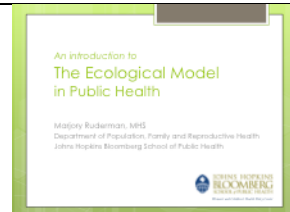
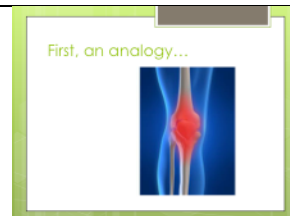


## Transcript: An introduction to The Ecological Model in Public Health

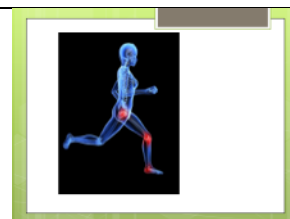
Presented by Marjory Ruderman, MHS, Department of Population, Family and Reproductive Health, Johns Hopkins Bloomberg School of Public Health (June 2013)



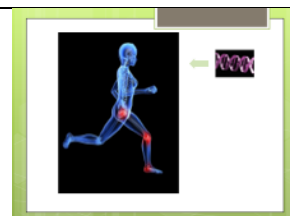
This is a brief, basic-level introduction to the ecological model, sometimes called the social-ecological model, and its applications in public health practice. Because this is an introduction to the topic, I'll assume that you have little experience with this model and start with an analogy that may be more familiar.



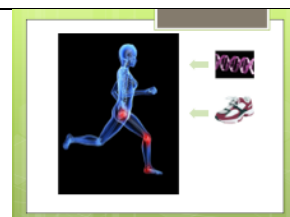
Say you've gone to the doctor because you've developed knee pain after taking up running. There is clearly something wrong your knee, so you might be surprised when the doctor tells you that she can't solve your knee problem without examining your hips.



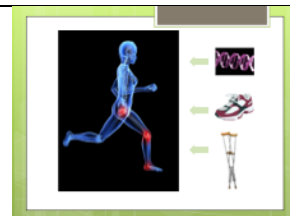
She points out that you have developed patterns of movement over the course of your lifetime that have resulted in weak hips, and the hips are a major part of the chain of movement all the way down your leg. Maybe you've even had ankle pain crop up since you started compensating for the pain in your knee. But it's not just the way you walk and run, the habits your muscles have picked up over a lifetime. There are other factors the doctor considers.



Do you have a family history of joint problems?



What kind of shoes do you wear?



Have you had any injuries in the past?



What's true for individual health is also true for population health, in the sense that you can't look at individual outcomes or health problems without examining the larger context that created them. Unlike a medical model, though, population health models take a much broader view of health over the life span.



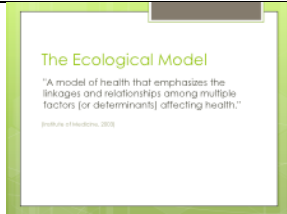
"An ecological or population health model emphasizes the importance of the social and physical environments that strongly shape patterns of disease and injury as well as our responses to them over the entire life cycle." - Fielding, Teutsch, Breslow 2010

The ecological model that we're focusing on in this tutorial "emphasizes the importance of the social and physical environments that strongly shape patterns of disease and injury as well as our responses to them over the entire life cycle"

(Fielding JE, Teutsch S, Breslow L. A framework for public health in the United States. *Public Health Reviews* 2010;32:174-189).

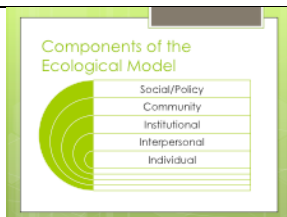


The ecological model of health has its origins in the fields of psychology and human development, in the mid-20<sup>th</sup> century work of Lewin, Barker, and Bronfenbrenner, and others who began to understand behavior in a context of the interplay of the individual and the environment. This work was taken up by public health fields like health promotion, health psychology, epidemiology, and maternal and child health, and expanded on throughout the latter half of the 20<sup>th</sup> century to the present. At this point, the ecological model is an integral component of public health training and competencies, such as those developed by the Council on Linkages Between Academia and Public Health Practice.



The Institute of Medicine has defined the ecological model as "a model of health that emphasizes the linkages and relationships among multiple factors (or determinants) affecting health."

(Institute of Medicine. *Who Will Keep the Public Healthy? Educating Public Health Professionals for the 21st Century*. Washington, DC: The National Academies Press, 2003.)



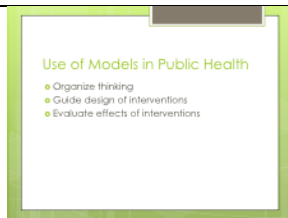
What are these factors affecting health? Well, there are too many to list in detail here, ranging from the micro level to the macro level. Typically, they're grouped into categories roughly like this:

- Individual factors, sometimes called intrapersonal factors, like genetics and individual behaviors.
- Interpersonal factors, like social support and family characteristics.
- Institutional and community environments, which might include work sites, schools, service systems and transportation.
- And finally, broader social, economic, and political influences, which could encompass a range of factors from laws and regulations to racism and discrimination.



There are different ways of illustrating the ecological model and categorizing its components. In this illustration from the IOM, the levels are groups as individual behavior; social, family and community networks; living and working conditions; and broad social, economic, cultural, health, and environmental conditions and policies at the global, national, state, and local levels. The dotted lines represent the multidirectional flow of influence within and between levels. For example, individual characteristics may influence the response to family and community factors. And we see that these influences on health act in a dynamic way over the life span.

*(Institute of Medicine. The Future of the Public's Health in the 21st Century. Washington, DC: The National Academies Press, 2002.)*



We've talked about the basic elements of the ecological model. Let's take a step back and discuss why we need models in the first place. Models are important in public health because they help us organize our thinking, identify opportunities for intervention, and assess whether interventions are having the desired effects. Having a model to help us understand the effects of social and physical environments on health isn't enough, we also have to know how to apply it.



The IOM distinguishes between the ecological model—a framework for the determinants of health—an ecological view, which is an understanding of health outcomes within that framework, and an ecological approach, which involves developing strategies to influence multiple levels and determinants of health.

*(Institute of Medicine. Who Will Keep the Public Healthy? Educating Public Health Professionals for the 21st Century. Washington, DC: The National Academies Press, 2003.)*



Let's turn to an example of an ecological model for obesity. Obesity is often used in examples of applying an ecological framework, so you're probably familiar with some variation on this theme. I would argue that these models often are not fully elaborated, with just selected components highlighted. In designing interventions, of course you have to select targets; but understanding the big picture is a critical first step before narrowing your focus. The examples I've filled in here aren't necessarily comprehensive, but I've tried to include a representative range of factors. There's also a lot of interaction among factors and overlap across levels that my limited graphic design skills couldn't capture, so we could reasonably differ in how we'd choose to identify or group many of these elements. This is just a quick look at how we might begin to examine obesity from within an ecological model.

*Individual* factors could include both genetics and epigenetics (changes in gene expression without a modification to the DNA sequence). For example, there is evidence of epigenetic changes associated with obesity that are related to environmental exposures to endocrine disrupting chemicals, and to maternal obesity—exposures early in life that trigger

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changes in physiological processes that can persist into adulthood. Individual factors also include knowledge, attitudes, and behavior related to diet and exercise.

The *interpersonal* level includes cultural factors like food choices, traditions, and cultural meanings of thinness and fatness that are reinforced at the family level as well as at the societal level. Other family characteristics that could fall into this category include caregiver behavior, time pressures affecting the ability to cook and eat together, and the role of food in the context of family relationships.

*Institutional* factors might include school and workplace food options and opportunities for physical activity, and access to health promoting services like wellness programs, clinics, or gyms. In the workplace, providing time and space for lactating mothers to pump breast milk could even be a factor. The degree to which breastfeeding reduces the risk of later obesity is still in question, but I'm mentioning it just as an example of the array of factors that could be considered in a full picture of the influences.

*Community* factors include access to, and affordability of, healthy food, recreation facilities, health care services; walkability and the layout of streets; the safety of outdoor spaces; having neighbors who exercise; and community norms related to food choices and accepted weight ranges. And again, as an example of the full range of factors that could be at play, how about school hours? Insufficient sleep has been linked to obesity, so might school system policies that start the high school day very early in the morning, at odds with teenagers' natural or preferred sleep patterns, contribute to sleep deficits that prime the body to store more fat?

I put community level social norms in here, but social norms may act on a larger societal level, too, so they could reasonably be placed in the broadest level of the model. Other factors in the broad *social and policy* level could include things like regulations pertaining to school food programs, agricultural subsidies, zoning laws, exposure to obesogenic chemicals in foods, food packaging, and other products, all of which are affected by the regulatory environment. And the balance between individual rights and regulations—which we recently saw come into play when Mayor Bloomberg tried to ban the sale of very large cups of soda in New York City restaurants.

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As we discussed, elucidating a model is just the first step toward identifying opportunities for intervention. The CDC’s Health Impact Pyramid illustrates the value of interventions focused on contextual factors and the social determinants of health for achieving the greatest population health impact.

(Frieden. *A Framework for Public Health Action: The Health Impact Pyramid. American Journal of Public Health. 2010 April; 100(4): 590–595.*)



If you’d like to continue to explore concepts and approaches that are related to the ecological model of health, I encourage you to visit the MCH Navigator, where you can learn more about:

- The social determinants of health. “Health starts where we live, learn, work, and play.” This simple phrase, which was helped into the common public health vernacular through the work of the Robert Wood Johnson Foundation, encapsulates the main idea behind the social determinants of health.
- Health equity, which is defined in Healthy People 2020 as “attainment of the highest level of health for all people” and the elimination of health disparities.
- And the life course framework, which is, to oversimplify it, a way of thinking about the interplay of risk and protective factors across the life span, almost like a 3-D version of the ecological model.



And you can visit the webpage of the Women’s and Children’s Health Policy Center for other online learning tutorials. Thanks for listening.