

## **The Department of Biobehavioral Health Strategic Plan 2014 – 2019**

**Mission:** Advance the Frontiers of Transdisciplinary Research and Training in Health and Behavior

**Vision:** BBH seeks to advance its national and international leadership in transdisciplinary research, dissemination, and the learning environment through the use of team-science approaches to address issues that connect health with behavior from cell to society.

### **Overarching Goals for 2014 – 2019 Strategic Plan**

The 2014-2019 plan focuses on leading the College and University efforts in three priority areas:

1. Integrative Research in Stress, Resilience and Health;
2. Global Health Equity Research and Training; and
3. Health Disparities Solutions Research and Training.

### **Background**

The Department of Biobehavioral Health (BBH) was founded in 1991 as an interdisciplinary doctoral program within the College of Health and Human Development and expanded in 1995 to offer undergraduate degrees, now serving 30 graduate and 800 undergraduate students. The department's community of 30 faculty members represents multidisciplinary academic perspectives and backgrounds that reflect diverse populations. Our productive research collaborations and graduate/undergraduate training opportunities extend across the College and University, as well as other domestic and global universities and communities.

The overarching goal of BBH in 2014-2019 is to enhance and prioritize our research growth while strengthening graduate and undergraduate education. This emphasis will shape and guide all decisions to invigorate and improve the quality of our scholarship and training. For example, we will boost our research productivity by strengthening our research infrastructure, particularly in new faculty who are methodologists, to increase the number of funded grants and scientific publications, as well as integrative and innovative research opportunities to improve health behavior outcomes associated with today's leading domestic and global disease burdens. Further, we will strengthen our graduate and undergraduate education by incorporating into our curriculum more of the knowledge gained from the clusters of departmental faculty who focus on our priority research areas. As part of those efforts, we aim to grow our pool of graduate trainees from the current average of 30 doctoral students to 40 or more in the next five years. In addition, we will use a team-science module approach to train these students. Similarly, we will align our undergraduate curriculum with the research foci within BBH, as well as with societal needs. We will also take measures to balance the quality of instruction with the challenges of the major's unprecedented recent and projected growth.

Our plan focuses on strengthening our research clusters not only to advance the goals of our research priorities but also to support emerging research initiatives that build on our dynamic strengths. The three overarching research and training goals will: (a) mobilize a critical mass of our faculty who represent research clusters that integrate key components of the department's

priority areas; (b) promote innovative initiatives in areas in which the department is poised to develop new research collaborations across the College and University; (c) support the development and implementation of integrative research innovations; (d) increase research productivity, strengthen collaborative research synergies, and influence research in the broader field to integrate leading-edge methods through the strategic hiring of methodologists; and (e) increase interdisciplinary collaborations across the College and University. The description of each overarching goal is organized into four domains: A) Research, B) Graduate Education, C) Undergraduate Education, and D) Resources Needed.

### **Goal 1:**

### **Formalize a Research Cluster in “Integrative Sciences in Stress, Resilience and Health” for Transdisciplinary Research and Graduate Student Education**

#### **Rationale**

BBH is already well known for its strength in the biology of stress. Over the next five years, we will formalize a research cluster in the “Integrative Sciences in Stress, Resilience and Health” to foster transdisciplinary collaborations and enhance pre- and post-doctoral student education in BBH. We have already established areas of critical mass among our faculty that can serve as the conceptual foundation and intellectual leadership to guide the further development of this research cluster. Although much of the existing stress research has focused on the negative health effects of stress, several of our faculty have focused on personality and biobehavioral factors that confer resilience in the face of stressful life events. This research cluster will provide an intellectual focal point and build capacity for scientists to develop transdisciplinary and transformative research collaborations on grants and scientific publications, as well as pre- and post-doctoral student education. This cluster will also serve as a catalyst for intra- and inter-departmental collaborations, synergy that positions the group to grow a research funding portfolio, and a vehicle to attract additional accomplished and promising scholars. Because many BBH faculty and others in our College study biological and behavioral protective factors which may blunt physiological and behavioral responses to stress, we are in a unique position to take a leadership role to advance the science of stress resilience nationally and internationally.

- A. *Research:* Grow our current research activities and strengthen communication between BBH faculty and faculty in other departments at Penn State.
1. Inventory available resources and expertise in integrative stress and health research at Penn State.
  2. Identify and expand potentially intersecting areas of integrative stress and health research across the University.
  3. Enhance the synergy among faculty who study factors related to links between stress, resilience, and health to better understand the different biobehavioral levels at which their research is conducted. Strategies include:
    - a. Establish an annual symposium on Stress, Health, and Resilience, which we will publicize across the diverse disciplines represented by our faculty, and which will provide opportunities for collaboration, identification of common interests, and novel experiences for undergraduates.

- b. Host three visiting scholars who will be invited to present workshops on novel methodologies, collaborate on specific grant proposals, and lead graduate seminars on stress/resilience and health.

*B. Graduate training:* Increase capacity and resources for graduate training.

1. Use the collective intellectual capital of the research clusters and initiatives to provide students with competitive proposals for NSF and NIH pre-doctoral traineeships.
2. Engage scholars outside BBH through research resulting from the cluster/initiative to participate in our graduate training in classes or labs through the use of technology.
3. Strengthen current dual title degrees in Bioethics (e.g. stronger partnership with Rock Ethics Institute), Clinical and Translational Science (CTS), and the Masters of Public Health (MPH) through marketing efforts, such as better use of technology (websites, social media, etc.).
4. Strengthen our commitment to graduate student research support, including offering a regular course on developing, writing and submitting a mentored research proposal (e.g., NRSA pre- or post-doctoral proposal or equivalent).

*C. Undergraduate education:* Increase capacity for improving quality of instruction in undergraduate education.

1. Increase opportunities for undergraduates to gain hands-on research experience (e.g., biomarkers of health assessment in the Biomarker Core Laboratory).
2. Seek resources to create additional Honors Courses (e.g., social justice and research ethics) and expand opportunities for the Honors Option in existing BBH courses.
3. Conduct curriculum review and revision, based on outcome assessment, to enhance opportunities for students to gain the knowledge, skills, and tools to directly facilitate change in their own and others' health-promoting behaviors. Consider developing and seeking resources to expand current course offerings related to stress and health [e.g., BBH 432 (Biobehavioral Perspectives on Stress)] into the World Campus learning environment.

*D. Resources Needed.* Recruit faculty from diverse backgrounds (Diversity Challenge #5) with expertise in multiple domains who conduct high quality integrative biobehavioral research that fits into more than one of our three priority research areas.

1. Hire at least three methodologists in the next two years. We propose that the first two be hired in the 2014-2015 academic year with foci on clinical trials, latent variable modeling, and/or repeated-measures designs in stress/resilience research. These hires are critical to achieving the objectives in all three of our goal areas. Many methodologists have substantive health interests in addition to their expertise in novel methods. New hires could include scholars in any of the following:
  - a) Genetic analysis and epigenetics to strengthen the cluster of faculty in genetics of health behavior.
  - b) Innovative models (human and/or animal) of social stressors, resilience, and social determinants of health.
  - c) Innovative data collection and data analysis methods critical for studying individuals' stress, behavior, and health intensively over time in a naturalistic setting (e.g., ecological momentary assessment; daily diaries; remote biosensing).

- d) New methods of analysis that are responsive to the growing availability of other types of “big data” or complex data related to health, biology, and behavior (e.g., social media; PET scanning, neuroscience, genetic data).
  - e) Innovative statistical analyses that, when applied to existing data, hold the promise of advancing science (e.g., latent variable modeling; clinical trials; methods for drawing causal inference when randomization is impossible).
  - f) Resilience interventions (e.g., cognitive; behavioral; brief interventions; scaled intervention; prevention innovation).
  - g) Integrative immunology (e.g., central nervous system inflammation; novel inflammatory biomarkers; immunology and microbiome interface).
2. Hire a staff person who can facilitate the development of online courses as well as marketing efforts through the use of technology (e.g., web sites, social media).
  3. Work with the college office of Development to seek funds to endow a lecture series to support invited lectures that integrate topics related to all the three goals - stress, resilience, and health, global health equity, and health disparities solutions.

## **Goal 2:**

### **Formalize an initiative in “Global Health Equity” Research and Training**

#### **Rationale**

The Department of Biobehavioral Health has a strong record and tradition of promoting global health research focusing on health issues such as aging, HIV/AIDS, smoking, non-communicable diseases (e.g., diabetes, hypertension), and environmental issues (e.g., pesticide use). More than half of the BBH faculty are engaged in research activities in countries outside of the United States. In the next five years, we plan to lead a global health research initiative by creating an intellectual environment that provides faculty and graduate students with opportunities to develop a more comprehensive understanding of health-related issues from a global perspective. (Diversity Challenge #1). Such a perspective would respond to global health inequities within and among nations by addressing, for example, the burden of non-communicable and communicable diseases in the global south in contrast to the burden in the global north. A global health research initiative will also focus on integrative issues that affect domestic and immigrant populations such as ethics and social justice and reducing and eliminating health risks. The BBH focus complements those of the University’s Office of Global Programs, as well as units within and outside HHD, which have identified global health as a key theme in their strategic plans.

*A. Research:* Develop and strengthen communication about global health between BBH faculty and faculty within other departments at Penn State.

1. Identify and expand areas of intersecting and integrative global health research, such as ethics and social justice, across the University.
2. Inventory available resources and expertise in global health research at Penn State.
3. Promote synergy among Penn State faculty who study factors related to inequities in non-communicable and communicable diseases in global health to enhance transdisciplinary collaborations.
4. Partner with the University Office of Global Programs, Hershey Medical School and the College, to host a bi-annual symposium on global health equity to provide opportunities

for collaborations with scholars from other institutions and other countries and explore common interests, and novel experiences for students.

5. Host two visiting scholars who will be invited to present workshops on emerging global health issues and collaborate on grant proposals on global health.

*B. Graduate training opportunities in Global Health:* As all nations are increasingly interconnected, it is imperative that graduate students have the opportunity to develop a fuller appreciation of global issues which are particularly salient for students interested in medicine, public health, ethics, social justice, biology, epidemiology, economics, labor and trade, and related areas (Diversity Challenge #1).

1. Partner with other units within and outside HHD in global research projects (e.g. the Rocks Ethics Institute to strengthen the dual degree in bioethics) that will support graduate research assistants.
2. Increase faculty and graduate student involvement in research and engaged scholarship at sites that host students in the Global Health minor.
3. Promote new graduate courses in bioethics and social justice issues that integrate inequity in health at the global and domestic levels.
4. Support and strengthen new global health research and research capacity building initiatives currently being led by BBH faculty (e.g., aging research outreach efforts in China, Sweden, South America and research capacity building in Ecuador).
5. Use technology to provide access to international scholars in graduate courses and research projects.

*C. Undergraduate education in Global Health:* BBH established a University-wide Global Health Minor in 2010. It began as an 18 credit minor and subsequently expanded to 21 credits. The minor's first cohort of students had their field experience in South Africa in summer 2011. Since then the minor has graduated 51 students across 18 majors in eight colleges. Beginning summer 2014, the minor will offer faculty members opportunities to explore research collaborations with research partners in host countries. (Diversity Challenge #5).

1. Develop a new field supervision model for faculty interested in supervising global health minor students in new sites.
2. Develop an evaluation process to measure the impact of the minor on the education of students who have graduated or will graduate with the minor.
3. Link new global health minor field sites with faculty research sites to leverage faculty who maintain existing collaborations in other countries.
4. Develop an Online Certificate Program in Global Health to be offered through World Campus that will use technology to link scholars from around the world.
5. Expand undergraduate education and training in global health to integrate new instructional technologies such as development of online and hybrid courses and the use of mobile learning tools.

*D. Resources Needed:* Recruit faculty who can bring to BBH/CHHD expertise in global health and productive lines of high quality research that fit into more than one priority research area. Examples include, but are not limited to:

1. Hire at least two new faculty with a research focus in global health (e.g., bioethics; reducing the burden of communicable and/or non-communicable disease in the Global South). Hire one of these faculty members in the 2014-15 academic year.
2. Work with the college office of Development office to identify funding sources to support faculty members to pilot global health research and training.
3. Work with the college office of Development to identify funds to support faculty-led research capacity initiatives in low resource countries.
4. The staff hire requested in Goal 1, D-2 could also be used to facilitate the use of technology in the global health courses.

### **Initiative 3:**

#### **Coordinate and Expand Research and Training Efforts in “Health Disparities Solutions”**

##### **Rationale**

The Department of Biobehavioral Health has a long history in and commitment to conducting both basic and applied research aimed at understanding the mechanisms underlying differences in behavioral and health outcomes based on race-ethnicity, gender, socioeconomic status, age group, and geographic location, as well as by social and physical environment. This knowledge helps to identify intervention points to ameliorate inequalities, particularly when they arise from avoidable, unfair, or unjust circumstances. Our faculty collaborate with others both within and outside of BBH to collect and analyze primary data on clinical and community-based research in targeted groups, as well as analyzing secondary data on representative population-based samples. This is done through the use of a wide variety of established and newer innovative research methods to examine both intra- and inter-individual variability in behavioral and health outcomes. In many cases, these transdisciplinary studies have explicitly or implicitly focused on examining: social justice issues such as the link between racism and sexism to health outcomes; the links among social and psychological factors and daily stressors (e.g., economic or food insecurity, maltreatment) that impact behavioral and health outcomes across the lifespan. Modifiable mediators or moderators of those links (e.g., resiliency, culture, social support) need to be examined as well. Over the next five years, the department will focus on coordinating and building on the efforts of the cluster of faculty who conduct research in this priority area in ways that harmonize with the efforts of faculty clusters in the “Integrative Sciences in Stress, Resilience, and Health” and “Global Health Equity.” Given the multidisciplinary perspectives and training of the BBH faculty, along with our established collaborative relationships with faculty in other Penn State departments, we are the most uniquely situated department of any within the Penn State community to examine issues around stress and health disparities at the basic, clinical, and population levels. (Diversity Challenge #1)

A. *Research:* Develop and strengthen communication about health disparities between faculty within BBH and across other departments at Penn State.

1. Identify and expand areas of potentially intersecting integrative health disparities research, such as bioethics, across the University (e.g., building on the Bioethics dual degree program and partnering with the Rock Ethics Institute).
2. Inventory available resources and expertise in health disparities research at Penn State.
3. Enhance synergy among Penn State faculty who study genetic, biological, developmental, psychological, social, and environmental factors related to disparities in

behavioral and health outcomes to better understand the different biobehavioral levels at which their research is conducted.

4. Coordinate with the annual symposium on stress, resilience and health (Goal 1) the bi-annual symposium on global health (Goal 2) to include a focus on health disparities solutions to provide opportunities for collaborations with scholars from other colleges and institutions and explore common interests, and novel experiences for students.
5. As a part of the BBH colloquium series, host two visiting scholars who will be invited to present workshops on emerging health disparities solution, collaborate on grant proposals, and lead graduate seminars.

*B. Graduate training opportunities in health disparity research:* The U.S. Government's *Healthy People 2020* mandate and major funding agencies (e.g., NIH, NSF) increasingly focus on the importance of conducting both basic research related to health disparities and more applied research in diverse clinical and community populations, as well as leveraging findings from those research streams to reduce or eliminate health disparities. Given that focus, it is imperative that graduate students develop a fuller appreciation of these issues, not only as important topics in themselves but also as areas of desired expertise for students interested in post-doctoral and faculty research positions. (Diversity Challenge #5).

1. Partner with other units within and outside of HHD (e.g., Hershey Medical School) in disparities research projects that will support graduate research assistants.
2. Promote new graduate courses in bioethics and social justice issues that integrate inequity in health at the domestic and global health levels.
3. Provide opportunities for graduate students to participate in research and engaged scholarship in communities in which disparities are persistent by building networks in such communities.
4. Strengthen BBH leadership in recruiting diverse students from efforts such as the annual HHD/CON Healthy People Penn State Research Conference and the use of internet and social media sites. (Diversity Challenge #3).
5. Develop appropriate criteria for the graduate admissions process to ensure students from historically disadvantaged groups are given appropriately serious consideration. (Diversity Challenge #3).
6. Seek funding for students in underrepresented groups to participate in the dual title degrees in Clinical and Translational Science, Bioethics, and the MPH.

*C. Undergraduate education in health disparities:* The department offers one of the longest running undergraduate courses in health disparities at Penn State (BBH/AF AM 302 Diversity and Health). While several other courses have enhanced their focus on health disparities in recent years, we need to expand our offerings in this area. (Diversity Challenge #5)

1. Conduct a curriculum review and revision as needed to integrate health disparities issues into all BBH courses.
2. Develop opportunities for engaged scholarship (e.g. internships, service-learning, etc.) at sites where health disparities are identified/addressed.
3. Promote new courses (e.g., immigrant health, environmental health) that build on research expertise across units within and outside of HHD.
4. Seek resources to expand course offerings related to health disparities through the World Campus.

5. Work with Women's Studies to have BBH health disparities courses as choices for their "Diversity Certificate."

*D. Resources Needed:* Recruit faculty with expertise and productive lines of high quality research in health disparities and behavioral and health outcomes:

1. Hire at least two new faculty from diverse backgrounds whose research focuses on health disparities (e.g., community interventions, ethics and social justice that reduce disparities, racial discrimination and impact on cardiovascular health, effects of poverty and discrimination on the brain, genetic admixture and disease prevalence). (Diversity Challenge #4).
2. Partner with organizations (e.g., Highmark) that have indicated an interest in supporting collaborative research to eliminate disparities in health. Funding from such a collaboration could be sought to support graduate research assistantships, particularly for students from underrepresented groups. (Diversity Challenge #3).
3. Work with the college office of Development to seek funds to support faculty members for collaborative health disparities research, intervention, and outreach.
4. Hire a staff person to facilitate research and outreach into communities dealing with health disparities.

## **SUMMARY**

In the 2014-2019 Strategic Plan, BBH will focus on three strategic priority areas for research and training: (1) Integrative Sciences in Stress, Resilience and Health; (2) Global Health Equity; and (3) Health Disparities Solutions. To accomplish the initiatives in the next five years, we need new faculty positions: three methodologists with expertise that cuts across multiple clusters of departmental research; two global health researchers whose research builds on geographic locations with existing faculty research; and two faculty with research experience in developing community health interventions to eliminate disparities in health. One of the faculty hires should be in the areas of bioethics and social justice to link the three areas of priorities. Reflecting our department's commitment to a community based on respect, inclusiveness, and multidisciplinary research, we aim to fill these positions through the strategic recruitment and hiring of accomplished scholars from diverse backgrounds and perspectives.

### **Diversity and the BBH Strategic Plan**

As articulated and noted in the department's strategic plan, BBH's commitment to promoting and strengthening diversity is central to its mission in research, teaching, and outreach, in the College and University, as well as in the wider community. Not only is that commitment the right approach but a strategic approach given the changing diversity and interconnectedness of the nation and world. We strive to ensure meaningful representation of human differences in our faculty, students, and staff, and believe our teaching, research, and outreach should reflect the respect, fairness, inclusiveness, and connectivity implicit in our commitment to diversity. The leadership of BBH faculty members in the College's diversity plan is evident in the vision, structure, process, and outcomes of the department's current plan.

### **Sustainability and BBH Strategic Plan**

Sustainability, as defined by Penn State, is "the simultaneous pursuit of human health and happiness, environmental quality, and economic well-being for current and future generations."



The Department of Biobehavioral Health is uniquely positioned to make a strategic contribution in all three dimensions of the definition through BBH Goals 2 and 3 to coordinate and expand research and training efforts in global health equity and health disparities solutions. Our efforts to research and analyze data concerning differential health behaviors and unequal outcomes based on race-ethnicity, gender, SES, age and other mitigating factors, while investigating intervention opportunities to improve those differences, dovetails well with Strategy 1.1 of the Sustainability Strategic plan (to incorporate sustainability learning opportunities into program delivery). Specifically, by enhancing synergistic relationships among scholars at Penn State who engage in health disparities research domestically and globally, we will highlight the dimensions of sustainability related to economic and environmental inequalities that are inherent in Penn State's definition of sustainability. Further, we will develop courses on immigrant health and environmental health to enhance graduate and undergraduate learning opportunities in the social inequality aspect of sustainability. The environmental and social inequality aspect of sustainability is an under-valued component of sustainability and one where BBH is poised to be a leader.