
Community Wellbeing

Grand Challenge:

Build stronger, more vibrant communities

Description:

All communities — and rural communities in particular — face challenges related to economic status (poverty/job opportunities), health and wellbeing, food security, environmental health, and key resources and infrastructure, such as water, housing, transportation, and social services.

Community-based research will identify the factors that facilitate or impair the development of a strong, sustainable community. Informed by these findings, new programs, policies, and practices can be deployed to enhance the wellbeing of communities and their citizens.

Foundations:

- Identify the environmental, socioeconomic, and health factors that lead to community success or community decline
- Engage the community in modifying outcomes

Disaster Resilience

Grand Challenge:

Mitigate the impact of disasters on individuals and communities

Description:

Disasters have a lifecycle: prevention and mitigation; preparedness; response; and recovery. To understand the risks and impacts of disruptive events requires an understanding of a community's infrastructure and key resources, socioeconomic issues, environment, natural and cultural resources, and the physical and mental health of its people. Different communities have varying needs, and communities in Mississippi face unique challenges.

Developing technologies, tools, practices, policies, and laws to reduce the impact of disasters will involve disparate approaches: materials science, modeling, legal and regulatory expertise, communications (to increase public awareness), education, ethics, and more.

Foundations:

- Understand the risks and impacts throughout the lifecycle of disasters
- Develop technologies, tools, practices, policies, and laws to reduce those risks and impacts to achieve resilience and sustainability for communities

Brain Wellness

Grand Challenge:

Mitigate the impact of brain damage and disease by better understanding neurological changes and recovery

Description:

To develop innovative and effective means for solving pressing health issues related to the brain and its functions, we must understand how damage occurs and disease forms, how pathologies begin and progress, how genetic and environmental factors affect damage and disease, and what enables or prevents full recovery from such events.

Evidence-based approaches for mitigating the impact of neural injury, disease, and addiction will be developed, deployed, and evaluated by working collaboratively across the continuum — from basic neuroscience to community-engaged research to clinical care and education.

Foundations:

- Understand the neuroscience of injury, addiction, and disease
- Translate those findings into new technologies, methods, treatments, and practices that improve recovery and enhance functional capacity

Big Data

Grand Challenge:

Effectively harness and systematically analyze large amounts of data from disparate sources for a wide variety of purposes

Description:

Big data has the capability to expand our understanding of the world, maximize our resources, and create positive societal impacts by rapidly advancing solutions to global problems.

The science of big data can be categorized into the areas of algorithm development, data analytics and intelligence, data security, virtual reality, simulation, and visualization. Big data can be applied to areas affecting many corners of society, such as precision medicine and population health, science and engineering, strategic communications, security, business, intelligence, finance, education and pedagogy, digital humanities, law, politics, and public policy, to name a few.

Foundations:

- Advance the science of big data (gather, secure/store, transfer, analyze, and visualize data)
- Advance the application of big data (analyze and interpret big data to enable better/smarter decisions and lasting solutions)