Abstract for Thesis

Prevalence of Morbidity and Disease-Specific Morbidities in Assam

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The stock of human capital is a crucial determinant of economic growth and human development (Javed & Haq, 1981; Mincer, 1984; Sen, 1999; Galor & Tsiddon, 1997; Pelinescu, 2015). Furthermore, population health status significantly impacts the stock of human capital (Grossman, 1999; Goldin, 2016; Baldacci et al., 2008). It is thus essential to regularly assess the status of population health. In federal countries such as India, state governments shoulder the primary responsibility of health care delivery to the population. States like Assam rely heavily on the public health delivery system to achieve their desired health outcomes. Thus, public investments in health become a causal factor of health outcomes. Further, since public investments in health are primarily met out of the State exchequer, the status of population health becomes a critical identifier of progress made in development at the state level. This thesis studies the status of population health in India, focusing on Assam.

Global health estimates reflect a health transition underway in most countries (Reddy, 2016). The economic literature discusses population health status in the context of demographic and epidemiological transitions. The consensus is that developed countries have moved towards higher burdens of non-communicable diseases, whereas developing countries face dual burdens of communicable and non-communicable diseases. Some other literature also points to multiple disease burdens due to weather and climate-related adverse impacts on health (Watts et al., 2018). While these transitions are occurring, the rate in developing countries is

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not uniform. Similarly, health and disease burden transitions within countries' sub-national levels are also different. Various methods exist to study health transitions at the national and sub-national levels. Estimating levels of morbidity among population and disease burdens are regularly used in country-level and state-level assessments.

This thesis has three essays. First, we provide a long-term view of methodological issues surrounding morbidity and disease surveys of the National Sample Survey Organisation (NSSO)[1], India. The second essay provides population-level estimates of morbidity and disease specific morbidities for India and states based on NSSO unit-level records of the 71st and 75th rounds (2014-15 & 2017-18). We further examine socio-economic determinants of chronic and acute morbidity and disease-specific morbidity in Assam. The third essay is based on a primary study on the prevalence of morbidity and disease-specific morbidity among tea plantation workers of Assam.

At the Assam state level, we find the dual prevalence of diseases - communicable and non-communicable. However, morbidity reporting is much lower than in developed states such as Kerala. This should draw attention to the population-level awareness regarding an individual's well-being (Sen, 2002). For example, a person's well-being may be much below the desired levels. However, the self-perception regarding one's morbidity status may not be adequate. Similarly, undiagnosed, and unsought treatments may also bring down the reporting of morbidity at the population level. The NSSO unit-level records show a sufficiently high reporting of "other diseases". Urban Assam reports morbidity levels more than rural. There are NSS region-level differences in morbidity reporting in Assam. E.g., the Western Plains region has the highest reporting of acute and chronic morbidity. The lowest reporting is from the Central Brahmaputra Plains.

[1] Since 2019, the NSSO and Central Statistical Organisation has merged to be known as the National Statistical Office.

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NSSO provides data on morbidity by chronic ailments (which has a reference period of more than 30 days), by acute ailments (which has a reference period of 15 days), and by hospitalization cases (which has a reference period of 365 days). Another critical categorization of morbidity is a spell of ailment which refers to a continuous period of sickness due to any particular type of disease within a reference of 15 days. We must consider all of the above morbidity cases to assess morbidity status at the population level. Reporting of chronic and acute ailments are mutually exclusive categories. However, a spell of ailment contains all diseases reported in all categories. Therefore, the proportion of the population reporting spell of ailments by different disease categories provides robust information on disease burdens. In Assam, cases of hospitalization are higher for non-communicable diseases in the 71st and 75th rounds. Acute ailments reported at the population level are 25 per 1000 population and 19 per 1000 population, respectively. Chronic ailments reporting is 8 per 1000 population and 6 per 1000 population, respectively. Between the 71st and 75th rounds, reporting of chronic and acute ailments has decreased. For disease specific morbidity for hospitalisation cases, overall, in India the prevalence is higher for NCDs and Other diseases, except for North Eastern states where prevalence is higher for infectious diseases apart from other diseases. However, regarding disease prevalence for spell of ailments due to infectious diseases, cardiovascular diseases, and non-communicable diseases has increased in Assam. The proportion of the population in Assam suffering from spell of infectious group of diseases is highest among all other disease burdens in 75th rounds.

The third essay is on the health status of tea plantation workers of Assam based on a primary survey among 723 households and 3525 household members. The worker sample drawn was 1269. The tea plantation workers of Assam are highlighted as one of the most vulnerable groups in terms of health and nutrition outcomes (Biwas et al., 2002; Medhi, Barua & Mahanta, 2006). However, their contribution to the state's economic growth due to revenues

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earned by the tea sector is unparalleled (Mech, 2017). Compared to our findings on morbidity at the population level (6 per 1000 for chronic morbidity and 19 per 1000 for acute morbidity) from NSSO 75th round (2017-18) unit level records, the worker level reporting of morbidity (25.9 percent for chronic and 21.7 percent for acute) based on our primary survey conducted in 2021-22 is higher. The morbidity status of our sample worker is directly related to wage loss. In terms of disease prevalence, we find multiple prevalence of diseases - communicable, non-communicable, and occupation hazards related.

At the worker level, among communicable diseases, prevalence of tuberculosis (19 cases reported in chronic category) was widespread apart from common cold and fever (104 incidents in the category acute ailments). Undiagnosed diseases (22 incidents of chronic ailments) were also frequently reported. The most common NCD prevalent among the workers is hypertension (59 chronic cases). Anaemia (21 chronic cases) and gastritis (38 chronic and 14 acute cases) were also widely reported. Occupational health hazards, such as body and backache (26 acute and 54 chronic cases), headache (17 acute and 15 chronic cases) joint or bone diseases (17 chronic cases), and accidental injuries (11 acute cases) were also commonly cited.

Based on anthropometric measurements, we observed a high incidence (34.7 percent) of low BMI among the worker population. Female workers reflecting low BMI status is 37.7 percent and male workers are 30.2 percent. However, observed low BMI of workers do not show causality with their reporting about morbidity status. There is a lack of dietary diversity among the workers population, with their diet mostly comprising carbohydrates. However, the type of diseases reported and from in-depth interviews with health facilitators clearly points morbidity linkage of tea plantation workers with nutritional status, dietary intake, workplace hazards and low socioeconomic conditions.

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