POPLHLTH 211  Introduction to environmental health

Course coordinator
Professor Alistair Woodward
Epidemiology and Biostatistics
School of Population Health
Email: a.woodward@auckland.ac.nz

Course description
This course is intended to provide students with basic skills and knowledge about environmental health. By this we mean external causes of disease and injury, with an emphasis on the physical environment, and in particular, those factors that can be modified. The course will build on basic understandings of health determinants and epidemiology learnt in Population Health (POPLHLTH 111).

The quality of the physical living environment, or habitat, is fundamental to human survival and quality of life. Human habitats have changed significantly over time, and for much of the world’s population contact with the natural environment has been replaced by the built environment as cities increasingly become the dominant human habitat. This has meant a transition in the types of hazards to health from environmental factors. In the past, public health was mostly concerned with specific environmental threats, such as pathogens in drinking water, or noise in the workplace. These remain important, but the scope of environmental health has enlarged to include diffuse, widely distributed hazards (acid rain, persistent organic pollutants that accumulate through food chains). Now we understand that external causes of disease and injury seldom act in isolation, but rather through interactions, and this means that prevention needs to take a systems approach. It makes sense to tackle road crash injuries, for instance, bearing in mind the reasons why people are on the road, and why they travel in particular transport modes, as well as the “acute” causes of injury such as speed and alcohol.

Environmental health has also shifted in scale, from the classic local hazards (second hand smoke in homes) to regional issues, such as smog in North Asia, to global problems. Climate change is perhaps the best-known example of a threat to health that results from disruption of physical and biological systems on a planetary scale.

Key course objectives
By the conclusion of the course, each participant will:

1. Be able to describe ways in which the environment affects health and the approximate magnitude of the burden of ill-health attributable to environmental causes
2. Be able to describe three tools that are used to investigate environmental causes of disease and injury (environmental epidemiology, risk assessment, health impact assessment)
3. Be able to describe ways in which the knowledge of causes is applied to control environmental hazards
4. Be able to describe the main national legislative frameworks for environmental health in New Zealand
5. Be able to use a risk assessment framework for considering an environmental hazard
6. Know why and how the quality of water, food and air are managed in New Zealand
7. Be able to describe the benefits and challenges to community wellbeing that cities can provide as the dominant human habitat
8. Be able to describe how food and energy systems can positively and negatively influence health and environmental sustainability, including win-win strategies in these systems for both objectives
9. Know what opportunities there are for career development in environmental health
10. Know how and where to find information of relevance to environmental health outside the health literature.

Course structure
The course is organised into two lectures of an hour each week with one 2-hour tutorial per fortnight.

Module 1: Global and local
In this module we introduce the course, provide an overview and illustrate the application of environmental health in different settings. These span the local (household and neighbourhood), metropolitan (what environmental health means in Auckland), regional (a Pacific perspective), and global dimensions. We provide some background to the development of environmental health as a discipline, describe different approaches to viewing the links between the environment and wellbeing and demonstrate some useful tools for investigating these links. We demonstrate how indigenous models of health provide us all with a longstanding foundation for viewing wellbeing and the environment.

Module 2: Protection from hazards
Keeping people safe from specific environmental hazards continues to be a major part of environmental health work in New Zealand. Isolating and understanding the links between specific hazards and health will continue to be of vital importance. In this module we introduce a systematic approach to risk assessment and management and illustrate this by closer examination of five important environmental health topics: air pollution, water quality, food contamination, noise and injury.

Module 3: Understanding habitats
We move from considering specific hazards to considering the complex systems that make up human habitats. These systems include both positive and negative influences on wellbeing, as well as for environmental sustainability. We introduce two major pieces of overarching legislation that provide a mandate for ecosystem health activities in New Zealand: the Local Government Act and the Resource Management Act. We show how each Act is important for wellbeing and sustainability. We discuss two approaches to influencing health outcomes using the legislation: making submissions and using Health Impact Assessment.

Next we examine some of the important big-picture questions that define environmental health in the 21st century – how we live in cities (including the shape of our cities, transport systems and housing); how we choose and use our energy resources; and how to achieve health-promoting, sustainable food systems. We also focus on the health and equity implications of climate change as one example of the consequences of working at a global ecological limit.

Wrap up
We use an interactive panel format with guests from a broad variety of environmental health fields of work. This session will be useful for introducing students to career opportunities in environmental health.
# Lecture schedule

<table>
<thead>
<tr>
<th>Wk</th>
<th>Module</th>
<th>Lecture Topic</th>
<th>Tutorial Topic</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Global and local environmental health</td>
<td>Introduction to the course and Module 1 Environmental Health - local</td>
<td>No tutorial in 1st week</td>
</tr>
<tr>
<td>2</td>
<td>Environmental Health - global The physical environment and Maori well-being</td>
<td>Environmental health in the Pacific Environmental health in the city</td>
<td>Tutorial 1: Second hand tobacco smoke</td>
</tr>
<tr>
<td>3</td>
<td>Environmental Health - local</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Protection from Hazards</td>
<td>Intro to Module 2/Environmental</td>
<td>Tutorial 2: Hazard assessment – an outbreak</td>
</tr>
<tr>
<td>5</td>
<td>Contaminated food</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Water</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Injury</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Air Quality</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Noise</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Understanding Habitats Intro to Module 3 Legislative frameworks</td>
<td>Policy submission Impact assessment – wind turbines</td>
<td>Tutorial 4: Making a policy submission</td>
</tr>
<tr>
<td>11</td>
<td>Food systems</td>
<td>Climate change</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Transport systems Cities</td>
<td></td>
<td>Tutorial 5: Documentary and discussion</td>
</tr>
<tr>
<td>13</td>
<td>Housing &amp; Neighbourhoods Energy systems</td>
<td></td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>Wrap up Environmental Health Careers Panel</td>
<td>Wrap up lecture</td>
<td>No tutorial in final week</td>
</tr>
</tbody>
</table>

## Course assessment

- Assignment 1 20%
- Assignment 2 30%
- Tutorial exercises 10%
- Final examination 40%

## Recommended readings/textbooks

There are two recommended textbooks for the course. A list of recommended readings is given for each lecture.

  
  This is available as an e-book through the University library, as well as on desk copy at Tamaki Campus library.

- **Yassi A, Kjellstrom T, de Kok T, Guidotti T. Basic environmental health. Oxford University Press 2001**
  
  This text is available on short loan from the Tamaki campus library, and the first chapter readings are available electronically.