

Anthro 220 Seminar 1
Current Problems in Biological Anthropology -- Winter 2016

A Survey of Evolutionary Medicine and Evolutionary Public Health

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Tuesdays 9:00-11:50 a.m. Haines 350

Evolutionary medicine is the emerging perspective that seeks to understand contemporary human health and disease in light of the evolutionary history of our species; evolutionary public health is the application of this perspective at the community- or societal-scale. This seminar is intended as a forum in which to explore current research that either explicitly employs this paradigm or is conducive to such analyses, across a broad range of topics. Because our goal will be to address a variety of topics, participants will select the specific readings to be covered with advice from the instructor. Each participant is to choose one topic or area, select appropriate readings, and lead the discussion with assistance from the instructor. Although the course does not include a formal writing assignment, participants are encouraged to look for opportunities to develop potentially publishable papers; the field of evolutionary medicine presents unique affordances in this regard, as the existing biomedical literature is voluminous, yet only a tiny fraction of this information has been employed to explore evolutionary questions.

In preparation for the first week's meeting, please read the following overview papers (although there is some overlap among them, it is incomplete, hence it is well worth reading all three):

Gluckman, Peter D., et al. "How evolutionary principles improve the understanding of human health and disease." *Evolutionary Applications* 4.2 (2011): 249-263.

Nesse, Randolph M. "Ten questions for evolutionary studies of disease vulnerability." *Evolutionary Applications* 4.2 (2011): 264-277.

Stearns, Stephen C. "Evolutionary medicine: its scope, interest and potential." *Proceedings of the Royal Society B: Biological Sciences* 279.1746 (2012): 4305-4321.

At the first meeting, we will sort out the topics to be covered and the schedule. Accordingly, **please bring to the first meeting a prioritized list of topics that you would be interested in exploring** – remember, you will play a central role in that week's discussion, hence the topics should be metaphorically akin to the pericardium, i.e., near and dear to your heart (feeble attempt at medical humor). To aid you in this regard, in addition to topics mentioned in the above three papers, below are some resources; these are simply intended to provide a starting point – you are free to choose topics not included herein.

General resources

<http://evmedreview.com/> -- blog / clearinghouse; compiles abstracts of recent ev med publications, etc.

<http://emph.oxfordjournals.org/content/current> -- *Evolution, Medicine, & Public Health* a prominent, relatively new exclusively ev med / ev public health journal

[http://onlinelibrary.wiley.com/journal/10.1111/\(ISSN\)1752-4571](http://onlinelibrary.wiley.com/journal/10.1111/(ISSN)1752-4571) -- *Evolutionary Applications* publishes many ev med papers

Topics addressed in the 2014 Anthro 220 Ev Med seminar (I am conceivably willing to revisit these if seminar participants wish to do so)

Sexually-transmitted disease

Addiction, alcohol, psychoactive substance abuse

Cancer

Myopia

Post-fertile lifespan / menopause

Inflammation, infection, and cardiovascular disease

Life History Theory & cancer; & early stress; & sex diffs; & timing of puberty

Hygiene Hypothesis

Fever / brinksmanship

Dental occlusion & breastfeeding, diet

Mental illness / low mood / elusiveness of happiness

Menstruation

Timing of birth as function of fetal energy needs

Lists of possible topics

Presumably reflecting the ardor of some proponents of ev med, the Wikipedia page on the subject is fairly good, with many topics listed:

http://en.wikipedia.org/wiki/Evolutionary_medicine

Randy Nesse's topic suggestions:

Hypertension

Coronary heart disease

Asthma

Inflammatory bowel disease

Schizophrenia

Depression

Obsessive-compulsive disorder

Pre-eclampsia

Erythroblastosis fetalis

Osteoarthritis

Rheumatoid arthritis

Lupus

Acute myelocytic leukemia

Gout

Precocious puberty

Marfan's syndrome

Muscular dystrophy

Cystic fibrosis

Hemophilia

Acne

Psoriasis

osteoporosis
Peptic ulcers
Hemochromatosis
Wilson's disease
Specific allergies
Breast cancer
Tuberculosis
Alzheimer's disease
HIV/AIDS
Hepatitis
West Nile virus
Opportunistic nosocomial infections
Sleeping sickness
Dengue hemorrhagic fever
Panic attacks
Multiple sclerosis
Huntington's chorea
Prion diseases (CJD, mad cow)
Joe Alcock's topic suggestions:
Migraines
Blood Clots
Iron Deficiency
Meningitis
Fear/Anxiety
Hypertension
Pelvis Shape
Rheumatoid Arthritis
Cholesterol
Scoliosis
Diabetes Type I
Haemophilus
Alzheimers
Helicobacter pylori
Selfish Mitochondria
Sleep Apnea
Hypertension
Sickle Cell Anemia
Diet and Depression
Adrenaline
Hallucination/Dreams
Blind Spot
Mosquito Vectors
Anorexia
Allergies and Immune System
Cholera and Cystic Fibrosis

Leticia Avilés' topic suggestions:

Antibiotic resistance

Virulence and transmissibility (mode and rate).

Emerging diseases (SARS, ebola, etc.).

Flu epidemics and vaccine development. OR: Where do flu strains come from?.

Puzzling genetic diseases: Huntington's chorea, cystic fibrosis, Tay-Sachs, etc.

Interaction between infectious and genetic diseases.

Inbreeding and drift in human populations.

Are human ABO blood types adaptive?

Contrasting evolutionary theories of senescence (mutation accumulation vs. antagonistic pleiotropy).

Can we eliminate aging?

Why menopause? Theories and controversies.

Design compromises: in childbirth, eating and breathing, walking upright, etc.

Obesity/diabetes and the "thrifty" genotype hypothesis.

Myopia.

Lactose intolerance.

The "hygiene" and other hypotheses to explain increasing incidence of allergies and asthma.

Hygiene and autoimmune disorders (insulin-dependent diabetes, rheumatoid arthritis, lupus).

Evolution of anticancer mechanisms.

Parallels with other transitions between levels of organization.

Menstrual cycling and breast cancer.

Vitamin D, sun, and cancer.

Genetic conflicts of pregnancy

Testing evolutionary hypothesis of mental disorders (anxiety, depression, schizophrenia, bipolar disorder, etc.)

Positive psychology and the happiness hypothesis.