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Publications

1. Centre released PRC Newsletter Vol. 1 No. 3 covering the activities of all the PRCs during the period July-September, 2020. Prof. Jyoti S. Hallad edited the Newsletter.
2. Golandaj JA. and Kallihal KG. (2020). "Awareness, attitude and practises of biomedical waste management amongst public health-care staff in Karnataka, India", *Journal of Humanities and Applied Social Sciences,* Vol. 3, No. 1, pp. 49-63, DOI:10.1108/JHASS-08-2019-0041
3. Shriprasad H., 2020 'Covid -19 in Karnataka; Recent Scenario and Instant Measures to Suppress the Pandemic' *International Journal of Social and Economic Research,* Volume - 10, Issue – 1
4. Pradeep S Salve, Suvarna K.Naikar, Javeed A.Golandaj and Jyoti S. Hallad, (2020), "Situational analysis of Maternal Death Review in India: Evidence from Health Management Information System", *Children and Youth Services Review - Elsevier*, 119 (2020) 16 November 2020, 105723, https://doi.org/10.1016/j. childyouth.2020.105723
5. S.R. Vatavati and M. S. Kampli (2020), an Opinion Article "Surgeries and Surgical site Infection in India: A Analysis of Health Management Information System 2019-20" *Journal of Surgery and Surgical Research*, ISSN 2455-2968
6. Golandaj JA**.** (2020). "Insight into the COVID-19 led slow-down in TB notifications in India", *Indian Journal of Tuberculosis***,** Vol. 68 (2021), pp. 142-145, https://doi.org/10.1016/ j.ijtb.2020.12.
7. Pradeep S. Salve, Mahadevi N. Korkoppa, Channabasappa Noolvi, H. R. Channakki and Jyoti S. Hallad (2020), "Low Birth Weight and Infant Deaths in India: A District-Level Analysis Using the Health Management Information System Data" *Demography India*, 31st December 2020 Vol. 49 No. 2 (2020) pp 67-75, ISSN 0970-454X

Workshops/Webinars conducted and Participation in workshops

1. Dr. Jyoti S. Hallad, conducted online workshop on 'CS-Pro' software-data entry programme, Batch Editing and Cross Tabulation in September, and December 2020. Staff members from 6 PRCs attended
2. Centre organized a Webinar on "Mental Health & COVID-19" under Padmavibhushana Dr. D. Veerendra Heggade Chair for Studies on Health & Demography (DVH Chair) on 5th October, 2020. Dr. Shriprasad H., coordinated the activities.
3. Research staff attended the workshop on NHM-PIP Monitoring in September, 2020 organized by NHSRC, New Delhi.
4. Research staff attended the workshop on 'Orientation of new HMIS website' organized by MoHFW, Statistics Division in September, 2020.

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ARTICLES

Determinants of self-reported health status: evidence from countrywide surveys of older adults in India

Sanjeev Bakshi[1*]

Abstract

The present study investigates the socioeconomic factors associated with the SRH for the older adults in India. Data of the 52nd and the 60th round of the National Sample Survey have been made use of for this purpose. The present study models the SRH (from a global perspective), measured on a 3-point ordinal scale, for its association with the immediate socioeconomic environment of the older adults. An ordinal logit regression model is utilized for the purpose. The immediate socioeconomic environment of an older adult consists of the living arrangements, the financial dependence, the marital status and the economic status of the household. Further, these associations have been studied after controlling for the objective measures of health, namely, the physical health and the relative perception of health status. The results indicate that the objective measures of health and the relative change in the state of health during past one year contribute maximum to the information on the perception of the present state of health. Although the information provided by the immediate socioeconomic environment is lesser, it is not insignificant. SRH was found better for more educated older adults. The financial dependence and poor status of the household reduce the chances of better SRH. On the other hand, co-residence enhances the chances of better SRH. The older adults in rural areas are less likely to perceive a better health status when compared to their urban counterparts.

Keywords: ageing, India, National Sample Survey, older adults, self–reported health, social determinants of health.

Introduction

The physical, the mental and the social well-being constitute the health of an individual (WHO, 1978) and a population in general. For populations passing throughthe demographic transition,

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life expectancies at various ages show an increasing trend over time. To ensure healthy ageing, in such populations, the latter part of the life span of an individual should be free from chronic diseases and impairments. In this context, the prevailing health scenario is best measured in terms of the disease-free life expectancies and the disability-free life expectancies.

At the individual level, the number of diseases and the number of impairments one suffers from, give an account of his/her health. These can be considered as objective measures of physical health. Besides these objective measures, self-reported health (SRH) has received great attention in recent literature (Babones, 2009; Bailas et al., 2003). Inclusion of SRH, while accounting for an individual's health, is akin to giving him/her say in his/her assessment of health. Furthermore, it is opined that SRH captures those hidden aspects of health that go unnoticed otherwise. Although SRH it is a subjective measure of health its salience has grown over time and there are reasons for that. Firstly, there is recognition of the need to give weight to a person's perception of his/her health along with the objective indicators of health in health-related studies. Equally important is the strong association that this indicator has been found to have with the future mortality (Huisman and Deeg, 2010; Idler and Benyamini, 1997; Jylhä, 2009 a) and future functional status (Bond et al., 2006; Hoeymans et al., 1997; Mossey and Shapiro, 1982).

Though simple to measure, the SRH has been criticised for being culture-specific and that each person has a different frame of reference while assessing his/her status of health. Nevertheless, its consistency that the lower states indicate a high risk of future mortality is universal and that makes it appealing in health-related studies. In other words, this measure not only incorporates the objective state of health but also what cannot be measured by these objective states. According to Jylhä (2009 b), the SRH is "crossroad between the social world and psychological experiences on one the hand and the biological world on the other." Further, the social conditions prevailing at childhood also affect the perception of health at older ages (Nicholson, 2005). SRH, which is an indicator of the future state of health, can serve as an indicator of health-related quality of life of the older adults (OAs).

Unlike the non-older adults, most of the OAs are retired from active economic life, the marital status is at the risk of changing from married to widowhood and they may be dependent on others for care and sustenance. Further, the prevalence of chronic health conditions are common among OAs. The demographic transition, thus, infuses health transition in the society where the health scenario is predominated by chronic diseases. These changes have a profound impact on the quality of life of older adults. Health, being one of the salient integrands of the quality of life, is affected by the socioeconomic environment of older adults. A framework of the Social Determinants of Health (Kelly et al. 2009; WHO 2007) is provided by WHO. In brief, the framework consists of three levels of factors that influence health and health differentials in society. These three levels are namely, the socioeconomic and political context, structural determinants of health inequities and the intermediary determinants of health.

Akin to the social determinants of health the perception and subsequent reporting of own health may have socioeconomic determinants. Although an individual's perceptions regarding their health are pertinent upon his / her present state of physical health the conditioning of these perceptions by his / her socioeconomic environment cannot be ruled out. There had been a few studies concerning the socioeconomic aspects associated with the SRH among the OAs. Considering the increasing share of older adults in the demographic space of India and the concern for their well-being such investigations are warranted. The present study attempts to fill this gap. Moreover, such studies can be of potential interest to the social policymakers as they can establish how socioeconomic factors contribute to SRH that is an integral component of health-related quality of life (HRQoL).

Methods

As mentioned in the previous section SRH is an indicator of the future state of mortality. Perception of the state of current health is influenced by the current state of physical health and the relative state of health of OA. The relative state of health status is a comparative perception of one's current state of health when compared to the state of health during a reference period in

the past. Apart from these factors, the socioeconomic environment of an OA may influence her / his perception of the current state of health (Figure 1).

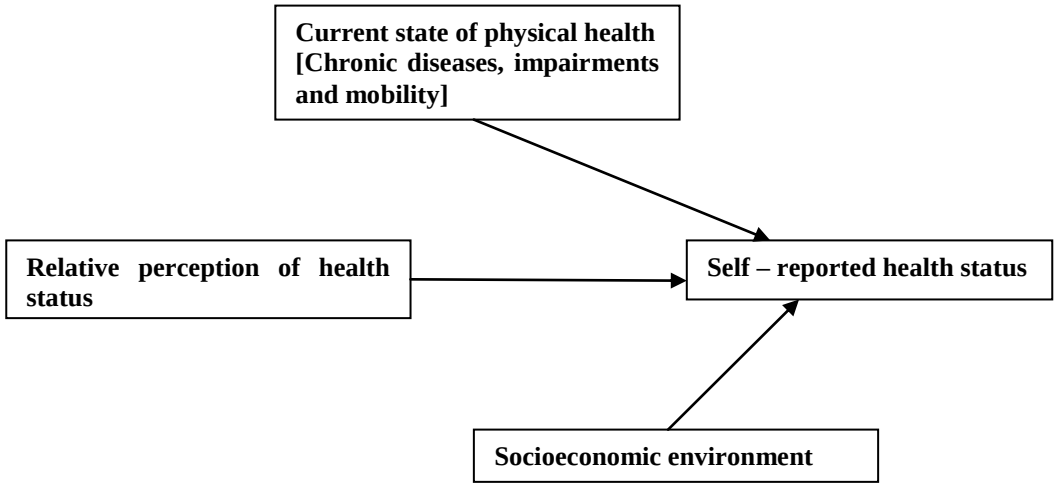

Figure 1: Influence of various factors on self-reported health status

The aim of the present study is an investigation into the influence of the latter set of factors on the SRH of the OAs. For this purpose, pooled data from the 52nd and the 60th rounds of the National Sample Survey are utilized. A person aged sixty years and above is defined as an OA in these surveys. These surveys were conducted during 1995-96 and 2004 respectively. The effective sizes of samples that are utilized in the present study are 27888 and 28248 respectively for the two reference periods. In these surveys, the SRH was measured on a five-point ordinal categorical scale. The categories were Poor, Fair, Good, Very Good and Excellent. For analyses, similar categories were collaged. Fair and Good were collaged into the category Fair / Good. Very Good and Excellent were collaged into the category Very Good / Excellent. The terms used for Poor, Fair / Good and Very Good / Excellent categories in the present study are respectively, Low, Normal and High.

As illustrated in Figure 1 the SRH may have associations with the current state of physical health, the relative perception of health status and the socioeconomic environment of the OA. In the present study, the set of variable that are used to define the physical health are the number of

chronic diseases, the number of impairments and the state of being mobile. The relative perception of health status is an ordinal variable with categories, namely, “worse”, “somewhat worse”, “nearly the same”, “somewhat better” and “much better”. Responses for this variable are recorded considering a reference period of one year before the date of the survey. The set of variables representing the socioeconomic environment of an OA include years of education, gender, age, marital status, financial dependence, living arrangements, economic affluence of the household and rural/urban place of residence. To account for any changes over time, the reference periods as former (1995-96) and latter (2004) are also considered in the analysis. The economic affluence of household is defined based on the per capita monthly expenditure of the households. Based on the pentiles of the distribution of per capita monthly expenditure the households are categorized into five groups called as the 1^{st}, the 2^{nd}, the 3^{rd}, the 4^{th} and the 5^{th}pentile. The 5^{th}pentile represents the most affluent group of households. The order of decreasing affluence is from the 5^{th} through the 1^{st}. The categorization is done separately for the households in the rural and urban areas.

The associations of SRH with a number of chronic diseases, the number of impairments and the state of being mobile (the three variables for measuring physical health), relative perception of health status and economic affluence of the household are measured using gamma measure for ordinal variables. The chi-square measure of association is utilized to investigate the association of the rest of the variables with SRH.

The set variables representing the socioeconomic environment that are included in the study are based on the Social Determinants of Health Framework (WHO 2007). However, a modified form of the framework is utilized keeping in view the information available in the data sets utilized for the purpose. Akin to the social determinant of health the study proposes a social determinants perspective to the SRH. The immediate socioeconomic environment of an OA is defined bytheir age, their marital status, their years of education, their gender, their living arrangements (alone or co-resident type), their financial dependency, rural/urban place of residence and the economic

affluence of their household. The association of SRH with socioeconomic environment is investigated utilizing the ordinal logistic regression model. The model is explained as follows:

Letting p_1, p_2 and p_3 denote the probabilities that an older adult perceives his/her health as "high", "normal" and ""low" respectively. The model associating the probabilities of perception about the state of health and various potential factors is given as

$$\ln\left(\frac{p_1}{p_2 + p_3}\right) = \alpha_1 - \left(\sum_{i=1}^{k} \eta_i x_i\right)$$

$$\ln\left(\frac{p_1 + p_2}{p_3}\right) = \alpha_2 - \left(\sum_{i=1}^{k} \eta_i x_i\right)$$

Where, β_i is the effect of the variable x_i. Here x_i are variables representing the physical health, the relative health and the socioeconomic environment.The effect of the set of variables representing the socioeconomic environment is interpreted in terms of odds ratios. Further, these effects are obtained after controlling for physical health and relative health status. The odds ratios represent the odds in favour of the higher status of health (when compared to the lower status). This means the odds in favour of the "high" status of SRH (when compared to the odds in favour of "normal" or "low" statuses of SRH). It also means the odds in favour of "high" or "normal" statuses of SRH (when compared to the odds in favour of the "low" status of SRH). Henceforth, the term "odds in favour of higher status of SRH" (HS) is used in the sense discussed above.

Findings

Sample-based profile of older adults during former reference period 1995-96

The proportions of OAs in the categories, namely, "high", "normal" and "low" were found to be 0.11, 0.72 and 0.17 respectively. The respective figures for older females were 0.07, 0.72 and 0.21. The distributions for both the genders were found to differ significantly from each other. The proportion of older males is found to be higher than that of older females for the category

"high" whereas for the category "low" older females have proportion higher than that of older males (Table 1).

The sample was composed of OAs with 49.9 % being males and 50.1 % being females. The rural OAs constituted 78.1 % of the sample the remaining 21.9 % belonged to urban areas. Most of the OAs were married (61.0 %). However, 38.2 % reported being widowed. A small percentage of 0.9 % reported being unmarried/divorced/separated (classified as "others"). About 13.1 % of the OAs were residing alone and 86.9 % of the OAs were co-residing with others. The gender, the place of residence and the marital status were found to have a significant association with the SRH. However, the living arrangements were not found to have a significant association with SRH (Table 2).

Table 1: distributions of the older adults, by gender, over different states of self-reported health

gender	self-reported health	reference periods		m.d.i.s statistic (p-value)
		1995-96	2004	1995-96 and 2004
older males	high	0.11	0.07	
	normal	0.72	0.72	205.54(0.00)
	low	0.17	0.21	
older females	high	0.07	0.04	
	normal	0.72	0.71	213.40(0.00)
	low	0.21	0.25	
m.d.i.s statistic (p-value)		158.29 (0.00)	166.43 (0.00)	

Note: m.d.i.s stands for minimum discrimination information statistic.

The state of physical health is represented by the number of chronic diseases, the number of impairments and mobility. The number of OAs who reported being free of chronic diseases and impairments were 39.9 % and 60.3 % respectively, Further 89.9 % of OAs had no restriction on mobility (Table 3). A very high and significant association was found between mobility and SRH. The value of gamma was found to be 0.84 (Table 3) in this case. On the other hand, the number of chronic diseases and the number of impairments were found to have a significant negative association with SRH. The values of gamma were found to be respectively, - 0.47 and – 0.56 (Table 3) for these associations. The relative perception of health status and SRH were

found to have a high degree of positive association. The value of gamma for this associationis found to be 0.72 and significant.

The financially dependent, partially dependent and not dependent OAs constituted 53.2 %, 16.0 % and 30.8 % of the sample respectively. Financial independence is found to have a significant positive association with SRH. The value of gamma for this association is found to be 0.41 (Table 3). About 69.8 % of OAs were illiterate. Education showed a significant positive association with SRH. The value of gamma for this association was found to be 0.19 (Table 3). The value of gamma for the association between SRH and economic affluence is found to be 0.10 (Table 3). This indicated a positive and significant association.

Table 2: percentage distribution of older adults over different attributes for reference periods 1995-96 and 2004 and p values of chi-squared statistic for testing the association between SRH and respective variables

attributes	1995-96		2004	
	Percentage	$\chi 2$ *p value*	percentage	$\chi 2$ *p value*
gender				
older male	49.9	0.00	50.5	0.00
older female	50.1		49.5	
place of residence				
rural	78.1	0.00	75.6	0.00
urban	21.9		24.4	
marital status				
others	0.9		0.7	
widowed	38.2	0.00	38.3	0.00
currently married	61.0		60.9	
living arrangements				
alone	13.1	0.00	16.2	0.26
co-residence	86.9		83.8	

Profile of older adults during the latter reference period 2004

The proportion of older males in “high”, “normal” and “low” states of SRH was found to be 0.07, 0.72 and 0.21 respectively. The corresponding figures for older females were found to be 0.04, 0.71 and 0.25 respectively (Table 1). The distribution of older males and older females over different states of SRH were found to be significantly different. The proportion of older males in category “high” if found to be higher than that of older females in the same category. On the

other hand, the proportion of females in the category "low" is found to be higher than that of older males during the same reference period. The distributions of SRH, for both the genders, are found to be significantly different for the two reference periods. It is observed that over the time the proportion in category "low" has increased while the proportion in category "high" has increased. This is observed for the distribution of SRH for both the genders (Table 1).

The sample was composed of 50.5 % of older males and 49.5 % of older females. OAs residing in rural and urban areas were 75.6 % and 24.4 % respectively. Marital status as the widow and currently married was reported respectively by 38.3 % and 60.9 % of the OAs. About 83.8 % of OAs co-resided and the remaining were residing in the alone type of living arrangement. The gender, the place of residence, the marital status and the living arrangements were found to be significantly associated with SRH (Table 2).

Table 3: percentage distribution of older adults over different attributes for reference periods 1995-96 and 2004 and p values of gamma for measuring the association between SRH and respective ordinal variables

attributes	1995-96		2004	
	percentage	$\Gamma\ (p\ value)$	percentage	$\Gamma\ (p\ value)$
difficulty in mobility				
severe	1.7		1.4	
partial	8.4	0.84 (0.00)	6.5	0.73 (0.00)
no difficulty	89.9		92.0	
financial dependence				
dependent	53.2		53.0	
partially dependent	16.0	0.41 (0.00)	13.7	0.44 (0.00)
not dependent	30.8		33.3	
education				
illiterate	69.8		65.5	
<10 years	24.5	0.19 (0.00)	25.9	0.26 (0.00)
10 or more years	5.7		8.6	
no of chronic diseases				
0	39.9		72.9	
1	32.2	-0.47 (0.00)	22.7	-0.49 (0.00)
2 or more	27.9		4.3	
no of impairments				
0	60.3		84.0	
1	24.0	- 0.56 (0.00)	14.4	-0.54 (0.00)
2 or more	15.7		1.6	

relative health				
worse	3.9		2.3	
somewhat worse	22.1		18.2	
nearly the same	67.5	0.72 (0.00)	66.2	0.84 (0.00)
somewhat better	5.0		10.3	
much better	1.4		2.9	
economic stratum				
1st pentile	18.4		18.8	
2nd pentile	20.7		19.6	
3rd pentile	21.4	0.10 (0.00)	21.2	0.13 (0.00)
4th pentile	20.5		17.8	
5th pentile	19.1		22.6	

The OAs who were mobile, free of chronic diseases and free of any impairment constituted respectively 92.0 %, 72.9 % and 84.0 % of the sample. These variables with a gamma value of 0.73, - 0.49 and - 0.54 were found to have a significant association with SRH. The OAs who had a total or partial financial dependence on others were respectively found to be 53.0 % and 13.7 % of the sample. The rest of the OAs were not financially dependent on others. With a gamma value of 0.44, financial independence and SRH were found to have a positive and significant association. In what follows the findings of the ordinal logistic regression of SRH on various socioeconomic factors are presented. The associations are interpreted in terms of odds ratios.

Table 4: Ordinal logistic regression odds ratios for regression of self-reported health on various socioeconomic variables

variables	odds ratio (p value for effects)	variables	odds ratio (p value for effects)
Immobility		*Dependence*	
severe	0.12 (0.00)	not dependent	2.10 (0.00)
partial	0.29 (0.00)	partially dependent	1.45 (0.00)
no difficulty®		dependent®	
Relative health		*Economic affluence*	
worse	0.00 (0.00)	first pentile	0.59 (0.00)
somewhat worse	0.01 (0.00)	second pentile	0.74 (0.00)
nearly the same	0.05 (0.00)	third pentile	0.85 (0.00)
somewhat better	0.20 (0.00)	fourth pentile	0.88(0.00)
much better®		fifth pentile®	
Years of Education		*Marital Status*	
> 10 years	1.44 (0.00)	Others	0.79 (0.05)
< 10 years	1.17 (0.00)	Widowed	0.97 (0.17)
illiterate®		currently married®	

Gender		*Residence*	
male	0.85 (0.00)	urban	1.25 (0.00)
female®		rural®	
Living arrangements		Reference Period	
co-residence	1.41 (0.00)	2004	0.26 (0.00)
alone®		1995-96®	
Impairments	0.72 (0.00)	Threshold	
Chronic diseases	0.61 (0.00)	high	0.06 (0.00)
Age	0.97 (0.00)	normal	0.00 (0.00)

Note: p-value corresponds to the test of the hypothesis that the corresponding effect is 0 against the alternative that it is not zero.

The association of various socioeconomic factors with SRH

The odds in favour of HS are 0.85 times lesser among the older males when compared to the older females (Table 4). There is no significant difference observed between married and widowed OAs in this respect. However, the odds in favour of HS are found to be reduced by 0.79 times among the unmarried/divorced/separated (called others) OAs when compared to the married OAs (Table 4). Financial dependence among the OAs is found to have a significant association with SRH. When compared to the financially dependent OAs the OAs who are partially dependent or not dependent have odds in favour of HS higher by 1.45 times and 2.10 times (Table 4) respectively. SRH is also found to show a significant association with the level of education among the OAs. The odds in favour of HS are found to be 1.17 times and 1.44 times higher (Table 4), respectively, for OAs with less than 10 years of education and 10 or more years of education. This is in comparison to the illiterate OAs. Increasing age of OAs reduces the odds in favour of HS. A year of increase in the age of an older adult reduced the odds in favour of HS by 0.97 times (Table 4) when compared to the previous year. The living conditions and household are alsofound to have a significant association with SRH as discussed in what follows.

As mentioned earlier the OAs are either in an alone type of living arrangement or they are in a co-residence type of living arrangement. The OAs who co-reside have 1.41 times (Table 4) higher odds in favour of HS when compared to the OAs who are living alone. When compared to the OAs in the most affluent economic strata the OAs belonging to the 1st, the 2nd, the 3rd, and the 4thpentileshave respectively, 0.59, 0.74, 0.85 and 0.88 times lesser odds in favour of HS

(Table 4). The urban OAs have odds in favour of HS that are 1.25 times higher (Table 4) than that of the rural OAs. The odds in favour of HS are found to be lesser by 0.26 times (Table 4) during the later reference period (2004) when compared to the former reference period.

Discussion

The investigation of the association of the relative state of health, the household affluence and the financial dependence with the SRH is a distinguishing feature of the present study. Not only the objective measures of health dictate the perception but also the relative change in the health status as experienced by an older adult during last one year. Apart from these health factors the individual characteristics, household composition and economic condition also have a significant role in shaping the perception about health. Among the individual characteristics, the roles of education and financial dependency are worth mentioning. It can be said that education helps in reporting a better status of health whereas; economic dependency forces an older adult to report a lesser health status.

Older adults in poorer households perceive poor health status. The finding that older adults living in poor households are more likely to report better health status is not supported by the present population of older adults. It also comes out from the present analysis that co-residence is congenial for a better perception of health status. To put it in other terms, living in multigenerational households enhances the chances of feeling healthier. The older adults in rural areas are less likely to perceive a better state of health when compared to their urban counterparts. The possible reasons could be lesser infrastructure and particularly health infrastructure in the rural areas.

Conclusion

The basic question investigated in the previous sections is what makes the OAs feel healthier? And the question a policymaker has to address is how to make the OAs feel healthier? This can be achieved by mitigating the risk of future mortality and the risk of future poor functional status. A large chunk of the proposed solutions lies in the prevailing health infrastructure of

society. But, this is not of the preview of the present investigation. What the present investigation emphasises is that there are also socioeconomic dimensions to addressing the question of perception of better health status among the OA population. Thus, the socioeconomic environment, akin to SRH, is a predictor of the future state of mortality and functional status of OAs. Consequently, there are socioeconomic solutions to this and these solutions can contribute their bit in improving the perception about health among the OAs. Among these broad set of social and economic factors, the factors that can be controlled and regulated to the benefit the older adults can be identified.

References

Babones, S. J. (2009), The consistency of self-rated health in comparative perspective. *Public Health*, 123, 199-201.

Bailis, D. S., Segall, A., & Chipperfield, J. G. (2003), Two views of self-rated general health status. *Social Science and Medicine*, 56, 203-217.

Bond, J., Dickinson, H. O., Matthews, F., Jagger, C. & Brayne, C. (2006), Self-rated health status as a predictor of death, functional and cognitive impairment: a longitudinal cohort study. *European Journal of Ageing*, 3, 193-206.

Hoeymans, N., Feskens, E. J. M., Kromhout, D., Van Den Bos, G. A. M. (1997), Ageing and the relationship between functional status and self-rated health in elderly men. *Social Science and Medicine*, 45, 1527-1536.

Huisman, M., & Deeg, D. J. H. (2010), A commentary on MarjaJylhä's "what is self-rated health and why does it predict mortality? Towards a unified conceptual model." *Social Science and Medicine*, 70, 652-654.

Idler, E. L., & Benyamini, Y. (1997), Self-rated health and mortality: a review of twenty-seven community studies. *Journal of Health and Social Behaviour*, 38, 21-37.

Jylhä, M. (2009 a), What is self-rated health and why does it predict mortality? Towards a unified conceptual model. *Social Science and Medicine*, 69, 307-316.

Jylhä, M. (2009 b), Self-rated health between psychology and biology. A response to Huisman and Deeg. *Social Science and Medicine*, 70, 655-657.

Kelly MP, Steward E, Morgan A, Killoran A, Fischer A, Threrlfall A, Bomejoy J (2009), A conceptual framework for public health: NICE's emerging approach. Public health 123: 14-20.

Mossey, J. M., & Shapiro, E. (1982), Self-rated health: a predictor of mortality among the elderly. *American Journal of Physical Health*, 72, 800-808.

Nicholson, A., Bobak, M., Murphy, M., Rose, R., & Marmot, M. (2005), Socio-economic influences on self-rated health in Russian men and women - a life course approach. Social Science and Medicine, 61, 2345-2354.

WHO, (1978), Declaration of Alma-Ata. http://www.euro.who.int/AboutWHO/Policy/20010827_1.

WHO, (2007), A conceptual framework for action on the social determinants of health. Discussion paper for the Commission on Social Determinants of Health.

The health of older adults in India: an empirical investigation into the perspective of social determinants of health

Jyoti Thanvi[1], Sanjeev Bakshi[1*], Shailendra Kumar Mishra[2] and Prasanta Pathak[3]

Abstract

Health at older ages is more about chronic conditions and special care that these chronic conditions require. The present work is an investigation into the health of older adults in India from the perspective of Social Determinants of Health. For the purpose, health is defined in terms of the prevalence of selected chronic diseases. Pooled data from the 42nd and the 52nd rounds of the National Sample Survey has been utilized for the investigation. Associations of the prevalence of selected chronic diseases with various socioeconomic factors are explored utilizing the logistic regression models. The results are interpreted in terms of the odds ratios pertaining to the logistic regression models. The prevalence of chronic diseases are found to be associated with gender, marital status, financial independence, living arrangements and education of the older adults. Place of residence and economic affluence of the households are also found to be associated with the prevalence of selected chronic diseases. However, each of the selected chronic diseases has its distinct pattern of prevalence across a multitude of socioeconomic factors. The investigation supports the inclusion of Social Determinants of Health perspective into the health policy planning for older adults.

Keywords: ageing, chronic diseases, health, older adults, social determinants

Introduction

Ageing of a population occurs at the latter phase of demographic transition. Such populations show a relatively increasing share of people at higher ages. India has an ageing population. The present study considers people aged sixty or above as older adults (OAs). The number of older adults enumerated in the censuses of 1971 and 2011 were 32,699,731 and 103,849,040, respectively. Corresponding to these census years their proportions in the population were 0.06 and 0.09, respectively.

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Unlike the people at younger ages, the OAs are at higher risk of suffering from chronic conditions. They are likely to be out of workforce and their marital status may be at risk of changing from married to the widow. Entering into older adulthood may also change the social roles of a person. All these changes accompanying older adulthood make OAs distinct from the rest of the population. Ageing and its implications are well documented and debated in the demographic literature. One of the issues of concern in the developing world is the preparedness of these societies to ensure healthy ageing of the increasing proportion of OAs.

Health being one of the dimensions of well being is too complex an entity to be captured by a single measure or indicator. According to the World Health Organisation (WHO) "health is a state of complete physical mental and social well being and not merely absence of disease or infirmity." To put it in other words diseases and infirmities touch upon the physical aspects of health whereas the mental and the social aspects should not be ignored. This definition applies to all including the OAs.

Though diseases are governed by various biological factors operative in a human being, recent literature has shown that social and economic environmental factors are strongly associated with the prevalence of a disease in a population (Gliksman et al, 1995, Smith et al, 1997, Chandola 1998, Cambois et al, 2001, Adda et al, 2003, Zimmer et al, 2003, Kaneda et al, 2004, Baker et al, 2005, Raotio et al, 2005, Matthews et al, 2005, Matthews et al, 2006, Petrelli et al, 2006, Zimmer, 2006 and Merkin et al, 2007). Even early childhood conditions have a lasting effect on the health at later life (Hayward et al, 2004). The interference of socioeconomic conditions in health at older ages has been debated in detail in recent demographic literature. These studies provide insight into a gamut of the problem in different socio-cultural environments.

Such studies cover the developed countries and the countries of south-east Asia. Studies exploring the strength of association between health and socioeconomic factors for OA in India are lacking. Further, the relative economic position of an OA in a household and its association with health of him/her has not been addressed in these studies. The present study is an attempt to fill these gaps. The aims of the present study are as follows:

1. Defining the physical health of an OA.
2. Investigating the association of socioeconomic and demographic factors with the health of an OA.

Methods and data

In the present section first, the health of an OA is defined pertaining to physical aspects. It is followed by an introduction to the conceptual framework pertaining to the Social Determinants of Health (SDH). A model of health is proposed based on SDH. Finally, the empirical analyses are carried out utilising the logistic regression models.

Physical health

As stated earlier, WHO has comprehensively defined health as "a state of complete physical, mental, and social well-being and not merely the absence of disease, or infirmity." Physical well being materializes in the absence of diseases and the absence of any kind of handicap. This is indicated substantially by the chronic diseases which OAs suffer from and the disabilities they encounter with growing age. Either or both of these have a bearing on the OAs ability to perform day to day activities. This may lead to a handicap of one kind or the other which in turn may put restrictions on their mobility. Therefore, the diseases and the disabilities faced by an OA indicate his state of physical health.

The present study utilises pooled data from the 42nd and the 52nd rounds of the National Sample Survey. These surveys were conducted during 1986-87 and 1995-96. These two surveys contain information on seven chronic diseases. These are chronic cough, piles, urinary problems, problem in joints and limbs (PJL), hypertension, heart disease, and diabetes. These diseases fall into two groups. The first four, which fall into the first group, do not require any diagnosis for being detected. The remaining diseases fall into the second group. They can be detected only after proper diagnosis. For the first group of diseases, the information on each disease is available in the form of a nominal binary variable, indicating whether the disease is present or not. For the second group, the information is available on each disease in the form of a nominal variable having three alternative responses. These responses are disease present, disease absent and not known. Since "not known" is not indicative of presence or absence of a disease, all the units responding as "not known" are not included in the analysis. Thus, for the second group of diseases also we are left with information on four binary variables, indicating the presence or absence of disease.

SDH framework

As mentioned earlier for an individual the state of being disease-free and impairment free defines good physical health. Thus, the number of acute and chronic morbidities suffered by an individual and the number of impairments suffered by an individual can serve as indicators of health. The socioeconomic and cultural factors can be viewed as various kinds of exposures that the older adults get subjected to during their lifetime. Moreover, the population of older adults is heterogeneous concerning socioeconomic and cultural aspects. The differentials in the socioeconomic and cultural aspects may correspond to the differentials in the health of older adults. However, if such an association is confirmed, it may be possible to control and ameliorate some of these factors that can shape the health at older ages. Thus, the health of older adults can be improved by creating an environment that is conducive to the improvement of health.

The conceptual framework used in the present study rests partly on the framework outlined in the final report of the WHO Commission on the Social Determinants of Health (Kelly et al. 2009; WHO 2007). In brief, the framework consists of three levels of factors that influence health and health differentials in society. These three levels are namely, the socioeconomic and political context (policies at national and international level), structural determinants of health inequities (income, education, occupation, social class, race/ethnicity and sex) and the intermediary determinants of health (material, psychosocial, behavioural and biological, health system).

These variables operate at micro/individual, semi-macro/household and macro level. The present study shall study the association between health and structural determinants of health only as the information on intermediary variables is not available and the effect of socioeconomic and political environment will be similar for all the older adults in a country.

The variables, namely, income, education, occupation, social class, race/ethnicity and sex describe the socioeconomic position of an individual. The variables social class and race/ethnicity, which form a part of the WHO framework, are not included as they are not relevant to the Indian older adult population. However, the present study adds marital status, age, and living arrangements to the list of structural determinants as they are relevant in the social context of the older adults in India. The variables used in the present study are discussed below

in detail. The variables that represent the environments constitute different systems. The framework of analysis presumes that health is an outcome of the effects of these systems. These systems are discussed in what follows.

The economic system consists of a set of variables related to the economic aspect of the life of an OA. Moreover, this study distinguishes between "household economic conditions" and the "financial status" of an OA within a household. The categorical variable financial dependence with three response categories, namely independent, fully dependent and partially dependent, is the variable that indicates financial security. While an OA in the category "independent" enjoys some financial security, OA in the category "fully dependent" does not enjoy that sort of financial security. An OA in the category "partially dependent" enjoys a state of financial security in between the two, mentioned already. Based on the per capita monthly expenditure, the households have been divided into five groups based on pentiles. This grouping has been done for rural and urban regions separately.

The demographic variables age, marital status and gender build up this system. The classification of marital status (MS) as currently married, widowed, never married, divorced and separated has been natural and exhaustive. Most of the OAs in Indian society are confined to either of the first two marital states. The latter three states contain a small proportion of the OAs. In the present analysis, these latter three states are clubbed into a single category "others." Education may influence health awareness among the OAs. Thus, education has been included here in the form of a categorical variable with two categories as illiterates, and literates. Living arrangements (alone and co-residence as categories), place of residence (rural and urban as categories) and reference period (former 1986-87 and later 1995-96 as categories) are other variables included in the framework.

The Model

Suppose for a given population "P" and a given disease "D", we have a binary response variable Y_D^P coded 1 if a disease/disability is observed and coded 0 otherwise. Letting, π denote the probability that the given disease/disability has been observed, we may write

$$P(Y_D^P = 1) = \pi$$
$$P(Y_D^P = 0) = 1 - \pi$$

Let $\mathbf{X} = (x_1, x_2 ... x_k)$ be a set of explanatory variables that influence Y. Then, the logistic regression model is given by

$$\ln\left(\frac{\pi}{1-\pi}\right) = \sum_{j=1}^{k} \beta_j x_j$$

where, β's are the coefficients for the independent variables namely, the age, the gender, the marital status, the education, the financial independence, the living arrangements, the economic status of the household, the place of residence and the reference period.

Findings

The health of older females

The older females had a higher proportion reporting the chronic diseases, namely, PJL, hypertension and diabetes during 1995-96 when compared to 1986-87. The proportions were found to be higher by 0.08, 0.08, and 0.02 (Table 1) for PJL, hypertension and diabetes respectively. A slight increase was also observed in the proportion of older females reporting urinary problems. However, a decline of 0.02 (Table 1) in the proportion of older females reporting chronic cough was observed. The proportion of older females reporting heart disease and those reporting piles did not differ during the two reference periods for both the chronic diseases.

Table 1: Proportion with 95% confidence interval of older males and older females who reported having selected chronic diseases during reference periods 1986-87 and 1995-96

	Older males			*Older females*		
	1986-87(95% CI)	*1995-96(95% CI)*	*|difference| (p-value)*	*1986-87(95% CI)*	*1995-96(95% CI)*	*|difference| (p-value)*
Problem in joints and limbs	*0.30 (0.29, 0.30)*	*0.34 (0.34, 0.36)*	*0.05 (0.00)*	*0.34 (0.33, 0.35)*	*0.42 (0.41, 0.43)*	*0.08 (0.00)*
Chronic cough	*0.23 (0.22, 0.23)*	*0.24 (0.23, 0.24)*	*0.01(0.14)*	*0.21 (0.20, 0.21)*	*0.19 (0.18, 0.20)*	*0.02 (0.00)*
Hypertension	*0.07 (0.07, 0.07)*	*0.14 (0.13, 0.14)*	*0.07(0.00)*	*0.08 (0.07, 0.08)*	*0.16 (0.15, 0.16)*	*0.08 (0.00)*
Heart disease	*0.04 (0.03, 0.04)*	*0.04 (0.04, 0.05)*	*0.01 (0.00)*	*0.04 (0.03, 0.04)*	*0.03 (0.03, 0.04)*	*0.00 (0.56)*
Piles	*0.03 (0.03, 0.03)*	*0.03 (0.03, 0.04)*	*0.01(0.00)*	*0.02 (0.02, 0.02)*	*0.02 (0.02, 0.02)*	*0.00 (0.63)*
Urinary problems	*0.03 (0.03, 0.03)*	*0.04 (0.04, 0.05)*	*0.01(0.00)*	*0.02 (0.02, 0.02)*	*0.02 (0.02, 0.03)*	*0.00 (0.02)*
Diabetes	*0.02 (0.02, 0.03)*	*0.05 (0.05, 0.06)*	*0.03(0.00)*	*0.02 (0.01, 0.02)*	*0.04 (0.04, 0.04)*	*0.02 (0.00)*

The health of older males

The proportion of older males who report PJL, hypertension, heart disease, piles, urinary problems and diabetes rose by 0.05, 0.07, 0.01, 0.01, 0.01 and 0.03 (Table 1) during the reference period 1995-96 when compared to the reference period 1986-87. However, the proportions of males who report chronic cough are not found to differ significantly during the two reference periods.

As described in the methods and data section the prevalence of selected chronic diseases among the OAs is modelled as a function of various socioeconomic variables. In what follows the associations between various socioeconomic variables and the prevalence of selected chronic diseases is described based on the odds ratios pertaining to logistic regression models. The logistic regression models utilised for the purpose are found to be significant (Table 2). An year of increase in the age enhances the odds in favour of hypertension, chronic cough, heart disease, PJL, piles and urinary problems by 1.01, 1.02, 1.03, 1.03, 1.02 and 1.04 times respectively. However, increasing age is not found to be significantly associated with prevalence of diabetes.

Health over the two reference periods

The prevalence of chronic diseases, namely, hypertension, diabetes, PJL, and urinary problems is found to be more likely during the latter reference period when compared to the former reference period. The increase in odds is found to be 1.81, 1.93, 1.33 and 1.23 times respectively (Table 2) for the above mentioned chronic diseases. The prevalence of the rest of the chronic diseases is not found to differ significantly over the two reference periods.

Place of residence and health

The OAs residing in rural areas are less likely to have hypertension, diabetes and heart disease when compared to their urban counterparts. Among the rural OAs the odds for having these chronic diseases are reduced by 0.58, 0.55 and 0.81 times respectively (Table 2) when compared to the urban OAs. However, their odds of having a chronic cough, PJL, and piles are comparatively higher by 1.48, 1.34 and 1.18 times (Table 2). The prevalence of urinary problems is not found to differ significantly between rural and urban OAs.

Household economic stratum and health

The fifth pentile of per capita monthly expenditure is the stratum of most affluent households. The prevalence of chronic diseases in the rest of the strata can be lower or higher than the fifth pentile. The chronic diseases that have relatively lower prevalence in the lower strata are found to be hypertension, diabetes, heart disease, piles and urinary problems. The odds in favour of having hypertension are found to be reduced by 0.77, 0.70, 0.57 and 0.48 times (Table 2) for the strata represented by the fourth through the first pentiles respectively. The corresponding figures for diabetes are 0.74, 0.65, 0.60 and 0.44 times (Table 2) respectively. For heart disease the respective figures are 0.75, 0.66, 0.59 and 0.81 times (Table 2) respectively. For urinary problems the respective figures are 0.80, 0.85, 0.84 and 0.72 times (Table 2) respectively. The prevalence of piles is not found to be significantly different in the economic strata represented by the third and fourth pentiles when compared to the fifth pentile. However, for the second and the first pentile the odds are found to be lesser by 0.86 and 0.76 times respectively.

On the contrary chronic cough and PJL are found to have a relatively higher prevalence in the lower economic strata when compared to the highest economic stratum represented by the fifth pentile. When compared to the OAs in the most affluent stratum, the OAs in the strata represented by the fourth through the first pentile are, respectively, 1.11, 1.14, 1.15 and 1.24 times (Table 2) more likely have a prevalence of chronic cough. PJL is 1.15 times (Table 2) more likely to be prevalent among the OAs of strata represented by the first and second pentiles. The strata represented by the third and the fourth pentiles are not found to differ significantly from the fifth pentile in this aspect.

Living arrangements and health

The OAs with an alone type of living arrangement are less likely to experience the prevalence of chronic diseases when compared to the OAs who have a co-residence type of living arrangement. However, an exception is observed for PJL. The prevalence of PJL is found to be 1.26 times (Table 2) more likely among the OAs with alone type of living arrangement. The prevalence of hypertension, chronic cough diabetes, heart disease, piles and urinary problems is reduced by 0.80, 0.92, 0.71, 0.68, 0.76 and 0.80 times (Table 2) respectively among the OAs with alone type of living arrangement when compare to the OAs with co-residence type of living arrangements.

Financial dependence and health

Financial dependence is observed to be conducive to prevalence of chronic diseases. The findings indicate that the prevalence of chronic diseases is more likely among the fully dependent and partially dependent OAs when compared to financially independent OAs. Hypertension is 1.23 times and 1.67 time (Table 2) more likely to be prevalent among the partially dependent and fully dependent OAs when compare to financially independent OAs. The corresponding figures for the prevalence of chronic cough are 1.26 and 1.58 respectively. For the prevalence of diabetes, the corresponding figures are 1.39 and 1.63 respectively. In the case of the prevalence of heart disease the corresponding figures are 1.73 and 1.44 respectively. For the prevalence of PJL the corresponding figures are 1.29 and 1.65 respectively. The corresponding

figures for the prevalence of piles are 1.05 and 1.20 respectively. For the prevalence of urinary problems, the corresponding figures are 1.13 and 1.76 respectively.

Gender and health

The findings indicate that the prevalence of chronic cough, diabetes, PJL, piles and urinary problems is less likely among older females when compared to older males. For the respective chronic diseases, the odds are lower by 0.60, 0.79, 0.95, 0.66 and 0.50 times(Table 2) among older females when compared to older males. However, both the genders are not found to differ significantly concerning the prevalence of hypertension and heart disease.

Marital status and health

A comparison of widow OAs with that of currently married OAs indicate a significant difference between these two groups vis-à-vis prevalence of hypertension, chronic cough, diabetes and PJL. The chronic diseases, namely, hypertension, chronic cough and PJL are respectively 1.16, 1.22 and 1.21 times (Table 2) more likely to be prevalent among widow OAs when compared to currently married OAs. However, diabetes is found to be 0.86 times (Table 2) less likely to be prevalent among the widow OAs as compared to their currently married counterparts. Further, the prevalence of heart disease, piles and urinary problems among widow OAs is not found to be significantly different from that of currently married OAs.

Literacy and health

The prevalence of all the selected chronic diseases except PJL is less likely among the illiterate OAs when compared to literate OAs. However, for the prevalence of PJL the illiterate OAs are not found to differ significantly from the literate OAs. The odds for the prevalence of hypertension, diabetes, heart disease, piles and urinary problems are likely to be reduced by 0.44, 0.38, 0.55, 0.55 and 0.77 times respectively (Table 2) among the illiterate OAs when compared to literate OAs. The odds for the prevalence of chronic cough are found to be 1.09 times (Table 2) more likely among the illiterate OAs when compared to the literate OAs.

Discussion

Health is an important integrant of the quality of life of the OAs. Chronic diseases at older ages are detrimental to their quality of life. Prevalence of chronic diseases varies with varying socioeconomic conditions of OAs. Life in a rural set up is conducive to a relatively higher prevalence of chronic cough, PJL and piles. On the other hand, an urban set up is conducive to a relatively higher prevalence of hypertension, diabetes and heart disease. A difference in lifestyle may be the reason for such differing prevalence of chronic diseases. Economic affluence is more likely to be conducive to the prevalence of hypertension, diabetes, heart disease, piles and urinary problems; whereas lower economic affluence is more likely to be conducive to the prevalence of chronic cough and PJL.

At the individual level, financial independence is more likely to keep an OA free of chronic conditions. Possibly a financially independent OA is capable of bearing the cost of maintaining a sound health. Gender wise the older females are better placed vis-à-vis prevalence of chronic cough, diabetes, PJL, piles and urinary problems. Widowhood is a socially disadvantageous state among OAs. This may be the reason why hypertension, chronic cough and PJL are more likely to be prevalent among widow OAs. However, diabetes is more likely among currently married OAs. Literacy is associated with financial affluence. The lifestyle factors of affluence may be the causes of a higher likelihood of prevalence of hypertension, diabetes, heart disease, piles and urinary problems among the literate OAs. An individual OA or an OA couple living alone has a lower likelihood of the prevalence of chronic conditions. An OA being in a state of sound health can afford for alone type of living arrangement. But for OAs in a state of ill health co-residence is a better option for the availability of support and care. This indicates the salience of co-residence at older ages.

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Table 2: Odds ratios with 95% confidence intervals for logistic regression of prevalence of selected chronic diseases on various socioeconomic variables

variables	hypertension	chronic cough	diabetes	heart disease	problems in joints and limbs	piles	urinary problems
intercept	0.11(0.08, 0.14)	0.04(0.03, 0.05)	0.07(0.04, 0.12)	0.01(0.01, 0.01)	0.03(0.03, 0.04)	0.01(0.01, 0.01)	0.00(0.00, 0.00)
age	1.01(1.01, 1.01)	1.02(1.02, 1.02)	1.00$^{\$}$(0.99, 1.01)	1.03(1.02, 1.04)	1.03(1.03, 1.03)	1.02(1.01, 1.03)	1.04(1.04, 1.05)
gender							
female	1.05$^{\$}$(0.97, 1.13)	0.60(0.57, 0.63)	0.79(0.69, 0.90)	0.97$^{\$}$(0.86, 1.09)	0.95(0.91, 0.99)	0.66(0.58, 0.75)	0.50(0.44, 0.56)
male®							
marital status							
others$^{\#}$	1.03$^{\$}$(0.75, 1.39)	1.22(1.01, 1.46)	1.12$^{\$}$(0.66, 1.77)	0.83$^{\$}$(0.49, 1.32)	1.10$^{\$}$(0.93, 1.30)	1.36$^{\$}$(0.84, 2.06)	0.60$^{\$}$(0.31, 1.04)
widowed	1.16(1.08, 1.26)	1.22(1.17, 1.28)	0.86(0.75, 0.99)	0.95$^{\$}$(0.85, 1.07)	1.21(1.16, 1.26)	1.01$^{\$}$(0.89, 1.16)	0.99$^{\$}$(0.87, 1.12)
married®							
education							
illiterate	0.44(0.41, 0.47)	1.09(1.04, 1.14)	0.38(0.34, 0.43)	0.55(0.50, 0.61)	0.97$^{\$}$(0.93, 1.00)	0.55(0.49, 0.61)	0.77(0.69, 0.85)
literate®							
financial independence							
fully dependent	1.67(1.54, 1.81)	1.58(1.51, 1.66)	1.63(1.43, 1.86)	1.44(1.28, 1.63)	1.65(1.58, 1.72)	1.20(1.06, 1.35)	1.76(1.56, 1.98)
partially dependent	1.23(1.12, 1.36)	1.26(1.19, 1.33)	1.39(1.19, 1.62)	1.73(1.51, 1.97)	1.29(1.23, 1.36)	1.05$^{\$}$(0.91, 1.22)	1.13$^{\$}$(0.97, 1.32)
independent ®							
living arrangements							
alone	0.80(0.72, 0.88)	0.92(0.87, 0.97)	0.71(0.60, 0.84)	0.68(0.59, 0.79)	1.26(1.20, 1.32)	0.76(0.65, 0.89)	0.86(0.74, 0.99)
co-residence®							
economic stratum							
first pentile	0.48(0.43, 0.53)	1.24(1.17, 1.31)	0.44(0.36, 0.52)	0.81(0.70, 0.92)	1.15(1.09, 1.21)	0.76(0.65, 0.89)	0.72(0.62, 0.84)
second pentile	0.57(0.52, 0.62)	1.15(1.09, 1.22)	0.60(0.51, 0.69)	0.59(0.52, 0.67)	1.15(1.09, 1.20)	0.86(0.75, 1.00)	0.84(0.73, 0.96)
third pentile	0.70(0.64, 0.77)	1.14(1.07, 1.22)	0.65(0.56, 0.76)	0.66(0.57, 0.77)	1.04$^{\$}$(0.95, 1.05)	1.02$^{\$}$(0.87, 1.19)	0.85(0.72, 0.99)
fourth pentile	0.77(0.71, 0.84)	1.11(1.05, 1.18)	0.74(0.64, 0.84)	0.75(0.66, 0.85)	1.00$^{\$}$(0.98, 1.09)	0.99$^{\$}$(0.86, 1.14)	0.80(0.70, 0.92)
fifth pentile®							
place of residence							
rural	0.58(0.54, 0.61)	1.48(1.42, 1.56)	0.55(0.50, 0.62)	0.81(0.74, 0.90)	1.34(1.29, 1.40)	1.18(1.05, 1.33)	0.94$^{\$}$(0.84, 1.05)
urban®							
reference period							
1995_96	1.81(0.71, 0.92)	0.98$^{\$}$(0.94, 1.02)	1.93(1.74, 2.14)	0.95$^{\$}$(0.86, 1.05)	1.33(1.28, 1.37)	1.02$^{\$}$(0.92, 1.12)	1.23(1.11, 1.35)
1986-87®							
model chi-square (p-value)	2769.75(0.00)	1644.01(0.00)	1153.05(0.00)	562.06(0.00)	2836.24(0.00)	362.58(0.00)	621.96(0.00)

never married/divorced/separated; ® reference category; note: the effects in logistic regression models are found to be significant at level of significance 5 percent or less unless otherwise stated; $ indicates that the effects in logistic regression models are not found to be significant at 5 percent level of significance.

Conclusion

The share of older adults in the population of India is projected to reach 12.4% by 2026 (Census of India, 2006). This trend of increasing share is expected to continue in foreseeable future. Health issues among the OAs are distinct from the rest of the population in terms of the disease patterns and the need for health care. Hence, ensuring to the older adults a decent quality of life is as necessary as addressing the issues like malnutrition among children, maternal health and child health. In other words, issues related to the quality of life of the older adults need to be considered on equal footing along with other high priority issues. To put the matters explicitly we need to know the need for geriatric care in India and how to fulfil the unmet need for geriatric care. This requires specially designed countrywide sample surveys and incorporation SDH perspectives into health policies of OAs. Policies promoting co-residence and financial independence of OAs may also contribute to an enhanced quality of life among OAs. Further, the quantum and the type of geriatric care required may differ from region to region for the reason that process of ageing is not uniform across the states of India and the socioeconomic environment is also not uniform across different states of India. Therefore, region-specific socioeconomic and health policies may be needed to mitigate the effect of financial constraints, widowhood and gender on the health-related quality of life of older adults.

References

Adama Peter, Michael D. Hurd, Daniel McFadden, Angela Merrill and Tiago Riberio (2003), Healthy, wealthy, and wise? Tests for direct casual paths between health and socioeconomic status. *Journal of Econometrics,* Vol. 112, pp. 57-63.

Adda Jèrôme, Tarani Chandola and Michael Marmot (2003), Socio-economic status and health: causality and pathways, *Journal of Econometrics*, Vol.112, pp. 3-56.

Agresti, Alan (1996), An Introduction to Categorical Data Analysis. John Wiley & Sons, INC.

Baker, Kristine R.,Mary Beth Ofstedal, Zachary Zimmer, Zhe Tang and Yi-Li Chuang (2005), Reciprocal Effects of Health and Economic Well-Being among Older Adults in Taiwan and Beijing. Policy Research Division Working Paper ISSN: 1554-8538, Population Council.

Barbotte Eric, Francis Guillemin, Nearkasen Chau and the Lorhandicap Group (2001), Prevalence of Impairments, disabilities, handicaps and Quality of Life in the General Population: A Review of Recent Literature. Bulletin of the World Health Organization, 79 (11).

Cambois, Emmanuelle, Jean- Marie Robine and Mark D. Hayward (2001), Social Inequalities in Disability Free Life expectancy in the French Male Population, 1980-1991. *Demography*, Vol. 38, No. 4, pp. 513-524.

Census of India (2006), Population projections for India and states 2001-2026: report of the technical group on population projections constituted by the national commission on population. Registrar General and Census Commissioner, India.

Chandola, Taran (1998), Social Inequality in Coronary Heart Disease: A Companion of Occupational Classifications, *Social Science and Medicine.* Vol.47, No. 4. pp. 525-533.

Deeg, Dorly J.H. (2007), Health and Quality of Life in Quality of Life in Old Age: International and Multi-Disciplinary Perspectives by Heidrun Mollenkopf and Alan Walker (Ed.). *Springer*. pp. 195-214.

Gliksman, M. D, R. Lazarus, A. Wilson and S.R. Leader (1995), Social Support, Marital Status and Living Arrangement Correlates of Cardiovascular Disease Risk Factors in the Elderly. *Social Science and Medicine.* Vol. 40. No. 6. pp. 811-814.

Hayward, Mark. D. and Bridget K. Gorman (2004), The long Arm of Childhood: The Influence of Early- Life Social Conditions on Men's Mortality, *Demography*, Vol. 41, No. 1, pp. 87-107.

Kaneda Toshiko, Zachary Zimmer and Zhe Tang (2004), Differentials in Life Expectancy and Active Life Expectancy by Socioeconomic Status among Older Adults in Beijing. Policy Research Division Working Paper ISSN: Population Council.

Kelly MP, Steward E, Morgan A, Killoran A, Fischer A, Threrlfall A, Bomejoy J. (2009), A conceptual framework for public health: NICE's emerging approach. *Public health* 123: 14-20.

Luke, Douglas A. (2004), Multilevel Modeling. SAGE PUBLICATIONS.

Manor Orly, Sharon Matthews and Chris Power (1997), Comparing Measures of Health Inequality. *Social Science & Medicine,* Vol.45, No.5, pp. 761-771.

Matthews Ruth J., Lvey K. Smith, Ruth M. Hamock., Carol Jagger and Nicola A. Spiers (2005), Socio-Economic Factors Associated with the onset of Disability in Older Age: A Longitudinal Study of People Aged 75 Years and Over, *Social Science and Medicine,* Vol. 61,pp. 1567-1575.

Matthews, Ruth J., Carol Jogger, Ruth M. Harcock (2006), Does Socio-Economic Advantage Lead to a Longer, Healthier Old Age?, *Social Science and Medicine,* Vol. 62,pp. 2489-2499.

Merkin, Sharon Stein, Ana V. Deiz Roux, Josef Coresh, Linda F. Fried, Sharon A. Jackson and Niel R. Powe (2007), Individual and Neighbourhood Socio-Economic Status and Progressive Chronic Kidney Disease In an Elderly population : The Cardiovascular Health Study, *Social Science and Medicine,* Vol. 65, pp. 809-821.

Pal Sarmishta and Robert Placious (2006), Old Age Poverty in Indian States: What do the Household Data Tell Us?

Petrelli, Alessio, Roberto Gnavi, Chiara Marinnacci and Givseppe Costa (2006), Socioeconomic Inequalities in Coronary Heart Disease in Italy: A Multilevel Population –Based study, *Social Science and Medicine,* Vol. 63, pp. 446-456.

Ravito, Nina, Eino Heikkinen and Shah Ebrahim (2005), Socio-Economic Position and its Relationship to Physical Capacity Among Elderly People Living in Jyvaskyla, Finland: Five and Ten-Year Follow-up Studies, *Social Science and Medicine,* Vol. 60, pp. 2405-2416.

Smith, James. P and Raynard Kington (1997), Demographic and Economic Correlates of Health in Old Age. *Demography,* Vol. 34, No. 1, pp. 159-170.

WHO (2007), A conceptual framework for action on the social determinants of health. Discussion paper for the Commission on Social Determinants of Health.

Zimmer, Zachary, Napaporn Chayovan, Hui-Sheng Lin and Josefina Natividad (2003), How Indicators of Socioeconomic Status Relate to Physical Functioning of Older Adults in Three Asian Societies, Policy Research Division Working Paper No. 172, Population Council.

Zimmer Zachary (2006), Poverty, Wealth Inequality, and Health among Older Adults in Rural Cambodia. Policy Research Division Working Paper ISSN: 1554-8538, Population Council.

Health inequality among elderly people in rural India

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Abstract

The study attempts to examine the health inequalities among the elderly people in rural India, with an effect of social and economic factors as these factors are detrimental to the health inequality in any society. Especially when society is diverse, multicultural, overpopulated, and undergoing rapid but unequal economic growth. Perceived health status, the prevalence of any disease, utilization of inpatient, and outpatient care are taken as dependent variables. Data from SAGE is used for the analysis. Descriptive statistics, Bi-variate, multi-variate, and concentration index has been carried out. Results reveal that with the increase in age, self-reporting in poor health and prevalence of disease increases; moreover utilization of health care facilities decreases with increased age. These inequalities can also be seen among female elderly, uneducated elderly, and elderly with poor economic characteristics.

Introduction

Health inequality has been identified as one of the most imperative issues of the contemporary world. The historical studies show that inequality in health is not a recent phenomenon. It has existed through periods but, came up as an entity of scholastic investigation after the ninth century, with the increase in information on epidemiology (Machenbach, 2006). Inequality in health increase with an increase in age and the divide in care for the health and treatment-seeking behavior widens along with the change of economic status. Globally, the number and proportion of the old age population are increasing because of the combined effects of increasing longevity and decline in fertility (Matthews, *et al.*, 2006). This growth is going to be challenging from the perspective of the economic and non-economic point of view. The growth carries great social economic and public health implications, which include a gap in the health status of the elderly

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and higher expenditure on health care in the rural area. Health inequality plays a vital role in the need for social security reforms, reduction in workforce, and a shortage of active persons which results in increasing old-age dependency ratio (Kalavar and Jamuna, 2011; Mishra and Sharma, 2001). Especially in developing countries, this problem will arise gradually.

India is the second-largest populated country in the world. India is in the transition stage according to health and socioeconomic conditions. It is believed by some thinkers that India may not be able to cater to the growing aging population. It is observed that the burden of ill health varies by different population sub-groups and people from lower socio-economic status experience poor health outcomes (Marino, *et al.*, 2003*)*. Treatment seeking for diseases is low especially in rural areas, and people belonging from low socio-economic strata of the society. This fact is very challenging from the development point of view. In the absence of appropriately well-designed policies and programmers for the older population (60 years and above), the existing socio-economic inequalities will have a strong impact on the health and well-being of older people (NRCNA, 2011).

Sixty-nine percent of the total population of India lives in rural areas. In which a huge proportion lives below the poverty line that continues a hopeless fight and constantly losing the battle for health and survivorship. Many of them suffer from a health problem which is primarily related to the social and economic perspective; and, that is, challenging for the household in the rural area health is the important factor for the producing goods and services as well as being well human being and contribution in the inclusive development of the country. The health problems of older adults are very much different from a young child or young adults. Apart from health problems due to aging them also suffer from various types of problems which may be related to social inequalities economic inequalities and the inequalities related to health care utilization (Arber and Ginn, 1993). All vital health problems and the major cause of premature cardiovascular disease and cancer are more common among people with a lower level of education income and occupation status. This paper aims to evaluate the relationship between health inequalities and the socio-economic status of the elderly population. Socio-economic inequalities in self-reported

health increase with an increase in early old age to the oldest old population. Studies emphasize that elderly in lower occupational grades often deterioration quicker in physical health compared with the elderly population from higher grades. (Tarani, *et. al.,* 2007). The result from the prospective cohort study shows that physical health deteriorated more rapidly with age among men and women from the lower occupational grades. Social inequalities in self-reported health increase in early old age. People from lower occupational grades age faster in terms of a quicker deterioration in physical health compared with people from higher grades. The widening gap suggests that health inequalities will become an increasingly important public health issue, especially as the population ages. The average gap in physical component scores between a high and low-grade civil servant at age 56 was 1.60 and this gap increased by one over 20 years. The average physical health of a 70years old man or woman who was in a high-grade position was similar to the physical health of a person from a low grade around eight years younger. In mid-life, this gap was only 4.5 years (Chandole, *et al.,* 2007). Although mental health improved with age, the rate of improvement is slower for men and women in the lower grades.

The cross-sectional studies show that health inequalities decrease with increasing age. Results from longitudinal studies are inconsistent but, none of them take differential mortality into account. Disadvantaged people die younger than people in the advantage of socioeconomic circumstances. This may artificially weaken socioeconomic inequalities in health in later life.

This study shows that wealth inequalities in new cases of heart disease and poor reported health decline with age. Wealth inequalities in the onset of functional impairment remain constant with age differential mortality contributes, to the decrease in wealth inequalities with age in the oldest age groups (Mcmunn, *et al.,* 2008). The health care service use is inequitable, favouring those on higher income among the older population in developing nations. Despite being in better health, wealthier older people are significantly more likely to see a doctor, have an outpatient visit, and see a dentist, with a similar although non-significant trend seen in hospital admission. A recent, cross-sectional analysis of equity in service use among the general British population only found significant inequity in dental care. As the highest users of health care and, potentially more

barriers to access, more attention should be paid to patterns of service use among older people and to addressing existing inequalities (Allin, *et al.*, 2006).

Socio-economic inequalities in health among elderly

Age is positively related to the appearance of both physical and mental health problems. Furthermore, women are disadvantaged in terms of poor psychological and mental health state compared to men. Both low socioeconomic conditions and occupational status have a detrimental effect on individual health regardless of how socioeconomic or health status is approximated. Several studies report a significant socioeconomic, regional difference in mortality and others tackle the mediating pathways, namely lifestyle and mental health status, on the socioeconomic status of a healthy relationship. These issues are not addressed systematically and, the evidence provided is less pragmatic. Importantly, an issue not confronted by studies is endogeneity in the socioeconomic health relationship. Not only SES affects health but, also health status may affect individual SES. Further research is needed to disentangle the complex mechanisms that contribute to health inequalities (Athina, *et al.*, 2005). This study addresses the health inequality among the elderly in rural India which suggests social and economic inequality on the health of society is profound. In a large, overpopulated country like India with its complex social architecture and economic extremes, the effects on the health system are multifold. Unequal distribution of resources is a reflection of this inequality and adversely affects the health of the underprivileged population. The socially under-privileged are unable to access healthcare due to geographical, social, economic, or gender-related distances.

Health inequalities can be found in various aspects of health. For example, poor people may not only live longer and also live in poor health. It is seen that the old and disabled including the less empowered population do not receive proper treatment than the empowered. Access to health care remains irregular for the marginalized and of the rural population. Congregating or widening the inequalities may increase since the time person stops working which leads to changed socioeconomic circumstances. Inequalities in older people are persistent throughout

nations. These inequalities are apparent as the process of aging has gained momentum in developing countries with the increase in life-saving technology and reduction in fertility becoming the cause of concern for the wellbeing of the growing aged population. Health is the most important factor in determining human behaviour as well as the activity of daily life. India is undergoing an epidemiological transition and experiencing the double burden of disease, therefore; addressing the issue of health inequality becomes very important especially for the older people particularly in the rural area where utilization of health care facilities is limited. Particularly saying this in a rural area, where the income of the household is comparatively less, and the proportion of expenditure from income is low in the health care services. Henceforth the study attempt has been taken to understand the level of health inequality among the elderly in rural India and to assess the relative contribution of socio-economic and demographic factors on health inequality among the elderly.

Data & Methods

The study is based on data from the Global Aging and Adult Health Survey (SAGE, 2007-08). In India, it was conducted in the six states Assam, Karnataka, Maharashtra, Rajasthan, Uttar Pradesh, and West Bengal. These six population states, spread across India accounted for around 37% of India's population as per the 2011 census. The purpose of the SAGE survey was to collect the data on a broader range of the self-reported assessment of health and well-being. In India, a multistage stratified cluster sampling design was used to select the sample. Nineteen states were selected based on their geographical location and level of development. These 19 states were group into six regions, north-central, central, east, northeast, west, and south. A composite index was used to categorize states in the different levels of development. The state was selected randomly such that one state was selected from each region as well as from each level of development categories. The sample was stratified by states and the locality (urban and rural) resulting in 12 strata and is nationally representative. Two-stage and three-stage sampling was adopted in rural and urban areas. It involves face to face interviews with 12,198 Individuals

of age 18 years and above. It collected information about self-reported morbidities and health condition based on the interview.

The study considers health indicators such as self-reported health, diseases (Pain, Asthma, Hypertension, and Diabetes), inpatient, and outpatient as a dependent variable to measure the health inequality in the rural area. The paper examines the health inequalities among the elderly in rural India, i.e., a sample of respondents aged 50 years and above, has been considered for analysis. Bivariate and multivariate analyses have been carried out to assess the inequalities by selected background characteristics. The outcome in logistic regression analysis is often coded as 0 for 'no' and 1 for 'yes,' where 1 indicates that the outcome of interest is present, and 0 indicates that the outcome of interest is absent.

The study used the Concentration Index (CI) to measure inequalities in the older population's health status. The CI is computed as twice the (weighted) covariance of the health variable, and a person's relative rank in terms of economic status, divided by the variable mean according to the value of CI can vary between -1 and +1. A negative value implies that the outcome of the variable is concentrated among disadvantaged people while the opposite is true for its positive values. The value of CI will be zero when there is no inequality (Wagstaff & Van Doorslaer, 1991).

Results

Regional differential of elderly health status for rural India

This study investigates health inequality among the elderly population in rural India. The results show that the state of Maharashtra has a greater proportion of urban elderly followed by West Bengal whereas this proportion is lowest in the state of Assam. For the elderly residing in rural areas, it is seen that Uttar Pradesh had the highest percentage followed by Rajasthan. While the inquiry into the wealth quintile shows the state of Karnataka had the lowest elderly in the poorest category and West Bengal has the highest proportion of elderly in the poorest wealth quintile,

whereas the state of Rajasthan showed the highest proportion of elderly in the richest wealth quintile and the Assam had the lowest. The share of age group 50-60 years of age it was seen the highest proportion of it is concentrated in Uttar Pradesh and lowest in Assam and 70 years and above is in Rajasthan. The elderly population receiving health care as an inpatient was found highest in West Bengal followed by Rajasthan. The lowest prevalence of inpatient among the elderly is in state of Assam. Similar results evolve for receiving care through outpatients showed that the state of West Bengal had the highest health care received as an outpatient for the elderly and the state of Assam showed the least care received as an outpatient.

Self-reported health status and presence of at least one disease among elderlypopulation in rural India

The logistic regression estimates of adjusted and unadjusted were used to examine the self-reported health among elderly health status in rural India. The dependent variable is self-reported health status, and it is dichotomous (0=Good health; 1=Bad health) in nature. The independent variables are a set of socio-economic and demographic variables. Both unadjusted and adjusted odds ratio with 95% Confidence Interval (CI) for self-reported health status is presented. The results show that age, sex, religion, education, and wealth quintile are found as important predictors of self-reported health status among elderly. The odds ratio of self-reported health is increasing with the increase in age group among the elderly. Compared to the reference category (elderly population in the age group of 50-54 years) the odds of reported bad health is 1.247 [95% CI: 1.022-1.522] among 55-59 age group, 1.562 [1.234-1.887] among 60-64 age group. The elderly from a higher age group (75+) are four times more likely to have worse health status compared to the lower age group (50-54 age groups). Similarly, the odds of bad health for female elderly are 1.5 times higher than the male elderly persons. Concerning the Hindu category, the odds of having worse health are 1.3 times higher among the non-Hindu category. The odds of having bad health is decreased among educated persons compared to uneducated persons. Educated persons are less likely to have bad health compared to uneducated persons. The higher wealth quintiles have lower odds ratio comparing to the poorest wealth quintile. For example, the

elderly in the poorest wealth quintile group had the odds of bad health for 0.840, 0.878 for the middle, 0.737 for the rich, and 0.559 for the richest wealth quintile group. The adjusted model has reduced odds ratios compared to the unadjusted model. For each independent variable, the odds values are decreased slightly for the adjusted model.

The odds ratio for disease among the health of elderly reveals that the people in the age group 55-59, 60-64, 65-69, 70-74 and 75 and above years were 1.2, 1.5, 2.0, 2.3 and 4.0 times more likely poor health condition compared to age group 50-54 years. Females were had 1.5 times more likely poor health conditions compared to males at the level of significance. The odds of poor health conditions among other religions was 1.3 ($p<0.05$). Non-educated people were less likely poor health conditions compared to educated people. The odds of poor health conditions among richer and richest wealth quintile were 0.74 and 0.56 respectively.

Inpatient and outpatient care among the elderly population in rural India

The odds ratio for Inpatient and Outpatient care among the elderly population in rural India. Age 50-54 is kept as the reference category for age likewise males for gender, Hindu for religion, educated for education, and the poorest for wealth quintile as the reference category. The result for inpatient shows that the people in the age group 55-59, 60-64 and 75 and above years were 1.6, 1.08, more likely to inpatient compare to the age group 50-54 years at 1 % level of significance. And the age group, 65-69, 70-74, years was 0.9, 0.7, less likely to the inpatient. Females were 0.9 less likely to inpatient comparing the male as the reference category. The other religious group was 1.4 more likely to inpatient comparing to Hindu reference. Uneducated were 0.9 times less likely to inpatients as compared to educated people. In the wealth quintile, the rich and richest were more likely to inpatient as compared to the poorest category of the wealth quintile.

The result for outpatient shows, people in the age group 55-59, 60-64,65-69, 70-74, 75, and above are less likely to outpatient compared to the age group 50-54. Female were less likely outpatient compared to the male. People with lower education and other religious groups are less

likely to be the in patient compare to the reference group. In the wealth quintile, people belong from the poorest category was less likely inpatient compared to the poorest.

Concentration Index of diseases self-reported health out-patient and inpatient among elderly in India

The concentration index for disease, health, inpatient, and outpatient among the elderly in rural India was estimated. The model predicts the positive effects of education and wealth in seeking health care. The results show that among middle and richer households there exists prevalent inequality in diseases and health. On the other hand, findings suggest that the concentration of ill health is more in a poor household than in other households. However, the concentration index of the outpatient and inpatient are more in other households than a poor household; another important finding from the analysis shows the inpatient is the highest among the richest wealth quintile whereas lowest in poorest wealth quintile, whereas for outpatient it is highest for poorest and lowest for richest wealth quintile.

Discussion

Health status of elderly person is issues of concern especially in the rural India. This study examines the health status of elderly person in rural India. These are the silent finding of the study. First, there is higher health inequality among the elderly in rural India. Second, the health status of the elderly decreases with increasing age. Third, health status does not differ by gender and socioeconomic status in rural India. The findings of the study are consistent with the literature (Marino, *et al.,* 2003; Athina, *et al.,* 2005). The health status of the elderly is decreasing with the increase in age among the elderly population (Athina, *et al.,* 2005). Similarly, females were more vulnerable to poorer health status than male. People from the higher wealth category have less chance of being poor in state of health than the poorest wealth category people (Mcmunn, *et al.,* 2008). Diseases in the health of the elderly population of rural India vary by age group; elderly in the age group 75 and above years were a higher chance of having multiple diseases than the lower age group in rural areas. Females had more disease

compared to male in the age group 75 and above years. The economic gradient is quite strong for health care services in rural India. The concentration of disease among middle and richer households are more than poor household.People in rural India in the lower age group were more likely to be in inpatient while in the higher age group were outpatient.

Conclusion

Health status of the elderly population in rural India is decreasing with the increase in age. Females were more vulnerable to have poor health status than the male. People from the higher wealth category have less chance of being poor health status than the poorest people.

References

Arber, S., & Ginn, J. (1993), Gender and inequalities in health in later life. Social Science and Medicine, 36(1), 33–46.

Ceccanti, M., Spagnolo, P. A., Tarani, L., Attilia, M. L.,Chessa, L., Mancinelli, R., &Robinson, L. K. (2007), Clinical delineation of fetal alcohol spectrum disorders (FASD) in Italian children: comparison and contrast with other racial/ethnic groups and implicationsfor diagnosis and prevention. *Neuroscience &BiobehavioralReviews*, *31*(2), 270-277.

Das, D. & Das, M. (2012), The Growing Rural-Urban Disparity in India: Some Issues. *International Journal of Advancements in Research & Technology*, *1*(5), pp145-151.

Demakakos, P., McMunn, A., & Steptoe, A. (2008), Well-being in older age: a multidimensional perspective. *Financial circumstances, health and well-being of the older population in England. The*, 115-177.

Deogaonkar, M. (2004), "Socio-economic inequality and its effect on healthcare delivery in India: Inequality and healthcare" *Electronic Journal of Sociology*, ISSN: 1198 3655.

Diaz, E. L. &Davila, L. Garcia, A. Larriuze, M. (2012), "A Socioeconomic Index to Measure Health Inequalities in the Elderly Population: San Juan, Puerto Rico and Havana, Cuba" *International Union for the scientific study of population.*pp.2-5.

Goswami, A. Reddaiah, V.P., Kapoor, S.K., Singh, B., Dwivedi, S.N., Kumar, G., Dey A. B. (2004), Self-rated Health Status of the Aged in Rural Area. *Research & Development Journal, Help Age India*; 10(2): 7-16.

Joe, W. Mishra, U. S. & K. Navaneetham (2008), " Health Inequality in India: Evidence from NFHS 3, Economic and Political Weekly, Vol. 43, No. 31, pp. 41-47.

Kamble S.V., Ghodke Y. D., Dhumale G.B., Goyal R.C, Avchat S.S. (2012), Mental Health status of elderly persons in rural area of India, *Indian Journal of Basic & Applied Medical Research*; Vol.-1, Issue-4, P. 309-312.

Kalavar, J. M., & Jamuna, D. (2011), Aging of Indian women in India: The experience of older women in formal care homes. *Journal of women & aging*, *23*(3), 203-215.

Long, Larry, H., (1970), On Measuring Geographical Mobility, *Journal of the American Statistical Association*, Vol. (65), pp: 1195-1203.

Long, Larry, H., (1973), "New Estimates of Migration Expectancy in the United States", *Journal of the American Statistical association*, Vol. (68), pp: 37-43.

Mackenbach, J. P. (2006), *Health inequalities: Europe in profile*. Produced by COI for the Department of Health.

Matthews, R. J., Jagger, C., & Hancock, R. M. (2006), Does socio-economic advantage lead to a longer, healthier old age?. *Social science & medicine*, *62*(10), 2489-2499.

Patil, A. V., Somasundaram, K. V., & Goyal, R. C. (2002), Current health scenario in rural India. *Australian Journal of Rural Health*, *10*(2), 129-135.

Qadri, S. Ahluwalia, SK. Ganai, A. Bali, S. Wani, F. Bashir, H. (2013), " An epidemiological study on quality of life among rural elderly population of northern India" International Journal of Medical Science and Public Health 2013 Vol2 Issue 3.

Rajan S. L., Mishra U. S. & Shrama P. S., (2001), "Health concern among India's elderly" *International journal of aging and development*, 53, 181-194.

Sara Allin, Cristina Masseria & Elias Mossialos (2006), "Inequality in health care use among older people in the United Kingdom: an analysis of panel data" LSE Health.

Wagstaff, A., Van Doorslaer, E., & Watanabe, N. (2003), On decomposing the causes of health sector inequalities with an application to malnutrition inequalities in Vietnam. *Journal of econometrics*, *112*(1), 207-223.

Table 1: State wise differential of elderly health status in India, 2007-08.

Variable	Assam	Karnataka	Maharashtra	Rajasthan	UP	WB
Residence						
Urban	7.87	17.89	28.44	15.85	11.49	18.45
Rural	11.57	12.45	14	21.16	22.35	18.47
Wealth Quintile						
Poorest	10.79	7.98	16.27	13.45	21.23	30.27
Poor	9.88	11.84	12.81	20.13	23.02	22.32
Middle	11.8	15.17	17.42	20.13	17.13	18.35
Rich	8.95	19.44	24.08	18.84	15.86	12.83
Richest	9.37	14.18	17.53	25.72	21.43	11.78
Sex						
Male	10.99	12.6	17.24	20.01	21.18	17.97
Female	10.4	14.61	17.93	19.69	18.59	18.78
Age Group						
50-54	10.2	11.55	17.96	17.69	20.31	22.29
55-59	10.9	14.1	17.81	18.8	21.58	16.81
60-64	9.69	14.07	15.84	22.49	22.07	15.84
65-69	10.1	14.9	17.69	22.6	16.54	18.17
70-74	9.03	15.69	17.08	20.28	21.53	16.39
75+	9.69	17.44	14.46	21.31	19.37	17.73
Religion						
Hindu	9.51	14.99	18.14	20.37	19.51	17.47
Others	16.53	7.71	15.13	16.86	20.04	23.73
Inpatient						
Yes	9.04	15.22	17.58	19.28	19.16	19.73
Outpatient						
Yes	6	16	18	19	20	21

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Table 2: Odds ratio (adjusted &unadjusted) for self-reported health status and presence of at least one disease among elderly population in rural India, SAGE 2007-08.

	Self-reportedHealth						Presence of Disease					
		95% C.I.		Exp(β)	95% C.I.			95% C.I.		Exp(β)	95% C.I.	
Background characteristics	Exp(β) Adjusted	Lower	Upper	Unadjusted	Lower	Upper	Exp(β) Adjusted	Lower	Upper	Unadjusted	Upper	Lower
Age Group												
50-54®												
55-59	1.247**	1.022	1.522	1.251**	1.028	1.521	1.094*	0.9	1.33	1.079*	0.889	1.309
60-64	1.526***	1.234	1.887	1.542***	1.252	1.899	1.283**	1.049	1.57	1.208*	0.99	1.474
65-69	1.971***	1.569	2.476	1.989***	1.591	2.488	1.429***	1.162	1.758	1.312**	1.07	1.609
70-74	2.271***	1.736	2.971	2.284***	1.755	2.973	1.521***	1.205	1.918	1.364**	1.085	1.714
75+	3.974***	2.918	5.413	3.961***	2.923	5.369	1.870***	1.483	2.358	1.661***	1.323	2.085
Sex												
Male®												
Female	1.452***	1.245	1.693	1.543***	1.347	1.767	1.246**	1.089	1.426	0.996	0.884	1.122
Religion												
Hindu®												
Others	1.273**	1.044	1.553	1.266**	1.043	1.537	1.220*	1.033	1.441	1.178	1	1.387
Education												
Educated®												
Non-educated	0.733***	0.626	0.859	0.532***	0.465	0.609	1.603***	1.39	1.847	1.459	1.293	1.647
Wealth Quintile												
Poorest®												
Poor	0.840*	0.683	1.034	0.810**	0.661	0.993	1.165*	0.976	1.392	1.184	0.993	1.412
Middle	0.878	0.707	1.091	0.804**	0.651	0.993	1.142*	0.948	1.375	1.209	1.007	1.451
Rich	0.737***	0.591	0.92	0.634***	0.513	0.784	1.319**	1.087	1.6	1.438	1.192	1.734
Richest	0.559***	0.444	0.704	0.486***	0.391	0.603	1.268**	1.032	1.559	1.476	1.212	1.799

Note:®: Reference Category; *** *p<0.05, **p<0.01 and ***p<0.001CI- Confidence Interval.

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Table 3: Odds ratio (adjusted &unadjusted) for inpatient and outpatient care among elderly population in rural India, SAGE 2007-08.

Background characteristics	Availed Inpatient Care						Availed Outpatient care					
	Exp(β) Adjusted	95% C.I.		Exp(β) Unadjusted	95% C.I.		Exp(β) Adjusted	95% C.I.		Exp(β) Unadjusted	95% C.I.	
		Lower	Upper		Lower	Upper		Lower	Upper		Upper	Lower
Age Group												
50-54®												
55-59	1.067	0.799	1.426	1.072	0.802	1.431	0.895	0.687	1.165	0.897	0.689	1.167
60-64	1.08	0.798	1.463	1.091	0.807	1.476	0.819	0.619	1.084	0.819	0.62	1.082
65-69	0.94	0.694	1.273	0.952	0.704	1.287	0.868	0.653	1.154	0.863	0.651	1.145
70-74	0.715**	0.516	0.991	0.726*	0.525	1.004	0.677**	0.479	0.957	0.672**	0.477	0.946
75+	0.944	0.67	1.331	0.962	0.685	1.351	0.751*	0.538	1.05	0.746*	0.536	1.038
Sex												
Male®												
Female	0.958	0.785	1.168	1.005	0.841	1.202	0.937	0.773	1.136	0.911	0.766	1.083
Religion												
Hindu®												
Others	1.046	0.813	1.345	1.053	0.82	1.353	1.135	0.9	1.433	1.144	0.907	1.442
Education												
Educated®												
Non-educated	0.91	0.738	1.122	0.947	0.791	1.135	1.121	0.916	1.371	1.16*	0.975	1.381
Wealth Quintile												
Poorest®												
Poor	1.017	0.784	1.318	1.012	0.781	1.312	0.878	0.682	1.129	0.887	0.69	1.141
Middle	1.047	0.796	1.376	1.036	0.79	1.359	0.897	0.69	1.166	0.92	0.71	1.193
Rich	1.043	0.784	1.387	1.029	0.778	1.36	0.96	0.732	1.258	0.995	0.764	1.296
Richest	1.019	0.751	1.383	0.987	0.735	1.326	0.873	0.648	1.176	0.914	0.686	1.218

Note: ®: Reference Category; * *p<0.05, **p<0.01 and ***p<0.001 CI- Confidence Interval.**

Table 4: Concentration Index of diseases, self-reported health, out-patient and inpatient among elderly in rural India, 2007-08.

Wealth Quintile	Disease	Health	Out-patient	Inpatient
Poorest	0.006	-0.003	0.002	0.000
Poorer	0.006	-0.003	0.001	-0.002
Middle	0.018	-0.010	0.001	0.002
Richer	0.017	-0.018	-0.001	0.002
Richest	0.000	0.000	0.000	0.000
Total	**0.047**	**0.034**	**0.005**	**0.004**

Appendix:

Predictor variable definition

Self-rated health status	(Yes=1, Otherwise=0): There are information's collected on the current health status of older people. The response is purely perception based information. Hence, the respondents who reported their self-health as poor are classified as having poor self-rated health status (yes) and conversely for others (no) indicates good health status.
Inpatients	'Overnight' stays could be one night or longer in a hospital, health center, health clinic, in old persons home, nursing home, long-term care facility.
Outpatients	Received any health care in hospital or long term care facility but 'NOT including overnight' stay in hospital.
Pain	Bodily aches or pains (Bodily aches or pains" refer to any form of physical pain or discomfort in the body that interferes with a person's usual activities, Overall in the last 30 days.
Asthma	Have ever been diagnosed with chronic lung disease (Emphysema, Bronchitis).
Diabetes:	Have ever been diagnosed with diabetes (high blood sugar).
Place of residence	Rural/Urban residence
Hypertension	Have ever been diagnosed with high blood pressure (Hypertension).
Sex	Female/Male
Wealth quintile	The category comprises of five economic situation of household i.e. Poorest, poor, middle, rich and richest. Household income is highly associated with the health of the household members as well as to the extent of health care received by them.

Covid 19 Death body ill-treatment in India: Some observations

Shaukath Azim[1*]

Abstract

It is now universally regarded that COVID-19 is the only virus disease affected almost every country of the world. 'Positive' and 'negative' terms in the backdrop of Corona have become popular. Millions of people lost their life due to COVID-19 throughout the world. Other than unexpected consequences, deaths due to this virus brought uneven and distinct problems and challenges. About Twenty lakh people have lost their life, including in India. More than a lakh of COVID patients died in India. One of the unexpected problems of the pandemic in India is pitiable treatment of the death of Covid-19 patients. As the cases of mortality due to Corona are started to increase, mistreatment and neglect of dead bodies are also increased. Dead bodies were handled and treated cruelly in most part of the country. Everyone was scared to treat COVID patients. Many of them died due to medical negligence and lack of timely treatment. In this regard the World Health Organization (2020) reported that 'there is no evidence of persons having become infected from exposure to the bodies of persons who died from COVID-19. But people may die of COVID-19 in the health care facilities, home or in other locations'. It is disheartening that Covid-19 pandemic has brought the hazardous impact of many aspects of dying, death, burials, cremation, and funerals. The threat of disease transmission has led to restrictions on visits to the dying person. The whole process of death ceremonies changed drastically. In other words the Corona dead body treatment was completely modified. In this background this paper tries to examine the death related issues of Covid-19 patients. Why the dead bodies are being treated mercilessly? What are the economic and socio-cultural issues of death? What are the psychological consequences of dying and bereavement? This study is purely based on secondary data especially internet sources.

Introduction

One of the tragic wonders of the 21st century is the outbreak of the Corona virus in the globe. Nobody ever imagined that almost every country would face this peril. Every hardware sector of the world is affected by Covid-19. Somehow software industries survived with the onslaught of viruses by their digital platforms, artificial intelligence, networks, and online modes. Due to this problem every country encountered visible and invisible, expected and unexpected problems,

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consequences and challenges. Health sectors of the country come under terrific pressure due to its shortage and fail to address the issues of Covid-19 patients. First time every country of the world started to realize the importance of investment in health sectors especially primary and community medicine. The elderly population faced tremendous pressure and health risks during this period. All the hypothetical observations and measures regarding the pandemic which was done in the country during its early stages disproved in the later stages especially in India. At present India is witnessing rapid growth of Corona cases. Going by the speed of these cases, it is disheartening that India may overtake all the countries of the World. Due to this Pandemic, India is facing superlative contradictions and consequences. Whereas most of the consequences are expected, a few of them were/are unexpected. One of the unexpected problems of the pandemic is pitiable treatment of the death of Covid-19 patients. As the cases of mortality due to Corona are increasing, mistreatment and neglect of dead bodies are increasing. Dead bodies are being handled and treated cruelly in most part of the country. With this background, the present paper tries to examine the death related issues of Covid-19 patients. Why the dead bodies are being treated mercilessly? What are the economic and socio-cultural issues of death? What are the psychological consequences of dying and bereavement? This study is purely based on secondary data especially internet sources.

The Covid-19 pandemic has brought the hazardous impact of many aspects of dying, death, burials, cremation, and funerals. The threat of disease transmission has led to restrictions on visits to the dying person. (Social Science in Humanitarian Action, 2020:1) But, in every culture death of a loved one is treated with utmost importance. In a highly emotional-based country like India, death, and death related ceremonies have paramount importance among all the religious groups, though they follow different death rites and procedures. Birth, marriage, and death are the most important events in the life of every Indian.

Special arrangements are being made for these ceremonies. However, due to Corona, all these special arrangements have either been restricted or not allowed. Even the family members of the deceased are restricted from witnessing the death rites.

The background

Due to Covid-19, the Ministry of Health and Family Welfare issued seven-page special guidelines on dead body management on 15th March 2020. The key Facts according to this report firstly is that the main driver of transmission of COVID-19 is through droplets. There is unlikely to be an increased risk of COVID infection from a dead body to health workers or family members who follow standard precautions while handling the body. Secondly only the lungs of dead COVID patients, if handled during an autopsy, can be infectious. The Ministry has also given standard precautions to be followed by health care workers while handling dead bodies of COVID. Even with these guidelines, in recent times, at least after the reported cases of death started to increase, the treatment of dead bodies become inhuman. There are many instances in India that four to five dead bodies thrown into a pit, the dead body was lifted by JCBs, or it was pulled like a gunny bag from ambulance to pit. In this regard, the Supreme Court of India has also interfered.

The Supreme Court heard a matter of alleged harassment of Covid-19 positive patients and the mishandling of bodies of those who succumbed to the virus. The bench headed by Justice Ashok Bhushan took a suo moto cognizance of a letter by former law minister Ashwani Kumar highlighting news reports in this regard. Ashwani Kumar wrote to Chief Justice of India S A Bobde and other justices of the apex court, urging them to heed reports about coronavirus patients being ill-treated and bodies of those dying of the infection not being given a decent burial.

In his letter, dated June 8, the former Minister specifically referred to two alleged incidents from Madhya Pradesh and Puducherry. “The tragic and condemnable sight of a Covid-19 patient being chained to a bed in a hospital in Madhya Pradesh and another sight in Puducherry of a dead body being thrown in a pit for burial, has shocked the conscience of the Republic committed to human dignity under the Constitution, which recognizes dignity as a core constitutional value at the pinnacle in the hierarchy of non-negotiable constitutional rights,” he said. According to the

former Minister -these incidents were a grave infraction of the citizen's right to die with dignity, recognized by the apex court on various occasions. Kumar pointed out that the Supreme Court and different high courts have in the past given judgments declaring that the right to die with dignity and the right to decent burial or cremation is fundamental. (Indian Express (Online) dated 9-06-2020). Even then the cases of mistreatment of dead bodies are increasing everywhere in India. During the peak period of Corona in the Bellary district of Karnataka, four to five bodies were thrown out one pit. This has gone viral in social media. As a result, the District Collector of the district sought an open apology over the incident. Therefore ill-treatment of dead bodies has become one of the major unexpected problems in the country.

Disadvantaged Dying due to Corona: Good death vs bad death

The first question people friends or relatives enquire after hearing the death of their friends or relatives about the manner by which the death occurred. Many supplementary queries also posed on the causes of a death. Everyone with curiosity tries to know at length how their nearer or dear one died. Society has evolved certain expectations about the mode of the death should occur. Youngsters' death will have more queries than the older people. Society clearly defined on bad (unexpected) or good death (accepted). Bad" or poor quality deaths are marked by physical discomfort, difficulty breathing, social isolation, psychological distress, lack of preparation, being treated without respect or dignity, and the receipt of unwanted medical interventions or being deprived of treatments one desires (Krikorian et al., 2020). "Good deaths," conversely, are distinguished by physical comfort, emotional and spiritual well-being, preparation on the part of patient and family, being surrounded by loved ones in a peaceful environment, being treated with respect and dignity, and receiving treatments concordant with one's wishes (quoted in Carr, Deborah (2020). Due to unexpected and uncontrollable deaths, Corona-caused deaths are being strongly considered as bad death. These deaths have totally changed the entire procedure of normal deaths. Almost every cultural expectations have been violated in corona-caused deaths."Bad deaths" are distressing because they challenge notions of an idealized death, they prevent family members from having meaningful conversations and resolving "unfinished

business," they trigger pain in seeing a loved one suffer, and they may make family members feel guilty that they could not protect their loved one from the devastating situation (Carr, Deborah(2020).

The Body after death

In most cultures, death rites are performed meticulously according to their religious customs and traditions. Most of these rites are performed by their close relatives or friends. Everybody is witnessing the last rites of death ceremony. In different methods, the death body is being treated. Cremation or burial are the oldest and common methods practiced throughout the world. World major religion Christianity and Islam the practice is burial whereas most of the followers of Hindus follow cremation. Another method is sky burial, which involves placing the body of the deceased on high ground (a mountain) and leaving it for birds of prey to dispose of (For instance Parsees of India). Altogether, especially in India people give utmost importance to the death ceremonies. But due to Corona deaths, nearer and dearer ones are not allowed to carry out any kind of rites and rituals.

Body Management after death among different religions of the world

Religion	**Body**
Christianity	Burial
Hinduism	Cremation/burial
Greek Orthodox	Burial
Judaism	Burial
Buddhism	Cremation
Sikhism	Cremation
Parsees/Zorastrians	Sky Burial

However due to Corona death, the World Health Organization has clearly given precautions to be taken by the body after death. Almost every country of the world strictly adhered the guidelines specified by the WHO. One should know lot of precaution should be followed in dead body management. Though these precautions were taken with extreme research, socio-economic and cultural systems have been completely got halted due to Corona. Some of these guidelines are displayed in Table1

Table 1: Precautionary Measures for Handling and disposal of Non-COVID dead bodies

Risk Category	Bagging	Viewing in funeral parlour	Embalming	Hygiene preparation in funeral parlour	Disposal of dead body
Cat:1 Other than those specified in Cat 2 and Cat 3 below	Not Necessary	Allowed	Allowed with PPE*	Allowed with PPE*	Coffin burial or Cremation is optional
Cat.2 1) Human Immuno deficiency Virus Infection(HIV) 2) Hepatitis C 3) Creutzfeldt: Jacob Disease without Necropsy 4) Severe Acute Respiratory Syndrome(SARS) 5) Avian Influenza 6) Middle East Respiratory Syndrome(MERS) 8) Others**	Must	Allowed	Not Allowed	Allowed with PPE	Cremation is Advisable
Cat-3 1)Anthrax 2) Plague 3) Rabies 4) Viral haemorrhagic fevers 5) Creutzfeldt: Jacob disease with necropsy 6) Others**	Must	Not allowed	Not Allowed	Not Allowed	Cremation is strongly advisable

*PPE: Including disposable gloves, water repellent gown and surgical mask
** including other infectious diseases as advised by the physician/the infection control officer/or microbiologist

Human Involvement in Corona Dead-Body disposal

In the initial period of Covidization, nobody has information about the procedure of dead body mortuary management. Not only had that everyone feared to see or touch the body. Therefore the WHO prepared detailed guidelines to manage the dead bodies. These guidelines are specified in Table 2.

Table 2: WHO guidance on the use of Personal Protective Equipment in the Mortuary Management of COVID-19 bodies

Procedure	Hand Hygiene	Disposable gloves	Medical Mask	Respirator (N-95 or similar)	Long Sleeved gown	Face shield or anti-fog goggles	Rubber Gloves	Apron
Packing And transport of the body	Yes	Yes	Only if Rick of Splashing	--	Yes	Only if Splashing	-	-
Mortuary Care	Yes	Yes	Yes	Only with aerosol-generating procedure	Yes	Yes	-	-
Autopsy	Yes	Yes	-	Yes	Yes	Yes	Yes	Yes
Religious observation-care of body by family member	Yes	Yes	-	-	Yes Or Apron			

Caring for the deceased

According to Social Science in Humanitarian Action (2020:1) while the impact of an individual's death on their family, community and health care professionals is perhaps the most immediate concern in the context of a 'usual' death, death in the context of COVID-19 presents additional, practical, difficulties. Usually, the death of a person causes a socio-psychological

impact. People are not ready to accept government guidelines regarding the dead body. In this regard, different countries of the world have followed the different procedure in the treatment of deceased. They are given in the Table. 3

Table 3: Procedure in the treatment of deceased in different countries

Measure	Country example
Viewing the body is allowed	Hong Kong, Indonesia(with precautions), New Zealand(only for those in the same isolation bubble as the deceased)
Viewing the body in prohibited	Italy, China, Iran, Ecuador, India
Preparation of the body is allowed with protective guidelines	Hong Kong(PPE for mortuary staff) Ireland(facemask for the body while moving it), Turkey(Washing and shrouding following proper precautions), Pakistan
Preparation of the body is prohibited	China, Italy, Iran Ecuador, India
Contact with the body is prohibited	China, Israel, Indonesia, India
Mandatory cremation	China, South Korea
Recommended Cremation	Hong Kong, Philippines(bodies cremated with 12 hours unless religion forbids cremation)
Embalming is Prohibited	Hong Kong, Indonesia, Ecuador, India
Body can be transported across regions/countries	US(cremated or embalmed in hermetically sealed casket)
Cremated ashes only permitted to be transported	China

Source: *Key Considerations: Dying, bereavement and Funerary practices in relation to Covid-19 P.3*

Community Disengagement from Funerals

During any death occurs, whole community will be informed to about the death of a person. But in Covid-19 death, whole community is not allowed to join the funeral. But measures that restrict people visiting dying patients may have significant psychosocial impact on patients, health workers, family members and communities. (Social Science in Humanitarian Action, 2020) The idea of dying alone is particularly upsetting and it is important to explore ways of enabling

interaction between a patient and loved ones and/or spiritual advisors in a manner consistent with distancing guidelines.

Changes in mortuary and funerary practice can cause distress. Families should be informed in a careful, timely and compassionate manner about what will happen with the remains of their relative and expectations must be sensitively managed. Community and faith leaders can support this process. Families should understand the different steps that will be followed, and be assured that they that they will be able to retrieve their loved ones' ashes or identify the burial site. Time should be provided for family members to ask questions and to fully participate in decisions regarding the deceased as appropriate (Ibid, 2020)

What do be done?

1. Need for the development of Thanatology during COVID-19

Thanatology is a systematic study of death and death related activities. It is a science of death. This study was founded by the psychologist Elisabeth Kubler-Ross. Thanatology studies the emotional and physical aspects of death, as well as its individual, societal and cultural ramifications. This science trains the people on death related activities. The need for this was science was felt during American Civil War. Due to this war thousands of people died. But there was no proper disposal and care of dead bodies. Through this discipline, it was given scientific training to handle the dead bodies. In the same way Thanathologists would have played most important role during this Pandemic. However the discipline of Thanatology is not heard in India. Therefore efforts should be made to popularise this discipline in future.

2. Need for Hospice Volunteers and their Organizations

Recently most of the district administrations have trained some voluntary organizations to decently handle the Covid-19 death patients. Many voluntary organizations have been formed to manage the dead bodies. Therefore we need to develop Hospice volunteers and their organization

with proper training and reward. Hospice volunteers have a tremendous impact on the lives of the patients. They serve, of which they are a part, and the families and friends of the terminally ill. These volunteers perform different roles during the high rate of mortality. These volunteers serve the deceased family. This type of volunteering has incredible impact on the lives of the patient, the patient's family. The presence and service of hospice volunteers is targeted towards ultimately providing patients, caregivers, and families with the most comfortable and compassionate end-of-life experience possible. Every taluk and districts should have Hospice organizations to meet the exigencies of life.

3. Need for Palliative Care

During any Pandemic outbreak we urgently require various types of help, support and care system. Palliative care is very much popular particularly in developed countries. Palliative care is medical care that is focused on providing patients with relief from the symptoms, ailments, and pain that accompany a chronic or life-threatening illness, regardless of whether or not the illness is terminal or non-terminal. Palliative care does not seek to postpone or hasten death**,** but seeks to improve the overall quality of life of those who are suffering from a serious illness. Palliative care, like hospice care, is a that employs the skills of physicians, social workers, therapists, specialists and counselors to provide your loved one, family, and friends with comfort and comprehensive support while living with a chronic or life-threatening illness.

On the whole we can conclude that there is an urgent need for dignified treatment of any deaths including Covid-19 patients. No doubt friends and close relatives of deceased fail to see the performance of final rites, they should be properly educated the severity of the pandemic. Any mishandling and cruelty of dead bodies should be reported to the concerned. In this regard media should play a responsible role and as sociologists we should show empathy towards the deceased. Human dignity should be sustained even after the death.

References

Carr, Deborah (2020), *'Bereavement in the Time of Coronavirus: Unprecedented Challenges Demand Novel Interventions'.*

https://www.tandfonline.com/doi/full/10.1080/08959420.2020.1764320 (accessed 30 October 2020).

https://www.chp.gov.hk/files/pdf/grp-guideline-hp-ic-precautions_for_handling_and_disposal_of_dead _bodies_en.pdf (accessed 31 October 2020).

https://crhcf.org/insights/the-difference-between-hospice-and-palliative-care/ (accessed 7 July 2020).

https://www.joincake.com/blog/thanatology/ Cassie Barthuly (accessed 1 July 2020).

https://indianexpress.com/article/india/supreme-court-suo-moto-cognizance-mistreatment-of-covid-patients-6454568/ (accessed 9 July 2020).

https://courses.lumenlearning.com/wm-introductiontosociology/chapter/death-and-dying/ (accessed 7 July 2020).

https://www.britannica.com/topic/burial-death-rite (accessed 7 July 2020).

https://crhcf.org/insights/understanding-hospice-volunteering/ (accessed 7 July 2020).

https://opendocs.ids.ac.uk/opendocs/bitstream/handle/20.500.12413/15236/SSHAP%20COVID-19%20brief.%20Death%20and%20funerals.pdf?sequence=1&isAllowed (accessed 7 July 2020).

Thompson, Neil and Cox, Geryy R.(Eds) (2017), *Handbook of the Sociology of Death, Grief, and Bereavement A Guide to Theory and Practice, Routledge, London.*

Fertility Trends and Differentials in Gujarat

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Abstract

India had experienced substantial fertility reduction and fertility transition in all the states but fertility levels and trends vary considerably in these states. Fertility in Gujarat is declining and recently Gujarat has achieved the below replacement level fertility. The rural urban differential has narrowed down from 1971 to 2018 but the levels and trends of fertility vary considerably. This paper has examined the fertility trends and differentials in Gujarat from 1971 to 2018. The data has been use from the Sample Registration System and an analysis of changes and trends has conducted from 1971 to 2018. The analysis revealed that the total fertility rate in Gujarat declined from 5.6 in 1971 to 2.1 in 2018, according to Sample Registration System estimates. Fertility in Gujarat has been decline at a slower pace and rural areas lagging behind urban areas. The results confirm the persistence of differences in fertility. The pattern of fertility decline was not uniform in rural and urban areas and rural areas were lagging. It also shows that fertility is declining slowly in Gujarat. The fertility decline was mainly due to the education, decrease in higher-order births of three and above. There has not been any significant decline in first and second-order births in Gujarat. There is a negative relationship between education and fertility. This indicates the education of women has contributed to lower fertility. Therefore, the education of girls needs to be encouraged. There is a need to give more thrust on rural areas with high fertility for achieving universal below-replacement fertility in Gujarat.

Keywords: Fertility, Trends, Differentials, Gujarat

Introduction

India had experienced fertility transition in all the states but fertility levels and trends vary considerably in these states. Although, fertility is decreasing throughout the country, yet, the importance of acceleration in fertility reduction efforts is important to achieve universal below replacement level fertility, especially in Gujarat where the fertility transition remains slow.

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Gujarat is one of the developed states in India but it lags behind the national average in achieving a decline in fertility. The fertility decline below the replacement level but the fertility in rural areas is well above the replacement level fertility and the levels and trends of fertility vary considerably. Fertility in Gujarat is decreasing at a slower pace and rural areas lagging behind urban areas.

The experiences of the European countries indicate that during the early stages of fertility transition of a country, urban fertility differs from rural fertility and usually urban fertility is lower than rural fertility (Mosk, 1980). Another study of rural-urban differentials in India based on the Sample Registration System data of 1972-81 revealed that there was a decline in marital fertility at the older ages and a marginal increase in fertility at the younger ages. Urban women were having lower fertility than rural women did and voluntary fertility control was the main reason responsible for a larger decline in marital fertility (Pathak and Murthy, 1987). In their study of fertility trends and differentials in Andhra Pradesh, Ramchandran and Ramesh showed the fertility differentials by individual characteristics, such as education, religion, caste, and occupation. A strong negative association was observed between the educational level of women and fertility, both in rural and urban areas (Ramchandran and Ramesh, 2005).Evidence also suggests that fertility reduction in recent years in India is largely due to fertility reduction among uneducated and poor women (Bhat, 1996).

In their paper on fertility, trends in Gujarat based on the Sample Registration System data of 1971-94 revealed that the CBR was higher than the national average in 1971, 1984, and lower by 1994. The decline in urban CBR in Gujarat followed India's urban CBR from 1971-94, but it remained higher than India's urban CBR for the entire period and the gap narrowed after 1987. The general fertility rate indicates a faster decline in Gujarat than in India during 1981-93. Gujarat had a lower GRR than India in 1981, 1986, and 1993. Rural GRR was lower for the state in all 3 years, but urban GRR was lower only in 1993. ASFR decreased for women aged 15-19 years to 26.3 in 1993. ASFR declined by about 50 percent for adolescents and women aged older than 35 years during 1981-93 (Ghasura et al., 1996).

All the states of India are experiencing fertility transition and majority of the states had reached the replacement level of fertility. The pace of change is not uniform across the states. The fertility level in rural areas of Gujarat remains high. The total fertility rate (TFR) in Gujarat had declined from 5.6 in 1971 to 2.1 in 2018; the TFR in rural areas has declined from 5.9 to 2.4 whereas TFR in urban areas declined from 4.7 to 1.8 during 1971-2018. Gujarat has already achieved below replacement level fertility in urban areas but rural areas are lagging with high fertility (Registrar General and Census Commissioner of India, 2018).

The National Family Welfare Programme has been traditionally focus on regulating fertility using family planning methods to achieve the small family norm. Particular emphasis in programme implementation has been on the promotion of terminal methods of family planning - female and male sterilization. In recent years, the scope of the Programme has been broaden to cover issues related to reproductive and child health. Gujarat government is emphasizing population stabilization and fertility reduction through various social and economic development programmes.

The population of Gujarat has increased from 26.7 million in 1971 to 60.4 million in 2011, making it the 10th most populated state in India. The state contributes about 5 percent of the country's population with a geographical area of about 190000 sq. km. making it the seventh largest state in the country in terms of area. The urban population has been increase from 28.08 percent in 1971 to 42.58 percent in 2011. The density of population per sq. Km. has increased from 136 in 1971 to 308 in 2011. The literacy rate of the population has increased from 36.91 percent in 1971 to 79.31 percent in 2011. The sex ratio in Gujarat has declined from 959 in 1971 to 919 in 2011 (Registrar General and Census Commissioner of India, 2001).

Methods

The data has been use from the Sample Registration System and an analysis of changes and trends has conducted from 1971 to 2011.

Results

Vital rates in Gujarat

The vital rates play an important role in the growth of the population. The trends of birth, death, and infant mortality rate in Gujarat has presented in Table 1. It is reveal from the table that the birth rate in Gujarat has been decline from 40 per thousand populations in 1971 to 19.7 per thousand populations in 2018.

Table 1: The trends of birth rate, death rate and infant mortality rate by residence in Gujarat, 1971-2018

Year	Birth Rate			Death Rate			Infant Mortality Rate		
	Total	Rural	Urban	Total	Rural	Urban	Total	Rural	Urban
1971	40.0	41.5	35.8	16.4	17.6	13.0	144	155	110
1976	37.4	39.0	32.7	15.3	16.8	11.0	146	159	100
1981	34.5	36.1	29.8	12.0	12.4	10.7	116	123	89
1986	32.2	32.9	30.8	10.5	11.3	8.6	107	124	66
1991	27.5	28.2	25.9	8.5	8.8	7.9	69	73	57
1996	25.7	26.9	23.0	7.6	8.3	6.2	61	68	46
2001	25.0	26.7	21.5	7.8	8.9	5.6	60	68	42
2006	23.5	25.0	21.1	7.3	8.2	5.9	53	62	37
2011	21.3	22.9	19.0	6.7	7.4	5.7	41	48	27
2018	19.7	21.6	17.4	5.9	6.3	5.3	28	33	20

Source: *Registrar General of India, 2009;Registrar General and Census Commissioner of India, 2018*

Similarly, the crude death rate in Gujarat has also declined from 16.4 per thousand populations in 1971 to 5.9 per thousand populations in 2018.Infant Mortality Rate (IMR) per thousand live births in Gujarat has declined from 144 per thousand live births in 1971 to 28 per thousand live births in 2018. Similarly, the birth rate, death rate, and the infant mortality rate have been decline in both

rural and urban areas but birth rate, death rate and infant mortality rate is higher in rural areas than urban areas in Gujarat during 1971-2018.

Table 2: The trends of age specific fertility rate per 1000 women by residence in Gujarat, 1971 to 2018

Age Group	1971	1981	1991	2001	2011	2018	% change during 1971-2018
Total							
15-19	72.3	56.6	39.5	26.4	23.4	10.9	84.9
20-24	295.3	294.4	244.3	221.4	193	135.5	54.1
25-29	292.7	239.5	178	193.8	162.9	153.6	47.5
30-34	229.4	153.2	95	84	68.5	82.5	64.0
35-39	135.6	76.1	40	29.7	20	28.1	79.3
40-44	63.2	29.2	16.6	13.9	5.9	8.8	86.1
45-49	21.9	12	6.4	3.3	2.9	3.4	84.5
Rural							
15-19	75.3	58.8	41	30.7	27.1	13.9	81.5
20-24	307.4	313	250	240.3	211.1	165.2	46.3
25-29	297	256.2	182.7	213.7	174.6	160.6	45.9
30-34	244.4	165.2	99.3	96.4	74.3	89.3	63.5
35-39	150.2	84.4	43.3	33.7	23.3	31.9	78.8
40-44	73.1	31.4	17.4	16.6	8.6	10.0	86.3
45-49	25.6	14	7.1	3.2	3.6	3.0	88.3
Urban							
15-19	63.9	50.2	35.7	17.2	16.9	6.7	89.5
20-24	264.1	244.7	230.3	185.8	162.5	9.6	63.7
25-29	279.7	198.4	167.7	157.2	147.6	145.9	47.8
30-34	187.6	117.3	85.5	60.2	60.9	75.8	59.6
35-39	91.2	50.1	33	22	14.9	24.1	73.6
40-44	36.9	22.7	14.8	8.6	2.3	7.4	80.0
45-49	10.1	5.9	4.5	3.4	1.9	3.8	62.4

Source: *Registrar General of India, 2009; Registrar General and Census Commissioner of India, 2018*

Fertility trends in Gujarat

The trends of age-specific fertility rates per 1000 women by residence in Gujarat are depicted in Table 2. The age-specific fertility rates are much higher in rural areas than in urban areas in Gujarat in all age groups. There is a consistent fertility decline by residence among all age groups in Gujarat. The age-specific fertility rates declined from 1971 to 2018 in both urban and rural areas of Gujarat. The peak age of child bearing is 20-29, with steadily declining fertility rates thereafter. The high fertility is still concentrated in the prime child bearing age 20-29 years in both urban and rural

areas in Gujarat. Fertility rates declined sharply in the age group 15-19 and beyond the age of 30, reaching extremely low levels for women age 40-44 and 45-49 in Gujarat. Early child bearing is substantial in Gujarat, which accounted for 3 percent of births in the age group 15-19. It was also observe that 71 percent of births occur to women below the age of 30 in Gujarat. The contribution of early child bearing (age 15-19) is higher 2.9 percent in rural areas than 1.9 percent in urban areas of Gujarat. It is also found that the percentage of births occur to women below the age of 30 in 2018 is 72 percent in rural areas and 69 percent in urban areas of Gujarat. The percentage change in age-specific fertility rate during 1971-2018 reveals that the overall decline in fertility rates is more in urban areas compared to rural areas in Gujarat. The high fertility is still concentrated in the prime child bearing age 20-29 years in both urban and rural areas in Gujarat. Fertility rates declined sharply in the age group 15-19 and beyond the age of 30, reaching extremely low levels for women age 40-44 and 45-49 in Gujarat. Early child bearing is substantial in Gujarat, which accounted for 3percent of births in the age group 15-19. It was also observe that 71 percent of births occur to women below the age of 30 in Gujarat. The contribution of early child bearing (age 15-19) is higher 2.9 percent in rural areas than 1.9 percent in urban areas of Gujarat. It is also found that the percentage of births occur to women below the age of 30 in 2018is 72 percent in rural areas and 69percent in urban areas of Gujarat. The percentage change in age-specific fertility rate during 1971-2018 reveals that the overall decline in fertility rates is more in urban areas compared to rural areas in Gujarat. The fertility decline is slower in the middle age groups 20-29 for rural and urban areas in Gujarat but it is increase in age groups 25-29 onwards in rural and urban areas of Gujarat. The minimum decline of 47 percent has been notice in the age group 25-29 in Gujarat. A similar picture is observed in rural and urban areas of Gujarat.

The total fertility rate declined considerably from 1971 to 2018 in Gujarat. The trends of total fertility rate by residence in Gujarat from 1971-2018 is presented in Table 3. The pace of fertility decline has accelerated during the period 1971-81, with an estimated TFR of 5.6 per woman in 1971 to 4.3 in 1981 and it again declined to 3.1 in 1991. The pace of fertility decline has decelerated, with an estimated TFR of 3.1 in 1991 and 2.9 in 2001. In 2011, it further declined to

2.4 shows an accelerated fall in Gujarat during 2001-2011. The fertility declined rapidly during the 2001-2011 decade but the pace of fertility decline has decelerated; with an estimated TFR of 2.1 in 2018.The annual decline in fertility during the period 1971-2018 was 1.3 percent in Gujarat. The comparison of the TFR between 1971-81 and 1981-1991, shows that the rate of decline in the TFR is lower during 1971-1981 compared to 2.79 percent during 1981-1991 in Gujarat. Similarly, the comparison of the TFR between 1991-2001 and 2001-2011 in Gujarat indicates that the rate of decline in the TFR is lower during 1991-2001 compared to 2001-2011. There was a fertility decline of 0.65 percent during 1991-2001 in Gujarat as compared to 1.72 percent per annum in 2001-2011. The comparison of the TFR between 2001-2011 and 2011-2018 in Gujarat indicates that the rate of decline in the TFR is lower 1.7 percent per annum during 2001-2011 compared to 1.8 percent per annum during 2011-2018. The fertility declined during 1971-81 by 2.2 percent per annum in rural areas as compared to 2.8 percent per annum in urban areas of Gujarat. There was rapid fertility decline of 3 percent per annum in rural areas of Gujarat as compared to 1.5 percent per annum in urban areas of Gujarat during 1981-91. There was no rural fertility decline during 1991-2001 in Gujarat but fertility declined by 2.1 percent per annum in urban areas of Gujarat.

Table 3: The trends of total fertility rate by residence in Gujarat, 1971 to 2018

Year	Total	Rural	Urban
1971	5.6	5.9	4.7
1976	5.2	5.5	4.2
1981	4.3	4.6	3.4
1986	3.8	4.0	3.3
1991	3.1	3.2	2.9
1996	3.0	3.2	2.6
2001	2.9	3.2	2.3
2006	2.7	3.0	2.3
2011	2.4	2.6	2.0
2018	2.1	2.4	1.8

Index of TFR			
1971	100	100	100
1976	93	93	89
1981	77	78	72
1986	68	68	70
1991	55	54	62
1996	54	54	55
2001	52	54	49
2006	48	51	49
2011	43	44	43
2018	38	41	38
Percent decadal growth			
1971-1981	23.2	22.0	27.7
1981-1991	27.9	30.4	14.7
1991-2001	6.5	0.0	20.7
2001-2011	17.2	18.8	13.0
2011-2018	12.5	7.7	10.0
Percent annual growth			
1971-1981	2.3	2.2	2.8
1981-1991	2.8	3.0	1.5
1991-2001	0.7	0.0	2.1
2001-2011	1.7	1.9	1.3
2011-2018	1.8	1.1	1.4
1971-2018	1.3	1.3	1.3

Source: *Registrar General of India, 2009; Registrar General and Census Commissioner of India, 2018*

The rate of decline in the rural TFR is higher during 2001-2011 (1.9 percent per annum) in Gujarat compared to 1.3 percent per annum in urban areas of Gujarat. On contrary, the rate of decline in the rural TFR is lower 1.1 percent per annum than 1.4 percent per annum in urban areas of Gujarat during 2011-2018. On average, women in Gujarat give birth to six children (5.6) in 1971 as compared to two children (2.1) in 2018. The TFR of rural Gujarat was 5.8 and in the urban areas, it was 4.7 in 1981, thus having a difference of 19 percent whereas the TFR of rural India was 6.1 and in the urban areas, it was 4.1, thus having a difference of 33 percent. It declined to 3.7 in rural areas and 2.6 in urban areas of Gujarat in 2011, a difference of 30 percent

whereas it declined to 2.4 in rural areas and 1.8 in urban areas in 2018, a difference of 25 percent. The percentage of annual decline in the TFR was 1.3 both in rural and urban areas during 1971-2018 in Gujarat.

Marital Fertility trends in Gujarat

Age at the marriage of females is a key factor that influences fertility. Based on the distribution of live births by age of married females, age-specific marital fertility rates (ASMFRs) per 1000 women are calculated. The trends of age-specific marital fertility rates per 1000 women by residence in Gujarat have depicted in Table 4. There is consistent marital fertility decline by residence among all age groups except the age group 15-19.The age-specific marital fertility rates declined from 1984 to 2018 in Gujarat. Marital fertility in Gujarat is much higher in rural areas than in urban areas in all the age groups and its peak is in the age group 15-19 years. A perceptible decline in marital fertility has found for a female age 30 years and above both in rural areas and urban areas of Gujarat. The high marital fertility is still concentrated in the prime child bearing age 20-29 years in both urban and rural areas of Gujarat. Marital fertility rates increased in the age group 15-19 and it declined sharply beyond the age of 20, reaching extremely low levels for women age 40-44 and 45-49. Early marital fertility is substantial in Gujarat, which accounted for 37 percent of births in the age group 15-19 in Gujarat. It was also observe that 88 percent of births in Gujarat occur to women below the age of 30. Surprisingly, the contribution of early marital fertility (age 15-19) is higher 40 percent in urban areas than 37 percent in rural areas of Gujarat. However, a higher 88 percent of births occur to women below the age of 30 in urban areas than 87 percent of births occur to women below the age of 30 in rural areas of Gujarat in 2018. The percentage change in age-specific marital fertility rate during 1981-2018 reveals that the overall decline in fertility rates ismore in rural areas compared to urban areas in Gujarat. The decline is perceptible for the higher age groups 40-49 in both urban and rural areas of Gujarat. During 1984-2018, the marital fertility declined by 64 and 71 percent in the age groups 40-45 and 45-49 in urban areas in Gujarat as compared to 49 and 14 percent in rural areas of Gujarat. It is slower in the early age groups (15-19 and 20-24) for both the rural and urban areas in Gujarat. The increase in marital fertility of 20 percent the age group 15-19 has noticed in Gujarat

Table 4: The trends of age specific marital fertility rate by residence in Gujarat, 1984-2018

Age Group	1984	1991	2001	2011	2018	% change during 1984-2018
Total						
15-19	179.2	150.6	154.1	179.4	394.3	-120.0
20-24	376.0	337.9	323.4	300.2	330.2	12.2
25-29	250.7	201.3	214.8	184	190.1	21.0
30-34	133.0	100.5	89.5	72.8	89.1	33.0
35-39	67.6	42.8	31.6	21.4	29.5	56.4
40-44	25.8	18.4	15.3	6.5	9.4	63.6
45-49	9.4	7.3	3.7	3.3	3.7	60.6
Rural						
15-19	161.8	133.4	155.9	174.6	388.6	-140.2
20-24	382.4	344.9	338.7	314.3	349.4	8.6
25-29	273.0	206.1	233.5	195.8	196.0	28.2
30-34	140.9	103.7	102.2	78.9	94.9	32.7
35-39	77.0	45.3	35.9	25.1	33.5	56.5
40-44	29.6	18.7	18.2	9.5	10.7	63.9
45-49	11.3	8.0	3.6	4.1	7.3	70.8
Urban						
15-19	256.6	243.1	147.6	194.7	412.3	-60.7
20-24	362.7	320.4	291.4	273.3	293.3	19.1
25-29	210.1	190.5	179.1	168.3	200.8	4.4
30-34	115.9	93.3	64.6	64.8	83.2	28.2
35-39	49.9	36.7	23.4	15.9	25.4	49.1
40-44	15.4	17.6	9.5	2.5	7.8	49.4
45-49	4.9	5.5	4.0	2.1	4.2	14.3

Source: *Registrar General of India, 2009; Registrar General and Census Commissioner of India, 2018*

Fertility by the level of education of the women

Female education has a direct impact on fertility. To ascertain levels of fertility by the educational status of the women age-specific fertility rate and total fertility rate by the educational status of the women in Gujarat have depicted in Table 5. Illiterate women have higher levels of age-specific fertility rates both in rural and urban areas of Gujarat than the

'Literate'. Fertility attains the peak in the age group 20-29 years both in rural and urban areas of Gujarat. Within the Literate group, there is a general decline in the fertility rates with the increase in the educational status both in rural and urban areas of Gujarat, barring a few exceptions.

Table 5: Age specific fertility rates and total fertility rates by education in Gujarat, 2018

Age Group	Educational level								
	Illiterate	Total Literate	Without any formal education	Below primary	Primary	Middle	Class X	Class XII	Graduate and above
Total									
15-19	11.1	11.0	54.1	29.3	14.8	7.0	7.1	7.7	0.0
20-24	177.9	134.3	139.2	271.5	204.6	162.5	101.7	50.5	85.6
25-29	174.1	152.2	123.9	181.3	156.9	172.9	176.6	130.5	98.1
30-34	91.7	81.2	72.4	105.1	85.9	70.7	76.9	82.8	77.6
35-39	29.5	27.8	19.7	28.4	39.6	32.7	22.9	17.6	17.3
40-44	12.2	7.8	8.0	16.3	8.6	3.7	13.3	2.9	0.6
45-49	5.3	2.6	2.0	7.4	5.8	10.2	0.0	0.0	5.0
TFR	**2.5**	**2.1**	**2.1**	**3.1**	**2.6**	**2.3**	**2.0**	**1.5**	**1.4**
Rural									
15-19	15.3	14.0	82.6	43.6	22.9	9.0	8.1	2.4	0.0
20-24	210.4	163.1	149.1	326.8	231.5	174.7	112.9	62.0	101.4
25-29	183.4	158.0	143.6	201.1	157.4	164.4	194.5	123.0	76.6
30-34	100.7	86.5	108.2	87.6	89.8	83.6	71.6	93.2	91.6
35-39	30.6	32.8	6.4	26.7	39.7	46.4	27.4	23.5	26.4
40-44	11.1	9.4	8.1	14.5	14.0	4.9	6.0	6.7	0.0
45-49	4.1	2.3	3.2	4.6	1.5	4.6g	0.0	0.0	0.0
TFR	**2.8**	**2.3**	**2.5**	**3.5**	**2.8**	**2.4**	**2.1**	**1.6**	**1.5**
Urban									
15-19	0.0	6.7	0.0	2.6	4.0	4.2	5.5	14.3	0.0
20-24	58.2	97.2	114.7	152.1	151.1	143.5	88.5	41.0	77.6
25-29	134.4	146.5	81.4	146.5	156.1	182.7	162.6	136.7	106.1
30-34	59.6	76.9	13.4	138.2	81.4	59.5	80.5	75.4	73.5
35-39	25.1	24.1	41.0	31.4	39.6	21.9	20.0	14.1	15.2
40-44	17.1	6.6	7.9	19.3	3.4	2.7	18.5	1.0	0.7
45-49	10.2	2.9	0.0	24.0	10.3	14.2	0.0	0.0	6.0
TFR	**1.5**	**1.8**	**1.3**	**2.3**	**2.2**	**2.1**	**1.9**	**1.4**	**1.4**

Source: *Registrar General and Census Commissioner of India, 2018*

The pattern of higher order births

The distribution of live births by order of birth gives an idea about the total number of children ever born to the eligible women and it gives a broad idea for the preference of the small family. The proportion of lower order births are expected to increase as a result of the reduction in higher order births when fertility declines from high to low levels,. The distribution of live births by order of births in Gujarat has given in Table 6.

Table 6: Percentage distribution of live births by order of birth in Gujarat and India, 1991-2018

Year	Live births by order of birth			
Total	**1**	**2**	**3**	**4+**
1991	39.2	25.1	17.3	18.5
1996	35.2	29.3	18.2	17.3
2001	37.1	31.2	16.9	14.8
2006	39.2	30	15.4	15.5
2011	41.1	33.3	14.9	10.7
2018	61.3	26.5	8.0	4.2
Rural				
1991	40.1	24.8	16.8	18.2
1996	34.6	28.1	18.5	18.8
2001	35.7	30.2	17.8	16.2
2006	36.8	28.8	16.1	18.3
2011	38.6	32.4	16.3	12.7
2018	58.3	27.3	9.1	5.3
Urban				
1991	33.8	26.6	19.8	19.8
1996	36.6	32.5	17.5	13.4
2001	40.7	33.7	14.6	11.1
2006	43.6	32.1	14.1	10.2
2011	46.0	34.9	12.3	6.8
2018	66.0	25.4	6.3	2.2

Source: *Registrar General of India, 2009; Registrar General and Census Commissioner of India, 2018*

From the table, it may be observe that the percentage of births of four children and above in Gujarat has declined from 19 percent in 1991 to 4 percent in 2018. As expected, the percentage of first order births and second order births in Gujarat has increased from 39.2 percent and 25.1 percent in 1991 to61.3 percent and 26.5 percent in 2018 respectively. The percentage of three order births in Gujarat has decreased from 17.3 percent in 1991 to 8 percent in 2018. It was noticed that the percentage of birth order up to 2 has increased from 64 percent in 1991 to 88 percent in 2018 whereas the percentage of birth order 3 and above in Gujarat has declined from 36 percent in 1991 to 12 percent in 2018. A similar pattern has found both in rural and urban areas. This shows the evidence of fertility decline in Gujarat.

Discussion

The analysis revealed that the total fertility rate in Gujarat declined from 5.7 in 1981 to 2.1 in 2018, according to Sample Registration System estimates. Gujarat had experienced a reduction in fertility but still, rural areas are having higher fertility and the levels and trends of fertility vary considerably. It also shows that fertility is declining slowly in Gujarat. It also shows a faster decline during 1981-91 and a moderate fall during 1991-2001 and a steep drop during 2001-2011 but slow decline during 2011-18 in Gujarat.Despite fertility differentials, the decline has observed both in rural and urban areas including the illiterate. The causes of decline may be different among the population of Gujarat. There is a need to analyse the factors that have contributed to the rapid decline in fertility during 1981-91 and recent decadesin detail. The above analysis clearly shows that, fertility differentials exist in Gujarat because of variations in education. There is a negative relationship between education and fertility. This indicates the education of women has contributed to lower fertility. Therefore, the education of girls needs to be encouraged. There is a need to give more thrust on rural areas with high fertility for achieving universal below-replacement fertility in Gujarat.

Conclusion

The results confirm the persistence of differences in fertility and it varies by residence and education. The pattern of fertility decline was not uniform in rural and urban areas and rural areas were lagging in Gujarat. A strong negative association has found between the education level of women and fertility, both in rural and urban areas of Gujarat. The fertility decline was mainly due to the education, decrease in higher order births of three and above and decrease in fertility among older women in the age group 30 and above.

References

Bhat, P. N. M. (1996), "Contours of fertility decline in India: a district level study based on the 1991 census". in Srinivasan K. (Ed.), Population Policy and Reproductive Health, *Hindusthan Publishing Corporation*, New Delhi, pp. 96-117.

Ghasura, N. D; Thakar, P. H., and Pandya, P. S. (1996),"Fertility Trends in Gujarat", *Journal of Family Welfare*, Vol. 42 No. 4, pp 55-63.

Mosk, C. (1980),"Rural-urban fertility differences and the fertility transition", *Population Studies*, Vol.34 No. 1, pp.19.

Pathak, K. B. and Murthy, P. K. (1987), "Rural urban fertility differential in India", *Jansankhya*, Vol. 5 No.1, pp.41-59.

Ramchandran P. and Ramesh P. (2005), "Fertility trends and differentials in Andhra Pradesh",in Christophe Z. Guilmoto and S. Irudaya Rajan (Eds), *Fertility Transition in South India*, Sage Publications, New Delhi, pp. 114-136.

Registrar General of India. (2009), Compendium of India's fertility and mortality indicators 1971-2007 based on the sample registration system (SRS), Registrar General of India, New Delhi.

Registrar General and Census Commissioner of India (2001), Final Population Totals, Census of India, Paper 1 of 2001, Controller of Publications, New Delhi.

Registrar General and Census Commissioner of India (2018), Sample registration system statistical report 2018. Registrar General and Census Commissioner of India, New Delhi.

Popular Articles

Fertility Transition during 1972-2006 and in Recent Decade in South India

All the four major states in South India namely, Andhra Pradesh, Karnataka, Tamil Nadu and Kerala, have achieved replacement level fertility between 1972 and 2006. This is a major demographic achievement which needs to be highlighted. Secondly, fertility has been observed to be converging towards below replacement level in all states during the recent decade despite having varying levels of socioeconomic development. The onset of fertility decline was observed in the 1970s. The total fertility rate (TFR) in 1972 was the highest in Andhra Pradesh (4.5 children per woman), followed by Karnataka (4.2), Kerala (4.0) and Tamil Nadu (3.8) according to Sample Registration System (SRS). The TFR levels declined to 2.1 in Karnataka, 2.0 in Andhra Pradesh, 1.7 in Tamil Nadu and Kerala by 2006. The TFR declined faster by 58 per cent in Kerala during 1972-2007, followed by 56 per cent in Andhra Pradesh, 55 per cent in Tamil Nadu and 50 per cent in Karnataka. It was found that the National Family Health Survey (NFHS) fertility estimates for the years 1992-93, 1998-99 and 2005-06 are closer to SRS.

Kerala achieved replacement level fertility in 1988 according to SRS and the NFHS estimates were below the replacement level in all the three rounds. Tamil Nadu achieved replacement level fertility in 1993 according to SRS and the NFHS estimates were marginally higher than replacement level in 1998-99 and below the replacement level in 2005-06. Andhra Pradesh achieved replacement level fertility in 2004 according to SRS and the NFHS estimates were below the replacement level in 2005-06. Karnataka achieved replacement level fertility in 2006 according to SRS and the NFHS estimates were below the replacement level in the year 2005-06. Thus, the year of achieving replacement level fertility among states was consistent between SRS and NFHS. It was predicted by Dyson in 2002 that Kerala will achieve replacement level fertility in 1988, Tamil Nadu in 1993, Andhra Pradesh in 2002 and Karnataka in 2009. But, Andhra Pradesh had achieved replacement level fertility two years later than the above predictions and Karnataka three years earlier. These states were able to achieve replacement fertility because of change in fertility attitudes. The IEC activities under the Ministry of Health and Family

Planning, New Delhi, were able to change fertility attitudes which should to be credited. Accordingly, the ideal number of children, one of the measures of fertility attitudes, had been declining from 1992-93 to 2005-06 in all states of South India and it stood at 2.1 children or less in 2005-06 (NFHS rounds).

It is beloved that the couple protection rate (CPR) should be between 60 and 70 per cent to achieve replacement level fertility. But, the CPR was below 60 per cent throughout study period in all states (Year Books). However, it is found that the number of Medical Termination of Pregnancies (MTPs) was exceptionally high in Kerala and Tamil Nadu (Year Books) and the number of hysterectomies was high in Andhra Pradesh (NFHS rounds). The average number of MTPs (32,267) in Kerala during 1975-2006 was able to annually avert one birth, and the yearly average number of MTPs (51,105) in Tamil Nadu during 1974-2011 was able to annually avert 0.82 births. These findings have further been collaborated by NFHS data on pregnancy wastage. The hysterectomy surgeries are very common in Andhra Pradesh. The same had reflected in NFHS data on menopause. About 8 per cent currently married women in 1992-93 and 13 per cent in 1998-99 in age group 30-34, 52 and 55 per cent, respectively, in age 44-45 and 83 and 82 per cent, respectively, in age group 48-49 had reported attaining menopause. These percentages of currently married women attaining menopause in Andhra Pradesh is significantly higher in all ages compared to other states in South India. The large number hysterectomy surgeries is a significant factor in contributing to fertility decline in Andhra Pradesh. Fertility in Karnataka declined only due to contraceptive use and therefore, it took longer time to achieve replacement level fertility compared to other states in South India, especially, Andhra Pradesh.

In the recent decade, TFR is converging at 1.8 children per woman in all states. At the same time, fertility differentials became insignificant by 2018 between rural and urban residence and among states. This would perhaps indicate stabilization of fertility at sub-replacement level in near future in South India.

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Out of Pocket Spending and Maternal Health Care

Introduction:

Maternal Health is a significant aspect for the development of any country for increasing equity and decreasing poverty. Further, The Millennium Development goals and the maternal-related targets and indicators under Goals 4 and 5 of the MDGs prompted the member nations to devise appropriate strategies and pump more resources into the health sectors. Studies reveal that the economic burden of maternal health is not only creates financial problems but also has social implications; it creates social tension between partners and family. Women not receiving any maternal care i.e., antenatal, delivery, postnatal care due to financial crisis may recover less quickly and may suffer physical and mental health problems. According to the World Bank report (2011) OOPE comprises 86 percent of private health expenditure in India. Many NSSO surveys have revealed that OOPE in maternal health has become a huge burden to poor households. Hence, the center as well as state governments have launched many maternal health programs like Janani Shishu Suraksha Karyakrama (JSSK), Janani Suraksha Yojana (JSY), Pradhan Mantri Matru Vandana Yojana, Prasooti Araike, etc to address the problems and to increase public expenditure on health. However, despite these, India continues to contribute almost a quarter of the global estimates of maternal morbidity and mortality. Despite that Out of Pocket Expenditure' (OOPE) in maternal health is too high. The services provided by Public Health Institutions, particularly Primary Health Centres (PHCs) / Government hospitals are accessible to the public, mostly free of cost, in practice, there are various instances, where households have to pay from their pocket. The expenses that the patient or the family pays directly to the health care provider, without a third-party (insurer or State) are known as 'Out of Pocket Expenditure' (OOPE). It may be medical expenses like payments towards doctor's fees, medicine, diagnostics, operations, charges for blood, ambulance services, etc, while non-medical expenditures include money spent towards traveling expenses, lodging, charges of escort, attendant charges, etc. OOPE on healthcare forms a major barrier to health-seeking behavior. The poor sections do not have any form of financial protection and are forced to make OOPE

when they fall sick. Often, these households have to resort to borrow or sell assets to meet this expenditure. As per the National Health Accounts (NHA) of India (2012-13), 64.2% % of Total Health Expenditure in India is considered to be OOPE by the individuals/households. The results of District Level Health Survey (DLHS) 4 (2016) have brought out the fact that there has been a significant increase in OOPE on institutional deliveries in the Karnataka State. It revealed that the top five districts that had the highest OOPE have been in the southern divisions of Karnataka. Chikkamagalur topped the list with an OOPE of Rs. 5920 per delivery followed by Bangalore Rural with Rs. 5590, Bangalore Urban with Rs. 5410 etc. The least average OOP expenditures were observed in the north Karnataka districts of Belgaum (Rs.1500), Bidar (1590), Bagalkot (Rs. 1600), etc, on average delivery expenses incurred per beneficiary. Another interesting fact that can be observed is that in few districts the rural OOP had been higher than the total OOP. This scenario is observed in 11 districts of Karnataka as per the report. All these indicate that there is underutilization of the inefficiencies of the various schemes made available in reaching out to the beneficiaries. The question is why OOPE is still high despite many demand-side interventions (Maternal Health Programmes) that are introduced to remove the major financial burden of institutional deliveries on the BPL families. Hence, it is time for the state to seriously consider a publicly financed healthcare system that would reduce costs that are normally paid OOP by individuals and families in the private sector, thereby reducing barriers to seeking appropriate healthcare. It is understood that despite several maternal health schemes OOPE on institutional delivery remains high over time, across states and socio-economic groups. It is suggested that to reduce OOPE in maternal health the coverage and benefits provided by various maternal health schemes should be strengthened, monitored, and regulated periodically.

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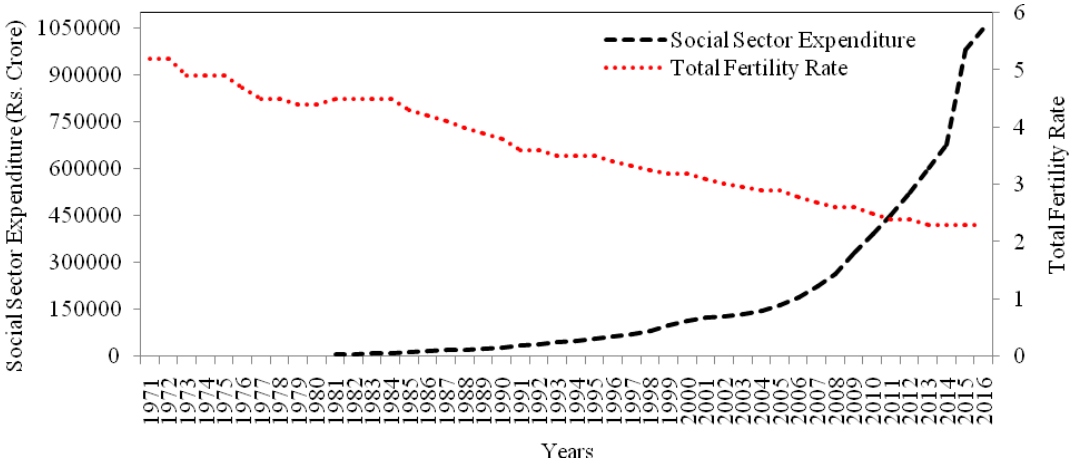
Current Statistics

Figure 1: Trends in Social Sector Expenditure (Rs. Crore) and Total Fertility Rate (TFR), India, 1971-2016.

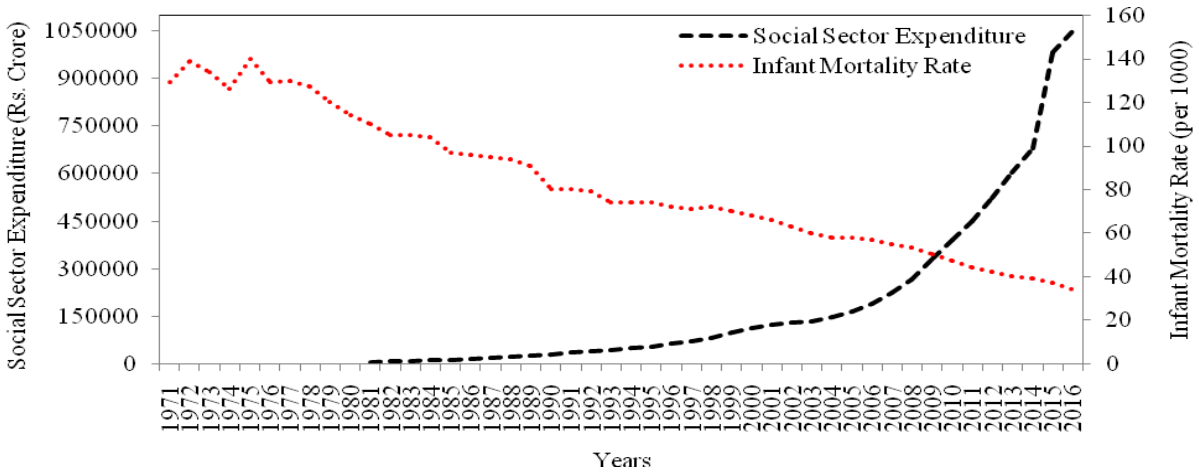


Note: Social Sector Expenditure includes expenditure on social services, rural development, food storage and warehousing under revenue expenditure, capital outlay and loans and advance by the State Governments; Total fertility rate – The number of children born to a woman if she passes through the childbearing years.
Source: Sample Registration System and NITI Aayog website.

Figure 2: Female Labour Force Participation Rate (per 1000) and Total Fertility Rate (TFR), India, 2012.

Note: Female Labour Force Participation – the share of working-age women who report either being employed, or being available for work; Total Fertility Rate – the number of children born to a woman if she passes through the childbearing years.
Source: Sample Registration System and NITI Aayog website.

Figure 3: Trends in Social Sector Expenditure (Rs. Crore) and Infant Mortality Rate (IMR), India, 1971-2016.



Note: Social Sector Expenditure includes expenditure on social services, rural development, food storage and warehousing under revenue expenditure, capital outlay and loans and advance by the State Governments; Infant Mortality Rate - probability of dying between birth and exactly one year of age expressed per 1,000 live births.
Source: Sample Registration System and NITI Aayog website.

Figure 4: Female Labour Force Participation Rate (per 1000) and Infant Mortality Rate (IMR), India, 2012.

Note: Female Labour Force Participation – the share of working-age women who report either being employed, or being available for work; Infant Mortality Rate - probability of dying between birth and exactly one year of age expressed per 1,000 live births.
Source: Sample Registration System and NITI Aayog website.