



PUBH 201: Principles of Epidemiology

Term: Fall 2026

Credits: 3.0

Lecture Times & Location: Tuesday & Thursday 2:30–3:45 p.m., Calder Health Sciences Building 160

Modality: In-Person

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Instructor Information

- **Instructor:** Dr. Alan Berg (Associate Professor of Public Health)
- **Email:** aberg@university.alkimi.ai
- **Office:** Calder Health Sciences Building 310
- **Office Hours:**
 - Monday & Friday: 11:00 a.m.–12:30 p.m. (In person, Calder Health Sciences Building 310)
 - Thursday: 10:00–11:00 a.m. (Virtual via Zoom; link posted in Canvas)
 - Also available by appointment.

Course Description

Measures of disease frequency and association, study designs, bias and confounding, screening, outbreak investigation, and causal inference. PUBH 201 introduces the fundamental quantitative science of public health and preventive medicine. Students learn to quantify disease frequency and distribution across populations, calculate and interpret measures of association, and evaluate the methodological strengths and limitations of experimental and observational study designs. The course provides rigorous training in identifying selection bias, information bias, and confounding, while teaching students how to execute field outbreak investigations, assess diagnostic screening tests, and establish causal inference.

Prerequisites

PUBH 101 and STAT 205.

Measurable Student Learning Outcomes

Upon successful completion of PUBH 201, students will be able to:

1. **Compute Measures of Disease Frequency and Association:** Calculate and interpret incidence proportion, incidence rate, point and period prevalence, risk ratios, rate ratios, odds ratios, and attributable risk measures.
2. **Differentiate and Critique Epidemiological Study Designs:** Compare the architecture, strengths, limitations, and ethical considerations of randomized clinical trials, prospective/retrospective cohort studies, case-control studies, and cross-sectional surveys.
3. **Evaluate Threats to Validity: Bias, Confounding, and Interaction:** Identify sources of selection bias, information bias, and misclassification; apply stratification and multivariable techniques to detect and control for confounding and effect measure modification.

4. **Conduct Outbreak Investigations and Surveillance Analysis:** Apply the standardized steps of an outbreak investigation, construct and interpret epidemic curves, calculate attack rates, and identify likely sources of contagion.
5. **Appraise Screening Programs and Apply Causal Criteria:** Calculate sensitivity, specificity, positive predictive value, and negative predictive value for screening tests; apply Bradford Hill's viewpoints to evaluate causality.

Required Course Materials & Approximate Costs

1. **Gordis, Leon, David D. Celentano, and Moyses Szklo. *Gordis Epidemiology*. 6th ed., Elsevier, 2018.** Approx. \$75 print, \$45 digital rental.
2. **Aschengrau, Ann, and George R. Seage III. *Essentials of Epidemiology in Public Health*. 4th ed., Jones & Bartlett Learning, 2020.** Approx. \$85 print or digital.
3. **Total estimated cost:** \$85 to \$125.

Generative AI Policy (AI Level 2: AI Permitted with Disclosure for Specified Tasks)

In accordance with Alkimi University Academic Policies (Student Handbook §5.8), PUBH 201 operates under **AI Level 2**.

- **What is permitted:** You may use generative AI tools to generate practice 2x2 contingency tables, verify formulas for epidemiological calculations (such as attributable risk or screening metrics), and check draft narrative text of your outbreak report for clarity.
- **What is prohibited:** You may not use generative AI to compute epidemiological measures on graded problem sets, draft critical appraisals of published peer-reviewed studies, complete weekly quizzes, or answer examination questions. All data analyses must be performed by you.
- **Disclosure:** All submitted problem set solutions and written critiques must include an AI disclosure statement detailing any tools used and the specific nature of their assistance. If no tools were used, state: 'No generative AI tools were used in preparing this work.'

Grading Components and Weights

- **Midterm Examination 1:** 15% (In class, Thursday, October 1)
- **Midterm Examination 2:** 15% (In class, Thursday, November 12)
- **Outbreak Investigation Simulation Report:** 20% (Due Friday, October 23 at 11:59 p.m.)
- **Epidemiological Study Critique Paper:** 15% (Due Friday, November 20 at 11:59 p.m.)
- **Weekly Problem Sets & Canvas Quizzes:** 15% (Due Mondays at 11:59 p.m. in Canvas; lowest quiz score dropped)
- **Final Comprehensive Examination:** 20% (Thursday, December 17, 2026, 1:00–3:00 p.m.)

Grading Scale (Alkimi University Standard)

- **A:** 93–100% | **A-:** 90–92%
- **B+:** 87–89% | **B:** 83–86% | **B-:** 80–82%
- **C+:** 77–79% | **C:** 73–76% | **C-:** 70–72%
- **D+:** 67–69% | **D:** 60–66% | **F:** Below 60%
- **Extra credit:** No individual extra credit assignments are offered in this course.

Course Schedule (Fall 2026)

Week	Dates	Topics & Readings	Assignments & Deadlines
Week 1	Aug 27	The Epidemiological Approach to Disease and Health: Historical origins (John Snow and the Broad Street pump),	<i>First day of classes: Wed Aug 26.</i>

Week	Dates	Topics & Readings	Assignments & Deadlines
		definition of epidemiology, descriptive versus analytic epidemiology, and population thinking. <i>Reading: Gordis, Ch. 1</i>	
Week 2	Sep 1, 3	Measuring Disease Occurrence: Morbidity and Mortality: Incidence rate, cumulative incidence, prevalence, crude mortality, cause-specific mortality, and age-adjusted rates using direct standardization. <i>Reading: Gordis, Ch. 2–3</i>	<i>Wed Sep 2: Add/section change deadline.</i>
Week 3	Sep 8, 10	Evaluating Diagnostic and Screening Tests: Validity and reliability, sensitivity, specificity, false positives/negatives, positive and negative predictive values, and the impact of disease prevalence. <i>Reading: Gordis, Ch. 4–5</i>	<i>Mon Sep 7: Labor Day (no classes). Wed Sep 9: Census date (last day to drop without a W).</i>
Week 4	Sep 15, 17	The Natural History of Disease and Prognosis: Incipient stages, incubation period, case-fatality rates, five-year survival, median survival time, and life table/Kaplan-Meier survival analysis. <i>Reading: Gordis, Ch. 6</i>	—
Week 5	Sep 22, 24	Experimental Studies: Randomized Controlled Trials: Randomization methods, blinding (single, double, triple), placebo effect, intention-to-treat analysis, ethical safeguards, and clinical trial phases. <i>Reading: Gordis, Ch. 7–8</i>	—
Week 6	Sep 29, Oct 1	Cohort Studies: Design and Execution: Prospective versus retrospective cohort designs, selection of exposed and unexposed cohorts, loss to follow-up, and person-time metrics; Midterm Examination 1 in class. <i>Reading: Gordis, Ch. 9</i>	Midterm Examination 1 (in class).
Week 7	Oct 6, 8	Case-Control Studies and Cross-Sectional Surveys: Design of case-control studies, selection of controls, recall bias, nested case-control studies, and cross-sectional prevalence surveys. <i>Reading: Gordis, Ch. 10</i>	—
Week 8	Oct 15	Measures of Association: Relative Risk and Odds Ratios: Calculating relative risk in cohort studies, calculating odds ratios in case-control studies, and matching in epidemiological studies. <i>Reading: Gordis, Ch. 11</i>	<i>Oct 12–Oct 13: Fall break (no classes). Fri Oct 16: Midterm grades due.</i>
Week 9	Oct 20, 22	Measures of Public Health Impact: Attributable Risk: Attributable risk in exposed groups, population attributable risk, and translating risk metrics into public health policy and intervention targets. <i>Reading: Gordis, Ch. 12</i>	Outbreak Investigation Simulation Report due Fri Oct 23 at 11:59 p.m.
Week 10	Oct 27, 29	Field Epidemiology and Outbreak Investigation: Steps of an outbreak investigation, case definition development, line lists, epidemic curves, food-specific attack rates, and secondary attack rates. <i>Reading: Aschengrau & Seage, Ch. 13</i>	—
Week 11	Nov 3, 5	Threats to Validity: Selection and Information Bias: Systematic error versus random error, non-response bias, Berkson's bias, diagnostic suspicion bias, and differential versus non-differential misclassification. <i>Reading: Gordis, Ch. 14</i>	<i>Fri Nov 6: Last day to withdraw (W) or elect Pass/No Pass.</i>
Week 12	Nov 10, 12	Confounding and Effect Measure Modification: Criteria for confounders, restriction, matching, stratification, Mantel-Haenszel pooling, and distinguishing confounding from interaction; Midterm Examination 2 in class. <i>Reading: Gordis, Ch. 15</i>	Midterm Examination 2 (in class).
Week 13	Nov 17, 19	From Association to Causation: Causal Inference: Hill's criteria for causation (temporality, strength, dose-response, biological plausibility, consistency), counterfactual models, and directed acyclic graphs. <i>Reading: Gordis, Ch. 16</i>	Epidemiological Study Critique Paper due Fri Nov 20 at 11:59 p.m.
Week 14	Nov 24	Public Health Surveillance Systems: Active versus passive surveillance, syndromic surveillance, reportable diseases, CDC Morbidity and Mortality Weekly Report (MMWR), and global alert systems. <i>Reading: Aschengrau & Seage, Ch. 5</i>	<i>Nov 25–Nov 27: Thanksgiving break (no classes).</i>

Week	Dates	Topics & Readings	Assignments & Deadlines
Week 15	Dec 1, 3	Social and Molecular Epidemiology: Social epidemiology paradigms, biomarkers in epidemiological research, genetic susceptibility, gene-environment interactions, and ethical considerations. <i>Reading: Gordis, Ch. 17</i>	—
Week 16	Dec 8	Synthesis and Emerging Frontiers in Epidemiology: Big data and machine learning in epidemiological surveillance, climate-driven disease vectors, and comprehensive final exam review. <i>Reading: Course review packet</i>	<i>Wed Dec 9: Last day of classes. Thu Dec 10: Reading Day.</i>
Finals	Dec 17	Final Comprehensive Examination: Thursday, December 17, 2026, 1:00–3:00 p.m., Calder Health Sciences Building 160.	Comprehensive examination covering measures of association, study designs, validity, screening, and causal inference.

Course Policies

Attendance Policy

Class attendance is required for every lecture. Quantitative problem-solving workshops and case discussions will be conducted during class meetings, and missing lectures directly impairs your mastery of statistical epidemiology calculations. If you miss class due to illness or an emergency, email Dr. Berg promptly to obtain missed exercises. Students who miss the first two class meetings without notifying the instructor may be dropped. Students may miss class for religious observance without penalty if they notify the instructor in writing within the first two weeks of the semester (by Wednesday, September 9, 2026). Absences for university-sponsored activities (athletics, performances, conferences) are excused with a letter from the sponsoring office at least one week in advance.

Late Work Policy

Homework problem sets and papers submitted late will incur a 10% penalty per calendar day for up to three days. Submissions beyond 72 hours will receive zero credit. Weekly Canvas quizzes must be completed before the posted Monday deadline.

Major Progression and Prerequisite Requirements

Students majoring in Public Health must achieve a minimum grade of C in PUBH 201 to advance to PUBH 340 Public Health Research Methods. A grade of C- or below does not satisfy major requirements.

Final Exam Policy

The final examination (Thursday, December 17, 2026, 1:00–3:00 p.m.) is scheduled by the University Registrar and can't be moved without the Dean's written approval (Faculty Handbook §5.5). A student with three or more final exams on the same calendar day may reschedule one of them. Requests go to the instructor of the middle exam by the last day of classes. For this term, send the request by Wednesday, December 9, 2026 (Student Handbook §6.4).

Academic Integrity

Alkimi University is an academic community devoted to rigorous scholarship, open intellectual inquiry, and uncompromising ethical conduct. All students are subject to the regulations of the Alkimi University Academic Integrity Policy. Academic dishonesty—including plagiarism, cheating on examinations, unauthorized collaboration, fabrication of empirical data, and unauthorized submission of academic work generated by artificial intelligence—undermines the integrity of the university and carries severe disciplinary sanctions. Sanctions range from a failing grade on an assignment or exam to an administrative course failure recorded as an 'XF' on the official transcript, academic suspension, or expulsion. Suspected violations are formally investigated and resolved through the Office of Academic Integrity in accordance

with Faculty Handbook §6. For detailed information, consult the Office of Academic Integrity, Lovell Hall 315, (555) 555-0163, integrity@university.alkimi.ai.

Accessibility Services

Alkimi University is committed to providing equitable educational access and reasonable accommodations for all students with documented disabilities, including physical, sensory, psychological, learning, and chronic health conditions. Students requesting academic accommodations must formally register with the Office of Accessibility Services, Harlan Hall 204, (555) 555-0155, access@university.alkimi.ai. Once approved, students will receive an official Faculty Accommodation Letter detailing approved accommodations. Students should present this letter to the instructor as early in the semester as possible, and at least one week prior to any exam or assignment requiring accommodation. Accommodations cannot be applied retroactively.

Student Wellness and Mental Health

Your physical health, psychological well-being, and mental health are essential to your academic success. If you experience heightened stress, anxiety, depressive symptoms, personal trauma, or academic burnout, free, confidential counseling and medical care are available through the Hollis Health & Counseling Center, located in the Hollis Center. Routine appointments are available Monday–Friday 8:00 a.m.–6:00 p.m. and Saturday 10:00 a.m.–2:00 p.m. during the semester by calling (555) 555-0190 or emailing health@university.alkimi.ai. Urgent, 24/7 crisis psychological counseling is accessible immediately at (555) 555-0199.

Campus Student Support Services

- **Academic Advising Center:** Lovell Hall 101 | (555) 555-0158 | advising@university.alkimi.ai
- **Writing Center:** Whitcombe Library 3rd Floor | Free consultations on papers, reports, and research projects at any stage.
- **Whitcombe Library:** Whitcombe Library, Main Floor | (555) 555-0170 | askalibrarian@university.alkimi.ai
- **Hollis Health & Counseling Center:** Hollis Center | (555) 555-0190 | 24/7 Counseling Line: (555) 555-0199 | health@university.alkimi.ai
- **Epidemiology Quantitative Help Table:** Calder Health Sciences Building 310 | Problem set help, formula derivations, and study design consultations with Dr. Berg, Tuesdays 1:00–2:15 p.m.