0.05, * p<0.10.

Table 4S: Falsification test- NEDV approach

	Logistic regression: Average Marginal Effects (b/se)		Linear Probability Model (b/se)	
	(1)	(2)	(3)	(4)
Dependent variable: Any transient ailment in past 15 days (=1)				
Standardized share of daughters	-0.001 (0.003)	-0.001 (0.003)	-0.001 (0.003)	-0.001 (0.003)
Dependent variable: Own perception of change in health from past year (worse=1, same/better=0)				
Standardized share of daughters	0.002 (0.005)	0.001 (0.005)	0.003 (0.005)	0.002 (0.005)
Dependent variable: Own perception of change in health from past year (same/worse=1, better=0)				
Standardized share of daughters	0.004 (0.004)	0.003 (0.004)	0.003 (0.004)	0.003 (0.004)

Notes: Author's calculations using NSSO's 71st round; *** p<0.01, ** p<0.05, * p <0.10, Clustered standard errors at district level. Detailed are results available on request. Columns (1) and (3) are from full models in equation 1. Modified model (2) and (4) above additionally controls for co-morbidity by controlling for chronic ailments.

Table 5S: Results with alternate classification of variable of interest

	Model 1 (Chronic ailment as dependent variable)		Model 2 (Self-reported health at dependent variable with physical wellbeing indicators controlled for)	
	(1) Average Marginal Effects (Logistic model)	(2) OLS	(3) Average Marginal Effects (Logistic model)	(4) OLS
Coefficient of standardized number of daughters at district level (Z-scores) (b/se)				
Standardized deviation from mean	0.0088** (0.0041)	0.0084** (0.0039)	0.0085** (0.0040)	0.0098** (0.0042)
Standardized deviation from median	0.0088** (0.0041)	0.0084** (0.0039)	0.0085** (0.0040)	0.0098** (0.0042)
Standardized deviation from mean within social group	0.0075* (0.0039)	0.0074** (0.0038)	0.0047 (0.0039)	0.0056 (0.0041)
Standardized deviation from mean within religion	0.0087** (0.0040)	0.0083** (0.0039)	0.0069* (0.0040)	0.0081* (0.0041)
Standardized deviation from mean within location (rural/urban)	0.0078* (0.0040)	0.0077** (0.0039)	0.0041 (0.0038)	0.0058 (0.0040)
Standardized number of sons	-0.0066* (0.0036)	-0.0068* (0.0035)	-0.0081** (0.0036)	-0.0087** (0.0038)
Standardized daughters to sons ratio	0.0070** (0.0030)	0.0064** (0.0029)	0.0029 (0.0028)	0.0033 (0.0030)
Coefficient of share of daughters in total children (raw measure) (b/se)				
Share of daughters in total children (0-100)	0.0003*** (0.0001)	0.0003*** (0.0001)	0.0002* (0.0001)	0.0002** (0.0001)

Notes: Author's calculations using NSSO's 71st round; *** p<0.01, ** p<0.05, * p <0.10, Clustered standard errors at PSU level. Detailed results are available on request.

Table 6S: Results for quantiles of standardized number of daughters

Variable	(1) Q2	(2) Q3	(3) Q4	(4) Q5
	b/se	b/se	b/se	b/se
Model 1 (Chronic ailment at dependent variable)				
Standardized number of daughters (Logistic Regression)	0.0260	0.0493	0.1559**	0.1392*
	(0.0630)	(0.0661)	(0.0639)	(0.0753)
Average Marginal Effects	0.0041	0.0078	0.0252**	0.0224*
	(0.0010)	(0.0105)	(0.0103)	(0.0121)
Standardized number of daughters (OLS regression)	0.0050	0.0077	0.0243**	0.0210*
	(0.0097)	(0.0100)	(0.0099)	(0.0117)
Model 2 (Self-reported health at dependent variable with physical wellbeing indicators controlled for)				
	b/se	b/se	b/se	b/se
Standardized number of daughters (Logistic Regression)	-0.0937	-0.0216	0.0032	0.0414
	(0.0763)	(0.0671)	(0.0774)	(0.0885)
Average Marginal Effects	-0.0123	-0.0029	0.0004	0.0056
	(0.0101)	(0.0090)	(0.0104)	(0.0119)
Standardized number of daughters (OLS regression)	-0.0139	-0.0025	0.0007	0.0070
	(0.0100)	(0.0089)	(0.0104)	(0.0120)
	5,439	5,442	5,466	5,424

Note: Base category Q1, Author's calculations using NSSO's 71st round; *** p<0.01, ** p<0.05, * p <0.10, Clustered standard errors at district level.

Table7S: Results for different age cohorts across gender

Variable	(1) Model 1	(2) Model 2
	b/se	b/se
Standardized number of daughters		
Average Marginal Effects	0.0089** (0.0041)	0.0084** (0.0040)
OLS	0.0084** (0.0039)	0.0097*** (0.0042)
Age cohort >=70 years (Base: 60 to 69 years) (Average Marginal Effects)	0.0251*** (0.0075)	0.0851*** (0.0079)
Age cohort >=70 years (Base: 60 to 69 years) (OLS)	0.0245*** (0.0073)	0.0903*** (0.0087)
Males >=70 years (Base: Females 60-69 years) (Average Marginal Effects)	0.0350*** (0.0108)	-0.0097 (0.0096)
Males >=70 years (Base: Females 60-69 years) (OLS)	0.0316*** (0.0105)	-0.0182* (0.0106)

Note: Author's calculations using NSSO's 71st round; *** p<0.01, ** p<0.05, * p <0.10, Clustered standard errors at district level, Control scheme same as the full model in Table 2. Models 1 & 2 have chronic ailment as dependent variable and Self-reported health at dependent variable with physical wellbeing indicators controlled for, respectively

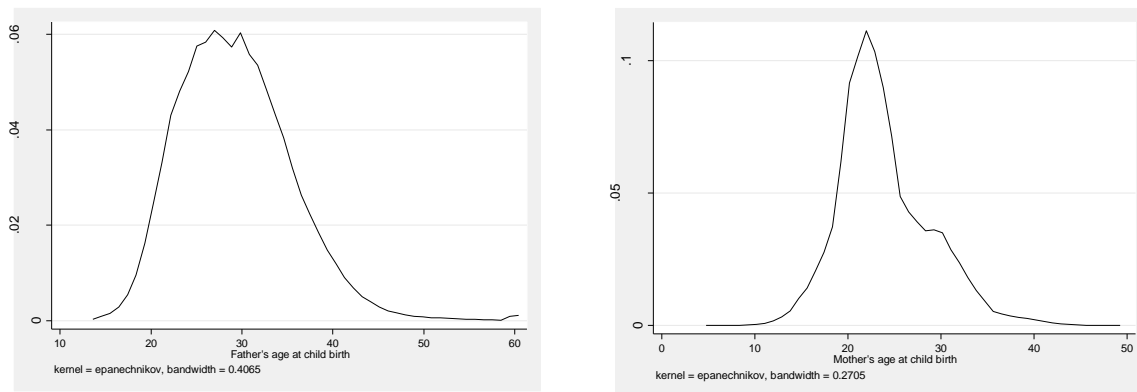
Table 8S: Logit and LPM models for Chronic illness on standardized number of daughters, rural and urban

	(1) Rural Logistic b/se	(2) Rural OLS b/se	(3) Urban Logistic b/se	(4) Urban OLS b/se
Standardized share of girls in total children (Z-score)	0.086** (0.036)	0.015** (0.006)	0.102*** (0.038)	0.021*** (0.008)
Average Marginal Effects (for Logistic models)	0.013** (0.006)		0.020*** (0. .008)	
Total children alive	-0.002 (0.021)	-0.001 (0.003)	-0.022 (0.026)	-0.004 (0.005)
<i>Gender</i> (Base- Female): Male	0.101** (0.050)	0.016** (0.008)	-0.070 (0.050)	-0.015 (0.010)
Age	0.142*** (0.041)	0.021*** (0.007)	0.163*** (0.041)	0.032*** (0.008)
Age ²	-0.001*** (0.000)	-0.000*** (0.000)	-0.001*** (0.000)	-0.000*** (0.000)
<i>Marital status</i> (Base- Never/Widowed/Divorced/Separated): Currently Married	0.096 (0.112)	0.018 (0.019)	0.016 (0.131)	0.002 (0.027)
<i>Social group</i> (Base- Others/Upper Caste): Scheduled Tribe	-0.964*** (0.179)	-0.139*** (0.022)	-1.307*** (0.273)	-0.213*** (0.035)
Scheduled Caste	-0.225*** (0.085)	-0.039*** (0.014)	-0.244** (0.095)	-0.047*** (0.018)
Other Backward Caste	-0.156** (0.074)	-0.026** (0.013)	0.055 (0.086)	0.011 (0.018)
<i>Religion</i> (Base-Hindu): Muslim	0.286** (0.127)	0.050** (0.024)	0.167 (0.104)	0.034 (0.022)
Others	0.430*** (0.140)	0.069*** (0.024)	0.267** (0.124)	0.050** (0.025)
<i>Type of household</i> (Base-Regular wage/salaried): Non-Regular wage/salaried	-0.299*** (0.078)	-0.050*** (0.014)	-0.088 (0.056)	-0.017 (0.011)
<i>Source of water</i> (Base-Tap/tubewell/handpump): Others	0.463*** (0.132)	0.083*** (0.026)	0.744*** (0.139)	0.168*** (0.033)
<i>Multiple elderly members in same household</i> (Base- No): Yes	-0.067 (0.064)	-0.011 (0.010)	-0.077 (0.062)	-0.016 (0.012)
<i>Economic independence</i> (Base-Independent): Dependent	0.182*** (0.063)	0.029*** (0.010)	0.132** (0.059)	0.026** (0.012)
<i>Health insurance</i> (Base-any Govt. scheme) Any non govt. insurance	-0.427** (0.217)	-0.084** (0.042)	-0.137 (0.123)	-0.030 (0.028)
Not covered	-0.770*** (0.090)	-0.143*** (0.019)	-0.600*** (0.081)	-0.128*** (0.018)
<i>Living arrangement</i> (Base- Alone or only with spouse): Spouse & other members	-0.623*** (0.073)	-0.109*** (0.014)	-0.503*** (0.085)	-0.106*** (0.019)
W/O spouse but with children/Others	-0.521*** (0.073)	-0.091*** (0.014)	-0.392*** (0.085)	-0.085*** (0.019)

	(0.106)	(0.019)	(0.139)	(0.030)
Allopathic hospitals per million HH in district	-0.001	-0.000*	-0.001	-0.000
	(0.001)	(0.000)	(0.001)	(0.000)
Allopathic doctors per million HH in district	-0.000	-0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)
Constant	-5.744***	-0.418*	-6.310***	-0.759**
	(1.519)	(0.244)	(1.505)	(0.303)
Observations	14593	14593	11793	11793

Note: Author's calculations using NSSO's 71st round; *** p<0.01, ** p<0.05, * p <0.10.

Figure 1S: Density plots for parental age at childbirth



Note: Authors' calculations from NFHS-4