Master of Science in Public Health (specializing in Global Health)

Programme code: MSPUHE
Webpage: www.ntnu.edu/studies/mspuhe

This programme description is valid for students admitted in the academic year 2016/2017.

Introduction

The Master of Science (MSc) in Public Health, specializing in Global Health, provides an in-depth study of global health, focusing on various aspects in low and middle income countries including cultural understanding and how development, policy, environment and climate influences health. Furthermore, it aims to focus on development, implementation and analysis of socio-technological innovations in global health, to meet complex health challenges and improve overall health outcomes.

Given the strength of NTNU in engineering and technology, this would be the first master's programme in Norway to integrate global health with innovations in the past, present and future.

The degree awarded to students completing the programme of study will be Master of Science in Public Health.

The MSc in Public Health is administered by the Department of Public Health and General Practice at the Faculty of Medicine.

Learning Outcome

General learning outcome:
The graduated student should be able to analyze important global health problems, inequity, and how to contribute to addressing these challenges including through capacity building of research and education.

Specific learning outcome:

Knowledge: the student will be able to

- demonstrate knowledge of global health problems, predominantly in low- and middle income countries;
- describe maternal, newborn, child, adolescent and sexual health and rights;
- understand epidemiology, theoretical research models and research ethics;
- explain the UN Millennium Developing Goals and their importance in improving global health, and apply the coming Sustainable Developing Goals in their studies;
- understand how health policies are developed, analyzed and used;
- understand the need and the future of technological innovations in global health development;
- identify and understand ecological factors influencing health.

Skills: the student will be able to

- work in interdisciplinary teams;
- formulate accurate research questions and write a project protocol;
- use quantitative and qualitative research methods;
- critically value when to use different research method;
- plan, collect data, analyze, synthetize material, present results orally and written;
- critically read, interpret and discuss scientific literature;

General competence: the student will have developed

- competence in global health and different ways to address this;
- experience of incentives and barriers to improvements;
- awareness of interrelations between health, cultural, social, ecological and political dimensions;
- utilization of technology as innovation in health managements;
- communication of global health issues.

Target Groups and Admission Requirements

The MSc in Public Health specializing in Global Health is suitable for students who are motivated towards developing a theoretical base on health and health systems, and an emphasis on methodology and training in different research methods.

There will be a special emphasis on innovation and technological support and services in global health

Admission to the MSc in Public Health requires a bachelor's degree (or an equivalent 3-year higher education) in Health, Development Studies, Sport Sciences, or in Technology/Engineering subjects with relevance for health care. Other relevant disciplines may be accepted after an individual evaluation of the applicant's qualifications.

International applicants need to submit proof of English proficiency (TOEFL, IELTS, APIEL or University of Cambridge test). More details about the language requirements are available at www.ntnu.edu/studies/langcourses/languagerequirements

Applicants who are not citizens of the European Union (EU) or the European Economic Area (EEA) need to provide a financial guarantee to get a residence permit in Norway.

Teaching Methods and Learning Activities

The teaching includes lectures and seminars. All students must participate in group work and have individual assignments. The language of instruction and examination is English.

Compulsory HSE Training

All master's students must participate in compulsory Health, Safety and Environment (HSE) training. This includes a HSE lecture and a fire protection course, both held in the first two weeks of the semester. When these activities have been completed, the student must pass an electronic test. This is to be done by 1 September 2016. If the student fails to do so, the access card to the campus/hospital buildings will be withdrawn.

Programme Structure

The master program is made up of the following two components:

- Compulsory courses (60 credits)
- Master's thesis (60 credits)

Compulsory Courses

KLH3002	Epidemiology I	7.5 credits	Autumn
PH3000	Global Health	15 credits	Autumn
PH3001	Qualitative Research Methods	7.5 credits	Autumn
PH3002	Innovation in Global Health	7.5 credits	Spring
PH3003	Statistical Methods in Public Health Research	7.5 credits	Spring
PH3004	Health Policy	7.5 credits	Spring
Various codes	Experts in Teamwork – Interdisciplinary Project	7.5 credits	Spring

The course *Experts in Teamwork* (EiT) is compulsory for all master's degree students at NTNU, and is taught every Wednesday in the second semester. Read more about EiT at www.ntnu.edu/eit

Master's Thesis

PH3901	Thesis in Global Health	60 credits

The student must have passed all examinations in compulsory courses before she/he can submit the master's thesis. The deadline for submission of the thesis is 1 June in the fourth semester.

Model of the MSc in Public Health specializing in Global Health

Year 1		**Year 2**	
1st semester (autumn)	*2nd semester (spring)*	*3rd semester (autumn)*	*4th semester (spring)*
KLH3002	PH3002	PH3901	
PH3000	PH3003		
	PH3004		
PH3001	EiT		

Course Descriptions

KLH3002	**Epidemiology 1**
Credits:	7.5
Period:	Autumn
Teaching methods:	Lectures and home work assignments. The lectures will take place during the weeks that the master's program of Clinical Health Science has intensive education. The lectures will be given in English. Form of assessment can be changed for re-sit examinations.
Required previous knowledge:	Admission to the MSc in Public Health at NTNU
Mode of assessment:	3-hour written examination Letter grades (A-F)
Credit reduction due to overlapping courses:	HLS3557: 7.5 credits HLS3553/MDHLS373: 4 credits
Host department:	Department of Public Health and General Practice
Course coordinator:	Post Doctor Signe Opdahl

Learning outcome

After completing KLH3002 the student should be able to:

- describe the characteristics of basic study designs relevant for population based and clinical research (cross sectional studies, case-control studies, cohort studies, as well as randomized controlled trials) and explain how these are used in epidemiological research;
- describe how measures of disease occurrence such as prevalence, incidence proportion, incidence rate are used, interpreted and calculated;
- describe how measures of association between exposure and disease such as risk difference, rate difference, risk ratio, rate ratio and odds ratio are used, interpreted and calculated;
- explain what is meant by precision in calculation of measures of disease and measures of association and interpret measures of precision;
- identify sources of systematic error in epidemiological studies like selection bias, information bias and confounding, and explain how these occur and may be dealt with;
- interpret and calculate the primary measures used for diagnostic testing such as sensitivity and specificity, predictive values of a positive and negative test;
- explain the differences between the terms causality and statistical association;
- explain the meaning of the terms effect modification and interaction.

Academic content

Students shall acquire knowledge about the study of distribution and causes of disease in human populations. The course will introduce the students to epidemiological methods, study design, random and systematic error, i.e., bias and confounding, causality and effect modification.

PH3000	**Global Health**
Credits:	15
Period:	Autumn
Teaching methods:	Lectures, seminars, group work, written and oral presentations, individual studies. The language of teaching and examination is English. Timetable will be available at https://timeplan.medisin.ntnu.no/timetable_show.php
Required previous knowledge:	Admission to the MSc in Public Health. Exchange students may be accepte after an individual evaluation.
Compulsory activities:	Written presentations Oral presentation on a given global health topic
Mode of assessment:	3-hour written examination Letter grades (A-F)
Host department:	Department of Public Health and General Practice
Course coordinator:	Professor Elisabeth Darj

Learning outcome

Upon completion of the course PH3000 the student is able to:

- identify, describe and analyze important global health problems; understand the relation between determinants of health and major health problems, and ways to address them;
- describe sustainable ways to improve health considering economic, cultural and ethical issues;
- describe and assess the global burden of diseases, morbidity, mortality, communicable and non-communicable diseases, and preventive measures;
- describe and assess women’s -,maternal - and child health, sexual reproductive health and rights;
- describe and assess health consequences of exposure to violence and war trauma;
- explain the interconnecting causes of global health problems;
- describe the Millennium Developing Goals and the Sustainable Developing Goals 2015-2035;
- present, discuss and communicate major global health issues and critically consider evidence based major interventions improving health;

- demonstrate competence in analyzing the global burden of health, the distribution of ill health and interaction with health determinants, incentives and barriers to improvements, the interrelations between health, cultural, social, ecological and political dimensions;
- communicate global health issues and sustainable responses to the multifaceted health challenges.

Academic content

The course PH3000 will address global health issues, predominantly in low and middle income countries. It will provide knowledge of the global burden of diseases (both communicable and non-communicable diseases) and their impact on the health of populations. Furthermore, global initiatives for the eradication of diseases will be presented. Other topics include:

- Maternal and reproductive health and reproductive rights;
- Newborn infant, child, and adolescent health;
- Violence (structural, external and domestic) and health;
- Nutrition and child growth with emphasis on the interaction between nutrition and infection;
- Determinants of health, inequality and inequity in health, and tools to address them;
- Introduction to medical anthropology, to understand cultural perspectives on disease, illness, sickness and treatment;
- Human rights and other ethical responsibilities on health;
- Environmental/ecological factors affecting health, such as climate, pollution, urbanization;
- Familarization on immunization, vaccines, antibiotic resistance, epidemics and of microbes transmissions (travel, animals, food, trading).

PH3001	**Qualitative Research Methods**
Credits:	7.5
Period:	Autumn
Teaching methods:	Lectures and assignments (both individual and group assignments). The total of both of the individual assignments must be passed in order to pass the whole course. The teaching is delivered during one week from Monday 08:30 AM to Thursday 16:00 PM, usually in week 38. (The same course is taught in Norwegian usually in week 4, with the course code KLH3015). A one-day compulsory exam seminar is held approximately 8 weeks later. In the time between the teaching and the exam seminar, the students work in groups.
Required previous knowledge:	The course is intended for students admitted to the MSc in Public Health or another 2-year master's programme in medical or health sciences at NTNU Other students, including exchange students, may be accepted after an individual evaluation.
Compulsory activities:	Examination seminar
Mode of assessment:	Portfolio assessment (see above) Letter grades (A-F)
Credit reductions due to overlapping courses:	HLS3004: 3.5 credits, SMED8015: 5,0 sp KLH3015/MDV6282: 7.5 credits
Host department:	Department of Public Health and General Practice
Course coordinator:	Professor Aslak Steinsbekk

Learning outcome

After completing the course PH3001, the student should:

- have knowledge about methods and norms for acquiring data, analysis and reporting of qualitative data in a medical research tradition;
- have extensive knowledge about what qualitative research methods are;
- be able to plan and conduct individual qualitative interviews;
- be able to analyze texts;

- be able to plan, conduct and analyze small qualitative studies.

Academic content

Qualitative research methods are well suited in order to study personal experiences, understanding, reflections and reasoning. The course will provide an overview of questions concerning theoretical background, collecting data, analysis and reporting of relevance for clinical and health sciences research in a medical research tradition.

PH3002	**Innovation in Global Health**
Credits:	7.5
Period:	Spring
Teaching methods:	This course will be divided into two parts. The first part will focus on lectures/discussion/case studies. The second part will focus on team work, focused around a single technology per team (of 3-4 students), that will analyze a technology in progress of implementation or a technology that is in early stage of development. The students will be required to come up with a "forecast" for the future of the technology in terms of the scope, focus and pathway to implementation. Students will analyze whether the given technology has a chance in sustainability, what are the bottlenecks and what needs to change in the technology for it to be highly successful. Ethical and social issues will also be discussed. The language of teaching and examination is English.
Required previous knowledge:	Admission to the MSc in Public Health. Exchange students may be accepte after an individual evaluation.
Compulsory activities:	Exercises
Mode of assessment:	Map evaluation Letter grades (A-F)
Host department:	Department of Public Health and General Practice
Course coordinator:	Associate Professor Muhammad Hamid Zaman

Learning outcome

Knowledge:

The course PH3002 will provide students with in depth knowledge on the following key topics:

- History of technological innovation in global health
- The process of technology development, optimization and implementation in global health
- The essential features needed for a technological innovation to succeed
- A richer understanding of what kind of technologies are scalable and which are not
- An understanding of stakeholders in technology development and implementation.

Skills:

Through the course PH3002, we anticipate that the students will develop the following skills:

- Analyzing various models of technology development process and implementation
- Analysis of the role and responsibilities of various stakeholders in technology development and implementation
- Group hands-on projects on assessing a technology's promise and trajectory to improve health outcomes
- Group presentations on the technology development and implementation cycle for global health applications.

General competence:

Upon finishing the course PH3002, the students will have an in-depth understanding of global health technologies, their trajectory and the bottlenecks in their implementation, as well as experience working

in teams to assess the in country viability and sustainability of a given technology, given the in country financial, socio-cultural, technological and logistical realities.

Academic content

Technology and innovation is an integral part of healthcare, in both developing and developed countries. While understanding key concepts of epidemiology, health management and statistics are common topics to the study of Global Health, few courses focus on the importance of technology and innovation, its history, its present and future, and its inherent challenges. The course PH3002 will introduce these key ideas in an interactive way using examples that have been successfully implemented and those that failed. We will analyze the key attributes of success and failures of technology in this course.

This course will address the importance of technology in improving overall health outcomes in global health. The course will focus on the process of technology, development, optimization and implementation in low and middle income countries. We will also focus on when and why technology is needed, when it is necessary, and what information it can and cannot provide. In that regard, issues of ethics will also come into play. In addition, the course will analyze the history of technology in global health, the current state of technology and what the future technological needs may be. During this course, we will also focus on three kinds of technologies: 1) successful examples of technology implementation 2) near-misses and 3) those that failed despite showing promise in early/ prototype stages. These lessons will guide the framework of our discussion about the need and the future of the technologies. Finally, we will also study the current bottlenecks, including social, technological and financial, that may hinder technology development and adoption in resource limited settings.

PH3003	**Statistical Methods in Public Health Research**
Credits:	7.5
Period:	Spring
Teaching methods:	Lectures and exercises. Approved exercises from the same or previous semesters are required to sit for the exam. Approved compulsory activities are valid for three subsequent semesters after approval. The lectures and examination is given in English.
Required previous knowledge:	The course is intended for students admitted to the MSc in Public Health or another 2-year master's programme in medical or health sciences at NTNU Other students, including exchange students, may be accepted after an individual evaluation.
Compulsory activities:	Exercises
Mode of assessment:	4-hour written examination Letter grades (A-F)
Credit reductions due to overlapping courses:	HLS3550/KLH3004/KLH3100/MNFSIB1/ST3000/ST3001: 7.5 credits KLMED8004: 5 credits
Host department:	Department of Public Health and General Practice
Course coordinator:	Professor Eva Skovlund

Learning outcome

After completing the course PH3003, the student should:

- be able to choose suitable descriptive measures for presenting data (measures of location and spread, frequencies, graphical methods);
- have knowledge about probability distributions;
- be able to apply statistical methods for comparing mean values and proportions in two samples, as well as methods for evaluating linear associations between two continuous variables;
- know the assumptions of the relevant methods;
- be able to perform statistical analyses by a statistical software package;
- be able to describe and interpret results.

Academic content

The course will provide an introduction to applied statistics, i.e. how numbers and data are organized and understood, and how conclusions can be drawn.

PH3004	**Health Policy**
Credits:	7.5
Period:	Spring
Teaching methods:	Lectures, workshops, group-based assignments. The language of teaching and examination is English.
Required previous knowledge:	Admission to the MSc in Public Health. Exchange students may be accepte after an individual evaluation.
Compulsory activities:	Attendance to lectures
Mode of assessment:	4-hour written examination Letter grades (A-F)
Host department:	Department of Public Health and General Practice
Course coordinator:	Professor Jon Magnussen

Learning outcome

After completing the course PH3004 the student is familiar with a broad typology of health systems, as well as different models for organization, provision and evaluation of health care. The student is able to:

- describe health systems in LMI countries in terms of their strengths and weaknesses;
- describe and discuss policy initiatives in terms of their potential positive and negative impacts;
- discuss special challenges related to health policy and health systems in LMI countries;
- understand the motivation for specific policy initiatives, and to assess their potential implications on quality, efficiency and equity;
- understand the major health policy issues and initiatives, and the relevance of these for design and implementation of health policy in LMI countries.

Academic content

A health care system encompasses the resources, organizations and institutions that deliver health care to the population. A fundamental policy goal is universal access to services. On this background this course will discuss different types of health systems with emphasis on policy issues such as:

- Health care financing; including mechanisms for revenue collection and pooling
- Organization of health care; including primary vs. specialized care, centralized vs. decentralized systems and private vs. public solutions
- Cost-effectiveness analysis of health care interventions; including principles for economic evaluation and the special challenges facing low and middle income countries.
- Economic incentives and provider payment

PH3901	**Thesis in Global Health**
Credits:	60
Teaching methods:	Individual supervision limited to 50 hours. The primary supervisor must hold a scientific position at NTNU. If necessary the student may choose to use one or more additional supervisors, for whom there is no requirement of a position at the university. A master's thesis agreement, including a project description, must be submitted by a given deadline in the second semester. Assessment: Master's thesis and oral presentation/examination used to adjust the grade of the thesis. The thesis must be written in English.
Required previous knowledge:	The student must be admitted to the Master of Science in Public Health, specializing in Global Health. In order to be eligible to defend his/her master's thesis, the student must have passed all exams, i.e. coursework worth 60 credits in total.
Compulsory activities:	Attendance to lectures
Mode of assessment:	Thesis and oral presentation/examination
Host department:	Department of Public Health and General Practice
Course coordinator:	Professor Elisabeth Darj

This is a temporary course description. Minor changes may occur for the academic year 2017/2018.

Learning outcome

After completing the course PH3901 the student should:

- know how to formulate a precise research problem;
- be able to scientifically test and answer a research problem;
- have skills in preparing and analyzing study data;
- know how to present a research problem and discuss the results critically by use of relevant scientific literature;
- have skills in preparing the results in a scientific format with sound language an precise statements; - describe a scientific work in a clearly written report (master's thesis).

Academic content

The master's thesis must be scientifically structured and be founded in valid theory and literature within the topics at hand. Research focus areas may be assessment of mechanisms, risks and causes, methods, treatments and interventions or classification and categorization of patient groups. Also topics like health care organization, external conditions, costs and interaction between sectors and professions may be chosen. Studies of clinical practice and dissemination of scientific results and knowledge are accepted granted methods of hypothesis testing are applied. The research must comprise elements of originality. It is expected that the student shows an independent contribution to data collection and/or analysis, and presentation of results. It is advisable to hook-up the research to active research groups or projects within the university or university hospital.