**Table II: Content analysis of articles that met the inclusion criteria**

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| **SOCIAL CLASS** | |
| **Serial No** | **Article Title** | | **Author and Author Information** | **Health Outcome** | **Research Question** | **Pathways** | **Explanation** | **Recommendations** | **Approach** |
| 1 | Social class-related gradient in the association of skeletal growth with blood pressure among adolescent boys in India  (2008)7 | | Shobha Rao\* and PritiApte  Biometry and Nutrition Group, Agharkar Research Institute, G.G. Agarkar Road, Pune | Skeletal Growth with blood pressure | The present study examined blood pressure levels, adiposity and growth of adolescent boys from high and low social classes. | Social class-related differences in prevalence of high blood pressure among adolescents have rarely been reported. In our study, the prevalence of HSBP was associated with adiposity (BMI and body fat) while the prevalence of HDBP was associated with stunting. Therefore our findings suggest that high systolic blood pressure was the health consequence of adiposity in HSE class, while high diastolic blood pressure appeared as the health consequence of growth retardation in LSE class. | No Statement | No Statement | Approach: Socio-Contextual |
| 2 | Association of dietary factors and other coronary risk factors with social class in women in five Indian cities  (2000)8 | | Ram B Singh 1,2 MD, Raheena Beegom3 PhD, Satya P Verma4 MD, Memuna Haque5 PhD,  Reema Singh6 PhD, Amita S Mehta7 PhD, Amit K De8 PhD, Soma Kundu8 MSc,  Subarna Roy8 MSc, Aparna Krishnan6 MSc, Harita Simhadri6 MSc, Nikhila B Paranjpe5 MSc  and Nisha Agarwal5 MSc  1N.K.P. Salve Institute of Medical Sciences, Nagpur, India  2Medical Hospital and Research Centre, Moradabad, India  3College for Women, Trivandrum, India  4Appolo Hospital, New Delhi, India  5College of Home Science, Nagpur, India  6Centre of Nutrition, Mumbai, India  7SVT College of Home Science, Mumbai, India  8Centre of Nutrition, Calcutta, India | Coronary Risk Factors | In the present report, the authors describe the diet and lifestyle characteristics in relation to social class in women subjects of the five city study, because there are wide differences in dietary intakes between rich and poor, as well as between rural and urban in association with differences in pattern of diseases. | Mean BMI, obesity, overweight, central obesity and sedentary lifestyle were also significantly more common among subjects with higher social classes compared to the lower social classes. | The consumption of pro-atherogenic foods; total visible fat, milk and milk products, meat, eggs and also sugar and confectionery were significantly increased in higher social classes. Subjects in social classes 4 and 5 were poor, unskilled workers whose earnings were irregular which did not allow them to consume adequate food. However, in social classes 1–3, the subjects were professionals, wives of businessmen, shopkeepers and skilled workers who are usually household workers. These classes of women were consuming a higher amount of pro-atherogenic food and had helpers for household work, resulting in a higher prevalence of sedentary lifestyle among them. | No Statement | Approach: Individual characteristics and Socio-Contextual |
| 3 | Social class, coronary risk factors and undernutrition, a double burden of diseases, in women during transition, in five Indian cities  (1999)9 | | Ram B. Singhaa ,\*, RaheenaBeegomb, Amita S. Mehtac, Mohammad A. Niaza, Amit K. Ded,  Ranjan K. Mitrad , MemunaHaqueg , Satya P. Vermae , Gopal K. Dubef , Hikjul M. Siddiquif ,  hGurpreet S. Wander , Edward D. Janusi, A. Postiglionej, Mohammad S. Haquek  aHeart Research Laboratory, Medical Hospital and Research Centre, Moradabad, India  bCollege for Women, Trivandrum, India  cSVT College of Home Science, Bombay, India  dCollege for Science, Calcutta, India  eAppolo Hospital, New Delhi, India  fNKP Salve Institute of Medical Sciences, Nagpur, India  gCollege of Home Science and Centre of Nutrition, Nagpur, India  hDayanand Medical College, Ludhiana, India  iRoyalChildrens Hospital, Parkville, Australia  jInstitute of Internal Medicine and Metabolism, Naples, Italy  kDhaka Medical College, Dhaka, Bangladesh | Coronary Risk Factors and Undernutriion | To find out the association between social class and coronary risk factors in women. | This study shows that coronary risk factors, hyobesity, central obesity, a sedentary lifestyle, oral pertension, diabetes mellitus, total cholesterol and a contraceptive intake and postmenopausal status was family history of CAD were significantly associated with higher social classes in an urban population women from various geographical areas of India. | As the transition from annual poverty to affluence progresses, communicable diseases and under nutrition tend to decline in importance relative to problems resulting from non-communicable diseases | No Statement | Approach: individual characteristics and socio-contextual |
| 4 | Social class and coronary artery disease in a urban population of North India in the Indian lifestyle and heart study  (1997)10 | | Ram B. Singha ,\*, Mohammad A. Niaza, Amer S. Thakura, Edward D. Janusb, MahmoodMoshiric  A Centre of Nutrition, Medical Hospital and Research Centre, Moradabad-10 (UP) 244001, India  bQueen Mary Hospital, Hong Kong, Peoples’ Republic of China  cRajaie Cardiovascular Research Centre, Tehran, Iran | Coronary Artery Disease | To determine the association of social class with prevalence of coronary risk factors and coronary artery disease (CAD) | The Indian Lifestyle and Heart study shows that the strength of the association of level of social class CAD and coronary risk factors were significantly with the prevalence of CAD in both males (odds ratio associated with level of socioeconomic status in this 0.98, 95% confidence interval 0.83 to 1.09) and cohort of urban subjects from north India. Higher and females (odds ratio 0.82, 95% confidence interval middle social classes 1–3 were associated with higher 0.68 to 0.97). prevalence of CAD including myocardial infarction and angina pectoris diagnosed by new criteria of under the leadership of Heller showed that coronary Cardiovascular Health Study. | The Indian urban population is under rapid transition reported that the prevalence of CAD was lowest in from poverty to affluence in conjunction with rapid laborers and highest in professionals and skilled changes in diet and lifestyle. | Lower coronary risk socioeconomic group on incidence of management of and survival observed among lower social classes appear to be due tophysically demanding occupations and low fat. | Approach: Socio-contextual |
| 5 | Social class and coronary disease in a rural population of north India  (1997)11 | | R. B. Singh, J. P. Sharma, V. Rastogi, M. A. Niaz, S. Ghosh, R. Beegom and  E. D. Janus  Centre of Nutrition and Heart Research Laboratory, Medical Hospital and Research Centre, Moradabad, India;  Clinical Biochemistry Unit, Queen Mary Hospital, Hong Kong | Coronary Disease | To demonstrate the association of socioeconomic status with prevalence of coronary artery disease and coronary risk factors. | The Indian Social Class and Heart Survey showed that coronary artery disease and coronary risk factors were significantly associated with social class in a rural population of North India. Social classes 1 and 2 were associated with a higher prevalence of coronary artery disease. This association remained significant on age adjusted analysis, but declined after the addition of other lifestyle characteristics in a multivariate analysis. | Level of education, income, occupation, employment status, indices of social class, measures of living conditions, area based measures, life span measures and measures of income inequality are widely considered measures of social class. Some experts suggest that other than income or educational status, prestige of a particular job may be important. Survotham and Berry reported that coronary artery disease was more prevalent among high income groups without giving any explanation. Other workers emphasized that people engaged in physically demanding work such as farming were less likely to develop coronary disease than people with sedentary occupations'. In a recent study, Gupta found that although illiterate and less educated people were more physically active, they had a higher prevalence of coronary disease. It is possible that illiterate and less educated people in this study included mainly rich farmers who are known to consume a relatively higher fat diet. Smoking was also more common among them. | No Statement | Approach: individual and socio-contextual |
| 6 | Socioeconomic gradients of cardiovascular risk factors in China and India: results from the China health and retirement longitudinal study and longitudinal aging study in India  (2017) | | Hu P: Division of Geriatric Medicine, David Geffen School of Medicine at UCLA, 10945 Le Conte Avenue, Suite 2339, Los Angeles, CA, 90095-1687, USA, Wang S and Lee J: Center for Economic and Social Research, University of Southern California, Los Angeles, CA, USA | Cardiovascular risk | The goal of this study is to compare socioeconomic status (SES) gradients of cardiovascular risk factors (CVRF) both within and between China and India. | No statement | No statement | A cross-country comparison of socioeconomic inequalities in illness may provide some insight into possible causal explanations and potential interventions. For example, by comparing data from the U.S. HRS and the English Longitudinal Study of Aging (ELSA), Bank et al. showed that even though US residents are much less healthy than their English counterparts and the health differences exist at all points of the SES distribution, the differences between US and English populations cannot be fully explained by universal lifetime health care access in England (Banks et al. 2006). A similar analysis between China and India in the future would be integral in further elucidating the role of SES and access to care in health outcomes. | Approach: socio-contextual |
| 7 | Prevalence of undernutrition and associated factors: A cross-sectional study among rural adolescents in West Bengal, India.  (2017) | | AmitavaPal and P.C. Dhara: Ergonomics and Sports Physiology Division, Dept. of Human Physiology with Community Health, Vidyasagar University, Midnapore, West Bengal, India, AK Pari: Dept of Physiology, Suri Vidyasagar College, Birbhum, West Bengal, India and A Sinha: Dept. of Physiology, Panskura Banamali College, Purba Midnapore, West Bengal, India | Undernutrition | The present study was undertaken to investigate the prevalence of malnutrition among 10 to 17 years old adolescent and its association with socio-demographic factors. | The adolescents belonged to lower social class were significantly more likely to be stunted | Social class difference too had also found in child undernutrition. The risk of being undernourished was significantly higher among lower social class (Scheduled Tribe and Scheduled Caste) adolescent compared to the upper or middle social class. This may be because availability and accessibility of heath care services in rural areas are not in par with urban areas. | In addition to the existing universal education program, there is a need to provide mass education regarding health and child nutrition in the rural regions, particularly among the socioeconomic groups that are educationally lagging. In this endeavor, cooperation is necessary among the government, non-governmental organizations, medical personnel and the local people. The results of the present study will be useful for policy makers and programmers to formulate various developmental and health care programs. Nutritional intervention is also necessary to improve the nutritional status among the adolescents. | Approach: Socio-Contextual |
| 8 | Factors associated with body mass index among slum dwelling women in India: an analysis of the 2005-2006 Indian National Family Health Survey (2017) | | Maya Laxmi Patel: Interdisciplinary School of Health Sciences, University of Ottawa, Ottawa, ON, Canada  Raywat Deonandan: Interdisciplinary School of Health Sciences, University of Ottawa | Body Mass Index | With this study, we sought to determine the factors associated with Indian women’s body mass index (BMI) in slum environments, with special attention paid to women with tribal status. | No statements | No statements | Expected factors, such as age, diabetes, and a sedentary lifestyle, are associated with increasing BMI among slum dwelling Indian women, the important insight arising from our study is that nutritional health challenges to Indian slums may not be dissimilar to challenges experienced by other urban residents, though the experiences of tribal peoples are deserving of more focused attention in future research projects. | Approach: Individual |
| 9 | The burden of infectious and cardiovascular diseases in India from 2004 to 2014 (2017) | | K, Banerjee, LK, Dwivedi : International Institute for Population Sciences, Mumbai, India | Infectious and cardiovascular diseases | Using the 60th (2004) and 71st (2014) rounds of the National Sample Survey, this study assessed the balance between infectious diseases and cardiovascular diseases (CVD) from 2004 to 2014, as well as changes in the disease burden in various socioeconomic and demographic subpopulations. | A decrease in the beta coefficients for many categories for both infectious diseases and CVD from 2004 to 2014 was noted. For example, the chance of having CVD among the Other Backward Classes was 0.40 (p<0.01) in 2004, which declined to 0.10 ( p<0.01) in 2014. | This study also brings to the forefront the fact that the burden of NCD has spread to the underprivileged classes of society previously thought to be safe. Poor households, households paying no medical insurance premiums, illiterate individuals, and Scheduled Castes/Tribes, which previously had a lower risk of CVD and a higher chance of having infectious diseases, are now burdened with both. This study provides evidence of the ongoing compression of CVD in the older ages of the population, and thereby confirms the theory of diffusion, according to which increased chances of suffering from CVD trickle down the social gradient. | Policies impacting unplanned urbanization, the marketing of unhealthy food, and healthy-living initiatives need to be monitored to create a conducive environment for improved public health. An urgent need-assessment of the health resources and infrastructure available for the elderly to serve the older population suffering from CVD is required. Integrating NCD programs within existing health services and systems would probably be most effective. This study documented an increase in the burden of CVD among disadvantaged population groups, hinting at the importance of immediate control measures informed by analyzing the specific causes of this phenomenon and by transforming health insurance dynamics with a focus on the poorer sections of the population | Approach: Individual |
| 10 | Relationship between body mass index and dental caries in children, and the influence of socio-economic status.  (2017) | | S Kumar and J Kroon: Population and Social Health Research Programme, Menzies Health Institute Queensland and School of Dentistry and Oral Health, Griffith University, Gold Coast, Queensland, Australia, R, Lalloo: School of Dentistry, The University of Queensland, Brisbane, Queensland, Australia and School of Dentistry and Oral Health, Griffith University, Gold Coast, Queensland, Australia. S, Kulkarni: Department of Public Health Dentistry, Panineeya Institute of Dental Sciences & Research Centre, Hyderabad, India, NW Johnson: Population and Social Health Research Programme, Menzies Health Institute Queensland, Griffith University, Gold Coast, Queensland, Australia. | Dental Caries | To determine the association of body mass index (BMI) with dental caries in Indian schoolchildren, and to analyse the influence of socio-economic status. | There were differences in the association of BMI  with dental caries across the categories of family SES  . Among children from families with high  SES, overweight children had approximately 71%  fewer caries than did normal-weight children, both  before (IRR = 0.29; 95% CI: 0.11–0.78) and after  (IRR = 0.27; 95% CI: 0.10–0.73) adjusting for the  effect of all other explanatory variables | Although the underlying reason for this  inverse association is unclear, several studies have  attributed it to dietary habits. One of these studies  suggested that although parents of overweight children may restrict the consumption of sugary food,  thus leading to development of fewer caries, the children remain overweight because they consume more  calories than they expend33. Another study reasoned  that overweight children might consume more fatty  acids, but less sugar, compared with healthy or underweight children | Dentists from the study region,  in their position as health-care providers, can educate  and motivate parents, particularly those children who  are overweight, on healthy eating practices. Furthermore, health-education programmes for preventing  dental caries and obesity, with multisectoral co-ordination between health and education departments of  the state, should be contemplated | Approach: Individual |
| 11 | Socioeconomic disparities in coverage of full immunisation among children of adolescent mothers in India, 1990-2006: a repeated cross-sectional analysis.  (2016) | | C Kumar:  Department of Geography, School of Earth Sciences, Central University of Karnataka, Kalaburagi, Karnataka, India, PK Singh: Population Health & Nutrition Research Program, Institute for Human Development, New Delhi, Delhi, India. L Singh: National Institute of Medical Statistics, Indian Council of Medical Research, New Delhi, Delhi, India, RK Rai: Society for Health and Demographic Surveillance, Suri, West Bengal, India | Immunity | This paper assesses trends and extent of socioeconomic disparities in the coverage of full immunisation among children of adolescent mothers in India. | Findings showed that the difference in the probabilities of children availing full immunisation belonging to the most disadvantaged and advantaged mix of socioeconomic characteristics (based on their place of residence, education and economic status) was almost twofold to threefold and such disparities were consistent over the survey period. | The most deprived children in terms of receiving full immunisation appeared to reside in rural areas, belonged to poor families, and their mothers were illiterate. Interacting the impact of children belonging to socially deprived groups (ie, SC/ST) in association with their place of residence and economic status did not present much variation in probability, compared with the situation when the extreme ends of their mother's education was introduced in the socioeconomic spectrum. This experiment established the fact that economically poor children of illiterate adolescent mothers from rural areas, irrespective of the social groups they belonged to, were the most deprived groups of children in terms of availing full vaccination. | The study strongly advocates for the promotion of a comprehensive scheme focusing on adolescent mothers and their children to improve levels of full immunisation while minimising the social disparities in the overall coverage. The geographical concentration of adolescent women out of all women of reproductive age, and those belonging to deprived groups, presented in this study would help policymakers to prioritise the intervention in health programmes including immunisation. | Approach: Socio-Contextual |
| 12 | Overweight and Obesity in School Children of a Hill State in North India: Is the Dichotomy Urban-Rural or Socio-Economic? Results from a Cross-Sectional Survey. (2016) | | M Bhargava: Department of Community Medicine, Yenepoya Medical College, Yenepoya University, Mangalore, Karnataka, India  SD Kandal and P Aggarwal: Department of Community Medicine, Himalayan Institute of Medical Sciences, SRH University, Dehradun, India. HC Sati: All India Institute of Medical Sciences, New Delhi, India. | Overweight and obesity | Present study is a pioneer study for overweight and obesity in school children of Dehradun district of Uttarakhand, a hill state of North India using standard WHO cut-offs. It was done with the objective to estimate the prevalence of overweight and obesity in the school-going children (6–17 years age) and to assess the demographic and dietary correlates of overweight and obesity in this age group in context with their urban-rural and socio-economic status. | The present study found an overall prevalence of overweight as 15.6% of which 5.4% were obese. This prevalence of overweight is comparable to that of the range indicated by a review in India in 2007 (overweight: 8.5%–29% and obesity 1.5–7.4%) | Mid-day meal is a wholesome lunch provided by the state to all government school children till class 8. Due to expensive fruits, fruit intake in our study is simply a marker of affordability and shows positive association with overweight and obesity. The deficit in RDA is comparable in urban and rural areas, but the difference in deficit between private and government schools is very significant (30.7% in urban government and 26.3% in rural government). | School curriculum that includes education about diet as modifiable risk factor can address both ends of spectrum of malnutrition. | Approach: Individual |
| 13 | Disparities in Prevalence of Cardiometablic Risk Factors in Rural, Urban-Poor, and Urban-Middle Class Women in India. (2016) | | I Mohan: Department of Preventive and Social Medicine, RUHS College of Medical Sciences, Jaipur, Rajasthan, India., R Gupta: Department of Medicine, Fortis Escorts Hospital, Jaipur, Rajasthan, India., A Misra & , U Shrivastava: Department of Diabetes & Metabolic Diseases, Fortis C-DOC Centre of Excellence, Chiragh Enclave, New Delhi, India., KK Sharma: Department of Pharmacology, Rajasthan University of Health Sciences, Jaipur, Rajasthan, India , A Agrawal : Department of Home Science, University of Rajasthan, Jaipur, Rajasthan, India., NK Vikram: Department of Medicine, All India Institute of Medical Sciences, New Delhi, India., V Sharma : Science and Society Division, Department of Science and Technology, Government of India, New Delhi, India RM Pandey: Department of Biostatistics, All India Institute of Medical Sciences, New Delhi, India. | Cardiovascular disease | To determine location-based differences in CVD risk factors in India we performed studies among women in rural, urban-poor and urban middle-class locations. | The present study shows high prevalence of multiple cardiovascular risk factors, including diabetes, in urban middle-aged women in India. The prevalence of obesity, abdominal obesity, hypertension, hypercholesterolemia and impaired fasting glucose is significantly greater in urban middle-class and urban-poor women compared to the rural. There is a significantly increasing trend in all these metabolic factors with increasing urbanization. | Urbanization is one of the most dramatic demographic changes occurring in developing countries such as India. Greater prevalence of diabetes and other CVD risk factors with increasing urbanization is due to multiple factors. Changes in diet have been attributed to economic growth leading to changes in food consumption, relative cost, availability and media and industry influences. Changes in physical activity have been attributed to mechanization at work and home. Change in transportation (e.g. increased motorised vehicle ownership), and changes in the built environment (e.g. increased urban sprawl and poor connectivity in residential areas) also lead to lower physical activity | Control of unhealthy consequences of this transition shall require innovative strategies that promote healthy urbanization with focus on macrolevel as well as microlevel environments, that promote physical activity and improve availability and intake of healthy foods. | Approach: Socio-Contextual |
| 14 | Do socio-economic inequalities in infant growth in rural India operate through maternal size and birth weight? (2016) | | PL Griffiths: Centre for Global Health and Human Development, School of Sport, Exercise and Health Sciences, Loughborough University , Loughborough , Leicestershire , UK, N Balakrishna & S Fernandez Rao: National Institute of Nutrition, Indian Council of Medical Research , Hyderabad , India, W Johnson: MRC Human Nutrition Research, Elsie Widdowson Laboratory , Cambridge , UK | Infant size | To establish whether SES inequalities in under-nutrition, proxied by infant size at 12 months, operate through maternal and early infant size measures. | Findings show that socio-economic status has significant direct and indirect  associations with WAZ and LAZ, with direct associations accounting for 47% of the  total effect for LAZ and 40% for WAZ at 12 months. Significant indirect pathways  explain the majority of the total socio-economic effect on infant anthropometric  outcomes at 12 months and have been identified to be maternal height and WAZ at  6 months (WAZ only). | No statement | Evidence from this  study suggests that targeting evidence based nutrition and growth interventions  (Bhutta et al., 2013 provides a review of evidence based nutrition specific  interventions and Ruel et al., 2013 a review of evidence based nutrition sensitive  interventions (Bhutta and others 2013; Ruel, Alderman, Maternal and Child Nutrition  Study Group. 2013)) towards infants from the most vulnerable poor families with the  shortest mothers would have the greatest potential for breaking the cycle between  poverty and malnutrition in infancy in rural South India. | Approach: Socio-Contextual |
| 15 | Growth and obesity status of children from the middle socioeconomic group in Lucknow, northernIndia: A comparison with studies on children from the upper socioeconomic group. (2015) | | P Gupta: Department of Paediatrics, Era's Lucknow Medical College, Lucknow, Uttar Pradesh. N Mittal and Meenakshi JV: Department of Economics, Delhi School of Economics, Delhi University, Delhi. A Kulkarni and V Bhatia: Department of Endocrinology, Sanjay Gandhi Postgraduate Institute of Medical Sciences, Lucknow, Uttar Pradesh | Growth and obesity status | Children from the upper socioeconomic group in India currently show a modest positive secular trend in height, accompanied by a high prevalence of obesity. We examined the anthropometric pattern among children from the middle socioeconomic group. | Our results show that urban children belonging to the MSEG in  Lucknow have become taller at final height (except for 3rd centile  girls) than the USEG cohort of 1992 from the same region  (Lucknow, Allahabad, Varanasi).1  They compare favourably with  their 2009 USEG nationally representative counterparts with  respect to boys. However, with respect to girls, the MSEG still  lags behind the national USEG data for 1992 and 2009 for the  older age groups. The gender difference is unlikely to be due to  genetically shorter population in our region, otherwise it would  have affected boys and girls equally | An explanation could be that  the negative bias towards the girl child in our region has not  allowed girls to achieve improvement in height to the extent to  which the boys have. There is an improvement of height percentiles  in the pre-pubertal years, which is not carried through during the  pubertal growth spurt, suggesting that perhaps a few more years  of improved nutrition for the girl child may also bring her at par  with the national USEG data. | These results have  implications for contextualizing the obesity epidemic seen among  children within its socioeconomic context and pointing to a  gender bias for improvement in heights. | Approach: Socio-Contextual |
| 15 | Education, gender, and state-level disparities in the health of older Indians: Evidence from biomarker data. (2015) | | J Lee: Dornsife Center for Economic and Social Research, University of Southern California, 638 Downey Way, Los Angeles, CA 90089, USA; RAND Corporation, Santa Monica, CA, USA., ME McGovern: Dornsife Center for Economic and Social Research, University of Southern California, 638 Downey Way, Los Angeles, CA 90089, USA; RAND Corporation, Santa Monica, CA, USA. DE Bloom and J O’Brien: Department of Global Health and Population, Harvard T.H. Chan School of Public Health, Boston, MA, USA. P Arokiasamy: International Institute for Population Sciences, Mumbai, India. A Risbud and V Kale: National AIDS Research Institute, Pune, Maharashtra, India. P Hu: University of California, Los Angeles, CA, USA | Anemia and Cardiovascular health; | Using biomarker data on hemoglobin and CRP, we propose to empirically examine health disparities in anemia and cardiovascular risk among older Indians | We find evidence for an education gradient in Hb, but there is no evidence of state-level differences. Despite recent economic growth, the risk of anemia, most likely associated with malnutrition is higher for women and for those without schooling. This is consistent with previous evidence on younger Indians (Subramanian et al., 2009).We find that about one third of Indians have a CRP level considered to be high risk (>3 mg/L), which is comparable to results from the English Longitudinal Study on Ageing (Hamer and Molloy, 2009). We also find that CRP is greater among the oldest old and among urban residents. Although there are substantial state-level differences, there is no evidence of an education gradient for CRP, which is consistent with existing evidence from Costa Rica (Rosero-Bixby and Dow, 2009). | No statements | There are several policy relevant implications to these results (subject to the limitations we discuss below). First, our analysis shows that cardiovascular disease is likely to be an important detrimental factor for population health encompassing all socioeconomic groups in Indian society, and therefore interventions to improve cardiovascular health should not only be targeted at the better-off individuals living in urban areas. Second, gender and education disparities in hemoglobin (and therefore likely also in nutrition) persist among older Indians, also implying that nutrition programs should also be targeting this age group rather than just women of reproductive age and children, especially considering that the health of older individuals may be especially sensitive to these conditions (Carmel, 2001; Chaves et al., 2005). Third, when we decompose state-level differences, we find that these disparities are mainly due to differences in the association of risk factors with CRP rather than in the distribution of risk factors. | Approach: Individual |
| **SOCIO ECONOMIC STATUS** | |
| **Serial No** | **Article Title** | | **Author and Author Information** | **Health Outcome** | **Research Question** | **Pathways** | **Explanation** | **Recommendations** | **Theoretical perspective** |
| **1** | Impact of socioeconomic status and living condition on latent tuberculosis diagnosis among the tribal population of Melghat: A cohort study (2016) | | RS Kashyap, AR Nayak, AA Husain, SD Shekhawat: Biochemistry Research Centre, Central India Institute of Medical Sciences, Nagpur. AR Satav: Tribal Health Research Centre, Maharashtra. RK Jain, DV Raje: Statistical Analysis Wing. HF Daginawala, GM Taori: Biochemistry Research Centre, Central India Institute of Medical Sciences, Nagpur. | Latent tuberculosis infection | To study socioeconomic status (SES) and living conditions (LC) as risk factors for latent tuberculosis infection (LTBI) and their impact on QuantiFERON-TB gold (QFT-G) and tuberculin skin test (TST) outcome for determining a better diagnostic test for LTBI in the malnourished tribal population of Melghat. | Low SES status has direct impact on living conditions of the tribal population. Both factors ultimately may dispose other risk factors which include illiteracy, poor hygiene practices, and poor diet which lead to latent tuberculosis infection | Same statement as pathway | We believe that if policy makers extend their comprehensive and integrated approach of disease control by targeting at least household level factors, like SES and LC, the prevalence of LTBI in such isolated regions of the country would be much under control. | Approach: Socio-contextual |
| 2 | Socioeconomic status and esophageal squamous cell carcinoma risk in Kashmir, India  (2013)12 | | Nazir A. Dar,1,2,7Idrees A. Shah,1Gulzar A. Bhat,1 Muzamil A. Makhdoomi,1Beenish Iqbal,1Rumaisa Rafiq,1Iqra Nisar,1Arshid B. Bhat,1 Sumaiya Nabi,1 Akbar Masood,1Sajad A. Shah,1 Mohd M. Lone,3  Showkat A. Zargar,4FarhadIslami2,5 and Paolo Boffetta2,6,7  1Department of Biochemistry, University of Kashmir, Srinagar, India; 2The Tisch Cancer Institute and Institute for Transitional Epidemiology, Mount Sinai School of Medicine, New York, USA; 3Departments of Radiation Oncology and 4 Gastroenterology, SK Institute of Medical Sciences, Soura, Srinagar, India; 5 Digestive Disease Research Center, Shariati Hospital, Tehran University of Medical Sciences, Tehran, Iran; 6 International Prevention Research Institute, Lyon, France | Esophageal Cancer | To study esophageal squamous cell carcinoma (ESCC) risk with low socioeconomic status (SES), in Kashmir, an area with a high incidence of ESCC in the northernmost part of India. | Higher education, living in a kiln brick or concrete house, use of liquefied petroleum gas and electricity for cooking, and higher wealth scores all showed an inverse association with ESCC risk. Compared to farmers, individuals who had government jobs or worked in the business sector were at lower risk of ESCC, but this association disappeared in fully adjusted models. Occupational strenuous physical activity was strongly associated with ESCC risk. In summary, we found a strong relationship of low SES and ESCC in Kashmir. | Formal education and appliance ownership-based wealth score, as well as living in certain house structures and using certain cooking fuels that reflected higher economic status in Kashmir valley, were inversely associated with ESCC risk. In this study, living in kiln brick and concrete houses as compared to living in adobe houses was associated with a lower ESCC risk. | No Statement | Approach: Socio-contextual |
| 3 | Association Between Obesity, Dental Caries and Socioeconomic Status in 6- and 13-year-old School Children  (2012)13 | | BashaSakeenabiaHiremathShivalingaSwamybRoshan Noor Mohammedc  a Reader, Department of Preventive and Community Dentistry, College of Dental Sciences, Davangere, Karnataka, India.  b Dean and Director, Government Dental College and Research Institute, Fort, Bangalore, India.  c Reader, Department of Paediatric Dentistry, College of Dental Sciences, Davangere, Karnataka, India. | Obesity and Dental Caries | To investigate the association between dental caries, obesity and socioeconomic status (SES) in 6-and 13-yearold school children in Davangere city, Karnataka, India. | The study indicates that 28.54% of children with sugar consumption have dental caries and that 17.83% of overweight children and 7.58% of obese children consume sugar. These results support the hypothesis that the relationship between obesity and caries is established by means of the link between the consumption of fermentable carbohydrates and the development of caries or obesity. | No Statement | In future preventive programmes, the strategies should aim for nutrition control to avoid high weight as well as carries, including meal frequency control and reduction in fermentable carbohydrates. | Approach: Individual characteristics |
| 4 | Socioeconomic status and the prevalence of coronary heart disease risk factors  (2002)14 | | Kanala KR Reddy PhD, FICN, Alahari P Rao PhD and Thavanati PK Reddy PhD Department of Physical Anthropology, School of Biological and Earth Sciences, Sri Venkateswara University, Tirupati, Andhra Pradesh, India | Coronary heart disease risk | The present study is aimed at assessing the prevalence of CHD risk factors in different socioeconomic classes from a semiurban population of South India. | The findings from the study showed that coronary risk factors such as hypercholesterolemia, hypertriglyceridemia and sedentary life style were more prevalent among higher SES groups. Low HDLC, on the other hand, was more common in lower SES groups. | In the developed world, increased awareness and education about diet and lifestyle risk factors may have been partly responsible for the decline in CHD prevalence among the higher social classes. However, the situation in developing countries, especially in India, is different. Rapid industrialization and urbanization have brought about enormous changes in dietary patterns and lifestyles. This is most obvious among higher SES groups, which tend to experience a greater prevalence of CHD risk factors. | No Statement | Approach: Socio-Contextual |
| 5 | Hypertension and determinants of blood pressure with special reference to socioeconomic status in a rural south Indian community | | Gilberts EC,1 Arnold MJ, Grobbee DE  1Department of Epidemiology and Biostatistics, Erasmus University, Rotterdam, The Netherlands. | Hypertension and Blood Pressure | The objective of the study was to establish the prevalence of hypertension and to assess determinants of blood pressure with special reference to socioeconomic status in a rural south Indian community. | In this study, hypertension was observed more than twice as often in rich than in poor people. The risk of developing atherosclerosis in the first group is, therefore, considerably raised. | No Statement | An important feature in preventing this trend can be a reduction of body weight and prevention of obesity in the higher socioeconomic classes. | Approach: Individual |
| 6 | Socioeconomic Gradients and Distribution of Diabetes, Hypertension, and Obesity in India.  (2019) | | Daniel J. Corsi: OMNI Research Group, Ottawa Hospital Research Institute, School of Epidemiology and Public Health, University of Ottawa, Ottawa, Ontario, Canada;  S. V. Subramanian: Department of Social and Behavioral Sciences, Harvard T.H. Chan School of Public Health, Boston, Massachusetts | Diabetes, Hypertension and Obesity | To conduct a comprehensive equity analysis of the socioeconomic gradients and distribution of diabetes, hypertension, and obesity in India using the latest national data set. | This article provides a comprehensive picture of the socioeconomic gradients and distribution of  diabetes, hypertension, and obesity in India using a recent national survey. We have several key  findings. First, analyses of socioeconomic gradients by wealth, education, and social caste in the  prevalence of diabetes, hypertension, and obesity were generally positive. The strongest and most  consistent gradients were observed when using household wealth as the SES marker. The gradients  were positive but of smaller magnitude for education and social caste. The magnitude of the gradient  for each SES marker was strongest for obesity, followed by diabetes and hypertension. | Although the risk factor burden is greater among the higher SES. groups, mortality is lower,3 suggesting that wealthier groups have better access to treatments and  health care, possibly through private insurance or through greater affordability of out-of-pocket  health expenditures | Resource allocation  should be optimized proportional to the burden of disease within states or districts. India’s Ministry  of Health and Family Welfare has been establishing policies and strategies around the prevention and  control of noncommunicable diseases in recent years, including, for example, The National  Programme for Prevention and Control of Cancer, Diabetes, Cardiovascular Diseases and Stroke. In  many districts and rural areas, however, the population continues to face a substantial burden of  communicable diseases and maternal-child undernutrition. Continuing efforts are required to  ensure progress on improving the social circumstances and conditions in these areas while also  promoting improvements in health behaviors such as smoking and poor diet, which can improve the  cardiovascular disease risk factor profile. | Approach: Individual and Socio-Contextual |
| 7 | Socio demographic Determinants of Preterm Birth and Small for Gestational Age in Rural West Bengal, India.  (2019) | | Rai RK MPH: Society for Health and Demographic Surveillance, Suri, West Bengal, India,  Sudfeld CR DSc: Department of Global Health and Population, Harvard T. H. Chan School of Public Health, Boston, MA, USA, Barik A MD: Suri District Hospital, and Niramoy TB Sanatorium, Suri, West Bengal, India. Fawzi WW DrPH: Departments of Global Health and Population, Nutrition, and Epidemiology, Harvard T. H. Chan School of Public Health, Boston, MA, USA. Chowdhury A DM: Department of Hepatology, School of Digestive and Liver Diseases, Institute of Post Graduate Medical Education & Research, Kolkata, West Bengal, India. | Preterm Birth and Small for Gestational Age | To address the need for population-based data on preterm birth and SGA in India, this study used pregnancy-tracking data from the Birbhum Health and Demographic Surveillance System (HDSS) located in the state of West Bengal, India to examine risk factors for preterm birth and SGA | A high burden of preterm births (16%) and SGA (38.2%) and indicate that both maternal education and household wealth (p-value for trend: p < 0.05) are independent predicators of preterm births and SGA. We also determined that primigravity was in the risk SGA. | The role of maternal education in strengthening positive pregnancy outcomes is well documented; educated women can thus minimize information asymmetry during their pregnancy and seek out health care as needed. Greater wealth may decrease the risk of preterm and SGA through multiple pathways including improved diet and nutrition status and greater access to quality health care | Future population-based studies using ultrasound dating should be conducted in rural India, particularly to improve accuracy of preterm and SGA estimates. | Approach: Individual |
| 8 | Socioeconomic inequality in functional deficiencies and chronic diseases among older Indian adults: a sex-stratified cross-sectional decomposition analysis.  (2019) | | Singh L:  ICMR - National Institute of Medical Statistics, New Delhi, India, Goel R: Indian Council of Medical Research, New Delhi, India.  Rai RK: Society for Health and Demographic Surveillance, Suri, India, Singh PK: Division of Preventive Oncology, ICMR - National Institute of Cancer Prevention and Research, Noida, Uttar Pradesh, India. | Functional deficiencies and chronic diseases | Stratified by sex, income-related inequalities have been decomposed for functional deficiencies and chronic diseases among older adults, and the degree to which social and demographic factors contribute to these inequalities was identified in this study. | The relative contribution of socio-demographic factors to IADL deficiency was highest among those with poor economic status (38.5%), followed by those who were illiterate (22.5%), which collated to 61% of the total explained inequalities. Similarly, for chronic diseases, about 93% of the relative contribution was shared by those with poor economic status (42.3%), rural residence (30.5%) and illiteracy (20.3%). | No statement | Pro-poor intervention strategies could be designed to address functional deficiencies and chronic diseases, with special attention to women. | Approach: Socio-Contextual |
| **CASTE** | |
| **Serial No** | **Article Title** | | **Author and Author Information** | **Health Outcome** | **Research Question** | **Pathways** | **Explanation** | **Recommendations** | **Theoretical perspective** |
| **1** | Caste-based social inequalities and childhood anemia in India: results from the National Family Health Survey (NFHS) 2005-2006  (2016) | | P. Vart: Department of Health Sciences, Community and Occupational Medicine, University Medical Center Groningen, University of Groningen, Groningen. A. Jaglan: Department of Paediatrics, Medical College Guwahati, Guwahati. K. Shafique: School of Public Health, Dow University of Health Sciences, Karachi, | Childhood anemia | We examined the association of caste with childhood anemia in India and explored the effect modifying role of adult education and household wealth. | Most of people of disadvantageous cates belong to low socioeconomic groups in India. Low socioeconomic status may affect the prevalence of anemia via several pathways including 1) poor living and working conditions, 2) adverse health behaviors such as maternal smoking poor dietary habits and 3) limited health car use and limited health literacy which might influence their noncompliance with use of iron supplements. In our data also, more women were smokers in disadvantageous castes than in other caste. Thereby, these pathways might explain the association between caste and childhood anemia. | No additional statement. The statement on pathways was given as the explanation as to why disadvantageous caste groups have childhood anemia | Eleventh five year plan for anemia control for children in India can also be benefited from targeted IFA (Iron-Folic Acid) supplements to disadvantageous caste. Furthermore, future studies should investigate causal pathways that link caste to childhood anemia. | Approach: Socio-Contextual |
| 2 | Distribution of CC-chemokine receptor-5-∆32 allele among the tribal and caste population of Vidarbha region of Maharashtra state. (2013) | | Chavhan AB1, Pawar SS, Jadhao RG, Patil KG  1Department of Zoology, Shri Shivaji Science College, Amravati, India ; Department of Zoology, Institute of Science, Nagpur, India | To analyze the frequency of the CC-chemokine receptor-5 (CCR5)-[increment]32 allele of the CCR5 chemokine receptor, which is considered a Caucasian marker, in Bhil tribal and Brahmin caste sample sets from the population. | Sickle cell anemia | In India, as a consequence of high consanguinity, caste and area endogamy, some communities exhibits higher incidences of the diseases, what determines a major public health problem | The high incidences of HbS gene in tribes than in castes attribute the age old practices of consanguinity among them. Earlier researchers have stigmatized the tribal and low caste populations with prejudice mind of confining sickle cell gene with these groups. Wrong notions that were deeply rooted in the Indian society are that the high incidence of sickle cell gene among the tribes and lower castes is due to admixture. On the contrary, as evident from the present study the occurrence of sickle cell gene among higher caste populations is it an indication of carrying this mutant gene from ancient times independently. It is needless to say that SCA is confined to the lower caste and tribal groups only. | The most effective approach to minimize the problem of haemoglobinopathies in India is to offer genetic counseling, proper health education, sensitization to the individual concern, prenatal diagnosis and selective termination of pregnancy of the affected fetus. | Approach: Individual |
| 3 | Population Differentiation of Southern Indian Male Lineages Correlates with Agricultural Expansions Predating the Caste System (2012)17 | | GaneshPrasad ArunKumar,1,13 David F. Soria-Hernanz,2,3Valampuri John Kavitha,1,4VaratharajanSanthakumari Arun,1Adhikarla Syama,1KumaranSamy Ashokan,5 KavandanpattiThangaraj Gandhirajan,6Koothapuli Vijayakumar,5Muthuswamy Narayanan,7Mariakuttikan Jayalakshmi,1 Janet S. Ziegle,8 Ajay K. Royyuru,9Laxmi Parida,9 R. Spencer Wells,2 Colin Renfrew,10 Theodore G. Schurr,11 Chris Tyler Smith,12 Daniel E. Platt,9 Ramasamy Pitchappan,1 13  1The Genographic Laboratory, School of Biological Sciences, Madurai Kamaraj University, Madurai, Tamil Nadu, India  2National Geographic Society, Washington, District of Columbia, United States of America  3Institut de BiologiaEvolutiva (CSIC-UPF), Departament de CiènciesExperimentalsi de la Salut, UniversitatPompeuFabra, Barcelona, Spain  4Department of Biotechnology, Mother Teresa Women's University, Kodaikanal, Tamil Nadu, India  5Nilgiri Adivasi Welfare Association, Kota Hall Road, Kothagiri, Tamil Nadu, India  6Government College of Fine Arts, Chennai, Tamil Nadu, India  7Department of Zoology, St. Xaviers College, Palayamkottai, Tamil Nadu, India  8Applied Biosystems, Foster City, California, United States of America  9Computational Biology Group, IBM - Thomas J. Watson Research Center, New York, New York, United States of America  10McDonald Institute for Archaeological Research, University of Cambridge, Cambridge, United Kingdom  11Department of Anthropology, University of Pennsylvania, Philadelphia, Pennsylvania, United States of America  12The Wellcome Trust Sanger Institute, Wellcome Trust Genome Campus, Hinxton, United Kingdom  13Chettinad Academy of Research and Education, Kelampakkam, Chennai, Tamil Nadu, India | To conduct a genetic study to understand the origin of the caste system | Genetic | The present study shows that the MPG classification reflects the genetic structure of the TN populations slightly better than other models, and that both tribal and non-tribal populations possess predominantly autochthonous lineages derived from a common gene pool established during the Late Pleistocene and Early Holocene. | Southern Tamil Nadu and the Kerala zone represent one such agricultural frontier zone that has persisted to the present after local foragers began to adopt cultivation based on agricultural sedentism around 3 Kya. Nowadays, TN tribes exhibit a wide variety of occupations and subsistence strategies, and mostly inhabit the Western Ghats Mountains, which harbor tropical and semi-tropical rain forests. In this context, two of the three tribal groups associated with foraging lifestyles (HTF and HTK) show the clearest signals of genetic drift, most likely due to strong founder effects and long-term isolation. | No statement | Approach: Individual |
| 4 | Genetic variation in South Indian castes: evidence from Y-chromosome, mitochondrial, and autosomal polymorphisms (2008)18 | | Watkins WS1 TharaR,Mowry BJ, Zhang Y, Witherspoon, DJ, Tolpinrud W, Bamshad MJ, Tirupati S, Padmavati R, Smith H, Nancarrow D, Filippich C, Jorde LB1Department of Human Genetics, University of Utah, Salt Lake City, | To examine if caste endogamy has an influence on gene mapping | Genetic variation | Paternally-inherited Y-chromosome SNPs show that caste populations have greater affinity to a sample of Europeans than to a sample of eastern Asians. Unlike the Y-chromosome data, maternally-inherited mtDNA polymorphisms demonstrate a contrasting pattern – castes, regardless of rank, have higher affinity to eastern Asians than to Europeans. | No statement | No statement | Approach: Socio-Contextual |
| 5 | Social Affiliation and the Demand for Health Services: Caste and Child Health in South India.  (2007)19 | | Luke N1, Munshi K. 1 Brown University | This paper assesses the role of social affiliation, measured by caste, in shaping investments in child health | Child health | Low caste households spend more on their children's health than high caste households in the tea estates | Low caste households with access to inferior networks will distance themselves from their home community, which implies that their children are less likely to end up residing in their ancestral locations where the returns to human capital are relatively low. Higher returns to human capital among the low castes translate into larger investments in child health. | No statement | Approach: Individual |
| 6 | Women's health in a rural community in Kerala, India: do caste and socioeconomic position matter?  (2006)20 | | Mohindra KS1, Haddad S, Narayana D.  1Groupe de RechercheInterdisciplinaireen Santé (GRIS), Université de Montréal, Québec, Canada. | To examine the social patterning of women's self-reported health status in India and the validity of the two hypotheses: (1) low caste and lower socioeconomic position is associated with worse reported health status, and (2) associations between socioeconomic position and reported health status vary across castes. | Mortality rates among women | The burden of low socioeconomic position combined with lowness of caste can lead to “double deficits” in health. Small household landholdings, which are linked with poor health, yielded high ORs among SC/ST women, and to a lesser extent among OBC women showing a magnifying effect. Forward caste women are buffered from the negative effect of small household landholdings. | No statement | Implementing interventions that concomitantly deal with caste and socioeconomic disparities will likely produce more equitable results than targeting either type of inequality in isolation. | Approach: Individual |
| 7 | Y-chromosomal insights into the genetic impact of the caste system in India.  (2007)21 | | Zerjal T1, Pandya A, Thangaraj K, Ling EY, Kearley J, Bertoneri S, Paracchini S, Singh L, Tyler-Smith C.  1 The Wellcome Trust Sanger Institute, Wellcome Trust Genome Campus, Hinxton, Cambs | To analyze if the Y chromosome which is paternally inherited, so a Y-chromosomal lineage should remain within its caste of origin. | Genetics | The Jaunpur castes showed a marked reduction in genetic diversity compared with the rest of India. However, this reduction was not equally distributed among the castes, but was instead restricted to the Brahmins and Kshatriyas. | No statement | No statement | Approach: Socio-Contextual |
| 8 | Genetic affinities among the lower castes and tribal groups of India: inference from Y chromosome and mitochondrial DNA.  (2006)22 | | Thanseem I1, Thangaraj K, Chaubey G, Singh VK, Bhaskar LV, Reddy BM, Reddy AG, Singh L.  1Centre for Cellular and Molecular Biology, Uppal Road, Hyderabad- 500 007, India. | The Y-chromosome and mitochondrial DNA of three tribal populations of southern India, compared the results with available data from the Indian subcontinent and tried to reconstruct the evolutionary history of Indian caste and tribal populations. | Genetics and DNA variation | The lower castes which constitute more than 85% of the hierarchical Hindu caste system have the indigenous M52, M95 and M89, as their major Y lineages. This result suggests that the Indian lower castes are genetically more associated with the tribal populations, than to the higher castes, an evocative of their tribal origins. | No statement | No statement | Approach: Individual |
| 9 | The mortality divide in India: the differential contributions of gender, caste, and standard of living across the life course. (2006)23 | | Subramanian SV1, Nandy S, Irving M, Gordon D, Lambert H, Davey Smith G1Department of Society, Human Development and Health, Harvard School of Public Health | To examine the role of gender, caste, and standard of living to inequalities in mortality across the life course in India. | Mortality | Caste differentials in mortality were substantial among children and adolescents (aged 6–18 years) and the elderly, with scheduled tribe members experiencing a greater mortality risk across the life course. | No statement | No statement | Approach: Socio-Contextual |
| 10 | Genetic structure of four socio-culturally diversified caste populations of southwest India and their affinity with related Indian and global groups(2004)24 | | RevathiRajkumar and VK Kashyap1DNA Typing Unit, Central Forensic Science Laboratory, 30 Gorachand Road, Kolkata, | To examine the genetic structure of four diversified caste groups in Karnataka | Genetic Structure | The genetic affinity of Lyngayat with other related southern caste populations, like, Iyengar, Vanniyar and TanjoreKallar reiterates its heterogeneous past. It is noteworthy that although the southern populations exhibited higher affinity amongst each other, the high-ranking populations, like, Iyengar, Lyngayat and Vanniyar also displayed some genetic similarity to Brahmins from Bihar and Orissa, indicating that the gene pool of Iyengar and Lyngayat probably consists of genetic inputs from both southern and northern groups. | No statement | No statement | Approach: Socio-Contextual |
| 11 | Genetic evidence on the origins of Indian caste population(2001)25 | | Bamshad M1, Kivisild T, Watkins WS, Dixon ME, Ricker CE, Rao BB, Naidu JM, Prasad BV, Reddy PG, Rasanayagam A, Papiha SS, Villems R, Redd AJ, Hammer MF, Nguyen SV, Carroll ML, Batzer MA, Jorde LB.1 Department of Pediatrics, University of Utah, Salt Lake City, | To examine the origin of the Indian castes | Genetics | The effects of high mutation rates for the Y-chromosome STRs ,tend to obscure relationships between caste and continental populations | No statement | No statement | Approach: Socio-Contextual |
| **GENDER** | |
| **Serial No** | **Article Title** | | **Author and Author Information** | **Health Outcome** | **Research Question** | **Pathways** | **Explanation** | **Recommendations** | **Theoretical perspective** |
| 1 | Gender Difference in Blood pressure, Blood Sugar, and Cholesterol in Young Adults with Comparable Routine Physical Exertion(2013)26 | | T.S.Anish1,2 [Safraj Shahulhameed](http://www.ncbi.nlm.nih.gov/pubmed/?term=Shahulhameed%20S%5Bauth%5D),1 [K. Vijayakumar](http://www.ncbi.nlm.nih.gov/pubmed/?term=Vijayakumar%20K%5Bauth%5D),1,2 [Teena Mary Joy](http://www.ncbi.nlm.nih.gov/pubmed/?term=Joy%20TM%5Bauth%5D),2 [P. R. Sreelakshmi](http://www.ncbi.nlm.nih.gov/pubmed/?term=Sreelakshmi%20PR%5Bauth%5D),2 and [Anu Kuriakose](http://www.ncbi.nlm.nih.gov/pubmed/?term=Kuriakose%20A%5Bauth%5D)2  1Health Action by People (HAP), Government Medical College, Thiruvananthapuram, Kerala, India  2Department of Community Medicine, Government Medical College, Thiruvananthapuram, Kerala, India | Blood pressure, Blood Sugar, and Cholesterol | To find out the gender difference in the pattern of the clinical and biochemical indices related to NCD in young adults with comparable daily physical activity. | With the incidence of NCD is rising among women, it is imperative that urgent steps should be taken to increase the level of physical activity among women. | The plausible mechanism suggested for this kind of an observation is that the endogenous hormones of women are less atherogenic and has got less effect on insulin resistance. Neither estrogen nor androgen is now considered as a protective agent against diabetes or cardiovascular morbidities. But the effect of female sex hormones are found milder and the increased levels of androgens are considered a risk factor for cardiovascular events even among women. Another argument is that even though the mechanisms responsible for the gender differences in BP control and regulation are not clear, there is some evidence that interactions between sex hormones and the kidneys could play a role. Both endogenous and exogenous female sex hormones markedly influence the systemic and renal hemodynamic response to salt and water retention. | Our study indicates that community programs to reduce NCDs can be more effective if the observed gender difference in physical activity is taken into account and programmes tailored with the existing social customs in mind. | Approach: Individual |
| 2 | Gender inequality and bio-social factors in nutritional status among under five children attending anganwadis in an urban slum of a town in Western Maharashtra, India(2013)27 | | [Kriti A Patel](http://www.ncbi.nlm.nih.gov/pubmed/?term=Patel%20KA%5Bauth%5D), [Sanjivani D Langare](http://www.ncbi.nlm.nih.gov/pubmed/?term=Langare%20SD%5Bauth%5D), [J. D. Naik](http://www.ncbi.nlm.nih.gov/pubmed/?term=Naik%20JD%5Bauth%5D), and S. S. Rajderkar  Department of Community Medicine (PSM), Government Medical College, Miraj, Maharashtra, India | Nutritional status | The present cross-sectional study aims to assess the nutritional status (gender differences) of 146 under-5 children attending Anganwadis and also to study the bio-socio-demographic factors associated with malnutrition attending three Anganwadis of Adopted Urban slum area, involving anthropometric examination using standardized techniques and interview using predesigned semi-structured questionnaire for the mothers in September-October 2011. | The present study revealed that the prevalence of malnutrition is still high in urban slum area of Miraj town of Western Maharashtra and specially, under-5 children are the most vulnerable group with marginal gender differences | No Statement | The study highlights the awareness for the need of family planning, more attention to girl's nutrition, and educating mothers to achieve improvement in nutritional status of the girl child in spite of limited resources. Improvements in the functioning and utilization of Integrated Child Development Services ICDS Scheme need to be made in order to address the problem of malnutrition. Nutritional rehabilitation centers should be started in community and person from the community is identified and linked with health centers to treat under-nourished children. The families from communities should be encouraged for home based activities for alternative source of income, which will help in improving their purchasing power. Community support is also necessary to negate such gender inequalities pertaining to nutrition. | Approach: Individual |
| 3 | Socioeconomic Correlates of Gender Differential in Poor Health Status Among Older Adults in India(2013)28 | | 1Anamika Pandey and LaishramLadusingh1International Institute for Population Sciences, Deonar, Mumbai, India. | Self Assessment of Health | This study emphasizes the need to expand geriatric health care facilities in the public health system and also to recommend the need of gender sensitivity in all social assistance programs. | Resultsfrom the multivariate analysis provide enough evidence to conclude that significant gender differences exist among the older adults in reporting poor self-rated health. | A part of the older female excess in poor self-assessed health is also because older women are, on an average, more likely to be living without spouse and other members, which has a negative impact on their health. The presence of spouse and other household members provides a sense of security and opportunities for companionship and intimacy, which is important for the physical and mental well-being of older people. Much of the gender differential in reporting poor self-perceived health status among the older adults can be explained by the higher level of engagement of female older adults in unpaid work/not working followed by their higher level of illiteracy and economic dependency when compared to the older men. Apart from this, living arrangements also contributed much to the gender gaps in SRH. Older women were found to be more disadvantaged in terms of their current living arrangement, which contributed to the existing gender gaps. | To combat the gender differences in health in old age, we need to formulate policies and programs that can tackle the social and economic inequality among older men and women. | Approach: Individual |
| 4 | Gender Differences in the Prevalence of Electrocardiogram Abnormalities in the Elderly: A Population Survey in India(2012)29 | | [RupaliSachin Khane](http://www.ncbi.nlm.nih.gov/pubmed/?term=Sachin%20Khane%20R%5Bauth%5D)1 and [Anil D. Surdi](http://www.ncbi.nlm.nih.gov/pubmed/?term=Surdi%20AD%5Bauth%5D)2  1Department of Physiology, D. Y. Patil Medical College, Kolhapur, Maharashtra, India.  2Department of Physiology, V.M. Medical College, Solapur, Maharahtra, India. | Electrocardiogram Abnormalities | The objective of this study was to obtain accurate estimates of the prevalences of ECG changes in the general population, and to describe these prevalences in relation to age and sex. Moreover, it aimed at finding out gender differences in the prevalence of ECG abnormality in older people free from angina, and CHD and its associated risk factors | ECG predictors of myocardial damage (left bundle branch block or Q waves) were more prevalent in men. However, the prevalence of ST-T wave abnormalities in females was more than that in males. | The differences that exist between healthy men and women in various ECG parameters probably reflect the interplay of anatomic, structural, hormonal, autonomic, and genetic factors. | No Statement | Approach: Individual |
| 5 | Temporal trends and gender differentials in causes of childhood deaths at Ballabgarh, India - Need for revisiting child survival strategies(2012)30 | | [Anand Krishnan](http://www.ncbi.nlm.nih.gov/pubmed/?term=Krishnan%20A%5Bauth%5D),1 [Nawi Ng](http://www.ncbi.nlm.nih.gov/pubmed/?term=Ng%20N%5Bauth%5D),2 [Suresh K Kapoor](http://www.ncbi.nlm.nih.gov/pubmed/?term=Kapoor%20SK%5Bauth%5D),3 [Chandrakant S Pandav](http://www.ncbi.nlm.nih.gov/pubmed/?term=Pandav%20CS%5Bauth%5D),1 and [Peter Byass](http://www.ncbi.nlm.nih.gov/pubmed/?term=Byass%20P%5Bauth%5D)2  1Centre for Community Medicine, All India Institute of Medical Sciences, New Delhi, 110029, India  2Umea Center for Global Health Research, Department of Public Health and Clinical Medicine Umea University, Umea, Sweden  3Department of Community Health, St. Stephen’s Hospital, Delhi, India | Childhood deaths | This paper uses available information on causes of death among under-five children of Ballabgarh to measure the decadal changes in major causes of childhood deaths among the population of Ballabgarh project from 1972 to 2004 and the gender differences in the causes of death in the last decade. | In societies in which care is equal for boys and girls, baby girls have a lower mortality rate than baby boys: the ratio of neonatal mortality for boys to girls is usually at least 1.2. In the current study however, this was reversed. Data from different sources in India show that the major causes of death in the first week of life are due to asphyxia and prematurity whereas most of deaths in the 7-28days are due to sepsis. A review of all child deaths in the study area between 1991-95 showed that for early neonatal deaths (<7days), there was a slight preponderance of boys (55: 45) whereas for late neonatal deaths, the ratio was reversed to 40:60, which was more or less maintained till 5years of age. | No Statement | The results of this paper emphasize the same call for a revision of strategy to a broader development paradigm (resulting in reduction of incidence) and universal coverage (addressing equity), both of which are principles enshrined in primary health care approach. This will require interventions beyond health sector as well as scaling up of health systems to deliver universal coverage. This demands major financial investments which governments and donor agencies need to deliberate. | Approach: Socio-Contextual |
| 6 | Gender based within-household inequality in childhood immunization in India: changes over time and across regions (2012)31 | | Singh A Indira Gandhi Institute of Development Research, Mumbai, Maharashtra, India. | Childhood immunization | This study therefore has two objectives: to estimate the gender based within-household inequality (GWHI) in immunization status of Indian children and to examine the inter-regional and inter-temporal variations in the GWHI. | No Statement | The findings of the study are of potential value and are indicative. For example, scholars have argued that with declining fertility levels and with the advancement of sex-detection technologies, one would expect that the post-natal discrimination against the female children gets converted into prenatal discrimination and the female children thus born should get equal attention and the discrimination against female children should go down. | When children grow up healthier, they do better in school and are more productive as adults. Therefore, it is critical that government of India places investing in immunization high on their national health agenda. Since in India boys are preferred over girls when it comes to provision for health care which includes immunization, the achievement of the above mentioned MDG (Millennium Development Goal) by India will depend on whether the Government of India is able to create an atmosphere where parents pay equal attention to immunization of both, boys as well as girls. | Approach: Individual |
| 7 | Highprevalence and gender bias in distribution of *Plasmodium malariae*infection in central east-coast India (2009)32 | | Dhangadamajhi, G., Kar, S.K. and Ranjit, M.R. Regional Medical Research Centre (ICMR), Bhubaneswar-751023, Orissa, India | Plasmodium malariae | The study demonstrates that the parasite distribution in Orissa is random with substantially higher prevalence of *P.malariae*than previously suspected and this may be seasonal. A study of the bionomics of vector(s) responsible for *P. malariae* transmission in Orissa is needed to provide information for the control of malaria in the state | No Statement | The plausible explanation may be due to the indoor biting property of the vector(s) responsible for *P. malariae* transmission in this hyperendemic region. Although the vectors responsible for *P.malariae*transmission in Orissa is not known, the higher prevalence of *P. malariae* in females may be due to higher exposure to the indoor biting vectors involved. | No Statement | Approach: Socio-Contextual |
| 8 | Gender Identity of Children and Young Adults with 5a-Reductase Deficiency  (2008)33 | | E.P. Praveen1, Ankush K. Desai1, M.L. Khurana1, Jim Philip1, Marumudi Eunice1, Rajesh Khadgawat1, Bindu Kulshreshtha1, Kiran Kucheria2, Devendra K. Gupta3, Ashu Seith4 and Ariachery C. Ammini1Department of Endocrinology and Metabolism, 2Division of Genetics, Department of Anatomy, 3 Department of Pediatric Surgery and 4Department of Radiology, All India Institute of Medical Sciences, New Delhi, India | 5a-Reductase Deficiency | To understand Male pseudohermaphroditism among children based on their gendered identity | Children with 5a-reductase deficiency are usually reared as females, as the genital ambiguity is not very obvious at birth. However, they virilize later. The virilization at puberty is associated with change in gender role in most cases. | Most patients have a male gender identity by adolescence. Some have been reported to have an uncertain gender identity in childhood which resolves at puberty leading to gender role change. Others have been reported to have female gender identity that continues post-pubertally, resulting in their maintenance of female gender role. These authors believe gender identity continuously evolves during childhood becoming fixed only after puberty. Our experience with children with DSD23 indicates that prenatal androgen exposure has a greater impact in determining male gender identity than the sex of rearing and socio-cultural influences. | No Statement | Approach: Individual |
| 9 | Gender differences in body mass index in rural India are determined by socio-economic factors and lifestyle.(2006)34 | | Mary Barker, Ginny Chorghade,1 Sarah Crozier,1 Sam Leary,2 and Caroline Fall,1  1MRC Epidemiology Resource Centre, University of Southampton, Southampton General Hospital, Southampton SO16 6YD  2Avon Longitudinal Study of Parents and Children (ALSPAC), 22/24 Tyndall Avenue, Bristol BS8 1TQ  Corresponding author: Dr Mary Barker, MRC Epidemiology Unit, University of Southampton, Southampton General Hospital, Southampton SO16 | Body Mass Index | The purpose of this study was to identify social and economic factors associated with this difference in thinness, and to explore the behaviour in men and women that might underlie these associations. | We found that both men and women from farming households were thinner than those whose households were engaged in other types of work. Women but not men were significantly thinner in farming households that owned more land and milking animals, lived further from the main village and had a traditional joint family structure. In contrast, men but not women had higher BMIs if they lived in ‘cash-wealthy’ households - families living in better housing, having more material possessions, amenities, and consuming more oil. | Women in families with more land were thinner than those who owned less land. Land wealth seems to have a negative rather than positive effect on women’s BMIs, but was unrelated to men’s BMIs. Though both men and women undoubtedly have hard-working lives, the farming women seemed to have time for little else other than work. The pattern that described farming families with a joint family structure disadvantaged women more than men. This pattern may be identifying traditional family units where young married women are at the bottom of the hierarchy of decision-making and access to resources. | No Statement | Approach: Socio-Contextual |
| 10 | A contingent valuation study to estimate the parental willingness-to-pay for childhood diarrhoea and gender bias among rural households in India(2004)35 | | Mo Amin1 and Farhana Khondoker2  1Department of Economics, University of Ottawa, 2 Saddle Crescent, Ottawa, Ontario K1G 5L4, Canada  2Clinical Epidemiology Program, Ottawa Health Research Institute, 503 Smyth Road, Ottawa, Ontario K1H 8L6, Canada | Diarrhea | In this paper, we aimed to apply the contingent valuation technique to estimate the parents' willingness to pay for their child's diarrhoeal episode in rural India. The main objective was to explore whether or not parents' systematically valued their children differently on the ground of their child's gender, and if so to what extent does this valuation-based discrepancy exists between genders. | This study shows that in terms of the willingness to pay for child's health care, parents differed on their valuations between sexes and were significantly biased towards male children. In general, we found that educated parents were more willing to pay for their child's health care compared to uneducated parents. In particular, the relationship was found to be stronger in the case of mother being educated. However, the results indicate that gender bias towards male children increased as parental education increased. Although, this result emanated from a small sample of rural households, the result nevertheless insinuates that gender bias does not necessarily diminish with higher educational attainment. If this relationship between parental education and valuation of children (as expressed by WTP) holds true for illness, it may well hold true for education, nutrition, access to information, and other social programmes. In other words, this disturbing trend of gender bias can give rise to an inequitable resource allocation between sexes that may lead to an imbalanced social development. | No Statement | No Statement | Approach: Individual |
| 11 | Gender disparities in tuberculosis: report from a rural DOTS programme in south India  (2004)36 | | R. Balasubramanian,\* R. Garg,† T. Santha,\* P. G. Gopi,\* R. Subramani,\* V. Chandrasekaran,\*  A. Thomas,\* R. Rajeswari,\* S. Anandakrishnan, M. Perumal,‡ C. Niruparani,\* G. Sudha,\*  K. Jaggarajamma,\* T. R. Frieden,† P. R. Narayanan\*  \* Tuberculosis Research Centre, Chennai, World Health Organization, Stop Tuberculosis Unit, South East Asia Regional Office, New Delhi, Department of Medical Services, Tamil Nadu, India | Tuberculosis | To examine gender differences in tuberculosis among adults aged \_14 years with respect to infection and disease prevalence, health care service access, care seeking behaviour, diagnostic delay, convenience of directly observed treatment (DOT), stigma and treatment adherence. | No Statement | Men may have a higher risk of TB infection due to more frequent social contacts. | No Statement | Approach: Individual |
| 12 | Selective Gender Differences In Childhood Nutrition And Immunization In Rural India: The Role Of Siblings  (2003)37 | | Rohini Pande International Center for Research on Women, 1717 Massachusetts Avenue, NW, Suite 302, Washington, DC 20036, USA. | Childhood Nutrition and Immunization | This article addresses some of these gaps in the literature by examining gender differences in immunization and severe stunting among surviving rural Indian children under age 5. In particular, it focuses on the effects of the sex composition of surviving older siblings on such gender differences. | It also appears that, as hypothesized, not all girls and boys are treated equally, and there is evidence of patterns of selective neglect in the case of severe stunting and immunization that are consistent with the literature on mortality differences and that persist even after maternal, household, and community factors are taken into account. Thus, both girls and boys with only surviving siblings of the opposite sex fare better than do children with no surviving older siblings. Conversely, children with two or more surviving same sex siblings are worse off in terms of these two health outcomes. The strength of the preference for sons and the low value of girls are evident in that the harmful effect of having surviving older siblings of the same sex alone is harsher for girls than it is for boys, while the protective effect of having only opposite-sex surviving older siblings is weaker for girls than it is for boys. | That parents may discriminate selectively on the basis of gender *and* on where a particular son or daughter “fits” into the overall sex composition of the family strongly suggests that parental and societal norms about the values of girls relative to boys and about a desirable family sex composition are key to explaining why certain children fare worse than their siblings and why girls with older sisters fare particularly badly. | The strength of these results for immunization has particularly sobering policy implications for programs such as the Expanded Program on Immunization, which has been in place in India for many decades. | Approach: Individual |
| 13 | Gender, family, and the nutritional status of children in three culturally contrasting states of India  (2002)38 | | Paula Griffiths,a\*, Zoe Matthews . b, Andrew Hindeb  aCarolina Population Center, University of North Carolina, University Square, CB#8120. 123 West Franklin Street, Chapel Hill, NC 27516-3997, USA  bDepartment of Social Statistics, University of Southampton, Southampton, SO17 1BJ, UK | Nutritional Status | This paper has three main aims: to measure the clustering of children with low weight for age z-scores within families, to establish whether significant differences exist by gender in weight for age z-scores, and to demonstrate whether the presence of a mother-in-law in the household has any significant impact on the nutritional status of young children. Regression modelling is used to examine the weight for age z-scores of children under the age of four years in Maharashtra, Tamil Nadu and Uttar Pradesh using the 1992–93 Indian National Family Health Survey data. | It is only towards the end of the first year of life that the infant will be competing for a share of family resources. At older ages mothers have greater potential to discriminate in food allocation as the child stops breastfeeding. The observed insignificance of gender in  the 12–48 month age group compared to the significant finding in favor of females in the 1–11 month age group in Tamil Nadu and Uttar Pradesh shows that the female gender advantage disappears in the older age group, suggesting either that their biological advantage diminishes as they get older or that gender discrimination begins to reverse the biological differences observed. | In Tamil Nadu a child with the ‘worst’ characteristics lives in a family where the mother does not watch television at least once a week, has an illiterate mother, experienced an episode of diarrhea in the two weeks prior to the survey, was small at birth, is still breastfeeding, is male, has a father who works in a manual occupation, and lives in a family which does not contain a mother-in-law/daughter-in-law dyad. Conversely, a child with the ‘most favorable’ qualities lives in a family where the mother watches television at least once a week, the mother has a ‘middle school plus’ education, did not report an episode of diarrhea in the two weeks prior to the survey, was average or large sized at birth, has stopped breastfeeding at the time of the survey, is female, has a father who works in a non-manual occupation, and lives in a family which does contain a mother-in-law/daughter-in-law dyad. | No Statements | Approach: Individual |
| **EDUCATION** | |
| **Serial No** | **Article Title** | | **Author and Author Information** | **Health Outcome** | **Research Question** | **Pathways** | **Explanation** | **Recommendations** | **Theoretical perspective** |
|  |  | |  |  |  |  |  |  |  |
| 1 | Linkages between maternal education and childhood immunization in India  (2012)39 | | KritiVikram, M.A., Reeve Vanneman, Ph.D., and Sonalde Desai, Ph.D, University of Maryland | Childhood Immunization | Explore hypotheses that mothers’ education leads to better human, social, and cultural capitals which then help increase immunization rates for their children. | Educated mothers may have better knowledge of good medical practices and thus be more aware of the benefits of medical care | No Statement | No Statement | Approach: Individual |
| **WEALTH** | |
| **Serial No** | **Article Title** | | **Author and Author Information** | **Health Outcome** | **Research Question** | **Pathways** | **Explanation** | **Recommendations** | **Theoretical perspective** |
| 1 | Adult education and child mortality in India: the influence of caste, household wealth, and urbanization(2008)40 | | Singh-Manoux A1Dugravot A, Smith GD, Subramanyam M, Subramanian SV.1NSERM, U687-IFR69, Hôpital Paul Brousse, Bâtiment | Child Mortality | To examine the association between adult education and child mortality, and to explore the influence of other socioeconomic markers - caste, household wealth and urbanization - on this association. | Household wealth is important to consider as there have been results showing material factors explain away the association between education and child mortality | No Statement | No Statement | Approach: Socio-Contextual |
| 2 | Socioeconomic and gender inequalities in neonatal, postneonatal and child mortality in India: a repeated cross-sectional study, 2005-2016. (2019) | | Omar Karlsson1: Centre for Economic Demography, Lund Universitet Ekonomihogskolan, Lund, Sweden Rockli Kim: Harvard Center for Population and Development Studies, Cambridge, Massachusetts, USA. William Joe: Population Research Centre, Institute of Economic Growth, Delhi, India. S V Subramanian: Department of Social and Behavioral Sciences, Harvard T.H. Chan School of Public Health, Boston, Massachusetts, USA | Neonatal, postneonatal and child mortality | In India, excess female under-5 mortality is well documented. Under-5 mortality is also known to be patterned by socioeconomic factors. This study examines sex differentials and sex-specific wealth gradients in neonatal, postneonatal and child mortality in India. | Across all outcomes, we identified a socioeconomic gradient where the probability of mortality decreased with increasing household wealth. We find a stronger wealth gradient in neonatal mortality for boys while the wealth gradient in child mortality is much stronger for girls. Measuring through a male:female ratio of predicted neonatal mortality, we found greater male neonatal mortality at all levels of household wealth. We found greater female postneonatal mortality over most of the wealth distribution, except in the wealthiest households. The female disadvantage in child mortality was primarily observed in poorest households. | Globally, India and China have the most significant deficits in the proportion of women that would be expected in their populations (ie, ‘missing women’), and research has suggested that the resulting surplus of men leads to social problems, such as increased crime in general, and against women in particular.27 28 India’s excess female under-5 mortality has often been attributed to a preference for sons rooted in cultural and institutional traditions.29 30 Parents may feel that sons will provide them with security in their old age, or they may believe that sons have higher earning potential, be able to sustain the family lineage and do not have the dowry costs associated with girls. Studies have suggested that economic development by itself is not enough to break down the tenacity of norms favouring sons, but that female education and access to ‘modern’ information through media reduces son preference. | Substantial gains towards the Sustainable Development Goals can be made by reducing neonatal mortality in poor households. | Approach: Individual |
| 3 | Malnutrition among women and children in India: limited evidence of clustering of underweight, anemia, overweight, and stunting within individuals and households at both state and district levels. (2019) | | JS Varghese: Nutrition and Health Sciences Program, Laney Graduate School, Emory University, Atlanta, GA and AD Stein: Hubert Department of Global Health, Emory University, Atlanta, GA | Malnutrition | Our objective was to describe the prevalence of a comprehensive list of dual burdens of malnutrition in individuals and households across the 36 states and 640 districts of India. | At the state and district levels, individual burdens of stunting and underweight were strongly associated with poverty (30), while maternal overweight was positively associated with wealth. The inverse relationship of CAN-WAN excess with wealth index indicates that the deviation from the expected prevalence for this dual burden might be partly attributable to standard of living, a proxy for household possessions as well as living conditions. The absence of an association of excess dual burden prevalence with wealth for other dual burdens possibly indicates that, although wealth is a driver of each individual burden, any co-occurrence is driven by other factors that are not related to wealth. | No explanation | All the dual burdens of public health significance for which the observed prevalence is greater than the expected prevalence are a combination of two undernutrition burdens in an individual or household, which suggests the continued need for poverty alleviation. Policies that are targeted at households, such as the National Food Security Act, and individuals, such as “Anemia Mukt Bharat” or Anemia Free India through Intensified-National Iron Plus Initiative and the Integrated Child Development Services, could focus on better broad implementation rather than customization for a limited number of dual-burden households. | Approach: Socio-Contextual |
| **INCOME** | |
| **Serial No** | **Article Title** | | **Author and Author Information** | **Health Outcome** | **Research Question** | **Pathways** | **Explanation** | **Recommendations** | **Theoretical perspective** |
| 1 | Visual Impairment in Urban School Children of  Low-Income Families in Kolkata, India  (2012)41 | | \*Sambuddha Ghosh1  , Udayaditya Mukhopadhyay1  , Dipankar Maji2  , Gautam Bhaduri3  1Assistant Professor, Regional Institute of Ophthalmology, 2DADHS (Public Health), Government of West Bengal,  SwasthyaBhawan, 3Professor & Director, Regional Institute of Ophthalmology, Kolkata, India | Visual Impairment | To evaluate pattern of visual impairment in school children from low-income families in Kolkata | No Statement | It was also evident from this study  that although refractive error was the principal cause of  lack of visual acuity in the students, existing spectacle  use before school eye screening was very low | Our observation  Justifies special planning with priority in SES program for  school children from low-income families. Identifying  schools located near slum areas may help reach these  children in need | Approach: Socio-Contextual |
| 2 | Convergence of prevalence rates of diabetes and cardiometabolic risk factors in middle and low income groups in urban India: 10-year follow-up of the Chennai Urban Population Study. (2011)42 | | Deepa M1Anjana RM, Manjula D, Narayan KM, Mohan V1Madras Diabetes Research Foundation & Dr. Mohan's Diabetes Specialities Centre, WHO Collaborating Centre for Noncommunicable Diseases Prevention and Control, IDF Centre for Education, Chennai, India. | Diabetes and cardiometabolic risk factors | The aim of this study was to look for temporal changes in the prevalence of diabetes and cardiometabolic risk factors in two residential colonies in Chennai. | As the epidemiological transition matures, the epidemic of diabetes and obesity in India and other developing countries will move to the urban poor and to rural areas as presently seen in developed countries | This could pose a huge socioeconomic burden on developing countries as the poor cannot afford to pay for lifelong treatment that chronic diseases require. | No Statement | Approach: Socio-Contextual |
| 3 | Income and Nutritional Status of the Fishing CommunityResiding in Coastal Bay of Bengal: A Case Study(2011)4 | | Baidyanath Pal1, ManabenduChattopadhyay2, Moumita Maity1, \*,Barun Mukhopadhya1, and Ranjan Gupta11Biological Anthropology Unit, Indian Statistical Institute2Economic Research Unit, Indian Statistical Institute | Nutritional Status | The paper presents the results of a surveycarried out during 2006-07 with the objective of throwing light on the life and living conditions of an economically weaker community such as ‘fishing community’ residing in thecoastal area of Bay of Bengal in West Bengal and Orissa, India, in the context of global scenario. | The BMI of the population is significantly associated with the per capita householdincome and in turn the per capita household income depends on the amountof land. So, as we know that the study population is a fishing community, it is anecessity for them to have agricultural land for an amelioration of their livelihood. | The very poor households cannotrestrict their consumption only to costly items like cereals but go for a lot of otheritems which are relatively cheap and sometimes are collected from nature such asfish and vegetables. | Marketing and social security (including health insurance) programs should beundertaken and implemented for the benefit and upliftment of the fishermen. | Approach: Socio-Contextual |
| 4 | Tobacco control among disadvantaged youth living in low-income communities in India: introducing Project ACTIVITY.(2010)44 | | Arora M1 Stigler M, Gupta V, Bassi S, Dhavan P, Mathur N, Tripathy V, Perry C, Reddy KS1HRIDAY (Health Related Information Dissemination Amongst Youth), New Delhi, India. | Tobacco Control for Youth | To provide an overview of Project ACTIVITY, a group randomized intervention trial designed to test the efficacy of a community-based, comprehensive approach to tobacco control for youth (10-19 years) living in low-income communities in India. | No Statement | No Statement | The enforcement of tobacco control legislation in India e.g. ban on sale of tobacco products to those younger than 18; and prohibition of sale of tobacco products within 100 yards of educational institutions (Tobacco Control Act of India, 2003) will be integral to the success of curbing tobacco use and has been included as an important strategy in Project ACTIVITY. | Approach: Socio-Contextual |
| 5 | Income inequality and the double burden of under- and overnutrion in India.(2007)45 | | Subramanian SV1, Kawachi I, Smith GD.1Department of Society, Human Development and Health, Harvard School of Public Health, Boston, | Nutritional Status | This study examined the association between contextual income inequality and the double burden of under- and overnutrition in India. | Highly unequal states are characterized by the simultaneous existence of overconsumption by privileged groups and food insecurity among the poor. | In addition to being an indicator of maldistributed resources, income inequality may also be a marker of a less generous, or inefficient, public distribution system, e.g. as a result of corruption | No Statement | Approach: Socio-Contextual |
| **POVERTY** | |
| **Serial No** | **Article Title** | | **Author and Author Information** | **Health Outcome** | **Research Question** | **Pathways** | **Explanation** | **Recommendations** | **Theoretical perspective** |
| **1** | Multidimensional poverty, household environment and short-term morbidity in India. (2017) | | B Dehury and SK Mohanty, International Institute for Population Sciences | Short term morbidity | The objective of this paper is to examine the linkages of multidimensional poverty, deprivation of household environment and short-term morbidities in India. | Our results confirmed a higher prevalence of short-term morbidities among those who were multidimensional poor and living in a poor household environment compared to the other households. This shows that along with poverty, household environmental conditions have an important effect on the health of the population in general and short-term morbidities in particular. | Most of the households with poor environment had low sanitation and were deprived from drinking water facilities. Hence short term morbidities affected these households more. | Providing access to improved sanitation, drinking water and cooking fuel requires a multipronged strategy that will certainly improve the health of the population. | Approach: Socio-Contextual |
| 2 | Addressing poverty through disease control programmes: examples from Tuberculosis control in India(2012)46 | | Vishnu VardhanKamineni, Nevin Wilson, and Lakbir Singh Chauhan 1International Union Against Tuberculosis and Lung Diseases (The Union), South-East Asia Regional Office, New Delhi, India. | Tuberculosis | The purpose of the study was to obtain an understanding on pro-poor initiatives within the framework of tuberculosis control programme in India and to identify mechanisms toimprovethe uptake and access to TB services among the poor. | The participants in the study discussed the barriers in accessing diagnostic and treatment services, especially among the poor and vulnerable populations within their jurisdictions. | Several factors identified as impeding access to TB diagnostic services among the poor include lack of awareness of existing TB services, lower education levels among the marginalized groups, sub-optimal or ineffective ACSM implementation by the RNTCP, discrimination in relation to gender/age/religion, and apathy of health care providers towards the poor. | There is a need for evaluating and addressing wider issues related to poverty within the scope of the TB Control Programme. Addressing health inequities necessitates multi-sectoral coordination, and that sustained TB control efforts involving pro-poor approaches with resulting decline in TB prevalence among the poor and advancing the welfare of the poor seems likely. This is possible only when intensified efforts sustained by the RNTCP, are augmented with coordinated and synergistic efforts of concerned departments across diverse sectors dealing with populations that are considered to be poor | Approach: Socio-Contextual |
| 2 | Multidimensional Poverty and Child Survival in India(2011)47 | | Sanjay K. Mohanty  Department of Fertility Studies, International Institute for Population Sciences, Mumbai, Maharashtra, India. | This paper measures poverty in multidimensional space and examine the linkages of multidimensional poverty with child survival. | Child survival | No Statement | People who are educationally poor might not fully realize the benefits of the maternal and child care while those are economically poor may perceive health services as unaffordable. Second, early marriage of girls and early motherhood, poor nutritional intake of mother during pregnancy (may cause low birth weight), poor environmental condition (unsafe water, no sanitation facilities, use of cooking arrangement, crowding etc), exposure to childhood diseases are equally higher among educationally, economically health poor. | From policy perspectives, multidimensional poverty clearly demonstrates the multiple deprivation of a household in the key domain of human development, that is, education, health and living standard and inequality in child health outcome. The multidimensional poverty index will serve better for policy formulation as it can address the growing inequality in health care utilization and health outcome among population sub-groups in the country effectively. | Approach: Socio-Contextual |
| 3 | Poverty, child undernutrition and morbidity: new evidencefrom India(2005)48 | | Shailen Nandy,1  Michelle Irving,2  David Gordon,3  S.V. Subramanian,4  & George Davey Smith5  1Research Student, School for Policy Studies, University of Bristol,  2Research Associate, School for Policy Studies, University of Bristol, Bristol, England.  3Professor, School for Policy Studies, University of Bristol, Bristol, England.  4Assistant Professor, Harvard School of Public Health, Harvard University, Boston, USA.  5Professor, Department of Social Medicine, University of Bristol, Bristol, England. | Child Undernutrition | Using anthropometric data on 24 396 children in India, we constructed an alternative composite index of anthropometric failure  (CIAF) and compared it with conventional indices. The CIAF examines the relationship between distinct subgroups of anthropometric  failure, poverty and morbidity, showing that children with multiple anthropometric failures are at a greater risk of morbidity and are  more likely to come from poorer households. | No Statement | Undernourishedchildren are also more likely to come from poorer backgrounds (20, 24) where they do not get enough food and are exposed to poor living conditions (e.g. lacking proper sanitation or clean drinking water), which in turn lead to disease andfurther under nutrition. | No Statement | Approach: Socio-Contextual |
| 4 | Impact of poverty on the prevalence of diabetes andits complications in urban southern India (2001)49 | | A. Ramachandran, C. Snehalatha, V. Vijay and H. King\*  Dr A. Ramachandran MD, PhD, FRCP, Director, Diabetes  Research Centre & M. V. Hospital for Diabetes, | Diabetes | The impact of poverty on the profile of diabetes and its complications was  studied | The finding of lower prevalence of diabetesin the socially deprived urban Indians was in contrast to thepositive association of diabetes and social deprivation in westerncountries | This was likely to be due to a higherlevel of physical activity in the LIG, as most of them wereengaged in manual work involving moderate to strenuousphysical activity. | No Statement | Approach: Socio-Contextual |
| **SOCIO-ECONOMIC POSITION** | |
| **Serial Number** | **Article Title** | | **Author and Author Information** | **Health Outcome** | **Research Question** | **Pathways** | **Explanation** | **Recommendations** | **Theoretical perspective** |
| 1 | Socioeconomic Position and Prevalence of Self-Reported Diabetes in Rural Kerala India: Results From the PROLIFE Study (2012)50 | | Safraj S1, Anish Ts, Vijayakumar K, KuttyVR,Soman CR  1Health Action by People, Trivandrum, Kerala, India | Diabetes | This article aims to study the relationship between socioeconomic position (SEP) and prevalence of self-reported diabetes in a rural population in Kerala, India. | No Statement | No Statement | The state has witnessed dramatic improvements in the quality of life of people, consequent to urbanization. Diets are getting richer and physical activity is declining as the middle class is burgeoning. The burden of diabetes is likely to be much higher in the immediate future, calling for effective preventive strategies. | Approach: Individual |
| **IMMIGRANT** |  | |  |  |  |  |  |  |  |
| **Serial Number** | **Article Title** | | **Author and Author Information** | **Health Outcome** | **Research Question** | **Pathways** | **Explanation** | **Recommendations** | **Theoretical perspective** |
| 1 | Diabetes in Immigrant Tibetan Muslims in Kashmir, North India. (2018) | | MSU Riyaz and MK Rather: Department of Internal and Pulmonary Medicine, Sheri Kashmir Institute of Medical Sciences, Srinagar, 190011, J&K, India. PA Department of Internal and Pulmonary Medicine, Sheri Kashmir Institute of Medical Sciences, Srinagar, 190011, J&K, India | Diabetes | The current study is designed to assess the prevalence of diabetesand its risk factors in this closely knit ethnically distinct  population | These data suggest that high-altitude adaptations may offer  protection from diabetes at high altitude but the risk of  diabetes would increase at lower altitudes especially when  coupled with the adoption of a non-traditional diet | No explanation | Further studies  into the mechanisms underlying these changes are required  to understand the reasons for higher prevalence of diabetes among this population when compared to the Tibetans  living at high altitudes and native Kashmiris living at the  same altitude. | Approach: Socio-Contextual |
| 2 | Maternal health care access among migrant women labourers in the selected brick kilns of district Faridabad, Haryana: mixed method study on equity and access (2018) | | A Siddiah: Department of Community Health, St John's National Academy of Health Sciences.  S, Kant, P, Haldar, SK Rai and P Misra: Centre for Community Medicine, All India Institute of Medical Sciences | Maternal health care access | This study was planned with the objective of documenting the maternal health care utilization among women labourers working in brick kilns situated in an area of Haryana, north India. | Majority (81.7%) of women in our study belonged to SC/ST, a disadvantaged section which is associated with poor uptake of antenatal care. Age wise break up of institutional delivery showed that older women had less institutional delivery rate. Women’s social class, and more number of years in brick kilns along with location of brick kilns might have limited the access to institutional care at the time of delivery. Circular migration has also shown to affect health service uptake at place of origin. Many preferred government health facility for care during pregnancy and opted for institutional delivery if good facility, free treatment, and quality of care was available. | Majority (81.7%) of women in our study belonged to SC/ST, a disadvantaged section which is associated with poor uptake of antenatal care. Age wise break up of institutional delivery showed that older women had less institutional delivery rate. Women’s social class, and more number of years in brick kilns along with location of brick kilns might have limited the access to institutional care at the time of delivery. Circular migration has also shown to affect health service uptake at place of origin. Many preferred government health facility for care during pregnancy and opted for institutional delivery if good facility, free treatment, and quality of care was available. | Firstly, mapping of such unorganised migrant settlements and reaching out to them through the public health system is needed. Intense information education and communication activities targeted to migrant populations about the existing public health facilities, free referral transport, RSBY is an important strategy. Since JSY is a 100% centrally funded scheme, the health system could become flexible to provide cash incentives for institutional delivery to migrants at their place of work. It must be ensured that migrants avail maternal and child health care with zero out-of-pocket expenditure irrespective of work place. This is expected to increase the uptake of maternal health services. Under the mobile health map programme, migrant populations are accessing primary health care in the United States [31, 32]. Similarly, considering the seasonality of migration, local public health system must be sensitised to provide outreach maternal health services using dedicated migrant mobile health units involving frontline workforce such as ASHA (Accredited Social Health Activist). There is a scope to report how social inequity influence health indicators in national level surveys. For this NFHS and DLHS must include such migrant population in their surveys. Concerted efforts by the concerned stake holders within and outside public health system to address maternal health needs of migrant women is need of the hour to achieve universal health coverage. | Approach: Socio-Contextual |
| 3 | Prevalence of Neglected Tropical Diseases (Leishmaniasis and Lymphatic Filariasis) and Malaria Among a Migrant Labour Settlement in Kerala, India.  (2019) | | S George, TM Joy, KN Panicker, LS George and K Leelamoni: Department of Community Medicine, Amrita Institute of Medical Sciences, Amrita Vishwa Vidyapeetham, Ponekkara, Kochi, Kerala. A Kumar: Department of Microbiology, Amrita Institute of Medical Sciences, Amrita Vishwa Vidyapeetham, Ponekkara, Kochi, Kerala. M Raj: Department of Public Health, Amrita Institute of Medical Sciences, Amrita Vishwa Vidyapeetham University, Ponekkara, Kochi, Kerala. P Nair: Amrita Institute of Medical Sciences, Amrita Vishwa Vidyapeetham, Ponekkara, Kochi, Kerala | Neglected tropical diesease and Malaria | A cross sectional study was conducted to assess the prevalence of NTDs (leishmaniasis and lymphatic filariasis) and  malaria among migrant labor settlement in Kochi, Ernakulam district and also to study the associated risk factors of  these diseases among the migrant workers | Level of education, type of native house, presence of  domestic animals, use of mosquito nets and habit of sleeping  outside was not found to be statistically significant for the  prevalence of malaria and filariasis according to this study. | The living conditions  of these migrant laborers are very bad with poor personal  hygiene, poor sanitation and overcrowding making it conducive for vector breeding and consequent transmission of  malaria and other vector borne diseases. | Only active surveillance among  the migrant workers and their subsequent treatment coupled  with clean environment will help in averting a possible outbreak. The findings of the present study will help formulate  policies to implement measures to prevent transmission and  re-emergence of these vector borne diseases. The public  health care system along with the ministry of labour should  address this important emerging issue. | Approach: Socio-Contextual |
| 4 | Access to childhood immunisation services and its determinants among recent and settled migrants in Delhi, India  (2018) | | YS Kusuma, S, Kaushal, and AB Sunadr: Centre for Community Medicine, All India Institute of Medical Sciences, New Delhi, India BV Babu: Socio-Behavioural and Health Systems Research Division, Indian Council of Medical Research, New Delhi | Immunisation services | The objective of the study is to understand the access of childhood immunisation services to the socio-economically disadvantaged migrants and the determinants of full immunisation uptake up to the age of 1 year. | Childhood immunisation coverage rates were low as only 31% of recent-migrant children and 53% of settled-migrant children were fully immunised against seven vaccine-preventable diseases (VPDs) by 12 months of age. | Lack of awareness of the immunisation schedule and location of health facilities, mobility, illness of the child, fear of vaccines and side-effects were the main reasons for incomplete or no immunisation. Mother's educational attainment, TV viewership, hospital birth and receipt of information on childhood immunisation from the health workers during postnatal visits increased chances of getting the child fully immunised against seven VPDs by 1 year of age | There is a need to deliver services with a focus on recent migrants. Investing in education and socio-economic development and providing secured livelihoods and equitable services are important to improve and sustain access to healthcare services in the long run. | Approach: Individual |
| 5 | Determinants of internal migrant health and the healthy migrant effect in South India: a mixed methods study.  (2017) | | W Dodd: Department of Population Medicine, University of Guelph, Guelph, S Humphries: Department of Sociology and Anthropology, University of Guelph, K Patel: International Development Studies Program, Menno Simons College affiliated with the University of Winnipeg and Canadian Mennonite University, Winnipeg, S Majowicz: School of Public Health and Health Systems, University of Waterloo, Waterloo, Ontario, M Little and C Dewey: Department of Population Medicine, University of Guelph, Guelph | Migrant Health | Previous research on the connections between health and labour mobility within India have primarily focused on the negative health outcomes associated with this practice. Thus, there is a need to better identify the determinants of internal migrant health and how these determinants shape migrant health outcomes. | Our quantitative data on self-reported illness demonstrates that migrant workers and non-migrant adults from the same rural area have similar health profiles. However, migrant males under age 40 appear to have a higher prevalence of some health problems including connective tissue problems. Moreover, for health problems reported among migrant workers, the relationship between a particular health outcome and migrant labour activities was obvious in some cases (e.g., a broken arm due to a workplace accident). At other times though, the association between health and migrant labour was less clear (e.g., joint pain attributed to ongoing manual labour), however the causal relationship between migration and a poor health outcome was clear in the mind of the respondent. | Despite these connections between internal migrant activities and poor health outcomes, the similar health profile between migrant and non-migrant adults in this context calls into question the idea that internal migrant workers have a distinct health advantage over their non-migrant counterparts. In the research area, non-migrant adults are largely engaged in agricultural work, either on their own land, or on the land of large landowners. This work is physically demanding, and as other studies have demonstrated, rural agricultural workers, are at risk for a host of occupational hazards and health problems. In some cases, rural-to-urban and rural-to-rural migrant workers are exposed to similar working conditions as non-migrant workers. | The importance of internal labour migration for individuals and households in this setting and throughout India means the diagnosis of health problems associated with internal labour migration must be combined with the identification and measurement of the determinants of internal migrant health. With greater resources allocated to public health interventions that respond to these contextual determinants of health, it is more likely that internal labour migration will contribute to the expected gains in human development for migrant workers and their households. | Approach: Socio-contextual |
| 6 | Evaluation of the Universal Immunization Program and Challenges in Coverage of Migrant Children in Haridwar, Uttarakhand, India. (2015) | | L Nath: Master of Public Health scholar, National Institute of Epidemiology, Chennai, Tamil Nadu, P Kaur: Scientist C, Department of Health Systems Research, National Institute of Epidemiology, Chennai, Tamil Nadu, S Tripathi: Surveillance Medical Officer, National Polio Surveillance Project, Haridwar, Uttarakhand | Immunization | India has a dropout rate of 17.7% between Bacillus Calmette-Guιrin (BCG) and measles (District Level Household Survey (DLHS)-3). Haridwar district had the highest dropout rate of 27.4% from BCG to diphtheria, pertussis, and tetanus (DPT) 3 (DLHS-3) in Uttarakhand. We evaluated the Universal Immunization Programme (UIP) among migrants in Haridwar in two blocks. | Our evaluation indicated low immunization coverage with gaps in the health system in terms of inadequate cold chain maintenance, inadequate monitoring, and poor implementation of systems for tracking dropouts. | The community did not adequately utilize the services due to lack of counseling from the health staff, lack of awareness, and social determinants such as low literacy level. | We recommended mobile immunization teams comprising ANMs and ASHAs to cover widespread rural migrant clusters. Interventions such as counseling of parents, prelisting of migrant children with the help of local brickkiln managers/contractors at construction sites, and incentivizing ASHAs for these activities could be considered. All injection safety and cold chain guidelines were to be stringently implemented. Mechanisms to track dropouts and supervision needed to be strengthened to improve the coverage. In October 2013, Government of Uttarakhand, sanctioned a special “Brick Kiln Plan” which covers 200 kilns in Haridwar wherein every Tuesday 11 mobile immunization teams covered five brick kilns each. Three field supervisors were recruited for monitoring and microplanning. An “ASHA reward” scheme was initiated to encourage ASHAs working in migrant clusters for mobilizing the dropouts and left-outs. | Approach: Individual |
| **DISPARITY/DISPARITIES** |  | |  |  |  |  |  |  |  |
| **Serial Number** | **Article Title** | | **Author and Author Information** | **Health Outcome** | **Research Question** | **Pathways** | **Explanation** | **Recommendation** | **perspective** |
| 1 | Determinants of Stunting, Wasting, and Underweight in Five High-Burden Pockets of Four Indian States (2018) | | Rajesh Kumar Sinha, Richa Dua, Vasundhara Bijalwan, Shivani Rohatgi: National Nutritional Rehabilitation Resource and Training Centre, Lady Hardinge Medical College and Associated Kalawati Saran Children's Hospital, New Delhi, India  Praveen Kumar: Department of Pediatrics, Lady Hardinge Medical College and Associated Kalawati Saran Children's Hospital, New Delhi, India | Stunting, wasting and underweight | The study was conducted with the objective to identify significant predictors of stunting, wasting, and underweight. | Food security status and usage of toilet facility emerged as major predictors of childhood stunting and underweight, thus underpinning the importance of addressing poverty and providing sanitation facilities to rural households. Low BMI status of mothers also emerged as a major predictor of childhood stunting and underweight which shows that both maternal and child under-nutrition are interrelated | The analysis also tried to address the question that whether stunting, wasting, and underweight share common predictors. It was found that some predictors such as food security status, usage of toilet facility, mothers BMI status, and age group of children were common for underweight and stunting. Wasting did not share any common predictor with stunting or underweight. | Commission on Social Determinants of Health has identified that apart from policy intervention and inter-sectoral convergence, social participation and empowerment are the key strategies for dealing with inequities. Women empowerment using adult learning methods such as participatory learning and action approach have shown evidence of improving child survival and growth along with addressing other social determinants in underserved and marginalized communities and could also be integrated into the intervention package. | Socio-Contextual |
| 2 | Triple Burden of Obesity, Undernutrition, and Cardiovascular Disease Risk among Indian Tribes (2016) | | Kshatriya GK and Acharya SK: Department of Anthropology, University of Delhi, Delhi-110007, India | Obesity, Undernutrition, and Cardiovascular, Disease Risk | The present study estimated the prevalence of the triple burden of obesity, undernutrition, and hypertension and highlighted the risk for potential CVDs among nine major Indian tribes from different geographic locations of three states. | The findings revealed a high prevalence of hypertension among the studied Indian tribes, with a high prevalence of undernutrition and overweight among women and men respectively. The prevalence of obesity was similar among men and women. The increased prevalence of overweight along with high undernutrition and hypertension indicated that women are at a higher risk of CVD-related vulnerabilities. | Several urban and market centers have developed in and around the tribal regions, which have considerable influence the socio-cultural lifestyle and habits of the nearby inhabiting tribes. A glimpse of this adaptation and shift from indigenous traditions to an urban lifestyle was considerably visible during fieldwork. | A systematic and comprehensive health policy along with timely intervention programs is strongly warranted. | Individual |
| 3 | Socioeconomic and gender inequalities in neonatal, postneonatal and child mortality in India: a repeated cross-sectional study, 2005-2016 (2019) | | Karlsson O: Centre for Economic Demography, Lund Universitet Ekonomihogskolan, Lund, Sweden Kim, R: Harvard Center for Population and Development Studies, Cambridge, Massachusetts, USA. Joe W: Population Research Centre, Institute of Economic Growth, Delhi, India Subramanian SV:  Department of Social and Behavioral Sciences, Harvard T.H. Chan School of Public Health, Boston, Massachusetts, USA | Neonatal, postneonatal and child mortality | This study examines sex differentials and sex-specific wealth gradients in neonatal, postneonatal and child mortality in India. | Overall, boys had greater neonatal mortality than girls and the difference increased between 2005-2006 and 2015-2016. Girls had greater postneonatal and child mortality, but the difference decreased between the surveys and was not statistically significant for child mortality in 2015-2016. A negative wealth gradient was found for all mortality outcomes. Neonatal mortality was persistently greater for boys. Girls had higher child mortality than boys at low levels of wealth and greater postneonatal mortality over much of the wealth distribution. The wealth gradient in neonatal mortality increased between surveys. Females had a stronger wealth gradient than boys for child mortality. | No statement | Substantial gains towards the Sustainable Development Goals can be made by combating neonatal mortality, especially at low levels of wealth. Although impressive improvements have been made in reducing the female disadvantage in postneonatal and child mortality, concerted engagements are necessary to eliminate the gender gap-especially in poor households and in north India. | Socio-Contextual |
| **INEQUALITY/INEQUALITIES** |  | |  |  |  |  |  |  |  |
|  | **Article Title** | | **Author and Author Information** | **Health Outcome** | **Research Question** | **Pathway** | **Explanation** | **Recommendation** | **Perspective** |
| 1 | Demographic surveillance over 12 years helps elicit determinants of low birth weights in India (2019) | | Apte A, Patil R, Lele P, Choudhari B, Bhattacharjee T, Bavdekar A, Juvekar S: Vadu Rural Health Program, KEM Hospital Research Centre, Pune, Maharashtra, India | Low birth weights | To assess trends in the birth weight, the proportion of low birth weight, maternal factors and health care facilities for delivery in villages of Western Maharashtra from the year 2004 to 2016 and to analyze factors associated with low birth weight for total birth data of 2004-2016 | Female gender, first birth order, poor maternal education, and maternal occupation were found to be significantly associated with the risk of LBW.  Females were associated with lower birth weights than male babies and had a 16% increased risk of LBW. | The exact reason for this gender difference is not known, however, some role of androgens secreted by fetal testes in male fetuses maternal food intake and vitamin D receptor genotype influencing intrauterine and early postnatal growth, through interactions with gender-related growth regulators is suggested | No statement | Individual |
| 2 | Biological risk factors for coronary artery disease among adults residing in rural area of North Karnataka, India (2019) | | Kavi A, Walvekar and PR: Department of Community Medicine, Jawaharlal Nehru Medical College, KLE Academy of Higher Education and Research, Nehru Nagar, Belagavi, Karnataka, India. Patil RS: Department of Internal Medicine, Jawaharlal Nehru Medical College, KLE Academy of Higher Education and Research, Nehru Nagar, Belagavi, Karnataka, India. | Coronary artery disease | Coronary artery disease (CAD) accounts for 60% of all deaths and 47% of burden of diseases which is progressively increasing in rural population in terms of absolute numbers. Biological risk factors contribute significantly to the cardiovascular burden. Hence, this study was undertaken to assess the biological risk factors among adults residing in rural area. | This study assessed various biological risk factors for CAD among the adult residents in the rural area. The higher women participants in this study (51.2% vs. 48.8%) were comparable with two studies conducted in rural area of Faridabad and Delhi districts of North India, where the proportion of women was higher (52.0%; 62.5%) as compared to men (48.0%; 37.5%), respectively. | Advancing age, lesser education, and retirement from the job were the contributors for the increasing prevalence of these risk factors; however, the SES did not show any influence on the risk factors. | Residents of the rural area lack the necessary health-care infrastructure and management facilities for CAD due to variety of constraints, including the low SES and lack of education. Thus, aiming at the primary prevention by assessment of the modifiable biological risk factors and doing selective screening instead of universal screening and targeted interventions can be undertaken to minimize the risk factors and hence combat the problem of increasing CAD-related mortality and morbidity in the economically disadvantaged group of the society. Risk assessment by primary care physicians can aid in planning the appropriate interventions suiting to the local needs | Individual |