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## Syllabus for Population 135: "Causes and Consequences of Population Aging"

The course will meet three hours per week. There will be a term paper, a midterm, and a final exam. Prerequisites for the course include at least one prior course in demography, such as Econ 175, Population Studies 100 or 110, Sociology 176, or Anthro 194, or a course on aging in the School of Public Health (may be taken concurrently). The prerequisite may be waived with consent of the instructor. The technical level of the course will be tailored to the backgrounds of the students, and optional special sessions will be used to cover more technical topics, if necessary. Some background in economics will be useful, but is not required. Examinations will be constructed to accommodate students from a variety of backgrounds.

This course will examine the causes and consequences of population aging from a demographic perspective, with an emphasis on social and economic consequences of aging. We will begin by considering the demographic causes of population aging, rooted in declining fertility and mortality. We will study these processes separately, with particular emphasis on issues surrounding mortality, such as the question of limits to length of life, the reliability of mortality data for older ages, and problems in forecasting mortality at older ages. We will then assess the effects of changing vital rates on age distributions using stable population models and related analytics. Their dynamic role in the gerontological transition will also be considered. In addition, we will consider the epidemiological transition, and examine recent trends in health and disability, and expectation of active life. Are the gains in length of life mainly in years of disability? Can the age at retirement be raised? Are the data biased by changing economic incentives?

After considering these causes of population aging, we will turn to the social and economic arrangements through which the elderly are supported--the family, the public sector and life cycle saving, with or without financial markets. We will first study Third World populations, in which support is provided primarily within the family. The emphasis will be on Asian populations. We will then consider the role of life cycle saving, and its implications for capital accumulation and labor productivity. We will consider the relative importance of the bequest motive and life cycle saving as sources of wealth accumulation industrial populations. We will then consider the growth of public sector transfer systems, including pensions and health care, and their size and structure in the U.S. and other industrial nations. Transfers to the elderly will be considered in the context of transfers to all ages, and particularly to children. These various means of old age support will be integrated in a formal model of transfer systems and capital accumulation in populations with overlapping generations, which will be estimated for various populations. We will consider "generational accounting". This model, and other projections and simulations, will be used to assess the consequences of population aging due to fertility and mortality change for the macro-economy and for life cycle consumption and welfare. We will also consider issues of intergenerational equity and conflict. How does the federal debt constitute a transfer from unborn generations to those currently alive? Should young adult generations of today worry about the viability of the social security system in their older years?

We will then consider labor force issues. How is the productivity of workers related to their age? How will population aging affect the productivity, vitality and creativity of the labor force? Do internal labor markets lead to a systematic deviation of the age-earnings profile from the age-productivity profile? How do the public and private systems of taxation, pensions, disability insurance and health insurance influence the labor supply decisions of the elderly?

The last section of the course will provide an overview of the consequences of population aging, and an assessment of policy options.

# **CAUSES AND CONSEQUENCES OF POPULATION AGING: PRELIMINARY OUTLINE**

## **I. GLOBAL POPULATION AGING: A DESCRIPTIVE OVERVIEW**

## **II. MORTALITY DECLINE AND THE OLDER POPULATION**

- A. Limits to length of life?**
- B. The compression of morbidity**
- C. Forecasting mortality**
- D. Analytic issues in old age mortality**
- E. Data issues and old age mortality**

## **III. MORBIDITY AND DISABILITY IN THE OLDER POPULATION**

- A. Theoretical perspectives: Selection vs Trauma Avoidance**
- B. Epidemiological evidence**
- C. Historical trends**
- D. Economic analysis**

## **IV. THE DEMOGRAPHY OF POPULATION AGING**

- A. Lessons from Stable Population Tables**
- B. Comparative Stable Populations: fertility decline**
- C. Comparative Stable Populations: mortality decline**
- D. Historical Patterns**
- E. The Gerontological Transition**
- F. Forecasts of the Elderly Population**

## **V. THE ECONOMIC ANALYSIS OF POPULATION AGING**

## **VI. LIFE CYCLE SAVING AND CAPITAL ACCUMULATION**

- A. Basic analysis**
- B. Empirics**
- C. Consequences of changing fertility**
- D. Consequences of changing mortality**

## **VII. THE ECONOMICS OF TRANSFER SYSTEMS**

- A. Examples: family, public sector, market**
- B. Basic analysis**
- C. Empirics**
- D. Consequences of changing fertility**
- E. Consequences of changing mortality**

## **VIII. TRANSFER SYSTEMS IN THE THIRD WORLD**

- A. Empirical studies of intra-familial transfers**
  - 1. Asia*
  - 2. SubSaharan Africa*
- B. Simulation studies of intra-familial transfers in aging populations**
- C. Public Sector programs in the Third World**

## **IX. TRANSFER SYSTEMS IN THE INDUSTRIAL WORLD**

- A. Empirical Studies of Intra-familial support**
- B. Simulation Studies of kin-networks in aging populations**
- C. Public Sector programs in industrial countries**

## **X. THE ECONOMICS OF LABOR SUPPLY DECISIONS AT OLDER AGES**

- A. The role of health and disability insurance**
- B. The role of private pensions**
- C. The role of public pensions**

## **XI. CONSEQUENCES OF POPULATION AGING: AN ANALYTIC OVERVIEW**

(Actual readings and lectures deviated from the plan shown in the outline above.)

## **I. Background on Population Aging**

To be done for Tuesday, September 1.

Rowland, D.T. (1991) "The Gerontological Transition Hypothesis," presented at the Annual Meeting of the Population Association of America.

Suzman, Richard, Kevin Kinsella and George Myers (1992) "Demography of Older Population in Developed Countries," 1.1 in Oxford Textbook of Geriatric Medicine (galleys version).

For review (optional): see pages 1-7 of Lee, Ronald (1991) Population Aging and Its Social and Economic Consequences a series of lectures presented at Peking University in October, 1991. Please do not read ahead! (A Working Paper of the Department of Demography, University of California, Berkeley.

Background Descriptive Material (optional; browse):

Kinsella, Kevin (1989) "Aging in the Third World," U.S. Department of Commerce, Bureau of the Census.

Torrey, Barbara Boyle, Kevin Kinsella and Cynthia Taeuber (1987) An Aging World International Population Report Series P-95, No.78 (Bureau of the Census: USGPO).

Optional Analytic Material; recommended for technical demographers:

Preston, Samuel H. (1982) "Relations Between Individual Life Cycles and Population Characteristics," American Sociological Review v.47 (April), pp. 253-264.

Coale, Ansley (1957) "How the Age Distribution of a Human Population is Determined," reprinted in Nathan Keyfitz and David Smith, eds., Mathematical Demography--selected papers (Springer-Verlag, Berlin) pp.167-172.

## **II. Demography 135: The Demography of Population Aging**

Olshansky, S. Jay, B.A. Carnes, and C. Cassel (1990) "In Search of Methuselah: Estimating the Upper Limits to Human Longevity," Science v.250, no. 4981 (November), pp.634-640.

Lee, Ronald D. and Lawrence Carter (1992) "Modeling and Forecasting U.S. Mortality," Journal of the American Statistical Association (September). (You don't need to master the technical details.)

Manton, Kenneth, Eric Stollard and H.Dennis Tolley (1991), "Limits to Human Life Expectancy: Evidence, Prospects and Limitations," Population and Development Review (December) pp.603-637.

Fries, J.F. (1980) "Aging, Natural Death, and the Compression of Morbidity," New England Journal of Medicine v.303, n.130 pp.130-135.

## Optional Additional Reading on Mortality Change

Gavrilov, L.A. and N.S. Gavrilova (1991) *The Biology of Life Span: A Quantitative Approach* (Harwood Academic Publishers).

Guralnik, Jack M., Machiko Yanagishita, and Edward L. Schneider (1988) "Projecting the Older Population of the United States: Lessons from the Past and Prospects for the Future," *The Millbank Quarterly* v.66 n.2 pp.283-308

for review; read after today's lecture

Lecture 1 in Lee, *China Lectures*, pp.8-14 "The Demography of Aging".

Lecture 2 in Lee, *China Lectures*, pp.15-22 "Economic Aspects of Dependency, Mortality Change and the Life Cycle".

## Optional Technical

Lee, Ronald D. "Fertility, Mortality and Intergenerational Transfers: Comparisons Across Steady States," presented at an IUSSP Seminar on the Family, the Market and the State in Aging Societies, September 1988, Sendai, Japan. Forthcoming in conference volume.

Lee Appendix to *China Lectures* (all eight pages; pages unnumbered).

Preston and Coale, as assigned last time.

## Optional Reading on Gerontological Transition

Ryder, Norman (1988) "Effects on the Family of Changes in the Age Distribution," in United Nations (1988) *The Economic and Social Consequences of Population Aging*, pp. 98-120.

Demography 135: Aging--Readings for September 15, 1992

## III. Consequences of Declining Mortality

Readings are quite light for the coming week. I will be developing most of the lecture from Chapter 2 of the *China Lectures*, which you should not read in advance! A number of readings are to be found in:

United Nations (1986) *Consequences of Mortality Trends and Differentials* (New York), henceforth UN (1986).

McNicoll, Geoffrey (1986) "Adaptation of Social Systems to Changing Mortality Regimes," in UN (1986), pp.13-19.

Chernichovsky, Dov (1986) "Interactions Between Mortality Levels and the Allocation of Time for Leisure, Training, Consumption and Saving Over the Life Cycle," in UN (1986) pp.126-134.

You might want to skim some of the other articles in this collection.

Readings to do for class on September 22.

#### **IV. Economic Status of the Elderly, and Overview of Retirement Behavior**

Read Chapter 2 of my lectures as a review of class on September 15. If you have questions as read over it, bring them to class for discussion.

James H. Schultz (1992) *The Economics of Aging*, fifth edition (Auburn House, Dover, Mass.). Read Chapter 2 "The Economic Status of the Aged," pages 15-62, and Chapter 3, "To Work or Not to Work," pages 63-94.

Hurd, Michael (1990) "Research on the Elderly: Economic Status, Retirement, and Consumption and Saving," *Journal of Economic Literature* (June) pages 565-606.

This is a lot of reading. It is not very demanding, but it is still quite a bit to read all at once. Again I suggest that you not leave all the reading to the Tuesday before class. Read the Schulz one day, the Hurd, another. They cover similar material from somewhat different perspectives.

#### **V. Health and Retirement Behavior of the Elderly**

Readings to do for class on September 29.

Read Chapter 2 of my China lectures as a review of class on September 15. If you have questions as you read over it, bring them to class for discussion.

James H. Schulz (1992) *The Economics of Aging*, fifth edition (Auburn House, Dover, Mass.). Read Chapter 3, "To Work or Not to Work," pages 63-94.

Hurd, Michael (1990) "Research on the Elderly: Economic Status, Retirement, and Consumption and Saving," *Journal of Economic Literature* (June) pages 589-606.

Crimmins, Eileen and Maria Pramaggiore (1988) "Changing Health of the Older Working Age Population and Retirement Patterns Over Time," in Rita Ricardo-Campbell and Edward Lazear eds. *Issues in Contemporary Retirement* (Hoover Institute Press, Stanford, CA), pp.132-152, and the "Discussion" by Donald Parsons, pp.153-161.

#### **VI. Aging and the Social Security System in the US**

Readings to do for class on October 6.

Read Chapter 3, "Labor Supply, Health and Retirement," pages 23-31, of the China lectures as a review of class on September 29, plus for new material on aging and the labor force. Bring questions to class.

Henry Aaron, Barry Bosworth, and Gary Burtless (1989) **Can America Afford to Grow Old?** Chapters 1 (Introduction) and 2 (The Social Security and Medical Programs), pp.1-54

## **VII. The Demography of Pensions in Aging Populations, and The Demography of Familial Support for the Aged**

Readings to do for class on October 13.

Henry Aaron, Barry Bosworth, and Gary Burtless (1989) **Can America Afford to Grow Old?** Read Chapter 3 if you have not already done so.

Nathan Keyfitz (1985) "The Demography of Unfunded Pensions," **European Journal of Population**, v.n.1, pp.5-30.

John Casterline, Lindy Williams, Albert Hermalin, M.C. Chang, Napaporn Chayaovan, Paul Cheung, Lita Domingo, John Knodel, and MaryBeth Ofstedal (1991) "Differences in the Living Arrangements of the Elderly in Four Asian Countries: The Interplay of Constraints and Preferences," Research Report n.91-10 of the Comparative Study of the Elderly in Asia of the Population Studies Center of the University of Michigan.

Linda Martin (1990) "Changing Intergenerational Family Relations in East Asia," in Samuel Preston, ed., **World Population: Approaching the Year 2000**, a special issue of **The Annals** of the American Academy of Political and Social Science, v.510, pp.102-114.

### **Optional:**

Lawrence Kotlikoff (1992) *Generational Accounting* (Free Press), particularly the Chapter titled "Generational Accounting".

## **VIII. More on Familial and Public Sector Support for the Elderly**

Readings to do for class on October 20. These are lighter than usual because you have the take-home midterm during the week.

Jiang Lin (1992) "Parity and Security: A Study of Old Age Support in Rural China"

Ronald Lee, "Public Sector Transfer Systems in Industrial Nations," Chapter 4 of *China Lectures on Aging*.

## **IX. Intergenerational Transfers and Savings**

Readings to do for class on October 27.

Ronald Lee, "Kinship, Demographic Change and Old Age Support," Chapter 5 of *Lectures on Aging*.

Franco Modigliani (1988) "The Role of Intergenerational Transfers and Life Cycle Saving in the Accumulation of Wealth," *Economic Perspectives* v.2 n.2 (Spring), pp.15-40.

Laurence Kotlikoff (1988) "Intergenerational Transfers and Savings," *Economic Perspectives* v.2 n.2 (Spring), pp.41-58.

Hurd, Michael (1990) "Research on the Elderly: Economic Status, Retirement, and Consumption and Saving," *Journal of Economic Literature* (June) section V on "Consumption and Saving" pages 606-629.

Readings to do for class on November 3. Readings are less because there is a homework problem assigned.

Ronald Lee, "Life Cycle Savings, Old Age Support and the Macro Economy," Chapter 6 of Lectures on Aging.

Ronald Lee, "Population Age Structure, Intergenerational Transfers, and Wealth: A New Approach, with Applications to the U.S."

## **X. Aging and the Social Sciences**

Demography 135: Aging

Readings to do for class on November 10.

These readings are all found in Robert Binstock and Linda George, eds., *Handbook of Aging and the Social Sciences*, 3rd Edition (Academic Press, 1990).

Jack Habib, "Population Aging and The Economy" pp.328-349

Bruce Jacobs, ("Aging and Politics"), pp.350-361

Toni Antonucci, "Social Supports and Social Relationships," pp. 205-227

## **XI. Mortality and Morbidity**

Readings to do for class on November 17.

Kenneth G. Manton, "Mortality and Morbidity" in Robert Binstock and Linda George, eds., **Handbook of Aging and the Social Sciences**, 3rd Edition (Academic Press, 1990). (Excellent reading, covers a lot of ground.)

George Meyers, Barbara Boyle Torrey, and Kevin Kinsella, "The Paradox of the Oldest Old," in Richard Suzman, David Willis, and Kenneth Manton, eds., **The Oldest Old** (Oxford University Press, 1992), pp. 58-88. (This is an excellent reading as an introduction to the subject.)

## **XII. Social Aspects of Aging**

Readings to do for class on November 24. These are all chapters from: Judah Matras, **Dependency, Obligations and Entitlements** (Prentice Hall, 1990?).

"Age Grading, Stages and Domains of the Life Course, and Life-Course Transitions," pp.104-125.

"After the Baby Boom: the new aging, life course, and family life cycle," pp.296-305.