

**IIT Mandi**  
**Proposal for a New Course**

**Course Number:** HS 501

**Course Name:** Global Health and Demography

**Credit:** 4

**Distribution:** 3-0-2-4

**Intended for:** Discipline Elective for MA Development Studies and Outside Discipline/Free Elective for Other Postgraduates and B.Tech. (3rd and 4th year)

**Prerequisite:** Elementary knowledge of probability and statistics; consent of the instructor

**Mutual Exclusion:** None

**1. Preamble:**

In this course, we will explore the levels and trends of health issues among different populations across the globe, with a special focus on South Asia, and particularly India; the evolution of health system structure and the innovations introduced to improve population health. Further, we will examine how demographic and epidemiological challenges have evolved together and impacted development in India. We will draw discussions from various theories of demography, public health, epidemiology, and social sciences to understand the drivers of such transformations. By the end of this course, students will be able to apply essential demographic, public health and economic tools to adopt and evaluate evidence-based approaches to address health challenges.

**2. Course Modules with quantitative lecture hours:**

**Unit 1: Introduction to Global Health and Demography (5 lecture hours + 4 lab hours)**

- Why should we study global health and demography?
- Evolution of these subjects and their scope
- Current population and health trends across the globe, South Asia, and India
- Globalization, Population and health transformations
- Sources of data for measuring population process and health

**Unit 2: Demographic Measurement (5 lecture hours + 12 lab hours)**

- Age-Sex structure- measurement and trends
- Population aging and dependency ratios
- Basic measures of fertility, mortality, nuptiality and migration
- Estimating life expectancy using life tables
- Stable population model

**Unit 3: Morbidity and Public Health (10 lecture hours + 8 lab hours)**

- Measures of population health- prevalence and incidence
- Measuring burden of disease-DALYs, DFLE, HLE
- Basic concepts of epidemiology, study designs, risk of a disease,
- Exploring the issues of association, causation, interaction, inference, confounding and generalisability
- Survival analysis

#### **Unit 4: Demographic determinants of health (7 lecture hours)**

- Health issues during infancy and childhood- nutrition, infectious diseases and breastfeeding
- Adolescent health- sexual and reproductive health, anemia, BMI
- Maternal health
- Later adulthood and onset of non communicable diseases
- Health of older adults- NCDs, disability, Pain and Cognition
- Lifestyle and health behavior
- Mental health across age groups

#### **Unit 5: Social Determinants of Health (7 lecture hours + 4 lab hours)**

- Poverty, inequality and health
- Mortality selection and poverty
- Education and health- lifestyle choices, morbidity and health care utilization
- Social capital and health- variations by income, education and ethnicity
- Migration, urbanization and health;
- Multiple deprivations and health
- Social vulnerability and intergenerational impact of health

#### **Unit 6: Space, Place and Health (3 hours)**

- Space, culture and health-why is it essential to study health at disaggregated geographies
- Impact of natural and indoor environment on health
- Thinking about health at multiple level of geographies

#### **Unit 7: Health Policy and Innovations ( 5 hours)**

- Health systems across developed and developing nations- special focus on India and its states
- National and state policies on child health, sexual and reproductive health, major diseases and family welfare
- Universal health coverage- components and measurement
- Health system strengthening and health care financing reforms
- Policy and social innovations for modifying health behaviors, health care utilization and health care financing- with special focus on India

### **3. Laboratory/practical/tutorial Modules:**

- Introduction to handling large scale health dataset (understanding structure using STATA or R)- such as the Demographic and Health Surveys; Gateway to Global Ageing data (with focus on LASI); National Sample Survey Organisation – Health consumption rounds; IHME- Global Burden of Disease data; Census of India; Sample Registration System Data
- Creating population pyramids using excel
- Direct indirect adjustment of Crude death rates for different age sex structures using excel
- Adjusting health data for age-sex structure
- Construction of abridged life table using excel
- Estimating under-five mortality rates using DHS data on Stata/R
- Calculation of disability rates
- Calculation of disease free life expectancy
- Calculation of prevalence rates for childhood diseases and undernutrition using DHS
- Calculation of prevalence rates of major diseases using LASI, and the NSSO data
- Estimating the socio-economic gradient of any health issue (of choice) and quantifying their association

#### 4. References:

##### (a) Reading list

###### (i) Basic reading list

1. Bhende, A. A., Kanitkar, T. (1978). Principles of Population Studies. India: Himalaya Publishing House.
2. Slovník Richard (2016). Global Health 101: 4<sup>th</sup> ed. United States: Jones & Bartlett Learning.
3. Rothman, K. J., Greenland, S., Lash, T. L. (2008). Modern Epidemiology. United Kingdom: Wolters Kluwer Health/Lippincott Williams & Wilkins.

###### (ii) E-references-

1. <http://papp.iussp.org/>
2. <https://www.publichealth.columbia.edu/research/programs/population-health-methods>
3. <https://www.ined.fr/en/>
4. <https://www.youtube.com/@gregmartin>
5. <https://openwho.org/>

###### (iii) Reference books for laboratory sessions

1. Moultrie, T. A., Dorrington, R. E., Hill, A. G., Hill, K., Timæus, I. M., & Zaba, B. (2013). Tools for demographic estimation. International Union for the Scientific Study of Population.
2. Croft, T. N., Marshall, A. M., & Allen, C. K. (2018). Guide to DHS Statistics. Rockville, Maryland, USA: ICF; 2018.

###### (iv) Reading List:

1. J Swanson, D. A., & Stephan, G. E. (2004). A demography time line. The methods and materials of demography, 2, 779-786.
2. Lee, S., & Lim, H. (2019). Review of statistical methods for survival analysis using genomic data. Genomics & informatics, 17(4).
3. Ladusingh, L. (2018). Survey Sampling Methods. India: Prentice Hall India Pvt., Limited.
4. Hsiao, W. C. (2003). What is a health system? Why should we care. Harvard School of Public Health, working paper, 33.
5. Mosley, W. H., & Chen, L. C. (1984). An analytical framework for the study of child survival in developing countries. Population and development review, 10, 25-45.
6. Murray, C. J. (1994). Quantifying the burden of disease: the technical basis for disability-adjusted life years. Bulletin of the World health Organization, 72(3), 429.
7. Berkman, L. F., Kawachi, I., & Glymour, M. M. (Eds.). (2014). Social epidemiology. Oxford University Press.
8. Deaton, A. (2013). The great escape: health, wealth, and the origins of inequality. Princeton University Press.
9. Morland, P. (2019). The human tide: how population shaped the modern world. Hachette UK.

**Similarity with the existing courses:**

**(Similarity content is declared as per the number of lecture hours on similar topics)**

S. No.		Course Code	Similarity Content	Approx. % of Content
1.	Applied Biostatistics	BE303	Introduction to survival analysis; Introduction of different study designs; Measures of important probabilities	~10%

**Justification of new course proposal if cumulative similarity content is >30%: --**