Title: Trends and Determinants of Health Inequalities in Older Population: What Matters More in Past and Present?

Abstract:

The socioeconomic gradient of health inequalities among the older population in India has declined, but much less is known about relative contributions of explanatory factors for health inequality. Data from the National Sample Survey (2004), (2014) has been used for analysis. Results indicate that the narrowing of socioeconomic inequality in the health status of the older population (60 years and above) since 2004 has been sizable (CI=-0.0888), far exceeding the narrowing of 70 years and above inequality (CI=-0.0543). Further, decomposition analysis reveals that illiteracy, marital status, low economic status, and females show significantly increasing importance in order to explain the inequalities in health status. On the contrary, the importance of rural place of residence, aged 70+ and religion has declined. Hence, results show that the inequalities are the artefact of existing inequalities in economic, education and marital status, which need immediate attention of policymakers to promote healthy and active aging.

Keywords: Health inequalities. Older population. Socioeconomic determinants. Decomposition Analyses.

Introduction

In India, the issue of socioeconomic inequalities in health has been largely discussed in the context of women and children (Jain et al. 2012; Goli and Arokiasamy 2013; Goli et al. 2013). Despite India having the second largest older population in the world in terms of absolute numbers, the association between socioeconomic inequality and health among the older population remains poorly understood (National Research Council of the National Academies, 2011). Specifically, the extant literature in India that has attempted to establish an association between socioeconomic gradient and health status of the older population used simple bivariate percentage distributions and odds ratios in their investigation (Kumar 2003; Mishra 2005; Pou and Goli 2012). As such studies are unable to provide critical insights into the changing contributions of underlying factors that create an imbalance in the health status of the older population over the period. The aim of this study is to fill this gap.

Objective and Rationale:

This study is designed specifically to address two objectives: first, to quantify the socioeconomic inequality in the health of India's older population by using socioeconomic status based Concentration Indices (CIs). Second, to calculate the change in relative contribution of the key socioeconomic factors to the total explained health inequalities over the period (Hosseinpoor et al. 2006; Wagstaff et al. 2003) for the older population of 60 to 69 years and 70 years and above separately. Finally, by determining the contribution of each socioeconomic factor to inequality in health status, we identify which vulnerable group would be potential targets for an effective policy intervention to reduce health inequality among India's older population. Further, this study proposes to carry out change decomposition analyses, to find the critical contributors of change in health inequality over the period.

Data and Methods:

Data from the 60th round and 71st round of National Sample Survey (NSS) conducted by the National Sample Survey organization (NSSO) during 2004 & 2014 was used in the statistical analyses. The survey uses a stratified multi-stage design in data collection.

Statistical Methods

In the first stage of statistical analyses, socioeconomic differentials in the health status of the older population were assessed by cross-tabulations. Further, the socioeconomic differentials in the health status are tested for statistical significance by Pearson's Chi Square test. In the second stage, CIs were estimated as inequality measures. Finally, the CIs were decomposed to observe the contribution, as a percentage of different socioeconomic predictors to the total health inequality. All the statistical analyses in this paper were carried out using STATA 12.0 (STATA crop LP, College Station, Texas, USA) and Microsoft excel program.

Results:

Socioeconomic Differentials in the Health Status of the Older Population

Socioeconomic and demographic differentials of self-reported health status of the older population are presented in Table 2. The results show that a significant decline in proportion of the older population of 60 years and above were found with poor health status (37.7%, 34.5%) as compared to the older population of 60 to 69 years (19.7%, 17%). The difference in poor health

status by economic status shows considerable decline (7.2%, 3.8%), but still large disparity remained among the poorest and richest population. Further, assessment of inequality in poor health status by different educational category (illiterate and higher secondary and above) indicate significant increase (11.2%, 11.6%) in within group disparity over the period. Moreover, considerable and statistically significant differences in the prevalence of poor health status were also reflected across the other socioeconomic and demographic characteristics of the older population.

Socioeconomic Inequalities in the Health Status of the Older Population

Although, the results show that the values of concentration indices for all three categories of the older population recorded sizable decline, but still CI in poor health status in 2014 was recorded as high as -0.02680 for older population age 60 year and above. This indicates a sizeable volume of socioeconomic inequalities in the prevalence of poor health status are still present among the older population in India. Moreover, the unexplained part of total health inequality among the older population of 70 years and above is slightly more than age group of 60 to 69 years. This implies there is relatively more complexity involved in terms of exploration of critical determinants causing health inequality in the older population of 70 years and above in comparison with older population of 60 to 69 years.

The results of decomposition analyses of poor health status were presented in table 3, 4 and 5 for the older population of 60 years and above, 60 to 69 years and 70 years and above respectively. The estimates of the relative contribution of socioeconomic factors to overall health inequality in case of all the older population of 60 years and above show increasing contribution of poor economic status, illiterate and currently married by 3.5%, 10%, 10.7% respectively. However, rural place of residence (19.4%), age group 70 years and above (32%) Muslim religion (2.9%) and SC/ST (1.2%) recorded significant decline in contribution in order to explain the socioeconomic inequality in poor health status. Further, sizable decline has also been registered in contribution of low economic status in determining the poor health status i.e. 27.2% for older population aged 70 years and above in India. Similarly, the rural place of residence and illiteracy have also registered considerable decline in their contribution for inequality in health status. Moreover, population of age 60-69 year depicts an interesting trend of increasing explanatory power of illiteracy, followed by poor economic status and currently married in India during year 2004 to 2014. The phenomenal rise of relative contribution of education and marital status in 2014 compared to 2004 is a highlight among the findings.

Conclusion and Discussion:

This study advances a number of intriguing finding, it suggests that older individuals with a lower socioeconomic status are more likely to suffer from poor health status. A comparative assessment of decomposed contributions of socioeconomic factors for the older population 60 to 69 years and 70 years and above suggest that the contribution from a rural place of residence, illiteracy and marital status to total health inequalities was reduced for the later age group as compared to considerable increase in case of former age groups. There are two patterns of health care concerns emerging from this study: firstly, social groups who are unable to survive up to the higher age bands need better socioeconomic support to acquire better health knowledge and health care to extend their survival chances. Secondly, those groups who are in higher age bands need better economic support to increase healthy life years. This study envisages that in order to provide better health status for the older population, the main challenge will be reaching to the needs of the most deprived older population, such as the poorest of the poor and illiterate older population living in the rural areas. Therefore, health policy actions need to consider both efficiency and equity in terms of health care utilisation and health outcomes for the older population.

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Table 1: Percentage distribution for older population sample by background characteristics

Background variables	Older population											
	All the older population (60 year and above)				60 to 69 years				70 Years and Above			
	2004		2014		2004		2014		2004		2014	
	%	Freq[a]	%	Freq[a]	%	Freq[a]	%	Freq[a]	%	Freq[a]	%	Freq[a]
Sex												
Male	50.0	17750	49.39	13914	49.3	13513	49.02	8607	52.4	4237	50.05	5307
Female	49.0	17081	50.61	13564	51	13342	50.98	8601	48	3739	49.95	4963
Place of residence												
Rural	75.7	22265	68.75	15423	77	17544	68.64	9618	71.1	4721	68.75	5505
Urban	24.3	12566	31.25	12335	23	9311	31.36	7590	28.9	3255	31.04	4765
Educational attainment												
Illiterate	67.6	22027	56.85	13873	68.6	17166	55.24	8293	63.8	4861	61.39	5580
Primary	17.9	6692	21.0	6347	16.9	4935	20.62	3928	21.2	1757	20.06	2419
Secondary	10.3	4170	7.02	2168	10.1	3223	14.83	1525	10.7	947	11.28	643
Higher secondary & above	4.3	1926	5.10	5090	4.3	1520	9.32	3462	4.3	406	7.30	1628
Marital status												
Currently married	59.2	20959	63.64	18239	62.8	17201	71.44	12879	46.4	3758	49.71	5360
Others	40.8	13872	36.36	9239	37.2	9654	28.56	4329	53.6	4218	50.29	4910
Religion												
Hindu	84.3	27959	83.17	21918	84.2	21507	82.91	13654	84.9	6452	83.65	8264
Muslim	9.3	3660	10.17	3104	9.6	2898	10.61	2015	7.9	762	9.34	1089
Others	6.4	3209	6.67	2456	6.2	2447	6.48	1539	7.2	762	7.01	917
Social Group												
Schedule Tribes (ST)	6.6	3257	7.54	2456	7.1	2698	7.91	1590	4.6	559	6.58	866
Schedule Castes (SC)	17.4	5274	15.63	3953	18.7	4344	16.28	2582	13.1	930	14.48	1371
Other Backward Castes (OBC)	39.8	12948	43.61	10996	40	10061	44.38	7066	39	2887	42.31	3930
Others	36.2	13343	33.33	10073	34.1	9743	31.48	5970	43.3	3600	36.64	4103
Economic Groups												
Poor	40.7	11656	45.47	9462	42.1	9374	46.20	6084	35.5	2282	44.17	3738
Middle	32.5	11501	30.64	8854	32.7	8968	30.51	5612	31.7	2533	30.88	3242
Rich	26.9	11672	23.88	9157	25.2	8511	23.29	5509	32.8	3161	24.95	3648
Total	100	34831	100	27473	78.1	26855	64.14	17205	21.9	7976	35.86	10268

Note: freq[a ;] Unweighted Sample Size

Table 2: Bivariate associations between socioeconomic status and prevalence rate (per 100) of poor health status among older population during 2004-2014

Covariates	Older Population											
	All the older population (60 year and above)				60 to 69 years				70 years and above			
	PHS^1	x^2 test	PHS^2	x^2 test	PHS^1	x^2 test	PHS^2	x^2 test	PHS^1	x^2 test	PHS^2	x^2 test
Age												
60-69	19.7	977.64***	16.96	940.25***	-		-		-		-	
70 and above	37.7		34.5		-		-		-		-	
Sex												
Male	21.5	59.66***	21.1	71.03***	17.5	63.75***	19.1	51.53***	35.2	12.37***	35.7	33.04***
Female	25.8		25.4		22.0		23.4		40.3		41.2	
Place of residence												
Rural	24.5	104.1***	24.4	2.18	20.6	99.76***	21.3	0.757	39.5	45.56***	39.7	16.18***
Urban	21.2		20.6		16.9		21.2		33.3		36.7	
Educational attainment												
Illiterate	25.8		26.6		21.6		23.2		41.9		42.1	
Primary	21.9		22.6		17.9		22.6		33.5		38.2	
Secondary	16.5	311.40***	15.3	313.26***	13.7	225.0***	17.6	186.47***	26.3	105.95***	30.8	115.14***
Higher secondary & above	14.6		15.1		12.8		13.3		21.6		26.7	
Marital Status												
Others	28.3	241.55***	29.9	342.0***	23.3	81.35***	25.1	92.99***	40.8	58.1***	43.1	67.63***
Currently Married	20.4		19.4		17.6		20		34.0		34	
Religion												
Others	23.5		23.6		19.4		17		36.1		37.7	
Muslim	32.4	78.64***	27.5	154.12***	28.0	64.57***	31.2	173.5***	51.5	26.21***	46.8	26.10***
Hindu	22.7		22.7		18.9		20.3		36.5		37.2	
Social Groups												
Schedule Tribes (ST)	19.5		24.2		15.6		18.6		42.0		36.6	
Schedule Castes (SC)	26.5		23.2		22.8		22		45.9		40.7	
Other Backward Castes (OBC)	23.7	0.128	23.2	22.60***	19.7	3.36	22.4	16.17***	38.6	5.81	40.3	31.78***
Others	23.0		23.1		19.1		22.3		34.0		36	
Economic Groups												
Poor	26.8		24.03		22.3		23.1		45.7		40.5	
Middle	23.0	163.61***	24.37	24.33***	19.4	144.91***	20.1	37.38***	36.5	77.34***	39	13.40***
Rich	19.8		20.31		16.0		19.5		30.4		35.8	

Note- PHS^1; Poor Health Status 2004, PHS^2; Poor Health Status 2014, Level of significance: *$p < 0.1$ ** $p < 0.05$ *** $p < 0.01$.

Table 3: Contribution of predictor variables based on decomposition analysis for poor health status of the all older population aged 60 years and above

Covariates	CI	Contribution to CI	% Contribution	CI	Contribution to CI	% Contribution
		2004			2014	
Aged 70 and above	-0.1799	-0.01215	**13.5**	0.02469	0.00529	**-18.72**
Rural residence	-0.2015	-0.01820	**20.2**	-0.14968	-0.00022	**0.8**
Female	-0.0269	-0.00075	**0.8**	-0.01053	-0.00032	**1.1**
Poor economic status	-0.6653	-0.04857	**53.8**	-0.65559	-0.01593	**56.3**
Illiterate	-0.1700	-0.02129	**23.6**	-0.13090	-0.00951	**33.6**
Muslim religion	-0.0762	-0.00162	**1.8**	0.00752	0.00031	**-1.1**
SC/ST caste	-0.1872	0.00019	**-0.2**	-0.16993	0.00040	**-1.4**
Currently married	-0.0001	0.00001	**0.0**	0.02441	-0.00301	**10.7**
Poor health status	-0.1156	-0.09022	**100**	-0.02680	-0.02827	**100**
	Residual = -0.02538			Residual = -0.02538		

Note: CI; Concentration Index

Table 4: Contribution of predictor variables based on decomposition analysis for poor health status of the older population aged 60-69 years

Covariates	CI	Contribution to CI	% Contribution	CI	Contribution to CI	% Contribution
		2004			2014	
Rural residence	-0.1799	-0.01694	**19.9**	-0.14751	0.00324	**-9.49**
Female sex	-0.0052	-0.00023	**0.3**	-0.01445	-0.00079	**2.32**
Poor economic status	-0.6509	-0.04769	**55.9**	-0.64638	-0.02384	**69.73**
Illiterate	-0.1483	-0.01715	**20.1**	-0.14588	-0.01023	**29.93**
Muslim religion	-0.0537	-0.00185	**2.2**	0.010505	0.00062	**-1.82**
SC/ST caste	-0.1661	0.00053	**-0.6**	-0.15893	0.00059	**-1.71**
Currently married	-0.0215	-0.00197	**2.3**	0.032796	-0.00378	**11.05**
Poor health status	-0.0943	-0.08529	**100**	-0.03794	-0.03418	**100**
	Residual= -0.00897			Residual= -0.00376		

Note: CI; Concentration Index

Table 5: Contribution of predictor variables based on decomposition analysis for poor health status of the older population aged 70 years and above

Covariates	CI	Contribution to CI	% Contribution	CI	Contribution to CI	% Contribution
		2004			2014	
Rural residence	-0.2120	-0.01164	**17.0**	-0.1527	-0.00329	**9.57**
Female sex	0.0102	-0.00014	**0.2**	-0.0031	-0.00001	**0.02**
Poor economic status	-0.7139	-0.03932	**57.3**	-0.671	-0.01030	**30.01**
Illiterate	-0.1455	-0.01546	**22.5**	-0.1121	-0.00281	**8.17**
Muslim religion	-0.0671	-0.00150	**2.2**	0.00459	0.00000	**0.00**
SC/ST caste	-0.2024	-0.00044	**0.6**	-0.1876	-0.01446	**42.11**
Currently married	0.0015	-0.00011	**0.2**	0.0328	-0.00347	**10.12**
Poor health status	-0.0819	-0.0686	**100**	-0.0276	-0.03434	**100**
	Residual= -0.0133			Residual= 0.00678		

Note: CI; Concentration Index