Center for Human Environmental and Equity Research

Environmental Justice

Natural Environment

Access

Economics

Genetics

Air

Exposure

Food

Water

Environment

Chemical Environment

Personal Health

Population Health

Community

Social Environment

Across Life Span

Across Generations

CHEER
Pittsburgh Center for Human Environmental and Equity Research (CHEER)

Goal: To be the nexus of multidisciplinary, intersectional, and community-based environmental health research focused on identifying and eliminating environmental health disparities.

Motivation

- Inspiring and integrating environmental health and environmental health disparities research across the University of Pittsburgh, the region and beyond.
- Positioning CHEER as a rallying point and major driver for national funding for environmental health disparities research.
Environmental Health Sciences Core Centers

Scientific collaboration and cutting-edge technologies can advance environmental health sciences. The NIEHS Environmental Health Sciences (EHS) Core Centers Program facilitates these collaborations by funding institutional infrastructure to support scientific equipment, facilities, and other resources that can be shared among environmental health researchers. By pursuing shared research questions, the EHS Core Centers identify emerging issues that advance understanding about how pollutants and other environmental factors affect human biology and may lead to disease.
Organizational Structure for CHEER

Office of Research
- Vice Chancellor of Research
- Office of Community and Government Relations
- Office of Sustainability

Administrative Core
- Director
  Aaron Barchowsky
- Deputy Director
  Jeanine Buchanich

Internal Advisory Board

External Advisory Board

Research Synergy Groups
- Environmental Health Inequities Across the Life Span.
  Leaders: Catharine Haggerty, Ashley Hill and Community?
- Etiology of Environmental Health Disparities.
  Leaders: Sally Wenzel, Patricia Opresko, and Community?
- Emerging Environmental Technologies and Equitable Interventions.
  Leaders: Carla Ng, David Sanchez, and Community?

Investigator Development Core Pilot Projects
Community Research Advisory Board

Translational Research Support Core
- Core leader: Jeanine Buchanich
- Co-leader: Tina Ndoh

Community Engagement Core
- Core leader: Tina Ndoh
- Stakeholder Advisory Board

Research Facilities Cores
- Multiomic Analysis Core.
  Core Leader: Stacy Wendell
- Bioinformatics and Modeling Core.
  Core leader: TBA
Example of Federal Grants for Translational and Community Engaged Research

Research to Action: Assessing and Addressing Community Exposures to Environmental Contaminants (PAR-22-210)

• Encourages multidisciplinary projects to investigate the potential health risks of environmental exposures of concern to a community and to develop and implement an environmental public health action plan based on research findings.

• Reflects NIEHS’ and NIMHD's commitment to environmental health disparities and environmental justice research.

• Must employ community-engaged research methods to conduct research and to translate research findings into public health action.

• Should respond to environmental justice concerns of affected community groups and natural and technological disasters.
Example of Federal Grants for Translational and Community Engaged Research

Research to Action: Assessing and Addressing Community Exposures to Environmental Contaminants (PAR-22-210)

• Develop equitable community-university partnerships where:
  • Communities identify and define problems and risks related to environmental exposures and stressors that are of greatest importance to them.
  • Communities receive the scientific and financial support necessary to conduct rigorous research in partnership with academic researchers that will accurately characterize the distributions and sources of environmental exposures and exposure-health relationships (if any) in their community and empower all involved to take action to reduce potential health risks.
  • Communities co-develop training/education, communication, remediation, prevention and interventions with academic researchers and other project partners to reduce or eliminate such exposures and to improve health outcomes.
  • Training/education, communication, remediation, prevention and interventions are equitably implemented and provided in accessible, culturally appropriate formats and developed at a literacy level and in language(s) appropriate for members of that community.
Summary of CEC Roles for NIEHS EHSCC
CHEER CEC Areas of Focus

• Building relationships
  • Staying involved with efforts of our community partners
  • Inviting partners to co-lead RSGs
  • Developing mechanisms for information exchange with the community that are complementary and not redundant

• Ensuring that EHD research reflects the needs of our community partners
  • Co-developing research agenda with CHEER partners
  • Using the Community Advisory Research Board for feedback on cultural relevance and appropriateness of studies
  • Goal to increase EHD research lead by our community partners – focus on larger federal funding opportunities

• Capacity building for both community partners and Pitt faculty
  • Faculty development in working with community partners
  • Community development in grant application process and EHD technical support
PAthogen Storm: Linking Basement Flooding-Associated Infection to Environmental Inequities

<table>
<thead>
<tr>
<th>PATHOGENS</th>
<th>GI</th>
<th>Pulmonary</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Salmonella</td>
<td>Nontuberculous mycobacteria</td>
</tr>
<tr>
<td></td>
<td>Fecal Coliforms</td>
<td>Pseudomonas aeruginosa</td>
</tr>
<tr>
<td></td>
<td>Norovirus</td>
<td>Legionella pneumophila</td>
</tr>
</tbody>
</table>

Race of household
Aging infrastructure and changes in climate are resulting in more urban flooding in Pittsburgh.
Aging infrastructure and changes in climate are resulting in more urban flooding in Pittsburgh.

- Precipitation has increased 15% in Pittsburgh from 2016-2020 compared with 2010-2015.
Aging infrastructure and changes in climate are resulting in more urban flooding in Pittsburgh.

- Precipitation has increased 15% in Pittsburgh from 2016-2020 compared with 2010-2015.
- Basement flood waters and flood water-associated aerosols could be an exposure route to pathogenic organisms.

### Nonfoodborne GI Infections

<table>
<thead>
<tr>
<th>Pathogen</th>
<th>Number of Infections</th>
</tr>
</thead>
<tbody>
<tr>
<td>Salmonella</td>
<td>135 million / year</td>
</tr>
<tr>
<td>Fecal Coliforms</td>
<td></td>
</tr>
<tr>
<td>Norovirus</td>
<td></td>
</tr>
</tbody>
</table>

### Pulmonary Infections

<table>
<thead>
<tr>
<th>Pathogen</th>
<th>Cost (billion/year)</th>
</tr>
</thead>
<tbody>
<tr>
<td>NTM</td>
<td>$2.39</td>
</tr>
<tr>
<td>P. aeruginosa</td>
<td></td>
</tr>
<tr>
<td>L. pneumophila</td>
<td></td>
</tr>
</tbody>
</table>

$2.39 billion / year in hospital costs.
Preliminary evidence suggests racial inequality in non-foodborne GI incidence in Pittsburgh

<table>
<thead>
<tr>
<th>Neighborhood</th>
<th>Racial breakdown</th>
<th>Incidence per 1000 people from 2016-2018</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>% Black</td>
<td>% White</td>
</tr>
<tr>
<td>Homewood</td>
<td>95.30</td>
<td>4.16</td>
</tr>
<tr>
<td>Perry South</td>
<td>64.60</td>
<td>26.54</td>
</tr>
<tr>
<td>East Liberty</td>
<td>58.50</td>
<td>25.00</td>
</tr>
<tr>
<td>Mount Oliver</td>
<td>40.60</td>
<td>40.40</td>
</tr>
<tr>
<td>Perry North</td>
<td>39.90</td>
<td>62.67</td>
</tr>
<tr>
<td>Sheraden</td>
<td>38.90</td>
<td>49.86</td>
</tr>
<tr>
<td>Hazelwood</td>
<td>33.90</td>
<td>54.34</td>
</tr>
<tr>
<td>Bloomfield</td>
<td>25.20</td>
<td>81.57</td>
</tr>
<tr>
<td>Troy Hill</td>
<td>15.50</td>
<td>81.21</td>
</tr>
<tr>
<td>Crafton</td>
<td>9.10</td>
<td>66.28</td>
</tr>
<tr>
<td>Central Business District</td>
<td>9.00</td>
<td>74.57</td>
</tr>
<tr>
<td>Mount Washington</td>
<td>8.60</td>
<td>85.93</td>
</tr>
<tr>
<td>Elliot</td>
<td>7.60</td>
<td>65.52</td>
</tr>
<tr>
<td>Central Lawrenceville</td>
<td>6.60</td>
<td>86.17</td>
</tr>
<tr>
<td>Banksville</td>
<td>5.30</td>
<td>88.10</td>
</tr>
<tr>
<td>Brookline</td>
<td>4.10</td>
<td>91.43</td>
</tr>
<tr>
<td>Squirrel Hill South</td>
<td>3.40</td>
<td>82.03</td>
</tr>
<tr>
<td>Southside</td>
<td>3.30</td>
<td>88.54</td>
</tr>
</tbody>
</table>

Data provided by the Allegheny County Health Department.
Preliminary evidence suggests racial inequality in non-foodborne GI incidence in Pittsburgh

<table>
<thead>
<tr>
<th>Neighborhood</th>
<th>Racial breakdown</th>
<th>Incidence per 1000 people from 2016-2018</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>% Black</td>
<td>% White</td>
</tr>
<tr>
<td>Homewood</td>
<td>95.30</td>
<td>4.16</td>
</tr>
<tr>
<td>Perry South</td>
<td>64.60</td>
<td>26.54</td>
</tr>
<tr>
<td>East Liberty</td>
<td>58.50</td>
<td>25.00</td>
</tr>
<tr>
<td>Mount Oliver</td>
<td>40.60</td>
<td>40.40</td>
</tr>
<tr>
<td>Perry North</td>
<td>39.00</td>
<td>60.67</td>
</tr>
<tr>
<td>Sheraden</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hazelwood</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bloomfield</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Troy Hill</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Crafton</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Central Business District</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mount Washington</td>
<td>65.52</td>
<td>34.48</td>
</tr>
<tr>
<td>Elliot</td>
<td>50.00</td>
<td>50.00</td>
</tr>
<tr>
<td>Central Lawrenceville</td>
<td>91.30</td>
<td>8.70</td>
</tr>
<tr>
<td>Banksville</td>
<td>63.30</td>
<td>36.70</td>
</tr>
<tr>
<td>Brookline</td>
<td>91.43</td>
<td>8.57</td>
</tr>
<tr>
<td>Squirrel Hill South</td>
<td>82.03</td>
<td>17.97</td>
</tr>
<tr>
<td>Southside</td>
<td>88.54</td>
<td>11.46</td>
</tr>
</tbody>
</table>

**Combined incidence (per 1000 people 2016-2018)**

- City of Pittsburgh Average (All neighborhoods) = 1.07
- Average in Predominantly Black Neighborhoods = 1.64
- Average in Predominantly White Neighborhoods = 0.98

Data provided by the Allegheny County Health Department
**Unknowns:**

1. What are the source(s) of basement flooding?

2. Does exposure to basement flooding pose microbial health risks?

*Without this information, proper mitigation strategies cannot be deployed*
Pilot study will investigate the influence of land topology and race on basement flooding microbial exposure.

25 Households (land topology)
50% in Homewood (flat)
50% in Mon Valley (less flat)

Survey
Flood water sampling
Flood water aerosol sampling

For more details & to sign up, scan this!
Mission

Our mission is to eliminate barriers to family thriving in communities that have been and are over-burdened and under-resourced.

We do this by centering the voices, lived experiences, goals, and priorities of residents from these communities in the decisions, research, and investments in their communities so that residents are the primary beneficiaries.
Areas of Work

- Community Engagement & Education
- Equity-Based Facilitation
- Program Evaluation
- Research & Policy
Current Work with Pitt

The Pittsburgh Study

Community-partnered research and advocacy focused on child health equity

Dr. Jamil Bey
• TPS Core Team
• Internal Advisory Committee

Dr. Jason Beery (me!)
• Co-Chair, Policy & Place Committee
• Community Partner, ReCAST Project
Resiliency in Communities After Stress and Trauma (ReCAST Project)

Empowering Teens to Thrive Intervention (PI: Dr. Alison Culyba)

Sisterhood/Manhood Intervention (PI: Dr. Liz Miller)

**Collective Efficacy Intervention (PI: Dr. Mary Ohmer):**

- Promote community change through a community-based intervention that engages youth and adults, fosters collective efficacy and community resilience, and increases community capacity and leadership to prevent violence and improve community mental health
- Community Partners: UrbanKind Institute and Neighborhood Resilience Project
- Currently running a collective efficacy training in Braddock area and WestSide (City) neighborhoods

(all interventions funded by Substance Abuse and Mental Health Services Administration)
Possible Future Work with Pitt

• NIH Cancer-inequity related Funding Opportunity Announcement

• Apply with partners from Pitt?

• Developing partnership with CHEER

• Would help with:
  • Grant opportunity identification
  • Proposal support and guidance (especially with federal grants)
  • Research/analysis support
CHEER-fully implementing multidisciplinary and community-based research to improve environmental health and address health inequities across our region, country, and the globe.