

**Health, Disease and Behavior
Life Sciences Pillar
Update April 18, 2008**



Health, Disease and Behavior: *Situation and Trends*

- The cost of chronic illness treatment and lost productivity is \$34 billion in Mass.^a
- Mass. ranks 40th in the US for burden of chronic disease, and 32nd for preventable hospitalizations. ^a
- In 2005, Mass. hospitalizations for congestive heart failure, diabetes and asthma totaled \$190 million. ^a
- Mass. individuals and businesses are at an economic disadvantage unless the spiraling costs of health care can be controlled.
- Half of all deaths in the US are attributable to tobacco use, poor diet, and physical inactivity
- Potentially modifiable risk factors and behaviors account for over 90% of the risk for coronary heart disease
- Obesity is at epidemic proportions, with concurrent rises in diabetes and other comorbidities

^aSource: Mass. Health Care Quality and Cost Council
www.mass.gov/Ihcc/docs/fs_lead_recommendations.pdf

Health, Disease and Behavior: *Situation and Trends*

- Translational research in the Life Sciences can improve health, quality of life, and economic development:
 - Individual, family, and community–based behavior change interventions can improve chronic disease management and quality of life, & reduce health care costs and improve workforce productivity
 - Environmental factors, exposures, and gene/behavior interactions can have a profound influence on health & development
 - Innovative technologies & information systems can improve health and influence the quality & cost of health care services

Health, Disease and Behavior: *Case Statement*

- Advances in the life sciences and related technologies will not be meaningful to MA residents and industries unless they lead to environments and practices that sustain the health of individuals and diverse populations.
- Using a Social-Ecological Approach, the Health, Disease and Behavior pillar addresses the creation, application, dissemination, and translation of new knowledge and technologies to optimize health and quality of life and reduce health care costs in Massachusetts.

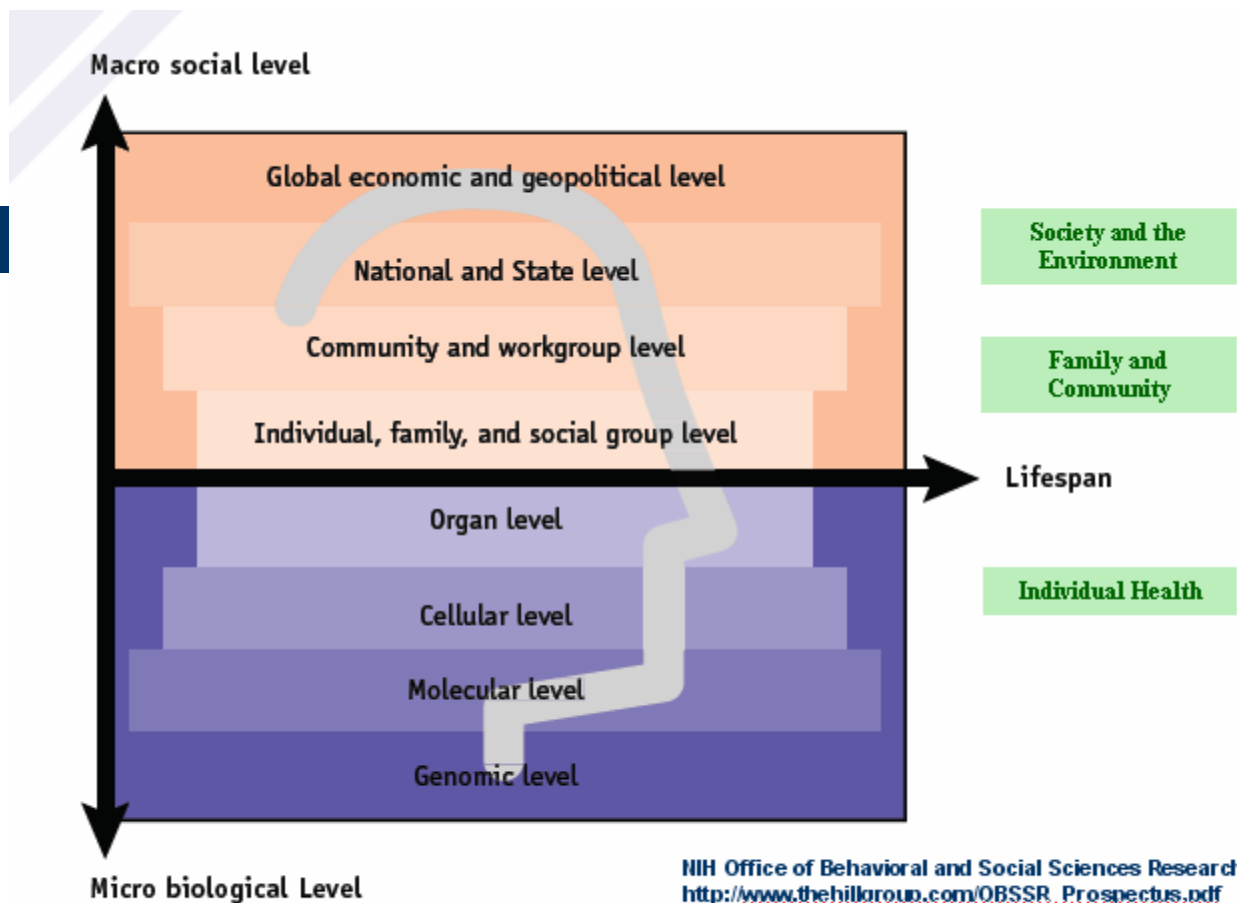


Figure 1. Health as a continuum between biological and social factors across the lifespan. (Adapted from Glass & McAtee, 2006).

Health and Behavior

Individual Health

Family and
Community

Society and the
Environment

- Quality of Life
- Nutrition and Physical Activity
- Health Behavior and Behavior Change
- Human Development
- Gene, Behavior and Environment Interactions
- Impact of Emerging Technologies on Human Health and the Environment

Research Areas of Strength: *Quality of Life*

- Reproductive health (A,L,W)
- Muscle structure, function and disorders (A,L)
- Speech, language, hearing in special needs populations (A,B,W)
- Public health and quality of care (A,W)
- Urban cultural and family health (D,L,W)
- Chronic conditions and their management (A,B,D,L,W)

Research Areas of Strength: *Nutrition and Physical Activity*

- Obesity and diabetes (A,D,L,W)
- Nutrition and food interventions in individuals, communities, policies (A,W)
- Micronutrients, food components, and technologies to improve health (A,D,L)
- Physical activity and diet assessment (A,B)

Research Areas of Strength: *Health Behavior and Behavior Change*

- Mental health, stress, violence, depression (A,D,W)
- Health interventions, behavior change (A,B,L,W)
- Occupational health (L)
- Sociocultural context for health and health disparities (A,B,D,L)

Research Areas of Strength: *Human Development*

- Aging and health (A,B,D,L,W)
- Sexual differences in the nervous system, cells, cognition and behavior (A,D)
- Language, literacy, learning, social development and disorders in infants and children (A,B,L,W)

Research Areas of Strength: *Gene-Environment Interactions*

- Genetic, endocrine, immune, nutritional and toxicological indicators in response to infectious and environmental agents (A, L)
- Gene/behavior/environment interactions in emerging communicable and chronic diseases (A,B,D,L,W)

Research Areas of Strength:

Impact of Emerging Technologies on Human Health and the Environment

- Technologies for patient-centric care (A,D,W)
- Environmental sensing (B,D,L)
- Water purification; soil ecology and environmental reclamation (A,D)
- Nanomaterial toxicity and handling (L)

Resource Recommendations

1. To convene an **annual 2-day conference** on Health, Disease, and Behavior Translational Research to foster collaborations among UMass system researchers and industry partners.
2. To provide **funding for pilot studies and demonstration projects** to encourage inter-campus collaborations.

Resource Recommendations

3. To establish a **database system** to identify faculty interests, expertise, and current research activities.
4. To create and maintain a **service to support biostatistics, bioinformatics, and qualitative research** in health, disease, and behavior.
5. To develop and maintain a **system of coordinated centers for human subject recruitment, assessment, and biological sample analyses**.

Health and Behavior Pillar

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