Epidemiology
MS, MPH  PhD, DrPH
WHAT IS EPIDEMIOLOGY?

• Study of the distribution and determinants of health-related states or events, including disease and the application of this study to the control of diseases and other health problems.

• Various methods can be used to carry out epidemiological investigations: surveillance and descriptive studies can be used to study distribution; analytical studies are used to study determinants.

www.who.int/topics/epidemiology/en/
Sample Topics of Epidemiologic Studies

Environmental Exposures
- Lead and heavy metals
- Air pollutants and other asthma triggers

Infectious Diseases
- Foodborne illness
- Influenza and pneumonia

Injuries
- Increased homicides
- National surge in domestic violence

Non-infectious Diseases
- Localized or widespread rise in particular type of cancer
- Increase in a major birth defect

Natural disasters
- Hurricanes Katrina & Rita (2005)
- Haiti earthquake (2010)

Terrorism
- World Trade Center (2001)
- Anthrax Release (2001)

www.cdc.gov/careerpaths/12teacherroadmap/epidemiology.html
POPULAR EPIDEMIOLOGIST SPECIALTIES

- Infectious and Chronic Diseases
- Maternal and Child Health
- Public Health Preparedness & Emergency Response
- Environmental Health
- Substance Abuse & Mental Health

MEET THE FATHER OF EPIDEMIOLOGY

JOHN SNOW, 1813-1858
Born in York, England, the son of a coal-yard laborer.

Snow spent his life trying to prove that repeated cholera outbreaks in London in the 1800s were caused by a contagion in the drinking water.

Snow’s persistent efforts to determine how cholera was spread and the statistical and mapping methods he initiated, earned him his title.

www.ph.ucla.edu/epi/snow/fatherofepidemiology.html
DEADLIEST PANDEMICS IN HISTORY

MEASLES
7th Century BC - 1963
200 million

BLACK DEATH
1340 - 1771
75 million

SMALLPOX
10,000 BC - 1979
300+ million

HIV / AIDS
1981 - TODAY
25+ million

PLAQUE OF JUSTINIAN
541 - 750
25 million

SPANISH FLU
1918 - 1919
50-100 million

TYPHUS
430 BC - TODAY
4 million

CHOLERA
1817 - TODAY
3 million

THIRD PANDEMIC
1855
12 million

HONG KONG FLU
1968 - 1969
1 million

In terms of an estimated death toll, smallpox is the deadliest pandemic in history. The highly contagious, rash-causing infection has killed more than 500 million people. Some believe that 90 percent of the native population of the New World was wiped out by the disease.
GRADUATE PUBLIC HEALTH PROGRAMS

with Epidemiology Focus

1. Johns Hopkins Bloomberg School of Public Health
2. Harvard T.H. Chan School of Public Health
3. U North Carolina Gillings School of Global Public Health
4. U Michigan School of Public Health
5. Columbia U Mailman School of Public Health
6. U Washington School of Public Health
7. Emory U Rollins School of Public Health

[Website Link] www.usnews.com/best-graduate-schools/top-health-schools/public-health-rankings
# Admission Requirements for Johns Hopkins Bloomberg School of Public Health

<table>
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<tr>
<th><strong>Application</strong></th>
<th>Statement of objectives and research goals (2 page limit)</th>
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<tr>
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<td>Resume/CV, Transcripts</td>
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<td>Three letters of recommendation (at least one academic, adviser preferred)</td>
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<td><strong>Standardized Tests</strong></td>
<td>GRE/MCAT or TOEFL/IELTS (scores less than 100/7.5 will not be considered)</td>
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<td>Average scores in the 70(^{th}) percentile or higher and an average GPA of 3.3</td>
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<td><strong>Courses</strong></td>
<td>Math through calculus</td>
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<td>Biology</td>
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<td>One additional science</td>
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<td><strong>Work Experience</strong></td>
<td>One year minimum of full-time post-baccalaureate work is required for the PhD and ScD, only.</td>
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# General Epidemiology and Methodology

*Doctoral course work for Johns Hopkins Bloomberg School of Public Health*

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<th>Year 1</th>
<th>Summer Before</th>
<th>First Term</th>
<th>Second Term</th>
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<td></td>
<td>Sexual Harassment and Sexual Violence Prevention Training</td>
<td>FY Epidemiology Doctoral Seminar</td>
<td>Epidemiologic Methods II</td>
<td>Epidemiologic Methods III</td>
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<td>Academic and Research Ethics at JHSPH</td>
<td>Introduction to Clinical Trials</td>
<td>Epidemiology Doctoral Seminar</td>
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<td>Principles of Genetic Epidemiology</td>
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<td>Year 2</td>
<td>First Term</td>
<td>Special Studies &amp; Research w/ primary course instructor</td>
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<td>Second Term</td>
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<th>Master’s (MPH or MS)</th>
<th>Doctorate (PhD or DrPH)</th>
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<tr>
<td><strong>Epidemiologist</strong>&lt;br&gt;studying diseases in a given population or group</td>
<td><strong>Director of Clinical Research</strong>&lt;br&gt;overseeing clinical research in a given institution</td>
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<tr>
<td><strong>Clinical Researcher</strong>&lt;br&gt;using research to study the efficacy of treatment</td>
<td><strong>Professor of Epidemiology</strong>&lt;br&gt;teaching in an academic setting, usually at a college or university</td>
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<tr>
<td><strong>Data Analyst</strong>&lt;br&gt;using data to draw conclusions for the good of public health</td>
<td><strong>Epidemic Intelligence Service Officer</strong>&lt;br&gt;investigating possible and actual disease outbreaks</td>
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www.publichealthonline.org/epidemiology/degree_programs/
Let’s Learn Public Health: Epidemiological Studies Made Easy

PU Alumni Join Ebola Intervention in West Africa
GERMS ON THE BIG SCREEN

-fun with epidemiology-

Contagion (2011)
- Lethal airborne virus that kills within days quickly turns pandemic
- The masses’ reaction rings true, harking back to the days of SARS

I Am Legend (2007)
- A rapidly-mutating virus goes airborne, wiping out the majority of humanity

28 Days Later (2002)
- The “Rage” virus spreads like the real-life Ebola virus and instantly causes rabies-like madness

Disease seemingly goes hand-in-hand with many of our worst nightmares in movies - fortunately, moviegoers can still get their big screen thrills armed with the best vaccination against the contagion of fear... KNOWLEDGE.

IMPORTANT LINKS

• American Journal of Epidemiology... academic.oup.com/aje
• Public Health Online: Epidemiology... www.publichealthonline.org/epidemiology/
• Public Health: Epidemiology & Research... www.publichealth.org/careers/epidemiology/
• Epimonitor... www.epimonitor.net/About.htm
• World Health Organization... www.who.int/topics/epidemiology/en/
• Centers for Disease Control and Prevention... www.cdc.gov/
  – Post-grad fellowships: www.cdc.gov/fellowships/full-time/bachelors.html
• National Institutes of Health... www.nih.gov/
• Explore Health Careers: Epidemiology... explorehealthcareers.org/career/public-health/epidemiology/