

**Injury Epidemiology Program
Department Of Epidemiology**

Program Learning Objectives

Introduction

Injury epidemiologists conduct research describing injury hazards, identifying risk factors for injury, or quantifying the effect of various interventions designed to prevent injury. From a public health perspective, injury is a major problem, however, it is received limited attention from epidemiologists. The scope of injury control is broad, encompassing such diverse areas as suicide, homicide, youth violence, intimate partner violence, firearm violence, transportation safety (including diverse areas such as motor vehicle occupant protection systems such as airbags and seat belts, use of cell phones while driving, pedestrian safety, policies alcohol and driving, roadway design, bicycle helmets), falls and other injuries in older adults, occupational injury, prevention of violence in the workplace, sports injuries, chronic and overuse injuries (also known as musculoskeletal disorders), and injury prevention as a global health concern.

Injury epidemiologists conduct research that advances the field of injury prevention. In injury control, there is a close link between research and prevention action. Injury research needs to be timely and address specific areas of prevention. Injury epidemiologists are expected to develop science that directly addresses prevention opportunities, and furthermore, are expected to be able to engage with non-epidemiologists (ranging from policy makers to community advocates) to implement interventions that (based on the best available scientific knowledge) prevent injuries.

Learning Objectives

The overall goal of the program in injury epidemiology is to develop epidemiologists who further the science of injury control through research and are capable of engaging with society use their research findings to prevent injuries.

Injury epidemiologists graduating from the program with a PhD will have these abilities:

- Command of the principles of epidemiologic study design and data analysis
- Ability to adapt and apply those tools to design and conduct injury research
- Ability to collaborate and communicate with other scientists and clinicians in diverse areas (biomechanics, industrial hygiene, ergonomics, trauma care)
- Ability to assess and integrate scientific information from diverse sources from a prevention and research standpoint
- Ability to communicate epidemiologic concepts, methods, and findings, to non-epidemiologists and non-scientists
- Ability to present research at a national meeting

Injury epidemiologists graduating from the program with a PhD will possess these key knowledge items:

- Understand the importance of injury, and specific areas within injury, from a public health perspective
- Understand basic concepts in injury prevention, such as the Haddon matrix, and the difference between active and passive intervention

- Understand the use of cohort, case-control, and case-crossover designs to assess risk factors for injury in diverse injury topics
- Understand the use of epidemiologic studies to quantify the effectiveness of interventions (e.g. use of ecologic studies to study such as traffic safety laws, or other regulations or policies implemented at the community level, in terms of reduction of injury risks at the level of the individual)
- Understand the use of case-crossover for the study of transient hazards
- Understand the application of surveillance techniques to injury surveillance
- Understand the global nature of the injury problem in diverse countries

Students completing the Masters degree in the injury program will develop a subset of the above knowledge and abilities.

Methods of Achieving Learning Objectives:

Coursework: Students are expected to complete one 3-credit course in the science of injury control. Currently, EPID 783 (administered in HBHE Dept) is the only such course. Another course in Maternal Health and Child Health (MHCH 753) addresses Violence Against Women. Students are strongly encouraged to take other courses that support and extend their area of expertise.

Dissertation for Doctoral Students: The dissertation is an opportunity for doctoral students to conceptualize, develop, and implement research in a specific topic or topics in injury. This research is expected to lead to published papers that significantly advance the science in the student's chosen area. Doctoral students will be proficient in specific study designs (e.g. case-crossover studies) or data analysis techniques (e.g. analysis of rates) that are particularly applicable to injury research. Methodologic work that clarifies, enhances, or demonstrates the use of epidemiologic concepts and/or methods to injury research is encouraged.

Thesis for Masters Students: The thesis paper is an opportunity to conduct independent mentored research and build research skills. Publication is strongly encouraged.

Research Skills: Students are expected to become involved in research early in their studies. Students are expected to take the initiative in setting up meetings with their faculty advisors, and with other researchers engaged in injury research. Engagement with the faculty on faculty research projects, either through paid employment or via the student working with existing data to write a new paper, is a fundamental and very important means for students to develop research skills. In addition, students should proactively seek out opportunities to develop their own independent research. They are strongly encouraged to solicit the assistance of faculty advisers in developing their independent research areas. Faculty can provide assistance with brainstorming ideas, refining research questions, advice on methods and data analysis tools, and access to existing databases. Faculty will actively promote and assist student in develop research ideas and conducting research, however, the impetus and commitment to developing, conducting, and publishing research needs to come from the student.

Resources: Students are encouraged to engage with the Injury Prevention Research Center, the Highway Safety Research Center, and other resources on campus. A wide range of researchers in the School and elsewhere at UNC conduct or facilitate research related to injuries, including (but not limited to) the Office of the Chief Medical Examiner, the Department of Emergency Medicine, Department of Surgery and Trauma Center, Department of Orthopedics, Division of Allied Health Sciences, Human Movement Sciences, Exercise and Sport Science, Sports Medicine Research Laboratory, Human Movement Laboratory, Maternal Health and Child Health, Health Behavior and Health Education, Center for Urban

and Regional Planning. Off-campus resources include Injury and Violence Prevention Branch in the Division of Public Health at the State's Department of Health and Human Resources; Division of Occupational and Environmental Health at Duke University; Terry Sanford Institute for Public Policy at Duke University; Duke Sports Medicine. Students are also encouraged to engage with local and national groups in the community interested in injury control. These can include Mothers Against Drunk Driving, KidsNCars, SafeKids, North Carolinians Against Gun Violence, as well as clinicians engaged in prevention activities, local schools, parks and recreation departments, assisted living facilities, etc.

Documentation of Achievement of Learning Objectives:

The demonstrated ability to design, conduct, and publish epidemiologic research in injury control is the ultimate demonstration of attainment of the objectives listed above. Publication of independent research, perhaps in collaboration with faculty, and collaboration on faculty-led publications, is one primary marker of attainment of the objectives. Another primary marker is success in obtaining funding for research through mechanisms such as grants or contracts.

For doctoral students, important interim markers of attainment of the objectives include:

- the Intra-department Review, in which faculty review student progress with the student
- completion of the Methods Qualifying Examination
- completion of the Injury Qualifying Examination
- defense of the dissertation proposal
- final dissertation defense
- professional interaction and engagement with scientists and clinicians involved in injury control
- professional interaction and engagement with community groups (such as advocates) involved in injury control

For Masters students, important interim markers of attainment of the objectives include:

- Masters comprehensive exam
- Thesis paper
- professional interaction and engagement with scientists and clinicians involved in injury control
- professional interaction and engagement with community groups (such as advocates) involved in injury control