Health Disparities and COVID-19 in EJ COMMUNITIES

Deepak Kumar, PhD
Julius L. Chambers Biomedical Biotechnology Research Institute (JLC-BBRI)
NORTH CAROLINA CENTRAL UNIVERSITY
DURHAM, NC
Overview:

1. JLC-BBRI and RCMI Center for Health Disparities (RCHDR)
2. Kumar-Research on Social Epigenomics
3. Health Equity, Environment and Population Health (HOPE) Program
4. Advanced Center for COVID-19 Related Health Disparities (ACCORD)
North Carolina Central University

- Founded in 1910 as an HBCU; a component of the 17-member University of North Carolina system.

- Strong commitment to training students who pursue degrees in STEM disciplines, behavioral sciences and conduct Health Disparities research, including a PhD program in Integrated Biosciences, with emphasis on health disparities.

- Houses two signature biomedical research institutes: the Julius L. Chambers Biomedical Biotechnology Research Institute (JLC-BBRI, est. 1998) and the Biomanufacturing Research Institute and Technology Enterprise (BRITE, est. 2008).

- RCMI grant awarded in September 2017
Health Disparities Research
Prepare minority Researchers

Julius L. Chambers Biomedical Biotechnology Research Institute (JLC-BBRI)

- Cancer
- Cardio-metabolic
- Neuroscience and Drug Abuse
- Nutrition
- HOPE
RCMI Community Engagement Core

Research With Care

TEAM NCCU

Collaborations with Durham (Urban) and Halifax County (Rural), NC
Prostate Cancer Disparities

Prostate Cancer Incidence Rates by Race and Ethnicity, United States, 1999–2014

Mortality

Year of Diagnosis

Year of Death

Rate per 100,000

Rate / 100,000

All Races
White
Black
AI/AN
A/PI
Hispanic†
Differentially modulated genes and microRNAs in prostate cancer tissues and body fluids

Srivastava et al., PLOS one 2014
MicroRNAs: Race associated biomarkers to targets for epigenetic therapy in prostate cancer

The role of miR-24 as a race related genetic factor in cancer

Yutaka Hashimoto¹, Marisa Tanaka¹, Shahana Majid¹, Kulkarni¹, Pritha Dasgupta¹, Tabatabai³, Deepak Kumar³

¹Department of Urology, VA Medical Center
²Department of Pathology, Veterans Affairs 94121, USA
³Julius L. Chambers Biomedical/Biotechnol Carolina Central University, Durham, NC 2

These authors contributed equally to this v

Open ACCESS Freely available online

MicroRNA Profiling in Prostate Cancer - The Diagnostic Potential of Urinary miR-205 and miR-214

Anvesha Srivastava¹, Helle Goldberger¹, Alexander Catalin Marian², Eric K. Oermann³, Sung-hae Uhm³, Deborah L. Berry³, Bhaskar V. S. Kallakury³, Subh Deepak Kumar²,³

¹Cancer Research Laboratory, Department of Biology, Chemistry and Physics, 2Biochemistry Department, Victor Babes University of Medicine and Pharmacy T Washington, D. C., United States of America, 4University of Tennessee Health Sci

Abstract

Prostate cancer (PCA) is the most common type of cancer

Differentially expressed microRNAs in African American vs. Caucasian American prostate Cancer

Received: 21 March 2019
Accepted: 14 June 2019
Published online: 05 July 2019

MicroRNA-214 targets PTK6 to inhibit tumorigenic potential and increase drug sensitivity of prostate cancer cells

Patrice Cagle¹, Suryakanth Niture², Anvesha Srivastava², Malathi Ramalinga², Rasha Aga², Leslimar Rios-Colon¹, Uchechukwu Chimere³, Simeng Suy², Sean P. Collins³, Rajvir Dahiya³ & Deepak Kumar²,³
Differentially expressed microRNAs in AA PCa – Biological basis of health disparities

Social Signal transduction theory:

- Economic Stability
- Education
- Neighborhood/Built Environment
- Health and Health Care
- Social and Community Context


Inflammatory response
Cell signaling
Epigenetic response
miRNAs

DMPFC Activity

Social Status

IL-6 Response

\[ a = -0.03, SE = 0.01 \]
\[ b = 1.43, SE = 0.88 \]
\[ c = -0.13, SE = 0.06 \]
\[ c' = -0.09, SE = 0.06 \]
\[ a \times b \text{ effect} = -0.04, SE = 0.03 \]
\[ 90\% \text{ CI} = -0.1071, -0.0013 \]
Social Stress

Neuro-Inflammatory Sensitization

Cognitive-Emotional & Health Effects

**Short-term**
- Hypervigilance
- Anticipation of adversity
- Sensitivity to pain
- Social anxiety

**Medium-term**
- Disrupted sleep
- Chronic pain
- Depressed mood
- Social withdrawal

**Long-term**
- Susceptibility to infection
- Inflammatory diseases
- Accelerated aging
- Early mortality

![Graph](image)

**Graph Legend**
- Eastman – Rush University Medical Center

**Bar Graphs**
- **0.5 mM Melatonin**
- **1μM Serotonin**
- **1 μM Melatonin**

**Cell Lines**
- PC3
- LNCaP

**Fold Change**
- miR-628-5p
- miR-214-3p
Model to study social epigenomics

Social Stress / Individual and Neighborhood factors
Mitogens: Hormones / cytokines / enzymes etc.
Epigenetic changes / miRNA expression
Cancer cell signaling / Cancer hallmarks
Aggressive Disease / Poor outcomes
miRNA biomarkers / therapeutics

DC (Prostate Cases)
Rate 188.3
Cases 490

Crime areas
High income
Low income
High education
Low education
Predom CA
Predomo AA

Prostate cancer by ward in DC
Crime map of DC
High rate
Crime rate
Building healthy communities by developing and implementing evidence based interventions to address health disparities, promote healthy living, chronic disease prevention and management, and exploring interactions between environment, health and technology.
County Tiers are calculated using 4 factors
• Average unemployment rate
• Median household income
• Percentage growth in population
• Adjusted property tax base per capita

Beginning with the 2019 rankings, only these four factors determine final Tier rank. In previous years, additional ‘adjustment factors’ were also considered in the calculations. In 2018, the North Carolina General Assembly eliminated these adjustment factors from the Tier ranking methodology (S.L. 2018-5, Section 15.2.a)
GOALS – HOPE program

facilitate evidence-based interventions and evaluate policies that advance population health

Examine environmental factors that may effect human health and health disparities

Implement strategies to positively impact racial health disparities that contribute to poor health outcomes especially in medically underserved areas

Leverage NCCU/NCRC resources to convert research into community practice

Conduct population health research and develop a core platform to assist in community based research
1. The HOPE program focuses to serve minorities, low income and medically underserved and address social determinants of health at a deeper level.

2. **Partnering** with Public Health Departments in 3 counties to initiate assessment and understand the needs.

3. **Buy-ins** from other local organizations and community free clinics.

**Activities:**

1. Health Equity Mapping for the counties
2. Mobile Health Unit
3. Food insecurity Research Interest Group
4. COVID19 related activities - ACCORD
4.57%  7.46%  23.65%  1.75%  6.50%  7.32%  0.35%  3.03%  3.98%  26.66%  5.04%  3.00%  6.69%  0.00%  5.00%  10.00%  15.00%  20.00%  25.00%  30.00%

Employment By Industry

Median Earnings By Industry

ANSON

INSURANCE

FOOD DESERTS

SNAP RETAILERS

TOXIC RELEASES- ANSON COUNTY

Quick Facts for 2018

Number of TRI Facilities: 5
Total Production-Related Waste Managed: 3 lbs
Total On-site and Off-site Disposal or Other Releases:
- Total On-site: 3 lbs
- Air: 3 lbs
- Water: 0 lbs
- Land: 0 lbs

Total Off-site: 0 lbs
Mobile Screening and Health Education Van - The mobile van will take resources to the community and medically underserved, build relationships, bring exposure to NCCU while improving the health of North Carolinians in rural counties. Health Departments and Local organizations have stepped upon providing personnel and fiscal support for the mobile unit operations.

Strategy – Partnering with Stakeholders

Healthy Cabarrus Partnerships for Life

April 8, 2020
William Pilkington, DPA, MPA, MA
Director, H.O.P.E. Program
North Carolina Central University
Julius L Chambers Biomedical/Biotechnology Research Institute
North Carolina Research Campus
600 Laureate Way
Kannapolis, North Carolina 28081
Dear Dr. Pilkington:

It is my pleasure, on behalf of Healthy Cabarrus, to express my full support for North Carolina Central University’s (NCCU) efforts to bring a mobile health clinic to Cabarrus County through its H.O.P.E. program. As the Executive Director of Healthy Cabarrus, our organization recognizes the tremendous impact a mobile clinic can make on communities with limited personal and public transportation.

Enabled in 1950, Healthy Cabarrus is a multi-sector collaboration devoted to improving the health of Cabarrus County. With tremendous enthusiasm, I strongly support the North Carolina Central University (NCCU) Julius L. Chambers Biomedical/Biotechnology Research Institute (HBBRI) expansion in Kannapolis and the mobile health unit. This mobile health unit will offer multiple opportunities for nursing faculty/nurse practitioners and students for community-based research and engagement.

For NCCU Department of Nursing faculty members with a research focus on health disparities with vulnerable populations, this unit will allow them to expand their research towards decreasing health disparities. Nursing faculty who are nurse practitioners would have an opportunity to meet the healthcare and educational needs of this community. Lastly, the unit will assist nursing students to be prepared to deliver culturally competent care and meet the needs for quality healthcare in a global society.

As Interim Department Chair of Nursing at NCCU, I am very pleased to provide this letter of commitment to and support for BHRII expansion in Kannapolis and the mobile health unit. With this letter of commitment, we are assuring our support to North Carolina Central University in moving NCCU research’s agenda forward.

Sincerely,

Yoananda
Yolanda M. VanBlaire, PhD, RN-BC, OCN, CNE, ANEF
Interim Director Chair of Nursing
Visiting Associate Professor

March 5, 2020
Deepak Kumar, PhD
H.O.P.E. Program Director
Julius L. Chambers Biomedical/Biotechnology Research Institute
North Carolina Central University
Kannapolis, NC

Re: Letter of Support for Mobile Health Clinic

Dear Dr. Kumar,

On behalf of the Cabarrus Health Alliance, I was support for the purchase of a mobile health clinic. Program in addressing a major gap in our areas impacted disproportionately by a number of health and leadership!

As the public health department, we are at the community outreach, and realize greatly the role patients and neighbors who they are. Transport, community, and in participant focus groups and patients, especially minorities and those living in transportation to keep their medical appointment care.

CCHA believes a mobile unit would provide timely services including:
- Breast exams (Cabarrus County has the fourth highest African American breast cancer rates)
- Wellness exams (Cabarrus County is a Health disparity and, mental health care)
- Communicable Disease screening (CCHA has rates of sexually transmitted infections, especially Americans. Although rates of infection are 2-3 times more common)

CCHA strongly supports CCHA on the Breast Health Initiative and the importance of community services.

The Anson County Health Department is especially pleased that North Carolina Central University will be making a long-term commitment to the health of our community.

As the Public Health Director for Anson County, I appreciate the need for additional health services for the medically underserved. One of the exciting components of this project is the opportunity to collaborate with community partners. We have already been working with H.O.P.E. staff to plan and develop new programs and services for our citizens, including health equity mapping and planning for assessing neighborhood community health needs.

The Anson County Health Department is especially pleased that North Carolina Central University will be making a long-term commitment to the health of our community.
NCCU Advanced Center for COVID19 Related Disparities (ACCORD) will conduct multidisciplinary research to study the public health and economic impact of COVID19 on underserved communities of NC.

ACCORD is supported by the North Carolina Policy Collaboratory at the University of North Carolina at Chapel Hill with funding from the North Carolina Coronavirus Relief Fund established and appropriated by the North Carolina General Assembly.

www.nccu.edu/accord
COVID-19 CASES, HOSPITALIZATION, AND DEATH BY RACE/ETHNICITY

FACTORS THAT INCREASE COMMUNITY SPREAD AND INDIVIDUAL RISK

<table>
<thead>
<tr>
<th>Rate ratios compared to White, Non-Hispanic Persons</th>
<th>American Indian or Alaska Native, Non-Hispanic persons</th>
<th>Asian, Non-Hispanic persons</th>
<th>Black or African American, Non-Hispanic persons</th>
<th>Hispanic or Latino persons</th>
</tr>
</thead>
<tbody>
<tr>
<td>CASES¹</td>
<td>2.8x higher</td>
<td>1.1x higher</td>
<td>2.6x higher</td>
<td>2.8x higher</td>
</tr>
<tr>
<td>HOSPITALIZATION²</td>
<td>5.3x higher</td>
<td>1.3x higher</td>
<td>4.7x higher</td>
<td>4.6x higher</td>
</tr>
<tr>
<td>DEATH³</td>
<td>1.4x higher</td>
<td>No Increase</td>
<td>2.1x higher</td>
<td>1.1x higher</td>
</tr>
</tbody>
</table>

Race and ethnicity are risk markers for other underlying conditions that impact health — including socioeconomic status, access to health care, and increased exposure to the virus due to occupation (e.g., frontline, essential, and critical infrastructure workers).

ACTIONS TO REDUCE RISK OF COVID-19

1 Data source: COVID-19 case-level data reported by state and territorial jurisdictions. Case-level data include about 80% of total reported cases. Numbers are unadjusted rate ratios.

cdc.gov/coronavirus

CS319360-A 08/08/2020
Heath Disparities as Driver of COVID-19

### Diseases with health disparities as drivers of COVID-19 outcome

<table>
<thead>
<tr>
<th>Subject</th>
<th>African American</th>
<th>American Indian</th>
<th>Hispanic/Latinx</th>
<th>Other</th>
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</thead>
<tbody>
<tr>
<td><strong>Social and Economic Well-Being</strong></td>
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<td>Income</td>
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<td>Education</td>
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<td>Employment</td>
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<tr>
<td><strong>Maternal/Child Health</strong></td>
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<tr>
<td>Infant Death Rate</td>
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<tr>
<td>Late or No Prenatal Care</td>
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<tr>
<td><strong>Child and Adolescent Health</strong></td>
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<tr>
<td>Death of Children</td>
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<tr>
<td>Teen Pregnancy</td>
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<tr>
<td>Children without Health Insurance</td>
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<tr>
<td><strong>Risk Factors</strong></td>
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<tr>
<td>Current Smokers</td>
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<tr>
<td>Overweight</td>
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<tr>
<td><strong>Mortality Rates</strong></td>
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<tr>
<td>Cancer</td>
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<tr>
<td>Heart Disease</td>
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<tr>
<td><strong>Communicable Diseases</strong></td>
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<tr>
<td>HIV Infection</td>
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<tr>
<td>Chlamydia</td>
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<tr>
<td><strong>Violence and Injury</strong></td>
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<tr>
<td>Homicide</td>
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<tr>
<td>Suicide</td>
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<tr>
<td><strong>Access to Health Care</strong></td>
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<tr>
<td>No Health Insurance</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Could Not See a Doctor</td>
<td></td>
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</tbody>
</table>

- Green indicates a group is faring better than the referent group
- Red indicates a group is faring worse than the referent group
- White indicates there is no significant difference between the referent and co
- Symbol indicates reliable rates could not be calculated

**Abstract**

The COVID-19 pandemic has forced our society to come face to face with complex issues that were once theoretical but are now being played out in real time. As data from the pandemic accumulates, it is clear that COVID-19 is impacting some parts of society more than others. Unfortunately, there is an almost complete overlap between COVID-19 risk factors and conditions that are already represented as health disparities, such as hypertension, diabetes, heart disease, lung disease and immune disorders. In this review, we discuss our current understanding of the physiological and pathophysiological pathways that link these diseases to COVID-19 outcome. An increased awareness of the factors underlying this issue, both societal and medical, is needed to understand the long-term implications and possible solutions needed going forward.

**Keywords**

COVID-19, health disparities, risk factors
COVID-19 Testing

- Nucleic acid (RNA) based) testing
- Study the impact of COVID19 in the underserved communities

Counties

<table>
<thead>
<tr>
<th>County</th>
<th>Population</th>
<th>Minority (%)</th>
<th>AA %</th>
<th>Uninsured adults (%)</th>
<th>Distress Tier</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anson</td>
<td>25,306</td>
<td>52</td>
<td>49</td>
<td>16</td>
<td>1</td>
</tr>
<tr>
<td>Cabarrus</td>
<td>201,448</td>
<td>28</td>
<td>18</td>
<td>12</td>
<td>3</td>
</tr>
<tr>
<td>Durham</td>
<td>306,457</td>
<td>49</td>
<td>37</td>
<td>15</td>
<td>3</td>
</tr>
<tr>
<td>Granville</td>
<td>58,874</td>
<td>39</td>
<td>30</td>
<td>15</td>
<td>2</td>
</tr>
<tr>
<td>Halifax</td>
<td>51,737</td>
<td>60</td>
<td>53</td>
<td>17</td>
<td>1</td>
</tr>
<tr>
<td>Rowan</td>
<td>139,605</td>
<td>23</td>
<td>16</td>
<td>16</td>
<td>2</td>
</tr>
<tr>
<td>Vance</td>
<td>44,482</td>
<td>56</td>
<td>50</td>
<td>16</td>
<td>1</td>
</tr>
</tbody>
</table>

Source: United States Census Bureau (2018); NC Institute of Medicine; NC Commerce

Deliverable: Increased testing and identification of barriers to testing and immunization in the underserved.
Messaging

- Developing and disseminating culturally sensitive messaging on COVID19 to medically underserved populations. *What is the right message!*

**Deliverable:** Impactful and positive messaging in underserved communities about COVID19, prevention measures and informed decision making on upcoming immunization and continued testing.

**Team:**
- Mass media faculty
- Social media strategist
- Social media/communications company
- Faith based organization leaders
- Community liaison
- Bioinformatics/Text mining
Preliminary Social Media Assessment

- 100% of participating ACCORD counties actively use Facebook to post/track COVID-19 cases
- Other platform (e.g. Twitter, Instagram, YouTube) use is sparse
- Facebook pages are generally much more active and up-to-date than Health Department websites
The Problem:

- COVID-19, has attracted agenda seekers to shape the narrative of COVID testing, clinical trial and vaccination for self-interest purposes. Multiple conspiracy theories become trending search terms on Google.

- We observed organized misinformation campaigns and anti-trust campaigns undermining the trust between the general public and public health organizations.

- Private anti-vaccination groups start to occur on social media.

- This can be more problematic for the underserved community where trust between public and public health organization is already low.

Winning the battle with misinformation and anti-trust campaign requires constant monitoring them as part of the social environmental scan. Understanding of their strategy also helps in developing counteracting messages and action.
The chasm between science and politics continues to grow, with Russian President Putin announcing this week that a fast-tracked vaccine for coronavirus disease 2019 (COVID-19) is ready for use, and President Trump indicating days earlier that a vaccine could be ready in the United States before the 3 November presidential election. There’s been a dangerous rush to get to the vaccine finish line first. In a race of “Sputnik” proportions (as Putin puts it), quick approval by regulatory agencies is needed to “win.” This is dangerous thinking, driven by political goals and instant gratification: Shortcuts in testing for vaccine safety and efficacy endanger millions of lives in the short term and will damage public confidence in vaccines and in science for a long time to come.

The Russian vaccine remains shrouded in mystery—there is no published information about it, and what has been touted comes from the mouths of politicians. In the United States, the pressure applied to government scientists by the administration on any aspect of the pandemic is becoming increasingly palpable, as they have been criticized or quieted in plain sight by the administration and Trump. Anthony Fauci, the nation’s foremost leader on infectious diseases and a member of the White House Coronavirus Task Force, has been the most willing to state things clearly, but he has had to deal with muzzling and outright abuse from Trump and White House aides. Putin, with no such obligations, could not be more brazen.

The urgency of the pandemic only heightens the import of this story. Countless lives are at stake—no compromises on the vaccine.

—H. Holden Thorp
# ACCORD Projects

## PILOTS

<table>
<thead>
<tr>
<th>PIs</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>Glenn and Beneby</td>
<td>COVID-19 Impacts on Community-Based Interventions for Justice-Involved Minority Young Adults: Practitioner and Consumer Perspectives</td>
</tr>
<tr>
<td>Burford and Watkins-Sneed</td>
<td>The Pandemic of Stress: Examining the Relations among Occupational Status, Perceived Stress, Self-Rated Health, and Sleep during COVID-19</td>
</tr>
<tr>
<td>Doherty</td>
<td>Contact tracing for COVID-19: acceptability and barriers in African American communities</td>
</tr>
<tr>
<td>Smith</td>
<td>COVID-19: IMPACT ON BLACK FAMILIES</td>
</tr>
<tr>
<td>Tomlinson</td>
<td>Stress, Coping, Perceptions &amp; Professional Outlook of HBCU Nursing Students Related to COVID-19</td>
</tr>
</tbody>
</table>

## PROJECTS

<table>
<thead>
<tr>
<th>PIs</th>
<th>Title</th>
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</thead>
<tbody>
<tr>
<td>Paul, Diggs, Mulrooney, Lee, Pilkington</td>
<td>The Role of Food Security in the Social Determinants of Health: Contingent Impacts of COVID-19 in North Carolina</td>
</tr>
<tr>
<td>Wymer, Constantini and Sivaraman Zheng</td>
<td>Development of a Conjugate Vaccine Against SARS-CoV-2</td>
</tr>
<tr>
<td>Baker and Doherty</td>
<td>Drug Repurposing for COVID19 Using Data Mining and Machine Learning Technologies</td>
</tr>
<tr>
<td>Dannai</td>
<td>Acceptability and Barriers to COVID-19 Testing, Tracing, and Immunization Among African American Students and Residents in Low-Income Communities</td>
</tr>
<tr>
<td>Kayvan</td>
<td>Experiences of African American Caregivers of Children with Autism: Rurality and Resources during the COVID-19 Pandemic</td>
</tr>
<tr>
<td>Moore</td>
<td>Global Supply Chain of Medical Equipment: Vulnerability Assessment, Emergency Response Tool, and Financial Impact Analysis</td>
</tr>
<tr>
<td></td>
<td>Field-ready genetic coronavirus test for use in low-resource underserved populations</td>
</tr>
</tbody>
</table>
To the Editor

Five steps to address hunger in America today

Hungry America, now hungrier.

Before the coronavirus outbreak, 1 in 7 Americans relied on Feeding America’s food bank network. On any given day it is estimated that over 40 million Americans are hungry. COVID-19 has exacerbated food insecurity as jobs have been lost and schools—a primary source of food for poor children—have been closed.

In early April, 22 million Americans, 13.5 percent of the U.S. workforce filed for unemployment benefits. Eight weeks later, a total of approximately 44.1 million Americans have filed for unemployment benefits. Since mid-March, the state of North Carolina has received more than 1.25 million jobless claims, spiking the state unemployment rate by 8 percentage points to 12.2 percent statewide.

Unfortunately, COVID-19 has exacerbated and exposed the depths of racial disparities in the United States as well. On average, COVID-19 is killing African Americans at a rate three times higher than white people in the United States. In North Carolina, 34 percent of COVID-19 deaths are African Americans, when African Americans represent 22 percent of the state population.
Table: Comparison of USDA-defined food deserts in study area versus COVID-19, socio-economics and food environment metrics.

<table>
<thead>
<tr>
<th></th>
<th>USDA Food Desert (Low Income and Low Access)</th>
<th>Non-Food Desert</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Zip Codes</td>
<td>19</td>
<td>25</td>
</tr>
<tr>
<td>COVID-19 Rate</td>
<td>78.22**</td>
<td>55.6**</td>
</tr>
<tr>
<td>Median Household Income</td>
<td>$45,720</td>
<td>$42,643</td>
</tr>
<tr>
<td>Percentage below Poverty Rate</td>
<td>20.30%</td>
<td>20.41%</td>
</tr>
<tr>
<td>Percentage below 2x Poverty Rate</td>
<td>44.38%</td>
<td>43.68%</td>
</tr>
<tr>
<td>Percentage receiving SNAP</td>
<td>19.26%</td>
<td>19.65%</td>
</tr>
<tr>
<td>Percentage Minority</td>
<td>42.73%</td>
<td>44.51%</td>
</tr>
<tr>
<td>SNAP Providers per 10,000</td>
<td>10.08</td>
<td>18.22</td>
</tr>
<tr>
<td>Retail Food Environment Index</td>
<td>9.09***</td>
<td>3.68***</td>
</tr>
<tr>
<td>Modified Retail Food Environment</td>
<td>12.22</td>
<td>17.82</td>
</tr>
<tr>
<td>Distance to supermarket</td>
<td>3.82**</td>
<td>2.43**</td>
</tr>
</tbody>
</table>

Statistically different at the following significance levels:  * p < .1  ** p < .05  ***p < .01
Thank you