Master of Population Studies
Syllabus

Approved by the Academic Council on 05 July 2023

INTERNATIONAL INSTITUTE FOR POPULATION SCIENCES
[Deemed to be University)

Deonar, Mumbai 400 088.   http://iipsindia.ac.in

अन्तर्राष्ट्रीय जनसंख्या विज्ञान संस्थान बेदनार, मुंबई
INTERNATIONAL INSTITUTE FOR POPULATION SCIENCES DEONAR MUMBAI
DEEMED UNIVERSITY
(विश्वविद्यालय समतुल्य)
IIPS

(स्थापना/ Established in 1956)
बेहतर भविष्य के लिए क्षमता निर्माण
Capacity Building for a Better Future

Master of Population Studies (MPS)					
Semester I					
Code	**Type**	**TITLE**		**Credits**	**Hours**
MPS F1	Foundation	Basic Statistical Methods for Population Studies		NC	45
MPS F2	Foundation	Social Science Concepts		NC	45
MPS C1	Core	Demography and History of Population		2	30
MPS C2	Core	Age-sex structure, Quality of Data and Population Dynamics		2	30
MPS C3	Core	Nuptiality		2	30
MPS C4	Core	Fertility		3	45
MPS C5	Core	Mortality, Morbidity and Public Health		3	45
MPS C6	Core	Research Methodology		3	45
MPS C7	Core	Population Ageing and Health Transition		3	45
MPS E1	Elective	E1.1: Healthcare Systems and Policies E1.2: Biostatistics and Epidemiology		3	45
MPS E2	Elective	E2.1: Concepts and Measures of Global Health E2.2: Operations Research in Reproductive Health		3	45
VV-I		Viva-Voce Examination I		2	30
	Total			**26**	**390**
Semester II					
MPS C8	Core	Migration and Urbanization		3	45
MPS C9	Core	Population, Development and Environment		3	45
MPS C10	Core	Gender Equity and Reproductive Health		3	45
MPS C11	Core	Population Policies and Programme Evaluation		3	45
MPS C12	Core	Statistical Methods and Computer Applications		2	30
MPS C13	Core	Population Projections		2	30
MPS C14	Core	Demographic Estimation Techniques and Models		2	30
MPS E3	Elective	E3.1: Urbanization, Space and Planning E3.2: Occupational Health E3.3: Monitoring and Evaluation in Population and Health		3	45
MPS E4	Elective	E4.1: Health Economics and Financing E4.2: Spatial Demography and Application of GIS E4.3: Large-scale Sample Surveys		3	45
MPS C15	Term paper			4	60
VV-II		Viva-Voce Examination II		2	30
	Total			**30**	**450**
Grand Total				**56**	**840**

BASIC STATISTICAL METHODS FOR POPULATION STUDIES

Course Outcomes:
CO1: Refresh on basic statistical methods and its application to population data.
CO2: Recognize the relevance of distribution in bivariate and multivariate tabulations.
CO3: Application of statistical distribution in diagnosing demographic outcome and indicators.
CO4: Develop an understanding of generalization based on principles of statistical analysis.

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

Tabulation of data, conversion of raw data into frequency distribution. Generating simple frequencies. Graphical presentation of nominal, ordinal data, Logarithms: properties of logarithms, Ratios, Proportion and rates, growth rates (arithmetic, geometric and exponential), Interpolation and Extrapolation.

Data Manipulation – recoding creating new variables, sorting, filtering and selection of specific data.

Measures of Location: Mean (arithmetic, geometric, harmonic) Median, Mode; Its temporal and cross-sectional comparison; virtues and vices as a means of aggregation. Analyzing mean, (arithmetic, geometric, harmonic), median, mode.

Measures of dispersion: Range, Variance, Standard Deviation, coefficient of variation; use and interpretation in comparative reading of situation. Measures of Skewness and Kurtosis.

Techniques of analysing bivariate nominal and ordinal level data: Contingency table, oddsratios, relative risk. Measuring association and interpreting concordance and discordance

Probability concept and set theory: Introduction to the concept of probability, A-priory, and mathematical probability. Events: exhaustive, mutually exclusive events; Illustrating 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: Normal distribution and its properties, applications of normal distribution.

Concept of correlation and regression: Pearson correlation coefficient, and its properties; Spearman ranks correlation coefficient. Concept of linear regression, fitting of regression line tobi-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, comparingtwo 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 with and without interaction, Concept of unbiased estimates, Introduction to Multivariable Analysis. Multiple regression. Concept of Multiple and Partial correlation coefficients in regression analysis, Standardized regression coefficients, Regression with dummy variables. Logistic regression.

ESSENTIAL READINGS:
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.

SUGGESTED READINGS:
1. Lipshutz, Seymour., Schaum's Outline Theory and Problems of *Set Theory and Related Topics* Series, Mcgraw Hill.
2. Marcello Pagano and Kimberlee Gourneau (2000) "Principles of Biostatistics" Second Edition, Duxbury Thomson Learning, United States.
3. Prakasam, C.P., G. Rama Rao, and R.B. Upadhyay (1987): *Basic Mathematics in Population Studies*, Gemini Publishers, Mumbai.
4. Siegel J.J. and D.A. Swanson (Ed.), 2004. *The Methods and Materials of Demography*. Second Edition. Elaevier Academic Press.
5. Venkatachary, K (1994). *Elements of Mathematics for Demographers*. Monograph Series No.9. Regional Institute for Population Studies, University of Ghana. Legon.
6. Bhat N.R and M.R. Singh, 1993. *Applied Mathematics*. New Delhi: Tata McGraw – Hill Publishing Company Ltd.
7. Dillon, W.R. and Goldstein, M. (1984): *Multivariate Analysis*, John Willey and Sons, New York.
8. Douglas and Altman (2006): Practical Statistics for Medical Research, Chapman and Hall Publication, Washington, D.C.
9. Fisher, L.D and Van Belle, G. (1993) Biostatistics: A Methodology of the Health Sciences, New York, Wiley Intgescience,

MPS F2   **(45 Hours)**

SOCIAL SCIENCE CONCEPTS

Course Outcomes:

CO1: To gain familiarity with basic social science concepts that has bearing on understanding population dynamics.

CO2: Imagine the varied axis of social reality, such as caste, tribe, gender, kinship and marriage, social mobility and religion in terms of its relevance in population studies.

CO3: Viewing population in space and time and read population geography in consideration of man-environment relationship, geographical factors and regional perspective.

CO4: Recognition of interplay between economic development and population changes in an evolving world order.

CO5: To understand the psychological concepts like perception, behaviour, emotion,personality, coping mechanism, communication and their bearing on Population Studies

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

      b) 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

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; Mapsscale, 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.

ECONOMICS

1. Introduction:

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

2. 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.

3. Basic Concepts in Macro Economics

Basic Concepts in National Income: Concept of GDP, NDP, GNP, NNP, NI, PCI, PPP, 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.

PSYCHOLOGY

1. Social Psychological Concepts:

The Value of psychology and perspectives in psychology; scientific study of social influences on behavior and the interaction between individuals and groups; social pressure, leadership

2. Basics of Psychology:

Why Psychology, branches of psychology, methods of research, Psychological wellbeing across major stages of the life span. Role of psychology in population studies.

ESSENTIAL READINGS:
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
5. Winston, New York, (1949), Chapters No.1, 3,7,11,15,22,24,25,26.
6. Srinivas M.N**.,** *Social Change in Modern India,* University of California Press, Berkeley, (1966)
7. Sen, A. (2018). Collective Choice and Social Welfare: An Expanded Edition. United Kingdom: Harvard University Press.
8. Haralambos, Michael, *Sociology: Themes and Perspectives,* Oxford University Press, Delhi (1980).
9. Sigmund Freud, The Interpretation of Dreams (1900)
10. Charles M. Duhigg, *The Power of Habit* (2012)
11. Karen Horney, The Neurotic Personality of Our Time (1937)
12. Oliver Burkeman, The Antidote: Happiness for People Who Can't Stand Positive Thinking(2012) .
13. Carl Gustav Jung, Man and His Symbols (1964)
14. Introduction to Psychology 10th Edition James W. Kalat (2013)Abler, R, Adams, J and Gould P., (1971): *Spatial Organization: The Geographer's view of the World,* Prentice Hall, New Jersey.
15. Johnston, R.J., (2004): *Geography and Geographers,* Oxford Unity Press.
16. Richard, Peet**.,** (1998): *Modern Geographic Thought,* Blackwall Publishers
17. Singh, R.L., (1971) *India: A Regional Geography,* National Geographical Society of India, Varanasi.
18. 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
19. Koutsoiannis A, 1979, Modern Microeconomics, London: Macmillan Press Ltd,

20. Lipsey and Chrystal, 2004, Economics, Oxford university Press, Part One, part two and part five
21. Dasgupta AK, Epochs of Economic Theory, OUP, Bombay, Chapters 2, 3, 4, 7 and 8
22. Kuppuswamy B**.,** *Social Change in India,* Konark Publication Pvt. Ltd. Delhi, (1972).
23. Muzumdar, Haridas , *The Grammar of Sociology: Man in Society*, Asia Publishing House, Mumbai (1966).
24. Johnson, Harry M, *Sociology: A Systematic Introduction,* Allied publishers, Bombay (1966).
25. Mc Gee, Reece , *Sociology: An Introduction ,* Holt, Rinehard and Winston, New York (1980).
26. Magill, Frank N (ed.), *International Encyclopedia of Sociology,* Fitzroy Dearborn Publishers, London, (1995).
27. Francis John Monkhouse (1956) *Maps and Diagrams: Their Compilation and Construction*, University of Michigan.
28. JF Friedman (1966) *Regional Development Policy: A Case Study of Venezuela,* Cambridge, Massachusetts : MIT Press, 1966.
29. Samuelson, Paul A. and William D. Nordhaus., "Economics", New York: Tata McGraw Hill, part one, two and five
30. Datt R and Sundaram K.P.M, 2000**,** Indian economy, S. Chand & Company Ltd, Part II.
31. Government of India, Ministry of Finance, Economic Division, Economic Survey

DEMOGRAPHY AND HISTORY OF POPUALTION

Course Outcomes:

CO1: Acquaint the students with the scope and relevance of the discipline ofpopulation studies.

CO2: Become aware of the global, regional and national population trends.

CO3: To understand the nature of diversity in the size, distribution, composition, and basic characteristics of population across Indian states.

CO4: To familiarize on various sources of demographic data in India, andtheir limitations.

CO5: To appreciate the historical perspectives on population change.

Introduction to Demography

Definition and Scope: Demography as a scientific discipline; Development of demography as a discipline. Multi-disciplinary nature of Demography, Linkage with other social science disciplines including statistics, mathematics, economics etc. Some basic demographic concepts. Balancing Equation and components of population change, Concept of doubling time. Malthusian concept of population growth and resources.

Sources of Demographic Data

Population census; Uses and limitations; Indian Censuses. Census taking under British India and later, details of different domain on which Indian census collect data, publication of census data/ reports. Vital registration system., Historical data – Parish Records, National Sample Survey, Sample Registration System, Demographic Health Surveys (DHS), Longitudinal ageing Survey in India, Other sample surveys. Strengths and weaknesses of various data sets

Population History

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

Demographic characteristics of first modern people. Socio-economic and demographic features of Indus Valley Civilisation, population change from medieval to Mughal times.

History of population in India: Population estimates in ancient time, population history during British rule, famine, plague, influenza and its impact on population, Trends and growth of India's population during pre-independence and post-independence period, major sources of data about the population in the past; major explanations of population change in the past; Contribution of fertility, mortality and migration to population change in the past.

ESSENTIAL READINGS:

1. Jacob S. Siegel and David a. Swanson (2004): *The Methods and Materials of Demography*, Second Edition, Chapters 1, 2, 3, 7, 8, 9,10, Elsevier Science, USA. https://books.google.co.in/books/about/The_Methods_and_Materials_of_Demography.html?id=-uPrAAAAMAAJ&redir_esc=y

2. John Weeks (2005): Population: An Introduction to Concepts and Issues, Wordsworth Learning. Singapore 9th edition.

3. Dyson, Tim, A Population History of India: From the First Modern People to the Present Day (Oxford, 2018; online edn, Oxford Academic, 18 Oct. 2018), https://doi.org/10.1093/oso/9780198829058.001.0001, accessed 20 Mar. 2023.

4. Bhende, A., and Kanitkar, T. (1996): *Principles of Population Studies* (Seventh Edition), Himalaya Publishing House, Bombay.

SUGGESTED READINGS:
1. Warren S. Thompson, (1930), *Population Problems, New York; London: McGraw-Hill, [C1930]*
2. Bogue, D., (1969): *Principles of Demography*, John Wiley and Sons, New York.
3. United Nations, (1973): *The Determinants and Consequences of Population Trends*, Vol. I, Chapters 1, 2 and 8.
4. Census of India: http://www.censusindia.gov.in
5. United Nations. DESA. World Population Prospects 2022. https://www.un.org/development/desa/pd/sites/www.un.org.development.desa.pd/files/wpp2022_summary_of_results.pdf
6. United Nations, (1998): Handbook on Civil Registration and Vital Statistics Systems, Management, Operation and Maintenance, New York.
7. United Nations (1958). Multilingual Demographic Dictionary, John Wiley & Sons Ltd., New York
8. International Institute for Population Sciences, Mumbai. www.iipsindia.ac.in

MPS C2   **(30 Hours)**

AGE-SEX STRUCTURE, QUALITY OF DATA
AND POPULATION DYNAMICS

CO1: To familiarize the students with age-sex structure of the population
CO2: To develop capacity in measuring and analyzing the age-sex structure of a populationand its determinants and consequences.
CO3: To develop an understanding of demographic transition and demographic dividend.

Concepts and Measures of age and sex structure
Defining age and sex, sex ratio, sex ratio at birth, classification of age group and its importance, Measures of age structure; median age, percent distribution, dependency ratio, potential support ratio.

Age and sex pyramid of developed and developing countries, variations in age distribution, sex ratio and sex ratio at birth. Concept of age standardization, demographic transition theory and demographic dividend.

Dynamics of Age-Sex Structure of the World and India
Present levels and past trends in the sex and age structure of the population of the world, developed and developing countries and India.

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 role of low fertility and low mortality. Implication of migration on age sex structure.

Evaluation and Adjustment of Demographic Data:
Appraisal of quality of age-sex data:

Types and source of errors

Methods of data evaluation and error detection: direct (Post-enumeration surveys)and indirect methods

Appraisal of birth and death statistics by means of balancing equation

Dual system of records

Techniques of evaluation of age and sex data:

Measures of errors in age data (Graphical representations, Whipple's index, Myer'sindex, Age ratio, Sex ratio and UN Joint score

Evaluation of age data for young and old ages

Techniques of errors adjustment in age data and prorating

Quality checks incorporated in survey procedures to minimize errors

Possible errors and implications

Component of non-sampling errors

Mechanisms and protocols to minimize and correct errors

ESSENTIAL READINGS:

1. Jacob S. Siegel and David a. Swanson (2004): The Methods and Materials of Demography, Second Edition, Chapters 1, 2, 3, 7, 8, 9,10, Elsevier Science, USA. https://books.google.co.in/books/about/The_Methods_and_Materials_of_Demography.html?id=uPrA

2. John Weeks (2005): Population: An Introduction to Concepts and Issues, Wordsworth Learning. Singapore 9th edition.

3. Bhende, A., and Kanitkar, T. (1996): Principles of Population Studies (Seventh Edition), Himalaya Publishing House, Bombay.

4. Preston, Samuel H., Heuveline, Patrick, and Guillot, Michel (2001) Demography: Measuring and Modeling Population Processes. Oxford: Blackwell Publishers.

SUGGESTED READINGS:

1. Warren S. Thompson, (1930), Population Problems, New York; London: McGraw-Hill, [C1930]

2. Bogue, D., (1969): Principles of Demography, John Wiley and Sons, New York.

3. United Nations, (1973): The Determinants and Consequences of Population Trends, Vol. I, Chapters 1, 2 and 8.

4. Census of India: http://www.censusindia.gov.in

5. United Nations. DESA. World Population Prospects 2022. https://www.un.org/development/desa/pd/sites/www.un.org.development.desa.pd/files/wpp2022_sum mary_of_results.pdf

6. United Nations, (1998): Handbook on Civil Registration and Vital Statistics Systems, Management, Operation and Maintenance, New York.

7. Mukherjee S.B. 1976. 'The Age Distribution of the Indian Population: A Reconstruction for the state and territories, 1881-1961'. East-West Centre, University Press of Hawaii, Honolulu.

8. S Irudaya Rajan, K S James (2008). Third National Family Health Survey in India: Issues, Problems and Prospects, Economic & Political Weekly, November 29, 2008 33

9. K S James, S Irudaya Rajan (2004). Respondents and Quality of Survey Data. Economic and Political Weekly February 14, 2004

NUPTIALITY

CO1: Familiarize students' basic concepts on nuptiality

CO2: Inculcate an understanding of various theories of family formation.

CO3: Identify the different sources of data for nuptiality

CO4: Perform nuptiality analysis

Nuptiality

Introduction, Basic Concepts, Sources of Data and their limitations. Measures of Nuptiality from Registration data.

Analysis of Marital Status Data from Census.

Singulate Mean Age at Marriage (SMAM) - Synthetic Cohort and Decadal Synthetic Cohort Method.

Indices of Nuptiality (Coale's Indices)

Marriage Pattern in India and Selected Countries and related factors.

Marriage squeeze: Concepts and Implications, Concepts of Hypergamy and HypogamyGross and Net Nuptiality Tables.

Non-marriage

Multistate approach in Nuptiality analysis. Standard Age Pattern of Marriage – Coale's Model.

Divorce and Widowhood.

    a. Definition and basic measures.

    b. Marriage Dissolution Tables and Remarriage Concept

    c. Mean Age at Widowhood/Divorce from Census Returns.

Definition and Measures of Remarriages of Widowed and Divorces

ESSENTIAL READINGS:
1. Siegel, Jacob S., and David A. Swanson (eds.), (2004) *The Methods andMaterials of Demography* (Second edition). San Diego: Elsevier Academic Press.
2. Newell, Colin (1988) *Methods and Models in Demography.* London: Frances Pinter.
3. Asha A. Bhende and Tara Kanitkar, (2003), *Principles of Population Studies,*
4. Sixteenth Revised Edition, Himalaya Publishing House, Mumbai.
5. Pathak, K.B. and F.Ram, (1998) Techniques of Demographic Analysis,Mumbai: Himalaya Publishing House, Chapter 4, Pp.108-153.

SUGGESTED READINGS:
1. Coale Ansley J. and T. James Trussell (1978) *Technical Note: Finding the TwoParameters that Specify a Model Schedule of Marital Fertility. Population Index 44, 2* (1978), pp. 203-213.

Increase: a Self-Teaching Guide to Elementary Measures. Honolulu: East-West Population Institute, East-West Center.

3. Rowland, Donald T. (2006), *Demographic Methods and* Concepts. New York: Oxford University Press.

4. 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: FertilityResearch, (All three chapters but selected pages).

5. Pollard, A.H., Yusuf, Farhat and Pollard, G.N. (1990) *Demographic Techniques* (third edition). Sydney: Pergamon Press.

MSP-C4   **(45 Hours)**

FERTILITY

Course Outcomes:

CO1: Familiarize students' basic concepts on fertility

CO2: Recognize socio-cultural and economic factors influencing fertilitybehaviours.

CO3: Inculcate an understanding of various theories of reproduction andfamily formation.

CO4: Identify the different sources of data for fertility measurements

CO5: Perform fertility analysis

A. FERTILITY

Terms and Concepts
Importance of the fertility study in population dynamics; Basic terms and concepts used in the study of fertility, desired family size, fertility regulation

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.

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

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.

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's Framework of Fertility, Intergenerational Wealth Flow Theory, U. N. Threshold Hypothesis, Reproductive motivations and value of children theories. Second demographic transition

B. FERTILITY MEASURES AND MODELS

Introduction of Basic Concepts
Sources of Data for Fertility Analysis
Concept of Period and Cohort Approaches

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 of Fertility

- Children Ever Born
- Completed Fertility
- Parity Progression Ratios

Reproduction Measures

Concept of Maternity Function

Basic Idea of Tempo and Quantum Effects

Fertility Models

Age patterns of Fertility: Coale and Trussell Fertility Model: Estimating M and m

Bongaarts and Potters Aggregate Fertility Model and its applications

ESSENTIAL READINGS:

1. Preston, Samuel H., Heuveline, Patrick, and Guillot, Michel (2001) *Demography: Measuring and Modeling Population Processes.* Oxford: BlackwellPublishers.
2. Siegel, Jacob S., and David A. Swanson (eds.), (2004) *The Methods andMaterials of Demography* (Second edition). San Diego: Elsevier Academic Press.
3. Newell, Colin (1988) *Methods and Models in Demography.* London: Frances Pinter.
4. United Nations, (1973), *Determinants and Consequences of Population Trends,Vol. 1*, pages 96-104, UN, New York.
5. Bongaarts, J and Potter, R (1983) *Fertility, Biology and Behavior: An Analysisof the Proximate Determinants*. Academic Press, New York.
6. Asha A. Bhende and Tara Kanitkar, (2003), *Principles of Population Studies,* Sixteenth Revised Edition, Himalaya Publishing House, Mumbai.
7. Pathak, K.B. and F.Ram, (1998) Techniques of Demographic Analysis,Mumbai: Himalaya Publishing House, Chapter 4, Pp.108-153.

SUGGESTED READINGS:

1. David G. Mandelbaum, (1974), *Human Fertility in India: Social Components and Policy Perspectives,* University of California Press, Berkeley.
2. United Nations, (1973), *Determinants and Consequences of Population Trends,Vol. 1*, pages 96-104, UN, New York.
3. Coale Ansley J. and T. James Trussell (1978) *Technical Note: Finding the TwoParameters that Specify a Model Schedule of Marital Fertility. Population Index 44, 2* (1978), pp. 203-213.
4. Palmore, James A. and Gardner, Robert W. (1983) *Measuring Mortality, Fertility and Natural*

Institute, East-West Center.

5. Rowland, Donald T. (2006), *Demographic Methods and* Concepts. New York: Oxford University Press.

6. 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: FertilityResearch, (All three chapters but selected pages).

7. Pollard, A.H., Yusuf, Farhat and Pollard, G.N. (1990) *Demographic Techniques* (third edition). Sydney: Pergamon Press.

8. Sydney H. Contz, (1968) , *Population Theories and the Economic Interpretation,* Routledge, London.

MORTALITY, MORBIDITY AND PUBLIC HEALTH

Course Outcomes:

CO1: Become familiar with the basic definitions and concepts used, importance and the scope of mortality study and its bearing on fertility, and population health.

CO 2: Become aware of varied sources of health data (morbidity, mortality, disability), their merits/demerits, uses and significance as indicators; and their basic measures.

CO3: Explain synthetic formulation of survival experience (e.g., life table).

CO4: To convey the transitional and differential dynamics of early age life experiences.

CO5: To understand the linkages among epidemiology, mortality transition, and public health.

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. Global Mortality and Emerging Issues

*Introduction and basic measures***:**

Some basic measures: - crude death rate (CDR) and Age-Specific Death Rates (ASDRs)- their relative 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), MORTPAK4

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.

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 and XI (1990, 2019); global leading causes of death (with a focus on Asia and India); cause of death statistics in India (RG: Rural and MCCD); 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, and burden of disease; 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.   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.

ESSENTIAL READINGS:
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. 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).
4. Ram, F. and K.B. Pathak (1998): Techniques of Demographic Analysis,2nd Ed, Himalaya Publishing house, Bombay (Chapters 2 & 3).
5. WHO (1992): International Statistical Classification of Diseases and related Health Problems, Tenth Revision, Vol. 1, Geneva.

SUGGESTED READINGS:
1. Omran, A. R. (1971): The epidemiologic transition: a theory of the epidemiology of population change, Milbank Memorial Fund Quarterly, Vol. XLIX, pp. 509-538.
2. 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).
3. Preston, S. H., Patrick Heuveline and Michel Guillot (2001): Demography: Measuring and Modeling Population Process, Blackwell Publishers, Oxford, UK (Chapters 2, 3 & 4).
4. 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

RESEARCH METHODOLOGY

Course Outcomes:
CO1: To understand the research design and scientific approaches to conduct of research in varied settings.
CO2: To familiarize the qualitative and quantitative methods of data collection.
CO3: To understand qualitative data analysis using packages like Atlas Ti and Nvivo.
CO4: Develop skills for writing proposal and scientific articles.
CO5: Introducing students to field level settings and primary data collection.

Scientific Methods of Research

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

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.

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.

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.

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.

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.

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.

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

ESSENTIAL READINGS:
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).
10. Kothari, CR (2020), Research Methodology - Methods And Technique, Generic, ASIN : B0BCPDGN66, 394 pages

POPULATION AGEING AND HEALTH TRANSITION

Course Outcome:

CO1: To impart knowledge of concepts and theoretical framework relating to demography of ageing, and its societal interface.

CO2: To understand the health transition, its linkage with ageing transitions.

CO3: To develop skills to analyze trends, determinants and consequences of population ageing.

CO4: To familiarize with aging data sets and its exploration.

CO5: To acquaint the students with ageing policies and programmes and its bearing on the welfare of the elderly.

I   Demography of Ageing:

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.

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

II   Life Course Perspectives and Social Dynamics of Ageing:

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.

Living Arrangements of Elderly, Old Age Homes, Social Networks, and Contribution of elderly: "Feminization" of Ageing, Dependency, Gender Dimensions and Discrimination, Widows, Elder abuse, Social and legal Vulnerability.

III   Ageing and Health:

Ageing and Functional Health: Non-communicable diseases, Ageing and disabilities; trends and prevalence. Well-being and life satisfaction.

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

Ageing and health risk factors: nutrition, diet and food practices; health risk behaviour- tobacco, alcohol; physical activities;

IV   Ageing Policies and Programmes:

Social and Economic Support Policies and Programmes for the Elderly- Retirement, Pensions and

and programmes for elderly in India. National Programmes for Health Care of Elderly (NPHCE);

National Policy for Senior Citizens.

Worldwide Longitudinal Ageing Studies: LASI, SAGE, SHARE, HRS, CHARLS, JSTAR, etc.

ESSENTIAL READINGS:
1. Chakraborti, Rajagopal Dhar (2004), The Greying of India: Population Ageing in the Context of Asia, SAGE Publications, New Delhi.
2. UNFPA (2001), Population Ageing and Development: Social, Health and Gender Issues, United Nations, Malta.
3. UNFPA (2011), Report on the status of elderly in select states of India, UNFPA, New Delhi.
4. Govt. of India (1999). National Policy for Older Persons, Ministry of Social Justice and Empowerment, New Delhi.
5. United Nations, Department of Economic and Social Affairs, Population Division (2019). World Population Ageing 2019: Highlights. UN, New York.

SUGGESTED READINGS:
1. World Health Organization (2015), WHO Report on Ageing and Health, Geneva, WHO.
2. United Nations (2001): Living Arrangements of Older Persons: Critical Issues and Policy Responses. Population Division, Department of Economic and Social Affairs, New York.
3. Sandra Gruescu, (2006), Population ageing and economic growth. Physica-Verlag.
4. Goli, S., B. Reddy, James, K. S. & Srinivasan, V. (2019). Economic independence and social security among India's elderly. Economic and Political Weekly. 54, 39, p. 32-41 10 p.
5. James, K.S and Goli S. (2017). Demographic Changes in India. Is the Country prepared for the Challenge? The Brown Journal of World Affairs, 23:169.
6. Berman, Lisa (2000) "Social Support, Social Networks, Social Cohesion and Health" Social Work in Health Care
7. Pool, Ian, Laura R. Wong and Eric Vilquin (ed) (2006), Age-structural transitions: challenges for development. Paris: CIRCRED.
8. National Institute of Ageing (2007). Why population ageing matters? A global perspective, US National Institute of Health.
9. Asian Development Bank Institute (2019). Ageing Societies: Policies and Perspectives, ADB, Japan.

HEALTHCARE SYSTEM AND POLICIES

Course Outcomes:
CO1: To develop capacity among students to analyze health systems from an international and comparative perspectives.
CO2: To provide a historical orientation to the students on Indian-scenario; national health policy, health care delivery system, national health programmes and health sector reforms.
CO3: To understand the need and relevance of health legislations as an instrument of protection and promotion of public health and inculcate the ability to critically review them.
CO4: To introduce the students to health policy and systems research and recent developments.

Unit 1: Basic Concepts: Concepts of Health; Public health; Community health; Preventive and curate health; Health promotion; Health services; and Primary, secondary and tertiary care.

Unit 2: Health System: Goals, boundaries, functions, and WHO's health system building blocks: service delivery, health workforce, health Information systems, access to essential medicines, financing and leadership/ governance.

Unit 3: Health Services: Basic models and functions of health services, international experiences and goals and elements in universal health care (UHC) approach.

Unit 4: Health care system in India: public sector, private sector, voluntary sector, human resources for health, access to health care, utilization and expenditure on health services, and UHC initiatives and challenges ahead.

Unit 5: Health policy: Concepts and tools of health policy, health policy stakeholders, health policy triangle framework, rational decision making to approach to health policymaking, introduction to health policy and systems research.

Unit 6: Health policymaking in India: Health planning in post-Independent India, Bhore Committee Report 1946, National health plus national health policy 2017, and current national health programmes.

Unit 7: Regulation in the health sector: Need for regulations, mechanisms for regulation, key legislations and standards in the health sector in India, and challenges in the implementation of regulations.

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

Field visits to public health facilities (Sub-Health Centre/Primary Health Centre/Community

ESSENTIAL READINGS:

1. Lassey M, Lassey W, and Jinks, M. (1997). Health Care Systems around the World: Characteristics, Issues and Reforms. Prentice-Hall, Inc.
2. Bodenheimer, Thomas S., Kevin Grumbach. *Understanding Health Policy*
3. Fort, Meredith, Mary Anne Mercer and Oscar Gish (Editors). *Sickness and Wealth: The Corporate Assault on Global Health*
4. Govt. of India (2017) - National Health Policy-2017, Ministry of Health and Family Welfare, New Delhi.
5. Peters, et.al (2002), Better Health System for India's poor: Findings, Analysis and Options: The World bank, New Delhi
6. Abel-Smith, Brian. An introduction to health: policy, planning and financing. Routledge, 2018. Murray, Christopher JL, and Julio Frenk. "A framework for assessing the performance of health systems." Bulletin of the World Health Organization 78 (2000): 717-731.

SUGGESTED READINGS

1. Bhore, J. (1946). Report of the health survey and development committee (Vol. 1-4). Manager of Publications.
2. Reddy, K.S. et.al (2011)" Towards achievement of universal health care in India by 2020: A Call of Action", www.thelancet.com
3. Banerjee, D. (1982), Poverty, class and Health Culture in India, Vol. 1 Parchi Prakashan, New Delhi.
4. Indian Council of Social Science Research and Indian Council of Medical Research (1981), Health for All by 2000 A. D., ICSSR, Delhi.
5. Madan, T.N. (1969), "Who Chooses Modern Medicine and Why", Economic and Political Weekly, pp. 1475-84.
6. K. Sujatha Rao, (2017), Do We Care: India's Health System, Oxford University Press, ISBN10 : 9780199469543, 478 pages

BIOSTATISTICS & EPIDEMIOLOGY

Course Outcomes:

CO1: To introduce the basic concepts of different streams of epidemiology, disease risks, and interventions as public health tools in population studies.

CO2: To introduce the study designs and methodology in cross-sectional, case-control, cohort, andexperimental data to analyse epidemiological patterns.

CO3: To understand the use of summary measures of disease burden over epidemiological data in populationscience.

CO4: To understand comparability of estimates obtained from various parametric and non-parametric models.

CO5: To appreciate the relevance of epidemiology in public policy making.

I. Basic concepts in Biostatistics

Biostatistics 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; Clinical agreement: kappa statistics, Mantel-Haenszel test; intra-class correlation; Surveillance

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

Issues in epidemiology: Association; causation; causal inference; Errors and bias; Confounding; Controlling confounding; Measurement of interactions; Generalizability

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

Statistical process control: special and common causes of variation, Shewhart, CUSUM and EWMA charts

II. Basic Concepts in Epidemiology

Introduction: Definition and objectives of epidemiology; Epidemiology and clinical practice; The epidemiologic approach; Infectious disease epidemiology, occupational epidemiology, disaster epidemiology

The dynamics of disease transmission: Modes of transmission; epidemic, endemic and pandemic; Disease outbreak; Determinants of disease outbreak; Herd immunity; incubation period; outbreak

significance

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.

Epidemiology and public policy: Epidemiology and prevention; Population versus high-risk approaches to prevention; epidemiology and clinical medicine; Risk assessment; Meta Analysis. Epidemiological Study Designs: Ecological, Cross-Sectional, Case-Control, Cohort Studies, Randomized Intervention Studies.

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

III.   Measurement of Health & Disease Burden

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.
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.
Issues in epidemiology: Association; causation; causal inference; Errors and bias; Confounding; Controlling confounding; Measurement of interactions; Generalizability.

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.

ESSENTIAL READINGS:
1. Gordis L: Epidemiology, ed. 5. Philadelphia, 2014. Elsevier Saunders; ISBN: 978-1-4557-3733-8
2. Bonita R, Beaglehole R, Kjellstrom T: Basic Epidemiology, ed. 2. World Health Organization, 2006.
3. Friedman L M, Furberg C D, DeMets D L: Fundamentals of Clinical Trials. Boston, PSG, 1982.
4. MacMahon B, Pugh T F: Epidemiology: Principles and Methods. Boston, Little Brown, 1970.
5. Altman D G: Practical Statistics for Medical Research, London: Chapman and Hall, 2006.
6. Bhore, J. (1946). Report of the health survey and development committee (Vol. 1-4). Manager of Publications.

SUGGESTED READINGS:
1. Lee E T: Statistical Methods for Survival Data Analysis, ed. 2. New York, JohnWiley & Sons.
2. Goldstein H: Multilevel Statistical Model. London, Institute of Education, 1999.
3. Everitt B S, Pickles A: Statistical Aspects of the Design and Analysis of ClinicalTrials, ed. 2. London, Imperial College Press.
4. Kutner MH, Nachtsheim CJ, Neter J, Li W: Applied Linear Statistical Models.5th edition, McGraw-Hill/Irwin, 2005.
5. Gelman A, Carlin JB, Stern HS, Rubin DB, Dunson DB, Vehtari A: BayesianData Analysis, 3rd ed. Chapman and Hall, 2013.

7. Groeneboom P: Nonparametric Estimation under Shape Constraints, CambridgeUniversity Press; 1 edition, 2014.
8. 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
9. Kestenbaum, Brya: Epidemiology and Biostatistics, Springe ,2009.

CONCEPTS AND MEASURES OF GLOBAL HEALTH

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; importance to study global health, global variation in demographic, health and epidemiological transitions; linkages between globalization and health; linkages between global and local health; current challenges, emerging trends and priorities in global health; 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, age and gender? GBD 1990, 2010 and 2019 - changes and continuities.

3. **Infectious Diseases, Non-Communicable Diseases (NCDs) and Nutrition**:
   Persistence of infectious diseases in developed and low- and middle-income countries; new and re-emerging infectious diseases across globe; difficulty in prevention, treatment, and rehabilitation from infectious diseases. Current and growing challenge of NCDs in developed and low- and middle-income countries; NCD's epidemiology in developed and low- and middle-income countries. Double burden of malnutrition and diseases in low- and middle-income countries; food security of undernutrition; short-term and long-term impact of undernutrition; nutrition transition.

4. **Determinants of Health**:
   Factors responsible for variation in the global burden of disease - culture, race, ethnicity, education, socio-political establishment, economic development and economic inequality. Role of water, sanitation, indoor and outdoor air pollution, food security, migration, disaster (man-made, natural), conflicts and epidemics in explaining global health disparities.

5. **Health care delivery systems**:
   Introduction to health systems; components of health system; financial models of health care; service delivery models; governments role in delivering health care; measurement of health system performance in developed and developing countries; role of WHO, World Bank, etc. in setting global and national health priorities.

Essential readings

1. Skolnik, R. (2008). Essentials of global health, Jones and Bartlett: Sudbury, MA.
2. Fried LP, Bentley ME, Buekens P, Burke DS, Frenk JJ, Klag MJ et al. (2010). Global Health is Public Health. *Lancet* 375, 535 – 7.
3. Huynen M, Martins P, Hilderink HBM. (2005). The Health Impacts of Globalisation: A Conceptual Framework. Globalization and Health 1:14.
   http://www.globalizationandhealth.com/content/1/1/14
4. 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.Council on Foreign Relations. (2014). The Emerging Global Health Crisis. Non-Communicable Diseases in Low- and Middle-Income Countries. Independent Task Force Report No. 72.
   https://www.cfr.org/sites/default/files/report_pdf/TFR72_NCDs.pdf
5. Fauci AS, Morens DM. (2012) The Perpetual Challenge of Infectious Diseases. N Engl J Med 366: 454 – 61.

Suggested readings

1. Hoffmann SJ. (2010). The Evolution, Etiology and Eventualities of the Global Health Security Regime. *Health Policy Plan* 25(6): 510-22. https://www.ncbi.nlm.nih.gov/pubmed/20732860
2. 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.
3. Dielman JL, Schneider MT, Haakenstad A, Singh L, Sadat N, Birger M, Reynolds A, Templin T, Hamavid H, Chapin A, Murray C. (2016) Development Assistance for Health: Past Trends, Associations, and the Future of International Financial Flows for Health. Lancet 387; 2536 – 44.
4. 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.
5. Mozaffarian D. (2017). Global Scourge of Cardiovascular Disease. Time for Health Care Systems Reform and Precision Population Health. Journal of the American College of Cardiology 70(1): 26 – 8.
6. 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.
7. Hsiao, W.C. (2003). What is a health system? Why should we care? Harvard School of Public Health Working Paper.
8. World Health Organization (2010). Key Components of a Well-Functioning Health System.
   http://www.who.int/healthsystems/publications/hss_key/en/
9. World Health Organization. (2017) Double Burden of Malnutrition.
   http://www.who.int/nutrition/double-burden-malnutrition/en/

OPERATIONS RESEARCH IN REPRODUCTIVE HEALTH

Course Outcomes:

CO1: To familiarize the concept of operation and intervention research in reproductive health and related fields.

CO2: To differentiate the operation research from other social science research.

CO3: To train students to identify research problems, design and methodology in operation research.

CO4: To familiarize the process of developing suitable indicators in keeping with the research design.

CO5: To develop a capacity to prepare proposal for operation research and its implementation.

1. Basic Concepts and Definition of OR
(a) What is Operations Research
(b) Focus, Objective and Characteristics of Operations Research
(c) Types and Examples of Operations Research
(d) Methods of Operations Research
(e) Implementation Research and Its Linkages with OR

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-Posttest Control Group Design
(b) Posttest –only Control Group Design
(c) Multiple Treatment Design

6. Design
(a) Experimental Design: Pretest-posttest control group design; Posttest-only control group design; Multiple treatment designs
(b) Quasi Experimental Deign: Non-equivalent control group; Time series design; Separate sample pretest-posttest design;

(c) Non-Experimental Design: Posttest-only design; Pretest-posttest design; Static-group comparison

7. Inferential Research Statistics Accordingly Operations Research design
    (a) $(X2, t, F)$-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) International Perspectives: Research Ethics; Recognize Ethical Issues in Operation Research Need of Ethical Standards in Operational Research; History and Foundation of Research Ethics; Principles; Codes and Regulations: International Landscape; Ethics Review Committee: Members, Roles
    Submission a Proposal for Ethical Clearance
    (b) ICMR Guidelines: Background; ICMR Code; Statement of General Principles; General Ethical Issues
    Responsible Conduct of Research (PCR); Ethical Review Procedures; Informed Consent Process; Vulnerability
    (c) Case Studies

10. Utilization and Dissemination, and Process Documentation

11. Critiques to OR proposal

ESSENTIAL READINGS:
1. Blumenfeld, S. (1985). *Operations research methods: A general approach in primary health care*. Primary Health Care Operations Research, Center for Human Services.
2. Fisher, A. A., Foreit, J. R., Laing, J. E., Stoeckel, J. E., & Townsend, J. (2002). Designing HIV/AIDS intervention studies: An operations research handbook.
3. Foreit, J. R., & Frejka, T. (1998). Family planning operations research: a book of readings.

SUGGESTED READINGS:
1. Gallo, G. (2004). Operations research and ethics: Responsibility, sharing and cooperation. *European Journal of Operational Research*, *153*(2), 468-476.
2. Mathur, R., & Swaminathan, S. (2018). National ethical guidelines for biomedical & health research involving human participants, 2017: A commentary. *The Indian journal of medical research*, *148*(3), 279.
3. Oliver, P. (2010). *The student's guide to research ethics*. McGraw-Hill Education (UK).
4. Ormerod, R. J., & Ulrich, W. (2013). Operational research and ethics: A literature review. *European journal of operational research*, *228*(2), 291-307.
5. Sanmukhani, J., & Tripathi, C. B. (2011). Ethics in clinical research: The Indian perspective. *Indian journal of pharmaceutical sciences*, *73*(2), 125.

MIGRATION AND URBANIZATION

Course Outcomes:

CO1: To make the students understand the basic concepts, definitions, sources of data etc. on migration and urbanization.

CO2: To develop a critical understanding on the various theories/models concerning migration and urbanisation.

CO3: To equip students on the measurement and estimation of level, trend and pattern of migration and urbanization.

CO4: To understand the trend and pattern of spatial distribution and its linkage with migration and urbanization.

CO5: To develop a critical understanding on the emerging migration and urban issues, government policies and programmes in the context of development.

I. SPATIAL DISTRIBUTION
   i.   Pattern and factors affecting spatial distribution of population
   ii.   Selected measures of concentration of population: Measures of concentration of population-Density, percentage distribution and dissimilarity index

   II.   MIGRATION Introduction and Concepts
   i Concept of mobility and migration, types of migration, censusdefinition of migrants and its limitations
   Sources and quality of data : Census, NSSO, Migration surveys

   Migration theories and models
   i.   Ravenstein's Laws of Migration
   ii.   Everett Lee's Theory of Migrationiii Mobility Field Theory
   iii. Todaro's Model of Rural-Urban Migrationv New Economics of Labour Migration
   iv.   Transnationalism Theory of Migration

   Internal Migration
  i Patterns and characteristics in developing countries with a special focus on India.
   ii   Causes and consequences of internal migration: demographic, economic, social and politicalconsequences at the individual, household and community level
   iii   Policies related to internal migration

   International migration

ii. Patterns and types of international migration: Historical and recent trends, Indian Diaspora andpeople of Indian origin.

iii. Causes and consequences of international migration: demographic, economic, social andpolitical consequences at the individual, household and community level

iv. Policies of international migration

Measures of Migration

i 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

i. Estimation of return migration

ii. Methods of estimating international migration

Migration and health

Migrants' rights and Social entitlements

III Urbanization Definition and Concepts

i. Definitional and conceptual problems and Data sources: Rural-Urban Fringe, Metropolis or Metropolitan Area, Conurbation, Metropolitan Region, Megalopolis, Metropolitan Hinterland, urban turnaround, sub-urbanization

ii. Definition of urban and other associated urban concepts in Indian census; Urban size class structure

Measures

i Degree and tempo of urbanization;

ii Urban population growth and its components;

iii Rank-Size rule and Primacy Index, Lorenz curve and Gini's concentration ratio

Theories

i. Kingsley Davis model of urbanization process

ii. Functional Classification of Urban Centres by Harrisiii The City-Region Relationship

iii. iv Theories and Models of urban planning, Concept of New Towns

Urbanization process

i Current urbanization process in developed and developing countries with special focus on India,

ii Major urbanization problems and policies

ESSENTIAL READINGS:

1. Cohen, Robin, (1996): Theories of Migration, The International Library of Studies on Migration

2. Eduardo Arriaga, (1975): "Selected Measures of Urbanization", in Sydney Goldstein and DavidSly (Eds.) Measures of Urbanization and Projections of Urban Population, IUSSP Belgium
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. United Nations, (2019): *World Urbanization Prospects, The 2018 Revision*, New York.
5. United Nations, (1974): Methods of Measuring Internal Migration, Manual VI, UN, New York.

SUGGESTED READINGS:

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. International organization for Migration (2021), World Migration Report 2022, IOM, Geneva.
4. Shryock, Henry S. Jacob S. Siegel and Associate, (1980): The Methods and Materials of Demography Vol.1 U.S. Bureau of the Census, Washington D.C.
5. Todaro, Michael P. (1976), Internal Migration in Developing Countries, International LabourOffice, 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, NewYork, Chapter-V
8. Weeks, John R. (2015), Population: An Introduction to Concepts and Issues, CengageLearning
9. Haas, H. d., Castles, S., & Miller, M. J. (2020). The age of migration: international population movements in the modern world. Sixth edition. New York, The Guilford Press

POPULATION, DEVELOPMENT AND ENVIRONMENT

CO1: To acquaint students on key concepts, indicators and composite indices of development
CO2: To familiarize students on various theories of population and development
CO3: To introduce pessimistic, optimistic and neutralistic views on population
CO4: To explain quantitative and qualitative aspects of human resources
CO5: To introduce the concepts of sustainable development, climate change and global warming

I. Concepts and Measures of Development

i. Need to study population in the context of development; Concepts of economic growth and economic development – definition and indicators; Limitations of per capita income as an indicator of development; Emphasis on equality, Lorenz curve and Gini coefficient.

ii. Economic determinants of development, non-economic determinants of development, and role of institutional factors in development.

iii. *Approaches towards development:* Growth oriented approach and basic minimum need approach; Human centred development – welfare approach, investment in human capital, Physical Quality of Life Index (PQLI), Human Development Index (HDI), Gender Development Index (GDI); Concepts and measures of money metric and multidimensional poverty, Human Poverty Index (HPI) and Multidimensional Poverty Index (MPI).

iv. Concepts of social development, social capital and social change.

II. Theories and Strategies of Development

i. *Theories of development:* Big push theory, Rostow's stages of growth, Arthur Lewis's two-sector model Liebenstein's critical minimum effort theory, Harrod-Domar model, and Solow's growth model.

ii. *Strategies of development:* Millennium Development Goals (MDGs), achievements with special reference to India; Concept of sustainable development, Sustainable Development Goals (SDGs); Development strategies through the different five-year plans in India; Recent development strategy (NITI Aayog) in India.

III. Population and Development linkages

▪ *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; and (iv) views of revisionists and need to study linkages between population change and development.

▪ Demographic transition theory, age structure transition, demographic dividends and population

growth. Divergent views regarding the relationship between population and development.

IV. Population and Resources

i. *Natural resources:* classification of natural resources, renewable and non-renewableresources, resources scarcity and resource depletion.
ii. *Capital resources:* effect of demographic factors on savings and investments, technology and development; importance of technology to improve the productivityof physical assets.
iii. *Human resources - quantitative aspects:* concepts labour force, economically activepopulation, 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.
iv. *Human resources – qualitative aspects:* factors influencing productivity of human beings need for investment in human capital, implications of population growth onfood, sanitation, housing, employment, education and health and social security to improve the quality of human resources.
v. Educational development, urbanization and exposure to mass media and their social consequences.

V. Population and Environment
i. *Ecosystem:* Basic concepts, structure and functioning, energy and material flow, changes and challenges of ecosystem; simplification, eutrophication, pollution.
ii. *Philosophical dimensions of the new environmentalism:* postmodernism, eco Marxism, deep ecology, social ecology and ecofeminism.
iii. *Sustainable development and environment:* Role of environment in development – evolution, inclusion and progress; Brundtland Commission – Our Common Future; "5 *Ps*" that shape the *SDGs*: People, Planet, Prosperity, Peace, and Partnerships; UNGC Ten Principles; Linkages of SDGs with environment. Living planet index, Human foot print, IPAT model; environmental-Kuznetz curve;
iv. *Environmental challenges:* Resource depletion and environment; pollution; poverty and environment; food, nutrition and environment; ecofeminism; solid waste; climate change and development; health and environmental challenges; occupational health.
v. *UN conventions on environment and development:* Major world commissions from 1972 to Rio+20 and so on; UNFCCC and challenges in making policies on environment; Environmental policies and programmes in India.

ESSENTIAL READINGS:
1. Birdsall Nancy, Kelley Allen, & Sinding Steven (2001). *Population Matters: Demographic Change, Economic Growth and Poverty in the Developing World,* Oxford: Oxford University Press. Chapters 2, 4 and 5.
2. Ray, Debraj (1998): *Development Economics.* Delhi: Oxford University Press. Chapters 3 & 4.
3. Todaro, Michael P. (1981): *Economic Development in the Third world.* New York: Longman. Chapter 3.
4. UNDP (2022). *Human Development Report 2021-2022: Uncertain Times, Unsettled Lives:*

5. UN Environment (2019). G*lobal Environment Outlook – GEO-6: Healthy Planet, Healthy People*. Cambridge University Press.
6. World Commission on Environment and Development (1987). *Our Common Future.* London: Oxford University Press.

 SUGGESTED READINGS:
1. Chary, S.N. & Vinod Vyasulu (eds). (2000). *Environmental Management: An Indian Perspective.* New Delhi: Macmillan India.
2. Coale A.J. and Hoover, E.M. (1958). *Population Growth and Economic Development in Low Income countries*. Princeton: Princeton University Press.
3. David Bloom, David Canning & Jaypee Sevilla, (2003): *The Demographic Dividend.* Sanata Monica: Rand Corporation. Chapter 2.
4. Irfan Habib, (2010), *Man and Environment: The Ecological History of India* (A Peoples History of India 36). New Delhi: Tulika Books.
5. Kapila, Ray and Uma Kapila (2001). *India's Economy in the Twenty First Century.* New Delhi: Academic Foundation. Chapters 1 to 5, 15, 16& 21.
6. Leibenstein, H. (1963). *Economic Backwardness and Economic Growth*. New York: John Wiley. Chapter 8.
7. 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.
8. Morton Lippmann, Beverly S. Cohen, Richard B. Schlesinger, (2003). *Environmental Health Science: Recognition, Evaluation, and Control of Chemical and Physical Health Hazards.* Oxford: Oxford University press.
9. Solow, R.M. (1956). A contribution to the theory of economic growth, *Quarterly Journal of Economics*, 70: 65-94.
10. United Nations Development Programme (1990). *Human Development Report, 1990.* Delhi: Oxford University Press. Chapter 1.

GENDER AND REPRODUCTIVE HEALTH

Course Outcomes:

CO1: To sensitize students to basic gender concepts, gender equity, gender inequalities and gender differentials.

CO2: To explain to students about empowerment, feminist and gender theories.

CO3: To familiarize students with the reproductive health paradigm and right-based approach to reproduction and gender egalitarianism.

Learning objectives: This paper aims to teach students about gender issues related to population, development and reproductive health. The main goal is to build skills for students to understand and analyze evidence pertaining to the institutional context of gender and gender-based inequalities and linkages between population, development and health with gender. Further, it provides a non-clinical foundation in the main aspects of reproductive health: maternal care, obstetric health, gynaecological morbidities, RTI/ STI/HIV/AIDS, infertility, abortion, family planning, and adolescent and men.

I.   Basic concepts and theories of gender
Definitions, Concepts and Terminologies: gender, third gender, unequal gender relations, gender equity, gender disparities, gender inequalities, gender mainstreaming, gender-sensitive planning and gender balance, Masculinity and femininity, importance of the study of gender issues in Population Studies.

II.   Gender Inequalities and Linkages with Development
Sex ratio trends and patterns in India; Son Preference, Desired sex composition of children, child sex ratio, the sex ratio at birth and sex-selective abortion; Marriage, customs and practices, dowry and mohar system, age at marriage; Purdah system; female genital mutilation; land rights of women; education, skill development and gender; labour force participation, household activities and social reproduction; gender differentials in nutrition and health; access to health care; political representation, and female headship; valuation of women in the context of marriage, dowry and development; gender-based violence (GBV) and its implications on child, adult and elderly; media and gender.

III.   **Autonomy, Empowerment and Status**
Concepts, definition and measurement; various indicators and frameworks; approaches: Functionalist, Marxist, Feminist, Behaviouralism; the process of empowerment; a paradigm shift in gender, development and empowerment: WID, WAD, GID, GAD, WED; policies and programmes related to empowerment.

IV.   **Reproduction physiology, Rights and Ethical issues**
Evolution of ideas about reproductive health and rationale of RH approach, Components of RH

Customs and taboos related to menstruation & puberty, and pregnancy in different societies; Aspects of adolescent sexual and reproductive behaviours, the vulnerability of adolescent and their health needs. Role of reproductive health policies and programmes on health. Ethical values in RH services; information, liberty of choice.

V.   Maternal, obstetric, gynaecological and contraceptive morbidity

Risk factors of maternal mortality and morbidity, Three delay model, Emergency obstetric care, Maternal near miss and obstetric fistula, Impact of cultural practices during pregnancy on women's health, Programmes, policies and strategies for safe motherhood. Behavioural and lifestyle factors of different reproductive morbidities, Issues related to RTIs/STIs, HIV infection, Issues related to menopause and socio-psychological health problems of menopausal women.

VI.   Infertility and abortion

Methodological issues in measuring primary and secondary infertility; social, cultural, environmental and anatomical risk factors of infertility. Consequences of infertility on marital stability of couples, mental health and violence. Assisted Reproductive Technologies(ART) use and misuse; surrogacy; laws and acts regarding their use. Abortion data and its measurement, type of abortions, the association of abortion with untimed and unintended births, Unsafe abortion and its association with maternal death and infertility, Laws regarding abortion

ESSENTIAL READINGS:

1. Kamla Bhasin, Understanding Gender (1999): Kali for Women, India, 88 pages, 9788186706213 (ISBN10: 8186706216).
2. Rosemarie Tong, Tina Fernandes Botts (2018), Feminist Thought; A More Comprehensive Introduction, 5th edition, by Routledge, ISBN 9781138329522, 432 Pages
3. Andrea Parrot, Nina Cummings (2006), Forsaken Females: The Global Brutalization of Women, Rowman & Littlefield Publishers, ISBN-10 : 0742545792, 270 pages
4. Michael S. Kimmel, The Gendered Society (2000), Oxford University Press, USA, ISBN 9780195399028 (ISBN10: 0195399021), 472 pages.
5. Berer, M., (2000): Making Abortions Safe: A Matter of Good Public Health Policy and Practice, Bulletin, WHO, Vol. 78(5), pp. 590-592.
6. Starrs, A. (2015): A Lancet Commission on sexual and reproductive health and rights: going beyond the Sustainable Development Goals. The Lancet, Vol 386 September 19, 2015.

SUGGESTED READINGS:

1. 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.
2. Chhabra P. Maternal near miss: an indicator for maternal health and maternal care. Indian J Community Med. 2014 Jul;39(3):132-7. doi: 10.4103/0970-0218.137145. PMID: 25136152; PMCID: PMC4134527
3. Zampas, C. (2013) Legal and ethical standards for protecting women's human rights and the practice of conscientious objection in reproductive healthcare settings. International Journal of Gynecology & Obstetrics 123(Suppl 3): S63-S65.
4. Macaluso, M., et al. (2010) A public health focus on infertility prevention, detection, and management. Fertility and Sterility 93(1):16.e1-10.

5. Basu, Alaka M., (1992): Culture, The Status of Women and Demographic Behaviour, Oxford University, New York.

6. Ellsberg Mary and Heise Lori L. (2005) Researching violence against women: A practical guide for researchers and activists. WHO and Path, Washington D.C.

7. Gita Sen, Adreinne Germain and Lincoln C. Chen, (Eds.), (1994): Population Policies

8. Rutstein SO, Shah IH. Infecundity, infertility, and childlessness in developing countries. DHS Comparative Reports No.9. Calverton, MD: ORC Macro and Geneva: World Health Organization, 2004

9. Pachauri, S. (Eds. 1999): Implementing a Reproductive Health Agenda in India: The Beginning, New Delhi; Population Council.

10. Rozee G.V. and Sayeed Unisa (Editors) (2016) Assisted Reproductive Technologies in the Global South and North: Issues, Challenges and Future, Rutledge, London

11 Michael A. Koenig, Shireen Jejeebhoy (2008) Reproductive Health in India: New Evidence , Rawat Publications.

12 The Women, Gender and Development Edition 2, (2011) by Nalini Visvanathan (Editor), Lynn Duggan (Editor), Nan Wiegersma (Editor), Laurie Nisonoff (Editor), et al ; ZED Books, London.

POPULATION POLICIES AND PROGRAMME MANAGEMENT

Course Outcomes:

CO1: To have an understanding of population policy in pro-natalist and anti-natalist divide around the world.

CO2: To appreciate the role of United Nations and International population conferences, including ICPD, in evolving changes in designing and advocating population policies and programmes.
CO3: To critically evaluate the population policies and programmes of India since independence.
CO4: To understand the management and quality of care in health services and family planning programmes.
CO5: To learn the tools of evaluating family planning programmes and SWOT approach.

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; World Population Conferences, Declarations and Plan of Action.Fertility influencing policies: pro-natalist policies, fertility control policies- direct and indirect.Policies and programmes for special groups: women and children.

Health influencing policies: historical perspective for policies and programmes in developing and developed countries.

India's health and family planning programmes: History of birth control movement, National Population Policies, National Health Policies, and National Health Mission.

B. POPULATION AND PROGRAMME MANAGEMENT

Strategic management approach, Targeting the people in need (Community Need Assessment); Client segmentation; and Unmet need approach.

Providing services; commercial distribution, community-based distribution (CBD) systems andsocial marketing.

Quality of Care: Definition, Importance and Framework of quality of care in family planning.

C. EVALUATION OF PROGRAMME

Evaluation of programmes: objective, types, framework and methodological issues and data

Management Information System (MIS); Role ofHMIS in evaluation of the programmes.

Operation Research Techniques (ORT) in evaluation.

Economic evaluation of the programmes: Cost-benefit analysis, Cost-effective analysis, SWOT analysis

Fertility impact of Family planning programme: Bongaarts' model for estimating fertility impact.

ESSENTIAL READINGS:
1. Government of India (2000), *National Population Policy- 2000*, Ministry of Health and Family Welfare: New Delhi.
2. Government of India (2017), *National Health Policy- 2017*, Ministry of Health and Family Welfare: New Delhi.
3. Srinivasan, K. (2017), *Population Concerns in India: Shifting trends, policies, and programs,* Sage Publications: New Delhi.
4. United Nations (1995): *Report of the International Conference on Population and Development*, Cairo, 5-13 Sept, 1994

SUGGESTED READINGS:
1. Chrissie, P. and Selwyn S. T. Leger (1993): *Assessing Health Need Using Life Cycle Framework*, Open University, Buckingham.
2. Peabody, J.W.; Rahman, H. Omar; Gertlor, Paull, J.; Haan, Joyce (1999): *Policy and Health Implication for Development in Asia*, Cambridge University Press. Cambridge.
3. 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.
4. United Nations (1998): *National Population Policies,* Department of Economics and Social Affairs, New York.
5. Asia Development Bank (2006*). Impact Evaluation: Methodological and Operational Issues.* Economic Analysis and Operations Support Division. ADB, Manila.
6. Jain, A (ed.) *Do Population Policies Matter? Fertility and Politics in Egypt, India, Kenya and Mexico*, Population Council, New York
7. Visaria, L and R R Ved (2016): *India's family planning programme: Policies, practices and challenges,* Routledge, London.

STATISTICAL METHODS AND COMPUTER APPLICATIONS IN LARGE SCALE DATA

Course Outcome:

CO1: To have hands on experience on statistical packages like SPSS, STATA to facilitate handling of large-scale data sets.

CO2: To familiarize with the data management such as recoding, sorting, filtering, file merging and splitting using SPSS and STATA

CO3: To understand and learn the uses of univariate, bivariate and multivariate analysis using software packages

i. 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.

ii. Correlation and regression analysis – interpretation and regression diagnostic test.

iii. Multivariable 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.

iv. Introduction to STATA and R - generating, variables, commands and do file editor. Survey analysis – estimation of mean, proportion, design effect and probit analysis and standard non-parametric test.

v. 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.

ESSENTIAL READINGS:

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.

MPS C13   **(30 Hours)**

POPULATION PROJECTIONS

Course Outcomes:

CO1: To train the students in mathematical and component methods of population projections.

CO 2: To develop the skills to use different demographic packages of projection of population, households, urban-rural, education, and employment for programs andpolicymaking.

Population Estimates and Projections

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

Methods of interpolation and extrapolation: linear, exponential, polynomial, logistics, and Gompertz curves. Intercensal and post-censal estimates. Regression method of projection for behavioural event. ARIMA.

Cohort component method: basic methodology; projection of mortality, fertility, and migration components; population projections of United Nations and Office of the RegistrarGeneral of India. Use of SPECTRUM and its applications.

Methods of rural-urban and sub-national population projections: ratio method, apportionment (Water) method, urban-rural growth difference method, and concept ofraking.

Methods of related socio-economic projections: labour force, school-enrolment, and households. Projection of Future Health Needs: Like ambulatory services, sanitary napkins, old age nest/home, health personnel, nursing staff (hospital and home-based), counselors etc. SPECTRUM software.

ESSENTIAL READINGS:
1. 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.
2. United Nations (1955). Manuals on methods of estimating populations: Manual II – Methods of Appraisal of Quality of Basic Data for Population Estimates. Department of Economics andSocial Affairs, New York. Chapter 1, 2, 3
3. United Nations, (1955): Methods of Appraisal of Quality of Basic Data for Population Estimates, Manual II. New York: United Nations. Chapter 1 & 3.
4. Pathak, K.B. and F. Ram (1998): *Techniques of Demographic Analysis*, Himalaya Publishing House, Second Edition, Mumbai.
5. 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.
6. Srinivasan, K. (1998), *Basic Demographic Techniques and Applications*. London: Sage Publications.

SUGGESTED READINGS:
1. 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.
2. Potter, R.G. and Kulkarni, P.M. (1977): Population Momentum: A Wider Definition, Population Studies Vol. 40 pp. 555-56.
3. Preston, Samuel H., and Subrata Lahiri (1991): "A Short-cut Method for Estimating Death Registration

4. Rele, J. R., (1987), "Fertility Levels and Trends in India, 1951-81", *Population and Development Review* Vol. 13 (2). Academic Press, New York.
5. Mishra, B.D. (1981): An Introduction to the Study of Population, New Delhi: South Asian Publishers, Pvt. Ltd. New Delhi.
6. K. Srinivasan. Training Manual on Demographic Techniques. Census of India and UnitedNations Population Fund, India. Chapter 4, 10
7. Jeremiah P. Banda (2003). Non-sampling errors in surveys. UNITED NATIONS SECRETARIAT ESA/STAT/AC.93/7. Statistics Division 03 November 2003
8. Census of India (2011). Report on Post Enumeration Survey, 2011. Registrar General &Census Commissioner.
9. 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.
10. Potter, R.G. and Kulkarni, P.M. (1977): Population Momentum: A Wider Definition, Population Studies Vol. 40 pp. 555-56.

DEMOGRAPHIC ESTIMATION TECHNIQUES AND MODELS

Course Outcomes:
CO1: To familiarize students with the indirect techniques of estimating demographic components under the limited circumstance of data availability.
CO2: To familiarise students with demographic models to understand the population issues and evaluate the observed demographic rates and ratios.

Demographic Models
Concepts of Demographic Models:
Stationary, Stable and 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?)

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] Completeness of Death Registration by Lopez
applications of MORTPAK in estimating age specific fertility rate (ASFR) and total fertility rate (TFR).

Indirect Method of Estimating Mortality:
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; applications of MORTPAK in estimating infant and child mortality.
(b) Modifications proposed by Sullivan and subsequently by Trussell over Brass method; and (c) the UN revised and extended version of Trussell's method.

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

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.

ESSENTIAL READINGS:

1. 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).
2. Preston, Samuel H. Patrick, Heuveline and Michel Guillot, 2003, *Demography: Measuring and Modeling Population Processes*, Blackwell Publishers, 2001 (First Indian Reprint 2003).
3. United Nations (1955). Manuals on methods of estimating populations: Manual III – Methods of Population Projections by Age and Sex. Department of Economics and Social Affairs, NewYork. Chapter 2.
4. Navaneetham Kannan and George Groenewold, (1998): *The Projection of Populations: Data Appraisal, Basic*

SUGGESTED READINGS:

1. 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.
2. 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.
3. Rele, J. R., (1987), "Fertility Levels and Trends in India, 1951-81", *Population and Development Review* Vol. 13 (2). Academic Press, New York.
4. Srinivasan, K. (1998), *Basic Demographic Techniques and Applications*. London: Sage Publications.
5. Government of India (2019): *Population Projections for India and States, 2011-2036.* New Delhi: NCP, MoHFW.
6. Field, J.L. (1990) Past projections: How successful? In Population Projections: Trends, Methods and Uses, Liverpool, 12-14 sept. 1990. Occasional paper 38. Office of Population Censuses and Surveys, pp. 23-29.
7. Shaw, C. (2007). Fifty years of United Kingdom national population projections: how accurate have they been? Population Trends 128: 8-23. Available at www.ons.gov.uk/ons/rel/population-trends-rd/population-treends/no--128--summer-2007/fifty-years-of-united-kingdom-national-population-projections--how-accurate-have-they-been-.pdf
8. Moultrie, Tom, Rob Dorrington, Allan Hill, Kenneth Hill, Ian Timæus and Basia Zaba, (2013) Tools for
9. Demographic Estimation. International Union for the Scientific Study of Population (IUSSP)
10. Office of the Registrar General of India, Government of India (2020): Population Projections for India and States, 2011-2036. Report of the Technical Group on Population Projection. National Commission on Population and Ministry of Health & Family Welfare, Government of India. New Delhi

URBANIZATION, SPACE AND PLANNING

Course Outcomes:

CO1: Developing a comprehensive understanding on concepts of space, place and region.

CO2: Understanding the history of urban planning and its illustration in Indian context.

CO3: Acquainting students with theories of regional development and various strategies of regional planning.

CO4: Developing a critical understanding on urban policies and progammes in India

CO5: Providing students a practical knowledge of Geographical Information Systems and its utility in regional and urban planning.

I.   Urbanization and Space

Urbanization and space: Definitions and concepts of urban areas & urbanization. Concepts and forms of 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 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

Definitions, concepts, purpose, types and levels; geography/demography and planning relationship.Region: concept and definition, types (formal, functionaland planning); Need for regional planning; Types of regional planning; Spatial structure of regions, Climate resilience,

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; causes and consequences, North-Eastern regional council, Mumbai Metropolitan Regional Development Plan.

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, important urban plans (New Delhi, Navi Mumbai, Chandigarh, Gandhinar, Bhubaneshwar); Smart Cities Mission; HRIDAY, AMRUT, PURA,

IV. Challenges in Urban planning

Recent urban policies and programmes; Urban redevelopment; Urban poverty, urban housing and real estate, Slums and slum rehabilitation; Urban pollution, Solid waste management; Management of migrants; Case studies of rehabilitation programs (SRA)

V. Remote Sensing, GIS and Urban and Regional Planning

Application of Remote Sensing and GIS in urban and regional planning.

ESSENTIAL READINGS:

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, Hyderbad.
4. Chand, M and V.K. Puri, (1983), *Regional Planning in India,* Allied Publishers Private Ltd, New Delhi
5. Mishra, R.P, (1992), *Regional planning: Concepts, Techniques, Policies and Case studies*, Concept Publishing Co., New Delhi

SUGGESTED READINGS:

1. Bhagat, R. B., Roy, Archana K. and Sahoo, Harihar. (2020). *Migration and Urban Transition in India: A Development Perspective*. Routledge India, New Delhi.
2. Kumar, A. and Bhagat, R. B. (2021). *Migrants, Mobility and Citizenship in India*. Routledge India, New Delhi.
3. Hall, P, (1992), *Urban and Regional Planning*, Third Editions, Routledge, London.
4. Harvey, D. (2012) *Rebel Cities: From the Right to the City to the Urban Revolution*, Verso, London
5. Leong, Goh C. and G.C. Morgan, (1982), *Human and Economic Geography,* Oxford University Press, Singapore.
6. Lo, C.P. and Yeung, A. K. W. (2002): Concepts and Techniques of Geographic Information Systems. Prentice Hall of India, New Delhi.
7. Nyerges, Timothy L. and, Jankowski Piotr (2010): Regional and Urban Gis: A Decision Support Approach, Rawat Publication, Jaipur.
8. Kawashima, T and P. Korcelli, (1982), Human Settlement Systems: Spatial Patterns and Trend, IIASA, Luxemburg.
9. Sarin, M, (1982), Urban Planning in the Third World: The Chandigarh Experience, Manshell, London.
10. MMRDA (2016), Mumbai Metroplotan Regional Development Plan 2016-2036 MMRDA, Mumbai.
11. UNEP and others (2007), Livable Cities: The benefits of environmental planning, The Cities Alliance, Washington. http://www.citiesalliance.org/idex.html

OCCUPATIONAL HEALTH

Course Outcomes:
CO1: To familiarize students with occupational health risks/ hazards and their demographic implications.
CO2: To train the students in basic concepts, theories, measurements and data sources of occupational health risks/hazards.
CO3: To acquaint students with various types of contemporary hazardous occupations throughout the world.
CO4: To develop in-depth understanding of intersectionality of occupation, health and demography in low and middle-income countries.
CO5: To develop critical thinking among students of social welfare policies and laws/ legislations/ acts for workers in India.

Teaching Strategy: Classroom teaching, seminars, case studies, group exercises and field visits.

I. Introduction of Occupational Health and Demography:

Definition, basic concepts, the scope of occupational health and importance in demography; Difference between occupational health risks and hazards; Historical development of occupational health, the intersectionality of occupational health, socioeconomic characteristics, and demography; Pre and Post industrialization theories on occupational health risks and hazards; Decent work; Women's health and safety.

II. Morbidity and Mortality:

Health Well-being of Workers; Occupation–related Morbidity, Health Disorders, Different types of Disabilities, and Mortality; Mental Health.

III. Types and Measurements of Occupational Health Risks:

Occupational disciplines and related risks - Mechanical, Chemical, Biological, Physical, Psychological, Medical, Ergonomic, and Work organization hazards/risks (Hazards or stressors that cause stress (short- term effects) and strain (long-term effects)); Measurements of occupational health safety, risks and hazards; Health impact assessment, Mental health assessment scale, Musculoskeletal disorder scale, American Thoracic Society and the Division of Lung Diseases (ATS-DLD-78), Occupational Stress Index (OSI), Job Strain Model, etc.

IV. Data Sources of Occupational Health:

International and National Data Sources of Occupational Health - Population Census, Services Statistics, Large - and Small-Scale Sample Surveys etc. Data limitations in the area of occupational health.

V. Legislation, Social and Welfare Policies:

Sustainable Development Goals - (Decent work), International Labour Organization (ILO) Declaration on Fundamental Principles and Rights at Work; International Labour Standards on Occupational Safety and Health, Wages and Working time; ILO - Occupational Safety and Health Convention, Health and Safety Acts; The Occupational Safety, Health and Working Conditions Code, 2020 etc. Child Labour and Health

VI. Occupational Health in India:

History of Occupational Health in India (types of occupations, work environment and working conditions); Health behavioral risks and hazards; Evolution of labour unions; and Contemporary occupational health challenges of workers in India. Social and Welfare legal provisions and acts in India; Hazardous Waste Management Rules – 2000, Constitutional Rights, Wage Regulations (Minimum Wage Act), Factory Act – 1948, Employees' State Insurance Act, 1948 (ESI Act), Workmen Compensation Act – 1960, Employee Provident Act – 1952, Labour Welfare Measures, Retirement Benefits/National Pension Scheme – 2004, Social Welfare Schemes and Programmes.

ESSENTIAL READINGS:
1. Benjamin O. Alli, (2008), Fundamental Principles of Occupational Health and Safety, Second Edition, International Labour Office, Geneva: ILO, Pages:1 – 221
2. Government of India, National Policy on Safety, Health and Environment at Work Place, Ministry of Labour and Employment, https://labour.gov.in/policies/safety-health-and-environment-work-place.
3. Government of India, Ministry of Rural Development, (2015), Occupational Health & Safety, Environmental Issues and Decent Work-Module-8, New Delhi. Pages: 1 -32.
4. Occupational safety and health in public health emergencies: A manual for protecting health workers and responders: Geneva: World Health Organization and the International Labour Office, 2018. Licence : CC BY-NC-SA 3.0 IGO.
5. Dianne E. G. Dyck, 2020, Occupational Health & Safety: Theory, Strategy & Industry Practice, 4th Edition, ISBN/ISSN: 9780433502074.

SUGGESTED READINGS:
1. Government of India, Report of the Working Group on Occupational Safety and Health for the Twelfth Five Year Plan (2012 To 2017), Ministry of Labour And Employment, New Delhi, Pages 1- 145.
2. Hyde, Martin, Singh Chungkham, Holendro, (2017), Work and Health in India, Policy Press, ISBN:9781447335436, 1447335430
3. Page count:280
4. M. Timothy McAdams, Jeffrey J. Kerwin, Vanessa Olivo, Huseyin A. Goksel, (2011), National Assessment of the Occupational Safety and Health Workforce, 200-2000-08017, Task Order 18, Pages 1 - 246.
5. Gautam Bhan, Antara Rai Chowdhury, Rashee Mehra, (2021), State of occupational safety and health practices at workplace for domestic workers in COVID-19 and possibilities for action, International Labour Organization, Geneva, ISBN: 9789220350768 (Print). Pages 1 - 36.
6. Jacques Tamin, (2020), Occupational Health Ethics: From Theory to Practice, Springer Cham, Hardcover ISBN 978-3-030-47282-5, https://doi.org/10.1007/978-3-030-47283-2
7. International Labour Conference, (2003), Global Strategy on Occupational Safety and Health, International Labour Organization: ISBN 92-2-116287-7 (print version), Geneva, Pages – 1 – 20.
8. Global Strategy on Occupational Health for All: The Way to Health at Work (1994), WHO Collaborating Centres in Occupational Health, WHO/OCH/95.1, GENEVA, Pages: 1 -72.
9. World Health Organization (WHO) - Regional Office for the Eastern Mediterranean (2001), Occupational health: A manual for primary health care workers, Cairo, WHO-EM/OCH/85/E/L, pages – 1-168.

MONITORING AND EVALUATION IN POPULATION &HEALTH

Course Outcomes:
CO1: Familiarize the students with concepts and methods of monitoring and evaluation research.
CO2: To acquaint with various designs employed in monitoring and evaluation.
CO3: Develop skills on statistical approaches for implementation programmes.
CO4: Orient students on health management information system.

I.   Introduction to Monitoring and Evaluation: Basic concepts, Difference between Monitoring and Evaluation; Linkage between Planning, Monitoring and Evaluation; Importance of Monitoring and Evaluation

II.   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; Learning and accountability of Monitoring and evaluation data

III.   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

IV.   Evaluation in Theory: Principles, norms and standards for evaluation; Criterion for evaluation; Theory of Change; Evaluating for results; Roles and responsibilities in evaluation; Scaling Impact

V.   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; Randomization, Statistical design of Randomization; Randomized control trials, time dependant cluster design, interrupted time series analysis.

VI.   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

VII. 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, Decomposition analysis

VIII. Management Information System and Use of Technology: MIS – Monitoring information system; Role of programmers; HMIS system; Global Positioning System, Use of Machine learning and Artificial Intelligence, Use of spatial data

ESSENTIAL READINGS:
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. Rossi, Peter H.; Mark W. Lipsey and Howard E. Freeman (2004). Evaluation, A Systematic Approach. Seventh Edition. Sage Publications – New Delhi.
5. United nations development Group. The Theory of Change, UNDAF Companion Guideline.

SUGGESTED READINGS:
1. IFRC and RCS (2002). *Handbook for Monitoring and Evaluation*. International Federation of Red Cross and Red Crescent Societies –Geneva
2. McLean R. and Gargani J. (2019) Scaling Impact Innovations for the Public Good. Routledge, New York.
3. 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
4. OECD (2021). Applying Evaluation Criterion Thoughtfully, OECD Publishing, Paris. https://doi.org/10.1787/543e84ed-en.
5. 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.

HEALTH ECONOMICS AND FINANCING

Course Outcomes:

CO1: To introduce various concepts on economic gradient of health and demand for and supply of health care.
CO2: To explain various measures on socio-economic inequality in health.
CO3: To familiarize the means and measures of health financing.
CO4: To understand the determinants of health insurance and its coverage.
CO5: To introduce the methods and measures on economic evaluation of health care.

I: **Introduction to Health Economics**
Defining health economics, why health economics is important, basic concepts in microeconomics, health across world and over time, scope of health economics, map of health economics, basic questions confronted by health economist, concept of efficiency and equity in health, Production Possibility Frontier (PPF), economic gradient of health, causation of income and health, Preston Curve, economic models and analysis, expenditure function, Theories of X and Y, positive and normative economics.

II. The Demand for Health and Health care
What is Health and Good Heath, Utility Analysis, Health as a form of human capital, What is Medical Care, The production of Good Health, Empirical evidences in the production of health, Health as human capital, Grossman Model, The Demand for Health Care, Demand function for health, Economic and non-economic factors of health care, Fuzzy Demand Curve, Price and income elasticity of demand for health care, Important consideration in estimating health care demand elasticity, provider's behavior, Empirical findings, externalities and market failure.

III. Health Financing
Health financing in low, middle and high income countries, demographic transition, epidemiological transition and health expenditure, disparity in disease burden and per-capita health spending, sources of health care in India, out-of-pocket expenditure on health care, catastrophic health expenditure, approaches in measuring catastrophic expenditure, impoverishment, health care payment and poverty, national and regional patterns of catastrophic health spending, determinants of catastrophic health spending, Drivers of health care expenditure, health financing in India, Equity in health care finances, Willingness to pay for health care, User charges as determinant of health financing

IV. Measuring Health Inequalities

Measurement of health inequality: A Prelude
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

Black Report and Beyond: Historical Background of Black Report, Explanation for social class

Measures of health inequality: 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

Measuring socioeconomic rank related health inequality: Slope index of inequality; Relative index of inequality; Concentration curve and concentration index: various ways of computing; Standardization; Inequality aversion; Normalised and Generalised concentration index; Corrected concentration index

Measuring inequality in healthcare utilization: Horizontal inequality; Vertical inequality; Regression based approach; Measurement of horizontal inequalities; Group inequality, common measures, Gini type index

V. Medical Care, Production and Cost
The Short-Run Production Function of the Medical Firm, Total Product, Marginal Product and Average Product Curve, Law of diminishing marginal productivity, The importance of costing in Health Economics, Short-run cost theory of medical firm, short run cost curves, Cost analysis, Implicit and explicit cost, , factor affecting short-run cost curves, cost minimization, constraints in measuring health cost

VI. Health Insurance
Health care system, a model of health care system, defining health insurance, need for health insurance, type of health insurance, demand for private health services, factors affecting the quantity demanded of health insurances, moral hazards, deductibles, co-insurance, managed care, adverse selection, loading fees, employed based insurance, reimbursement, selection effect, intermediary agent, regulation of health insurance, Need for Government intervention, Trends of health insurance, Coverage of health insurance in India

VII. Economic Evaluation
What is economic evaluation? Cost analyses; direct cost, Indirect cost, tangible cost, capital cost, fixed cost, variable cost, Opportunity cost, average cost, marginal cost, Incremental cost, steps in cost analyses: Identification, measurement and valuation, Various types of economic evaluation used in health care: 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.

ESSENTIAL READINGs:

  1. Rexford E. Snterre and Stephen P. Neun, Health Economics: Theories, Insights and Industry Studies, Thompson South – Western, 3rd Edition (614, San/Hea, 073226) Note: 4th Edition is out in 2007 (ISBN: 032432068X; ISBN13: 9780324320688)
  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 (2008), AGiide to Techniques and Their Implementation
  4. Xu K (2005). Distribution of health payments and catastrophic expenditures Methodology World Health Organization.

SUGGESTED READINGs

1. 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.

2. Grossman (1982), On the concept of Health capital and Demand for Health, Journal of Political Economy, 80(2)

3. Macintyre S (1997). The Black Report and Beyond-What are the issues, Social Science, Medicine, 44(6):723-745

4. Mohanty, S. K., & Dwivedi, L. K. (2021). Addressing data and methodological limitations in estimating catastrophic health spending and impoverishment in India, 2004–18. International journal for equity in health, 20(1), 1-18.

5. Ringel etal (2005) The Elasticity of Demand for Health Care A Review of the Literature and Its Application to the Military Health System

6. Victoria Y Fan and William D. Savedoff (2014), "Health Financing transition: A conceptual framework and empirical evidences, Social Science Medicine, 105 (2014):112-121

7. Wagstaff A, P. Paci and E van Doorslaer (1991), On the measurement of inequalities in health, Social Science and Medicine 33(5), 545-557

8. Wagstaff, Adam & van Doorslaer, Eddy, 2000. "Chapter 34 Equity in health care finance and delivery," Handbook of Health Economics, in: A. J. Culyer & J. P. Newhouse (ed.), Handbook of Health Economics, edition 1, volume 1, chapter 34, pages 1803-1862 Elsevier

SPATIAL DEMOGRAPHY AND APPLICATION OF GIS

Course Outcomes:
CO1: Understanding the concept of space and develop spatial dynamics in demographic process.
CO2: Learning visualisation tools of demographic data and draw inferences.
CO3: Learning different Geo-Spatial software to facilitate spatial analytical methods in demographic research.
CO4: Learning Geographic Information System (GIS), spatial pattern analysis and spatial statistical techniquesto explain a specific spatial pattern.

I.   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.

II.   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

III. GIS and Spatial Analysis of demographic data

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

  i. Population distribution map of India using dot and sphere/circle, cubes, combined; Cartograms
 ii. Density map by Choropleth and population density gradient by Isopleth;
iii. Fertility, mortality and natural growth of population by Polygraph.
 iv. Measurement of population concentration by cumulative curve.
  v. Migration flow by Carogram

Concept and application Models:

  i. Spatial Lag and Error Regression Modeling;
 ii. Multilevel modeling (hierarchical linear modeling);
iii. Geographically Weighted Regression;
 iv. Spatial Pattern Analysis;
  v. Urban and city level projection

ESSENTIAL READINGS:

1. Anselin, L. (2005). Exploring Spatial Data with GeoDa: A Wookbook. UC Santa Barbara, CA: Center for Spatially Integrated Social Science. available on http://geodacenter.asu.edu/.
2. Bailey, T. and Gatrell, A. C. (19l95): Interactive Spatial Data Analysis. Harlow, Longman.
3. Bonham, Carter G.F. (1995): Information Systems for Geoscientists–Modelling with GIS. Pergamon, Oxford.
4. Chen, X., Orum A.M., and Paulsen K.E. (2013). Introduction to Cities: How Place and Space shape Human Experience. West Sussex, Willey-Blackwell.
5. Kurland K. S., Gorr W. L. (2007). GIS Tutorial for Health. Redlands, CA, ESRI Press.
6. Lo, C.P. and Yeung, A. K. W. (2002): Concepts and Techniques of Geographic Information Systems. New Delhi, Prentice Hall of India.

SUGGESTED READINGS:

1. 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.
2. 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.
3. 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).
4. Reibel, Michael, (2007). *Geographic Information Systems and Spatial Data Processing in Demography: A Review.* Population Research and Policy Review 26: 601-608.
5. Griffith, D. A. and Amehein (1997): Multivariate Statistical Analysis for Geographers. Englewood Cliffs, New Jersey, Prentice Hall.
6. Robinson, A. H. H., Sale R., Morrison J. and Muehrcke, P. C (1984) Elements of Cartography. New York, John Wiley and Sons.
7. Chang, K. (2008). Introduction to Geographic Information Systems. New Delhi, McGraw Hill Education.
8. Shaw, G. and Wheeler, D. (1994). Statistical Techniques in Geographical Analysis. Englewood Cliffs, New Jersey, Prentice Hall.
9. Soja, E. W. (1996). Third space: Journeys to Los Angeles and Other Real-and Imagined Places. Wiley-Blackwell.
10. Dorling, D. and Fairborn, D. (1997): Mapping. Ways of Representing the World. Longman, Harlow.

LARGE-SCALE SAMPLE SURVEYS

Course Outcomes:
CO1: To decide sample size for large-scale and its allocation at the sates and districts level.
CO2: To select rural and urban Primary Sampling Unit (PSU) from sampling frame such as – Census, NSS, or other frame.
CO3: To implement stratified sampling for PSU selection.
CO4: To conduct household mapping and listing for household selection.
CO5: to device the mechanism or develop a tool to monitor the large-scale household survey.
CO6: To check he quality of household sample survey data to generate reliable estimate at the national, sub-national, global level.
CO7: To assess the cognitive process of survey response.

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.

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 household listing for preparation of frame for last stage sampling units; sample selection of PSUs and households.

Quality assurance procedures: Revisit of sub-samples; field check tables; non-response pattern; roles of supervisors, editors, field and nodal agencies; third party audit.

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.
Ethical considerations in large-scale sample surveys
Estimation of sampling weights

ESSENTIAL READINGS:
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. Roy, T.K., Acharya R., Roy, A.K. (2016). Statistical survey design and evaluating impact, Cambridge University Press, New Delhi.

SUGGESTED READINGS:
1. Kish, Leslie, (1995): Survey Sampling, John Wiley and Sons, Inc. New York.
2. Lohr L. Sharaon., (1999): Sampling: Design and Analysis, Duxbury Press, London
3. Ladusingh, L. (2018). Survey Sampling Methods, PHI Learning, New Delhi

Master of Population Studies (MPS)

Code	TITLE	Type	Credits	Hours	No. of Internal Exams	Weightage (%) Internal Exam	Weightage (%) Semester Exam
Semester I							
MPS F1	Basic Statistical Methods for Population Studies	F	NC	45	3	50	50
MPS F2	Social Science Concepts	F	NC	45	3	50	50
MPS C1	Demography and History of Population	C	2	30	2	40	60
MPS C2	Age-sex structure, Quality of Data & Population Dynamics	C	2	30	2	40	60
MPS C3	Nuptiality	C	2	30	2	40	60
MPS C4	Fertility	C	3	45	3	40	60
MPS C5	Mortality, Morbidity and Public Health	C	3	45	3	40	60
MPS C6	Research Methodology	C	3	45	3	50	50
MPS C7	Population Ageing and Health Transition	C	3	45	3	40	60
MPS E1	E1.1: Healthcare Systems and Policies E1.2: Biostatistics and Epidemiology	E	3	45	3	40	60
MPS E2	E2.1: Concepts and Measures of Global Health E2.2: Operations Research in Reproductive Health	E	3	45	3	40	60
VV-I	Viva-Voce Examination I	V	2	30			
	Semester credits		26	390			
Semester II							
MPS C8	Migration and Urbanization	C	3	45	3	40	60
MPS C9	Population, Development and Environment	C	3	45	3	40	60
MPS C10	Gender Equity and Reproductive Health	C	3	45	3	40	60
MPS C11	Population Policies and Programme Evaluation	C	3	45	3	40	60
MPS C12	Statistical Methods and Computer Applications	C	2	30	2	50	50
MPS C13	Population Estimation and Projections	C	2	30	2	50	50
MPS C14	Demographic Estimation Techniques and Models	C	2	30	2	50	50
MPS E3	E3.1: Urbanization, Space and Planning E3.2: Occupational Health E3.3: Monitoring and Evaluation in Population & Health	E	3	45	3	40	60
MPS E4	E4.1: Health Economics and Financing E4.2: Spatial Demography and Application of GIS E4.3: Large-scale Sample Surveys	E	3	45	3	40	60
MPS C15	Term paper	T	4	60			
VV-II	Viva-Voce Examination II		2	30			
	Semester credits		30	450			
	Grand Total		56	840			

Notes:

Course type: F – Foundation course; C – Core course; E – Elective course; V – Viva voce; T – Term Paper.
NC: Non-credited foundation courses are not counted for calculating the final grade.
Core papers: Must for all students and cannot be changed.
Elective papers: One elective paper should be opted from a pair.

Internal Examination: Teachers are given the flexibility to decide mode of mode of internal examination from the following list: Written Test; Open Book Test; Written Home Assignment; Individual Thematic Presentation; Thematic Group Presentation; Group Discussion; Surprise Test; MCQ Test; Case Study; Situation Analysis (group activity or individual activity); Field Visit; Small Group Project & Internal Viva-Voce; Role Play / Story Telling; Literature Review / Book Review; Model Development/Simulation Exercises (Group Activity or Individual Activity); In-depth Viva; Quiz; etc.

Term Paper: Weightage for evaluation of term paper: Guide: 0.25; Presentation & Defence 0.25; and Content: 0.50.

Evaluation of Term Paper: The Director & Senior Professor appoints an evaluation committee for term paper consisting of three members from among the faculty of IIPS. First, the committee members independently assess the 'oral presentation and defence' of the student and submit their grade to the Controller of Examinations. Second, the committee members independently evaluate the content of the 'final term paper' submitted by the student and submit their grades to the Controller of Examinations. The average of the evaluation is considered for the final grade of the term paper.

Best Term Paper Award: The Director & Sr. Professor appoints a committee consisting of three external experts for recommending the award of the best term paper. The term papers of top five ranks (based on the combined score of content, presentation and defence) are placed before the committee. The external members evaluate term paper and submit their recommendation in a sealed cover to the Controller of Examinations.

Viva voce: Director & Sr. Professor constitutes a committee comprising of one external examiner and three/four internal examiners for the viva-voce. The three/four internal examiners shall comprise of one senior professor (Chairperson), one/two faculty members and one programme co-ordinator. The committee members independently evaluate the performance of the students in the viva-voce and assign their grades. To arrive the final viva-voce grade, the average of the evaluation of the members is considered.

Evaluation of Term Paper: The Director & Senior Professor appoints an evaluation committee for dissertation consisting of three members from among the faculty of IIPS. First, the committee members independently assess the 'oral presentation and defence' of the student and submit their grade to the Controller of Examinations. Second, the committee members independently evaluate the content of the 'final dissertation' submitted by the student and submit their grades to the Controller of Examinations. To arrive the final term paper grade, the average of overall all grades of Guide, Presentation & Defence, and Content is considered.

Best Term Paper: The Director & Senior Professor appoints a committee consisting of three external experts for recommending the award of the best dissertation. The dissertations of top five ranks (based on the combined score of content, presentation and defence) are placed before the committee. The external members evaluate dissertations and submit their recommendation in a sealed cover to the Controller of Examinations.

Viva voce: Director & Sr. Professor constitutes a committee comprising of one external examiner and three/four internal examiners for the viva-voce. The three/four internal examiners shall comprise of one senior professor (Chairperson), one/two faculty members and one programme co-ordinator. The committee members independently evaluate the performance of the students in the viva-voce and assign their grades. To arrive the final viva-voce grade, the average of the evaluation of the members is considered.

Grades Table

GRADE TABLE FOR EVALUATION OF ANSWER SHEET

The Grades, Grade Point and Descriptions are as given below

Final Grade	Grade Point	Grade Description
O Only	10	Outstanding
A Plus	9	Excellent
A Only	8	Very Good
B Plus	7	Good
B Only	6	Above average
C Only	5	Average
P Only	4	Pass
F3	3	Fail
F2	2	Fail
F1	1	Fail
NA/Ab	0	Not Attempted / Absent

GRADE TABLE FOR SEMESTER GRADE CARD

The Grades, Grade Point and Descriptions are as given below

Final Grade	Grade Point	Grade Description
O Only	10	Outstanding
A Plus	9	Excellent
A Only	8	Very Good
B Plus	7	Good
B Only	6	Above average
C Only	5	Average
P Only	4	Pass
F Only	0	Fail
NA/Ab	0	Not Attempted / Absent