

Capacity Building for a Better Future

SYLLABUS M.P.S. COURSE



International Institute for Population Sciences

(DEEMED UNIVERSITY)

Deonar, Mumbai 400 088.

Website: <http://www.iipsindia.org>

About the Institute

The Institute was established in 1956 as the regional centre for training and research in Population Studies for the country of Asia and Pacific region. The International Institute for Population Sciences embraced the present name and was declared a “Deemed University” in 1985 by the Ministry of Human Resource Development, Government of India. The Institute is an autonomous body under the administrative control of the Ministry of Health and Family Welfare, Government of India. This is the only Institute of its kind in the world exclusively devoted to teaching and research in population sciences. Over the last fifty years, the Institute has helped in building a nucleus of professionals in the field of population in various countries in the ESCAP region. Many who were trained at the Institute now occupy key positions in reputed national and international organizations.

Rules for Master of Population Studies (M.P.S.)

The M.P.S. course is designed to provide a higher level of understanding of the population sciences including an in-depth knowledge of the linkages between population and various dimensions of socio-economic, health and environmental development. These courses also provide a comprehensive idea to conduct further research in various aspects of population and development.

| MPS One-Year Course | | | | |
|---|--------------------|---|----------------|--------------|
| Semester I | | | | |
| Paper Code | Explanation | TITLE | Credits | Hours |
| MPS F1 | Foundation | Basic Statistical Methods for Population Studies | NC | 45 |
| MPS F2 | Foundation | Social Science Concept and Issues | NC | 45 |
| MPS C1 | Core | Introduction to Demography and History of Population | 4 | 60 |
| MPS C2 | Core | Fertility and Nuptiality | 4 | 60 |
| MPS C3 | Core | Mortality, Morbidity and Public Health | 4 | 60 |
| MPS C8 | Core | Research Methodology | 4 | 60 |
| MPS E1 | Elective | E1.1: Healthcare Systems and Policies E1.2: Introduction to Biostatistics & Epidemiology | 3 | 45 |
| MPS E2 | Elective | E2.1: Concepts and Measures of Global Health E2.2: Population Ageing and Health Transition | 3 | 45 |
| Viva-Voce Examination (related to courses) | | | 1 | |
| Total | | | 23 | 420 |
| Semester II | | | | |
| MPS C4 | Core | Migration, Spatial Distribution and Urbanization | 4 | 60 |
| MPS C5 | Core | Population and Development | 4 | 60 |
| MPS C6 | Core | Gender Issues and Reproductive Health | 4 | 60 |
| MPS C7 | Core | Population Policies and Programmes | 4 | 60 |
| MPS C9 | Core | Advanced Statistical and Computer Applications | 4 | 60 |
| MPS C10 | Core | Indirect Estimation Techniques, Population Projection and Demographic Models (<i>Quality of data and projection are added</i>) | 4 | 60 |
| MPS E3 | Elective | E3.1: Spatial Demography E3.2: Operations Research E3.3: Monitoring and Evaluation | 3 | 45 |

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|---|----------|--|-----------|------------|
| MPS E4 | Elective | E4.1: Large-scale Sample Surveys E4.2: Health Economics and Financing E4.3: Urbanization, Space and Planning | 3 | 45 |
| Term paper | | | 6 | 90 |
| Viva-Voce Examination (related to courses taught in the programme) | | | 1 | |
| Total | | | 37 | 540 |
| Grand Total | | | 60 | 960 |

Term Paper

A student is required to write a term paper on some demographic or related problems under the guidance of a faculty member. The topics of the term paper have to be submitted at the beginning of the Second Semester. The term paper will be presented in formal seminar of the students and faculty members of the Institute. The content, presentation & defence and participation in the seminar shall be subjected to assessment by a committee comprising of faculty members.

Grading System

The following ten points grading system is followed in the Institute:

| Letter Grade & Qualitative Level | Value | Percentage |
|---|--------------|-------------------|
| O (Outstanding) | 10 | 85-100.0 |
| A+(Excellent) | 9 | 75.0-84.9 |
| A(Very Good) | 8 | 65.0-74.9 |
| B+(Good) | 7 | 55.0-64.9 |
| B(Above Average) | 6 | 50.0-54.9 |
| C (Average) | 5 | 45.0-49.9 |
| P (Pass) | 4 | 40.0-44.9 |
| F+(Fail) | 3 | 30.0-39.9 |
| F (Fail) | 2 | 20.0-29.9 |
| F- (Fail) | 1 | 0.0-19.9 |
| AB (Absent) | 0 | - |

1. The teacher concerned will set the question paper and also evaluate the answer books as per grading pattern.
2. A final grade for each paper will be arrived by taking weighted average of grades given in different sections of the paper in case of questions of unequal weights. The weights can be given in proportion to the credit (i.e. number of hours) assigned for each section of the paper.
3. Overall Grade will be arrived on the basis of the number of credit hours and grade points for each subject.
4. A student securing a overall average grade points (OAGP) of less than P only, i.e. grade F+ (plus) and below will not be eligible for the award of the degree.

Re-evaluation of Answer Sheets

A student can have access to his/her examination papers in the form of photo copies at a cost of Rs. 200/- per paper with prior approval of the Director.

A student can apply for re-evaluation of his/her answer sheet at a cost of Rs. 500/- per paper.

EVALUATION PROCEDURE FOR TERM PAPER

The term paper will be of 6 credits. Each of the students is given appropriate weightage for initiative and interest (by his/her guide) and for the content of the paper presentation, defence and his/her participation in the seminar by a Committee specially constituted by the Director for evaluation purpose.

Re-Examination

- (1) Re-examination will not be conducted during the course period.
- (2) Those students who fail or could not appear in any examination will be allowed to re-appear in a paper in the next semester examinations on payment of re-examination fee.
- (3) Those failing in any exam of final semester will not be awarded the degree in the same academic year. They can appear in the re-examination along with first semester of the next batch on payment of re-examination fee.
- (4) Maximum of three attempts will be allowed including the first appearance in each paper.
- (5) There will not be any down grading in re-examinations.

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| F1 | BASIC STATISTICAL METHODS FOR POPULATION STUDIES | (45 Hours) |
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Objective: This course aims to provide students with basic knowledge of statistical techniques which can be used in demographic analysis.

Introduction to statistics: Descriptive and Inductive statistics. Concept of variables, Nominal, Ordinal and Interval scale variables.

Tabulation of data, conversion of raw data into frequency distribution, graphical presentation of nominal, ordinal data, Logarithms: properties of logarithms, Rates and Ratios, Interpolation and Extrapolation.

Introduction to statistics: Descriptive and Inductive statistics. Concept of variables, Nominal, Ordinal and Interval scale variables.

Tabulation of data, conversion of raw data into frequency distribution, graphical presentation of nominal, ordinal data, Logarithms: properties of logarithms, Rates and Ratios, Interpolation and Extrapolation.

Measures of Central Tendency: Mean (arithmetic, geometric, harmonic) Median, Mode; Merits and demerits of different measures.

Measures of dispersion: Range, Variance, Standard Deviation; Merits and demerits of different measures of dispersion. Measures of Skewness and Kurtosis.

Techniques of analyzing bivariate nominal and ordinal level data: Contingency table, odds ratios, relative risk.

Introduction to set theory, permutations and combinations; Introduction to the concept of probability, A-priori, and mathematical probability. Events: exhaustive, mutually exclusive events; Laws of probability, additive and multiplicative laws of probability through demographic data, Bayes' theorem

Discrete probability distributions: Binomial and exponential functions, Binomial probability distribution and Poisson distribution and their properties. Continuous probability distribution; Introduction to Normal distribution and its properties, applications of normal distribution.

Introduction to the concept of correlation: Pearson correlation coefficient, and its properties; Spearman ranks correlation coefficient. Concept of linear regression, fitting of regression line to bi-variate data.

Concepts in Inductive statistics: Population, sample parameter, and statistic. Sampling distribution of mean and standard error. Concepts of statistical hypothesis, critical region, level of significance, confidence interval and two types of errors.

Testing statistical hypothesis and test of significance. Introducing the t distribution, comparing two groups, principles of comparison, independent t-test and paired t- test, Assumptions involved in t testing. Testing the association of attributes and Chi-square goodness of fit.

Analysis of Variance. Introduction to Multivariate Analysis. Concept of multi-variate regression. Concept of Multiple and Partial correlation coefficients in regression analysis. Standardized regression coefficients, Regression with dummy variables.

Essential Reading List

1. Blalock, Hubert M. (1960): *Social Statistics*, McGraw-Hill Book Company, New York.
2. Chakravorti, S.R. and Giri, N. (1997): *Basic Statistics*, South Asian Publishers, New Delhi.
3. Clarke, G.M. and Cooke, D.,(1994): *A Basic Course in Statistics*, Arnold, London.
4. Dixon, W.J and Massey, F.J. (1983) *Introduction to Statistical Analysis*, 4th ed., New York, MC Graw Hill, 380-381, 534.
5. Goon, A.M., Gupta, M.K. and Dasgupta, B. (1985): *Fundamentals of Statistics Vol. I* , The World Press Private Ltd. Calcutta.
6. Jain, S.K.1979. *Basic Mathematics for demographers*. Canberra: The Australian National University.
7. Lipshutz, Seymour., *Schaum's Outline Theory and Problems of Set Theory and Related Topics Series*, Mcgraw Hill.
8. Marcello Pagano and Kimberlee Gourneau (2000) "Principles of Biostatistics" Second Edition, Duxbury Thomson Learning, United States.
9. Prakasam, C.P., G. Rama Rao, and R.B. Upadhyay (1987): *Basic Mathematics in Population Studies*, Gemini Publishers, Mumbai.
10. Siegel J.J. and D.A. Swanson (Ed.), 2004. *The Methods and Materials of Demography*. Second Edition. Elaevier Academic Press.
11. Venkatachary, K (1994). *Elements of Mathematics for Demographers*. Monograph Series No.9. Regional Institute for Population Studies, University of Ghana. Legon.

Suggested Reading List

1. Bhat N.R and M.R. Singh, 1993. *Applied Mathematics*. New Delhi: Tata McGraw – Hill Publishing Company Ltd.
2. Dillon, W.R. and Goldstein, M. (1984): *Multivariate Analysis*, John Willey and Sons, New York.
3. Douglas and Altman (2006): *Practical Statistics for Medical Research*, Chapman and Hall Publication, Washington, D.C.
4. Ebdon, E. (1978): *Statistics in Geography*, Basil Blackwel, Oxford.
5. Fisher, L.D and Van Belle, G. (1993) *Biostatistics : A Methodology of the Health Sciences*, New York, Wiley Intgescience,
6. Goon, A.M., Gupta, M.K. and Dasgupta, B. (1985): *Fundamental of Statistics Vol. I* , The World Press Private Ltd. Calcutta.
7. Graeme Hutcheson and Nick Sofroniou, (1999): *The Multivariate for Social Scientist*, SAGE Publications.
8. Gupta, S.C. and Kapoor, V.K. (1986): *Fundamental of Mathematical Statistics*, Sultan Chand and Sons Publishers, Delhi.
9. Howell David C. "*Fundamental Statistics for the Behavioral Sciences*", 4th Edition, an International Thosuross Publishing Company, USA.
10. Mc Clave, James T., P. George Benson and Terry Sincich (2001): *Statistics for Business and Economic*, Eighth Edition, Prentice Hall, NJ, USA.
11. Norman R. Kurtz (1999): *Statistical Analysis for the Social Sciences*, Allyn and Bacon.
12. Retherford, R.D. and Choe, M. K., (1993): *Statistical Models for Casual Analysis*, A Wiley-Inter-Science Publications, John Wiley and Sons, INC, New York.
13. Sundaram, K. R., S. N. Dwivedi and V Sreenivas. (2009). *Medical Statistics-Principles & Methods*. Anshan Publisher.

SOCIOLOGY

1. Sociology: sociology as a social science- its nature, subject matter and scope
2. Relation of sociology with other social sciences, sociological perspective
3. Basic Concepts in sociology
4. The Family:
 - a) Sociological Significance of the Family
 - b) Types and functions of Family
 - c) Nuclear and joint families
5. Marriage: Different forms of marriage, changing patterns of marriage/mate selection in India
6. Kinship –features of kinship system in India, regional variations
7. Social stratification : Social Class and Caste: Principles of Class and Caste
8. Socialization : agencies of socialization
9. Culture: meaning and characteristics of culture.
10. Society and Culture in India
 - a) Aspects of society and culture in India, and its role and importance in Population Studies.
 - b) Social Institutions and their role in influencing demographic situation of the Population of India
- Family, Marriage, Kinship and Religion
11. Caste System
 - i) Concept and definition of Caste System,
 - ii) Changing Caste System in India
12. Social Mobility : vertical and horizontal, intra- and inter-generational mobility
13. Social Change

Definition and Concept of Social Change
14. Process of Social and Cultural Changes in India and their role in influencing demographic behaviour: a) Sanskritization b) Westernization c) Modernization

Essential Reading List

1. Davis, Kingslay, *Human Society*, MacMillan and Co., New York, (1975), Chapters 1, 3,5,6.
2. Kapadia, K. M., *Marriage and Family in India*, Oxford University Press, Calcutta, (1966).
3. Mandelbaum, D.G., *Society in India-Continuity and Change(vol.1) and Change and Continuity*, (Vol. 2). University of California Press, London, (1970).
4. Mac Iver R.M. and Charles H. Page, *Society: An Introductory Analysis*, Holt, Rinehard and Winston, New York, (1949), Chapters No.1, 3,7,11,15,22,24,25,26.
5. Srinivas M.N., *Social Change in Modern India*, University of California Press, Berkeley, (1966)
6. Haralambos, Michael, *Sociology: Themes and Perspectives*, Oxford University Press, Delhi (1980).

Suggested Reading List

1. Kuppaswamy B., *Social Change in India*, Konark Publication Pvt. Ltd. Delhi, (1972).
2. Muzumdar, Haridas , *The Grammar of Sociology: Man in Society*, Asia Publishing House, Mumbai (1966).
3. Johnson, Harry M, *Sociology : A Systematic Introduction* , Allied publishers, Bombay (1966).
4. Mc Gee , Reece , *Sociology: An Introduction* , Holt, Rinehard and Winston, New York (1980).
5. Magill ,Frank N (ed.), *International Encyclopedia of Sociology*, Fitzroy Dearborn Publishers, London, (1995).

GEOGRAPHY

1. Importance of Geographical factors- Physical factors (relief, rainfall, temperature, soil and vegetation) Economic and Social factors (Mineral resources and industrialisation, transport, language, religion and caste/tribe); the influence of geographical factors on population.
2. Geographical approaches: the concept of region- formal and functional regions; the concept of growth pole and regional development; core and periphery; distance and decay function; Maps-scale, choropleth, isopleths and distribution maps.
3. Physical divisions of India; administrative organization of India. Historic-Cultural regions; Agro-climatic regions; NSS regions.
4. Theoretical Perspectives in Geography- Place of geography in Social sciences; man and nature relationship- determinism and possibilism; Positivism (quantification) and Phenomenology; and Radical and Postmodern Geography.
5. Concept of Social Space; Social Structure and Spatial Structure; Role of time and space in social sciences.

Reading List

1. Abler, R, Adams, J and Gould P., (1971): *Spatial Organization: The Geographer's view of the World*, Prentice Hall, New Jersey.
2. Johnston, R.J., (2004): *Geography and Geographers*, Oxford Unity Press.
3. Richard, Peet., (1998): *Modern Geographic Thought*, Blackwall Publishers
4. Singh, R.L., (1971) *India: A Regional Geography*, National Geographical Society of India, Varanasi.
5. Francis John Monkhouse (1956) *Maps and Diagrams: Their Compilation and Construction*, University of Michigan.
6. JF Friedman (1966) *Regional Development Policy: A Case Study of Venezuela*, Cambridge, Massachusetts : MIT Press, 1966.

ECONOMICS

A. Introduction:

Defining Economics, Micro and Macro economics, Economic and non economic good, Basic Economic Activities, Factors of Production, Economic Systems.

B. Basic Concepts in Micro Economics

Concept of Marginal and Total Utility, Law of Diminishing Marginal Utility, Theory of Demand: Indifference curves Theory and Properties, Equilibrium of consumer, Income, Substitution and Price effect. Elasticity of Demand: Price, Income and cross elasticity, Basic concepts in theory of production, cost and market structure.

C. Basic Concepts in Macro Economics

Basic Concepts in National Income: Concept of GDP, NDP, GNP, NNP, NI, PCI, GDPPCI, PPP, GDPPCI (PPPUS\$), Theory of consumption and saving: Consumption function, Keynes' Psychological law of consumption, concept of APC and MPC, APS and MPS, Factors affecting consumption and savings, Basic concept of Investment.

D. Economic Theories

Political economy and protectionism – Mercantilism, Classical economics and free enterprise – Adam Smith and David Ricardo, Welfare economics – Alfred Marshall and Amartya Sen, Karl Marx and the Labour theory of Value, Empirical economics – Paul Samuelson.

E. Indian Economy: Structure, Planning and Growth

Characteristics of Indian Economy: Economic Transition in India, Strategy of economic planning in India, Industrial Policy 1956, 1977 and 1991, New Economic Reforms- 1991, Other Development issues: Poverty and Unemployment.

Essential Readings

1. Ahuja H.L, Advanced Economic Theory: Microeconomic Analysis, S. Chand and Company Limited, New Delhi, Chapters 5,6,7,8,9,12,16, 17, 18, 20
2. Koutsoiannis A, 1979, Modern Microeconomics, London: Macmillan Press Ltd,
3. Lipsey and Chrystal, 2004, Economics, Oxford university Press, Part One, part two and part five
4. Dasgupta AK, Epochs of Economic Theory, OUP, Bombay, Chapters 2, 3, 4, 7 and 8
5. Datt R and Sundaram K.P.M, 2000, Indian economy, S. Chand & Company Ltd, Part II.

Suggested Readings

1. Samuelson, Paul A. and William D. Nordhaus., "Economics", New York: Tata McGraw Hill, part one, two and five
2. Blaugh, M., 1962. "Economic Theory in Retrospect", London: Heinemann Ltd.
3. Haney, Lewis H., 1960, "History of Economic Thought", New York: Macmillan
4. Government of India, Ministry of Finance, Economic Division, Economic Survey, 2001-2002

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| C1 | INTRODUCTION TO DEMOGRAPHY AND HISTORY OF POPULATION | (60 Hours) |
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1. Introduction to Demography

Definition and Scope: Demography as a scientific discipline; Development of demography as a discipline. Some basic demographic concepts. Components of population change.

Historical trends in population situation in the world. Present population situation and past and future trends in the world and in developed and developing countries.

Brief description of Demographic transition theory.

2. Population History

Contribution of fertility, mortality and migration to population change in the past; major sources of data about the population in the past; major explanations of population change in the past; relation between population change and other social and economic changes at the national and local levels; All the above in relation to India

2. Sources of Demographic Data

Population census; Uses and limitations; Indian Censuses.

Vital registration system.

National Sample Survey. Sample Registration System and Demographic Health Surveys (DHS) and other sample surveys.

3. Dynamics of Age-Sex Structure

Present levels and past trends in the sex and age structure of the population of world and developed and developing countries. Present levels and past trends in the sex and age structure of India's population.

Importance of age-sex structure in population dynamics and factors affecting sex ratio of the population. Sex ratio of India's population and role of different factors in changing sex ratio.

Factors affecting age structure of the population: dynamics of age structure along with demographic transition; Ageing of the population and relative roles of low fertility and low mortality in population ageing.

4. Population growth rates – Arithmetic, geometric and exponential

Essential Readings

1. Jacob S. Siegel and David a. Swanson (2004): *The Methods and Materials of Demography*, Second Edition, Chapters 1, 2, 3, 7, 9,10, Elsevier Science, USA.
2. John Weeks (2005): *Population: An Introduction to Concepts and Issues*, Wordsworth Learning. Singapore 9th edition.
3. United Nations, (1973): *The Determinants and Consequences of Population Trends*, Vol. I, *Population Studies*, No. 50, Chapter VII, New York.

4. Bhende, A., (1996): *Principles of Population Studies* (Seventh Edition), Himalaya Publishing House, Bombay.
5. United Nations, World Population Ageing, 1950-2050
6. Livi-Bacci, M., (1996): *A Concise History of World Population* (2nd edition), Oxford.
7. www.censusindia.gov.in

Suggested Readings

1. World Population Prospects 2006, Vol I and II, United Nation
2. Warren S. Thompson, *Population Problems*
3. Bogue, D., (1969): *Principles of Demography*, John Wiley and Sons, New York.
4. Registrar General, India (1997): *Civil Registration System in India*, Office of the Registrar General, India, New Delhi. .
5. United Nations, (1998): *Handbook on Civil Registration and Vital Statistics Systems, Management, Operation and Maintenance*, New York.

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| C2 | FERTILITY AND NUPTIALITY | (60 Hours) |
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A. FERTILITY – SUBSTANTIVE

1. Terms and Concepts

Importance of the fertility study in population dynamics; Basic terms and concepts used in the study of fertility

2. Framework for Fertility Analysis

Determinants of natural fertility; Davis intermediate variables framework of fertility; Socio-economic determinants of proximate variables; Lee and Bulatao framework of fertility determinants.

3. Fertility Transition in Developed Countries

Historical fertility decline in European and Non-European Industrialized Countries and underlying factors; Below-replacement level fertility in developed countries and its implications.

4. Fertility Transition in Developing Countries

Pattern of fertility transition in developing countries; causes of high fertility in Africa and Asia. Fertility Transition in India: Historical trend and regional patterns in development, culture and fertility transition. Fertility Surveys – Findings and Emerging research issues.

5. Hypotheses and Theories of Fertility

Theory of Social Capillarity, Theory of Change Response, Theory of Diffusion and Cultural Lag, Liebenstein Theory, Becker's Theory, Easterlin Framework of Fertility, Caldwell's Theory, U. N. Threshold Hypothesis, Reproductive motivations and value of children theories.

B. FERTILITY MEASURES AND MODELS

6. Introduction

Some Basic Concepts
Sources of Data for Fertility Analysis
Problems in Fertility Analysis
Period and Cohort Approaches

7. **Direct Estimation of Fertility**
 Period Measures of Fertility
 - Basic Fertility Measures
 - Order-Specific Fertility Rates
 - Marital Status Specific Fertility Rates
 - Standardized Birth Rates and Coale’s Fertility Indices
 Cohort Measures
 Birth Interval Analysis
 Reproduction Measures
8. **Fertility Models**
 Age patterns of Fertility: Coale and Trussell Fertility Model: Estimating M and m
 Bongaarts and Potters Aggregate Fertility Model and its applications

C. NUPTIALITY

9. Introduction, Concepts, Sources and Quality of Nuptiality Data.
10. Measures and Indices of Nuptiality: Crude and Specific Rates; Standardization of Marriage Rates.
11. Analysis of Marital Status Data: Singulate Mean Age at Marriage (SMAM) – Synthetic Cohort and Decade Synthetic Cohort Method.
12. Gross and Net Nuptiality Tables.
13. Marriage Patterns in India and Selected Countries, Marriage Squeeze.
14. Divorce & widowhood: Basic concepts & Measures.
15. Standard Age Pattern of Marriage – Coale’s Model.

Essential Reading List

1. Asha A. Bhende and Tara Kanitkar, (2003), *Principles of Population Studies*, Sixteenth Revised Edition, Himalaya Publishing House, Mumbai.
2. David G. Mandelbaum, (1974), *Human Fertility in India: Social Components and Policy Perspectives*, University of California Press, Berkeley.
3. John R. Weeks, (2005), *Population: An Introduction to Concepts and Issues*, Ninth Edition, Wadsworth Publishing Company, Belmont, California.
4. Ronald Gray, Henri Leridon and Alfred Sipra, (1993), *Biomedical and Demographic Determinants of Reproduction*, Oxford University Press, Oxford.
5. Sydney H. Coontz, (1968), *Population Theories and the Economic Interpretation*, Routelage, London.
6. United Nations, (1973), *Determinants and Consequences of Population Trends, Vol. 1*, pages 96-104, UN, New York.
7. United Nations, (1999), *Below Replacement Fertility*, Population Bulletin of the UN, Special Issue Nos. 40/41, Department of Economic and Social Affairs, UN, New York.
8. Bongaarts, J and Potter, R (1983) *Fertility, Biology and Behavior: An Analysis of the Proximate Determinants*. Academic Press, New York.
9. Hinde, Andrew (1998) *Demographic Methods*. London: Arnold.
10. Newell, Colin (1988) *Methods and Models in Demography*. London: Frances Pinter.
11. Pathak, K.B. and F.Ram, (1998) *Techniques of Demographic Analysis*, Mumbai: Himalaya Publishing House, Chapter 4, Pp.108-153.
12. Preston, Samuel H., Heuveline, Patrick, and Guillot, Michel (2001) *Demography: Measuring and Modeling Population Processes*. Oxford: Blackwell Publishers.
13. Siegel, Jacob S., and David A. Swanson (eds.), (2004) *The Methods and Materials of Demography* (Second edition). San Diego: Elsevier Academic Press.
14. Coale Ansley J. and T. James Trussell (1978) *Technical Note: Finding the Two Parameters that Specify a Model Schedule of Marital Fertility. Population Index 44, 2 (1978), pp. 203-213.*

Suggested Reading List

1. Bogue, Donald J., Eduardo E. Arriaga, and Douglas L. Anderson, eds. (publication editor George W. Rumsey) (1993) *Readings in Population Research Methodology*. Chicago: United Nations Population Fund. Volume 3: Fertility Research, (All three chapters but selected pages).
2. Mishra, B.D. (1981) *An Introduction to the Study of Population*, New Delhi: South Asian Publishers Pvt. Ltd.
3. Palmore, James A. and Gardner, Robert W. (1983) *Measuring Mortality, Fertility and Natural Increase: a Self-Teaching Guide to Elementary Measures*. Honolulu: East-West Population Institute, East-West Center.
4. Pollard, A.H., Yusuf, Farhat and Pollard, G.N. (1990) *Demographic Techniques* (third edition). Sydney: Pergamon Press.
5. Rowland, Donald T. (2006), *Demographic Methods and Concepts*. New York: Oxford University Press.

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| C3 | MORTALITY, MORBIDITY AND PUBLIC HEALTH | (60 Hours) |
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A. MORTALITY

1. Basic Concepts and Measures of Mortality

Definition of deaths and fetal deaths according to WHO; Need and Importance of the study of Mortality; various sources of mortality data and its quality with special reference to the developing countries.

Introduction and basic measures:

Some basic measures: - crude death rate (CDR) and Age-Specific Death Rates (ASDRs)- their relatives merits and demerits.

Techniques of standardization and decomposition of Rates/Ratio

Need and importance of standardization: direct and indirect technique of standardization of rates and ratios in the light of mortality rates; Decomposition.

Infant mortality and its sub-division

Need and importance of the study of infant mortality in demographic analysis; Conventional measures of infant mortality (IMR) and its sub-divisions- Neo-natal, Post-Neonatal mortality and Peri-natal Mortality Ratio/Rate. Approaches for estimating infant and child mortality rates from birth history collected in large-scale surveys; and Lexis diagram.

Measures of maternal mortality

Maternal Mortality Rate, Ratios, Life time risk; Issues related to estimation of maternal mortality measures.

2. Life Tables

Introduction

Basic concept of a life table; types and forms of life table;

Brief history of life tables; Anatomy of life table; uses of life table in demographic analysis.

Construction of Life tables based on Age- specific death Rates (ASDRs)

Underlying assumptions of life table construction using ASDRs of a community during a specified period; Methods of life table Construction—Conventional approach, and those proposed by Greville and Chiang.

Model Life Tables (MLT)

Need for MLT for countries having poor vital registration statistic; underlying principles of constructing some important MLT systems - First UN MLT, Coale and Demeny Regional MLT; Brass two- parameter logit Life table system; and New UN MLT; WHO Model life table, Uses of model life tables in demographic analysis for countries having limited and / or defective civil registration and age- data; and Multiple decrement life table.

3. Mortality and health transitions

Levels and trends in mortality by regions, with special reference to India; age and sex specific mortality with a focus on excess female mortality; differentials by residence and socio-economic factors (occupation, income, education, etc); historic mortality transitions as experienced by developed countries (Europe); overview of epidemiological transition; changing disease and death pattern in developing countries; factors responsible for high mortality in the past; main causes of mortality decline in developing countries; current global mortality scenario; and concepts and overview of health transition.

4. Child survival framework

Importance of infant mortality in population and health; causes of infant mortality (endogenous and exogenous factors); levels and trends (global and south Asia/India); and Mosley and Chen' framework for child survival.

5. Causes of death

Importance of causes of death statistics; definition and sources of causes of death statistics; a brief history of the International statistical classification of diseases, injuries and causes of death (ICD); an overview of ICD – X (1990); global leading causes of death (with a focus on Asia and India); cause of death statistics in India (RG: Rural and M CCD); distribution of deaths by main causes by age, development, life expectancy (UN).

B. MORBIDITY AND PUBLIC HEALTH

6. Introduction to Morbidity

Need and importance of the morbidity study; sources of morbidity data; concepts and definitions of health and morbidity; conditions as proposed by WHO and other social scientists.

7. Measures of Morbidity

Need for morbidity indices; various measures of morbidity: incidence and prevalence rates; interrelationships between measures of morbidity; other measures related to working day loss etc.

8. Burden of disease

Need for the study; basic concepts; measurement and current global scenario.

9. Public Health and Epidemiology

Basic concepts of community health; principles of Epidemiology- basic concepts and definitions; types of Epidemiology: descriptive and analytical; epidemiology of communicable and non-communicable diseases; nutrition and health, environment and health; occupation and health.

Reading List

Compulsory Reading List

1. Caldwell, J, Sally Findley, Pat Caldwell and Gigi Santow (1990): What we know about health transition: The cultural, social and behavioural determinants of health. *The proceedings of an international workshop, Vol.1&2, ANU, Canberra*, Health Transition Centre.
2. Mosley, W. H. and L. C. Chen (1984): Analytical framework for the study of child survival in developing countries, *Population and Development Review* 10 (Supplementary Copy).
3. Murray, C. J. L., (1994): Quantifying the Burden of Disease: The Technical Basis for Disability Adjusted Life Years, *Bulletin of the WHO*, Vol. 72(3), pp.429-445.
4. Pugh, Thomas F. and Brian MacMohan (1970): *Epidemiology: Principles and Methods*, Little Brown Publishers, Boston (Chapters 1 through 5).
5. Ram, F. and K.B. Pathak (1998): *Techniques of Demographic Analysis, 2nd Ed*, Himalaya Publishing house, Bombay (Chapters 2 & 3).
6. Shryock, Henry S. Jacob Siegel and Associates (1980): *The Methods and Materials of Demography* Vol. 2, US Department of Commerce. Washington DC, pp. 389-393, Chapter 14.
7. WHO (1992): *International Statistical Classification of Diseases and related Health Problems*, Tenth Revision, Vol. 1, Geneva.
8. Weeks, John R. 2005. *Population: An Investigation to concepts and Issues*. 9th Edition, Wadsworth Publishing Co. CA.
9. Yaukey, David. 1985. *Demography: The study of Human population*. St. Martins, New York.

Suggested Reading List

1. Administrative Staff College of India (2002): *A comparative assessment of the Burden of Disease in selected states: Methodology, results, policy and program intervention*. Research Paper No. 2.
2. Coale, Ansley J. and Paul, Demney (1983): *Regional Model Life Tables and Stable Populations*, Academic Press, New York.
3. Government of India (1997) *Reproductive & Child Health Program: Schemes for Implementation*, Ministry of Health and Family Welfare, New Delhi.
4. Jagger, C (1999): *Health Expectancy calculation by the Sullivan Method: A Practical Guide*, NUPRI, Research Paper Series No. 68.
5. Murray C. J. L., J. A. Salomon, C. D. Mathers and A. D. Lopez (2002). *Summary Measures of Population Health: Concepts, Ethics, Measurement and Applications*. WHO, Geneva.
6. Office of the Registrar General of India (2007). *Medical Certification of Cause of Death 2001*. Ministry of Home Affairs, New Delhi.
7. Omran, A. R. (1971): The epidemiologic transition: a theory of the epidemiology of population change, *Milbank Memorial Fund Quarterly*, Vol. XLIX, pp. 509-538.
8. Park, J.E. and K. Park (1989): *Text Book of Preventive and Social Medicine (Twelfth Edition)*, M/S Banarsidas Bhanot Publishers, Jabalpur (Chapters 2 & 3).
9. Preston, S. H., Patrick Heuveline and Michel Guillot (2001): *Demography: Measuring and Modeling Population Process*, Blackwell Publishers, Oxford, UK (Chapters 2, 3 & 4).
10. United Nations (1973): *The Determinants and Consequences of Population Trends, Vol. I*, Population Studies No.50, Dept. of Economic and Social Affairs, United Nations, New York (Chapter 5).
11. United Nations (1982): *Model Life Tables for Developing Countries*, United Nations, New York.
12. United Nations (1998): *Too Young to Die: Genes or Gender*, Dept. of Economic and Social Affairs, United Nations, New York.
13. United Nations (1999): *Health and Mortality Issues of Global Concern*, Proceeding of the Symposium on Health and Mortality, Brussels, 19-22 November 1997.

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|-----------|---|-------------------|
| C4 | MIGRATION, SPATIAL DISTRIBUTION AND URBANISATION | (60 Hours) |
|-----------|---|-------------------|

A. MIGRATION

1. Concepts, pattern, determinants and consequences of migration and issues related to migration

Concept of mobility and migration, sources and quality of data, types of migration, census definition of migrants, limitations.

2. Internal Migration

Internal migration patterns and characteristics in developing countries with a special focus on India.

Determinants of internal migration: Causes of migration at the place of origin and at the place of destination.

Consequences of internal migration: demographic, economic, social and political consequences at the individual, household and community level.

International migration

3. Sources of international migration data and problems.

Patterns of international migration: Historical and recent trends, permanent immigrants, labour migration, brain drain, refugee migration and Illegal migration.

4. Causes and consequences of international migration.

Migration theories and models -

Ravenstein's Laws of Migration

Everett Lee's Theory of Migration

Mobility Field Theory

Lewis-Fei-Ranis Model of Development

Todaro's Model of Rural-Urban Migration

5. Measures of Migration

Direct estimation of lifetime and inter-censal migration rates from census data.

Indirect measures of net internal migration: Vital Statistics Method, National Growth Rate Method and Census and Life Table Survival Ratio methods.

Methods of estimating international migration.

Migration surveys

B. SPATIAL DISTRIBUTION AND URBANISATION

6. Spatial Distribution

Spatial distribution: importance and pattern, factors affecting spatial distribution of population: physical, economic, social factors and Govt. policies.

7. Urbanization

Urbanization definition and Importance; Important aspects of urbanization process-level and tempo of urbanization, urban population growth and its components, urban size class structure; Data sources; Definitional and conceptual problems; Definition of urban and other associated urban concepts in Indian census; Forces of urbanization and components of urban population growth in developed countries, sub-urbanization and urban turnaround; Current urbanization process in developed and developing countries with special focus on India, Kingsley Davis model of urbanization process; Forces of urbanization and components of urban population growth in developing countries, over urbanization phenomena and urban primacy, Major urbanization problems and policies in developing countries with focus on India.

8. Measures of Spatial Distribution and Urbanization

Selected measures of concentration of population-Density, percentage distribution and dissimilarity index; Selected measures of Degree and tempo of urbanization; Growth and distribution of urban population, Rank-Size rule and Primacy Index, Lorenz curve and Gini's concentration ratio.

Essential Reading List

1. Cohen, Robin, (1996): *Theories of Migration*, The International Library of Studies on Migration, Edward Elgar, Cheltenham.
2. Eduardo Arriaga, (1975): "Selected Measures of Urbanization", in Sydney Goldstein and David Sly (Eds.) *Measures of Urbanization and Projections of Urban Population*, IUSSP Belgium.
3. United Nations, (2004): *World Urbanization Prospects, The 2003 Revision*, New York.
4. United Nations, (1998): *World Population Monitoring 1997*, International Migration and Development, New York.
5. United Nations, (1974): *Methods of Measuring Internal Migration*, Manual VI, UN, New York.
6. Shryock, Henry S. Jacob S. Siegel and Associate, (1980): *The Methods and Materials of Demography Vol.1 & 2*, U.S. Bureau of the Census, Washington D.C.

Suggested Reading List

1. Oberai, A.S. (1987): *Migration, Urbanization and Development*, International Labour Office, Geneva
2. Gavin Jones and Visaria, Pravin, (Eds.), 1997: *Urbanization in large developing countries – China, Indonesia, Brazil and India*, Clarendon Press, Oxford.
3. Kingsley, Davis, (1972): *World Urbanization, 1950-70*, Vol. II, Analysis of Trends, Relationship and Development, Population Monograph Series 4 and 9, University of California, Berkeley.
4. Mitra R. G., (2002): *Understanding Patterns of Migration from Census 2001 Data*, Population Stabilization and Development, Council of Cultural Growth and Cultural Relations, Cuttack
5. Todaro, Michael P.(1976), *Internal Migration in Developing Countries*, International Labour Office, Geneva.
6. United Nations, (1979): "Trends and Characteristics of International Migration Since 1950" *Demographic Studies* No. 64, UN, New York.
7. United Nations, (1983): *Determinants and Consequences of Population Trends*, Vol 1, UN, New York, Chapter-VI.

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|------|--|-------------------|
| E1.1 | Healthcare Systems and Policies | (45 Hours) |
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1. Identify the structure, components and characteristics of global health care system
2. Understanding the needs and goals for various policies related to public health, policy environment, frameworks for policy analysis
3. Basic models and functions of health services, health care systems, international experience
4. Health infrastructure and health delivery system in India- public, private, NGOs, Indigenous health systems
5. National health programmes- Public health preparedness
6. Public health system- A re-appraisal and SWOT analysis, a critique on the health delivery system- problems related to structural, functional and management of public health care services
7. Health care system- stakeholders in health care system, human capital and health, role of government in providing health care, improving access to health care with quality
8. Health care legislations in India: Legal aspect of health care, MTP Act, biomedical waste Rules, COPRA Act, PNDT Act, Transplantation of human organs Act, etc.
9. Principles of planning and management of health programmes- monitoring and evaluation- quality assurance- health impact assessment- five year plans
10. Health services- Community needs assessment, Decentralization of health facilities
11. Sustainability of public health intervention- Concept and mechanism of sustainability, models and examples of sustainability, community ownership, Public-private mix
12. Introduction to health services and research policies - Perspectives- methodological approach
13. Major National Health Policies and Missions- NHP-2002, NRHM (2005-12)
14. Major public health problems – A critical review and analysis, identification of major areas of public health requiring interventions, ongoing public health interventions in India. Health system reforms and their impact

Essential Reading List

1. Lassey M, Lassey W, and Jinks, M. (1997). Health Care Systems around the World: Characteristics, Issues and Reforms. Prentice-Hall, Inc.
2. Graig, Laurene A. (1999) Health of Nations: An International Perspective on US Healthcare Reform. 3rd Edition, Congressional Quarterly, Inc.
3. Bodenheimer, Thomas S., Kevin Grumbach. *Understanding Health Policy*
4. Fort, Meredith, Mary Anne Mercer and Oscar Gish (Editors). *Sickness and Wealth: The Corporate Assault on Global Health*
5. Govt. of India (2002)-National Health Policy-2002, Ministry of Health and Family Welfare, New Delhi.
6. Govt. of India (2005) Report of the National Commission on Macroeconomics and Health, Ministry of Health and Family Welfare, New Delhi.

7. Peters, et.al (2002), Better Health System for India's poor: Findings, Analysis and Options: The World bank, New Delhi
8. Reddy, K.S. et.al (2011)" Towards achievement of universal health care in India by 2020 : A Call of Action", www.thelancet.com
9. Banerjee, D. (1982), Poverty, class and Health Culture in India, Vol. 1 Parchi Prakashan, New Delhi.
10. Indian Council of Social Science Research and Indian Council of Medical Research (1981), Health for All by 2000 A. D., ICSSR, Delhi.
Madan, T.N. (1969), "Who Chooses Modern Medicine and Why", Economic and Political Weekly, pp. 1475-84.

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|-------------|---|-------------------|
| E1.2 | INTRODUCTION TO BIOSTATISTICS & EPIDEMIOLOGY | (45 Hours) |
|-------------|---|-------------------|

Learning Objectives: The disciplines of Epidemiology and Biostatistics create and apply methods for quantitative research in health sciences. The Biostatisticians at Johns Hopkins School of Public Health have rightly said "Our designs and analytic methods enable health scientists and professionals in academia, government, pharmaceutical companies, medical research organizations and elsewhere to efficiently acquire knowledge and draw valid conclusions from their ever-expanding sources of information". The main objective of this course is to equip students with the basic concepts and methods employed in epidemiologic and biostatistical research. At the same time, the course aims to equip the students with recent advances in the fields of Epidemiology and Biostatistics. The idea is to emphasize concepts over details, with recent applications in public health. After going through this course, the students should be capable enough to take up responsibilities and actively participate in academics, government organizations, pharmaceutical companies, health organizations, etc. The introduction of such course is especially very important in India as there is very limited capacity in India at this moment.

A. Basic Concepts in Epidemiology

1. Introduction: Definition and objectives of epidemiology; Epidemiology and clinical practice; The epidemiologic approach; Infectious disease epidemiology, occupational epidemiology, disaster epidemiology
2. The dynamics of disease transmission: Modes of transmission; epidemic, endemic and pandemic; Disease outbreak; Determinants of disease outbreak; Herd immunity; incubation period; outbreak investigation; epidemiological modeling.
3. Identifying the roles of genetic and environmental factors in disease causation: Association with known genetic diseases; Age at onset; Family studies; Interaction of genetic and environmental factors.
4. Epidemiology and public policy: Epidemiology and prevention; Population versus high-risk approaches to prevention; epidemiology and clinical medicine; Risk assessment; Meta Analysis.
5. Epidemiological Study Designs: Ecological, Cross-Sectional, Case-Control, Cohort Studies, Randomized Intervention Studies.
6. Experimental epidemiology; Randomized trials; Clinical Trials- Basic concepts; Definitions; Historical perspectives, Phase I, II, III and IV trials, Protocol development, Use of control arms, Concepts of randomization and blinding, ethical issues

B. Measurement of Health & Disease Burden

1. Measuring the occurrence of disease: Measures of morbidity - prevalence and incidence rate, association between prevalence and incidence, uses of prevalence and incidence, problems with incidence and prevalence measurements; Surveillance; Quality of life including DALY, HALE, etc., Measures of mortality.

2. Assessing the validity and reliability of diagnostic and screening test: Validity of screening test – sensitivity, specificity, positive predictive value and negative predictive value; Reliability; Relationship between validity and reliability; ROC curve and its applications; Overall accuracy.
3. Issues in epidemiology: Association; causation; causal inference; Errors and bias; Confounding; Controlling confounding; Measurement of interactions; Generalizability.
4. Estimating risk: Estimating association – absolute risk, relative risk, odds ratio; Estimating potential for prevention – attributable risk; comparison of relative risk and attributable risk; Odds ratios for retrospective studies; Odds ratios approximating the prospective RR; Exact inference for odds ratio analysis of matched case-control data.
5. Modeling of Infectious Disease Process: Infectious diseases of human – malaria, tuberculosis, Hepatitis, HIV/AIDs, Deterministic modeling of infectious diseases
6. Probit and Survival Analysis Concepts and definition of Survival analysis - Kaplan-Meir, Life table method, Mantel-Haensal, method, Cox proportional hazards method, Dose response analysis.

Reading List:

1. Last J M: A Dictionary of Epidemiology, ed. 2. New York, Oxford University Press, 1988.
2. Bonita R, Beaglehole R, Kjellstrom T: Basic Epidemiology, ed. 2. World Health Organization, 2006.
3. Park LE, Park K: Textbook of Preventive and Social Medicine. Jabalpur, Banarasidas Bhanot, 1986.
4. Dunn G, Everitt B: Clinical Biostatistics: An Introduction to Evidence-based Medicine. Edward Arnold, 1995.
5. Friedman L M, Furberg C D, DeMets D L: Fundamentals of Clinical Trials. Boston, PSG, 1982.
6. MacMahon B, Pugh T F: Epidemiology: Principles and Methods. Boston, Little Brown, 1970.
7. Gordis L: Epidemiology, ed. 3. Philadelphia, 2004.
8. Rosner B: Fundamentals of Biostatistics, ed. 6, 2006.
9. Altman D G: Practical Statistics for Medical Research, London: Chapman and Hall, 2006.
10. United Nations Department of Economic and Social Affairs: Designing Household Survey Samples. United Nations, 2005.
11. Lee E T: Statistical Methods for Survival Data Analysis, ed. 2. New York, John Wiley & Sons.
12. Goldstein H: Multilevel Statistical Model. London, Institute of Education, 1999.
13. Murray C J L, Chen LC: Understanding morbidity change. In Arthur Kleinmann and Norma C Wane (eds.) Health and Social Change in International Perspective, Harvard Series on Population and International Health, March 1994.
14. Pocock S J: Clinical Trials: A Practical Approach. Michigan, Wiley Medical Publication, 1983.
15. Everitt B S, Pickles A: Statistical Aspects of the Design and Analysis of Clinical Trials, ed. 2. London, Imperial College Press.
16. Wackerly DO, Mendenhall W, Scheaffer RL: Mathematical Statistics with Applications, 7th edition, Wadsworth Publishing Co Inc, 2007.
17. Kutner MH, Nachtsheim CJ, Neter J, Li W: Applied Linear Statistical Models. 5th edition, McGraw-Hill/Irwin, 2005.
18. Gelman A, Carlin JB, Stern HS, Rubin DB, Dunson DB, Vehtari A: Bayesian Data Analysis, 3rd ed. Chapman and Hall, 2013.
19. Van Der Vaart: Asymptotic Statistics. Cambridge University Press, 2000.
20. Groeneboom P: Nonparametric Estimation under Shape Constraints, Cambridge University Press; 1

edition, 2014.

21. Robin H. Lock, Patti Frazer Lock, Kari Lock Morgan, Eric F. Lock, Dennis F. Lock: Statistics: Unlocking

the Power of Data, 1 edition, Wiley 2013

22. James F. Jekel: Epidemiology, Biostatistics and Preventive Medicine: With STUDENT CONSULT, Elsevier Health-US, 2013.

23. Kestenbaum, Brya: Epidemiology and Biostatistics, Springe, 2009.

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|-------------|---|-------------------|
| E2.1 | CONCEPTS AND MEASURES OF GLOBAL HEALTH | (45 Hours) |
|-------------|---|-------------------|

Rationale: This paper introduces to the students the basic concepts of global health. This course emphasizes on understanding the global burden of disease and measuring population health. A key component of this course is to understand the determinants of health and health disparities. It will also provide student with a broad understanding of the relationship between environment and health. It also develops the understanding of the students about the health care delivery system, human resources for health, migration of human resources for health, etc. Finally, it introduces to students the issues related to policy and health. The topics that will be covered in the course are listed below:

1. **Concept and introduction:** Concept of global health; why is it important to study global health?; health and development in the global context; demographic, health and epidemiological transitions; major patterns of distribution of disease in the world; sources of data on disease and disability
2. **Global burden of disease:** Concept of burden of disease; hypotheses related to burden of diseases – compression of morbidity, expansion of morbidity and dynamic equilibrium; measures of burden of disease at the population level – health expectancy and health gap; methods for estimating DFLE, HALE and DALY; how does the burden of disease and mortality vary by geography, social class, race and gender? GBD 1990, 2010 and 2013 – changes and continuities; new and re-emerging infectious diseases; issues related to HIV/AIDS; introduction to NCDs; double burden of diseases in developing countries; impact of tobacco abuse; trends and challenges related to maternal and child health; maternal mortality
3. **Determinants of Health:** Culture, gender, race, social, political and economic determinants of health and health disparities; contribution of income, education and other factors to health; Factors responsible for variation in the global burden of disease across countries; poverty and health; income inequality and health; health risk factors
4. **Environment and health:** Role of water, sanitation, indoor and outdoor air pollution and nutrition in explaining global health disparities; climate change and health; migration, disaster (man-made, natural), conflicts and epidemics
5. **Health care delivery systems:** Introduction to health systems; how to measure performance of health system?; health systems in different countries; factors responsible for better performance of health systems in developed countries; the distribution of human resources for health; quality of human resources for health; the push and pull factors associated with the migration of health care providers
6. **Policy and health:** Human rights approach to health; national and international policies related to health; how are global health priorities set?; the role of international actors like WHO, World Bank, etc. in global health; influence of international priorities on national priorities

Essential readings

1. Skolnik, R. (2008). Essentials of global health, Jones and Bartlett: Sudbury, MA.
2. Jacobsen, K.H. (2007). Introduction to global health, Jones and Bartlett: Sudbury, MA.
3. Markel, W.H., Fisher M., Smego R. (2007). Understanding global health, McGraw Hill: Columbus.

4. Merson, M.H., Black, R.E., Mills, A.J. (2001). International public health: diseases, programs, systems and policies, Gaithersburg, MD: Aspen Publishers.
5. Murray, C.J.L., Saloman, J.A., Mathers, C.D., Lopez, A.D. (2002). Summary measures of population health: concepts, ethics, measurement and applications, The World Health Organization: Geneva.
6. Murray, C.J.L., Saloman, J.A., Mathers, C. (2000). A critical examination of summary measures of population health, *Bulletin of the World Health Organization* 78(8): 981-994.
7. Cutler, D., Deaton, A., Lleras-Muney, A. (2006). The determinants of mortality, *Journal of Economic Perspectives* 20(3): 97-120.
8. Link, B.G., Phelan, J. (1995). Social conditions as fundamental cause of disease, *Journal of Health and Social Behavior* 35: 80-94.
9. Smith, J.P. (1999). Healthy bodies and thick wallets: the dual relation between health and economic status, *Journal of Economic Perspectives* 13(2): 145-166.
10. Shiffman, J. (2009). A social explanation for the rise and fall of global health issues, *Bulletin of the World Health Organization* 87(8): 608-613.
11. Gwatkin, D.R. (2000). Health inequalities and the health of the poor: what do we know? What can we do? *Bulletin of the World Health Organization* 78(1): 3-18.
12. Laxminarayanan, R. et al. (2006). Advancement of global health: key messages from the Disease Control Priorities Project, *Lancet* 367(9517): 1193-1208.
13. Murray, C.J.L., Frenk, J. (2000). A framework for assessing the performance of health systems, *Bulletin of the World Health Organization* 78(6): 717-731.
14. Mills, A., Rasheed, F., Tollman, S. (2006). Strengthening health systems, In *Disease Control Priorities in Developing Countries (2nd Edition)*, pages 87-102, New York: Oxford University Press.
15. Hsiao, W.C. (2003). What is a health system? Why should we care? Harvard School of Public Health Working Paper.
16. Anand, S., Baernighausen, T. (2004). Human resources and health outcomes: a cross country econometric study, *Lancet* 364(9445): 1603-09.
17. Chen, L. et al. (2004). Human resources for health: overcoming the crisis, *Lancet* 364(9449): 1984-1990.
18. Pallikadavath, S., Singh, A., Ogollah, R., Dean, T., Stones, W. (2013). Human resource inequalities at the base of India's public health care system, *Health & Place* 23: 26-32.
19. Zurn, P., Dal Poz, M.R., Stilwell, B., Adams, O. (2004). Imbalance in the health workforce, *Human Resources for health* 2(13): 1-12.
20. Willis-Stattuck, M. et al. (2008). Motivation and retention of health workers in developing countries: a systematic review, *BMC Health Services Research* 8: 1-8.
21. Brown, T.M., Cueto, M., Fee, E. (2006). The World Health Organization and the transition from 'international' to 'global' public health, *American Journal of Public Health* 96(1): 62-72.
22. Ruger, J.P. (2005). The changing role of the World Bank in global health, *American Journal of Public Health* 95(1): 60-70.
23. Ravishankar, N. et al. (2009). Financing of global health: tracking development assistance for health from 1990-2007, *Lancet* 373(9681): 2113-2124.
24. London, L. (2008). What is a human-rights based approach to health and does it matter? *Health Human Rights* 10(1): 65-80.

The aims of this course are:

- 1) To impart knowledge of concepts and theoretical framework relating to demography of ageing, and health, social and economic dynamics of population ageing
- 2) To impart concepts and theories of health transition, linkage between health transition and ageing transitions
- 3) To develop skills to analyze trends, determinants and consequences of population ageing
- 4) To build capacity to understand and use theoretical and empirical advancements to develop strategies, policies and programmes to meet challenges of population ageing and plan for health care and social and economic wellbeing of ageing population.

I Demography of Ageing:

A. Concepts and measures of population ageing; components of population ageing; Inter-relationship between population ageing, fertility, mortality and migration; population ageing and momentum of population growth, age structure transition and ageing, and declining population.

B. Population ageing trends and patterns in developed and developing countries; Factors determining ageing trends and patterns; Projected trends and pattern of population ageing; global and regional perspective.

C. Population ageing trends, patterns and determinants in India; state variations; future scenario of population ageing in India and states.

II Life Course Perspective and Social Dynamics of Ageing:

A. Life course perspective of population ageing; Age and Ageing, Ageism; Social Status and Roles of Elderly, Family Structure, Intergenerational relations, Kinship and family support, Social Security; Social network- Frameworks (Berkman and others) and measurement.

B. Living Arrangements of Elderly, Old Age Homes, Social Networks, and Contribution of elderly: "Feminization" of Ageing, Dependency, Gender Dimensions and Discrimination, Widows, Elderly abuse, Social and legal Vulnerability, Legislations to protect elderly in India.

III Health Transition: Understanding Health Transition and Ageing Transition; Critiques of "Health Transition" and "Epidemiological Transition" theory: Mortality and Morbidity Compression, Age Patterns of Mortality and Morbidity; Global burden of disease, communicable diseases, injuries and violence; Health Transition and emergent infectious diseases; social epidemiology and medical social determinants of health as fundamental causes of chronic disease; social determinants of health; the relative income hypothesis and the social gradients of health for ageing population: Healthy Ageing; WHO Framework for Healthy Ageing.

IV Ageing and Health:

A. Ageing and Life Expectancy: ageing and life expectancy; changing age pattern of mortality, oldest old mortality; ageing and epidemiological transition in disease prevalence and patterns; Measuring population health; life expectancy and disability free life expectancy, health adjusted life expectancy.

B. Ageing and Burden of Disease: Measurement issues in assessing burden of chronic and multiple diseases in ageing populations; Self-Reported Prevalence, Symptom based prevalence; Measured Prevalence; burden of non-communicable diseases, dual burden of communicable and non-communicable in developed and developing countries; injuries and violence Indian scenario; Ageing, Intrinsic Capacity and Biomarkers of Ageing.

C. Ageing and Functional Health: Ageing and disabilities; trends and prevalence; ageing and injuries, ageing and functional health on various domains- mobility, self-care, pain, vision, interpersonal activities, sleep and energy; Ageing and Quality of Life, WHOQol Ageing and Disability; WHODAS; Ageing and wellbeing and Life satisfaction.

D. Ageing and mental health problems; cognition, memory loss, dementia and depression; Alzheimer's and Parkinson.

E. Ageing and health risk factors: nutrition, diet and food practices; health risk behaviour- tobacco, alcohol; physical activities; Access to minimum living conditions (sanitation, water).

V Health Care System for Geriatric Care and Health Financing:

A. Availability and accessibility to geriatric care, Geriatric Health Care Institutions; Human Resource Development for Geriatric Care; institutional care; Long-term Care; Health Systems Inequalities for Addressing NCDs.

B. Ageing, health care and health financing: health care utilization, public and private health services utilization; outpatient and inpatient health care utilization; sources of health spending; out of pocket health expenditure; lack of health care options for elderly; Health induced impoverishment among elderly.

VI Population Ageing and Economic Conditions:

A. Population Ageing and Labour Force: Implications of population ageing on labor force, Retirement and work participation among elderly; occupational distribution among the elderly.

B. Ageing and Public Finance: Ageing, savings and investment; pressures on public finance - government health expenditure; implications for health insurance and health financing for elderly, Implications for Government expenditure for social security – pension, social support and housing; The Solow model with an ageing population, Becker’s family model; Bloom and Williamson’s model; ageing and poverty; Ageing, health and development.

VII Ageing Policies and Programmes:

A. Social and Economic Support Policies and Programmes for the Elderly- Retirement, Pensions and Social care Policies in developed and developing countries. Social security and welfare policies and programmes for elderly in India. National Programmes for Health Care of Elderly (NPHCE); National Policy for Senior Citizens.

B. Organizations Engaged in Wellbeing of Ageing Populations: Helpage International, Dignity Foundation, Age in Action, Age International, [Alliance for Aging Research](#), Alzheimer’s Disease International (ADI), [The Parkinson Alliance](#), Geriatrics Societies and Gerontological Associations; Age –friendly world: environment, security and health care.

C. Worldwide Longitudinal Ageing Studies in 40 countries: LASI, SAGE, SHARE, HRS, CHARLS, JSTAR, ELAS, KLoSHA

Reading List

1. World Health Organization (2015), *WHO Report on Ageing and Health*, WHO, Geneva.
2. United Nations (1994), *Ageing and the Family*, United Nations, New York
3. United Nations (1998), *Economic and Social Implications of Population Ageing*, Department of International Economic and Social Affairs, UN, New York.
4. United Nations (2001): *Living Arrangements of Older Persons: Critical Issues and Policy Responses*. Population Division, Department of Economic and Social Affairs, Special Issue Nos. 42/43, 2001, New York.
5. UNFPA, 2001, *Population Ageing and Development: Social, Health and Gender Issues*, United Nations, Malta.
6. Bloom, D.E., D. Canning, et.al. (2002): *The Demographic Dividend: A New Perspective on the Economic Consequences of Population Change*. Santa Monica, CA, RAND.
7. Bose, A.B. (2006). *Social Security for the Old*. New Delhi: Concept Publishing Company.
8. Linda J. Waite (ed.) (2004) *Ageing, Health, and Public Policy: Demographic and Economic Perspectives*, Supplement to Population and Development Review
9. Irudaya Rajan, (2007) *Social Security for the Elderly Experiences from South Asia*, Routledge, New Delhi.
10. Prskawetz, Bloom, and Lutz, eds., 2008 *Population Aging, Human Capital Accumulation, and Productivity Growth*, A Supplement to Population and Development Review.

11. Sandra Gruescu, (2006), *Population ageing and economic growth*. Physica-Verlag
12. Heslop A (1999), *Ageing and Development*, Social Development Working Paper: 3, Help Age International.
13. M. Alam (2004). Ageing, old age income security and reforms: An exploration of Indian situation. *Economic and Political Weekly*, 39(33): 3731-3740.
14. Pool, Ian, Laura R. Wong and Eric Vilquin (ed) (2006), *Age-structural transitions: challenges for development*. Paris: CIRCRED.
15. Berman, Lisa (2000) "Social Support, Social Networks, Social Cohesion and Health" *Social Work in Health Care* http://dx.doi.org/10.1300/J010v31n02_02

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|-----------|-----------------------------------|-------------------|
| C5 | POPULATION AND DEVELOPMENT | (60 Hours) |
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A. Concepts and Measures of Development:

Need to study population in the context of development: Meaning, definition and scope of development – definition and indicators.

Concepts of development and measures: Limitations of per capita income as an indicator of development; emphasis on equality, Lorenz curve and Gini coefficient; towards human centered development-welfare approach, investment in human capital approach, concepts of social development, physical quality of life index (PQLI); human development index (HDI), gender development index (GDI), human poverty index (HPI); concept of sustainable development.

B. Theories and Strategies of Development:

Theories of development: Arthur Lewis's two-sector model; big push theory, Liebenstein's critical minimum effort theory, Harrod-Domar and Solow's growth models.

Development strategies through the different five year plans in India.

Millennium development goals and achievements with special reference to India.

C. Linkages of Population on Development:

Divergent views regarding relationship between population and development: (i) Classical views: Malthus and marx, concept of optimum population (ii) population growth as obstacle to development Coale and Hoover study, tragedy of commons, limits to growth study, Enke's investment model (iii) population growth as conducive to development – views of Colin Clark, Ester Boserup and Julian Simon (iv) views of revisionists and need to study linkages between population change and development.

Effect of development on demographic variables; Demographic transition theory, demographic dividends and population ageing: effects of fertility and mortality declines, health improvements and migration on economic growth.

D. Population and Resources:

Natural resources: classification of natural resources, renewable and non-renewable resources, resources scarcity and resource depletion.

Capital resources: effect of demographic factors on savings and investments, technology and development; importance of technology to improve the productivity of physical assets.

Human resources - quantitative aspects: concepts labour force, economically active population, unemployment, types of unemployment, disguised, seasonal frictional and chronic. Factors affecting demand and supply of labour, effect of population growth and development on structure of employment.

Human resources – qualitative aspects: factors influencing productivity of human beings need for investment in human capital, implications of population growth on food, sanitation, housing, employment, education and health and social security to improve the quality of human resources.

E. Population and Environment:

Concepts of environment-biosphere, ecosystem, environmental Kuznetz curve, sustainable development-definition and scope.

Philosophical dimensions of the new environmentalism: postmodernism, eco Marxism, deep ecology, social ecology and ecofeminism.

Human impact on environmental - pressure of population on water, land and air; pollution and environmental degradation; Global warming and climate change- debate on climate change and mitigation.

Environmental degradation and its implications on population- food, health; poverty and local environment; development and displacement.

Environmental policies and programmes- global and national policies.

Essential Readings

1. Todaro, Michael P. (1981): *Economic Development in the Third world*. New York: Longman, Chapter 3.
2. Haq, Mahbubul (1996): *Reflections on Human Development*, Delhi: Oxford University Press. Chapters 1 & 2.
3. United Nations Development Programme (2007): *Human Development Report 2007/08*, New Delhi: Palgrave Macmillan Technical Note 1. pp. 393-99.
4. Ray, Debraj (1998): *Development Economics*. Delhi: Oxford University Press. Chapters 1, 2, 3 & 4.
5. Kapila, Ray and Uma Kapila (2001): *India's Economy in the Twenty First Century*. 2nd Revised Edition. New Delhi: Academic Foundation. Chapters 1 to 5, 15, 16 & 21.
6. Birdsall, Nancy, Kelley, Allen C. and Sinding, Steven W. (2001). *Population Matters: Demographic Change, Economic Growth and Poverty in the Developing World*, Oxford: Oxford University Press Chapters 2, 4 and 5.
7. David E Bloom, David Canning, Jaypee Sevilla, (2003): *The Demographic Dividend*. Sanata Monica, CA: Rand Corporation. Chapter 2.
8. National Research Council (1986): *Population Growth and Economic Development: Policy Questions*. Washington D.C.: National Academy Press. Chapters 1, 2, 3, 4, 6 & 8.
9. United Nations (1973): *The Determinants and Consequences of Population Trends*, Volume 1, Chapters 11 & 13.
10. Kawadia, G. and K. Ahuja, (2006): *Environmental Issues of Development*. Sections A and E, Ambala: Associated Publishers. Chapters 1, 3 & 13.
11. Goudie Andrew (1986) *The human impact on the natural environment*; Blackwell, UK
12. Rogers J W John and Feiss Geoffrey P (1998) *People and the earth* Cambridge University Press, UK

Suggested Readings

1. Sen, Amartya, (2002): The concept of development in Chenery Hollis and T.N. Srinivasan (eds), *Handbook of Development Economics* Vol. 1. Amsterdam: Elsevier. Chapter 1.
2. Jamison D. et al. (eds) (2006): *Disease Control Priorities in Developing Countries*, New York: Oxford University Press and World Bank. Chapter 1.
3. Chenery Hollis and T.N. Srinivasan (eds), (2002): *Handbook of Development Economics*, Vol 1, Amsterdam: Elsevier. Chapters 10, 11, 13 & 15.
4. United Nations Development Programme (1 UNDP, *Human Development Report 1990* Delhi: Oxford University Press. Chapter 1.
5. Lewis W.A, (1958): Economic development with unlimited supplies of labour. In A. N. Agarwala and P. Singh (eds.) *The Economics of Underdevelopment*. New York: Oxford University Press.
6. Leibenstein, H. (1963): *Economic Backwardness and Economic Growth*. New York: John Wiley Chapter 8.
7. Solow, R.M. (1956): A contribution to the theory of economic growth, *Quarterly Journal of Economics*, 70:65-94.
8. Coale A.J. and Hoover, E.M. (1958): *Population Growth and Economic Development in Low Income countries*, Princeton N. J.: Princeton University Press.
9. Simon Julian. (1981): *The Ultimate Resource*, Princeton N.J.: Princeton University Press.
10. United Nations (1973): *The Determinants and Consequences of Population Trends*, Volume 1, Chapters 3 & 7.
11. Martin Philips L, (2004): *Migration and Development: Towards Sustainable Solutions*, Geneva: ILO.
12. Chary, S.N and Vinod Vyasulu (eds). (2000): *Environnemental Management – An Indian Perspective*, New Delhi: Macmillan India.
13. United Nations. 2003. *Indicators for Monitoring the Millennium Development Goals: Definition, Rationale, Concepts and Sources*. New York: United Nations.

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| C6 | GENDER ISSUES AND REPRODUCTIVE HEALTH | (60 Hours) |
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1. Importance of the study of Gender Issues in Population Studies. Emergence of the Gender Issues as an important area of concern. Differences between sex and gender. Definitions, Concepts and Terminologies: gender, unequal gender relations, gender equity, gender disparities, gender inequalities, gender main streaming, gender sensitive planning and gender balance.
2. Patriarchy and Matriarchy, Kinship Structure and gender roles; Gender stratification in traditional and modern societies.
3. Feminists Theories: Evolution of feminism; Shift from women in development to gender in development. International and national experience: Different theories of feminism.
4. Autonomy, Empowerment and Status of Women: Concepts, definition and measurement; various indicators and their merits and demerits; Gender sensitive development and health intervention models and programme. Status of Women and Population Dynamics: Inter-linkages.
5. Gender and social institutions in India: State, Legal System, Religious, Family, Society, Marriage customs and patterns, dowry system, segregation and seclusion of women - Purdah system. Implications for sex ratio trends and patterns in India; Son Preference, Desired sex composition of children, child sex ratio, sex ratio at birth and sex selective abortion.
6. Gender inequalities in health: gender differentials in nutrition and health, mortality differentials by sex (children, adults, and aged) and gender inequalities in health care utilization.

- Gender inequalities at family level, in employment, in education, in important decision making process and in workplace.
7. Implications of gender inequalities for development - equal access to and utilization of services; equal participation in social development, equal access and control over capital for economic development; equal participation in policy and decision making process; equal distribution of political power.
 8. Right-based approach to gender equity and Reproductive Health and HIV/AIDS; Human rights related to gender, reproductive health rights.
Gender as a key determinant of vulnerability to poverty, gender and HIV/AIDS vulnerability and its demographic impact.
 9. Gender based violence: Different forms of violence during life time
 10. Gender and mass media: Language, image and portrayal of women in different mass media and the changes over the time
 11. Gender mainstreaming, gender sensitive financing and budgeting.
 12. National and international programme, policies and laws favoring empowerment of women. National Policy of Women Empowerment.
 13. Introduction to reproductive health, Definition and rationale of RH approach, Evolution of ideas about reproductive health, Components of RH and life cycle approach of RH, Recommendations from ICPD.
 14. Physiology of human reproduction, Male and female reproductive system; Conception, Pregnancy, Customs, and taboos related to menstruation and puberty in different societies.
 15. Maternal and obstetric morbidity, Maternal morbidity, safe motherhood programmes, emergency obstetric care, Cultural practices during pregnancy, childbearing and its impact on health of women, Effects of maternal death on family, Strategies to reduce maternal morbidity and mortality.
 16. Abortion and related issues, Spontaneous, induced abortion, legal and illegal abortions, safe and unsafe abortions and consequences of unsafe abortions, Laws regarding abortion.
 17. Infertility, Methodological issues in measurement of infertility, Sexual dysfunction, behavioural risk factors, and consequences, Assisted reproductive technologies and its use and misuse; component of infertility in government programmes.
 18. Gynecological and contraceptive morbidity: Anemia, Breast, Cervical, Ovarian, Prostate Cancer; Behavioural risk factors, Contraceptive morbidity related to different methods.
 19. Reproductive Tract Infection/Sexually Transmitted Infections and HIV/ AIDS: Issues related to HIV infection; socio-cultural, medical, public health and psychological perspectives, Social epidemiological questions concerning HIV infection in Asian countries with emphasis on India, Coping with HIV/AIDS infection: Psycho-social and economic issues, Reproductive Tract Infections (RTI) and Sexually Transmitted Infections (STIs) • Interaction between RTIs/STIs and HIV/AIDS • Impact of HIV/AIDS on fertility, mortality and its relationship with migration.
 20. Male Reproductive Health Issues: Men's reproductive health services, Men's role in women's health, Strategies to reaching out to men.
 21. Adolescent and Menopausal women, Aspects of adolescent sexual and reproductive behaviours, Socio-psychological and health problems of menopausal women.
 22. Gender and Reproductive Health • Rights based approach to gender equity and reproductive health and HIV/ AIDS • Gender and HIV/AIDS vulnerability and its demographic impact
 23. Reproductive rights and ethical issues • Human rights and values • Ethical values in RH services; information, liberty of choice • Professional and ethical issues

Essential Readings

1. Basu, Alaka M., (1992): *Culture, The Status of Women and Demographic Behaviour*, Oxford University, New York.
2. Berer, M., (2000): Making Abortions Safe: A Matter of Good Public Health Policy and Practice, Bulletin, WHO, Vol. 78(5), pp. 590-592. 2.
3. Bott, S. et al (Eds. 2003): *Towards Adulthood: Exploring the Sexual and Reproductive Health of Adolescent in South Asia*, World Health Organization, Department of Reproductive Health and Research, Geneva.

4. Dyson, Tim and Mick Moore, (1983). "On Kinship structure, female autonomy, and demographic behaviour in India", *Population and Development Review* vol. 9(1), pp. 35-60.
5. Ellsberg Mary and Heise Lori L. (2005) *Researching violence against women: A practical guide for researchers and activists*. WHO and Path, Washington D.C.
6. Folbre, Nancy. (1992). Improper arts: Sex in classical political economy. *Population and Development Review*. 18(1): 105-112.
7. Gita Sen, Adreinne Germain and Lincoln C. Chen, (Eds.), (1994): *Population Policies Reconsidered: Health and Empowerment and Rights*, Harvard University Press, Harvard.
8. Hess, B.B. and M.M. Ferree. (1987). *Analyzing Gender: A Handbook of Social Science Research*. Sage Publication, London.
9. Jeffery Patricia and R. Jeffery. 1997. *Population Gender and Politics: Demographic change in rural north India*. Cambridge University, Cambridge.
10. Miller, Barbara, D.(ed) (1993) *Sex and Gender Hierarchies*, Cambridge University Press, New York.
11. Pachauri, S. (Eds. 1999): *Implementing a Reproductive Health Agenda in India : The Beginning*, New Delhi ; Population Council.
12. Rutsein, Shea, O. and Shah, Iqbal, H. (2004): *Infecundity, Infertility, and Childlessness in Developing Countries*. DHS Comparative Reports No.9. Calverton, Maryland, USA ORC Macro and the World Health Organization.
13. Srinivasan, K. (Eds. 1996): *Population Policy and Reproductive Health*, New Delhi; PFI and Hindustan Publications.
14. United Nation. 2001. *Population, Gender and Development: A Concise Report*. UN, Economic and Social Affairs (Dept. of), New York
15. Verma, R., P.J. Pelto, S.L. Schenshul, and A. Joshi (Eds. 2004): *Sexuality in the Times of AIDS: Contemporary Perspectives from Communities in India*, New Delhi; Sage.
16. William Joan. 1989. Deconstructing Gender, 87 Michigan L Rev. 797. *Law Journal Article*
17. World Bank. (1991). *Gender and Poverty in India*. World Bank, Washington.
18. World Health Organization (2003): *Comparative Evaluation of Indicators for Gender Equity and Health*, Women and Health Programme, Centre for Health Development, Kobe, Japan.
19. World Health Organization, (1990): *Measuring Reproductive Morbidity*", Report of a Technical Working Group, Geneva, August 30-September1, 1989, WHO/MCH/90.4
20. World Health Organization. (1998). *Gender and Health. Technical paper* WHO/FRH/WHD/98. (Website: www.who.int)

Suggested Readings

1. Agnes, Flavia. (2000). *Law and gender inequalities: the policies of women's right in India*. Oxford, New Delhi.
2. Alan Guttmacher Institute, (2000): "Readings on induced abortion vol.1: Politics and policies-Articles from Family Planning Perspectives 1974-1999", The Alan Guttmacher Institute, New York.
3. Anker, R.(1997). *Gender and Jobs: Sex Segregation of Occupations in the World*, ILO, Geneva.
4. Balk, Deborah, 1997): "Defying Gender Norms in Rural Bangladesh: A Socio demographic Analysis". *Population Studies* Vol.51, pp. 153-172.
5. Bandhopadhyay, D. 2000. Gender and governance in India. *Economic and Political Weekly*. 35(3): 2696-269xxx).
6. Basu, Alaka Malwade. 2000. Gender in population research: Confusing implications for health policy. *Population Studies*. 54: 19-22.
7. Bergman Ylva, (2004): *Breaking Through, A Guide to Sexual and Reproductive Health and Rights*, Norra Skane Offset, Stockholm.
8. Bhasin K. (2000). *Understanding Gender*, Kali for Women Publishers, New Delhi.

9. Bhasin K. 1993. *What is patriarchy?*, Kali for Women Publishers, New Delhi.
10. Casterline, J.B., (1989): Collecting Data on Pregnancy Loss: A Review of Evidence from the World Fertility Survey, *Studies in Family Planning* Vol. 20(2):81-85.
11. Das Gupta, Monica, 1987. Selective discrimination against female children in rural Punjab, India. *Population and Development Review*, 13(1): 77-100.
12. Doyal L.(1995) *What Makes Women Sick: Gender and the Political Economy of Health*. London, Macmillan.
13. Dreze, Jean and Sen Amartya, (1995): *India: Economic and Social Opportunity*, Oxford University Press, New York.
14. Gittleshon, J.; Bentley, M.E.; Pelto, P.J.; Nag, M.; Pachuri, S.; Harison, A.B., and Landman, L.T (Eds), (1994): *Listening to Women Talk About Their Health: Issues and Evidence from India*, The Ford Foundation, New Delhi.
15. Goliber, T.J., (1997): *Population and Reproductive Health*, Population Bulletin Vol. 52(4), Washington, DC: Population Reference Bureau.
16. Harriet B. Presser, (1997): *Demography, Feminism and the Science-policy Nexus*, *Population and Development Review* Vol. 23(2), pp. 295-331.
17. Jeffery, Roger and Basu, Alka M. (Eds.), (1996): *Girls Schooling, Women's Autonomy and Fertility Changes in South Asia*, Sage Publications, New Delhi.
18. Jejeebhoy S. 1996. *Women's Education, Autonomy and Reproductive Behavior: Assessing what we have learned*. East West Centre, Hawaii.
19. Raju, S.and Leonard, A.(eds.) (2004): *Men as Supportive Partners in Reproductive Health*, Population Council, New Delhi
20. Reeves Hazel and Baden Sally (2000): *Gender and Development: Concepts and Definitions*, Report No. 55, Bridge (development- gender) Institute of Development Studies, University of Sussex, Brighton BN1 9RE, UK.
21. Singh, S.K., Lhungdim H., Chattopadhyay, A and Roy, T.K, (2006): "Women's vulnerability to STI/HIV in India, I.I.P.S, Mumbai.
22. Sonya, Andermahr, Lovell Terry and Wolkowitz, Carol, (1997): *A Glossary of Feminist Theory*, Arnold-Hodder Headline Group, London.
23. Sopher, David, (1980). *An Exploration of India: Geographical Perspective on Society and Culture*, Cornell University New York.
24. Unisa, S., (1999): *Childlessness in Andhra Pradesh, India: Treatment-Seeking and Consequences*, *Reproductive Health Matters*, Vol. 7, No. 13.

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| C7 | POPULATION POLICY AND PROGRAMMES | (60 Hours) |
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A. POPULATION POLICIES AND PROGRAMMES

Definition of Population Policy; principal features of a population policy; policies in the context of population growth, structure and distribution.

Policy formulation: Policy indicators, justification of population policy, socio-cultural, political and ethical issues related to population policy and the mechanism of how government decisions influence family decisions.

Role of the United Nations, and other International agencies; U.N. World Population Conferences: Bucharest (1974) and Mexico (1984), and Cairo (1994) the World Population Plan of Action in different countries.

Fertility influencing policies: pro-natalist policies, fertility control policies.

Programmes for special groups: women and children, youth, aged, and for tribal.

Health influencing policies: historical perspective of policies and programmes in developing and developed countries. The Alma Ata Declaration and Health for All by 2000 A.D.

Migration influencing policies.

National health and family planning programmes: CNA, RCH, National Population Policy- 2000, National Health Policy- 2002, and National Rural Health Mission 2005-2012.

B. POPULATION AND PROGRAMME MANAGEMENT

Reproductive health Programme Management: Principles: Human Resource Development System (HRDS), performance appraisal, feedback and counseling.

Reproductive Health Programme Management Strategies; Targeting the people in need; Marketing approach, client segmentation; community needs assessment; unmet need approach, and health seeking behavior. Providing services; commercial distribution, community based distribution (CBD) systems, and social marketing.

Quality of Care in Reproductive Health Programme: A Management Perspective: Definition and importance of quality of care. Framework for quality of care in family planning.

C. EVALUATION of FAMILY WELFARE PROGRAMMES

Introduction to evaluation of population, health and family welfare programme, objectives of the evaluation, types of evaluation, Evaluation Framework, Types and levels of indicators in FW programme evaluation. Discussion on Methodological Issues in different evaluation studies in India.

Role of MIS in evaluation of family welfare programmes, Operation Research Techniques (ORT) in evaluation and intervention.

Natural fertility; Potential fertility; Contraceptive Prevalence Rate; Use effectiveness of family planning methods; Unmet need for family planning, Wanted and unwanted fertility, Bongaarts' model for estimating fertility impact, Demand-supply framework to evaluate family planning programmes.

Cost-Effective Analysis, SWOT Analysis.

Essential Reading List

1. Bruce, Judith, (1990): "Fundamental Elements of Quality of Care: A Simple Framework", *Studies in Family Planning*, Vol. 21, No.2.
2. Giridhar, G. Sattar E.M. and Kang J.S., (Eds.), (1989): *Reading in Population Programme Management*, ICOMP.
3. Government of India, (1996): *Community Need Assessment*, Ministry of Health and Family Welfare, New Delhi.
4. Government of India (2002): *National Health Policy*, Ministry of Health and Family Welfare, New Delhi.
5. Government of India, (1999): *National Policy on Older Persons in India*, Ministry of Social Justice and Empowerment, New Delhi.
6. Government of India, (2000): *National Population Policy*, Department of Health and Family Welfare, Ministry of Health and Family Welfare, Govt. of India, New Delhi.
7. Jain, Anirudh, (1988): *Do Population Policy Matter? Fertility and Policies in Egypt, India, Kenya, and Mexico*, Population Council, New York.

8. Bertrand Jane T., Robert J. Magnani, Naomi Rutenberg (1994): *Handbook of Indicators For Family Planning Programme Evaluation*, The Evaluation Project, Carolina Population Center, University of North Carolina at Chapel Hill, USA.

Suggested Reading List

1. Peabody, J.W.; Rahman, H. Omar; Gertlor, Paull, J.; Haan, Joyce, (1999): *Policy and Health Implication for Development in Asia*, Cambridge University Press. Cambridge.
2. Peters, David H. Yazbeek Abdo S.; Sharma, Rashmi R.; Ramana G.N.V., (2002): *Better Health Care Systems in India*, World Bank, Washington D.C.
3. United Nations, (1979): "The Methodology of Measuring the Impact of Family Planning Programme on Fertility", Manual IX, *Population Studies*, No.66, New York.
4. United Nations, (1998): *National Population Policies*, Department of Economics and Social Affairs, New York.
5. World Bank, (2006): *World Development Report, 2006*, Oxford University Press, London.
6. World Health Organization, (1978): "Primary Health Care", International Conference on Primary Health Care, Alma Ata, USSR, 6-12, September.

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| C8 | RESEARCH METHODOLOGY | (60 Hours) |
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1. Scientific Methods of Research

Definition of Research, Assumptions, Operations and Aims of Scientific Research. The Research Process: conceptual, Empirical and Analytical Phases of Research: Essentials Criteria of Scientific methods.

2. Research Designs

Observational Studies: Descriptive, explanatory, and exploratory, monitoring and evaluative studies. Experimental Studies: Pre-test design, post-test design, Follow-up or longitudinal design, threat to internal validity. Action research studies, Panel Studies.

3. Methods of Data Collection

Quantitative Methods: Checklist schedules, questionnaire (mail method, interviews through telephone, internet and computers), interview schedule (face-to-face interviews or personal interviews).

Questionnaire/interview schedule design and construction: Principles of constructing a questionnaire/ interview schedule, Types of questions, framing of questions (simple, delicate, personal matter), sequencing of questions.

Qualitative Method: In-depth interviews, key informant interview, observation (participatory and non-participatory), focus group discussion, content analysis, social mapping, social networking, free listing, pile sorting, projective techniques, mechanical devices (camera, tape recorder), mystery client technique, vignettes method.

4. Measurement

Reliability and validity of measurement: Face, content, construct, convergent, concurrent, and predictive validity; Inter-coder reliability, stability, non random and random errors, scaling and composite indices.

Attitude Scales: Point scales, ranking scales, rating scales, limitations of attitude scales,
Types of Scales: Bogardus, Guttman, Likert, Semantic, Thurstone scale.

5. Sampling

Complete enumeration versus sampling.

Concept of sampling unit, sampling frame and sampling design.

Sampling methods: Simple random sampling, stratified sampling, systematic sampling, cluster sampling, and purposive sampling.

Multistage sampling in large-scale surveys, self-weighting designs, Stratification in multistage sampling.

Sampling and non-sampling errors, calculation of weights, sample size determination.

6. Data Collection, processing and analysis

Research ethics; At the level of respondent, community, organization and presentation of results
Fieldwork – interaction with community and respondent.

Editing, coding, data entry, validation & analysis.

7. Writing research proposal and report

Purpose of a proposal/report

Content of proposal/report: Introductory section, methodology adopted, analysis and inferences, summary, conclusion and recommendations.

References/Bibliography, Appendices, Footnotes.

8. Research Methodology Lab-exercise: ANTHROPAC, Atlast Ti and Group Work

Essential Reading List

1. Bernard, H. Russell, (1995): *Research Methods in Anthropology: Qualitative and Quantitative Approaches*, Altamira Press, Walnut Creek.
2. Goode W J and Hatt P K. 1952. *Methods in Social Resasrch*. McGraw Hills, New York.
3. Kish, Leslie, (1995): *Survey Sampling*, John Wiley and Sons, Inc. New York.
4. Lohr L. Sharaon., (1999): *Sampling: Design and Analysis*, Duxbury Press, London.
5. Lwanga S. K. and Lemeshow S., (1991): *Sample Size determination in Health Studies: A Practical Manual*, World Health Organisation, Geneva.
6. Mukherji, P.N., (1999): *Methodologies in Social Science*, Sage Publications, New Delhi.
7. Pullum W. 2006. An Assessment of Age and Data Reporting in the DHS Surveys, 1985-2003. DHS Methodological Report No. 5. Calverton, Maryland, Marco International Inc.
8. Royce A. Singleton and Bruce C. Straits, (1999): *Approaches to Social Research*, Oxford, Oxford University Press.
9. Young P V. 1994. *Scientific Social Surveys and Reasearch*. Prentice-Hall, New York (4th Edition).

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| C9 | ADVANCE STATISTICAL METHODS AND COMPUTER APPLICATIONS | (60 Hours) |
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1. Basics of MORTPAK4, SPECTRUM and applications.
2. Introduction to SPSS-facilities, creating database structure, data entry, specifying scales, validation of data entry, importing and exporting data. Data Manipulation – recoding creating new variable, sorting, filtering and selection of specific data, generating simple frequencies, use of syntax editor. Large scale data handling – (using NFHS, DLHS-RCH, NSSO) Merging, splitting data and formatting.
3. Correlation and regression analysis – interpretation and regression diagnostic test.
4. Multivariate analysis – concepts and interpretation of results of multiple regression, logistic regression, ANOVA, MCA with and without interaction. Survival analysis-cox regression test of proportionality and heterogeneity.
5. Introduction to STATA, generating, variables, commands and do file editor. Survey analysis – estimation of mean, proportion, design effect and probit analysis and standard non-parametric test.
6. Concept of data hierarchy and multilevel analysis. Introduction to MLwiN, importing and formatting data. Illustration of 2 and 3 level analysis using NFHS, DLHS-RCH, NSSO data.
7. Introduction to GIS and illustration.

References

1. *SPSS 14.0 Brief Guide* – SPSS Inc.
2. *SPSS regression models 11.0* - SPSS Inc.
3. *SPSS advanced models 11.0* - SPSS Inc.
4. *Stata user's guide: Release 8.*, 2nd Edition. Stata Press.
5. *Stata programming reference manual: Release 8.*, 2nd Edition. Stata Press.
6. *Stata survey data reference manual: Release 8.*, 2nd Edition. Stata Press.
7. Snijders, Tom A.B. and Bosker, Roel J., (1999): *Multilevel analysis: An introduction to basic and advanced multilevel modeling*. Sage Publications.
8. Cromley, Ellen K. and McLafferty, Sara L., (2002): *GIS and public health*. Guilford Press, New York.

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| C10 | Indirect Estimation Techniques, Population Projection and Demographic Models | (60 Hours) |
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I. Concepts of Demographic Models:

Stable population; Generalized Population; Momentum of Population Growth; Concept of Multiregional Model; and Micro Model such as Birth Interval, Waiting Time (Birth Distribution etc, Estimation of fecundability?)

II. Indirect methods for estimating fertility:

Needs for Indirect methods; Concept of Reverse Survival Method, Robust Method and method based on Generalized Population Model; Rele's Method; Concept of P/F ratio method and its modification [Hypothetical Cohort methods]

III. Indirect Method of Estimating Mortality:

1. Indirect Methods of Estimating Infant and Child Mortality

(a) Basic concepts, fundamental assumptions and underlying principles to the technique proposed by Brass based on retrospective data on children ever-born and surviving mothers classified by current age of mother; (b) Modifications proposed by Sullivan and subsequently by Trussell over Brass method; and (c) the UN revised and extended version of Trussell's method.

2. Some Methods of Estimating Adult (including Maternal Mortality) and Old Age Mortality

(i) Some methods of estimating adult mortality using successive census age-distributions; (ii) Methods of estimating life expectancies at older ages; and (iii) Estimation of maternal mortality through sisterhood method.

3. Some Indirect Methods for Estimating Death Registration Completeness for Countries Having Limited and Defective Vital Registration Data

An overview of some selected methods of estimating completeness of death registration, starting from Brass growth balance method and its subsequent development.

IV. valuation and Adjustment of Demographic Data

Appraisal of the quality of demographic data; types and sources of errors; sampling and non-sampling errors; methods of detecting errors in population data; post-enumeration surveys; dual record system; brief introduction to indirect methods.

Evaluation and measurement of errors in age reporting; methods of adjustment for age-sex data; method of graduation.

V. Population Estimates and Projections

Concepts of population projections; population estimates, forecasts and projections, uses of population projections.

Methods of interpolation; extrapolation using linear, exponential, polynomial, logistics, Gompertz curves and growth rate models.

Cohort component method: basic methodology; projection of mortality, fertility and migration components; population projections of United Nations, World Bank and Expert Committees of Government of India; accuracy of population projections.

Methods of rural-urban and sub-national population projections.

Methods of related socio-economic projections: labour force, school-enrolment, health personnel and households.

Essential Readings

1. Bennett, N.G., and S. Horiuchi (1981): "Estimating completeness of death registration in a closed population", *Population Index*, 47(2):207-221.
2. Bennett, Nail. G., and Shiro Horiuchi (1984): "Mortality estimation from registered deaths in less developed countries", *Demography*, 21(2):217-233.
3. Bhat P.N.M, (2002): General growth balance method: A reformulation for population open to migration, *Population Studies*, 56 (2002), 23-34, Printed in Great Britain.
4. Bhat P.N.M., (2002): Completeness of India's Sample Registration System: An assessment using the general growth balance method, *Population Studies*, 56 (2002), 119-134, Printed in Great Britain.
5. Coale, A.J., (1981): "Robust estimation of Fertility by the Use of Model Stable Population", *Asian and Pacific Census Forum*, Vol.8 No.2. East-West Centre, Honolulu, Hawaii.
6. EL. Badry, M.A., (1961): "Failure of Enumerators to make Entries of Zero", Errors in Recording Childless Cases in Population Censuses, *Journal of American Statistical Association* Vol. 56.
7. Hill, Kenneth (1987): "Estimating Census and Death Registration Completeness", *Asia and Pacific Population Forum*, 1(3): 8-13 & 23-24.

8. Horiuchi, S. and A. J. Coale (1982): "A Simple Equation for Estimating the Expectation of Life at Old Ages, *Population Studies*", Vol. 36, pp.317-326.
9. Keyfitz, Nathan (1977): *Introduction to the Mathematics of Population with Revision*, Addison-Wesley Publishing Company, Inc., Massachusetts.
10. Kim, Young J., Schoen, R. & Sarma, P.S.(1991) : Momentum and The Growth-Free Segment of Population, *Demography*, Vol.28, No.1 pp. 159-173.
11. Lahiri, Subrata (1990): Some New Approaches to the Estimation of Life Expectancies at Older Ages, In *Dynamics of Population and Family Welfare, 1989*, (eds. by Srinivasan and K.B. Pathak), pp.315-341.
12. Lahiri, Subrata, and Lysander Menezes (2004): "Estimation of adult mortality from two enumerations of a destabilized population subject to response biases in age-reporting", In *Population, Health and Development in India: Changing Perspectives*, (Eds. by T. K. Roy, M. Guruswamy, and P. Arokiasamy), Rawat Publications, Jaipur: 2004, pp.101-136.
13. Lahiri, Subrata, Arni S. R. Srinivasa Rao, and S. Srinivasan (2005): Role of Age-specific Growth Rates on Population Ageing in Some Developed and Developing Countries – A Comparative Study, *Demography-India*, 34(1): 63-83.
14. Martin, Linda G. (1980): "A Modification for use in Destabilized Population Brass's Technique for Estimating Completeness of Death Registration", *Population Studies*, 3(1):39-51.
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16. Mitra, S., 1984, "Estimating the Expectation of Life at Old Ages", *Population Studies*, Vol. 38, pp. 313-319.
17. Pathak, K.B. and F. Ram (1998): *Techniques of Demographic Analysis*, Himalaya Publishing House, Second Edition, Mumbai.
18. Potter, R.G. and Kulkarni, P.M. (1977) : Population Momentum : A Wider Definition, *Population Studies* Vol. 40 pp. 555-56.
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20. Preston, S.H.; Himes, Christine and Mitchell, Eggers (1989): "Demographic Conditions Responsible for Population Aging", *Demography*, 26 (4): 691-704.
21. Preston, Samuel H. Patrick, Heuveline and Michel Guillot, 2003, *Demography: Measuring and Modeling Population Processes*, Blackwell Publishers, 2001 (First Indian Reprint 2003).
22. Preston, Samuel H., and Subrata Lahiri (1991): "A Short-cut Method for Estimating Death Registration Completeness in Destabilized Populations", *Mathematical Population Studies*, 3(1):39-51.
23. Rele, J. R. (1967): "Fertility Analysis Through extension of Stable Population Concepts", *Population Monograph Series No.2*, University of Berkeley.
24. Rele, J. R., (1987), "Fertility Levels and Trends in India, 1951-81", *Population and Development Review* Vol. 13 (2). Academic Press, New York.
25. Schoen, R. and Kim Young J. (1991) : "Momentum Towards Stability as a Fundamental Principle of Population Dynamics" *Demography*, Vol.28 No.3, pp.455-466.
26. Seigel Jacob S. and David A. Swanson (eds.) (2004): *The Methods and Materials of Demography*. 2nd Edition, New York: Elsevier Academic Press. Chapters 20 & 21.
27. Smith Stanley K., Jeff Tayman, and David A. Swanson, (2001): *State and Local Population Projections: Methodology and Analysis*. New York: Kulwer Academic/Plenum Publishers. Chapters 3 & 7.

Suggested Readings

1. Government of India (2006): *Population Projections for India and States, 2001-2026*. New Delhi: Office of the Registrar General.
2. Makridakis, S. Steven C., Wheelwright, and Rob J. Hyndman (1998): *Forecasting: Methods and Applications*, New York: John Wiley and Sons, p607-.

3. Shryock, Henry S. Jacob S. Seigel and Associates: (1973): *The Methods and Materials of Demography*, Vol. I. Washington, D.C. U.S. Bureau of the Census. Chapter 8.
4. United Nations (1974): *Methods for Projections of Urban and Rural Population: Manual VIII*. Population Studies, No. 55. New York: Department of Economic and Social Affairs. Chapters 3 & 4.
5. United Nations (1983): *Indirect Techniques for Demographic Estimations*, Manual X, Population Studies No.81, Department International Economic and Social Affairs, (ST/ESA/SER.A/81).
6. United Nations (2006): *World Population Prospectus: The 2004 Revision* Vol. III: Analytical Report. New York: United Nations.
7. United Nations, (1955): *Methods of Appraisal of Quality of Basic Data for Population Estimates*, Manual II. New York: United Nations. Chapter 1 & 3.
8. Zlotnik, H. and Hill, K., (1981): "Use of Hypothetical Cohort in Estimating Demographic Parameters under Conditions of Changing Fertility and Mortality", *Demography*, Vol. 18, No.1.

Electives 3

| | | |
|-------------|---------------------------|-------------------|
| E3.1 | SPATIAL DEMOGRAPHY | (45 Hours) |
|-------------|---------------------------|-------------------|

A. Concepts and Theories

Demography as a spatial science; difference between spatial demography and population geography; Spatial pattern and spatial process; location, distance and area; Distance and decay relationship and spatial hierarchy; space, place and region; Type of spaces- concrete and abstract space; absolute, relative and relational spaces

Understanding demographic process by geographical scale; nature of disaggregated data- Census and secondary sources; Linking micro and macro demography in a spatial frame

Application of spatial frameworks to demographic process; Space, culture and fertility; Spatial pattern of mortality and diseases; Distance as factor in access to health care and health planning; Migration and distance- gravity model; space, culture and migration; urban sprawl and sub-urbanization

B. Statistical and Geospatial Data and Software

Spatial Concepts and Cartography: Spatial parameters: Site and location; Scale; Plane and spherical coordinate, Map Projection-UTM, Types of maps: cadastral, toposheet, thematic, digital; Representation of spatial and non spatial data;

Introduction to geospatial software: GIS: discrete data: point, and polygon data, Raster and vector data, layouts preparation. Geocoding and basics of digitization in ArcGIS

Introduction to Geoda: ESDA in (Exploratory Spatial Data Analysis); Local Indicators of Spatial Association (LISA)

Statistical Concepts: Bar diagram, Frequency polygon, Frequency curve; Test of significance, confidence intervals, Univariate and Multivariate Statistics: Correlation and Regression, Matrix algebra; Auto-correlation; kriging, Moran's I index

Introduction to Statistical software: SPSS, STATA, R

C. GIS and Spatial Analysis of demographic data

Representation of statistical data and automated cartography (Lab based exercises):

- a) Population distribution map of India using dot and sphere/circle, cubes, combined; Cartograms
- b) Density map by Choropleth and population density gradient by Isopleth;
- c) Fertility, mortality and natural growth of population by Polygraph.
- d) Measurement of population concentration by cumulative curve.
- e) Migration flow by Carogram

Concept and application Models:

- a) Spatial Lag and Error Regression Modeling;
- b) Multilevel modeling (hierarchical linear modeling);
- c) Geographically Weighted Regression;

- d) Spatial Pattern Analysis;
- e) Urban and city level projection

Reading list:

1. Anselin, L. (2005). Exploring Spatial Data with GeoDa: A Workbook. UC Santa Barbara, CA: Center for Spatially Integrated Social Science. available on <http://geodacenter.asu.edu/>.
2. Bailey, T. and Gatrell, A. C. (1995): Interactive Spatial Data Analysis. Harlow, Longman.
3. Barbara E., Ronald R. R., Stephen J. W., Tom P. E. and Sara R. C. (1997). *Geographic Information Systems, Spatial Network Analysis, And Contraceptive Choice*. Demography. 34(2): 171-187.
4. Bonham, Carter G.F. (1995): Information Systems for Geoscientists—Modelling with GIS. Pergamon, Oxford.
5. Chen, X., Orum A.M., and Paulsen K.E. (2013). Introduction to Cities: How Place and Space shape Human Experience. West Sussex, Wiley-Blackwell.
6. de Castro M. C. (2007). *Spatial Demography: An Opportunity to Improve Policy Making at Diverse Decision Levels*. Population Research and Policy Review 26: 477-509.
7. Dorling, D. and Fairborn, D. (1997): Mapping. Ways of Representing the World. Longman, Harlow.
8. ESRI (1993): Understanding GIS. Redlands, USA
9. Fraser Taylor, D.R. (1980): The Computer in Contemporary Cartography. New York, John Wiley and Sons,
10. Griffith, D. A. and Amehin (1997): Multivariate Statistical Analysis for Geographers. Englewood Cliffs, New Jersey, Prentice Hall.
11. Goodchild, M.F. and Janelle, D.G. (eds). (2003). Spatially Integrated Social Science: Examples in Best Practice. Oxford University Press.
12. John R. Weeks. 2004. The Role of Spatial Analysis in Demographic Research. Chapter 19 (pp. 381-399) in M.F. Goodchild and D.G. Janelle (eds.) (2004) Spatially Integrated Social Science New York, NY, Oxford University Press.
13. Kurland K. S., Gorr W. L. (2007). GIS Tutorial for Health. Redlands, CA, ESRI Press.
14. Lo, C.P. and Yeung, A. K. W. (2002): Concepts and Techniques of Geographic Information Systems. New Delhi, Prentice Hall of India.
15. Massey, D. (2008). for space. New Delhi, Sage Publications Ltd.
16. Monkhouse, F.J. and Wilkinson, H. R. (1962). Maps and Diagrams. London, Methuen and Company Ltd.
17. Parker R. N., Asencio E. K. (2008). GIS and Spatial Analysis for the Social Sciences: Coding, Mapping, and Modeling. New York, NY, Routledge/Taylor & Francis.
18. Paul V. (2007). *Demography as a Spatial Social Science*. Population Research and Policy Review 26: 457-476. (plus Introduction to the special issue of PRPR on Spatial Demography) pp. 455-456).
19. Editor. (2007). *Introduction to the Special Issue*. Population Research and Policy Review 26: 455-456).
20. Reibel, Michael, (2007). *Geographic Information Systems and Spatial Data Processing in Demography: A Review*. Population Research and Policy Review 26: 601-608.
21. Robinson, A. H. H., Sale R., Morrison J. and Muehrcke, P. C (1984) Elements of Cartography. New York, John Wiley and Sons.
22. Shaw, G. and Wheeler, D. (1994). Statistical Techniques in Geographical Analysis. Englewood Cliffs, New Jersey, Prentice Hall.
23. Soja, E. W. (1996). Thirdspace: Journeys to Los Angeles and Other Real-and-Imagined Places. Wiley-Blackwell
24. Sparks Corey. (2013). *Spatial Analysis in R: Part 1*. Spatial Demography 1(1) 131-139
25. Sparks Corey. (2013). *Spatial Analysis in R: Part 2*. Spatial Demography 1(2) 219-226
26. Zhu E J. and Chi G. (2008). *Spatial Regression Models for Demographic Analysis*. Population Research Policy Review 27:17–42 DOI 10.1007/s11113-007-9051-8

Operations Research in Reproductive Health

1. Definition of OR
 - (a) What is Operations Research
 - (b) Focus and Objective of Operations Research
 - (c) Types and Examples of Operations Research
2. Role of Researchers and Managers
3. Components of OR proposal
4. Identification of Problem and Solution
 - (a) Identification and Definition
 - (b) Justification
 - (c) Alternative Solution
 - (d) Indicators- Outputs, Outcomes and Impacts
5. Causality (Randomize Experimental Design)
 - (a) Pretest-Post test Control Group Design
 - (b) Post test –only Control Group Design
 - (c) Multiple Treatment Design
6. Quasi/Non-Experimental Design
 - (a) Non-Experimental Control Design
 - (b) Time Series, and Before and After Design
7. Inferential Statistics in Operations Research
 - (a) (X^2 , t, F)-tests
 - (b) Deciding Sample Size in case of Different Experimental Design
 - (c) Linking Different Design and Statistical Test
8. Study Design Exercises
9. Ethics in Operations Research
 - (a) ICMR Guidelines
 - (b) International Perspectives
 - (c) Case Studies
10. Utilization and Dissemination, and Process Documentation
10. Critiques to OR proposal

1. **Introduction to Monitoring and Evaluation:** Basic concepts, Difference between Monitoring and Evaluation; Linkage between Planning, Monitoring and Evaluation; Importance of Monitoring and Evaluation
2. **Monitoring and Evaluation Framework:** Resources for monitoring and evaluation, Engagement of stakeholders in monitoring and evaluation; Meaning of Indicators, Ideal requirement, process of developing indicator, illustration of indicators developed from large scale surveys, measurement, need & levels of indicator; Challenges in developing indicators from Large-Scale Surveys; Types of Indicators – Input, Process, Output, Outcome, Impact; Capacity building for monitoring and evaluation
3. **Monitoring of Policy Implementation:** Components of policy and programme, budget, staff, process of evaluation, developing tangible indicators for policy monitoring in terms of Input, Process, Output, Outcome, Impact; Result based inference
4. **Evaluation Design:** Determination of sample size under different approaches and design including measurement of change due to certain interventions; Quasi Experiment design, Case control design, Evaluation Terms of Reference- Formative and Summative Evaluations, Managing Evaluations; Evaluation at different points: Baseline, Mid-point, Concurrent and End line evaluation; Evaluating for results: Need and Uses of evaluation, Principles, norms and standards for evaluation; Roles and responsibilities in evaluation; Randomization, Statistical design of Randomization; Randomized control trials, time dependant cluster design, interrupted time series analysis.
5. **Assuring the Quality of Evaluation Design and Methodology:** Overview; Defining the context; The evaluation purpose; Focusing the evaluation; Evaluation methodology; Mandatory requirements for programme; SWOT analysis of NHM, ICDS and National Livelihood Mission; Social audit – meaning, objectives, advantage, case study of social audit
6. **Statistical Approaches of Evaluation of Intervention Programme:** Statistical inferences used in different intervention design – z, t, F and paired ‘t’ tests, two stage LSM, instrument variable method; Propensity score matching; Difference in Difference Method: Theory and application, advantage and disadvantage, regression implementation
7. **Management Information System and Use of Technology:** MIS – Monitoring information system; Role of programmers; HMIS system; Global Positioning System and use of other technology

References:

1. Casley, Dennis J and Kumar, Krishna (1988). *The Collection, Analysis, and Use of monitoring and Evaluation Data*. A World Bank Publication, The John Hopkins University Press
2. FHI (2004). *Introduction to Monitoring and Evaluation Monitoring and Evaluation, monitoring hiv/aids programs: A facilitator's training guide*. Family Health International
3. GoI & UNDP (2012). *Guiding Framework for Monitoring and Impact Evaluation of Capacity Building & Training of Panchayati Raj Institutions in States/UTs*. Government of India and United Nation's Development Programme

4. IFRC and RCS (2002). *Handbook for Monitoring and Evaluation*. International Federation of Red Cross and Red Crescent Societies –Geneva
5. NIRD&PR; MoRD and TISS (2016). *Social Audit: A manual for Trainers*. National Institute of Rural Development & Panchayati Raj; Ministry of Rural Development and Tata Institute of Social Sciences
6. Rossi, Peter H.; Mark W. Lipsey and Howard E. Freeman (2004). *Evaluation, A Systematic Approach*. Seventh Edition. Sage Publications – New Delhi.
7. Sullivan, T.M., Strachan, M., and Timmons, B.K. (2007). *Guide to Monitoring and Evaluating Health Information Products and Services*. Baltimore, Maryland: Center for Communication Programs, Johns Hopkins Bloomberg School of Public Health; Washington, D.C.: Constella Futures; Cambridge, Massachusetts: Management Sciences for Health, 2007
8. UNDP (2009). *Handbook on planning, monitoring and evaluating for development results*. United Nations Development Programme - New York
9. UNESCO (2014). *Monitoring and Evaluation Guidance for School Health Programs: Thematic Indicators*. United National Educational, Scientific and Cultural Organization.

Electives 4

| | | |
|-------------|---------------------------------------|-------------------|
| E4.1 | HEALTH ECONOMICS and FINANCING | (45 Hours) |
|-------------|---------------------------------------|-------------------|

Aim and General description

Health economics is a growing field of economics primarily dealing with issues relating to scarcity in the allocation health and health care. The aim of this proposed course is to familiarize the students with economic ideas and motivate them into undertaking future research and build their careers in health economics. This is an introductory course giving the application of economic principles to policy relevant questions in the arena of health and health care. The course begins with an overview of health economics and students will learn about the health care sector and how to apply economic tools in analyzing structure and performance of health care sector.

Teaching Strategy: Teaching by class room lectures, seminars, case studies and group exercise.

I: Introduction to Health Economics: Basic concepts in Economics– Utility, Demand and supply analysis, Elasticity, Expenditure Function, Production Possibility Frontier (PPF), Externalities and Market Failure: Approaches to Economics-Positive and Normative, Welfare economics and health.

II: Costing and Health Economics: Cost theory and cost analysis, Type of cost curves: SAVC, SAMC, STC, AFC, LATC, The importance of costing in Health Economics, Alternative definitions of cost, types of cost - monetary and non-monetary, measurement and valuation issues in cost, production cost and discounting, Constraints in measuring health cost.

III: Economic Evaluation: What is economic evaluation? Various types of economic evaluation used in health care, measuring outcome, Cost effectiveness analysis (CEA), Cost-Benefit Analysis (CBA), Divergence between social and private costs and benefits in health care, Limitations of economic evaluation, Consumer Impact Assessment.

IV: Concepts and Measures of Health Inequalities: Defining health inequality, Why measure health inequality; Health equity and inequality: Concept and definitions; Understanding of the concepts such as need, access and utilisation; cardinal and ordinal health variables; Presence of inequality: Review of some elementary measures of health inequality: Index based approach; Axiomatic approach to measurement; Individual-mean and inter-individual comparison; WHO Index, Coefficient of Variation, Generalised Entropy Index, Lorenz Curve and Gini Coefficient

V: Health Financing and Health Insurance: Health care financing system, source of health care spending, The Health Insurance – intermediary agent, The private health insurance, Regulation of health insurance, Government as health insurer in India, Equity in health care finances, Future investment strategies in health sector, Willingness to pay for health care, User charges as determinant of health financing, National Health Accounting: Sources and Uses of Funds, health budgeting, Interrelationship between epidemiological transition and health expenditure

Reading List: Essential

1. Rexford E. Snterre and Stephen P. Neun, Health Economics: Theories, Insights and Industry Studies, Thompson South – Western, 3rd Edition 4th Edition, 2007.
2. Drummond MF, Sculpher MJ, Torrance GW, O'Brien B, Stoddart GL, eds. Methods for economic evaluation of health care programmes, Third Edition, Oxford University Press, 2005.
3. O'Donnell O, Doorslaer E v, Wagstaff A and Lindelow M. Analyzing Health Equity Using Household Survey Data, A Guide to Techniques and Their Implementation
4. Gold Marthe R, Joanna E Siegel, Lousie B russel, and Milton C Weinstein, 1996, Cost effectiveness in health and medicine, new York: Oxford University Press.

Reading List: Suggested

1. Zweifel and Breyer, 1997, Health Economics, Oxford University Press)
2. Health economics: 3rd Edition by Phelps
3. The economics of health and health care, 2nd edition by Folland, Goodman and Stono (FGS)
4. Handbook of Health Economics (Anthony J. Culyer and Joseph P Newhouse eds., Elsevier Science, 2000: Available online at:
5. Culyer A J and J P Newhouse, 2000, The state and scope of health economics, Handbook of Health Economics, Volume 1A, Eds. Culyer and Newhouse, Elsevier, 2000, pages 1-7.

Recommended Journal:

1. Health Policy and Planning
2. Health Policy
3. Inequalities in Health
4. Bulletin of the World Health
5. The Lancet

I. Urbanization and Space

Urbanization and space: concepts and forms (formal and informal spaces); Differences between space, place and region; urbanization and space interaction: gravity model, distance decay model, forces of concentration and dispersion, urban agglomeration and spatial economy; Access to urban and right to the city

II. Evolution of Spaces of Settlements

Settlement: evolution, characteristics and factors; settlement pattern and hierarchy; Urban morphology; Change in urban land use and population density; Rural-urban relationship: dichotomy or continuum; Role of urban centres in rural development.

III. Urban and Regional Planning

Planning: Definitions, concepts, purpose, types and levels; geography/demography and planning relationship.

Regional development/planning: Region: concept and definition, types (formal, functional and planning); Need for regional planning; Types of regional planning; Spatial structure of regions,

Theories of regional development: Stages of development, economic base theory, Industrial location theory, Growth Pole theory; Core-periphery interactions.

Regional planning in India; Planning regions in India; Regional disparity in development; Special area development planning (hilly area development planning, (North-Eastern regional council, Mumbai Metropolitan Regional Development Plan).

Urban Planning: Concepts; history and origins of urban planning; pioneers of urban planning; types of urban plans: New towns, neighborhood, garden city, green belts; healthy urban planning, WHO concept of healthy city, livable city, sustainable city.

Urban policy since independence, five year plans, important urban plans (New Delhi, Navi Mumbai, Chandigarh); Smart Cities Mission; HRIDAY, AMRUT, PURA, RURBAN mission

IV. Challenges in Urban planning

Recent urban policies and programmes; Urban redevelopment; Urban poverty, urban housing and real estate, Slums and slum rehabilitation, The case of SRA in Mumbai; Urban pollution, Solid waste management; Management of migrants

V. GIS and Urban and Regional Planning

Application of GIS in urban and regional planning.

Essential Reading List

1. Friedman, John and William Alonso (1964) *Regional Development and Planning: A Reader*, The MIT Press, Massachusetts.
2. Friedman, John (1966) *Regional Development Policy: A Case Study of Venezuela*, MIT Press, Massachusetts.
3. Chaudhuri, J. R. (2001) *An Introduction to Development and Regional Planning*, Orient Longman, Hyderabad.
4. Chand, M and V.K. Puri, (1983), *Regional Planning in India*, New Delhi, Allied.

5. Friedman, J and W. Alonso, (eds: 1969), *Regional Development and Planning: A Reader*, Cambridge, MIT Press.
6. Lefebvre, H (1991) *The Production of Space*, Blackwell, Oxford.
7. Hall, P, (1992), *Urban and Regional Planning*, Third Editions, London, Routledge.
8. Harvey, D. (2008) 'The Right to the City', *New Left Review* 53 (September-October): 23-40.
9. Harvey, D. (2012) *Rebel Cities: From the Right to the City to the Urban Revolution*, Verso, London.
10. Husain, M, (1994), *Human Geography*, Jaipur, Rawat.
11. Leong, Goh C. and G.C. Morgan, (1982), *Human and Economic Geography*, Singapore, Oxford University Press.
12. Singh, R. Y. (1994), *Geography of settlements*, Rawat, Jaipur.
13. Ginsburg, N., Bruce Koppel and T.G. Mc Gee (1991) *The Extended Metropolis: Settlement Transition in Asia*, University of Hawaii Press, Honolulu.
14. Nath, V. (1971) Regional Development Policies “, *Economic and Political Weekly*, 6(30-32): 1601-1608.
15. Lo, C.P. and Yeung, A. K. W. (2002): *Concepts and Techniques of Geographic Information Systems*. Prentice Hall of India, New Delhi.
16. Nyerges, Timothy L. and Jankowski Piotr (2010): *Regional And Urban Gis: A Decision Support Approach*, Rawat Publication, Jaipur. ISBN: 9788131603697, 8131603695

Suggested readings

1. Friedman, J and Clyde Weaver, (1979), *Territory and Function: The evolution of regional planning*, London, Edward Arnold.
2. Kawashima, T and P. Korcelli, (1982), *Human Settlement Systems: Spatial Patterns and Trend*, Luxemburg, IIASA.
3. Knowles, R and J. Warling, (1983), *Economic and Social geography: Made Simple*, London, Heinemann.
4. Misra, R.P, (1992), *Regional planning: Concepts, Techniques, Policies and Case studies*, New Delhi, Concept.
5. Sarin, M, (1982), *Urban Planning in the Third World: The Chandigarh Experience*, London, Manshell.
6. MMRDA (2016), *Mumbai Metroplotan Regional Development Plan 2016-2036* MMRDA, Mumbai.
7. UNEP and others (2007), *Livable Cities: The benefits of environmental planning*, The Cities Alliance, Washington. <http://www.citiesalliance.org/idex.html>.

| | | |
|-------------|----------------------------------|-------------------|
| E4.3 | Large Scale Sample Survey | (45 Hours) |
|-------------|----------------------------------|-------------------|

Unit I: Scope of large scale surveys and sampling design

Need for large scale surveys, objectives of cross-sectional, longitudinal, rotational and interpenetrating surveys. Sample size determination and sample allocations for such surveys to districts, states and regions in terms of individuals, households and primary sampling units.

Unit II: Sampling frames

Sources of sampling frame for cross-sectional, longitudinal, rotational and interpenetrating surveys. Explicit and implicit stratifications, domain controlled sampling by regions and social groups, merging and segmentation procedures for small and large primary sampling units. Mapping and listing for preparation of frame for last stage sampling units. Sample selection of PSUs and households.

Unit III: Quality assurance procedures

Revisit of sub-samples, field check tables, non-response pattern, and quality lot assurance, roles of supervisors, editors, field and nodal agencies. Third party audit.

Unit IV: Software development

Computer assisted personal interview (CAPI), process of data transfers, introduction to features of Census and Survey Processing System (**CSPro**), steps for development of data entry software in CSPro.

Unit V: Ethical considerations in large-scale sample surveys

Unit VI: Estimation of sampling weights

Unit VII: Preparation of factsheets, reports and other deliverables

Reading List

1. United Nations (2005): Household Sample Surveys in Developing and Transition Countries. www.unstats.un.org/unsd/hhsurveys/
2. CSPro Software. www.census.gov/data/software/cspro.Download.htm
3. Kish, Leslie, (1995): Survey Sampling, John Wiley and Sons, Inc. New York.
4. Lohr L. Sharaon., (1999): Sampling: Design and Analysis, Duxbury Press, London
5. Ladusingh, L. (2018). Survey Sampling Methods, PHI Learning, New Delhi
6. Roy, T.K., Acharya R., Roy, A.K. (2016). Statistical survey design and evaluating impact, Cambridge University Press, New Delhi.