

SUPPLEMENTARY APPENDIX

Appendix Tables

Table A1 and A2 show results of regressions similar to those in Table 2 in the main text, except that they add interactions with assets and years of education. In general, the interactions show that association of higher asset wealth or years of education with mental health is not significantly different for Muslims or Scheduled Caste respondents than it is for higher caste Hindu respondents.

Table A3 presents odds-ratios from logistic regressions for dichotomized self-reported depression and anxiety. The two outcomes have been dichotomized such that reporting mild, moderate, severe or extreme problems implies having depression and anxiety. Only two models are shown for each of the outcome - a basic model with age and sex controls, and a full model with additional controls for state, rural residence, assets, education, and expenditure. The results of the logistic model are very similar to that of the ordered logit model in Table 2.

Table A4 shows odds-ratios from ordered logit or logistic regressions for alternative self-reported mental health outcomes available from the WHO-SAGE. For most mental health outcomes, Scheduled Castes and Muslims are significantly more likely to report having problems with mental health than higher-caste Hindus.

Table A5 shows that controlling for socioeconomic status by controlling for five asset categories or 17 individual binary assets does not change the results.

Tables A6 and A7 show logistic regressions stratified with state, with the basic and the full models, for anxiety and depression. It is important to remember that the state-wise samples are much smaller than the combined sample, and may not be powered to detect social group differences. Still, the results reveal that Muslims and Scheduled Castes are more likely to report having depression or anxiety across states.

Table A8 presents summary statistics for WHO-SAGE respondents, aged 18 to 85, and compares them to a nationally representative sample of adults of the same ages from the India Human Development Survey, 2011. Summary statistics are presented separately for Dalits, Muslims, and upper caste Hindus. The table shows that WHO SAGE oversampled

older adults. The SAGE respondents are, on average, poorer and less educated than the average Indian adult in each social group. This is likely because the SAGE was focused on health of older adults, and was conducted earlier than the IHDS-II. Patterns of disadvantage are similar in the WHO-SAGE and the IHDS. In both the surveys, Scheduled Castes are the most disadvantaged. Muslims are less likely to own assets have less education than higher caste Hindus. The only difference is in the proportion of Muslims which live in an urban area - in the WHO-SAGE, Muslims are less likely to be urban residents compared to higher caste Hindus, but nationally, they are more urbanized than higher-caste Hindus.

Appendix Figures

Figure A1 shows differences in self-reported mental health among the three social groups by measures of socioeconomic status. Largely, the figures do not reveal a consistent pattern to understand differences by social group and socioeconomic status. Although there are levels of education and assets without differences in mental health between the social groups, differences do exist for most levels. Moreover, disparities can be seen at both high and both ends of the distribution of socioeconomic status, as well as in the middle.

Figure A2 shows age patterns for dichotomous mental health outcomes for the three social groups. Age-misreporting and heaping is an important concern for data collection efforts in developing countries, and age-misreporting is likely to be higher among Scheduled Castes and Muslims, given that they are poorer and less-educated. Another concern is selection and mortality, especially above sixty. Still, these graphs show a pattern well-known to mental health researchers, that with age, mental health tends to worsen. Overall, Muslims and Scheduled Caste Hindus have worse mental health outcomes when compared to higher Caste Hindus at most ages.

Figure A3 shows differences in self-reported mental health by sex and 95% Confidence Intervals. These confidence intervals are constructed accounting for the clustering of observations in the primary sampling unit. The figure shows that disparities in mental health can be seen for both men and women.

Table A1: Ordered logit regressions do not find evidence that social group interacts with asset wealth to predict self-reported mental health

	depression	anxiety
Muslim	1.424+ (0.304)	1.642* (0.379)
Scheduled Caste	0.914 (0.135)	1.093 (0.183)
Female	1.870*** (0.172)	2.052*** (0.203)
0 - 4 assets (reference)		
5 or 6 assets	0.635** (0.0883)	0.818 (0.122)
7 or 8 assets	0.672** (0.0970)	0.656** (0.0901)
9 or 10 assets	0.484*** (0.0756)	0.447*** (0.0675)
more than 10 assets	0.361*** (0.0528)	0.423*** (0.0610)
5 or 6 assets X Muslim	1.411 (0.395)	1.241 (0.390)
7 or 8 assets X Muslim	0.915 (0.301)	0.725 (0.262)
9 or 10 assets X Muslim	0.502 (0.219)	1.108 (0.361)
more than 10 assets X Muslim	0.930 (0.285)	0.764 (0.269)
5 or 6 assets X Scheduled Caste	1.801** (0.385)	1.349 (0.301)
7 or 8 assets X Scheduled Caste	1.263 (0.306)	1.300 (0.335)
9 or 10 assets X Scheduled Caste	1.147 (0.310)	0.930 (0.252)
more than 10 assets X Scheduled Caste	1.151 (0.567)	1.193 (0.573)
<i>n</i>	10,125	10,125

WHO SAGE, 2007-08. Exponentiated coefficients. Standard errors clustered at the level of the primary sampling unit in parentheses. + $p < .1$, * $p < .05$, ** $p < .01$, *** $p < .001$. All regressions are weighed using national individual weights.

Table A2: Ordered logit regressions do not find evidence that social group interacts with education to predict self-reported mental health

	depression	anxiety
Muslim	1.507* (0.240)	3.809*** (1.339)
Scheduled Caste	1.186 (0.173)	1.676+ (0.458)
Female	1.759*** (0.185)	0.932 (0.0914)
no education (reference)		
1 - 5 years of education	0.881 (0.118)	0.840 (0.119)
6 - 8 years of education	0.773+ (0.104)	0.748+ (0.113)
9 - 12 years of education	0.722* (0.0983)	0.621*** (0.0811)
more than 12 years of education	0.448*** (0.0875)	0.426*** (0.0780)
1 - 5 years of education X Muslim	1.384 (0.359)	1.557 (0.422)
6 - 8 years of education X Muslim	1.537 (0.530)	0.967 (0.385)
9 - 12 years of education X Muslim	1.017 (0.368)	1.025 (0.293)
more than 12 years of education X Muslim	0.894 (0.366)	0.905 (0.438)
1 - 5 years of education X Scheduled Caste	0.928 (0.214)	1.430 (0.325)
6 - 8 years of education X Scheduled Caste	0.826 (0.227)	0.973 (0.282)
9 - 12 years of education X Scheduled Caste	1.042 (0.278)	1.530+ (0.390)
more than 12 years X Scheduled Caste	0.596 (0.292)	0.921 (0.441)
<i>n</i>	10,125	10,125

WHO SAGE, 2007-08. Exponentiated coefficients. Standard errors clustered at the level of the primary sampling unit in parentheses. + $p < .1$, * $p < .05$, ** $p < .01$, *** $p < .001$. All regressions are weighed using national individual weights.

Table A3: Odds-ratios from logistic regressions for having any self-reported depression or anxiety (mild, moderate, severe, or extreme)

	depression		anxiety	
	(1)	(2)	(3)	(4)
muslim	1.664*** (0.230)	1.327* (0.187)	1.787*** (0.253)	1.409* (0.193)
scheduled caste	1.398** (0.149)	1.057 (0.116)	1.543*** (0.184)	1.148 (0.136)
female	1.799*** (0.175)	1.758*** (0.198)	2.011*** (0.207)	2.041*** (0.233)
female	X	X	X	X
age dummies	X	X	X	X
state dummies		X		X
rural residence		X		X
asset categories		X		X
educational categories		X		X
per capita log expenditure		X		X
<i>n</i>	10125	10125	10125	10125

WHO SAGE, 2007-08. Exponentiated coefficients. Standard errors clustered at the level of the primary sampling unit in parentheses. + $p < .1$, * $p < .05$, ** $p < .01$, *** $p < .001$. All regressions are weighed using national individual weights.

Table A4: Odds-ratios from logistic or ordered logit regressions for alternative mental health outcomes

#	Survey question (response options)	Model	Odds-ratios			
			Scheduled caste		Muslim	
			age & sex controls	all controls	age & sex controls	all controls
1	Taking all things together, how satisfied are you with your life as a whole these days? (Very satisfied, satisfied, neither satisfied nor dissatisfied, dissatisfied, very dissatisfied)	Ordered logistic	1.592*** (0.149)	1.191+ (0.118)	1.867*** (0.291)	1.414** (0.169)
2	How satisfied are you with yourself? (Very satisfied, satisfied, neither satisfied nor dissatisfied, dissatisfied, very dissatisfied)	Ordered logistic	1.335* (0.150)	1.025 (0.124)	1.746*** (0.267)	1.364** (0.159)
3	How would you rate your overall quality of life? (Very good, good, moderate, bad, very bad)	Ordered logistic	1.839*** (0.208)	1.194+ (0.127)	2.340*** (0.379)	1.556*** (0.206)
4	Taking all things together, how would you say you are these days? Are you...? (Very happy, happy, neither happy nor unhappy, unhappy, very unhappy)	Ordered logistic	1.683*** (0.162)	1.183+ (0.107)	2.361*** (0.322)	1.761*** (0.235)
5	During the last 12 months, have you had a period lasting several days when you felt sad, empty or depressed? (Yes, no)	Logistic	1.300* (0.164)	1.116 (0.133)	1.454* (0.243)	1.221 (0.217)
6	... have you had a period lasting several days when you lost interest in most things you usually enjoy such as personal relationships, work or hobbies/recreation? (Yes, no)	Logistic	1.346* (0.163)	1.123 (0.131)	1.686** (0.279)	1.370+ (0.259)
7	... have you had a period lasting several days when you have been feeling your energy decreased or that you are tired all the time? (Yes, no)	Logistic	1.413** (0.173)	1.208 (0.147)	1.913*** (0.338)	1.624* (0.319)
8	I will now ask you some questions about how you felt yesterday overall. Did you feel ...depressed...? (Yes, no)	Logistic	1.042 (0.123)	0.903 (0.110)	1.664** (0.271)	1.525* (0.250)
9	... Did you feel ...worried... for much of the day yesterday? (Yes, no)	Logistic	1.343** (0.143)	1.059 (0.124)	1.273 (0.193)	1.023 (0.160)
10	... Did you feel ...tense or stressed.....for much of the day yesterday? (Yes, no)	Logistic	1.199+ (0.121)	1.032 (0.105)	1.661** (0.281)	1.505* (0.249)

WHO SAGE, 2007-08. Exponentiated coefficients. Standard errors clustered at the level of the primary sampling unit in parentheses. + $p < .1$, * $p < .05$, ** $p < .01$, *** $p < .001$. All regressions are weighed using national individual weights. Outcome 6 and 7 were asked for the last 12 month period preceding the survey, using the language in outcome 5. Outcome 9 and 10 were asked for the day before the survey. Models with age and sex controls adjust for age dummies and sex of the respondent. Models with all controls adjust for age dummies, sex of the respondent, rural residence, state of residence, education categories, asset categories, and per capita household log expenditure.

Table A5: Odds-ratios from ordered logit regressions for reporting depression and anxiety, with controls for asset categories and assets controlled individually

	depression		anxiety	
	(1)	(2)	(3)	(4)
muslim	1.402** (0.172)	1.399** (0.174)	1.499** (0.197)	1.528** (0.199)
scheduled caste	1.056 (0.108)	1.052 (0.107)	1.128 (0.115)	1.113 (0.112)
asset categories	X		X	
all 17 assets		X		X
sex	X	X	X	X
age dummies	X	X	X	X
rural	X	X	X	X
state dummies	X	X	X	X
N	10125	10125	10125	10125

WHO SAGE, 2007-08. Exponentiated coefficients. Standard errors clustered at the level of the primary sampling unit in parentheses. + $p < .1$, * $p < .05$, ** $p < .01$, *** $p < .001$. All regressions are weighed using national individual weights.

Table A6: Odds-ratios from logistic regressions for having any self-reported anxiety (mild, moderate, severe, or extreme) by state

	Assam		Karnataka		Maharashtra	
	(1)	(2)	(3)	(4)	(5)	(6)
muslim	4.536*** (1.282)	3.401*** (1.103)	1.470 (0.392)	1.812 (0.664)	1.379 (0.570)	1.235 (0.466)
scheduled caste	1.709+ (0.472)	1.397 (0.444)	1.548 (0.466)	0.851 (0.232)	1.746* (0.437)	1.484 (0.415)
female	X	X	X	X	X	X
age dummies	X	X	X	X	X	X
rural residence		X		X		X
asset categories		X		X		X
educational categories		X		X		X
per capita log expenditure		X		X		X
<i>n</i>	931	931	1400	1400	1804	1804

	Rajasthan		Uttar Pradesh		West Bengal	
	(7)	(8)	(9)	(10)	(11)	(12)
muslim	1.711 (0.618)	1.581 (0.596)	1.217 (0.273)	1.084 (0.264)	2.937** (1.139)	1.579 (0.513)
scheduled caste	1.320 (0.272)	1.236 (0.256)	1.578* (0.338)	1.372 (0.295)	1.224 (0.355)	0.659 (0.193)
female	X	X	X	X	X	X
age dummies	X	X	X	X	X	X
rural residence		X		X		X
asset categories		X		X		X
educational categories		X		X		X
per capita log expenditure		X		X		X
<i>n</i>	1937	1937	2117	2117	1849	1849

WHO SAGE, 2007-08. Exponentiated coefficients. Standard errors clustered at the level of the primary sampling unit in parentheses. + $p < .1$, * $p < .05$, ** $p < .01$, *** $p < .001$. All regressions are weighed using national individual weights.

Table A7: Odds-ratios from logistic regressions for having any depression (mild, moderate, severe, or extreme) by state

	Assam		Karnataka		Maharashtra	
	(1)	(2)	(3)	(4)	(5)	(6)
muslim	3.917*** (1.039)	3.464*** (0.954)	1.091 (0.353)	1.391 (0.545)	2.871+ (1.686)	2.522+ (1.377)
scheduled caste	1.535 (0.399)	1.433 (0.395)	1.534 (0.422)	0.849 (0.227)	1.378 (0.347)	1.094 (0.285)
female	X	X	X	X	X	X
age dummies	X	X	X	X	X	X
rural residence		X		X		X
asset categories		X		X		X
educational categories		X		X		X
per capita log expenditure		X		X		X
<i>n</i>	931	931	1400	1400	1804	1804

	Rajasthan		Uttar Pradesh		West Bengal	
	(7)	(8)	(9)	(10)	(11)	(12)
muslim	1.988* (0.650)	1.731+ (0.513)	0.927 (0.186)	0.856 (0.183)	3.002** (0.977)	1.650+ (0.495)
scheduled caste	0.967 (0.228)	0.853 (0.201)	1.370 (0.287)	1.256 (0.266)	1.589+ (0.404)	0.914 (0.244)
female	X	X	X	X	X	X
age dummies	X	X	X	X	X	X
rural residence		X		X		X
asset categories		X		X		X
educational categories		X		X		X
per capita log expenditure		X		X		X
<i>n</i>	1937	1937	2117	2117	1849	1849

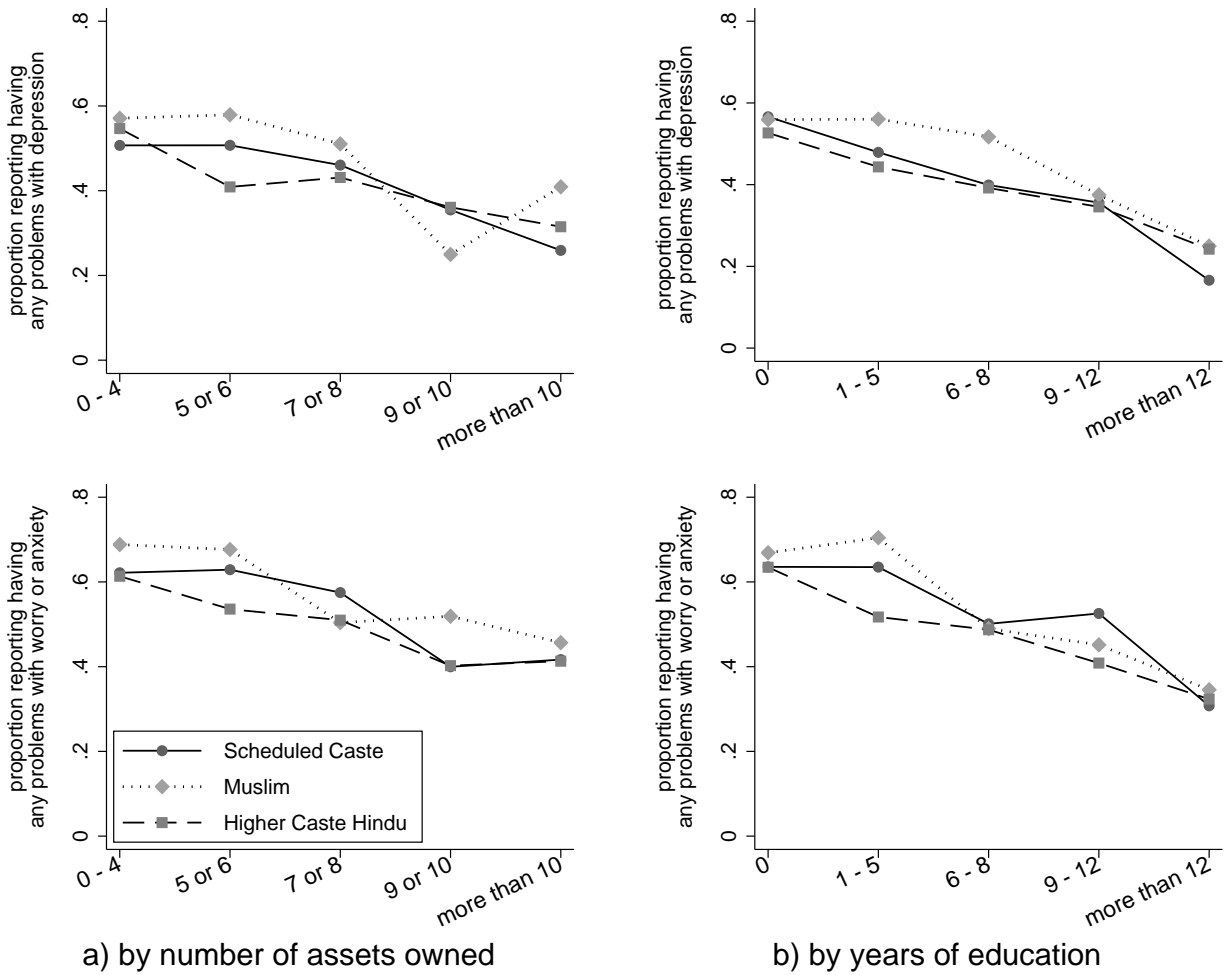
WHO SAGE, 2007-08. Exponentiated coefficients. Standard errors clustered at the level of the primary sampling unit in parentheses. + $p < .1$, * $p < .05$, ** $p < .01$, *** $p < .001$. All regressions are weighed using national individual weights.

Table A8: Comparison of adults in the SAGE's (2007-8) six state sample to adults in the nationally representative IHDS (2005)

	Scheduled Caste		Muslims		higher caste Hindus	
	IHDS	SAGE	IHDS	SAGE	IHDS	SAGE
age	39	49	38	49	41	50
urban	0.29	0.18	0.45	0.26	0.35	0.29
fraction with no education	0.41	0.57	0.37	0.54	0.27	0.39
years of education (if any)	8.36	6.94	8.14	6.89	9.38	8.34
electricity in home	0.81	0.55	0.84	0.58	0.88	0.77
household owns a motorcycle	0.21	0.10	0.25	0.15	0.38	0.27
household owns a TV	0.60	0.36	0.59	0.35	0.72	0.59
asset count (of 7 assets) ^a	2.35	1.74	2.55	1.97	2.98	2.55
<i>n</i>	27,548	1,964	16,406	1,350	76,065	6,864

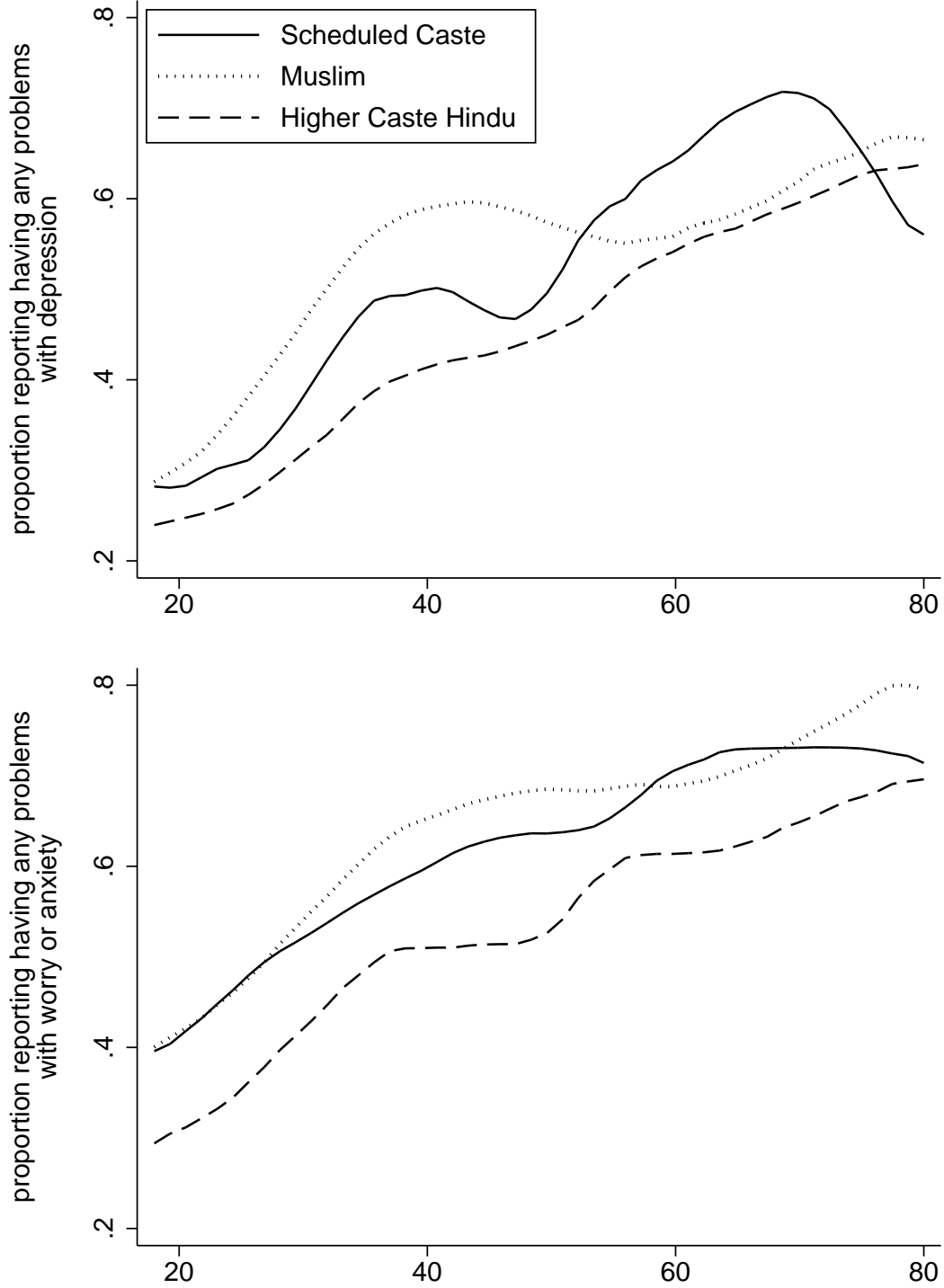
The table presents weighted summary statistics by population group for adults 18-85 from the WHO SAGE data and the India Human Development Survey (IHDS). ^aThe 7 assets, measured in both surveys, are a bicycle, a refrigerator, a motorcycle, a table or chair, a television, a computer, and a car.

Figure A1: Mental health outcomes by measures of socioeconomic status and social group



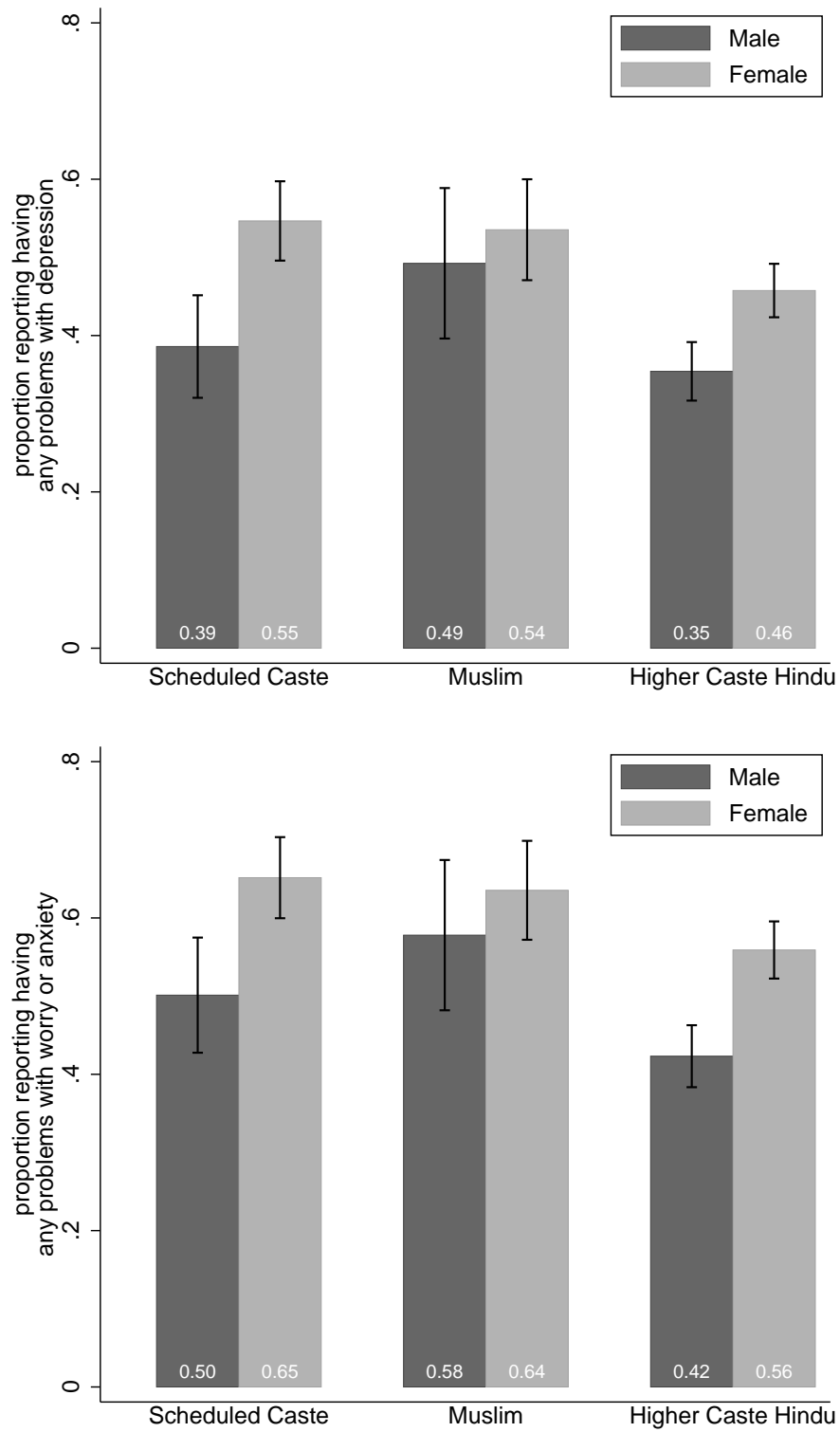
WHO SAGE, 2007-08.

Figure A2: Local polynomial regressions of mental health outcomes by age and social group



WHO SAGE, 2007-08.

Figure A3: Mental health outcomes by sex and social group



WHO SAGE, 2007-08.