

Sociology 126
Health of the Public:
Medicine and Disease in Social Context

Wednesday, Thursday 5:30–6:45 p.m.
Spring Term 2024
Location: TBD

Nicholas A. Christakis, MD, PhD, MPH
Sterling Professor of Social and Natural Science
Department of Sociology
Department of Ecology and Evolutionary Biology
Department of Biomedical Engineering
Department of Medicine
Yale University

email: nicholas.christakis@yale.edu

websites: <http://www.NicholasChristakis.net> or <http://www.HumanNatureLab.net>

office hours (Room 303, 17 Hillhouse Ave): Wednesdays 3:30-4:30, or by appointment (please email me or my assistant, Jess Collins, at jessica.collins@yale.edu).

Course Websites:

<http://humannaturelab.net/teaching> and Canvas

Course Description:

This course examines the social causes and context of illness, death, longevity, and health care in the USA today. How are health and illness defined? Who stays healthy and who falls ill? Who has a long life and who has a short one? What constitutes a good death and why do so few Americans achieve it? What is good medical care, who gets it, and why? What role do physicians play in producing health in our society? To what extent do factors outside individuals' control (factors such as genetics, parental traits, geography, or hospital quality) influence health and health care? Does socioeconomic inequality in society harm individual health? Do certain kinds of social networks or neighborhoods improve health? How do social factors “get under our skin” and literally become embodied? What are the collective constraints on individuals' life prospects? How do major epidemics like COVID-19 affect society, and how do societies respond effectively? What is the difference between an individualistic and a public health-oriented perspective on illness? And what issues of ethics and justice are raised by such questions? Would a different organization of society, different public expenditures, or different public policies matter?

While exploring these questions, we will also consider how social scientists, biologists, epidemiologists, public health experts, and doctors address them—how they use theory to understand them and how they make “causal inferences” based on observational or experimental data. However, students are not expected to have in-depth knowledge of social science methods or statistics. The readings span the medical, public health, and social science literatures, and they reflect both qualitative and quantitative approaches. They also introduce new areas of biosocial science, computational social science, and data science as applied to health. In many ways, this course serves as an introduction to public health as a multidisciplinary field.

Pedagogic Approach:

The course includes a range of readings from many different fields and from many policy perspectives, some of which you and others may disagree with. This is normal and desirable at a serious university. Moreover, the students in the class will have had different life experiences (sometimes personal) with some of the topics we explore – such as serious illness, disability, suicide, gun violence, poverty, autism, medical errors, among other things. Additionally, there is likely to be a range of opinions about whether individuals or their surroundings are relatively more responsible for the various threats to public health, or what the true cause of some particular circumstance or class of circumstances is. Our approach to these matters will be evidence-based and scientific, not personal, in both lecture and section.

Course Requirements:

- section attendance and class participation (10%)
- in-class mid-term exam on February 14 (25%)
- in-class mid-term exam (non-cumulative) on April 10 (25%)
- in-person final exam (cumulative) (40%)

Please check the above mid-term dates at the time you enroll in the class to make sure you have nothing that you can anticipate that conflicts with these exam dates (such as known sporting obligations, thesis deadlines, sibling graduations, etc.).

You can find copies of old mid-term and final exams at <http://humannaturelab.net/teaching>. The (in-person) final exam will require in-depth engagement with the major themes of the whole course.

If you feel any exam has been graded in error, please discuss this with the TF's first, and please review the exam re-grading policy on the course website.

We expect that all written work you do in this class will be your own, and that you will not cheat in any way. It's really depressing for all involved when this happens; it is surely embarrassing for the student; and it results in a very bad grade.

Course FAQ:

Answers to a selection of common questions are below, but many more questions are addressed at: <http://humannaturelab.net/teaching> and on the course website. Please check the FAQ before emailing us.

- Sociology 126 also counts as Global Health 140.
- There are no prerequisites.
- Lecture slides will generally be posted the week after they are shown in class.
- *Graduate students* taking SOCY 126 for credit should see the instructor to arrange different requirements.

Sections:

Sections will meet from the *second* week of class. Given uncertain enrollment in the class and the variability of student needs, it is likely we will need to open or close sections accordingly. We will try hard to find section times that work.

Dorothy Wu
Teaching Fellow
Department of Sociology

Other TF's TBD, as needed

Office hours: TBD

Books and Readings:

Books are available for purchase online and at the Yale Bookstore. Readings from books and articles *average* about 70 pages per session (range 15–200), or 140 pages per week. For over 20 years that I have been teaching this course, students have reported that they find the readings engaging (and they are updated every year). Readings are available online in the “Files” tab of Canvas.

Christakis, N.A. *Apollo's Arrow: The Profound and Enduring Impact of Coronavirus on the Way We Live*. New York: Little Brown, 2021 [paperback].

Harris, J. *Enhancing Evolution: The Ethical Case for Making Better People*. Princeton: Princeton University Press, 2007.

Illich, I. *Limits to Medicine: Medical Nemesis, The Expropriation of Health*. New York, NY: London: Marion Boyars Publishers, 1999 [1976].

Martin, E. *The Woman in the Body: A Cultural Analysis of Reproduction*. Boston: Beacon Press, 2001 [1987].

January 17 (Wednesday)

I. Course Introduction

We will briefly review the burden of illness and death in the USA, touching on the costs, family effects, and implications for people's well-being. We will also review the leading causes of death and how they vary by certain socio-demographic attributes. We will touch on how our attention to threats to our health is often skewed, including how we neglected the risk of pandemic disease until it was upon us. We will note geographic variation in illness and mortality and also the relevance of circumstances of birth (including diverse *in utero* exposures, birthweight, birth order, parental occupation, etc.) to lifelong health. In short, we will introduce the basic biosocial facts to be explored in the course. And we will introduce the tension between individualistic and collective perspectives on medical care. We will in particular consider the case of suicide and the extent to which it reflects individual decision-making or collective constraints.

January 18 (Thursday) and January 24 (Wednesday)

What Medical Care Has and Has Not Achieved

What are the benefits of medical care? How much do doctors actually help people? What are the relative roles of curative and preventative maneuvers in the health of the public? On the population level, what have been the benefits of "big medicine"? We will consider how the nature of illness and death has changed over the last century in the U.S. and around the world, as part of the "health transition." And we will introduce some ways of defining and measuring health other than mortality – including morbidity, physical functioning, quality of life, and "utility." We will also begin to consider the major determinants of health at the population level.

II. Session 1: The Health Transition (January 18)

Omran AR. The Epidemiologic Transition: A Theory of the Epidemiology of Population Change. *Milbank Memorial Fund Quarterly* 1971; 29: 509–538. [Please just read the partial extract and extension reprinted in the *Bulletin of the World Health Organization* 2001; 79(2): 161–170.

Fries, JF. Measuring and Monitoring Success in Compressing Morbidity. *Annals of Internal Medicine* 2003; 139: 455-459.

III. Session 2: The Role of Medical Care (January 24)

Preston S. American Longevity: Past, Present, and Future. Distinguished Lecturer in Aging Series, Center for Economic Policy, Syracuse University Policy Brief 7, 1996 (pp. 1–18).

Bailar JC and Gornik HL. Cancer Undefeated. *New England Journal of Medicine* 1997; 336: 1569–1574. [Along with commentaries, retorts, rejoinders, and ripostes in *New England Journal of Medicine* 1997; 337: 935–938.]

Kramer BS and Klausner RD. Grappling with Cancer—Defeatism versus the Reality of Progress. *New England Journal of Medicine* 1997; 337: 931–934.

- Kratzer TB, *et al.*, Progress Against Cancer Mortality 50 Years After Passage of the National Cancer Act. *JAMA Oncology* 2022; 8: 156-159
- Tunstall-Pedoe H, *et al.* Pattern of Declining Blood Pressure Across Replicate Population Surveys of the WHO MONICA Project, mid-1980's to mid-1990s, and the Role of Medication. *British Medical Journal* 2006; 332: 629-635.
- Papanicolas I, Woskie LR, and Jha AK. Health Care Spending in the United States and Other High-Income Countries. *JAMA* 2018; 319: 1024-1039.
- Cunningham SA, Mitchell K, Narayan KMV, and Yusuf, S. Doctors' Strikes and Mortality: A Review. *Social Science and Medicine* 2008; 67: 1784–1788.

January 25 (Thursday) and January 31 (Wednesday)

The Social Distribution of Illness

We will examine how disease and survival are distributed by basic socioeconomic variables. What is the role of sex, race, ethnicity, education, income, marital status, and other social variables (including intelligence and attractiveness) with respect to patient preferences, patient risks, patient care, and health outcomes? What are the methodological challenges of demonstrating and interpreting differences and inequalities in health outcomes and care? How do we distinguish the problem of unequal outcomes from that of unequal treatment, and what is the ethical implication of this difference?

IV. Session 1: Socioeconomic Status and Health (January 25)

- Link BG and Phelan J. Social Conditions as Fundamental Causes of Disease. *Journal of Health and Social Behavior* 1995 (Extra Issue): 80–94.
- Smith JP. Healthy Bodies and Thick Wallets: The Dual Relation Between Health and Economic Status. *Journal of Economic Perspectives* 1999; 13: 145–166.
- Goldman DP, Smith JP. Can Patient Self-Management Help Explain the SES Health Gradient? *PNAS: Proceedings of the National Academy of Science* 2002; 99: 10929–10934.
- Pickett KE, and Lauderdale DS. Widening Social Inequalities in Risk for Sudden Infant Death Syndrome. *American Journal of Public Health* 2005; 95: 1976–1981.
- Katsnelson A. The Neuroscience of Poverty. *PNAS: Proceedings of the National Academy of Science* 2015; 112: 15530-15532.
- Calvin CM, *et al.* Childhood Intelligence in Relation to Major Causes of Death in 68 Year Follow-Up: Prospective Population Study. *British Medical Journal* 2017; 357: J2708
- Mehic A. Student Beauty and Grades Under In-Person and Remote Teaching. *Economic Letters* 2022; 219: 110782.

V. Session 2: Unequal Treatment and/or Unequal Outcomes with Respect to Race and Ethnicity (January 31)

- Baicker K, Chandra A, Skinner JS, Wennberg JE. Who You Are and Where You Live: How Race and Geography Affect the Treatment of Medicare Beneficiaries. *Health Affairs*, “web exclusive” 2004: doi: 10.1377/hlthaff.var.33 (pp. 33–44).
- Blackhall LJ, Murphy ST, Frank G, Michel V, and Azen S. Ethnicity and Attitudes Toward Patient Autonomy. *JAMA* 1995; 274: 820–825.

Lauderdale D. Birth Outcomes for Arabic-Named Women in California Before and After September 11. *Demography* 2006; 43: 185–201.

Dehon E, *et al.* A Systematic Review of the Impact of Physician Implicit Racial Bias on Clinical Decision Making. *Academic Emergency Medicine* 2017; 24: 895-904

February 1 (Thursday)

VI. The Social Construction of Illness and Medicine

How are the seemingly objective, natural or scientific concepts of “body,” “disease,” “treatment,” or “cure,” influenced and determined by social phenomena and the medical system itself? How does the way people come to view the world have concrete and measurable effects on their health? How do people cognitively construct medically relevant concepts, such as diagnostic categories, and how do these constructions in turn influence medical care and human experience? We will consider diverse examples, including childbirth, plastic surgery, mental illness, etc..

Martin, E. *The Woman in the Body: A Cultural Analysis of Reproduction*. Boston: Beacon Press, 1987, pp. 27–67.

Bohren MA, *et al.* How Women Are Treated During Facility-Based Childbirth in Four Countries: A Cross-Sectional Study with Labor Observations and Community-Based Surveys. *The Lancet* 2019; 394: 1750-1763.

Jaarsma P and Welin S. Autism as a Natural Human Variation: Reflections on the Claims of the Neurodiversity Movement. *Health Care Analysis* 2012; 20: 20–30.

Wadman M. New Paper Ignites Storm Over Whether Teens Experience ‘Rapid Onset’ of Transgender Identity. *Science* August 30, 2018.

February 7 (Wednesday)

VII. Death and Dying

We will explore the nature of dying in the U.S. and what might be done to improve end-of-life care. We will consider the nature of a good death, how death affects family members, and where death occurs. We will examine how social policy or clinical arrangements (e.g., with respect to hospice care) affect the experience of dying. And we will discuss the role of physician decision-making and begin to consider the process by which physicians are socialized to their role as doctors.

Steinhauser KE, *et al.* Factors Considered Important at the End of Life by Patients, Family, Physicians, and Other Care Providers. *JAMA* 2000; 284: 2476–2482.

Singer AE, Meeker D, Teno JM, Lynn J, Lunney JR, and Lorenz KA. Symptom Trends in the Last Year of Life from 1998-2010: A Cohort Study. *Annals of Internal Medicine* 2015; 162: 175-183.

Loggers ET, Starks H, Shannon-Dudley M, Back AL, Appelbaum FR, and Stewart FM. Implementing a Death with Dignity Program at a Comprehensive Cancer Center. *New England Journal of Medicine* 2013; 368: 1417–1424.

Christakis NA and Lamont EB. Extent and Determinants of Error in Doctors' Prognoses for Terminally Ill Patients: Prospective Cohort Study. *British Medical Journal* 2000; 320: 469–473.

Butler K. What Broke My Father's Heart: How Putting in a Pacemaker Wrecked My Family's Life. *New York Times Magazine* June 18, 2010, pp. 39–43.

February 8 (Thursday)

VIII. Iatrogenesis and Medical Error

How common and serious are medical errors? What is the difference between “harm,” “error,” and “maloccurrence”? What is a “therapeutic misadventure”? How do physicians cope with the inevitability of mistakes and harm? In what ways is *iatrogenesis* (doctor-caused injury) a widespread socio-medical phenomenon? Why does harm occur and what, if anything, can be done about it? What ethical and policy issues are raised by medical mistakes?

Illich I. *Medical Nemesis: The Expropriation of Health*. New York, NY: Pantheon Books, 1976, Part I (pp. 1–107). [Page numbers may depend on edition; read until the subsection titled “Black Magic”]

Classen DC, *et al.* ‘Global Trigger Tool’ Shows that Adverse Events in Hospitals May Be Ten Times Greater than Previously Measured. *Health Affairs* 2011; 30: 581-589.

Reason J. Human Error: Models and Management. *British Medical Journal* 2000; 320: 768–770.

Friedman JW. The Prophylactic Extraction of Third Molars: A Public Health Hazard. *American Journal of Public Health* 2007; 97: 1554-1559.

M. Richtel, “This Teen Was Prescribed 10 Psychiatric Drugs. She Is Not Alone.” *New York Times*, August 27, 2022.

IX. February 14 (Wednesday)

MIDTERM #1

February 15 (Thursday) and February 21 (Wednesday)

Health Behaviors

How do individuals' choices and behaviors affect individuals' health risks and health status? We will consider a range of health-related behaviors that are socially patterned and that can have substantial effects on both individual and population health. We will also explore the role of broader social policies and environmental effects on individual outcomes.

X. Session 1: Obesity and Exercise (February 15)

McGinnis JM and Foege WH. Actual Causes of Death in the United States. *JAMA* 1993; 270: 2207–2212.

Chang VW and Christakis NA. Self-Perception of Weight Appropriateness in the U.S. *American Journal of Preventive Medicine* 2003; 24: 332–339

Randall A. Black Women and Fat. *New York Times*, May 6, 2012, p. SR5.

Strawbridge W, Cohen R, Shena S, and Kaplan G. Frequent Attendance at Religious Services and Mortality over 28 Years. *American Journal of Public Health* 1997; 87: 957–961.

XI. Session 2: Tobacco, Alcohol, and Firearms (February 21)

- Schroeder SA. Tobacco Control in the Wake of the Master Settlement Agreement. *New England Journal of Medicine* 2004; 350: 293–301.
- Dinakar C and O'Connor GT. The Health Effects of Electronic Cigarettes. *New England Journal of Medicine* 2016; 357: 1372-1381.
- O'Brien D, *et al.* Association Between Electronic Cigarette Use and Tobacco Cigarette Smoking Initiation in Adolescents: A Systematic Review and Meta-Analysis. *BMC Public Health* 2021; 21: 954.
- Hemenway D and Nelson E. The Scope of the Problem: Gun Violence in the USA. *Current Trauma Reports* 2020; 6: 29-35
- McMurtrie B. Why Colleges Haven't Stopped Binge Drinking: Decades of Attention Without Much Difference. *Chronicle of Higher Education* December 2, 2014.
- Tanz LJ, *et al.* Drug Overdose Deaths Among Persons Aged 10-19 Years – United States, July 2019-December 2021. *MMWR* 2022; 71: 1576-1582.

February 22 (Thursday) and February 28 (Wednesday)
The COVID-19 Pandemic

We will explore the virology, epidemiology, and public health impact of the once-in-a-century COVID-19 pandemic we are living through. We will review the deployment of “non-pharmaceutical interventions” as well as the development of vaccines to respond to the threat. We will explore the classic social and psychological responses to epidemic disease (including grief, fear, denial, and blame of others) and the social and economic impact of the pandemic. We will position the COVID-19 pandemic in the long history of deadly outbreaks that have afflicted our species. The COVID-19 pandemic has also engendered many controversies, both among scientists and the citizenry – regarding everything from mask wearing, the utility of “lockdowns,” the efficacy of “natural” immunity, the benefits or side effects of vaccination and boosters, to the origins of the virus itself. Science, and its interface with public policy, has become heavily politicized during COVID-19. We will review some of the latest data about these controversies and briefly discuss the process of politicization.

XII. Session 1: Onset, Epidemiology, and Impact of the COVID-19 Pandemic (February 22)

Christakis NA. *Apollo's Arrow: The Profound and Enduring Impact of Coronavirus on the Way We Live*. New York: Little Brown, 2021 [Paperback].

XIII. Session 2: Selected Pandemic Controversies (February 28)

- F.P. Polack, *et al.* Safety and Efficacy of the BNT162b2 mRNA COVID-19 Vaccine. *New England Journal of Medicine*, December 10, 2020.
- Goldberg Y, *et al.* Protection and Waning of Natural and Hybrid Immunity to SARS-CoV-2. *New England Journal of Medicine* 2022; 386: 2201-2212.

- Li Y, *et al.* The Temporal Association of Introducing and Lifting Non-Pharmaceutical Interventions with the Time-Varying Reproduction Number (R) of SARS-CoV-2: A Modeling Study Across 131 Countries. *Lancet Infectious Diseases* 2021; 21: 193-202.
- Howard J, *et al.* An Evidence Review of Face Masks Against COVID-19. *PNAS: Proceedings of the National Academy of Sciences* 2021; 118: e2014564118
- Feltham E, Forastiere L, Alexander M, and Christakis NA. Mass Gatherings for Political Expression Had No Discernable Association with the local course of the COVID-19 Pandemic in the USA in 2020 and 2021. *Nature Human Behavior* 2023; 7: 1708-1728.
- Engzell P, Frey A, and Vewrhaagen MD. Learning Loss Due to School Closures During the COVID-19 Pandemic. *PNAS: Proceedings of the National Academy of Sciences* 2021; 118: e2022376118.

February 29 (Thursday), March 6 (Wednesday), and March 7 (Thursday)
Inequality, Social Hierarchy, Stress, and Social Support

What do baboons in the Serengeti, civil servants in London, and actors in Hollywood have in common? How does relative position, and not just absolute position, matter to health? How can social structure be stressful? How can it be salubrious? What are the health consequences of stress and how might an individual's social support buffer the adverse effect of stress on health?

XIV. Session 1: Social Inequality and Individual Health (February 29)

- Subramanian SV and Kawachi I. Income Inequality and Health: What Have We Learned So Far? *Epidemiologic Reviews* 2004; 26: 78–91.
- Lynch JW, Davey-Smith G, Kaplan GA, and House JS. Income Inequality and Mortality: Importance to Health of Individual Income, Psychosocial Environment, and Material Conditions. *British Medical Journal* 2000; 320: 1200–1204
- Lochner K, Pamuk E, Makuc D, Kennedy BP, and Kawachi I. State-Level Income Inequality and Individual Mortality Risk: A Prospective, Multilevel Study. *American Journal of Public Health* 2001; 91: 385–391.
- Kondo N, *et al.* Income Inequality, Mortality, and Self-Rated Health: Meta-Analysis of Multilevel Studies. *British Medical Journal* 2009; 339: b4471

XV. Session 2: Stress, Status, and Social Hierarchy (March 6)

- Singh-Manoux A, Adler NE, and Marmot MG. Subjective Social Status: Its Determinants and Its Association with Measures of Ill-Health in the Whitehall II Study. *Social Science and Medicine* 2003; 56: 1321-1333.
- Sapolsky RM. The Influence of Social Hierarchy on Primate Health. *Science* 2005; 308: 648–652.

XVI. Session 3: Social Support and the Health Benefits of Relationships (March 7)

- House JS, Landis KR, and Umberson D. Social Relationships and Health. *Science* 1988; 241: 540–545.

Cohen S *et al.* Social Ties and Susceptibility to the Common Cold. *JAMA* 1997; 277: 1940–1944.

March 9 – March 24 – SPRING RECESS

March 27 (Wednesday), March 28 (Thursday), and April 3 (Wednesday) **Health and Social Networks**

Can there be a non-biological transmission of disease? How does the health care delivered to one person affect the health of others? Does treating depression in parents prevent asthma in their children? Does weight gain or seatbelt use or drinking by those close to you directly affect your health? We will examine the difference between social support (measured at the individual level) and social networks (construed at the group level); and we will consider how illness and health-related phenomena (ranging from sexual practices to smoking to obesity to emotions to altruism) might spread within a social network and result in positive and negative “externalities.” We will explore the evolutionary significance and biological basis for social network structure and function. We will consider new work involving interventions in online and offline networks to improve health, including a variety of experiments in this area. We will also evaluate some of the ethical implications of using network methods to target interventions.

XVII. Session 1: Social Network Function (March 27)

Papachristos AV and Wildeman C. Network Exposure and Homicide Victimization in an African American Community. *American Journal of Public Health* 2014;104: 143-150.
Christakis NA and Fowler JH. The Spread of Obesity in a Large Social Network Over 32 Years. *New England Journal of Medicine* 2007; 357: 370-379.

XVIII. Session 2: Social Network Structure (March 28)

Bearman PS, and Moody J. Suicide and Friendships Among American Adolescents. *American Journal of Public Health* 2004; 94: 89–96.
Apicella CL, Marlowe FW, Fowler JH, and Christakis NA. Social Networks and Cooperation in Hunter-Gatherers. *Nature* 2012; 481: 497–501.

XIX. Session 3: Social Network Interventions (April 3)

Valente TW. Network Interventions. *Science* 2012; 337: 49–53.
Centola D. The Spread of Behavior in an Online Social Network Experiment. *Science* 2010; 329: 1194–1197.
Alexander MA, Forastiere L, Gupta S, and Christakis NA. Algorithms for Seeding Social Networks Can Enhance the Adoption of a Public Health Intervention in Urban India,” *PNAS: Proceedings of the National Academy of Sciences* 2022; 119: e22120742119
Christakis NA and Fowler JH. Social Network Sensors for Early Detection of Contagious Outbreaks. *PLoS One* 2010; 5: e12948.

April 4 (Thursday)
XX. Social Capital

We will examine the very important concept of “social capital,” first advanced by sociologist James Coleman in 1988, and also the nature of “emergent” properties of social systems. How and why do groups of people come to have properties that do not inhere in the individuals themselves? And to what productive ends, both good and bad, might social capital be put—by individuals and by policymakers?

Coleman J. Social Capital in the Creation of Human Capital. *American Journal of Sociology* 1988; 94: S95–S120.

Hardin G. The Tragedy of the Commons. *Science* 1968; 162: 1243–1248.

XXI. April 10 (Wednesday)
MIDTERM #2

XXII. April 11 (Thursday)
Neighborhood Effects on Health

We will consider how neighborhoods, as a particular form of collective social structure, may influence individual health. We will examine how local social capital and collective efficacy play a role in health. And we will examine how local physical infrastructure and medical resources affect health. In the process, we will examine geographic variation in a large variety of seemingly objective medical procedures, including the striking differences in care at the end of life and the widely varying patterns of elective surgery across the U.S.. And we will consider the phenomenon of “physician-induced demand” for medical care.

Seresinhe CI, Preis T, and Moat HS. Quantifying the Impact of Scenic Environments on Health. *Scientific Reports* 2015; 5: 16899.

Leventhal T and Brooks-Gunn J. Moving to Opportunity: An Experimental Study of Neighborhood Effects on Mental Health. *American Journal of Public Health* 2003; 93: 1576–1582.

Keizer K, Linderberg S, and Steg L. The Spreading of Disorder. *Science* 2008; 322: 1681–1685

Omer SB, Salmon DA, Orenstein WA, deHart P, and Halsey N. Vaccine Refusal, Mandatory Immunization, and the Risks of Vaccine-Preventable Diseases. *New England Journal of Medicine* 2009; 360: 1981–1988.

XXIII. April 17 (Wednesday)
Behavior Genetics, Gene-Environment Interactions, and Social Epigenetics

We will consider the cutting-edge field of *biosocial science*, and in particular focus on the ways in which our genes are in conversation with our social environment over time scales ranging from years to millenia. To what extent does our genetic makeup influence our behaviors? To what extent do our genes increase or decrease our risk for illness given particular environmental exposures? What are the biological bases of resilience? And how does the social environment

come to regulate our genome? How do social exposures “get under our skin”? How are they literally embodied?

- Polderman TJC, *et al.* Meta-Analysis of the Heritability of Human Traits Based on Fifty Years of Twin Studies. *Nature Genetics* 2015; 47: 702-709.
- Caspi A, *et al.* Influence of Life Stress on Depression: Moderation by a Polymorphism in the 5-HTT Gene. *Science* 2003; 301: 386–389.
- Caspi A, Hariri AR, Holmes A, Uher R, and Moffitt TE. Genetic Sensitivity to the Environment: The Case of the Serotonin Transporter Gene and its Implications for Studying Complex Diseases and Traits. *American Journal of Psychiatry* 2010; 167: 509-527.
- Yong E. A Waste of 1,000 Research Papers. *The Atlantic*. May 17, 2019
- Slavich GM and Cole SW. The Emerging Field of Human Social Genomics. *Clinical Psychological Science* 2013; 8: 667-669.
- Miller G. The Seductive Allure of Behavioral Epigenetics. *Science* 2010; 329: 24–27.
- Szyf M. Lamarck Revisited: Epigenetic Inheritance of Ancestral Odor Fear Conditioning. *Nature Neuroscience* 2014; 17: 2-4.
- Laland KN, Odling-Smee J, and Myles S. How Culture Shaped the Human Genome: Bringing Genetics and the Human Sciences Together. *Nature Reviews Genetics* 2010; 11: 137-148.

April 18 (Thursday), April 24 (Wednesday), and April 25 (Thursday)
Public Policy and Health and Health Care

We will examine some macro and micro public policies that can affect individual and public health. As a powerful illustration, we will examine how society might respond to the emergence of new biotechnologies that promise to provide “super-human” enhancements to the human body, and we will consider moral aspects of these developments as well as how society might regulate them. We will also consider some developments in the use of artificial intelligence (AI) in health care. We will also explore the implications of having or not having health insurance for the health of Americans. We will close with a consideration of some illustrative individual, local, and national efforts to improve the health of the public, and with a recapitulation of the fundamental tension between individual and collective perspectives on health and health care. And we will discuss what a new era of “big data” can offer public policy as it relates to health and health care.

XXIV. Session 1: Social Control of Individual Use of New Biotechnologies (April 18)

- Harris J. *Enhancing Evolution: The Ethical Case for Making Better People*. Princeton: Princeton University Press, 2007, Chapters 1–8. (143 pages)
- Cohen J. Did CRISPR Help – or Harm – the First-Ever Gene-Edited Babies? *Science* 2019; doi:10.1126/science.aay9569

XXV. Session 2: A Selection of Policy Interventions (April 24)

- Andersen RE, Franckowiak SC, Snyder J, Bartlett SJ, and Fontaine KR. Can Inexpensive Signs Encourage the Use of Stairs? Results from a Community Intervention. *Annals of Internal Medicine* 1998; 129: 363–369.

Volpp KG, *et al.* A Randomized Controlled Trial of Financial Incentives for Smoking Cessation. *New England Journal of Medicine* 2009; 360: 699–709.

Reinhard E, Carrino L, Courtin E, van Lenthe FJ, and Avendano M. Public Transportation Use and Cognitive Function in Older Age: A Quasi-Experimental Evaluation of the Free Bus Pass Policy in the United Kingdom. *American Journal of Epidemiology* 2019; 188: 1774-1783.

Goldin J, Lurie IZ, McCubbin J, Health Insurance and Mortality: Experimental Evidence from Taxpayer Outreach, *NBER Working Paper* 2019: No. 26533.

XXVI. Session 3: Public Health and Individual Experience (April 25)

McGinnis JM, Williams-Russo P, and Knickman JR. The Case for More Active Policy Attention to Health Promotion. *Health Affairs* 2002; 21: 78–93.

Haines A and Ebi K. The Imperative for Climate Action to Protect Health. *New England Journal of Medicine* 2019; 380: 263-273.

Wallace-Wells D. Suddenly, It Looks Like We're in a Golden Age for Medicine. *New York Times Magazine* June 23, 2023.

Final Exam date TBD