Environmental Health Track  
UNCC School of Public Health

The task group is composed of Jim Oliver, Jim Amburgey, Mitch Cordova, Owen Furuseth, and Vivian Lord. I also had assistance from Inna Sokolova of Biology. The following, however, is developed almost entirely from a contribution by Vivian Lord, Interim Chair and Professor, Dept. of Public Health Sciences.

The environment, which is broadly defined to include physical, chemical, biological, and the social environment, plays a major role in determining health of individuals and communities. The World Health Organization estimates that about a quarter of all preventable diseases and illnesses, which result in thirteen million deaths annually worldwide, are directly caused by environmental factors. Similarly, overwhelming evidence of “man-made” causes of global climate change and continual global threat of bio-terrorism has generated tremendous interest in the field of Environmental Health. In the U.S., Healthy People 2010 provides a framework for reducing the burden of preventable illnesses; control of environmental factors is one of the ten targeted health indicators currently being tracked. At the local level, Environmental Health professionals play a key role in local health departments performing such wide ranging activities as vector control, air quality monitoring, hazardous waste disposal, radiation control, and hazmat response. More than 80% of local health departments in the U.S. employ Environmental Health professionals.

The MSPH in Environmental Health at UNC Charlotte’s Department of Public Health Sciences will provide a solid foundation in environmental health sciences and train graduates to confront complex environmental health issues both locally and globally. The students will develop skills to perform exposure and risk assessments, collect, analyze, and interpret environmental data, monitor environmental hazards in the community and workplaces, and develop intervention strategies to reduce environmental exposures.

1. The most natural “fit” within our existing faculty and coursework would be to have a course that looks at the environment and how it affects health behaviors. So this could be the physical environment (built environment, neighborhoods, architecture, transportation, geography, climate, nature) and how that might influence physical activity, driving, being outdoors, etc. I try to cover the idea of neighborhood in one of my courses, but I would love to co-teach or co-develop such a course with one or more faculty.

2. A cautionary note: We need at least 3 environmental folks to physically be in our dept in order to develop a track/concentration/degree. We have tried in the past to hire these folks but they are few and far between. Thus, any real progress on this front needs to keep in mind that we will need strategies to attract environmental public health researchers to come here.

3. We need to develop a mission/purpose and a competency-base for each track (masters or doctoral) and ensure we can meet all of the other constraints (a professional curriculum is more than a collection of courses). A major challenge to environmental health programs is that they either get so broad as to be trivial (a sampling of one from every category) or get so specialized that their appeal is limited in a program our size (ionizing radiation, airborne particulates, toxicology, occupational health).
4. We feel we have a real opportunity here to think about a focus on URBAN health (that would bring in Civil & Environmental Engineering, Architecture, water sanitation, urban planning, and transportation people around the health of urban environments.

5. There is an inter-college PhD in Infrastructure & Environmental Systems. PHS is visibly missing from this party, and this is something that could be modified to be housed within our “school” as one of the core area PhDs.

6. There is not a lot about occupational health, and that might be an area that needs to be developed/included in the discussion

7. Other possible courses beyond the core competencies: Risk Assessment, GIS, Toxicology, Occupational Safety and Health, Air and Water Pollution, Molecular Epidemiology/Biological Markers, and Environmental Policy.

A number of potential faculty in the University have been identified whose research (based on their self-descriptions) suggest they could be of value for this tract. These include faculty in Kinesiology, Earth Science, Civil and Environmental Engineering, Biology, and Public Health Services.

There also appear to already exist several courses that could constitute core courses for this tract, or optional/elective courses. A problem with these, however, may be their prerequisites. Courses identified include:

- Environmental Toxicology
- Oxidative Stress
- Topics in Toxicology
- Environmental Toxicology and Health
- Comparative Animal Physiology (different stressors and their physiological/health)
- Introduction to Biotechnology (Overview of basic molecular biology, techniques; uses of biotechnology tools in environmental and biomedical fields)
- Environmental and Occupational Epidemiology;
- Public Health Data Analysis
- Epidemiology
- Elements of GIScience and Technologies
- Introduction to Urban Studies
- Medical Geography
- Environmental Quality Management (environmental and risk assessment)
Possible faculty

Kinesiology
Reuben Howden, Asst. Prof.
Genetic control of cardiovascular and pulmonary function under different environmental conditions; human blood pressure regulation

Earth Science
Walter Martin, Assoc. Professor, Assoc. Chair
Air quality modeling, environmental science
Ross Meentemeyer
GIScience & spatial modeling, biological Invasions & disease ecology, human-environment Interactions
Wei-Ning Xiang
GIS applications in planning and decision-making
Eric Delmelle
Geovisualization, Geostatistics
Sarah Haas
Remote sensing & GIS

Civil and Environmental Engineering
James Amburgey, Asst. Prof
Drinking water treatment, environmental chemistry, pathogen/bioterrorism detection methods
James Bowen, Assoc. Prof.
Water quality modeling, predicting harmful algal blooms
John Daniels, Assoc. Prof.
Solid and hazardous waste management, subsurface contaminant transport
Helene Hilger, Assoc. Prof
Wastewater treatment, solid waste, landfill design

Biology
James Oliver, Prof.
Microbiology, environmental microbiology, survival of human pathogens in the environment
Matt Parrow, Asst. Prof.
Aquatic microbial ecology, biology of harmful algae
Amy Ringwood, Assoc. Prof.
Environmental toxicology
Inna Sokolova, Assoc. Prof.
Environmental toxicology
Yvette Huet, Prof.
Endocrinology

Public Health Services
Ahmed A. Arif, Assoc. Prof
Epidemiology, biostatistics, environmental and occupational epidemiology, public health data analysis
Larissa Brunner Huber, Asst. Prof.
Epidemiology
James N. Laditka
Epidemiology of chronic diseases and disability
Some Existing Courses

**Biology**
- **Amy Ringwood**
  - Environmental Toxicology
  - Oxidative Stress
  - Topics in Toxicology

- **Inna Sokolova**
  - Environmental Toxicology and Health
  - Comparative Animal Physiology (different stressors and their physiological/health)

- **Bullock**
  - Introduction to Biotechnology (Overview of basic molecular biology, techniques; use of biotechnology tools in environmental and biomedical fields)

**Public Health Services**
- **Ahmed A. Arif**
  - Environmental and Occupational Epidemiology;
  - Public Health Data Analysis

- **Larissa Brunner Huber**
  - Epidemiology

**Geography**
- **Dr. Ross Meentemeyer, Dr. Wei-Ning Xiang, Dr. Eric Delmelle, Ms. Sarah Haas**
  - Elements of GIScience and Technologies
  - Introduction to Urban Studies
  - Medical Geography
  - Introduction to Geographic Information Systems
  - Environmental Modeling with GIS
  - Spatial Modeling for Social and Economical Applications
  - Urban Ecology
  - Geovisualization
  - Spatial Statistics
  - Quantitative Analysis in Geography.

**Earth Sciences**
- Environmental Quality Management (environmental and risk assessment)

**Kinesiology**
- **Reuben Howden**
  - No regular courses in environmental health offered, but Reuben would be interested in teaching an environmental genetics course in the future.
  - (Mitchell Cordova, Chairperson, Department of Kinesiology)
The emerging picture of the 21st century city fits many descriptions. Some are centres of rapid industrial growth and wealth creation, often accompanied by harmful waste and pollution. Others are characterized by stagnation, urban decay and rising social exclusion and intolerance. Both scenarios point to the urgent need for new, more sustainable approaches to urban development. Both argue for greener, more resilient and inclusive towns and cities that can help combat climate change and resolve age-old urban inequalities.

The 2010/11 State of the World’s Cities Report, “Bridging the Urban Divide” examines the social, economic, cultural and political drivers of urban poverty and deprivation. It argues that much inequality and injustice stems from inadequate policy-making and planning by local authorities and central governments alike. Typical remedies include removing barriers that prevent access to land, housing, infrastructure and basic services, and facilitating rather than inhibiting participation and citizenship.

The report also emphasizes that lasting gains are best achieved through a combination of local action and national enabling policies. As we grapple with old and new challenges in a rapidly urbanizing world, this timely report can help inform research, policy dialogue and development planning for years to come……”.

Ban Ki-moon, Secretary-General, United Nations

“….The book focuses on the concept of the ‘right to the city’ and ways in which many urban dwellers are excluded from the advantages of city life, using the framework to explore links among poverty, inequality, slum formation and economic growth. ….”

Content:

Part 01: Urban Trends
1.1 Cross-currents in global urbanization
1.2 The wealth of cities.
1.3 Slum Dwellers: proportions are declining, but numbers are growing.

Part 02: The Urban Divide
2.1 The Urban Divide: Overview and perspectives.
2.2 The Economic Divide: Urban income inequalities
2.3 The Spatial Divide: Marginalization and its outcomes
2.4 The Opportunity Divide: When the “urban advantage” eludes the poor.
2.5 The Social Divide: Impact on bodies and minds.

Part 03: Bridging the Urban Divide
3.1 Taking forward the right to the city
3.2 The regional dynamics of inclusion
3.3 The five steps to an inclusive city

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Advocating for safe and healthy public transportation: Increasing Health Participation within a Multisectoral Framework

Mirta Roses-Periago, Director Pan American Health Organization -PAHO/WHO
Socorro Gross-Galiano, Assistant Director Pan American Health Organization
PAHO/WHO
Luiz Augusto C. Galvão, Manager Sustainable Development and Environmental Health Area PAHO/WHO
Alberto Concha-Eastman, Senior Advisor Violence and Injury Prevention
Eugênia Maria Silveira Rodrigues, Regional Advisor Road Safety


“….Efficient and healthy transportation systems that consider the wellbeing of populations are a desired and needed goal. A healthy and safe transportation system is one that is based on a legal framework which incorporates multisectoral work for its planning, design, and development; addresses equity at the population level; is affordable, reliable, and efficient; and has a low impact on the physical environment while providing safety to its users…”

“…this document highlights the negative health consequences of inappropriate transportation systems and presents useful strategies for overhauling and transforming them, while at the same time advocating for the continued development of well-designed, integrated, and economically viable public transportation systems that promote human health and overall quality of life…."

Content:
Introduction
Transportation Systems and Their Complexity
Public Transportation within Transport Systems
Crash Events and Public Health
Links of Different Modes of Transportation to Risks and Benefits
Overall Consequences to Health Linked to Transportation
Road Safety
Global Magnitude of Road Traffic Injuries
Magnitude of the Problem in the Americas
Modes of Transportation and Road Safety
Characteristics of Public Bus Systems in Latin America
Noise and Health
Pollution and Health (Respiratory Conditions)
Stress and Mental Health
Obesity and Health
Other Health Consequences
Preventive Interventions
Enhancement of Road Safety: Focus on Safe Public Transportation within a Healthy Transport System
General Environmental Benefits
Noise Reduction
Air Quality
Physical Benefits of Increased Walking and Exercise
Overcoming Social Isolation and Inequalities
Social and Economic Benefits
Policy Implications and Suggested Directions

Hidden cities: unmasking and overcoming health inequities in urban settings

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WHO/UN-HABITAT report – November 2010

“…..The report, Hidden cities: unmasking and overcoming health inequities in urban settings, will enable city leaders and urban planners to identify deprived populations and target measures to improve their health.

“….The report is based on a new analysis that looks beyond city averages or beyond the usual information from cities and towns to identify hidden pockets of ill-health and social deprivation. Past efforts have largely focused on data averages, and on differences between cities. The new approach combines available demographic data with novel analysis to unmask urban averages. These findings allow city leaders and policy makers to look at trends, even within neighbourhoods and understand differences within as well as between cities.

“….Hidden cities highlights the challenges and opportunities urbanization brings and its effect on the well-being of all urbanites. While it is generally understood that city dwellers on average, enjoy better health than their rural counterparts, very little is known about health differences that exist within cities.

The report Hidden Cities reveals the urban health inequities that are the result of the circumstances in which people grow, live, work and age, and the health systems they can access. No city – large or small, rich or poor, east or west, north or south – has been show to be immune to the problem of health inequity.

The future of our urban world has yet to be realized, but brings both a price and a promise. To what extent we will pay the price, as opposed to fulfilling the promise is in our hands….."

Content: http://bit.ly/bND0io

Part One. The dawn of an urban WORLD
Chapter 1. The rise of modern cities
Chapter 2. Health in an urban context
Chapter 3. Urban health inequity and why it matters

Part Two. Unmasking hidden cities
Chapter 4. Urban health inequities revealed
Chapter 5. Achieving the Millennium Development Goals
Chapter 6. Urban governance for reducing health inequities

Part Three. Overcoming urban health inequities
Chapter 7. Building an evidence base for action
Chapter 8. Taking action

Conclusion: The price and the promise of our urban world
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This message from the Pan American Health Organization, PAHO/WHO, is part of an effort to disseminate information Related to: Equity; Health inequality; Socioeconomic inequality in health; Socioeconomic health differentials; Gender; Violence; Poverty; Health Economics; Health Legislation; Ethnicity; Ethics; Information Technology - Virtual libraries; Research & Science issues. [DD/ KMC Area] Washington DC USA

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More responses (Cynthia Cassell, Dept. of Public Health Sciences):

It is exciting to see a proposal for an environmental health track with the plans for the UNCC School of Public Health. Due to the increased demand and usefulness of geographical information systems (GIS) analysis and geospatial analysis in public health, I would encourage the PHS faculty to collaborate with the Department of Geography and Center for Applied GIS to examine courses students could take in the environmental health track, like an introductory course to GIS analysis. I may have missed it, however, I did not see such courses listed in the proposal.

Both Drs. Ross Meentemeyer and Eric Delmelle with the Department of Geography and Center for Applied GIS were instrumental in writing several grant proposals while I was at UNCC. One of these grants included the funded March of Dimes Basil O'Connor Starter Scholar Research Award. They are both cc:ed to this email and would be helpful to consult with for the environmental health track. Eric Delmelle gave a great presentation to the PHS faculty in Spring 2010. His presentation was quite informative and well-received. Many PHS faculty seemed interested in collaborations due to GIS applications in public health. Eric continues to be a strong investigator and collaborator with the MOD project.

I went to the alumna mater’s (Hopkins) website and reviewed their MHS in Environmental Health program—the required courses are listed too—see below. I would suggest we focus our initial program on a curriculum similar to the “Sustainability and Environmental Health” or “Population Environmental Health” tracks. I don’t think we have anyone currently in the dept that could help with the Toxicology tract, but there may be experts at the university that would be interested in having a toxicology focus.

http://www.jhsph.edu/bin/mj/MHS_Environmental_Health.pdf