

# Public Health

<http://www.med.und.edu/master-of-public-health/>

FACULTY: R. Goldsteen (Director), K. Goldsteen, Hand, Hosford, Jonk, Oancea, Selya

## Degree Granted: Master of Public Health (M.P.H.)

### Mission Statement and Program Goals

The mission of the University of North Dakota Master of Public Health (MPH) Program is to support population health improvement in North Dakota, the Northern Plains and beyond through education, research, and service that create conditions needed to promote health and well-being, prevent disease and injury, and advance health and social equity among all populations.

Established in 2012, the Master of Public Health (MPH) program offers a 42 credit, accredited degree, which can be earned through full or part-time study. The educational priority of the MPH program is preparing students to respond to the growing demand for public health professionals who can transform data into information for decision-making. The size of health data is growing exponentially, and the skills to 'mine' big data are exceptionally valued by public and private health agencies, as well as healthcare provider and payer organizations. Therefore, both MPH specializations – Population Health Analytics and Health Management & Policy – emphasize analytics. Special features include an emphasis on faculty-student research collaboration; application of system dynamics to public health; and opportunities for experiential learning with UND's nationally recognized wellness initiatives and Grand Fork's many public and private organizations working collaboratively to improve health in the community. Residents of states in the Western Interstate Commission for Higher Education (WICHE) Region receive in-state tuition, and the program is designated as STEM. The MPH program was accredited by the Council on Education for Public Health (CEPH) in 2016. Admissions and program information can be found at: <http://www.med.und.edu/master-of-public-health/>.

### Master of Public Health (M.P.H.)

#### Admission Requirements

- Completion of the online application and payment of the application fee.
- A baccalaureate degree or equivalent from an accredited college or university (for U.S. degrees, accreditation by one of the six regional accrediting associations: MSA, NASC, NCA, NEASC-CIHE, SACS-CC or WACS-Sr.).
- An undergraduate and graduate (if applicable) cumulative grade point average (GPA) of at least 3.00.
- A standardized test.\* One of the following tests is required: Graduate Record Examination (GRE) General Test, Medical College Admission Test (MCAT), Graduate Management Admission Test (GMAT), Dental Admission Test (DAT), or Law School Admission Test (LSAT). There is no minimum score required for admission. Scores are used in combination with other indicators to determine eligibility for the MPH program. Standardized test scores must be sent by the testing service directly to UND. The institution code for the UND is 6878.
  - \*A standardized test is not required of applicants who have completed an advanced degree (Master's degree or higher) in a graduate program at an accredited U.S. or Canadian institution of higher learning.
  - \*A standardized test is not required of applicants who have a minimum of five years of relevant experience in public health that demonstrates ability to engage in graduate level coursework in the field of public health. Please contact the MPH Academic Coordinator for more information.
- Fluency in written and spoken English. All non-native speakers of English must meet the School of Graduate Studies requirements regarding fluency in written and spoken English. Please refer to the School of Graduate Studies website (<http://graduateschool.und.edu/graduate-students/new/admissions-international.cfm#language-proficiency>).

Applicants are required to submit the following supporting documentation:

- A written statement that describes the applicant's professional goals and motivation for seeking a degree in public health. In addition, applicants should comment on any personal qualities, characteristics, and abilities they believe will enable them to be successful in achieving their career goals.
- Resume listing work experience, including voluntary, and relevant accomplishments, awards, and honors.
- Official post-secondary academic transcripts from all institutions attended. Transcripts must be sent directly from the institutions to the UND School of Graduate Studies.
- Three (3) letters of recommendation from individuals who the applicant feels are most qualified to evaluate their academic potential and leadership potential in public health.

The Admissions Committee may request an in-person or Skype interview with an applicant to assist in the decision process. A background check will be completed on each student before admission is final.

### Program Requirements

The MPH program requires the successful completion of 42 credits of coursework. The MPH Core curriculum covers all areas required for public health programs accredited by the Council on Education for Public Health (CEPH) including biostatistics, epidemiology, social and behavioral sciences, environmental health, and health management and policy. The MPH program also requires completion of an 18 credit specialization in either Population Health Analytics or Health Management & Policy; a 3 credit Practicum; and a 3 credit Culminating Experience.

### Degree Requirements

Students seeking the Master of Public Health degree at the University of North Dakota must satisfy all general requirements set forth by the School of Graduate Studies as well as particular requirements set forth by the Master of Public Health Program.

### Coursework

Required MPH Core Coursework (18 credits):

MPH 531	Biostatistics 1	3
MPH 551	Epidemiology	3
MPH 520	Environmental Health	3
MPH 541	Social and Behavioral Sciences in Public Health	3
MPH 510	Health Care Systems	2
MPH 504	Leading and Managing Public Health Systems	2
MPH 505	Public Health Data Management in SAS	1
MPH 506	Public Health Data Management in R	1

### MPH Practice Experience

MPH 594 Practicum, 3 credits

The Practicum is a planned, supervised, and evaluated practice experience. It provides an opportunity to apply basic public health competencies acquired through coursework. The Practicum is designed to meet student goals, specialization criteria, and the needs of the Practicum organization. An approved proposal is required prior to enrollment in this course.

### MPH Culminating Experience

The MPH core courses must be completed before beginning the Culminating Experience.

MPH 995 Scholarly Project, 2 credits

The Scholarly Project is one component of the MPH Culminating Experience, and enrollment is concurrent with MPH 590. Students complete a project that demonstrates synthesis and application of knowledge acquired through coursework and other public health learning experiences.

MPH 590 MPH Seminar, 1 credit

The MPH Seminar is one component of the MPH Culminating Experience, and enrollment is concurrent with MPH 995. The course addresses current issues in public health. Presentations and discussions focus on dissemination, synthesis, and application of knowledge acquired through coursework and other public health learning experiences.

### MPH Optional Internship Experience

MPH 596 Public Health Internship, 6-24 credits

The Public Health Internship is a professional experience in an approved public health-related agency or organization. An internship is optional for MPH students, and can be paid or unpaid. It does not replace the 42-credit required coursework for the MPH degree but is an additional training experience, which would be undertaken when most or all MPH coursework is complete.

## Specializations

The two MPH specializations - Health Management & Policy and Population Health Analytics - provide integrative and practical learning experiences that are designed to foster intellectual growth, critical thinking, and essential problem-solving and communication skills. Graduates are prepared to work in many regional, national, and international settings including public health and other government agencies, health care delivery organizations, health plans, non-governmental health organizations, and academic institutions. Each specialization consists of 18 credits.

### Health Management and Policy Specialization

The specialization in Health Management & Policy provides students with skills needed to manage health care and public health systems effectively and efficiently, analyze and evaluate health policies, and communicate successfully to effect improvements in the health care and public health systems. The curriculum for the specialization is offered in partnership with the College of Business and Public Administration, which adds depth to the faculty expertise and course offerings available to MPH students.

#### REQUIRED COURSES = 12 credits

POLS 551	Health Administration and Organization	3
POLS 552	Health Policy	3
MPH 550	Population Health Research Methods	3
MPH 572	Health Care Budgeting and Finance	3

#### ELECTIVE COURSES = 6 credits

With advisor approval, other courses may be substituted.

POLS 501	Political and Public Policy Analysis	3
MPH 570	Special Topics in Population Health	1-3
POLS 561	Creation and Management of Social Enterprises	3
POLS 562	Political Advocacy and Social Entrepreneurship	3
MPH 574	Foundations of Health Economics	3
MPH 556	System Dynamics 1	3
MPH 558	System Dynamics 2	3
GEOG 474	Introduction to Geographic Information Systems (GIS)	2
GEOG 474L	GIS Laboratory (Co-requisite with GEOG 474)	1
GEOG 574	Advanced Techniques in Geographic Information Systems	3
EFR 510	Qualitative Research Methods	3
POLS 537	Program Evaluation	3

### Population Health Analytics Specialization

The specialization in Population Health Analytics provides students with skills needed to produce convincing and scientifically sound information about population health, evaluate the effectiveness of population health interventions, and provide the basis for improving health policies and programs. The course of study includes training in research methods, biostatistics, informatics, and communication of scientific results. Students learn how to design outcomes

and comparative effectiveness studies, collect and analyze population health data, and communicate results.

#### REQUIRED COURSES = 12 credits

MPH 532	Biostatistics 2	3
MPH 533	Advanced Biostatistics	3
MPH 550	Population Health Research Methods	3
MPH 556	System Dynamics 1	3

#### ELECTIVE COURSES = 6 credits

With advisor approval, other courses may be substituted.

MPH 534	Bioinformatics	3
MPH 535	Health Care Data Mining	3
MPH 538	Introduction to Structural Equation Analysis	3
MPH 558	System Dynamics 2	3
MPH 570	Special Topics in Population Health	1-3
MPH 574	Foundations of Health Economics	3
GEOG 474	Introduction to Geographic Information Systems (GIS)	2
GEOG 474L	GIS Laboratory (Co-requisite with GEOG 474)	1
GEOG 574	Advanced Techniques in Geographic Information Systems	3
EFR 510	Qualitative Research Methods	3
POLS 537	Program Evaluation	3

## Graduate Certificate in Public Health

The Graduate Certificate in Public Health is offered as part of the MPH Program. It is designed for people who wish to obtain formal training in public health, but do not want to earn the MPH degree. These include people currently working in the public health and health care fields, as well as others. The Graduate Certificate in Public Health requires completion of 15 credits.

Students may earn the certificate in one of two areas of emphasis: General Public Health or Population Health Analytics. Each area of emphasis requires completion of 15 credits, as outlined below. Applicants must meet all admissions requirements of the MPH Program except completion of a standardized test. All credits from the certificate program can be transferred into the MPH Program, if the student wishes. In addition, some students who complete the Graduate Certificate in Public Health will be eligible to sit for the Certified in Public Health (CPH) examination (see CPH eligibility requirements for more information).

### Area of Emphasis: General Public Health

The following courses are required for the General Public Health Emphasis of the Graduate Certificate in Public Health.

MPH 510	Health Care Systems	3
MPH 520	Environmental Health	3
MPH 531	Biostatistics 1	3
MPH 541	Social and Behavioral Sciences in Public Health	3
MPH 551	Epidemiology	3

### Area of Emphasis: Population Health Analytics

The following courses are required for the Population Health Analytics Emphasis of the Graduate Certificate in Public Health.

MPH 531	Biostatistics 1	3
MPH 550	Population Health Research Methods	3
MPH 551	Epidemiology	3

An additional six credits of electives must be completed to satisfy requirements for the Population Health Analytics Area of Emphasis. The following list includes approved electives. Another course may be substituted with advisor approval.

MPH 532	Biostatistics 2	3
MPH 533	Advanced Biostatistics	3
MPH 556	System Dynamics 1	3
MPH 574	Foundations of Health Economics	3
GEOG 474	Introduction to Geographic Information Systems (GIS)	2
GEOG 474L	GIS Laboratory	1

## Courses

### MPH 504. Leading and Managing Public Health Systems. 2-3 Credits.

This course introduces students to public health systems and their unique role in promoting health and preventing disease in populations, especially vulnerable populations. Organization, financing, and system performance are discussed. Differences between rural and urban public health systems, as well as international differences, are studied. The course covers professionalism, ethics, leadership, and management related to public health. Prerequisite: Enrollment in MPH degree program or certificate. On demand.

### MPH 505. Public Health Data Management in SAS. 1 Credit.

This course introduces students to the basics of data management using the statistical software SAS. The course emphasizes management and manipulation of large data sets using the active learning approach. Students need to bring their laptop computers to class, as well as a flash drive on which to store SAS programs and data sets. Data for exemplification will be chosen from the large array of online and publicly available health-related data sets. Prerequisite: Enrollment in MPH degree program or certificate. On demand.

### MPH 506. Public Health Data Management in R. 1 Credit.

This course introduces students to the basics of data management using the statistical software R. The course emphasizes management and manipulation of large data sets using the active learning approach. Students need to bring their laptop computers to class, as well as a flash drive on which to store R programs and data sets. Data for exemplification will be chosen from the large array of online and publicly available health-related data sets. Prerequisite: Enrollment in MPH degree program or certificate. On demand.

### MPH 510. Health Care Systems. 2 Credits.

This course introduces students to health care delivery systems, which provide diagnosis and treatment of health problems in societies. Topics include the organization, financing, and performance of health care delivery systems. Differences between rural and urban health systems, as well as international differences, are studied. Ethical issues related to the delivery of health care are discussed. Prerequisite: Enrollment in MPH degree program or certificate. On demand.

### MPH 520. Environmental Health. 3 Credits.

This course introduces the key concepts, principles, and applications of the primary science disciplines that underpin environmental health. It provides an overview of the major pollutants including their detection, impact on health, and principles of remediation. Ethical issues related to environmental health are discussed. Prerequisite: Enrollment in MPH degree program or certificate. On demand.

### MPH 531. Biostatistics 1. 3 Credits.

This MPH Core course introduces the selection, use, and interpretation of basic statistical tests and concepts that may be used in addressing, analyzing, and solving problems in public health and health care research. Prerequisite: Enrollment in MPH degree program or certificate. On demand.

### MPH 532. Biostatistics 2. 3 Credits.

This course continues the introduction to biostatistics begun in MPH 531 on the selection, use, and interpretation of basic statistical tests and concepts that may be used in addressing, analyzing, and solving problems in public health and health care research. Topics include multiple linear regression, analysis of variance as a special case of multiple linear regression, and an introduction to logistic regression. Prerequisite: MPH 531. F,S,SS.

### MPH 533. Advanced Biostatistics. 3 Credits.

This course develops advanced skills in biostatistics, with an emphasis on applied research in public health and medicine. Students learn how to derive quantitative answers to an applied research question by using multivariate statistical modeling. The course covers advanced topics in analysis of variance, linear and logistic regression, survival analysis, and generalized linear models. Prerequisites: MPH 532 and MPH 550. F,S,SS.

### MPH 534. Bioinformatics. 3 Credits.

This course introduces bioinformatics techniques and tools in analysis of various types of high-throughput biomedical data, such as microarray, genotyping and next-generation sequencing data. Students will learn the essential principles of conducting genomics research, and will gain hands-on experience of bioinformatics research using real research data. The advanced bioinformatics methods, such as data mining, graph theory, and high performance computing, are discussed. Prerequisite: Permission of Instructor. On demand.

### MPH 535. Health Care Data Mining. 3 Credits.

This course covers data mining concepts and methods that are important for health informatics. Basic topics in clustering and classification, such as hierarchical clustering, logistic discrimination, decision tree, variable selection, Bayesian decision model, and others are introduced. Students learn the techniques of data mining from an applications perspective. Students will have access to large healthcare datasets in a local server computer and have hands-on experience using data mining software. Prerequisite: Permission of Instructor. On demand.

### MPH 538. Introduction to Structural Equation Analysis. 3 Credits.

This course provides (a) introductory coverage of confirmatory latent variable techniques, including confirmatory factor analysis and structural equation methods; (b) in-depth presentation of special issues related to the application of these techniques in social science-based research; and (c) a comparison of these techniques with traditional analytical approaches. Prerequisite: Graduate statistics course with knowledge of linear multiple regression. On demand.

### MPH 541. Social and Behavioral Sciences in Public Health. 3 Credits.

This course introduces social and behavioral sciences theories and methods that are applied to public health problems. It covers: (1) description of social and behavioral determinants of health and health inequalities; (2) individual- and social/ interpersonal-level theories of health behavior and change methods; (3) theories and methods for improving the health of communities/populations; (4) public health evaluation strategies; and (5) public health policy and advocacy. Prerequisite: Enrollment in MPH degree program or certificate. On demand.

### MPH 544. Leadership of Health Care Organizations. 3 Credits.

Leaders of health care organizations can promote or inhibit optimum performance and desirable change. Students learn how to analyze and assess leadership qualities through application of leadership theories, methods, and techniques. Topics include leadership versus management, leading organizational change, dealing with workforce and organizational challenges, and related subjects. Prerequisite: MPH major or instructor consent. On demand.

### MPH 550. Population Health Research Methods. 3 Credits.

This course provides an overview of the research process including formulation of a research problem, selection of a research design, construction of an instrument for data collection, selection of a sample, collection and processing of data, and writing a research report. Topics include how to identify a research question; reasons and procedures for reviewing the literature; observational and interventional research designs; and commonly used measures in public health-related research. Prerequisites: MPH 531. On demand.

### MPH 551. Epidemiology. 3 Credits.

This course introduces the basic epidemiologic concepts used to study health and disease in populations including measurement, study design, and related statistical tests. Observational and experimental epidemiologic studies are described and their advantages and disadvantages compared. The course provides an overview of the major causes of morbidity and mortality in populations. Ethical issues related to epidemiology are discussed. Prerequisite: Enrollment in MPH degree program or certificate. On demand.

**MPH 554. Continuous Quality Improvement for Health Care Organizations. 3 Credits.**

This course provides a detailed view of quality improvement techniques, methods, and evaluation in health care organizations. The knowledge gained from these quality improvement methods enable students to identify, address, analyze, and solve organizational quality shortcomings with the ultimate goal of improving healthcare quality. Topics include quality assessment, quality assurance, total quality management, continuous quality improvement, health care reform related to quality improvement, patient safety, and quality health outcomes. Prerequisites: MPH 510 and MPH major or instructor consent. On demand.

**MPH 556. System Dynamics 1. 3 Credits.**

This course provides an introduction to the System Dynamics field of study which is a computer-aided approach to improving system performance through policy analysis and design. The knowledge and critical thinking skills gained from this course will enable students to work either independently or on interdisciplinary teams to effectively deal with problems arising from dynamically complex systems. Topics include: perspective and process; tools for systems thinking; the dynamics of growth; tools for modeling dynamic systems; instability and oscillation; model testing; and challenges for the future. This course is open to UND graduate students in all disciplines. On demand.

**MPH 558. System Dynamics 2. 3 Credits.**

This course builds on MPH 556: System Dynamics I. This course will enable students to effectively plan and manage System Dynamics projects by providing knowledge and skill relating to advanced modeling techniques, software capabilities, and client engagement processes. Topics include: model building, documentation and presentation best practices; use of historical data; model calibration and testing techniques; advanced software features; group model building; and implementation challenges. This course is open to UND graduate students in all disciplines. Prerequisite: MPH 556. On demand.

**MPH 570. Special Topics in Population Health. 1-3 Credits.**

This course explores special topics in the field of population health. Topics vary with faculty expertise and issues current in the field. The course may be repeated for credit if the topics are different. Prerequisite: Approval of Faculty Advisor. Repeatable to 6 credits. F,S,SS.

**MPH 572. Health Care Budgeting and Finance. 3 Credits.**

This course focuses on learning and applying financial and managerial accounting principles and techniques to health services organizations. The subject matter is designed to provide a working knowledge of accounting, finance, and budget terminology. Components of the class include the evolution of healthcare finance and reimbursement, revenue and expense classifications, financial reporting, budgeting, financial analysis, financing of public health agencies, and the current and anticipated financial impact of healthcare reform on the healthcare industry and health services organizations. Prerequisite: MPH major or instructor consent. On demand.

**MPH 574. Foundations of Health Economics. 3 Credits.**

This course serves as an introduction to the role of economics in health care and health policy. The microeconomic principles of supply and demand are introduced, and topics such as the demand for health, the derived demand for medical care, and the demand for health insurance are covered. On the supply side, the course examines the supply of medical care by physicians and hospitals, medical technology, and the role of managed care organizations. Implications of adverse selection, moral hazard, externalities, and asymmetric information are addressed. Cost benefit and cost effectiveness analyses are also introduced. The course examines the role of government in health care and health care reform including the implications of expanding insurance coverage under the Affordable Care Act. The effectiveness and efficiency of various health policies are also addressed, including government forms of insurance coverage such as Medicare, Medicaid, and the Department of Veterans' Affairs, price regulation of hospitals, provider payment reform, medical malpractice, uncompensated care, and health care workforce issues. Prerequisite: College Algebra and one of the following: Basic Statistics or Biostatistics, Introductory Micro- or Macro- Economics; or Consent of Instructor. On demand.

**MPH 590. MPH Seminar. 1 Credit.**

The MPH Seminar is one component of the MPH Culminating Experience, and enrollment is concurrent with MPH 995. The course addresses current issues in public health. Presentations and discussions focus on dissemination, synthesis, and application of knowledge acquired through coursework and other public health learning experiences. Prerequisite: Complete all MPH core courses. Corequisite: MPH 995. F,S,SS.

**MPH 594. Practicum. 1-3 Credits.**

The Practicum is a planned, supervised, and evaluated practice experience. It provides an opportunity to apply basic public health competencies acquired through coursework. The Practicum is designed to meet student goals, specialization criteria, and the needs of the Practicum organization. An approved proposal is required prior to enrollment in this course. Prerequisites: Enrollment in MPH degree program, completion of core courses and consent of instructor. Repeatable to 3 credits. F,S,SS.

**MPH 596. Public Health Internship. 6-24 Credits.**

The internship is a professional experience in an approved public health-related agency or organization. An internship is optional for MPH students, and can be paid or unpaid. It does not replace the 42-credit required coursework for the MPH degree but is an additional training experience, which would be undertaken when most or all MPH coursework is complete. Prerequisite: Approval of MPH program director. Repeatable to 24 credits. S/U grading. On demand.

**MPH 995. Scholarly Project. 2 Credits.**

The Scholarly Project is one component of the MPH Culminating Experience, and enrollment is concurrent with MPH 590. Students complete a project that demonstrates synthesis and application of knowledge acquired through coursework and other public health learning experiences. Prerequisite: Complete all MPH core courses or instructor permission. Corequisite: MPH 590. F,S,SS.

**MPH 996. Continuing Enrollment. 1-12 Credits.**

Repeatable. S/U grading.