

Epidemiologist

Snapshot

Career Cluster(s): Health Science; Science, Technology, Engineering & Mathematics

Interests: Critical Thinking; Public Health; Science; Statistics

Earnings (Yearly Average): \$74,560

Employment & Outlook: Much Faster Than Average Growth Expected

OVERVIEW

Sphere of Work

Epidemiologists are public health workers who investigate patterns and causes of disease and injury. They seek to reduce the risk and occurrence of negative health outcomes through research, community education, and health policy.

Work Environment

Work environments vary because of the diverse nature of epidemiological specializations. Epidemiologists typically work in offices and laboratories to study data and prepare reports. They also may work in clinical settings or in the field, supporting emergency actions.

Epidemiologists work full time and typically have a standard schedule. Occasionally, epidemiologists may have to work irregular schedules to complete fieldwork or attend to duties during public health emergencies.



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Occupation Interest

Epidemiologists are typically interested in science and mathematics. Professionals in this career must have the ability to effectively communicate with others and analyze problems from multiple perspectives.

A Day in the Life—Duties and Responsibilities

Epidemiologists collect and analyze data to investigate health issues. For example, an epidemiologist might study demographic data to determine groups at high risk for a particular disease. They also may research trends in populations of survivors of certain diseases, such as cancer, to identify effective treatments.

Epidemiologists typically work in applied public health or in research. Applied epidemiologists work for state and local governments, often addressing public

Duties and Responsibilities

- Planning and directing studies of public health and finding ways to prevent or treat them
- Collecting and analyzing information—including data from observations, interviews, surveys, and samples of blood or other bodily fluids—and finding the causes of diseases or other health problems
- Communicating findings to health practitioners, policymakers, and the public
- Managing programs through planning, monitoring progress, and seeking ways for improvement
- Supervising professional, technical, and clerical personnel
- Writing grant proposals to fund research

Profile

Working Conditions: Both Inside & Outside

Physical Strength: Light Work

Education Needs: Master's Degree

Licensure/Certification: Not Required

Opportunities for Experience: Internship;
Practicum

Interest Score: 15

health problems through education outreach and survey efforts in communities. Research epidemiologists typically work for universities or in affiliation with federal agencies, such as the Centers for Disease Control and Prevention (CDC) or the National Institutes of Health (NIH).

Epidemiologists who work in private industry may conduct research for health insurance providers or pharmaceutical companies. Those in nonprofit companies often focus on public health advocacy instead of research, which is expected to be unbiased.

WORK ENVIRONMENT

Immediate Physical Environment

Epidemiologists work in offices and laboratories that are well lit and ventilated. They may also work in clinical settings, such as hospitals, emergency rooms, or

doctors' offices. If an epidemiologist is working in a lab, they may need to wear special protective gear such as lab coats and goggles.

Epidemiologists working in the field may need to be active in the community, including traveling to support education efforts or to administer studies and surveys. Because modern science has reduced the prevalence of infectious disease in developed countries, infectious disease epidemiologists often travel to remote areas and developing nations to carry out their studies.

Human Environment

Communication is a necessary component of working in epidemiology. This field relies on effective communication to relay important information in ways that is both easy for colleagues and outsiders to understand. If something is miscommunicated, it could potentially halt or stall the process of preventing a public health crisis. Field work may require epidemiologists to interact with sick patients, although safety precautions ensure that the likelihood of exposure to disease is minimal.

Technological Environment

Epidemiologists must have an understanding of varying computer software, from analytical and scientific computer programs to typical office applications. In addition, these professionals are proficient in technologies for conducting laboratory testing.

EDUCATION, TRAINING, AND ADVANCEMENT

High School/Secondary

High school biology, chemistry, and other natural science classes can help prepare students interested in epidemiology. Additional courses in mathematics and English are helpful for sharpening analytical and communication skills.

Suggested High School Subjects

- Algebra
- Biology
- Chemistry
- Civics
- Earth or Life or Physical Science
- Economics

- English
- Geometry
- History
- Physics
- Sociology

Related Career Pathways/Majors

Health Science Career Cluster

- Biotechnology Research & Development Pathway
- Health Informatics Pathway

Science, Technology, Engineering & Mathematics Career Cluster

- Science & Mathematics Pathway

Postsecondary

Epidemiologists typically need at least a master's degree. The degree may be in a range of fields or specializations, although a master's degree in public health with an emphasis in epidemiology is common.

Epidemiologists who direct research projects—including those who work as postsecondary teachers in colleges and universities—often have a PhD or medical degree in their chosen field.

Coursework in epidemiology includes public health, biological and physical sciences, and math and statistics. Courses include comparative healthcare systems, medical informatics, and survey and study design.

Master's degree programs in public health, as well as other programs that are specific to epidemiology, may require students to complete an internship or practicum that typically ranges in length from a semester to a year. Internships and other training opportunities are available at federal agencies such as the CDC and the NIH.

Some epidemiologists have degrees in both epidemiology and medicine. These scientists often focus on clinical work. In medical school, students spend most of their first 2 years in laboratories and classrooms, taking courses such as anatomy, microbiology, and pathology. Medical students also learn to take medical histories, examine patients, and diagnose illnesses.

Transferable Skills and Abilities

Communication Skills

- Using speaking and writing skills to inform officials and the public, such as for community outreach activities to explain health risks
- Conveying information effectively to other health workers

Critical-thinking Skills

- Considering a variety of resources in responding to a public health problem or health-related emergency

Detail Oriented

- Exercising precision and accuracy in moving from observation and interview to conclusions

Leadership Skills

- Directing staff in research or in investigating a disease
- Assigning work and evaluating staff performances

Math and Statistical Skills

- Analyzing data when reviewing results from studies and surveys
- Using large databases and statistical computer programs

Related College Majors

- Biology
- Biostatistics
- Chemistry
- Ecology
- Health Science
- Nursing
- Public Health

Adult Job Seekers

For adults seeking a career in epidemiology, a desire to work in the public health field is suggested. If an adult already holds a degree in a related scientific or medical field, taking courses in epidemiology or similar subjects would be beneficial to starting their career in this field. For those without a related degree or licensure that are interested in becoming an epidemiologist, they must enroll in relevant continuing education courses or in a post-secondary accredited college or university before receiving their degree. A master's degree or higher is mandatory in this position.

Professional Certification and Licensure

Those who wish to work in clinical or academic positions may need to advance their qualifications through professional certifications or licensing.

Additional Requirements

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EARNINGS AND ADVANCEMENT

Earnings depend on the epidemiologist's location, education, and number of years in practice. Median annual earnings of epidemiologists were \$74,560 in 2020. The lowest 10 percent earned less than \$49,140, and the highest 10 percent earned more than \$126,040.

Epidemiologists may receive benefits such as paid vacations, holidays, and sick days; life and health insurance; and retirement benefits, usually paid by the employer.

Employment for epidemiologists is expected to continue its escalation in coming years. However, epidemiological and public health programs are largely dependent on public funding, so employment growth is directly impacted by budgetary conditions.

EMPLOYMENT AND OUTLOOK

Epidemiologists held 7,800 jobs in 2020. Employment is expected to grow much faster than average for all occupations through the year 2030 at a rate of 30 percent.

The COVID-19 pandemic contributed to increased demand for epidemiologists to identify and mitigate the impact of diseases.

Demand for epidemiologists is expected to increase as enhancements in healthcare technology permit the discovery of new and emerging diseases. However, because it is a small occupation, the fast growth is expected to result in only about 2,300 new jobs over the decade.

These discoveries require research to understand the diseases and to develop methods for mitigating their adverse health consequences. Many jobs for these workers are in state and local governments, where they are needed to help respond to emergencies and to provide public health services. However, because epidemiological and public health programs largely depend on public funding, budgetary constraints may directly impact employment growth.

Demand for epidemiologists also is expected to increase as more hospitals join programs such as the National Healthcare Safety Network and realize the benefits of strengthened infection control programs.

Related Occupations

- Anthropologist/Archaeologist
- Economist
- Environmental Scientist/Specialist
- Geographer
- Health Educator/Community Health Worker

Famous First

The Persian physician Avicenna discovered the contagious nature of tuberculosis circa 1020, and introduced the method of quarantine to limit the spread of contagious disease. Source: kids.kiddle.co



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- Mathematician/Statistician
- Medical Scientist
- Microbiologist
- Physician/Surgeon
- Political Scientist
- Registered Nurse
- Survey Researcher

MORE INFORMATION

American College of Epidemiology (ACE)

230 Washington Avenue Extension, Suite 101

Albany, NY 12203-5319

518.240.1210

office@acepidemiology.org

www.acepidemiology.org

American Public Health Association (APHA)

800 I Street NW

Washington, DC 20001

202.777.2742

www.apha.org

Association of State and Territorial Health Officials (ASTHO)

2231 Crystal Drive, Suite 450

Arlington, VA 22202

202.371.9090

www.astho.org

Council of State and Territorial Epidemiologists (CSTE)

2635 Century Parkway NE, Suite 700

Atlanta, GA 30345

770.458.3811

www.cste.org

National Academy for State Health Policy (NASHP)

1233 20th Street NW, Suite 303

Washington, DC 20036

202.903.0101

www.nashp.org

The Society for Healthcare Epidemiology of America (SHEA)

4040 Wilson Boulevard, Suite 300

Arlington, VA 22203

703.684.1006

info@shea-online.org

www.shea-online.org

Emily Porter; updated by Stuart Paterson

Conversation With...

REBECCA REES

Applied Epidemiology Fellow,
Council of State and Territorial Epidemiologists (CSTE)
Colorado Department of Health
In the field, 2 years

What was your individual career path in terms of education/training, entry-level job, or other significant opportunity?

I have always been driven by a desire to connect with people and drive change. For a long time, I thought I had to become a physician or obtain a PhD to do that. After my undergraduate education where I majored in neuroscience, I accepted an entry-level position as a clinical research coordinator at a large cancer research institute. To be honest, I did not even know about the field of public health or epidemiology until about a year into that first job. Public health and epidemiology represented a way for me to stay connected to science and community without pursuing a clinical career. I applied for CSTE's Applied Epidemiology Fellowship (AEF) because it was an opportunity to see how data moves to action at the state and local levels. My work as a fellow has allowed me to learn and grow in many ways, while also seeing how data is used by health departments to address the health needs of the communities we serve.

What are the most important skills and/or qualities for someone in your profession?

Epidemiologists must critically evaluate any and all data they see! Understanding how data is collected and how it was analyzed is vitally important if you hope to speak to a result in a comprehensive way. Did a survey use simple random sampling or convenience sampling? How might bias be present in the results? What was the sample size, and was it adequate to confidently reflect disparities in the data? These are all questions that I ask myself on a daily basis. It is also important to be able to collaborate with groups of diverse stakeholders. No single perspective is sufficient on its own to understand a problem or to brainstorm solutions. A successful public health professional brings all of the necessary voices to the table to facilitate meaningful and efficient conversations.

What do you wish you had known going into this profession?

I wish I had known more programming languages prior to starting my fellowship. I am very comfortable using SAS software and have not needed others in my current position, but I think the ability to code data in multiple languages would make me an even stronger epidemiology candidate in future positions. I would highly encourage people to become familiar with using a statistical package, either R, SAS, or Stata. There are coding skills that you can hone

throughout your career, but it is essential to come into this profession with the ability to work with and analyze data sets.

Are there many job opportunities in your profession? In what specific areas?

There are many job opportunities for students pursuing either a Master of Public Health (MPH) degree or a Master of Science (MS) degree. An MS is geared towards research with an emphasis on epidemiologic methods and biostatistics. With this degree, you can work in state, local, or territorial health departments, pharmaceutical companies, consulting firms, non-profit public health companies or continue on to pursue a doctorate degree. An MPH is an interdisciplinary graduate degree designed to educate and build skills in a range of areas including epidemiology, environmental health, health policy, biostatistics, program planning and evaluation, and more. Both an MPH and MS can be tailored to fit your unique interests within public health. Regardless, you can focus on infectious disease, maternal and child health needs, environmental health, and so much more.

How do you see your profession changing in the next five years, how will technology shift, and what skills will be required?

The dialogue surrounding how racism and discrimination are affecting communities and our society as a whole has rapidly grown and evolved in the past couple of years. In the next five years, not only do I hope that we, as public health professionals and epidemiologists, can lead necessary change, but I also hope to see the way that we collect and analyze data change to center the voices of those the data is supposed to represent. We must lead with humility and acknowledge that although we may be experts in working with data, we can never be the experts in understanding the lived experiences of the communities we serve. Therefore, we must bring together those with diverse areas of expertise to find innovative solutions that address the most pressing needs of communities.

What do you enjoy most about your job? What do you enjoy least about your job?

I really enjoy collaborating with so many other state agencies and community partners to do my work. I am constantly learning from my colleagues and being pushed to critically analyze data sets with new perspectives every day. Working for a state health department, however, definitely has its limitations. There are pretty clear restrictions on how we can use the data and cannot participate in advocacy efforts, which can be hard when we'd like to advocate for causes we believe in. Although this can be frustrating, it also helps maintain the integrity of our department and ensure that the public knows the data we release is not marred by our own personal biases.

Can you suggest a valuable “try this” for students considering a career in your profession?

I would suggest looking online for some basic statistics or facts about an issue of interest in your community. If you are interested in cancer research, look up the prevalence of cancer diagnoses. If you are interested in environmental impacts, look at the average air quality index in your region. After you find something you are interested in, think about how you would convey that data to an audience. Would you make an informational bulletin? Would you create an interactive dashboard? What about your topic is most important for your audience to know? All of these questions represent the world of applied public health. Moving data into spaces where people can use it to create change and improve the lives of our communities.