

**IMPROVING READING COMPREHENSION AMONG STUDENTS ENROLLED IN TWO  
UNDERPERFORMING SCHOOLS IN DURHAM COUNTY THROUGH THE READ AND  
FEED PROGRAM**

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A Capstone Project submitted to the faculty of the University of North Carolina at Chapel Hill in partial fulfillment of the requirements for the degree of Master of Public Health in the Public Health Leadership Program, Nutrition, and Health Policy and Management.

Chapel Hill  
2023

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## ABSTRACT

Dylan Mathews, Julie Munoz, Grace Ourada, Miriam Wiener: Improving Reading Comprehension among Students Enrolled in Two Underperforming Schools in Durham County through the Read and Feed Program  
Under the direction of Tokesha Warner, Lauren Kunz, and W. Oscar Fleming

Third grade reading proficiency is one of the most accurate measures of education access and quality over the short term, and health outcomes over the long term. Racial disparities in reading proficiency are shockingly stark in Durham County – only 36.8 percent of black children scored proficient in 3rd-grade reading compared with 76.8 percent of white children. To address this challenge, a two-year pilot program is proposed in two Durham County elementary schools chosen for their low 3rd-grade reading proficiency scores and reduced socioeconomic status of their student populations. The program will provide participating K-3 students with one-on-one after-school tutoring and a nutritious meal featuring locally grown produce. With the goal of increasing reading proficiency and improving overall nutrition status and knowledge, this initiative can address childhood literacy and health outcomes through community engagement and data-driven improvement.

Keywords: *education, literacy, nutrition, elementary students, Durham County, North Carolina, Read and Feed*

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## LIST OF ABBREVIATIONS

<i>BIPOC</i>	Black, Indigenous, and People of Color
<i>CFG</i>	Community Focus Group: Parents; Students; Teachers from Y.E. Smith and C.C. Spaulding Elementary Schools; Jumpstart Literacy Program at the Duke University Office of Durham and Community Affairs; Durham County School Board
<i>DLT</i>	Durham Literacy Taskforce: Read and Feed; NC Dept. of Agriculture; Black Farmers Coalition of Durham County; Durham County School District; Durham Literacy Center; End Hunger Durham
<i>DPS</i>	Durham Public Schools
<i>PLT</i>	Project Leadership Team: Julie Munoz, Dylan Mathews, Miriam Wiener, and Grace Ourada
<i>SDoH</i>	Social Determinant of Health
<i>SES</i>	Socioeconomic Status

## COMMON PROPOSAL

### Problem statement and goals

The CDC defines the social determinants of health (SDoH) as “nonmedical factors that influence health outcomes,” such as the “conditions in which people are born, grow, work, live, and age” (CDC, 2022). Education improves health outcomes directly and indirectly (Ross CE, Wu CL, 1995), which is why education access and quality is considered one of the primary SDoH. There is a significant correlation between lower socioeconomic status (SES), reduced educational access over the short term, and reduced health outcomes over the long term (Garner A.S., et al., 2012). For example, the chronic stress of living in poverty can lead to what has been referred to by the American Academy of Pediatrics as “toxic stress” (ibid). Toxic stress can lead to a range of chronic illnesses well into adulthood, including heart disease, substance abuse, and depression (Braverman, 2009).

Proficiency in 3rd-grade reading is considered one of the most accurate measures of educational access and quality and is potentially more reflective of SES than years of schooling (Dotson VM, et al., 2015). In Durham, only 44 percent of children scored proficient in 3rd-grade reading compared with the state average of 47 percent, and racial disparities are shockingly stark – 36.8 percent of black children scored proficient in 3rd-grade reading compared with 76.8 percent of white children (Public School Review, n.d.). Of the 13,759 students enrolled in Durham County public elementary schools, 65% of white kindergarteners could read at grade level compared with 38% of black students and 21% of Hispanic students (Grown in Durham, 2021). The majority population consists of children of color [See Appendix A.2], yet they had the highest rate of underperformance in literacy for their age group [See Appendix A.3].

Another primary concern is nutrition and food insecurity. Nutritional deficiencies have been shown to affect children's ability to learn (Taras, 2005). This directly impacts Durham Public Schools, as 63% of school meals are subsidized through the free and reduced meal program [see Appendix A.4] (Durham County Department of Public Health, 2021). Given the numerous factors that contribute to the overall educational experience of students, a multidisciplinary approach is needed [see appendix A.1 for a Rich Picture that illustrates the complex nature of this “wicked problem”]. We plan to target our nutrition-based literacy initiative toward K-3 students in two of Durham County Public Schools' most underperforming elementary schools.

## **Policy and Programmatic changes**

To address inequities in literacy within two of Durham County's lowest performing schools, we aim to implement an after-school Read and Feed Program that will provide students the ability to obtain tutoring that covers basic elementary subjects along with nutrition education, all while receiving a nutrient-dense meal to increase their learning ability to learn [See Appendix A.5 for RF program diagram]. Two schools – C.C. Spaulding and Y.E Smith – were selected for their low 3rd-grade reading proficiency scores combined with the reduced SES of their student populations (DPS, 2023b). The Read and Feed program aims to strengthen literacy skills in underserved elementary school students while providing meals in a nurturing neighborhood environment (RF, n.d.). Provided meals will cover nutritional requirements set by MyPlate and will assist students in being more attentive and retaining more information, while providing an incentive to participate [See Appendix A.6] (Brody, 2017). Of the children who have participated in Read and Feed, 93% of parents say their child is a stronger reader (RF, n.d.).

Participating students will attend one-hour tutoring sessions up to four times a week at their school and receive meals with every session (RF, n.d.). After a designated mealtime, children will spend 30-40 minutes working with a tutor on their reading and math skills (RF, n.d.). Nutrition education will be offered in addition to the core curriculum covered on state exams. Any K-3 student at the selected schools will be eligible to enroll in the free program, which will be offered Monday-Thursday. Students will register for as many days as they would like based on their individual availability.

Volunteer tutors will be recruited through partnerships with Read and Feed, local universities, the Duke Office of Durham and Community Affairs, and the Durham Literacy Center. They will undergo training from designated project personnel at Read and Feed to ensure they can adequately assist students based on approved protocols. Meals will be covered through grant funding and facilitated through End Hunger Durham. Local restaurants, farmers, and other organizational sponsors will help to supplement food items and other resources needed for meals. Trained staff and volunteers will track participation and attendance for evaluation purposes. Staff will also be required to supervise the program [See Appendix A.5], and we intend to secure funding for this purpose via grants, public appropriations, and partnerships with anchor institutions.

## **Community Partners**

As illustrated in the Power Analysis Grid [see Appendix A.9], our public health team will convene a group of stakeholders with a diverse, broad base of perspectives and experiences to design and implement the pilot



program [see Appendix A.10]. Stakeholders with a high level of influence and interest in the project are labeled as Key Players [see Appendix A.9], and include the Read and Feed Program, School Administrators at each school, and End Hunger Durham, all of whom will work in tandem with the Project Leadership Team. We recognize that our target population derives from a traditionally low-power status, which has historically not had as much influence as the other stakeholders considered. However, we have determined that parents and students will be consulted as much, if not more, than stakeholders identified as Key Players.

We will establish three co-design teams [see Appendix A.11]: 1) A *Project Leadership Team* (PLT) consisting of Julie Munoz, Dylan Mathews, Miriam Wiener, and Grace Ourada, to discuss project updates, leverage points to enhance the efficacy of the program, and engagement strategies to best support educational access and quality; 2) A taskforce of key specialists from within the community to be known as the *Durham Literacy Taskforce* (DLT) consisting of a farm-to-school liaison hired by the North Carolina Department of Agriculture for coordinating legal hurdles, strategizing and assisting with funding, and ensuring that all meals and produce meet quality standards set by the USDA; a representative from the Black Farmers Coalition of Durham County; the current Nutrition Coordinator and a Registered Dietician from the Durham County School District; Program Coordinator from Read and Feed; Director of Educational Programs from the Durham Literacy Center; and a representative from End Hunger Durham. The DLT will provide technical advice, messaging, fundraising, marketing, legal strategy, policy assistance, and community outreach; and 3) A *Community Focus Group* (CFG) of parents, students, and teachers from Y.E. Smith and C.C. Spaulding Elementary Schools, together with student literacy tutors from the Jumpstart Literacy Program at the Duke University Office of Durham and Community Affairs, local community members, and at least one representative from the Durham County School Board, to provide data on awareness of childhood literacy, nutritional needs, feedback on the program, and to evaluate the impacts as a result of the selected intervention.

**[See Appendix A.7 and A.8 for comprehensive budget details.]**

### **Engagement and Accountability**

Community partner engagement is essential for achieving long-term systemic change in educational access and quality. Engagement leverages local knowledge, resources, and grassroots support to create culturally appropriate, effective improvements. Community partners have the greatest understanding of the context in which they live, work, and play, along with the unique needs and challenges of the community. They can also help

mobilize local financial and human resources to a greater degree than stakeholders from outside the community. Further, community members will naturally be more committed to the long-term well-being of the community, so facilitating interactions through local stakeholder engagement helps to ensure that attempted reforms are sustained over a longer period. To maintain these relationships, it is imperative we establish clear and open lines of communication to ensure stakeholders remain informed about their involvement with the program. We therefore intend to create a memorandum of understanding (MOU) with key partners [See Appendix A.12].

Knowing which barriers exist will help maximize stakeholder participation. Stakeholders have rigorous schedules, and while all stakeholders have endorsed the proposed intervention, their level of involvement will be sporadic. We will adjust the program to meet the needs of the people it is intended to serve. Additional barriers include the complexity of bureaucratic procedures such as paperwork. We intend to set forth simplified procedures tailored to this community's specific needs. Through the community engagement process, it is essential to identify and use different strategies to ensure the effective implementation of our program. Three strategies for engaging include stakeholder meetings every three months, monthly newsletters, and periodic focus groups. We will need to establish and maintain relationships with existing community organizations to ensure that key stakeholders and our intended audiences are reached. This will occur during the program's design, improvement, and sustain phases [See Appendix A.13 for community partner rationale]. Stakeholders can give feedback during the meeting itself or through surveys available at the meeting. Using monthly newsletters as an engagement strategy for stakeholders will improve and increase the longevity of the program. A third strategy includes focus groups, we plan to use this method of engagement during the design and improvement phases of the program to provide insight that will guide decision-making during project implementation. Additionally, data will be collected through meeting records and post-meeting survey for evaluation purposes and quality assurance.

### **Program/ Policy Evaluation**

We will use a nonexperimental, observational, pre-and post-test study design to collect data on students participating in the program from initial enrollment. Evaluation will begin at baseline and then every six months thereafter to assess the effectiveness and the changes needed for the program to continue successfully long-term. Key quantitative metrics will look at the number of students attending the program and how often, increases in literacy level, and level of students' nutrition education.

Descriptive statistics will include the mean number of students attending and mean days/week attended. Literacy statistics will be evaluated by the mean number of students who had an increase in overall literacy measured by an Academic Progress Monitoring Tools Chart (Academic Progress Monitoring Tools Chart, n.d.), and overall school literacy measured by 3<sup>rd</sup> grade reading scores on end-of-grade testing. The quantitative data gathered on student nutrition knowledge will be analyzed by comparing before and after scores of a nutrition evaluation among students who participated in the Read and Feed program every 6 months.

Qualitative data will be collected to assess our program through one-on-one interviews and surveys given to stakeholders every 6 months. Data will be transcribed, and themes will be created based on the responses. Our outputs will assess population reached, effectiveness, fit, and adoption through the interview and survey responses. If the program shows limited progress at any point during the evaluation period, a stakeholder meeting will be held in which solutions will be discussed to increase success.

Given that the initial intervention plan will be piloted in two schools, the data will be used as evidence for the program's eventual expansion. Data will also be utilized for quality assurance during the iterative evaluation process. Key stakeholders will be consulted at each step of the evaluation process. Stakeholders will vote on any proposed modifications, and all must agree before any changes are implemented. Feedback from stakeholders will be used to shape and mold the program to better suit the needs of our target demographic within the Durham County Public School District. Through this approach, we seek to improve the program's effectiveness, reach, and adaptability, in order to reach our shared objectives.

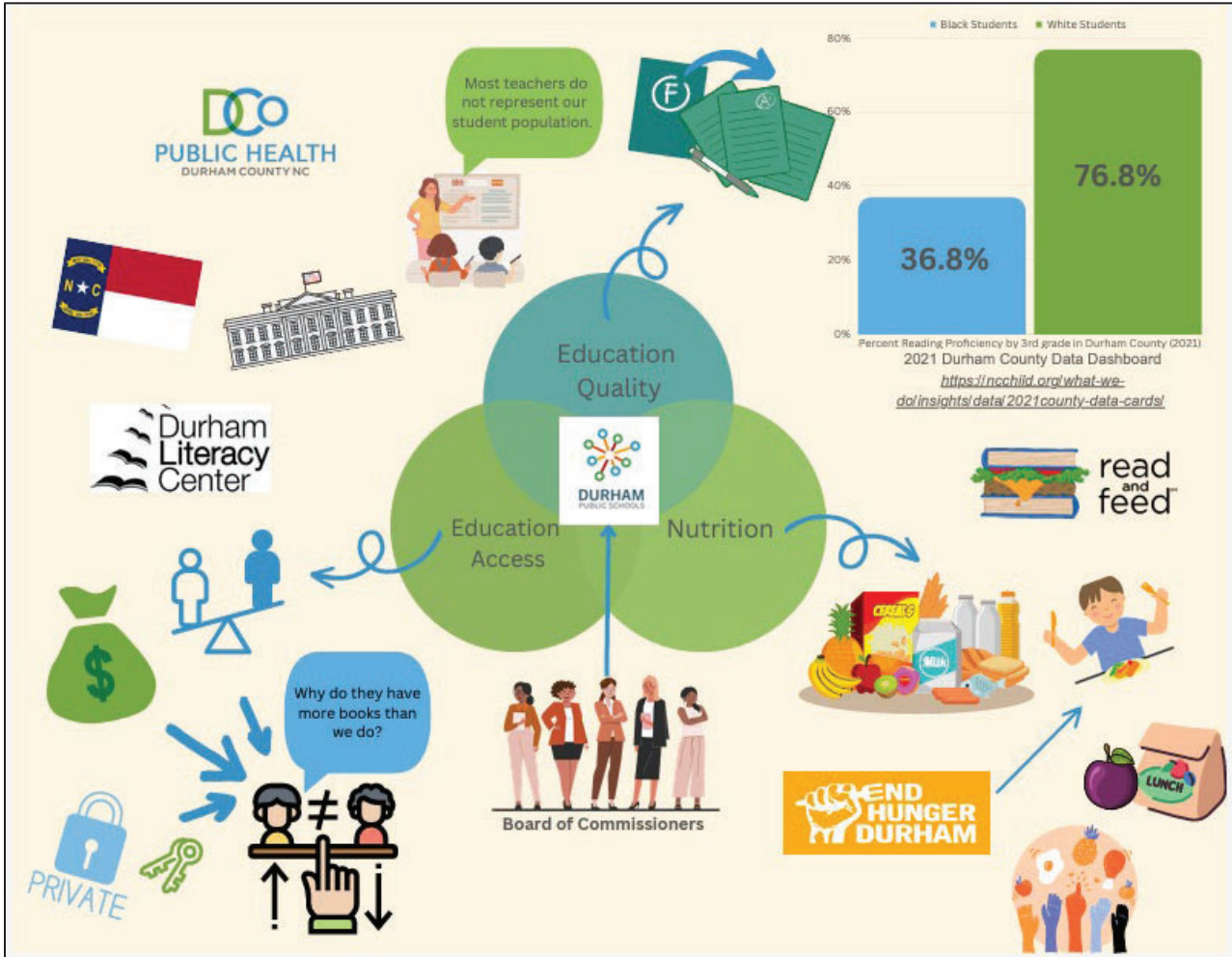
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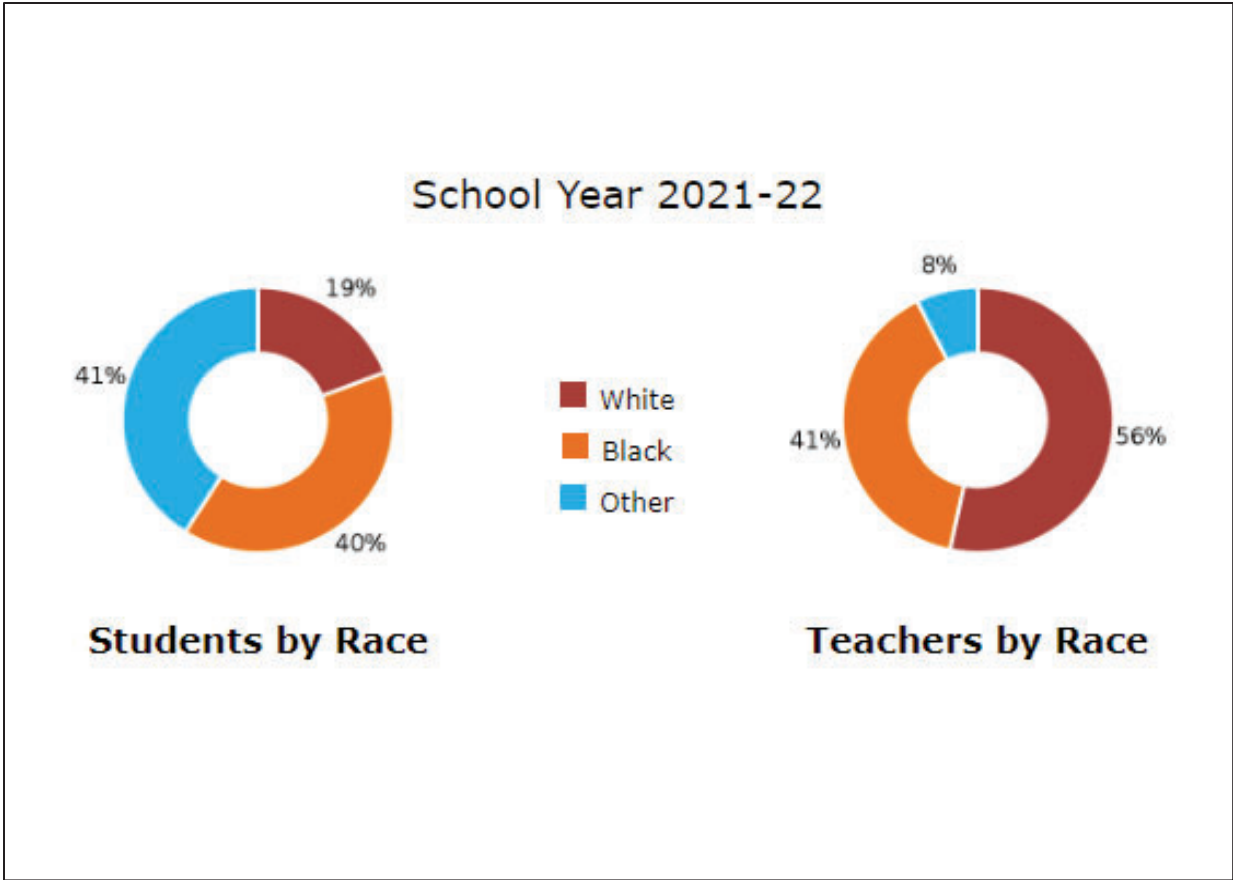
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APPENDIX A: COMMON PROPOSAL APPENDICES

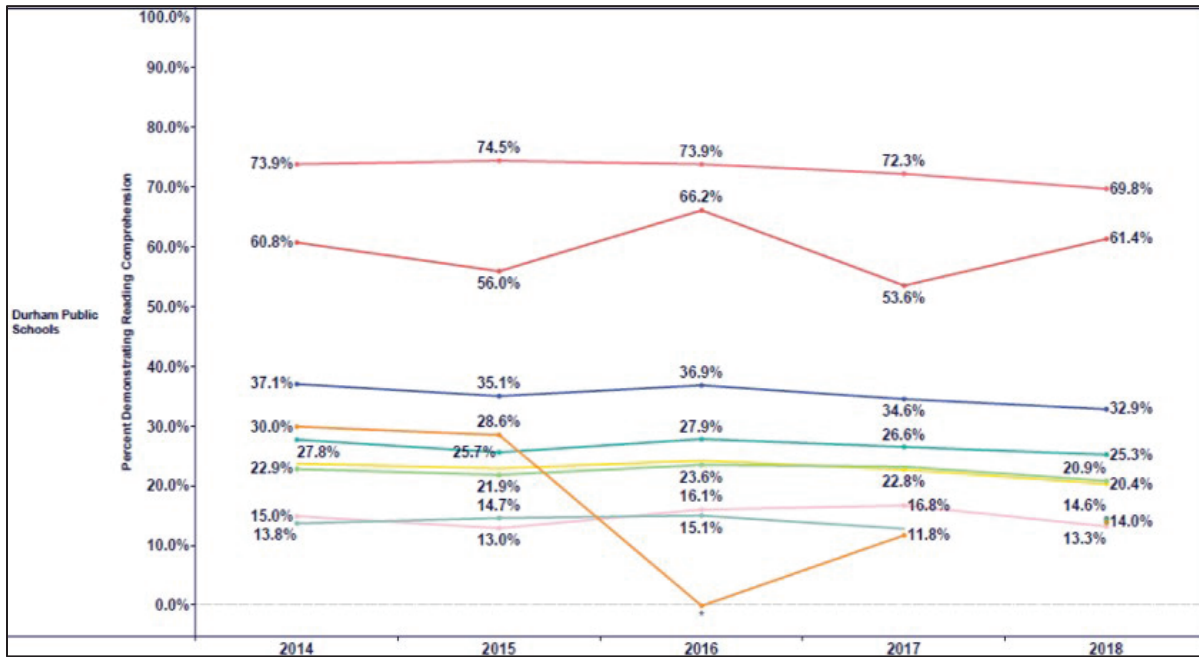
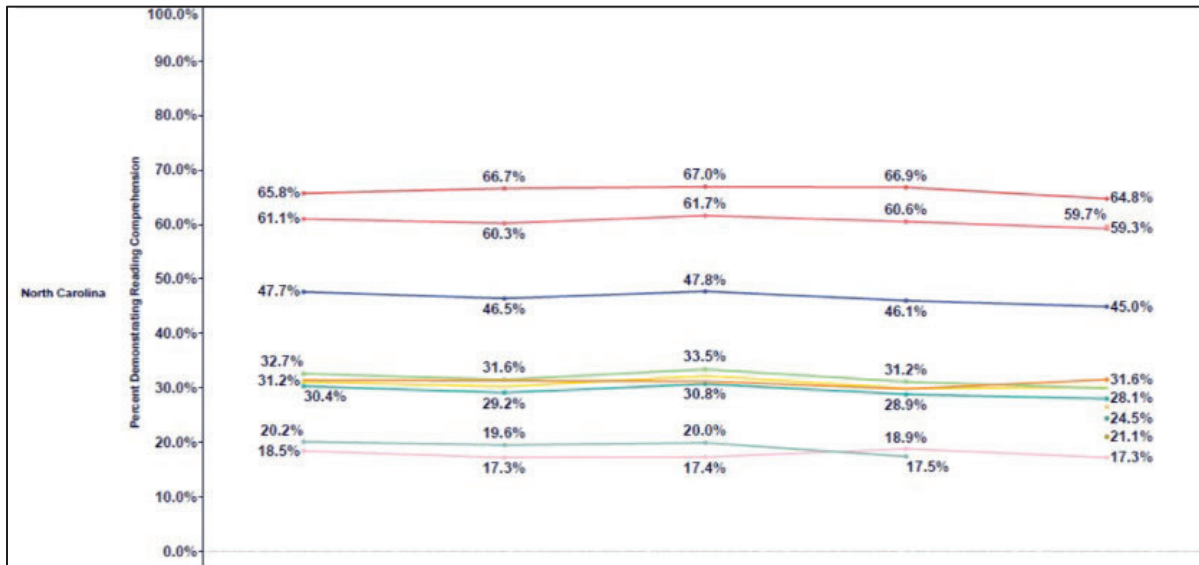
Appendix A.1. Rich Picture – Education Access and Quality in Durham



**Appendix A.2.** Student vs. School Staff Demographic



**Appendix A.3** Percent of Third Grade Students Scoring College and Career Proficiency on Third Grade End of Grade Assessments for Reading in North Carolina and Durham County by Subgroups





Appendix A.4 Food Bank of Central and Northern Carolina Food Insecurity Projections

# 2020-2021 DURHAM COUNTY PROFILE

In the 34 counties served by the Food Bank of Central & Eastern North Carolina, the impact of the COVID-19 pandemic means nearly 600,000 people may face hunger in 2021. COVID-19 is impacting communities and populations of people that were already made vulnerable by inequitable policies and structures. Food insecurity has emerged as a defined reality for hundreds of thousands of Americans who cannot keep food on the table. The Food Bank works every day to nourish people while building solutions to hunger through programming and partnerships, empowering North Carolina communities to thrive.

## THE NEED County population<sup>1</sup>: 311,848

Food insecurity <sup>1</sup>		Hunger <sup>2</sup>	
Number of people who are food insecure	42,890	Number of children receiving free/reduced school meals	21,242
Percentage of people who are food insecure	14%	Percentage of children receiving free/reduced school meals	63%
Children under 18 who are food insecure	13,270	Unemployment <sup>3</sup>	
Percentage of children under 18 who are food insecure	20%	Percentage unemployment June 2021	4.3%
Individuals over 65 who are living below the poverty level <sup>4</sup>	8,955		



**14%**

42,890 people are food insecure in Durham County.



**20%**

13,270 children under 18 are food insecure in Durham County.



**63%**

21,242 children receiving free/reduced school meals in Durham County.

## ADDRESSING NEEDS

Total lbs. of food distributed by the Food Bank in 2020-2021	138 million lbs.
Total meals provided in this county	7,741,344 meals
Total lbs. of food distributed in this county	9,289,613 lbs.

## TOP AGENCIES

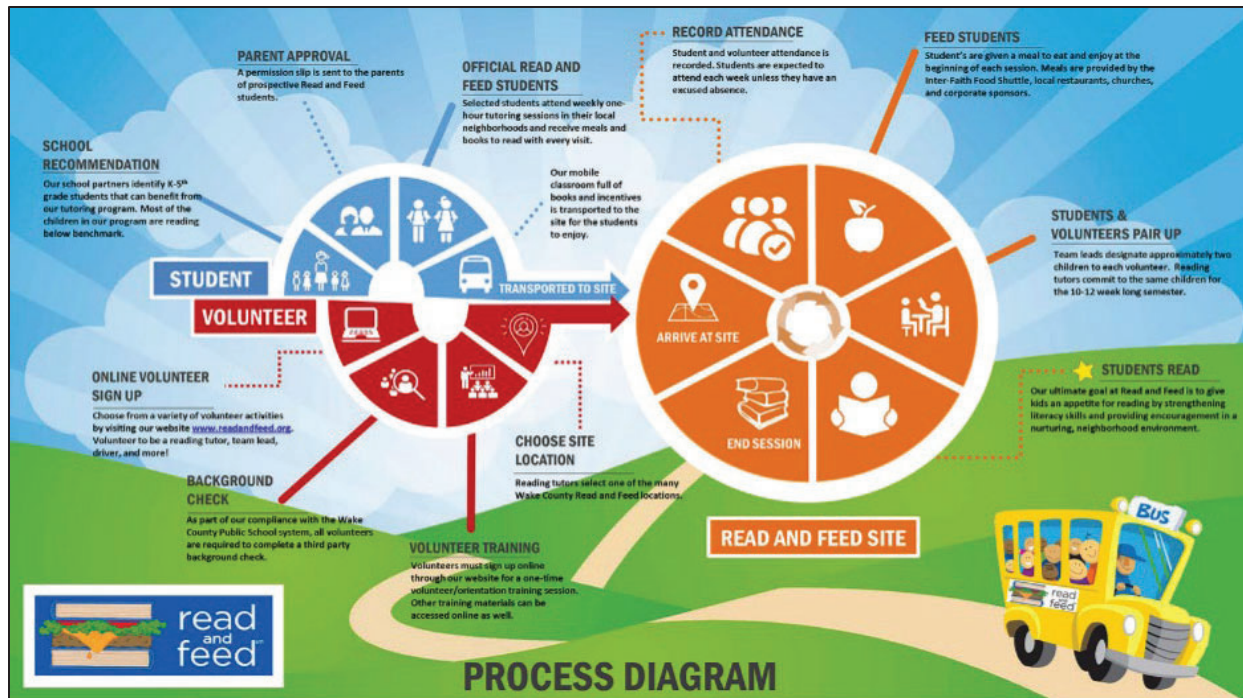
Boys and Girls Club of Durham  
Durham Exchange Club  
Durham Rescue Mission

Freedom House Durham  
Urban Ministries

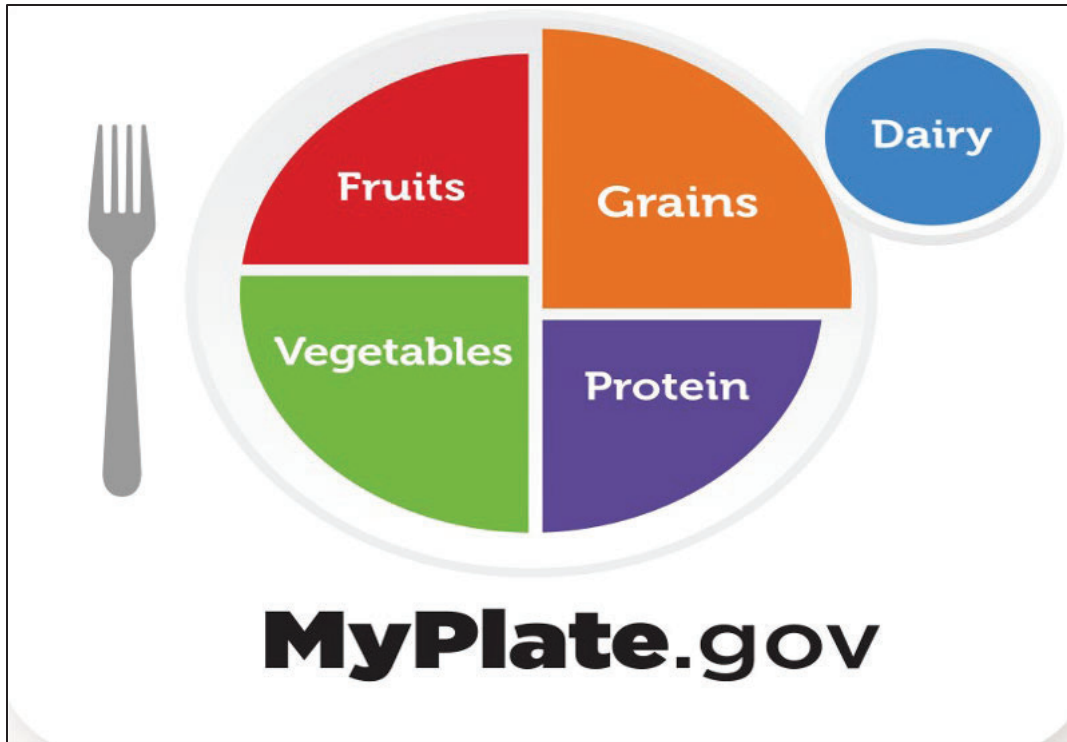








<sup>1</sup>Feeding America 2021 Food Insecurity Projections  
<sup>2</sup>NC Department of Health & Human Services, County Aging Profiles 2019  
<sup>3</sup>No Kid Hungry County Profiles, NC Department of Public Instruction  
<sup>4</sup>NC Civilian Labor Force Estimates June 2021

## Appendix A.5 Read and Feed Program Diagram



Appendix A.6 MyPlate Model



 <p><b>MyPlate</b></p> <p>The benefits of healthy eating add up over time, bite by bite. Small changes matter. <i>Start Simple with MyPlate.</i></p>	 <p><b>Fruits</b></p> <p>Make half your plate fruits and vegetables: focus on whole fruits.</p> <p><a href="#">Learn more</a></p>	 <p><b>Vegetables</b></p> <p>Make half your plate fruits and vegetables: vary your veggies.</p> <p><a href="#">Learn more</a></p>
 <p><b>Grains</b></p> <p>Make half your grains whole grains.</p> <p><a href="#">Learn more</a></p>	 <p><b>Protein Foods</b></p> <p>Vary your protein routine.</p> <p><a href="#">Learn more</a></p>	 <p><b>Dairy</b></p> <p>Move to low-fat or fat-free dairy milk or yogurt (or lactose-free dairy or fortified soy versions).</p> <p><a href="#">Learn more</a></p>

Appendix A.7 Budget Outline

BUDGET					
DIRECT COSTS					
a. PERSONNEL	Months	%FTE	Salary	Fringe	Total
Project Director	24	25%	\$50,000	\$8,250	\$31,250 x2 = \$62,500
Project Coordinator	24	100%	\$45,000	\$11,250	\$56,250 x2= \$112,500
<b>Total Personnel</b>					<b>\$175,000</b>
b. EQUIPMENT				Expense	Total
Cell Phone Reimbursement	24			\$50/month x 24 months	\$1,200
2 laptop computer				\$2000 each	\$2,000
<b>Total Equipment</b>					<b>\$3,000</b>
c. SUPPLIES				Expense	Total
Educational Materials (paper, pens, pencils, calculators, etc.)	24			2,000 x 24	\$48,000
Meals	24			2,700 x 24	\$64,800
<b>Total Supplies</b>					<b>\$112,800</b>
d. TRAVEL				Expense	Total
Car (gas) per diem 65.5 cents per mile (20,000 miles)				13,100 per year	\$26,200
<b>Total Travel</b>					<b>\$26,200</b>
e. OTHER EXPENSES				Expense	Total
Printing				In kind	\$0
Tutors/volunteer				In kind	\$0
Books				In kind	\$0
Supplemental Meals				In kind	\$0
Trainers				In kind	\$0
<b>Total Other</b>					<b>\$0</b>
f. EVALUATION				Expense	Total
Evaluator Salary - \$35/hr ea for three PhD Student Consultants (1,200 work hours total)	24		\$42,000		\$84,000
<b>TOTAL COMBINED BUDGET (YEAR 1 &amp; 2)</b>					
<b>2 YEAR GRAND TOTALS</b>					<b>\$401,000</b>
<b>TOTAL INDIRECT COSTS</b>					<b>\$31,700</b>
<b>TOTAL BUDGET</b>					<b>\$432,700</b>

## Appendix A.8 Budget Justification

### a. Personnel:

**Project Director:** this will be a part-time (50% FTE) position for 12 months each year. This position will be essential in the implementation process of the program and collaborate with key stakeholders during the process. They will be brought on board prior to program implementation during the planning process and will be responsible for researching, planning, developing, and implementing Read and Feed changes alongside the project coordinator and volunteers as well as delegating tasks to each.

**\$50,000/12 months x 50% = 25,000 + 25% fringe benefits of \$6,250 = \$62,500**

**Project Coordinator:** this will be a full-time position for 12 months each year. This position will work daily to coordinate the implementation of the program as well as delegate and manage tasks given to the volunteers. They will be responsible for designing marketing materials, helping to implement Read and Feed changes in schools, and a variety of other tasks as stated in our activities and outcomes.

**\$45,000/12 months + 25% fringe benefits of \$11,250 = \$56,250**

**Volunteers:** Their responsibilities will vary from tutoring, canvassing, and other tasks as needed/assigned and will aid in the start-up process as well. They will offer their services in-kind to the program.

**Total for all Personnel: \$87,500**

### b. Equipment:

**Cell Phone Reimbursement:** Due to the amount of time that the project manager being using their personal cell phone for social media marketing and contacting schools, we will provide reimbursement up to \$50/month for their current cell phone plan. **\$50/month x 12 months = \$600**

**Total for all Equipment: \$600**

### c. Supplies

**Educational Materials:** Given the need to accommodate an estimated 323 students we will provide reimbursement up to \$2,000/month for any educational materials or supplies that might be needed at the two school sites.

**\$2,000/month x 12 months = \$155.88**

**Total for all supplies: \$ 64,800**

### d. Travel

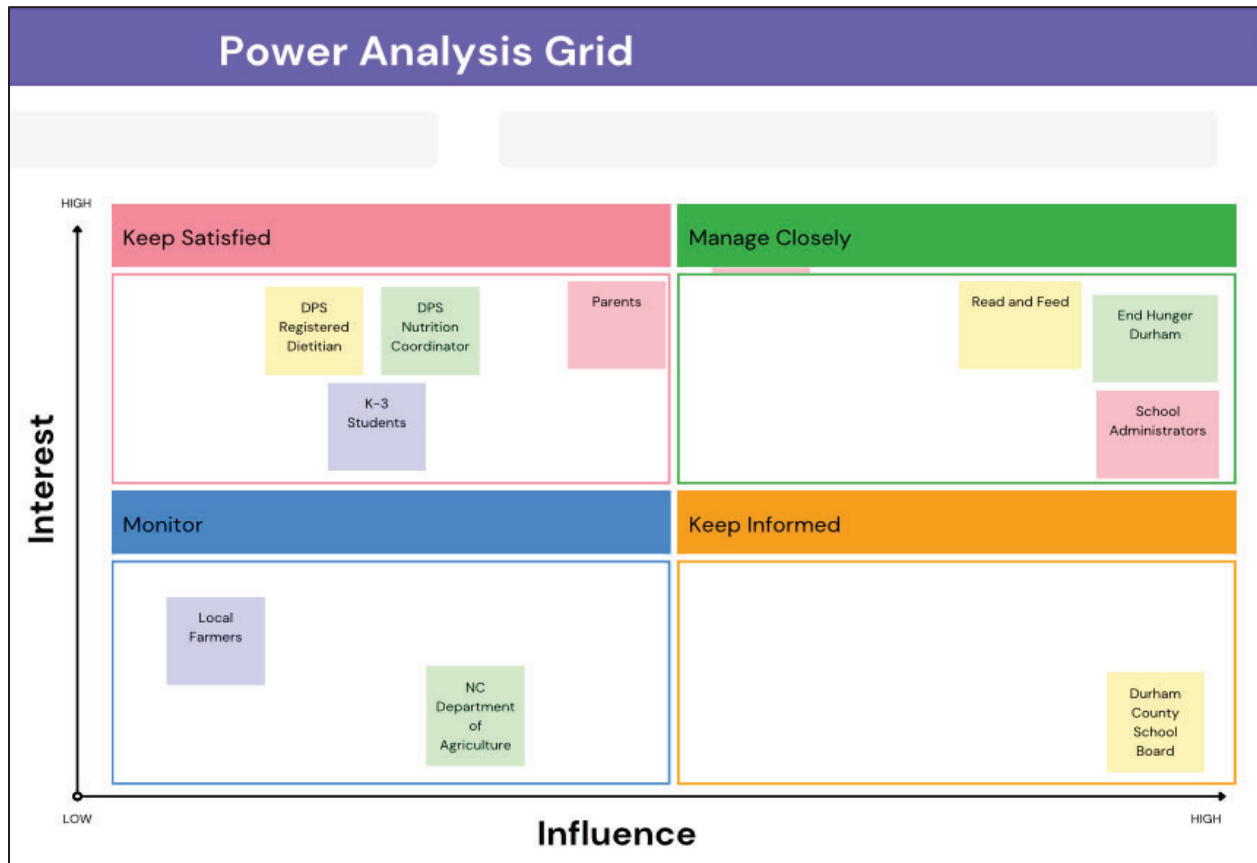
Each of the 2 schools in Durham County will be visited by the program manager and tutors; mileage for travel will be reimbursed at \$0.65.5/mile up t 20,000 miles (about 32186.88 km). This will be spaced throughout each year during the implementation phase and as a follow-up.

**Total for travel: \$ 26,200**

### f. Evaluation

**Evaluators:** We will secure the services of three PhD student consultants, who will be pivotal in leading our program evaluation and quality assurance efforts. Their expertise and experience will ensure that our program continues to meet the highest standards of quality and excellence.

Appendix A.9 Power Analysis Grid



*Note: While placed in the low influence/high interest quadrant, Parents and K-3 Students will effectively be considered “Key Players” for engagement purposes as discussed above.*

**Appendix A.10** List of Selected Stakeholders and their Affiliated Organizations

<b><i>Members</i></b>	<b><i>Organization</i></b>
<i>Farm-to-School Liaison</i>	<i>North Carolina Department of Agriculture</i>
<i>Farmer Representative/Food Distribution</i>	<i>Black Farmers Coalition of Durham County</i>
<i>Restaurant Representative/Meal Distribution</i>	<i>Restaurant Association of Durham County</i>
<i>Board Representative</i>	<i>Durham County School Board</i>
<i>Parent Representatives</i>	<i>YE Smith and CC Spaulding Elementary Schools</i>
<i>Nutrition Coordinator</i>	<i>Durham Public School District</i>
<i>Program Director</i>	<i>Read and Feed Organization</i>
<i>Volunteer Tutors</i>	<i>Duke Office of Durham and Community Affairs</i>
<i>Senior Program Coordinator</i>	<i>Duke Office of Durham and Community Affairs</i>
<i>Faith-Based Representative</i>	<i>End Hunger Durham</i>
<i>Director of Educational Programs</i>	<i>Durham Literacy Center</i>



**Appendix A.11 Key Stakeholders in Three Leadership Teams**

<b>Co-Design Team:</b> Project Leadership Team (PLT) Durham Literacy Taskforce (DLT) Community Focus Group (CFG)	Farm-to-School Liaison North Carolina Department of Agriculture (DLT)	Parent of a 2nd Grader in Y.E. Smith Elementary School with Low Reading Proficiency (CFG)	Program Director, Read and Feed Nonprofit Organization (DLT)	Farmer, Black Farmers Association of Durham County (DLT)	Julie Munoz, MPH Dylan Mathews, MPH Miriam Wiener, MPH Grace Ourada, MPH (PLT)
<b>Co-Design Role</b>	Promotes the interests of farmers, school children, food distributors, and the USDA. Provides insight into food quality standards, legal requirements, and governmental funding sources for meal allocation programs.	Provides ongoing insight into best practices for the academic, emotional, and physical health needs/preferences of underachieving youth in low resourced Durham County communities.	Promotes the interests of academic providers and students, and provides evidence-based tutoring and consultation services to strengthen literacy skills by 3rd grade.	Provides culturally relevant resources and strategies for providing afterschool meals for under-resourced students in Durham County, potential barriers to success, including low socioeconomic status, food access, lack of traditional farming knowledge among youth.	Uses co-design to heal and empower the community in order to build trust over time and connect the community to our team and other facilitators in a way that will be viewed as respectful, collaborative, and impactful over the long term.
<b>Design Justice Principle</b>	<i>"We center the voices of those who are directly impacted by the outcomes of the design process."</i>	<i>"Everyone is an expert based on their own lived experience, and... we all have unique and brilliant contributions to bring to a design process."</i>	<i>"We work towards non-exploitative solutions that reconnect us to the earth and to each other."</i>	<i>"Before seeking new design solutions, we look for what is already working at the community level. We honor and uplift traditional, indigenous, and local knowledge and practices."</i>	<i>"We use design to sustain, heal, and empower our communities, as well as to seek liberation from exploitative and oppressive systems."</i>
<b>Engagement</b>	Consulted Informed	Responsible Accountable	Responsible Accountable	Responsible Accountable	Responsible Accountable



**MEMORANDUM OF UNDERSTANDING  
BETWEEN THE PUBLIC HEALTH LEADERSHIP TEAM (PLT) AND READ AND FEED (RAF)  
NONPROFIT ORGANIZATION**

**1. PARTIES AND PURPOSE**

- a. The purpose of this MOU is to: affirm the mutual interests shared by both parties which include investing in the literacy, health, nutrition, well-being, and dignity of the K-3rd grade population of North Carolina. This will be accomplished through the sharing of resources, information, and services.

**2. PARTNERSHIP PRINCIPLES**

- b. We are collectively guided and inspired by our vision of achieving ideal student health and literacy in the North Carolina K-3rd grade population.
- c. We ensure to uphold an equity lens around literacy in program development, facilitation, and implementation.
- d. We are committed to upholding consistent, reliable communication between both parties. This includes regular communication to relay the status of our projects and the utilization of a project management tool to ensure milestones are being met.
- e. We are committed to maintaining transparency regarding internal and external decision-making, the strategy by which resources are allocated, and dissemination of program findings between both parties.
- f. The primary mode of communication between both parties will be e-mail. Meetings will largely be held on Microsoft Teams in light of the COVID-19 pandemic and member schedules. On-site meetings may be held, based on a vote by both parties.

**3. SCOPE OF ACTIVITIES & GOALS**

- g. RAF and PLT will collaboratively review and modify existing “inequitable” educational policies that are discriminatory against low-resourced students in grades K-3, in order to improve literacy outcomes among this demographic.
- h. RAF and PLT will convene on a monthly basis to provide updates and monitor progress on existing projects.
- i. RAF and PLT will identify areas for improvement in the current educational lesson plan to ensure that quality measures around literacy in low0resourced communities are being met.

**4. ACTIVITY AGREEMENTS**

- j. We, both parties, agree to extensively discuss all pertinent topics prior to enacting any decisions.
- k. We will refer to a pre-established conflict resolution plan in the event of a disagreement between both parties.
- l. We agree to continuously modify and improve the MOU in light of new developments and information as deemed necessary.

**5. ACCOUNTABILITY PLAN**

5.1 Improving literacy outcomes among K-3rd grade elementary school students in Durham County through the implementation of the following goals:

- m. Increase 3rd-grade reading proficiency by 25% in each of the two service areas chosen for their low 3rd-grade reading proficiency scores combined with the reduced SES of their student populations and identified as “High-Interest Schools” (HIS) via Community Focus Group (CFG) outreach in each area by May 2024.
- n. Increase funding for nutrition services by 10% through existing Read and Feed programming to provide 400 additional in-home and 200 additional congregate/group meals by May 2024.
- o. Purchase one transportation vehicle for each of the two service areas identified as “High-Interest Schools” (HIS) for meal and produce deliveries (two vehicles in total by May 2024).

**6. RENEWAL, TERMINATION, AND AMENDMENTS**

- p. The duration of the MOU is two years from the date of the last signature.
- q. The duration of this MOU can be lengthened with the written approval of each party.

- r. This MOU can be terminated with reasonable cause or if there is a breach of contract. If a termination is requested, the reason must be submitted to the other party through a written notice provided 75 days prior to the termination of the agreement.

**7. CONTACTS**

- s. The director(s) of Read and Feed will serve as its primary contact.
- t. Grace Ourada, Julie Munoz, Dylan Mathews, and Miriam Wiener will serve as the PLT's primary contacts.

*In witness thereof, the parties have offered their signatures hereto:*

\_\_\_\_\_

Read and Feed Representative

Signature \_\_\_\_\_

Date \_\_\_\_\_

Public Health Leadership Team Representative

Signature \_\_\_\_\_

Date \_\_\_\_\_

**Appendix A.13 RASCI Table**

<b>RASCI Table</b>		
<b>RASCI Levels Who is...</b>	<b>Community Partners</b>	<b>Rationale</b>
<b>Responsible</b> =owns the challenge/project	<ul style="list-style-type: none"> <li>• Project Leadership Team</li> </ul>	<ul style="list-style-type: none"> <li>• The Project Leadership Team is responsible for coordinating and engaging stakeholders. They will implement the engagement and accountability plan and ensure the project is meeting deadlines and operating on budget.</li> </ul>
<b>Accountable</b> =ultimately answerable for the correct and thorough completion of the deliverable or task, and the one who delegates the work to those <i>responsible</i>	<ul style="list-style-type: none"> <li>• Read and Feed Program</li> <li>• School Administrators</li> <li>• Parents/Caregivers</li> <li>• K-3 Students</li> </ul>	<ul style="list-style-type: none"> <li>• Read and Feed is accountable for using their after-school program structure to implement program activities.</li> <li>• School Administrators are accountable for delegating the correct resources (time, place, school staff) for the program.</li> <li>• Parents and Students are accountable for making sure that K-3 children are signed up, attending, and participating in the program.</li> </ul>
<b>Supportive</b> =can provide resources or can play a supporting role in implementation	<ul style="list-style-type: none"> <li>• End Hunger Durham</li> <li>• Black Farmers Association</li> <li>• Durham County School Board</li> </ul>	<ul style="list-style-type: none"> <li>• End Hunger Durham will facilitate food to school through partnerships with faith-based organizations.</li> <li>• The Black Farmers Association will be a key partner for providing local produce.</li> <li>• The Durham County School Board is providing the infrastructure to run the program</li> </ul>
<b>Consulted</b> =has information and/or capability necessary to complete the work	<ul style="list-style-type: none"> <li>• Duke Office of Durham and Community Affairs</li> <li>• Durham Literacy Center</li> <li>• DPS Nutrition Coordinator</li> <li>• DPS Registered Dietician</li> </ul>	<ul style="list-style-type: none"> <li>• The Community Affairs office will help supply tutors for Read and Feed</li> <li>• The Literacy Center will consult and inform about literacy resources in the county</li> <li>• The Nutrition Coordinator and Dietician will consult on healthy foods to be offered for students</li> </ul>
<b>Informed</b> =must be notified of results, process, and methods, but need not be consulted	<ul style="list-style-type: none"> <li>• North Carolina Department of Agriculture</li> </ul>	<ul style="list-style-type: none"> <li>• A liaison through the Department of Agriculture will remain informed about decisions affecting the farm-to-school food pipeline</li> </ul>

**Appendix A.14** Presentation Slides & Script

SLIDE #1: ALL

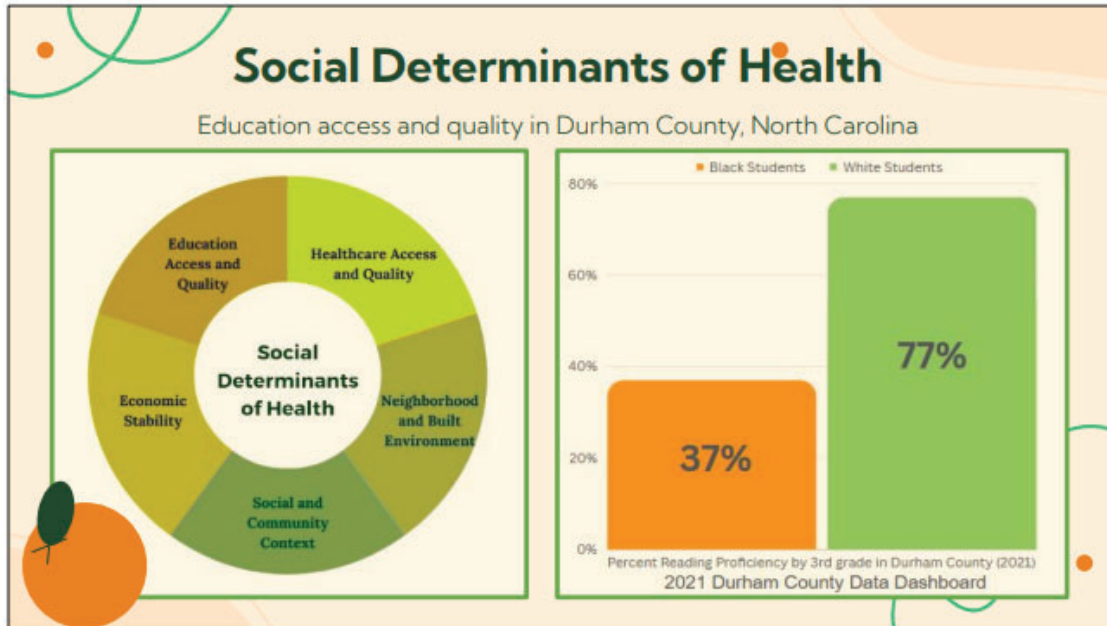


Dylan: Good evening, we are Team Feed. Fostering Equitable Education in Durham. My name is Dylan Mathews.

Julie: My name is Julie Munoz

Grace: My name is Grace Ourada

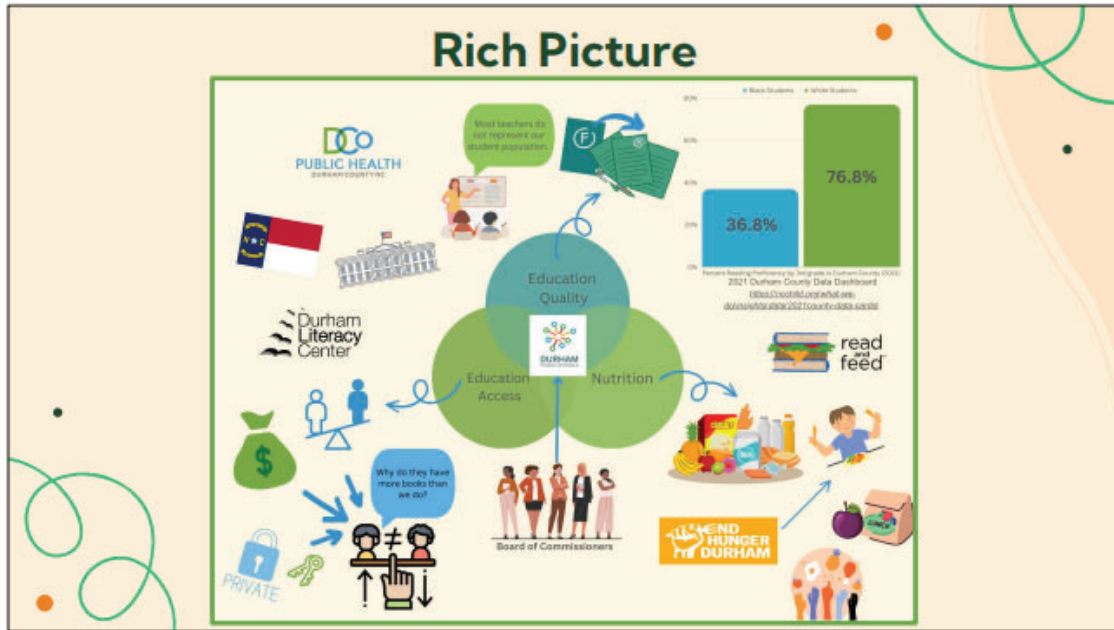
Miriam: And my name is Miriam Wiener..... Esteemed county commissioners, my colleagues and I are honored to be presenting tonight on the topic of Improving Reading. Comprehension Among Students in Two Underperforming Schools in Durham County Through the READ AND FEED Program.



Miriam: We'd like to start off by talking about the social determinants of health. In Durham County, we have a very serious problem brewing, where racial disparities in educational access and quality are shockingly stark. 3rd-grade reading proficiency is one of the most ACCURATE measures of educational access and quality, and in Durham County, only 37 percent of black children scored proficient in 3rd-grade reading compared with 77 percent of white children. When we see literacy rates plummeting for black students and the gap in proficiency levels between black and white students rapidly growing, we know we have a systemic crisis on our hands – a crisis that will soon affect us all. It's well-known that NON-MEDICAL factors such as racism and educational segregation influence the future health outcomes of individuals and communities. These often-invisible intergenerational factors lead to lower life expectancy and lower quality of life. Since our team was made aware that your top concerns include educational equity and health, we wanted to make it clear that socioeconomic status and the social determinants of health – especially educational access and quality – account for upwards of 60% of health outcomes. Education improves health – both directly and indirectly – through work and economic conditions, social and psychological resources, and a healthy lifestyle. For example, compared with the poorly educated, well-educated individuals are less likely to be unemployed, more likely to work full-time, have fulfilling, rewarding jobs, high incomes, and low economic hardship. The well-educated report a greater sense of control over their lives and their health, and they have higher levels of social support – both of which are associated with better health outcomes. Education is the principal pathway to financial security, independence, stable employment, and social success.

Picture link: <https://enterprises.upmc.com/blog/social-determinants-of-health/>





Miriam: Let's take a look at Durham County. As you can see on this slide, we've compiled what is referred to in public health as a RICH PICTURE - a visual representation of a system that leads to a particular outcome. We USE this tool for one simple reason – **in order to make changes to any system, we need to understand the system.** Looking at the entire picture here, we can see that in Durham County, there are reinforcing feedback loops that perpetuate BARRIERS to educational success for children of color. First, a lack of food access, leading to nutritional deficiencies; Second, discrepancies in educational quality – North Carolina's teacher workforce has only about 20 percent teachers of color, while more than half of the state's students are students of color. And what's worse, black students are 58 percent more likely than their white peers to be taught by a novice teacher. Students of color are underrepresented in honors and advanced classes and overrepresented in special education. And students of color are 3.9 times more likely than white students to receive a suspension; Third... educational access. Despite making up only 41 percent of the population, children of color account for 63 percent of children living in poverty. As mentioned previously, poverty is perhaps THE greatest predictor of lowered educational access.

## Program Overview

**Priority Population:**

- Students in grades K-3 at two schools in Durham



(Y.E. Smith & C.C. Spaulding)

**Read and Feed Program**

- Successfully implemented in Wake County, NC.
- Tutoring
  - ◆ One-hour session after-school
  - ◆ Offered Monday-Thursday
  - ◆ Basic Elementary subjects & nutrition education
  - ◆ Children receive nutrient dense meal
- Eligibility
  - ◆ All students eligible

**Partnerships**

- Volunteers will be recruited
- Local universities, Duke Office of Durham and Community Affairs, and the Durham Literacy Center to serve as tutors.



Grace: To address this challenge, we aim to implement a two-year pilot Read and Feed Program in C.C. Spaulding and Y.E. Smith Elementary schools in Durham County. The schools were chosen due to their low 3rd-grade reading proficiency scores and the reduced socioeconomic status of their student populations. The Read and Feed program aims to strengthen literacy skills among underserved elementary school children and provide meals in a nurturing environment. It is currently implemented in Wake County, NC, and has successfully increased the reading capabilities of students they serve, in addition to providing 630 children with tutoring and meal services. Provided meals will cover nutritional requirements set by MyPlate to nurture students as they receive assistance with school work. Participating students will attend one-hour tutoring sessions up to four times a week at their school and receive meals with every session. After a designated mealtime, children will spend 30-40 minutes working with a tutor on their elementary subjects. Nutrition education will be offered in addition to the core curriculum covered on state exams. Any K-3 student at the selected schools will be eligible to enroll in the free program. The program will run Monday-Thursday, and students will register for as many days as they would like based on their individual availability. Volunteers will be recruited through partnerships with Read and Feed, local universities, Duke Office of Durham and Community Affairs, and the Durham Literacy Center to serve as tutors - tutors will undergo training in order to successfully assist students.

A decorative slide with a light orange background. On the left, there is an illustration of a blue and white carton of milk and a yellow banana. On the right, there is an illustration of a brown paper bag filled with various vegetables like broccoli, carrots, and a red apple. The word "Goals" is centered at the top in a bold, dark font. Below it, two paragraphs of text describe long-term and short-term goals.

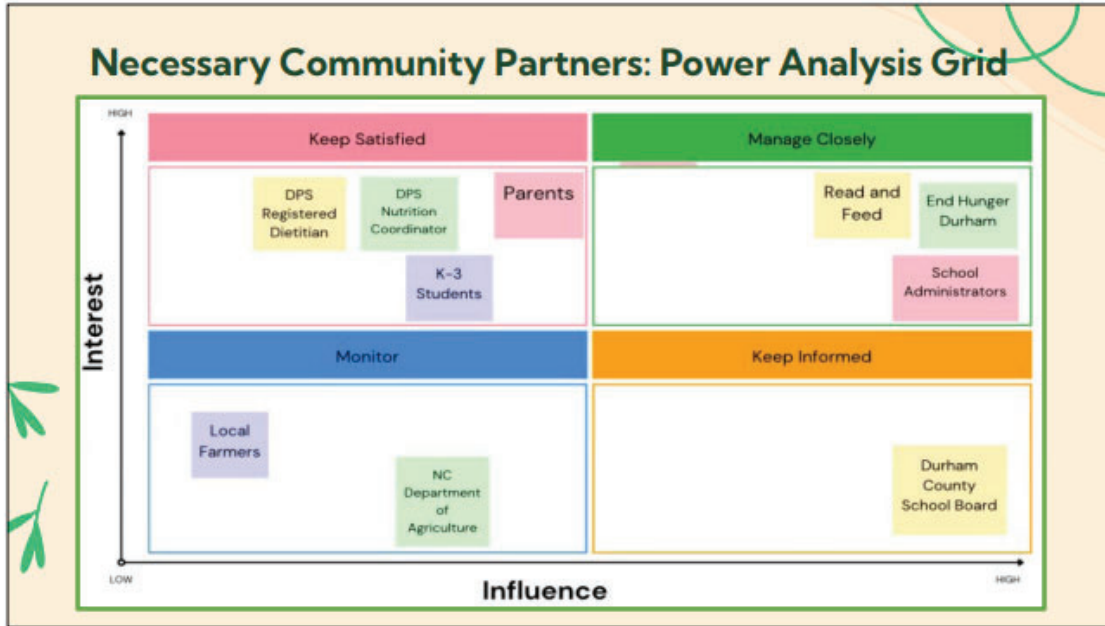
**Goals**

**Long-term:** Our goal is to improve 3rd-grade reading scores to meet or exceed the state average of 57% (2019) by the end of the second year.

**Short-term:** Our goal is to have 25% of students from the targeted schools enrolled and participating in program by 6 months.

Julie: We will now review the goals of our program. We have listed the primary SMART goals here. This includes a short-term and long-term objective. Ultimately, this initiative aims to improve childhood literacy and health outcomes through community engagement and data-driven improvement. In addition, we aim to enhance food security and nutrition status in the community by providing equitable access to food sources. To achieve this, we plan to offer a nutritious meal to all children in our pilot population. This will serve as an incentive for them to participate in the program but also assist with retention. Furthermore, we intend to integrate nutrition education into the standard curriculum to encourage long-term healthy food behaviors. We believe improving nutrition knowledge will empower children to make informed decisions and promote overall well-being.





Dylan: We used a power analysis grid to map the stakeholders of our project. A power analysis grid helps to recognize the most important and influential stakeholders to manage closely, as well as the perhaps less critical stakeholders to monitor or inform. Our stakeholders with a high level of influence and interest in the project are ones we will want to manage closely. They are considered “Key Players”. The Key Players are the Read and Feed Program, School Administrators at each school, and End Hunger Durham, all of which will work in tandem with the Project Leadership Team. Parents and the K-3 students participating in the program are included in the “Keep Satisfied” group. However, we recognize that our target population comes from a traditionally low-power status which has historically not had as much influence as other stakeholders considered. Parents and students will need to be consulted as much, if not more, than the stakeholders identified as “key players.” So, while the parents and students are placed in the “show consideration” portion of the power analysis grid; with our commitment to equity, we will consult with them as “key players.”



## Program Budget

- Funding
  - ◆ Grants
  - ◆ Public Appropriations
  - ◆ Partnerships with anchor institutions
- Partnerships
  - ◆ End of Hunger Durham
  - ◆ Local restaurants
  - ◆ Farmers
  - ◆ Organizational sponsors
- Why funding is needed:
  - ◆ This program has a positive impact on children in underserved areas – with the right resources, we can create a lasting impact on educational equity and success.

Grace: Our total projected budget for this 2-year program is \$432,700. The budget includes all allocated resources needed to successfully implement the Read and Feed Program to have a positive impact on the children we serve. The budget allocates a program director to work alongside stakeholders during the program duration, plus the project coordinator to help coordinate program implementation. Existing staff will participate in chaperoning and assisting in other aspects of the program. Equipment including educational material, electronics, travel expenses for picking up meals, marketing and social media, and evaluators to help ensure our program meets the highest standards of quality and success. Funding for our project will be secured through grants, public appropriations, and anchor institutions, and Grants from federal or state organizations will help get our project up and running. Meals will also be covered through grant funding and facilitated through End Hunger Durham. Local restaurants, farmers, and other organizational sponsors will help supplement food items and resources needed for meals. As mentioned previously, in-kind volunteers will be recruited from the Duke Office of Durham and Community Affairs.

SLIDE #8: GRACE

BUDGET		
a. PERSONNEL	Expenses	Total
Project Director	\$50,000 / 24 months + Fringe	\$62,500
Project Coordinator	\$45,000 / 24 months + Fringe	\$112,500
b. EQUIPMENT		
Electronics: phone computer	\$500 / 24 months \$2,000 each	\$3,000
c. SUPPLIES		
Educational Materials	\$2,000 / 24 months	\$48,000
Meals	\$2,700 / 24 months	\$64,800
d. TRAVEL		
Car (gas) per diem 65.5 centers per mile	\$13,100 / year	\$26,200
e. OTHER EXPENSES		
Printing	In-kind	\$0.00
Tutors/volunteer	In-kind	\$0.00
Books	In-kind	\$0.00
Supplemental Meals	In-kind	\$0.00
Trainers	In-kind	\$0.00
f. EVALUATION		
Evaluator salary - \$35/hr	\$42,000 / year	\$84,000
<b>2 YEAR GRAND TOTALS</b>		<b>\$401,000</b>
TOTAL INDIRECT COSTS		\$31,700 (8% of Grand Total)
<b>TOTAL BUDGET</b>		<b>\$432,700</b>

Grace: This is a brief breakdown of our budget. Funding for this program is essential in order to create a successful and beneficial program that has a lasting impact on educational equity and success in Durham County schools.

Personnel: \$175,000 or ~44%

Equipment: \$3,000 or ~1%

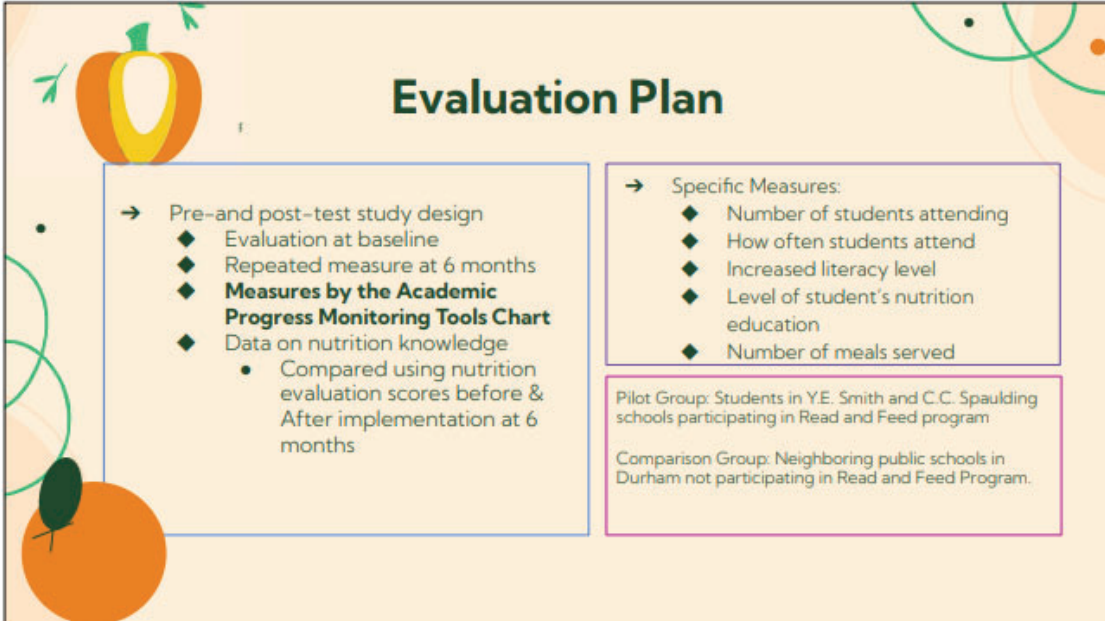
Supplies: \$112,800 or ~28%

Travel: Total \$26,200 or ~6%

Additional Expenses: 0% as we intend to acquire these resources from in kind donations

Evaluation: \$84,000 or ~21%

Indirect costs: additional 10% of total expenses after 2 years (\$401,000) added to final budget.



## Evaluation Plan

- Pre- and post-test study design
  - ◆ Evaluation at baseline
  - ◆ Repeated measure at 6 months
  - ◆ **Measures by the Academic Progress Monitoring Tools Chart**
  - ◆ Data on nutrition knowledge
    - Compared using nutrition evaluation scores before & After implementation at 6 months

- Specific Measures:
  - ◆ Number of students attending
  - ◆ How often students attend
  - ◆ Increased literacy level
  - ◆ Level of student's nutrition education
  - ◆ Number of meals served


Pilot Group: Students in Y.E. Smith and C.C. Spaulding schools participating in Read and Feed program

Comparison Group: Neighboring public schools in Durham not participating in Read and Feed Program.

Julie: With respect to our evaluation plan, we will use an observational pre-and post-test study design to collect data on students participating in the program. Evaluation will begin at baseline and every six months thereafter to assess effectiveness and make necessary changes. Quantitative metrics will look at attendance, meals served, changes in literacy level and changes in nutrition knowledge. Descriptive statistics will include average attendance and days attended. Nutrition knowledge statistics will be evaluated by the mean number of students who had an increase in overall literacy measured by use of an adapted Academic Progress Monitoring Tools Chart (Academic Progress Monitoring Tools Chart, n.d.) and overall school literacy will be measured by 3rd-grade reading scores on end-of-grade testing. Evaluation tools will be tailored to specific developmental stages. Qualitative data will be collected through interviews and surveys given to stakeholders every six months. One-on-one interviews will be conducted with students in grades k –1 to assess changes in knowledge and literacy. Data will assess population reached, effectiveness, fit, and adoption. Key stakeholders will be consulted at each step of the evaluation process. Feedback will be used to shape and mold the program to better fit the needs of the community. Three designated evaluators will lead program evaluation efforts for quality assurance.



## Engagement Plan

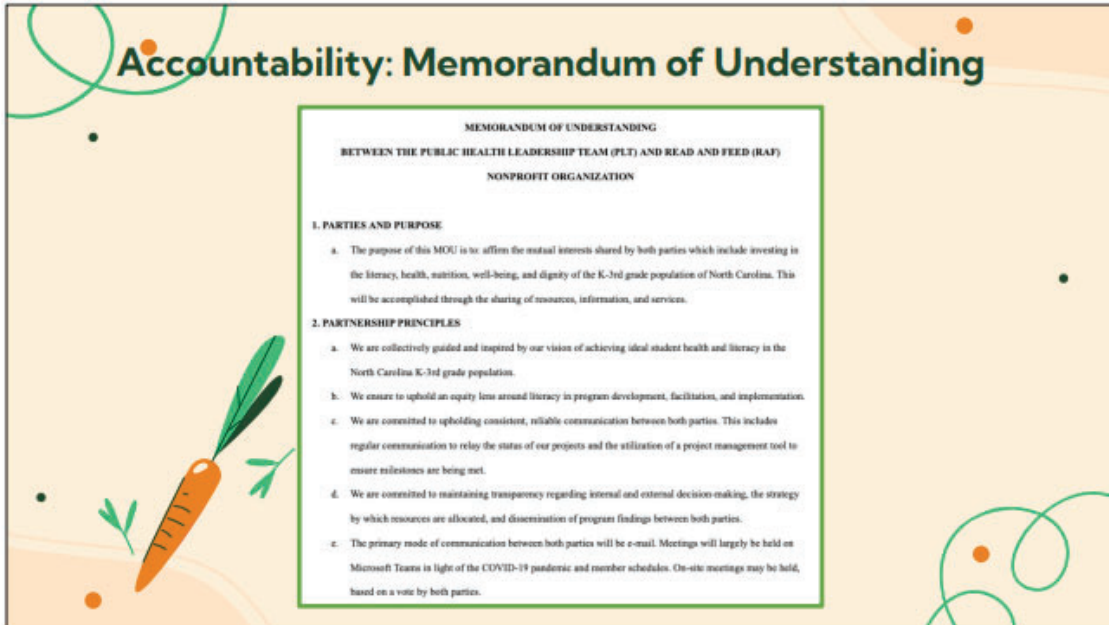


Responsible	Accountable	Supportive	Consulted	Informed
<ul style="list-style-type: none"> <li>Project Leadership Team</li> </ul>	<ul style="list-style-type: none"> <li>Read and Feed</li> <li>School Administrators</li> <li>Parents</li> <li>K-3 Students</li> </ul>	<ul style="list-style-type: none"> <li>End Hunger Durham</li> <li>Black Farmers Association</li> <li>Durham County School Board</li> </ul>	<ul style="list-style-type: none"> <li>Duke Office of Durham and Community Affairs</li> <li>Durham Literacy Center</li> <li>Dietitian &amp; Nutrition Coordinator</li> </ul>	<ul style="list-style-type: none"> <li>North Carolina Department of Agriculture</li> </ul>

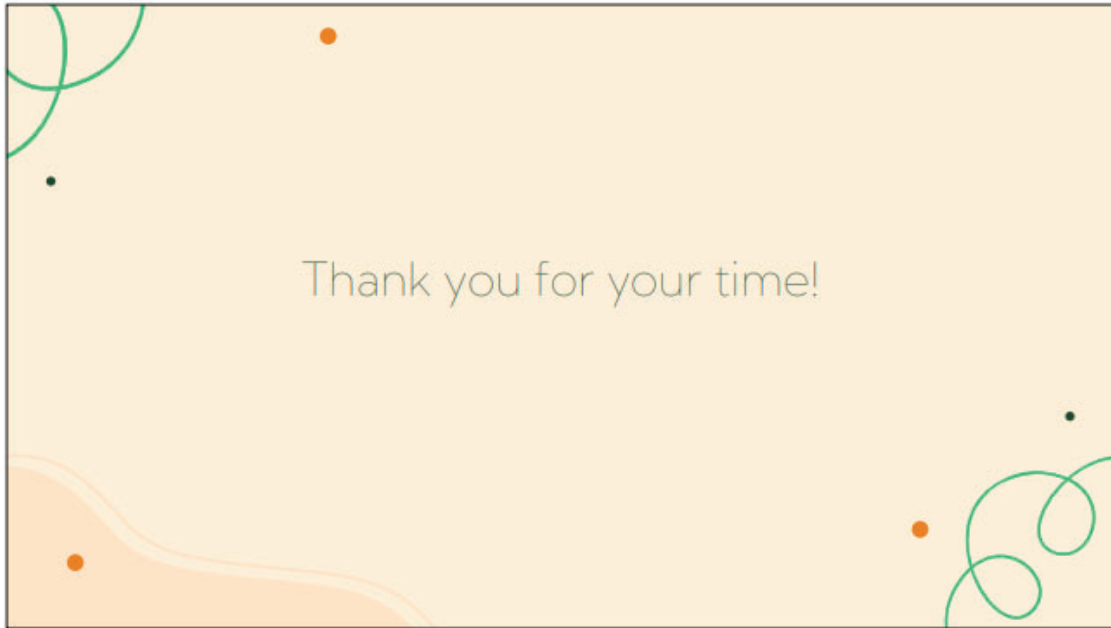
Dylan: We used a RASCI Table to help identify responsibilities among stakeholders by grouping them as either responsible, accountable, supportive, consulted, or informed. This helped identify priority partners and the level of engagement needed for different stakeholders. The Project Leadership Team is ultimately responsible for the program. They will implement the evaluation, engagement and accountability plans to ensure the project is meeting deadlines and operating on budget. The community partners identified as accountable, and in need of the highest levels of engagement, are the Read and Feed Program, School Administrators, parents, and students.



Dylan: Through the community engagement process, it is essential to use different strategies to ensure effective implementation of our program. Three strategies for engagement we will use are quarterly stakeholder meetings, monthly newsletters, and focus groups. Stakeholder meetings will help establish and maintain relationships with existing community organizations to ensure that key stakeholders are reached. This will occur during the program's design, improvement, and sustain phases. Stakeholders can give feedback during the meetings or through surveys available after the meeting. Monthly newsletters will be implemented during the improve and sustain phases of the program. We believe the newsletters will be particularly effective for engaging parents (one of our previously identified "key players") to keep them updated with program happenings, future plans and to celebrate successes along the way. A third strategy includes focus groups, we plan to use this method of engagement during the design and improvement phases of the program. They will provide valuable insight to guide decision-making during project implementation. Data from focus groups will be collected through meeting records and post-meeting surveys.



Miriam: One of our primary stakeholders is Read and Feed, and the MOU is therefore particularly important because it sets the tone for all OTHER stakeholder partnerships. The MOU also serves as an outline for the expectations and goals detailed in the RASCI Table. Our Leadership Team ultimately aims to foster **COLLABORATION** among existing organizations that are dedicated to improving the literacy and future health outcomes of students of color in Durham County while spearheading life-changing, empowering initiatives for this demographic. **We hope you'll support us in this mission!**



Miriam: Thank you so much for your time and for your URGENT consideration of this issue. We welcome any questions you may have.



The slide features a light beige background with decorative green swirls in the top-left and bottom-right corners, and orange dots scattered throughout. The title 'References' is centered at the top in a dark green font with a thin underline. Below the title, four references are listed in a smaller, dark green font, each preceded by a small black dot.

References

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## **APPENDIX B: DYLAN MATHEWS INDIVIDUAL ASSIGNMENTS**

### **APPENDIX B.1 SOCIAL DETERMINANT OF HEALTH ANALYSIS – Durham County, North Carolina**

#### Social Determinant of Health:

The CDC defines social determinants of health as non-medical factors that encompass the environment in which a person lives, works, and plays. Those factors ultimately have a large effect on a person's health outcomes; they include economic policy, social norms, social policy, climate change, racism, political systems (Office of Disease and Health Promotion, 2020). The CDC has grouped 5 domains of social determinants of health. They are Education Access and Quality, Economic Stability, Health Care Access and Quality, Neighborhood and Built Environment, and Social and Community Context (Office of Disease and Health Promotion, 2020). Education Access and Quality focuses on providing high quality education opportunities for school aged children and providing the resources and support to help them do well in school. People who have achieved higher levels of education are more likely to lead longer and healthier lives (Office of Disease and Health Promotion, 2020). With this direct connection between education access, education achievement and health outcomes, it is important to address disparities that exist in education to help achieve healthier lives for everyone.

#### Geographic and Historical Context:

Durham County, North Carolina has a population of 354,167 making it the 6<sup>th</sup> largest county in the state by population. Of those, 306,495 live in the city of Durham itself (Planning Department Current Estimated Population, n.d.). This suggests a very large urban population with outlying rural areas. Overall, the county has a population density of 1,189 people per square mile. The most densely populated area of the county has a population density of 11,786 people per square mile while the least densely populated area has a population density of 74 people per square mile (Design, n.d.). Further indication of an urban, rural divide.

The makeup of race in the county shows a predominantly white population (54%) with significant Black/African American (36.9%) and Hispanic/Latino (13.7%) populations (Durham County, n.d.). The Asian population makes up 5.5% of Durham County (Durham County, n.d.). This is more diverse than North Carolina as a whole where the race distribution is 69.9% White, 22.2% Black/African American, and 10.5% Hispanic/Latino.

Racial inequalities in Durham County are at least partly attributed to redlining and urban renewal policies that were implemented in the 1900s (De, A., & Hunt, H.,2018). Redlining is a practice where neighborhoods are labeled by lenders based on where lending money for homes is considered the riskiest. Maps created in Durham

County during this time showed a clear divide as to which neighborhoods were considered safe for investment and which ones were not. That divide corresponded directly to where most African Americans were living (De, A., & Hunt, H.,2018). Urban renewal is the redevelopment of land in a city where typically a lower income area is targeted. In Durham, one of the largest black neighborhoods was targeted for urban renewal in the 1960's and 1970's. The Hayti neighborhood had over 4,000 homes and 500 businesses removed to make room for the construction of a freeway (De, A., & Hunt, H.,2018).

The Durham County Public School System is committed to providing quality education to its students. The stated priorities of the 2023-2028 strategic plan include providing a safe and healthy environment, fostering academic excellence, recruiting, and retaining exemplary staff, community engagement, and conducting equitable business (Durham Public Schools Strategic Plan 2023–2028, n.d.) In addition to the K-12 schools, Durham County is home to three post-secondary education institutions. Duke University, North Carolina Central University, and Durham Technical Community College offer residents the chance to further their education from getting an associate degree to an advanced level doctorate.

#### Priority Population:

The priority population for this social determinant of health is children enrolled in Durham County Public Schools grades K-12. Durham County Public Schools features an enrollment of 31,333 students across 56 schools. The enrollment by race at all these schools shows differences compared to the overall population in the county. There are fewer White (19.4%) and Asian (2.1%) students by percentage and more Black/African American (38.5%) and Hispanic/Latino (34.3%) by percentage (Durham Public Schools Strategic Plan 2023–2028, n.d.). This would indicate that White and Asian populations in Durham County are disproportionately attending private schools in the area at a higher rate than their Black and Hispanic counterparts. There are 38 private schools in Durham County with an estimated enrollment of 6,757 students. The average annual cost of enrollment for these schools is ~\$10,000. More Durham County K-12 students attend private schools than the North Carolina statewide average (Top 10 Best Private Schools in Durham County 2023-24, n.d.).

#### Measures of Education Access and Quality:

In the Durham County public school system there are clear racial differences in test scores and graduation rates. When comparing test scores by race (see Appendix A), Black and Hispanic groups scored significantly lower than White and Asian groups across all subjects (Durham County community Health Assessment 2020, 2021). This

includes all grades and subjects across Durham County and is consistent across three years of data from 2017-2019. When comparing graduation rates by race (see Appendix B), American Indian and Hispanic cohorts had below average graduation rates compared to their peers in 2017 and 2019 (Durham County community Health Assessment 2020, 2021). Black students graduated at an equal rate compared to their peers (Durham County community Health Assessment 2020, 2021). Additionally, Economically Disadvantaged, Limited English Proficient, and Students with Disabilities cohorts graduated at below average rates (Durham County community Health Assessment 2020, 2021). Like the test scores, these differences are consistent across a three-year span from 2017-2019. The most notable change is a 23% increase in graduation rates for students with limited English proficiency from 2017-2019 (Durham County community Health Assessment 2020, 2021).

Rational/Importance:

With higher levels of education come better paying jobs, access to safer living conditions and higher quality healthcare (Education Is the Key to Better Jobs, n.d.) This all starts in the early stages of child development. With consistent access to high quality education, our youth can be given every opportunity to lead healthy lives for themselves. Efforts to improve this social determinant of health is an investment in the future and will pay huge dividends in the form of a healthy population. There is a clear opportunity for improvement in education outcomes in Durham County. With high racial disparities in education attainment (Durham County community Health Assessment 2020, 2021), we can expect those disparities to also be reflected in health outcomes in the county. As Durham works towards meeting their goals laid out in their 2020 Community Health Assessment, focusing on closing education gaps in the county should carry a high value.

Disciplinary Critique:

It is important for public health leaders to get involved in addressing this social determinant of health because it has the potential to have the biggest impact on the future health of our neighbors, communities, and country. Additionally, when clear disparities exist that impact larger health outcomes, public health leaders have a responsibility to work towards closing those gaps. It is imperative to provide quality education to every young person so that they can be given every opportunity to lead a healthy life. When we create an environment for our children to succeed, we are also addressing the other social determinants of health. With education attainment comes economic stability and better access to healthcare. When we prioritize the success and support of our children, we are creating safer neighborhoods and communities. Supporting quality education, and access to it, might seem like

focusing on one social determinant of health, but the far-reaching effects can affect every aspect of a person's life from where they live to where they work and to where they play.

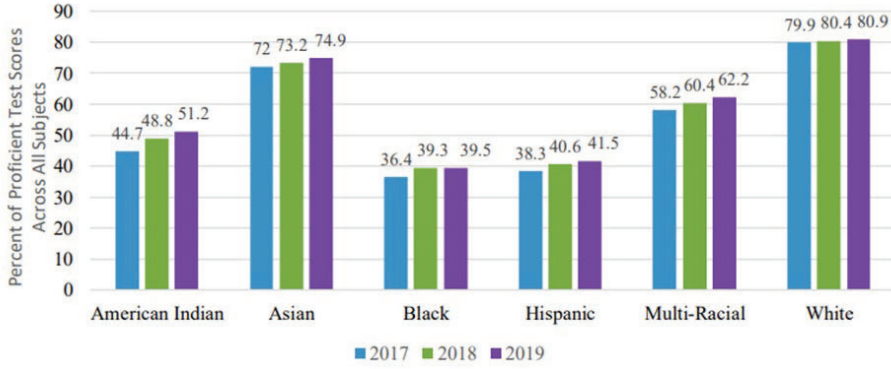
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**APPENDIX B.1.A SOCIAL DETERMINANT OF HEALTH APPENDICES**

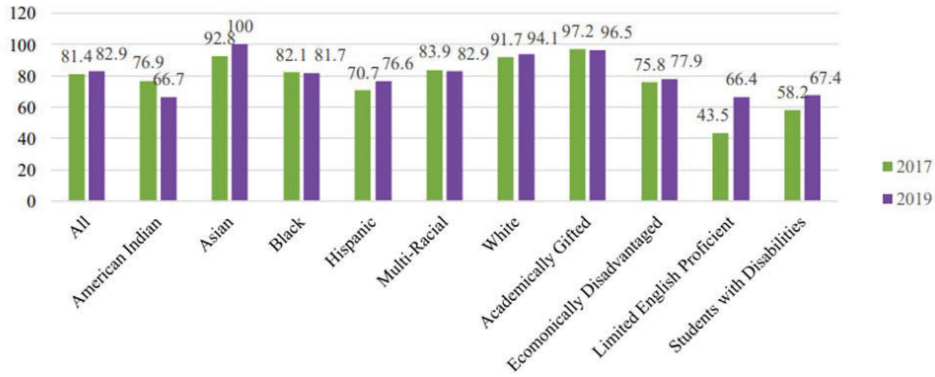
**Appendix A:**

Composite Subgroup Academic Performance Durham Public Schools, 2016-2019<sup>8</sup>



**Appendix B:**

Cohort Graduation Rate Durham Public Schools, 2017 & 2019<sup>8</sup>





## **APPENDIX B.2 COMMUNITY PARTNER ANALYSIS**

### Introduction:

Education Access and Quality focuses on providing high quality education opportunities for school aged children and providing the resources and support to help them do well in school. People who have achieved higher levels of education are more likely to lead longer and healthier lives (Office of Disease Prevention and Health Promotion, 2020). With this direct connection between education access, education achievement and health outcomes, it is important to address disparities that exist in education to help achieve healthier lives for everyone.

Our program aims to address education disparities in Durham County, North Carolina. The target population for this program is students in grades K-3 at Y.E. Smith and C.C. Spaulding Elementary Schools. Third grade reading proficiency is one the most accurate measures of education access and quality (Dotson VM et al, 2015). In 2023, only 39.3% of all third graders in Durham County scored at or above their grade level for reading (DPS, 2023b). At our selected elementary schools, students had the worst overall test scores in the county. 22.7% of students at C.C. Spaulding elementary and 25.2% of students at Y.E. Smith Elementary had proficient test scores across all subjects (DPS, 2023b).

Using the established Read and Feed literacy program, we are seeking to increase reading levels of students at these two schools while providing them with a consistent food source. Our goals will be monitored and measured through the reading level of the 3<sup>rd</sup> grade students at each school. The Read and Feed literacy program operates primarily in Wake County, North Carolina and with individual students. 93% of parents with a child enrolled in Read and Feed report that their child is a stronger reader after participating in the program (RF, n.d.). Our program will make the Read and Feed program available to all K-3 students at our participating schools. Individual participation is optional; we believe that the promise of a free meal 4 days a week in addition to the educational benefits will make this an attractive option for parents.

### Community Partner Mapping:

Using a power analysis grid (see Appendix A) to map out the different stakeholders can give us a sense of how to engage each of them. Our stakeholders with a high level of influence and interest in the project are ones we will want to label as Key Players. As such, there will need to be an open line of communication with them to keep them informed of updates and program progress while offering them the chance to provide input on the project's

direction. The stakeholders identified as Key Players are the Read and Feed Program, School Administrators at each school, and End Hunger Durham.

Stakeholders with a high level of influence but perhaps a low level of interest in our project are characterized as needing to keep their needs met. We will work to keep them abreast of any updates to our program but on a less frequent basis than our Key Players. The stakeholder identified as high influence and low interest is the Durham Public School Board.

Those with a low level of influence but an anticipated high level of interest in our program are stakeholders we will show consideration for their needs. This means keeping them informed with regular project updates and seeking their input on potential improvements to project implementation. Stakeholders meeting this level of high interest with low influence include the Durham Public Schools Nutrition Coordinator and the Registered Dietician. Parents and the K-3 students participating in the program are also included in this group. However, we recognize that our target population comes from a traditionally low-power status which has historically not had as much influence as other stakeholders considered. Parents and students will need to be consulted as much, if not more, than the stakeholders identified as key players. So, while the parents and students are placed in the “show consideration” portion of the power analysis grid; with our commitment to equity, we will consult with them as “key players.”

Stakeholders with a low level of influence and a low level of interest in our program are those that we will keep minimally informed. This means providing them with quarterly status updates. We anticipate the North Carolina Department of Agriculture to have low interest in the program given the smaller scale of our program. While local farmers will have interest in a potential revenue source that our program provides, they will likely not be very concerned with the day-to-day operations of the program.

#### Partner Worldviews:

With a CATWOE analysis, we can take a close look at each stakeholder’s unique perspective and what they bring to our program. One stakeholder with lived experience in our targeted social determinant of health is a student participating in the program. Appendix B shows the circumstances that a student reading below their current grade level may be dealing with. The student’s main concerns may be getting good grades and making friends at school. We can use those motivations to make sure our program is addressing them. One stakeholder without lived experience in our targeted social determinant of health is a local farm that might provide the food for the after-

school meals. Appendix C shows the CATWOE for a local farmer. From this, we can keep in mind the financial motivations of the farmers when implementing our program.

Conclusions:

Questions for the listed stakeholders will aim to gather more information about stakeholder motivations and recommendations for implementation. For instance, we plan to make this program four days a week from Monday-Thursday during school weeks. We need to know if this is too much or too little. Also, whether or not summer school programming would be a desired option. From our agricultural stakeholders, we need to know how feasible it is to sustain a feeding program with local produce as well as the associated costs. We also need to know from the Read and Feed program whether or not this amount of scaling up is feasible for them since they have not targeted full schools before.

One strength of this analysis to highlight to the county commissioners is that the power analysis grid clearly identifies which groups of stakeholders will require different levels of engagement throughout the project. Another strength is the potential for our program to make a profound impact. With the lowest test scores in the county, the two schools selected have the most room for growth which can give us a clear picture of just how effective this programming can be.

One limitation of this analysis is that it assumes the intended interest level for many of the stakeholders. While we can make educated inferences, there is always the possibility that some groups of stakeholders are more or less interested in our program than we initially thought. We will have to adapt our engagement strategy with those stakeholders accordingly. Additionally, we need to keep in mind that there are reasons why our selected schools have poor test scores. There are likely a lot more factors other than nutrition, and after school programming that affect education. While our program hopes to improve education access and quality, we need to remember our program's scope has limitations.

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**APPENDIX B.2.A COMMUNITY PARTNER ANALYSIS APPENDICES**

**Appendix A: Power Analysis Grid**

<p align="center"><i>High Influence/Low Interest</i> <b><u>Meet their needs</u></b></p> <p>Durham Public School Board</p>	<p align="center"><i>High Influence/High Interest</i> <b><u>Key Player</u></b></p> <p>Read and Feed Program School Administrators End Hunger Durham</p>
<p align="center"><i>Low Influence/Low Interest</i> <b><u>Keep informed minimally</u></b></p> <p>North Carolina Department of Agriculture Local Farmers</p>	<p align="center"><i>Low Influence/High Interest</i> <b><u>Show consideration</u></b></p> <p>Parents* K-3 Students* DPS Nutrition Coordinator DPS Registered Dietician</p>

\*While placed in the low influence/high interest quadrant, Parents and K-3 Students will effectively be considered “Key Players” for engagement purposes as discussed above.

**Appendix B: CATWOE Analysis 1**

<b>Customer</b>	Student
<b>Actor</b>	3 <sup>rd</sup> Grade Student reading below grade level at Y.E Smith Elementary
<b>Transformation</b>	To improve my literacy skills and become a better reader.
<b>Worldview</b>	Going to school, making friends, and understanding what is being taught to make good grades.
<b>Owner</b>	Parents, Teachers, Administrators, Read and Feed Tutors
<b>Environment</b>	After-school program and availability, peer support, availability of healthy food
<b>Root Definition:</b> To improve my literacy skills and become a better reader (p) by participating in an after-school program (q) in order to make good grades in school (r).	

**Appendix C: CATWOE Analysis 2**

<b>Customer</b>	Food Distributor
<b>Actor</b>	Local Farmer
<b>Transformation</b>	To provide healthy food for my local community, especially those who are less fortunate
<b>Worldview</b>	Earn a living through feeding the community around me
<b>Owner</b>	North Carolina Department of Agriculture
<b>Environment</b>	Conditions for growing food, economy dictating food prices and demand
To earn a living (p) by growing and selling high quality fruits and vegetables (q) in order feed my community (r).	

## APPENDIX B.3 ENGAGEMENT & ACCOUNTABILITY PLAN

### Engagement & Accountability Plan

#### Statement of Purpose:

To address literacy inequities at Durham County Public Schools, we are aiming to implement an after-school Read and Feed Program that provides students with a balanced meal and tutoring for basic elementary subjects and nutrition education. The Read and Feed program aims to strengthen literacy skills among under-served elementary school children and provide meals in an educational setting (RF, n.d.). Participating K-3 students will be eligible to attend one-hour tutoring sessions up to four times a week at their school and receive meals with every session (RF, n.d.). Proficiency in 3rd-grade reading is a key indicator in academic trajectory, creating an opportunity (*Third Grade Reading Level*, n.d.). Two schools, C.C. Spaulding, and Y.E Smith, were selected for their low 3rd-grade reading proficiency scores (DPS, 2023b). Successful implementation of our program will demand cooperation from a variety of stakeholders in the public school system and around Durham County. Keeping these stakeholders properly informed requires an engagement and accountability plan.

#### Rationale:

Community partner engagement is essential for achieving long-term systemic change in education access and quality because it leverages local knowledge, resources, and stakeholder support to create culturally responsive and effective improvements. The community partners have the best understanding of the context in which they live, work and play. They know the unique needs and challenges of their community. Using this knowledge is incredibly important to designing our education initiative so that it is tailored to the specific needs of students and families. The community partners can also help us mobilize resources, both financial and human, to support implementation of programs. Additionally, collaborating with stakeholders builds a sense of accountability with the program. Members of the community will naturally be more committed to the long-term well-being of their community, so facilitating interactions through stakeholder engagement helps ensure that our attempted reform is sustained over an extended period.

#### Priority Partner:

We used a RASCI Table (Appendix A) to help identify priority partners and the level of engagement needed for different stakeholders. Grouping stakeholders as either responsible, accountable, supportive, consulted, or informed led to us recognizing parents as one of the most important community partners in our program. Parents



of students are key stakeholders towards improving anything related to education access and quality. They are stakeholders who experience this SDoH as members of the community and are involved in addressing it as active participants in their children's lives. On an individual level, the parents have as much influence on their children's education as anyone else. Parents are the ones who can create a supportive learning environment at home. Parents are also the ones making choices about their children's education and setting goals that align with their values. On a community level, parents can advocate for resources that support their child's education. They can engage with school boards, governments, and other community organizations to push for improvements in the education system.

#### Engagement Barriers and Facilitators:

Knowing what barriers exist and other factors that positively impact engagement will help us maximize parent participation in the program. One factor that is essential for participation is effective communication. Establishing clear and open lines of communication with parents makes it easier for parents to stay informed about their children's involvement with the program and what they can be doing to help facilitate program success. Parents who are not well-informed about the benefits of their child's participation are going to be less likely to take an active role.

A factor that we need to be aware of that might negatively influence participation is work and time constraints. We need to recognize that parents have busy schedules and adjust our program to meet the needs of the people it is intended to serve. We cannot be rigid in our scheduling and inclusion of the kids that will be participating. Some families may be able to make four days of participation a week work for them, other families might only be able to participate once a week. The more flexible we are with our families, the more participation we will get.

Another barrier that might negatively impact parent participation is the complexity of any bureaucratic procedures, such as paperwork and required meetings. We need to make this process as simple as possible for the families of students. The less people understand about something, the less likely they are to participate. Our program should aim to have clear procedural outlines for parents to understand upfront what they are signing their child up for. From there, a parent can choose to get involved as much as they want. If we are lowering the barrier for entry to program with simplified procedures, we can expect more participation.

#### Engagement Methods:

Through the community engagement process, it is important to identify and use different strategies to ensure effective implementation of our program. Three strategies for engaging parents include PTA meetings, monthly newsletters and focus groups. PTA meetings are a strategy we can use that already has a structure in place. We will need permission from the PTA groups to have a short amount of dedicated time during their existing meetings to speak to parents. This will occur during the design, improve, and sustain phases of the program. Parents can give feedback during the meeting itself or through surveys that will be available at the meeting.

Using monthly newsletters as an engagement strategy for parents will take place during the improve and sustain portions of the program. As long as the program is running, monthly newsletters should be active, unless our stakeholders give a reason not to. This can be particularly effective for communicating with parents because we can include the types of information they are seeking. Some ideas initially could be to have an upcoming monthly calendar that notifies parents of the next month's schedule and any irregularities they need to be aware of or to highlight program successes along the way. We will need feedback on what version of this newsletter, electronic or hard copy, works best for our parents.

A third engagement strategy for parents is focus groups. We plan to use parent focus groups during the design and improve phases of the program. Focus groups should bring us some particularly insightful information during the design phase that will guide decision making during project implementation. Making sure there are enough focus group options for the parents who want to participate might be challenging as the groups need to find a common meeting time. Data will be collected through meeting records and post-meeting surveys.

#### Engagement Leadership:

Reflecting on the totality of the engagement plan, the project team, school administrators and the Read and Feed program will be leading the way. The project team was chosen because they are the ones ultimately responsible for this project. They are the ones implementing the engagement and accountability plan and ensuring the project is meeting deadlines and operating on budget. The project team will need to make sure that all stakeholders are working cooperatively, something that may not be easy since many of the stakeholders typically don't interact with one another. Addressing any problems that come up through the continuous engagement process is ultimately the responsibility of the project leadership team.

The Read and Feed program and school administrators are included as leaders in the engagement plan because the day-to-day operations of the program essentially run through them. Read and Feed will be using their

basic program structure to run daily activities. Their interactions with arguably the most important stakeholder of the project, the students, will be the most direct and consistent feedback we can get. School administrators are going to have a high-level view of our program and any potential successes or failures that are happening in real time. School administrators also have previous relationships with parents and students that can be leveraged as needed.

Disciplinary Critique:

Articulating accountability through a Memorandum of Understanding (MOU) between the parents (priority partner) and the project leadership team (engagement leader), provides several valuable benefits. It can enhance collaboration, clarify expectations and create a shared commitment to the success of the program. An MOU allows both the parents and the project leadership team to outline their desired outcomes so the two can begin aligning their goals. The MOU can also include performance measurements and indicators to gauge the program's success. With these indicators, accountability for the program can be established as the parents can refer to the MOU if the project team is failing to meet their obligations, and vice versa.

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**APPENDIX B.3.A ENGAGEMENT & ACCOUNTABILITY PLAN APPENDICES**

**Appendix A: RASCI Table**

<b>RASCI Table</b>		
<b>RASCI Levels Who is...</b>	<b>Community Partners</b>	<b>Rationale</b>
<b>Responsible</b> =owns the challenge/ project	<ul style="list-style-type: none"> <li>• Project Leadership Team</li> </ul>	<ul style="list-style-type: none"> <li>• The Project Leadership Team is responsible for coordinating and engaging stakeholders. They will implement the engagement and accountability plan and ensure the project is meeting deadlines and operating on budget.</li> </ul>
<b>Accountable</b> =ultimately answerable for the correct and thorough completion of the deliverable or task, and the one who delegates the work to those <i>responsible</i>	<ul style="list-style-type: none"> <li>• Read and Feed Program</li> <li>• School Administrators</li> <li>• Parents/Caregivers</li> <li>• K-3 Students</li> </ul>	<ul style="list-style-type: none"> <li>• Read and Feed is accountable for using their after-school program structure to implement program activities.</li> <li>• School Administrators are accountable for delegating the correct resources (time, place, school staff) for the program.</li> <li>• Parents and Students are accountable for making sure that K-3 children are signed up, attending, and participating in the program.</li> </ul>
<b>Supportive</b> =can provide resources or can play a supporting role in implementation	<ul style="list-style-type: none"> <li>• End Hunger Durham</li> <li>• Black Farmers Association</li> <li>• Durham County School Board</li> </ul>	<ul style="list-style-type: none"> <li>• End Hunger Durham will facilitate food to school through partnerships with faith-based organizations.</li> <li>• The Black Farmers Association will be a key partner for providing local produce.</li> <li>• The Durham County School Board is providing the infrastructure to run the program</li> </ul>
<b>Consulted</b> =has information and/or capability necessary to complete the work	<ul style="list-style-type: none"> <li>• Duke Office of Durham and Community Affairs</li> <li>• Durham Literacy Center</li> <li>• DPS Nutrition Coordinator</li> <li>• DPS Registered Dietician</li> </ul>	<ul style="list-style-type: none"> <li>• The Community Affairs office will help supply tutors for Read and Feed</li> <li>• The Literacy Center will consult and inform about literacy resources in the county</li> <li>• The Nutrition Coordinator and Dietician will consult on healthy foods to be offered for students</li> </ul>
<b>Informed</b> =must be notified of results, process, and methods, but need not be consulted	<ul style="list-style-type: none"> <li>• North Carolina Department of Agriculture</li> </ul>	<ul style="list-style-type: none"> <li>• A liaison through the Department of Agriculture will remain informed about decisions affecting the farm-to-school food pipeline</li> </ul>

**Appendix B:** Methods, Timing, and Measure Table

Engagement Method	Related Facilitator(s) / Barrier(s)	Timing	Performance measure		
			Description	Data source	Frequency
PTA Meetings	Limited to times the PTA decides. Need to recognize that not all parents participate in PTA.	Design, Improve, Sustain	Update parents on program progress, give opportunity for feedback	Meeting agenda/minutes Parent surveys	Monthly during school year
Monthly newsletters	Making sure the newsletters make it in the hands of the parents. A hard copy version could get lost with the students; an electronic version could be limiting who has access to it.	Improve, Sustain	Newsletters to be sent home with participating kids, updates on progress, calendar for the upcoming month, highlight successes	Feedback requested through surveys	Monthly during school year
Focus Groups	Dedicated times and locations to include participants	Design, Improve	Number of focus groups, Number of times to meet, Community asset mapping	Meeting records Surveys	Bimonthly



## APPENDIX C: JULIE MUNOZ INDIVIDUAL ASSIGNMENTS

### APPENDIX C.1 SOCIAL DETERMINANT OF HEALTH ANALYSIS– Durham County, North Carolina

#### Social Determinants of Health:

Social Determinants of Health Social determinants of health (SDOH) are the non-medical factors influencing health outcomes. The Centers for Disease Control and Prevention defines SDOH as conditions in which individuals are born, grow, work, and live; this encompasses a broader set of forces and systems shaping the conditions of daily life (CDC, 2022). SDOH are known to contribute to health disparities and inequities (Healthy People, 2030). Thus, addressing these factors is essential for reducing longstanding inequities in health, which requires action across sectors (WHO, 2023).

Education Access and Quality is one of the five domains of the social determinants of health outlined by the U.S. Department of Health and Human Services. Under this domain, the focus is providing high-quality educational opportunities for children and adolescents to help them reach their full potential. In the U.S., high educational attainment is strongly associated with lower adult mortality (Hayward et al., 2015). This is attributed to the fact that higher education improves access to better jobs, is associated with extrinsic and intrinsic rewards, allows individuals to acquire valuable information to support healthy lifestyles, allows access to health care that also reduces mortality, and equips individuals with cognitive skills that greater sense of control and human agency (Hayward et al., 2015). However, equitable access to quality education is one of the areas with the most striking disparities based on socioeconomic status (Rattermann et al., 2021).

Education is thought to foster the creation of an individual's "health capital" throughout their life course starting from childhood (Hayward et al., 2015). During this critical developmental period, individuals acquire the physical, cognitive, emotional, social, and economic resources that lay the foundation for health and well-being in later life (Patton et al., 2016). Unfortunately, disparities in educational access and attainment, along with racism in the educational setting, can significantly affect the trajectory of academic achievement for children and adolescents (Trent et al., 2019). These systemic issues have led to increasing economic segregation; as a result, students living in poverty are more likely to be in schools that lack access to the high-quality resources/learning opportunities available to wealthier peers (Rattermann et al., 2021). Individuals who reside and attend school in economically disadvantaged regions are more likely to have teachers with less experience/formal qualifications and other essential resources (materials, funding, etc.) (Rattermann et al., 2021). Additionally, research suggests that stress associated

with living in poverty can influence early brain development, making it difficult for those impacted to perform well in school (ODPHP, 2020; Francis et al., 2018). This reinforces that education is a factor that significantly impacts children in poverty. By increasing access to high-quality and comprehensive education programs, we seek to improve children's future health and invest in the next generation's well-being [see Appendix A] (ODPHP, 2020; Patton et al., 2016).

#### Geographic and Historical Context:

Durham County is one of the most populous counties in North Carolina, with approximately 311,848 residents (DCoPH, 2021). The county has a greater proportion of African American residents (36.5%) than the state (21.5%) or the nation (12.8%) (DCoPH, 2021). There is also a prominent Hispanic or Latino population (13.5%) that is larger than the North Carolina population (9.8%) (DCoPH, 2021). However, there is a stark difference in income among Durham's ethnic/racial minorities compared to two white residents due to educational inequities, which lead to disparate hiring practices and job opportunities (DCoPH, 2021).

Durham's longstanding educational inequities are a result of institutional and systemic racism. Six years after *Brown v. Board of Education*, Durham public schools (DPS) were still segregated based on race due to intentional delays from the Durham County Board of Education (Butchireddygari, 2019). In 1970, the integration process began after the Durham Board of Education was sued by the National Association for the Advancement of Colored People (Butchireddygari, 2019). However, the creation of charter and private schools has led to resegregation. According to recent data, DPS is comprised of 19% white students, 40% African American students, and 34% Hispanic students [see Appendix B] (SCSJ, 2022). Even more concerning, only eight out of the fifty-three regional public schools account for about half of all the white students in the DPS, while about seventeen public schools have a white student population that is less than five percent (Butchireddygari, 2019). Conversely, private schools are comprised of about 63% white students, 18 % African American students, and 5% Hispanic students (Butchireddygari, 2019). These observed differences result from discriminatory zoning practices. The rise of resegregation in Durham illustrates the need to examine these inequities further and develop solutions that will help young people, especially youth of color, reach their full potential.

#### Priority Population:

Given the existing educational inequities within Durham, intervention efforts should be focused on improving access to quality education within the public school district. To help initiate changes early on, students at

the elementary school level should be prioritized. Specifically, the target population should be children in grades k through 3, between the ages of 5 and 9 years of age. The skills and knowledge children acquire during this crucial period serve as the foundation for future academic achievement. Children with poor reading skills are more likely to struggle in school and participate in risky behaviors as adolescents (ODPHP, 2020). However, early intervention to develop reading skills can improve school performance and is linked to healthy behaviors (ODPHP, 2020). The existing racial disproportionalities in the county indicate that children of BIPOC communities, particularly those in socioeconomically disadvantaged households, face a greater risk of not reaching their academic potential. Thus, there will be an emphasis on creating equitable access across all ethnic/racial subgroups and consideration for socioeconomic barriers. Ensuring that all children are given equal access to resources, skills, and information at an early age will help to promote these changes. Initiating changes at these levels allows progression to be monitored through standardized testing that takes place in the third grade. Thus, prioritizing interventions to help children and adolescents do well in school can have long-term benefits for their mental and physical health (ODPHP, 2020).

#### Measure of Problem Scope:

Academic performance weighs heavily on an individual's future. Although standardized test scores may not accurately reflect a student's abilities, they are often used to make significant life decisions, such as course placement, grade promotion, and identifying academic or intellectual giftedness (ODPHP, 2020). Thus, low test scores can have detrimental effects on a student's academic opportunities. Nationwide, significant disparities in reading skills are recorded among 4th-graders by race/ethnicity, school type, and eligibility for the National School Lunch Program. Similar statistics have been documented within North Carolina (ODPHP, 2020). In 2022, almost half of the white students (44%) scored at or above proficient on the NAEP 4th grade reading exam, while less than a quarter of multiracial (22%), Hispanic (21%), and Black (17%) students scored as high as their peers [see Appendix D] (My Future NC, 2022b). Additionally, economically disadvantaged students in the county were less likely to score at or above proficient than those who were not [see Appendix D] (My Future NC, 2022b). Students who fall behind academically have a greater likelihood of having attendance issues, experiencing behavior struggles, and dropping out of school (SCSJ, 2022). Within DPS, Black students are 7.9 times more likely than White students to receive a short-term suspension [see Appendix C] (SCSJ, 2022). Additionally, White students in grades 3-8 were 3.4 times more likely to earn college-and-career-ready scores on final exams than African American students [see Appendix C] ((My Future NC, 2022a; SCSJ, 2022).

### Rationale/Importance:

Prioritizing education access and quality should be at the forefront of Durham's agenda, as it is a longstanding issue that has been overlooked. According to the recent Durham County Health Assessment (CHA), respondents identified discrimination and inequities as the top issues adversely affecting their quality of life (ODPHP, 2020). Discrimination was reported the most in educational settings, which calls for a more inclusive and accepting environment (ODPHP, 2020). Respondents also emphasized the need for education system improvements, making it one of the top concerns that must be addressed to support the community.

To provide the best quality education, we must take a comprehensive approach that considers other contributing factors. In Durham, the most pressing concern is nutrition and food insecurity. Food insufficiency is a well-documented issue known to affect a child's learning ability (Taras, 2005). This directly impacts DPS, as 63% of school meals served to children are subsidized through the free and reduced meal program--with most students qualifying for free meals [see Appendix E] (DCoPH, 2021). Research has shown the positive impacts of school breakfast programs on improved academic performance and cognitive functioning among undernourished populations (Taras, 2005). Thus, we must acknowledge the significance of addressing this SDOH and its potential to have a positive impact on future generations. [see Appendix A].

### Disciplinary critique (Nutrition specific):

Given the numerous factors contributing to an individual's educational experience, a multidisciplinary approach is needed. Thus, the involvement of a nutritionist is essential if we aim to improve educational access and quality. As part of ensuring equity, there needs to be consideration for each child's nourishment. In 2020, 20% of children under 18 reported food insecurity in Durham [Appendix E] (DCoPH, 2021). We can improve children's academic performance countywide by addressing the inequities in food access and ensuring proper nutrition. As the CHA outlines, a critical aspect of ensuring Durham families' health and wellness is access to nutritious daily meals. By adopting more efficient practices within the school system, we can help to mitigate these expenses and reduce the financial burdens Durham County faces.

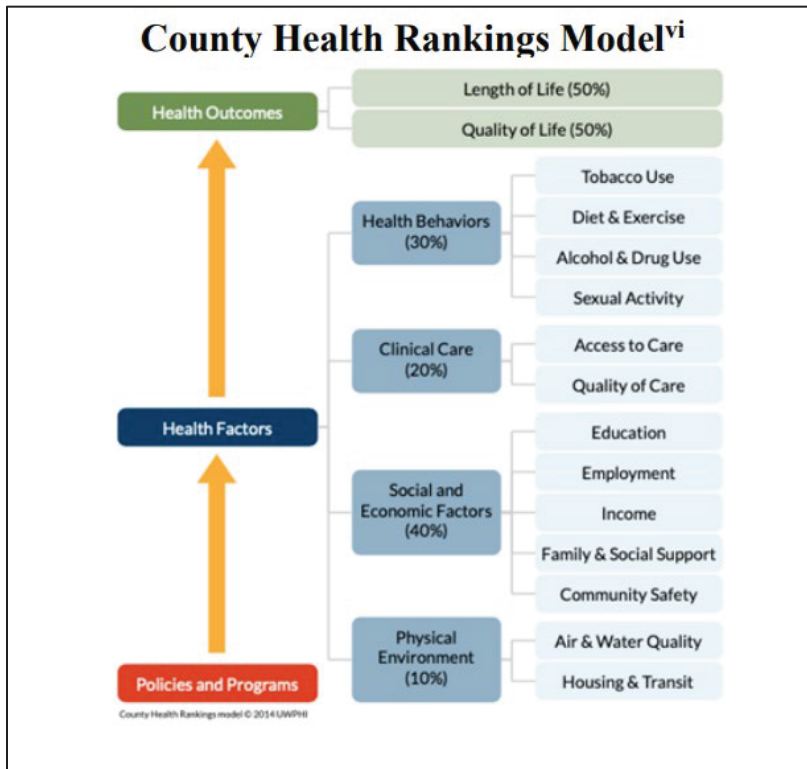
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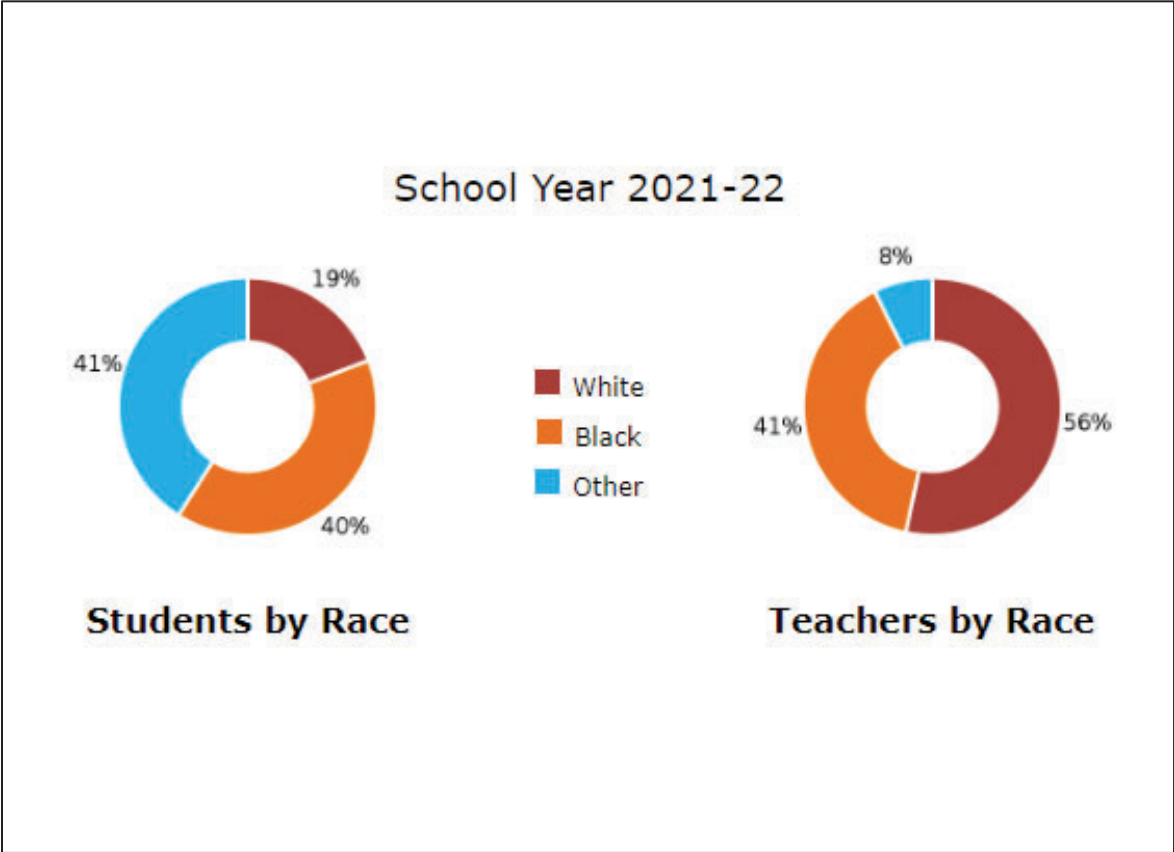
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APPENDIX C.1.A SOCIAL DETERMINANT OF HEALTH APPENDICES

Appendix A. Durham Population Health Model

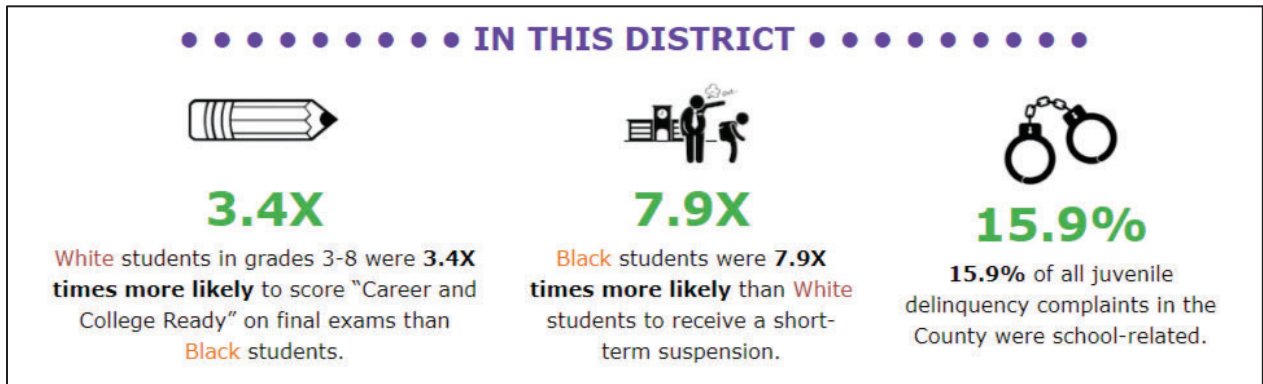


**Appendix B.** Student vs. School Staff Demographic

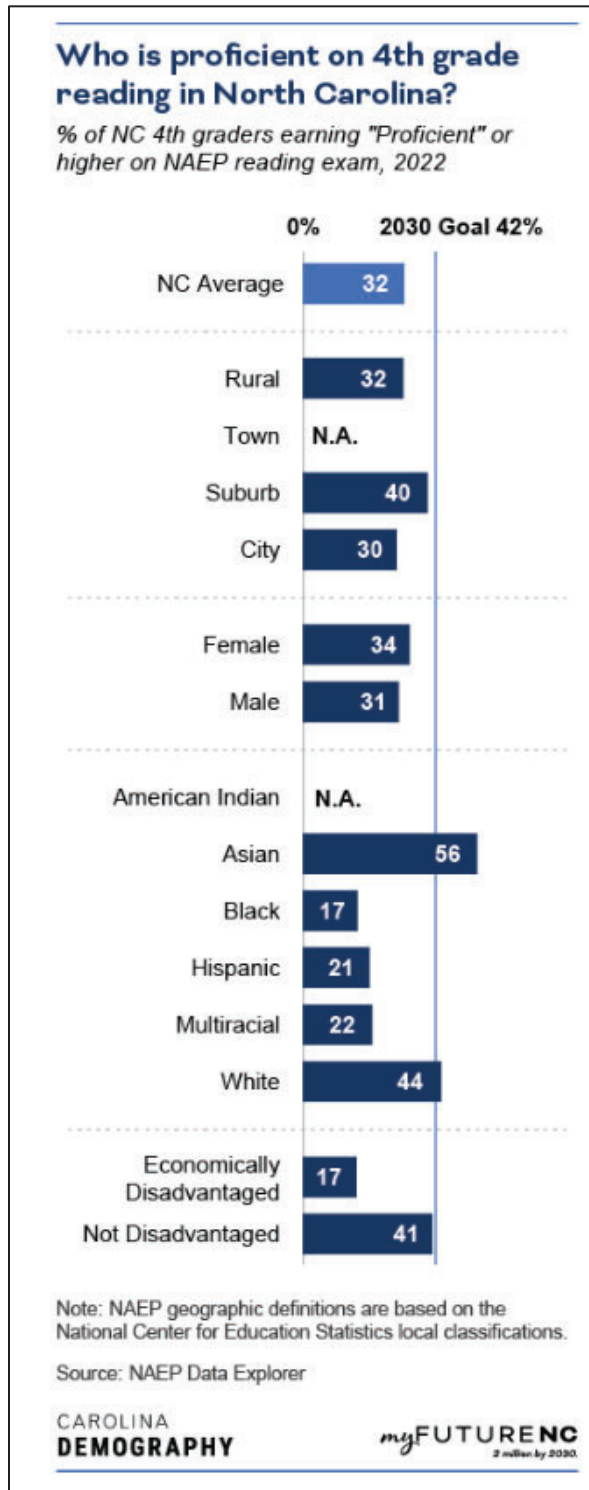




Appendix C. Racial Inequity Statistics in Durham County School District



Appendix D. 4<sup>th</sup> Grade Reading Proficiency Percentages by Demographics



Appendix E. Food Bank of Central and Northern Carolina Food Insecurity Projections

## 2020-2021 DURHAM COUNTY PROFILE

In the 34 counties served by the Food Bank of Central & Eastern North Carolina, the impact of the COVID-19 pandemic means nearly 600,000 people may face hunger in 2021. COVID-19 is impacting communities and populations of people that were already made vulnerable by inequitable policies and structures. Food insecurity has emerged as a defined reality for hundreds of thousands of Americans who cannot keep food on the table. The Food Bank works every day to nourish people while building solutions to hunger through programming and partnerships, empowering North Carolina communities to thrive.

### THE NEED County population<sup>1</sup>: 311,848

Food insecurity <sup>1</sup>		Hunger <sup>2</sup>	
Number of people who are food insecure	42,890	Number of children receiving free/reduced school meals	21,242
Percentage of people who are food insecure	14%	Percentage of children receiving free/reduced school meals	63%
Children under 18 who are food insecure	13,270	Unemployment <sup>4</sup>	
Percentage of children under 18 who are food insecure	20%	Percentage unemployment June 2021	4.3%
Individuals over 65 who are living below the poverty level <sup>3</sup>	8,955		



**14%**

42,890 people are food insecure in Durham County.



**20%**

13,270 children under 18 are food insecure in Durham County.



**63%**

21,242 children receiving free/reduced school meals in Durham County.

### ADDRESSING NEEDS

Total lbs. of food distributed by the Food Bank in 2020-2021	138 million lbs.
Total meals provided in this county	7,741,344 meals
Total lbs. of food distributed in this county	9,289,613 lbs.

### TOP AGENCIES

Boys and Girls Club of Durham  
Durham Exchange Club  
Durham Rescue Mission

Freedom House Durham  
Urban Ministries



<sup>1</sup>Feeding America 2021 Food Insecurity Projections  
<sup>2</sup>NC Department of Health & Human Services, County Aging Profiles 2019  
<sup>3</sup>No Kid Hungry County Profiles, NC Department of Public Instruction  
<sup>4</sup>NC Civilian Labor Force Estimates June 2021

## APPENDIX C.2 NUTRITION PROGRAM ANALYSIS

### Introduction:

Education Access and Quality is defined as a social determinant of health (CDC, 2021). A strong relationship between health and education exists, where academic performance affects future educational attainment and income, ultimately impacting one's health and quality of life (Florence, 2008). Providing children access to high-quality education requires a holistic approach, as numerous factors contribute to an educational experience. Nutrition and dietary behaviors are vital factors to consider when evaluating education in early years, as it is crucial in childhood development. Thus, a multi-pronged intervention is needed to help provide children with equal opportunities.

The Read to Feed program aims to strengthen literacy skills among under-served elementary school children and provide meals in a nurturing neighborhood environment [see Appendix A] (RF, n.d.). Implementation of this program within DPS would help address the issues related to inequities in food access and low literacy levels. Of the children who have participated in Read and Feed, 93% of parents say their child is a stronger reader (RF, n.d.). They also provide over 39,000 books annually to children in the program. Including nutritional aspects is crucial to drawing more children into the afterschool programs and maintaining participation (FRAC, 2021). In Wake County, Read and Feed serves approximately 630 children each year this amounts to about 13,000 meals (RF, n.d.). The effectiveness of this program in neighboring counties demonstrates its promise for students in Durham.

Durham County's Youth Children Task Force recommends expanding educational and support services in grades kindergarten through third so Durham's children meet or exceed the state average for reading and math proficiency (DCCFP, 2017). Thus, to help initiate changes early on, the target population for this proposed intervention will be children in grades K through 3 enrolled in Durham Public School District (DPS). The initial focus of the intervention will be on the schools with the lowest test score averages within the county to target those most in need and pilot the intervention before expanding county-wide.

Selected students would attend one-hour tutoring sessions three times a week at their schools and receive meals with every visit (RF, n.d.). After designated mealtime, children spend 30-40 minutes working with a tutor on their reading and math skills (RF, n.d.). Nutrition education will be offered in addition to the core curriculum covered on state exams. Volunteers will be recruited through partnerships with community organizations to serve as Tutors. Community members and parents are also welcome to volunteer as tutors, pending background checks.

Tutors will be placed at each facility and will undergo training from designated project personnel from the Read and Feed program to ensure they are competent and can adequately assist students. Meals will be covered through grant funding. Local restaurants, farmers, and other organizational sponsors will help supplement food items and resources needed for meals. Trained staff and volunteers to track participation and attendance for evaluation purposes. Staff will also be required to supervise during the after-school program.

#### Evidence Based Outcomes:

The Read and Feed program intervention will aim to reach specific outcomes throughout its implementation. Short-term and long-term outcomes have been established. Our short-term impact of the program is to increase the number of children in Durham with access to quality nutrition and education. By six months of implementing the program, at least 100 students from the two participating schools will be receiving nutrition education services through enrollment in the program. The long-term impact of this program is to see an increase in nutrition knowledge among students who participate in the program. Our objective is that at least 40% of the students from CC Spaulding and Y.E. Smith schools, who participated in the Read and Feed program, will see an improvement in their nutrition knowledge by the end of the second year.

#### Evidence Based Strategies and Activities:

Within the Durham County School District, there are 31 elementary schools. The program will be piloted within the two elementary schools with the lowest test score averages within DPS to target those most in need. Comparison of overall subgroup proficiency for the 2022-23 school year by school revealed C.C. Spaulding Elementary (22.7%) and Y.E. Smith Elementary (25.2%) [Appendix B] had the lowest percent of proficient test scores across all subjects for all students (DPS, 2023b). The target population for this proposed intervention will be children in grades K through 3, including approximately 323 students [Appendix C] (DPS, 2023a).

We intend to collaborate with local education agencies (LEAs), PTA, and the school board to implement an adapted Read and Feed program version. We will share the results of previous pilot programs in Wake County and explain how the program can improve food access, nutrition education, and literacy among children while providing essential nourishment to more students. Our first step is to work with these partners to gather data and come to an agreement on the two schools within the district with the greatest need for these resources based on the number of children eligible for free or reduced lunch and standardized test scores. We will then visit all eligible campuses in the district to distribute materials and infographics on the program, including data, why it is essential, and how to

enroll. We will hold school and community events to inform parents and families of enrollment benefits and help reduce any associated stigma. Additionally, we will seek families in the community eligible for programs to assist and encourage enrollment. Read and Feed personnel will facilitate all staff, tutor, and volunteer training. We will also train existing educators and faculty in the district to collect enrollment and participation data for evaluation purposes.

Partnerships with DPS nutrition services will be established to help determine the project material standards and execution. We will seek a proportion of the resources and meals from the local farmer's market, End Hunger Durham, and restaurants. Most meals will come from partnerships with Inter-Faith Food Shuttle, a local nonprofit organization that provides low-cost meals. Any remaining meals and associated resources not provided by partnerships will be covered through grant funding.

This program addresses various socio-ecological levels, including the individual, community, and institutional. At the individual level, free meals and tutoring will be provided to low-income children. At the community level, events will be organized in common areas to promote the program, educate community members, and partner with community leaders to raise awareness and financial support. At the institutional level, the program will select participating schools based on outlined criteria and determine the number of children enrolled in the Read and Feed program. Additionally, educators and faculty will be trained to help facilitate programs and collect data on student participation at the district level.

#### Community partners:

Key stakeholders include the Read and Feed organization, Durham City Council, Durham County School board, DPS nutrition services, individual school administrators, LEAs, DPS faculty, parents, our priority population children, local businesses, farmers market, End Hunger Durham, and community leaders. We will engage these stakeholders by inviting them to be part of each step of the process. The school board will be asked to approve the participation of the schools selected for the pilot. LEAs will be active participants enrolling children in the program. Parents and our priority population will be involved in planning to ensure this intervention is needed in the community and implementation as volunteers for canvassing. In evaluation, they will participate in surveys to assess attitudes toward the program and potential improvement areas. Community leaders will be invited to volunteer to spread the word and gather support for this program. Local businesses, organizations, and restaurants will be engaged through flyers and invitations to donate and be part of fundraising measures.

Budget:

For funding for our project, we will seek to obtain funds through the form of grants, public appropriations, and anchor institutions. Grants from federal or state organizations will help get our project up and running, as we have a specific initiative that some organizations might support. The National Institute for Food and Agriculture offers various specific funding opportunities that align with our project goals. Additionally, public appropriations will be a funding source we intend to partner with local organizations, restaurants, and farmers. We intend to supplement additional funding for meals through grants. Anchor institutions might be another plausible funding source as they make financial decisions based on what might best help the well-being and health of the community and helping to address nutritional needs among children, they may be inclined to make contributions.

**See appendix D and E for budget and budget justification.**

Conclusion:

The proposed program has both limitations and advantages. An advantage is that it has the potential to provide a solid foundation and establish healthy habits that will serve children in the future. Additionally, the program emphasizes creating equitable access across all ethnic/racial subgroups and considering socioeconomic barriers. This approach streamlines addressing the county's low literacy rates and food insufficiency. If successful, the program can extend into the summer to help address food insufficiency during the months those from food-insecure households most need access to meals. However, the program's limitations include a high dependency on in-kind contributions and resources for sustainability. Thus, the need for community buy-in is high. Given the need for resources and funding, we can only pilot the program in two schools. While this seeks to address those most in need of these resources, it also limits the program's reach in its initial stages.

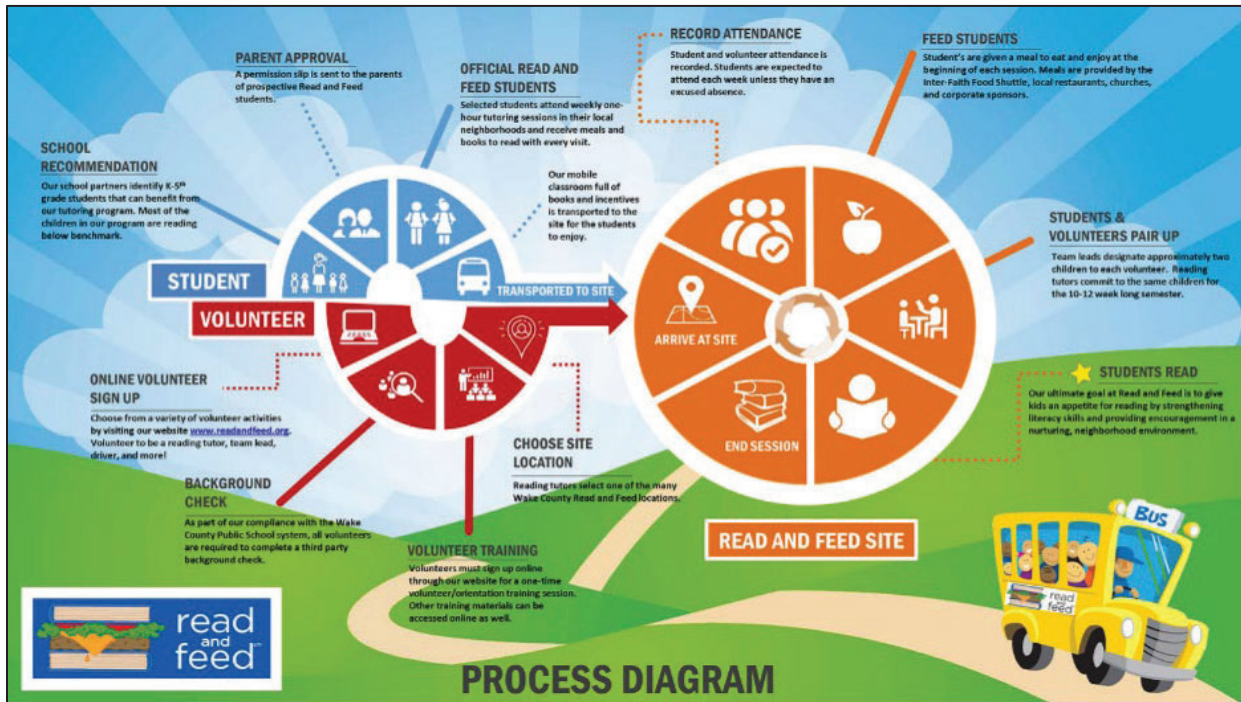
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## APPENDIX C.2.A NUTRITION PROGRAM ANALYSIS APPENDICES

### Appendix A. Read and Feed Program Diagram



Appendix B. Overall Subgroup Proficiency Comparison – Test Scores Across All Subjects

**3 COMPOSITE SCORE COMPARISONS BY SUBGROUP (BY SCHOOL)**

The table below provides the overall subgroup proficiency for the 2022-23 school year by school. The numbers represent the percent of proficient test scores across all subjects for each subgroup of students at each school.

	ALL	Asian	Black	Hispanic	Multi-racial	White	Academically Gifted	Economically Disadvantaged	Limited English Proficient	Students with Disabilities
Ignite Online Academy	36.5	*	31.5	26.3	41.5	64.2	86.2	23.6	8.0	13.0
Bethesda Elementary	38.6	89.5	38.2	30.4	45.5	69.2	>95	30.5	24.1	13.1
Burton Elementary	58.9	*	56.2	60.2	*	*	>95	51.1	47.1	30.2
C C Spaulding Elementary	22.7	*	20.9	20.4	*	*	*	17.8	16.7	9.6
Club Boulevard Elementary	63.1	*	44.0	36.7	85.7	>95	>95	36.4	16.5	26.6
Creekside Elementary	46.5	33.3	25.9	22.6	62.5	78.4	>95	28.9	13.0	8.5
E K Powe Elementary	52.6	*	36.4	25.3	76.7	84.9	>95	33.3	11.1	26.7
Easley Elementary	76.6	*	60.6	51.6	>95	92.8	>95	53.4	15.6	36.0
Eastway Elementary	39.6	*	34.5	45.8	25.0	*	>95	39.4	34.2	10.2
Eno Valley Elementary	41.8	69.2	37.8	39.1	38.2	71.4	>95	35.5	29.5	23.6
Fayetteville Street Elementary	41.8	*	40.9	42.6	*	57.1	93.8	40.9	28.0	21.2
Forest View Elementary	45.5	56.1	24.2	20.1	61.5	80.1	>95	21.4	16.4	33.6
George Watts Elementary	71.6	*	31.3	35.1	81.8	92.0	>95	33.3	27.5	47.3
Glenn Elementary	45.5	*	45.7	44.1	45.0	72.7	93.0	47.6	32.2	10.6
Hillandale Elementary	43.0	78.6	37.3	36.2	27.8	71.7	94.7	36.8	17.8	33.3
Holt Elementary	42.7	*	45.6	37.7	59.5	78.3	>95	40.2	20.8	23.9
Hope Valley Elementary	44.5	10.0	37.6	35.4	36.8	83.1	>95	32.6	19.3	18.2
Lakewood Elementary	31.3	36.4	22.0	24.6	41.9	91.9	>95	21.8	16.1	12.2
Lyons Farm Elementary	68.7	63.2	45.8	54.5	52.6	88.1	>95	39.7	30.6	36.7
Mangum Elementary	69.7	*	80.5	46.0	77.3	71.8	>95	57.1	26.7	43.1
Merrick-Moore Elementary	49.9	*	56.5	44.7	*	72.7	>95	46.1	30.5	24.6
Morehead Montessori	71.8	*	50.0	29.0	90.9	90.2	>95	37.8	46.7	42.9
Oak Grove Elementary	44.7	*	43.1	46.4	32.0	53.3	94.9	42.9	33.6	21.4
Parkwood Elementary	39.4	*	33.1	34.2	27.8	81.9	94.4	31.7	21.9	15.2
Pearson Elementary	80.4	84.6	65.3	70.8	85.8	93.1	>95	60.8	56.3	35.2
R N Harris Elementary	68.6	*	62.9	75.5	*	*	>95	63.4	55.2	26.8
Sandy Ridge Elementary	58.7	*	52.0	63.4	69.2	80.0	>95	56.5	47.6	16.0
Southwest Elementary	57.2	71.4	43.9	54.2	59.5	85.0	>95	42.5	32.0	34.0
Spring Valley Elementary	50.8	77.8	48.5	45.2	58.1	64.9	>95	41.2	33.0	16.7
W G Pearson Elementary	42.2	*	35.5	51.6	48.1	*	93.5	39.7	49.4	15.3
Y E Smith Elementary	25.2	23.1	19.1	25.4	*	*	76.9	25.7	15.2	18.4
Little River K-8 School	55.4	*	41.0	50.9	53.3	67.2	94.2	45.1	21.0	18.3
Brogden Middle	33.5	57.6	23.9	27.5	34.8	86.6	>95	26.3	13.0	14.2
George L Carrington Middle	44.1	78.1	38.9	37.8	47.1	77.2	>95	36.5	13.3	18.0
James E Shepard Middle	51.1	*	48.0	55.3	48.0	75.0	>95	45.7	25.0	22.1
Lakewood Montessori Middle	80.6	*	61.9	55.8	>95	>95	>95	53.1	19.1	51.0
Lowe's Grove Middle	32.4	45.5	28.7	31.1	33.3	66.3	90.6	29.5	16.5	17.4
Lucas Middle	38.0	*	31.9	30.1	75.6	63.7	90.7	32.1	13.5	26.4
Neal Middle	30.1	40.7	30.9	26.1	37.5	56.5	85.0	26.2	8.8	14.5
Rogers-Herr Middle	68.0	82.5	60.8	49.1	79.7	94.7	>95	49.3	19.5	30.0
Sherwood Githens Middle	51.4	50.0	41.2	33.3	60.6	83.7	>95	35.6	13.1	16.2
Durham School of the Arts	74.9	92.4	60.9	60.3	90.1	>95	>95	57.6	33.2	34.2
Lakeview School	<5	*	<5	<5	<5	*	*	<5	<5	<5
The School for Creative Studies	45.6	*	40.6	39.4	67.9	69.2	92.4	34.6	11.0	18.8
C E Jordan High	46.8	53.8	35.5	26.7	55.8	80.1	92.6	25.8	5.0	19.3
City of Medicine Academy	67.9	90.0	66.2	63.2	*	92.3	90.0	60.8	42.2	20.0
Durham's Performance Learning Center	7.7	*	8.3	6.5	*	*	*	9.5	<5	<5
Durham School of Technology	70.9	*	68.2	71.7	91.7	*	91.9	61.9	33.3	72.0
Hillside High	39.1	61.5	37.0	37.8	50.0	70.3	86.4	34.5	11.6	11.2
J D Clement Early College HS	86.6	>95	81.6	91.0	>95	92.3	>95	85.4	*	50.0
Middle College HS @ DTCC	82.1	*	75.0	90.0	*	*	*	75.0	*	*
Northern High	25.7	54.5	19.5	21.8	19.7	48.9	68.5	20.9	8.3	13.7
Riverside High	42.4	73.0	26.3	23.1	50.8	86.7	>95	24.3	5.1	19.5
Southern School of Energy and Sustainability	26.3	*	22.7	25.7	51.0	54.1	75.0	24.7	10.3	6.5

Appendix C. Total Student Enrollment by Grade – Durham Public School District

Membership by Grade 2022-2023 Month One																			
School	Code	PK	KI	01	02	03	04	05	06	07	08	09	10	11	12	XG	St/Tr	Total	
Bethesda	320304		95	130	94	106	93	99									617	617	
Brogden	320306								239	232	271						742	742	
Burton	320308	10	46	51	50	50	47	39									283	283	
Clement	320309											110	105	83	97		395	395	
Eastway	320310	12	55	75	60	63	69	68									390	390	
Jordan	320312											623	566	446	398	7	2,033	2,040	
Easley	320313		76	92	73	72	70	67									450	450	
Creative Studies	320314								86	86	93	78	77	61	59		540	540	
Eno Valley	320315	38	90	124	83	70	81	94									542	542	
Carrington	320316								222	255	278						755	755	
City of Med	320317											95	89	75	83	7	342	349	
Club Blvd	320318		61	65	66	64	66	65									387	387	
Creekside	320319		94	87	87	94	100	81									543	543	
Glenn	320320		86	110	84	91	89	103									563	563	
FLC	320322											49	42	46	18		155	155	
DSA	320323								220	209	211	290	224	287	264		1,705	1,705	
Hilandale	320324	22	92	91	85	75	78	96									517	517	
Hillside	320325											481	389	316	321	19	1,507	1,526	
Hope Valley	320327		100	114	90	114	114	95									627	627	
Holt	320328	23	88	138	100	92	108	93									619	619	
Forest View	320332		98	107	103	109	103	120									640	640	
Shepard	320338								129	117	135						381	381	
Lakewood	320339	20	64	62	64	66	58	54									368	368	
Little River	320340	20	46	49	27	43	67	45	25	26	28						356	356	
Lakeview	320341									5	4	18	13	13	3		56	56	
Lakewood Middle	320342								106	102	95						303	303	
Lucas	320343								125	111	135						371	371	
Fayetteville St	320344	10	40	37	44	31	30	42									224	224	
Lowe's Grove	320346								210	241	249						700	700	
Lyons Farm	320349	21	103	83	63	71	58	55									433	433	
Watts	320347	43	49	43	46	41	47	46									272	272	
Mangum	320348	21	52	51	47	41	55	44									290	290	
Merrick-Moore	320352		85	97	93	85	77	103									540	540	
Midd College	320353												47	59			106	106	
Morehead	320354	29	40	29	35	31	34	29									198	198	
Neal	320355								248	279	262						789	789	
Northern	320356											400	352	293	260	3	1,305	1,308	
Oak Grove	320360	31	64	76	72	81	85	71									449	449	
Parkwood	320362	20	100	117	100	85	104	78									584	584	
Powe	320363		57	72	61	71	74	48									383	383	
Pearsontown	320364	27	107	107	107	110	134	135									700	700	
Riverside	320365											597	506	382	324	3	1,809	1,812	
Githens	320366								265	259	239						763	763	
R N Harris	320367	10	42	46	51	45	53	46									283	283	
Southern	320368											521	323	237	201	1	1,282	1,283	
Sandy Ridge	320369	20	78	79	67	74	79	88									465	465	
Rogers-Herr	320370								225	210	208						643	643	
Southwest	320372	15	102	110	130	109	97	104									652	652	
Spaulding	320374	37	32	40	33	35	38	32									210	210	
Spring Valley	320376	35	87	86	73	96	86	82									510	510	
Pearson Elem	320388	24	53	57	38	62	54	55									319	319	
Smith	320400	17	40	49	49	45	41	46									270	270	
IGNITE Academy	320401		11	21	25	26	29	42	39	45	51	58	46	47	27		467	467	
DST	320701											62	74	68	47		251	251	
<b>Totals</b>			505	2,233	2,495	2,200	2,248	2,318	2,265	2,139	2,177	2,259	3,382	2,806	2,401	2,161	40	31,084	31,124

PK not included in any totals

Source: PowerSchool

PSR01 - Membership by Grade 10/12/2022 12:14 AM



Appendix D. Budget Outline

BUDGET					
<b>DIRECT COSTS</b>					
<b>a. PERSONNEL</b>	<b>Months</b>	<b>%FTE</b>	<b>Salary</b>	<b>Fringe</b>	<b>Total</b>
Project Director	24	25%	\$50,000	\$6,250	\$31,250 x2 = \$62,500
Project Coordinator	24	100%	\$45,000	\$11,250	\$56,250 x2= \$112,500
<b>Total Personnel</b>					<b>\$175,000</b>
<b>b. EQUIPMENT</b>				<b>Expense</b>	<b>Total</b>
Cell Phone Reimbursement	24			\$50/month x 24 months	\$1,200
2 laptop computer				\$2000 each	\$2,000
<b>Total Equipment</b>					<b>\$3,000</b>
<b>c. SUPPLIES</b>				<b>Expense</b>	<b>Total</b>
Educational Materials (paper, pens, pencils, calculators, etc.)	24			2,000 x 24	\$48,000
Meals	24			2,700 x 24	\$64,800
<b>Total Supplies</b>					<b>\$112,800</b>
<b>d. TRAVEL</b>				<b>Expense</b>	<b>Total</b>
Car (gas) per diem 65.5 cents per mile (20,000 miles)				13,100 per year	\$26,200
<b>Total Travel</b>					<b>\$26,200</b>
<b>e. OTHER EXPENSES</b>				<b>Expense</b>	<b>Total</b>
Printing				In kind	\$0
Tutors/volunteer				In kind	\$0
Books				In kind	\$0
Supplemental Meals				In kind	\$0
Trainers				In kind	\$0
<b>Total Other</b>					<b>\$0</b>
<b>f. EVALUATION</b>				<b>Expense</b>	<b>Total</b>
Evaluator Salary - \$35/hr ea for three PhD Student Consultants (1,200 work hours total)	24		\$42,000		\$84,000
<b>TOTAL COMBINED BUDGET (YEAR 1 &amp; 2)</b>					
<b>2 YEAR GRAND TOTALS</b>					<b>\$401,000</b>
<b>TOTAL INDIRECT COSTS</b>					<b>\$31,700</b>
<b>TOTAL BUDGET</b>					<b>\$432,700</b>

## Appendix E. Budget Justification

### a. Personnel:

**Project Director:** this will be a part-time (50% FTE) position for 12 months each year. This position will be essential in the implementation process of the program and work alongside key stakeholders during the process. They will be brought on board prior to program implementation during the planning process and will be responsible for researching, planning, developing, and implementing Read and Feed changes alongside the project coordinator and volunteers as well as delegating tasks to each.

**\$50,000/12 months x 50% = 25,000 + 25% fringe benefits of \$6,250 = \$62,500**

**Project Coordinator:** this will be a full-time position for 12 months each year. This position will work daily to coordinate the implementation of the program as well as delegate and manage tasks given to the volunteers. They will be responsible for designing marketing materials, helping to implement Read and Feed changes in schools, and a variety of other tasks as stated in our activities and outcomes.

**\$45,000/12 months + 25% fringe benefits of \$11,250 = \$56,250**

**Volunteers:** Their responsibilities will vary from tutoring, canvassing, and other tasks as needed/assigned and will aid in the start-up process as well. They will offer their services in-kind to the program.

**Total for all Personnel: \$87,500**

### b. Equipment:

**Cell Phone Reimbursement:** Due to the amount of time that the project manager being using their personal cell phone for social media marketing and contacting schools, we will provide reimbursement up to \$50/month for their current cell phone plan. **\$50/month x 12 months = \$600**

**Total for all Equipment: \$600**

### c. Supplies

**Educational Materials:** Given the need to accommodate an estimated 323 students we will provide reimbursement up to \$2,000/month for any educational materials or supplies that might be needed at the two school sites.

**\$2,000/month x 12 months = \$155.88**

**Total for all supplies: \$ 64,800**

### d. Travel

Each of the 2 schools in Durham County will be visited by the program manager and tutors; mileage for travel will be reimbursed at \$0.65.5/mile up t 20,000 miles (about 32186.88 km). This will be spaced throughout each year during the implementation phase and as a follow-up.

**Total for travel: \$ 26,200**

### f. Evaluation

**Evaluators:** We will secure the services of three PhD student consultants, who will be pivotal in leading our program evaluation and quality assurance efforts. Their expertise and experience will ensure that our program continues to meet the highest standards of quality and excellence.

## APPENDIX C.3 EVIDENCE BASED EVALUATION PLAN

### Introduction:

Education Access and Quality is defined as a social determinant of health (CDC, 2021). A strong relationship between health and education exists, where academic performance affects future educational attainment and income, impacting one's health and quality of life (Florence, 2008). Providing children access to high-quality education requires an integrated approach, as numerous factors contribute to an educational experience. Nutrition and dietary behaviors are vital factors to consider when evaluating education in early years, as it is crucial in childhood development. Thus, we intend to implement a multi-pronged intervention to help provide children with equal opportunities. The Read to Feed program aims to strengthen literacy skills among under-served elementary school children and provide meals in a nurturing neighborhood environment (RF, n.d.). Implementing this program within DPS (Durham Public School) seeks to address inequities in food access and low literacy levels. The target population for this proposed intervention will be children in grades k through 3 enrolled in Durham Public School District (DPS). The initial focus of the intervention will be on the two schools (C.C. Spaulding and Y.E. Smith) with the lowest test score averages within the county to target those most in need and pilot the intervention before expanding county-wide.

### Evidence Based Evaluation Plan:

The program is expected to have a long-term impact on nutrition knowledge among students in the Durham Public School System. One of the outcome objectives we will be evaluating is that at least 40% of the students from C.C. Spaulding and Y.E. Smith schools, who participated in the Read and Feed program, will see an improvement in their nutrition knowledge by the end of the second year.

### Study design/data collection

The abovementioned objective will be evaluated using a nonexperimental, observational, pre-and post-test study design. We will evaluate the program's success by analyzing key quantitative metrics such as the number of students attending, their frequency of attendance, and the level of their nutrition education. To gather this data, we will create a set of questionnaires using an Academic Progress Monitoring Tools Chart that is tailored to our specific curriculum. The questionnaire will cover topics such as MyPlate and food groups. Nutrition knowledge statistics will be evaluated by the mean number of students who had an increase in overall nutrition knowledge measured by the adapted Academic Progress Monitoring Tools Chart (Academic Progress Monitoring Tools Chart, n.d.).

Questionnaires will be tailored to specific developmental stages, such as age-appropriate questions for 7–9-year-olds. Descriptive statistics will include the mean number of students attending and the mean days/week attended. Additionally, qualitative data will be collected through one-on-one interviews. Qualitative data will be used to capture changes in nutrition knowledge among children within grades K-1. Students will be asked to identify fruits and vegetables to gauge their understanding of the curriculum.

Sample and Sample Strategy:

For this objective, we will administer nutrition questionnaires to students in grades 2-3 enrolled at the two participating schools regarding their nutrition knowledge. We will conduct a pretest at baseline and at the end of the 2-year program. However, every six months, we will survey students with a questionnaire identical to the posttest to gauge the validity and effectiveness of the program. We will compare the pre-and post-data to evaluate changes in student nutrition knowledge. Data will be compared between students who participated in the program and those who did not. The surveys will be created with collaboration from stakeholders, specifically the Read and Feed program, Durham Nutrition Services, and administrators. Teachers will administer them to each student at participating schools.

Specific Measures/Timing/Analysis Plan:

We will measure our success based on the outputs of population reached, effectiveness, fit, and adoption. The outcome will be a change in nutrition knowledge. We will specifically look for any existing disparities of race/ethnicity in nutrition knowledge and reading literacy. The quantitative data on student nutrition knowledge will be analyzed by comparing the average scores among students who participated in the Read and Feed program before the intervention to the average score among participants after. Students from a neighboring school with similar demographics not participating in the program will serve as a reference group or control. Results from the distributed questionnaires will be compared to those of students who did not receive the intervention (control). Qualitative data from interviews will be transcribed, and themes will be created based on the responses. Potential challenges to evaluating this outcome include the cooperation of students and school administration/teachers. Student questionnaires must be filled out entirely and appropriately for validity. Some ways to address this challenge will be ensuring all students are supervised when completing the administered questionnaires and ensuring that all forms are completed on the school campus. Additionally, given the selected age range of our target population, qualitative data will need to be used as a metric for changes in nutrition knowledge among those in grades k-1; this

poses challenges for capturing accurate data. Gaining access to the students might be challenging if the administration or teachers are unwilling to allocate class time for the survey. However, we aim to address these difficulties by engaging stakeholders early and consistently.

Sources of Funding:

Funding for our project will be secured through grants, public appropriations, and anchor institutions. Grants from federal or state organizations will help get our project up and running, as we have a specific initiative that some organizations might support. The National Institute for Food and Agriculture offers various specific funding opportunities that align with our project goals. A portion of the funding will be allocated to hiring three evaluators who will lead program evaluation and quality assurance efforts. We will secure the services of three PhD student consultants. Their expertise and experience will ensure that our program continues to meet the highest standards of quality and excellence.

**See Appendix D of Appendix C.2.A**

Data Use and Dissemination:

Given that the initiation intervention plan will be piloted in two schools, the data will be used as evidence for the program's expansion countywide. In addition, data will also be utilized for quality assurance during an iterative evaluation process as the program expands to other schools. Key stakeholders will be consulted at each step of the evaluation process. Stakeholders will vote on any proposed modifications, and all stakeholders must agree before implementation changes. Feedback from stakeholders will be used to shape and mold the program to better fit the needs of students within the Durham Public School District. Through this approach, we seek to improve the program's effectiveness, reach, and adaptability to reach the shared objectives.



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## **APPENDIX D: GRACE OURADA INDIVIDUAL ASSIGNMENTS**

### **APPENDIX D.1 SOCIAL DETERMINANT OF HEALTH ANALYSIS– Durham County, North Carolina**

#### Social Determinant of Health (SDOH):

The CDC defines social determinants of health as the “nonmedical factors that influence health outcomes,” such as the “conditions in which people are born, grow, work, live, and age” (CDC, 2022). Education access and quality is the ability for all people to have an “equal opportunity at equitable and standard education that will promote lifelong learning” (Team Leverage, 2023). The area of focus will be on education access and quality involving first and second-grade minority public school children, discussing the negative implications, both short-term and long-term, the current educational environment imposes on these children, their families, and their community.

Instruction is limited to school hours with language barriers preventing any transfer of instruction in the home, resulting in low literacy scores for minority students. Literacy is “the ability to read, write, speak, and listen effectively to make sense of the world” (National Literacy, n.d.) Low literacy contributes to both short-term and long-term impacts. Short-term impacts of low literacy include low End-Of-Grade test scores, absences, students feeling incompetent or lacking confidence in their work, and introducing behavioral issues in the classroom (Child illiteracy, 2023). Long-term impacts of low literacy include emotional and intellectual damage, risk of poverty, higher levels of crime, low health literacy in future medical endeavors, and leading students to fall behind in furthering their education (Low, 2022).

#### Geographic and historical context:

Durham County sits in northeast North Carolina with a population of 332,680 individuals, consisting of 54.7% white, 35.3% Black or African American, 6.0% Asian, 2.9% two or more races, 13.9% Hispanic or Latino, 1.0% American Indian & Alaska Native, and 0.1% Native Hawaiian & Other Pacific Islanders (Quickfacts, 2022). The median household income is \$65,619, with a child poverty rate of 19.1%, compared to the average rate of 15.3% in the United States (Burns, 2022).

Post-COVID-19, Durham County public school districts have seen a 4.8% decline in K-12 enrollment, with only 25% of 3rd-grade students producing proficient test scores (Promising, 2023). Public schools enroll over 32,000 students each year, yet analysis of racial backgrounds in grade proficiency shows an imbalance in the quality of education (Pertinent Facts, 2011).

As of 2022-2023, African American children make up 38.5% of the student body, Hispanic and Latino children make up 34.3%, and white students make up 19.4% (Grown in Durham, 2021). Of the 13,759 students enrolled in elementary public schools, 65% of white children just starting Kindergarten can proficiently read at grade level, 38% of black students read at grade level, and 21% of Hispanic students can proficiently read at grade level (Grown in Durham, 2021). The majority population in the public school system consists of children of color, yet minority students have the highest rate of underperformance in literacy for their age group (see Table 1.0).

Adding to the complexities of low literacy are inequitable suspension policies that unnecessarily remove minority students from the classroom. Minority students, and “black students are 6.3 times more likely than white students to receive a short-term suspension,” (Racial Equity, 2019). Efforts to address the inequity include altering existing policies to reflect non-discriminatory practices in school (The Civil Rights Project, 2013). In promoting an equitable and safe environment for elementary students, Durham public schools are implementing strategic planning tools, such as "culturally responsive teaching methods, social-emotional learning, reducing implicit bias and racial inequities, and using restorative practices," (Safer Schools, 2020). Improving security and implementing more ethical policies in Durham public schools aids in creating a nurturing learning environment and a safer community.

#### Priority population:

Minority students in first and second-grade levels in Durham County, North Carolina, were analyzed against socioeconomic standards and grade-level performance. These students make up the majority of the student population in Durham County, yet consistently read below grade-level, when compared to other non-minority children. As first and second grades are considered foundational years for learning, these children continue to lag behind their peers, as a result of COVID, this gap has widened. Reading levels are consistently below average in Durham public schools compared to the State average, ranking 228 out of the 321 school districts (Review, 2023). Students in Durham participate in required End-Of-Grade Tests (EOGs) in years 3-5, making years one and two essential building blocks in scoring proficient in years 3-5 (Parents, 2022).

#### Measures of SDOH:

COVID-19 has contributed to the decline in literacy and has had lasting impacts on students and educators. Like many school districts in the United States, Durham public schools are experiencing high turnover and a shift to a technology-based curriculum (Price, 2023). The pandemic substantially impacted the economically disadvantaged students in Durham County, increasing the gap in reading levels between races and socioeconomic groups. Children

from this demographic lacked the resources necessary to apply learning at home. Other factors, such as parental support, language barriers, and a lack of broadband connection at home, made it difficult to continue their education virtually. The pandemic alone has caused a “15-16% drop in grade-level proficiency for African-American students,” (Kummerer, 2022).

Rationale/Importance:

Education access and quality is a public health priority. In first and second grade, children learn reading, math, and language skills that are the building blocks for all future knowledge. Schools should aim to improve quality education and access by providing the necessary resources for students to complete their homework at school, increasing broadband access, allowing learning to continue in their homes, and providing additional support to students by implementing after-school programs, and language courses for families. Short term, students will increase their literacy levels, feel well-supported, attend class more regularly, obtain higher end-of-grade test scores, and increase the likelihood that they will graduate from high school. Long term, Durham will see an improved quality of life for their residents and increased economic prosperity as a result of a well-prepared and equitable educational system. Increasing quality education at a young age will help “improve outcomes for young children and increase economic security and mobility” (Grown in Durham, 2021).

Disciplinary critique (Nutrition specific):

Nutritionists play a role in quality education, as nutrition can influence an individual's ability to learn. According to the CDC, "healthy students are better learners," as a nutrient-dense diet assists in appropriate development, brain function, concentration, and retention (CDC, 2022). Individuals who lack the resources, accessibility, education, or means to secure nutritious foods at home count on school food programs for assistance. Nutrition professionals create healthy meal plans for public schools in Durham County and offer services to families or students requiring one-on-one nutrition assistance. Students participating in School Breakfast Programs will likely acquire "better grades and standardized test scores" and have "fewer absences and improved memory" (CDC, 2022).

Long term, the county will benefit from a healthy and educated workforce, which in turn will contribute to additional revenue to the public school system. In bettering the quality of education in Durham County, Durham will benefit from a “return on investment of \$3-\$13 for every dollar invested in early childhood” Chappel, 2019).

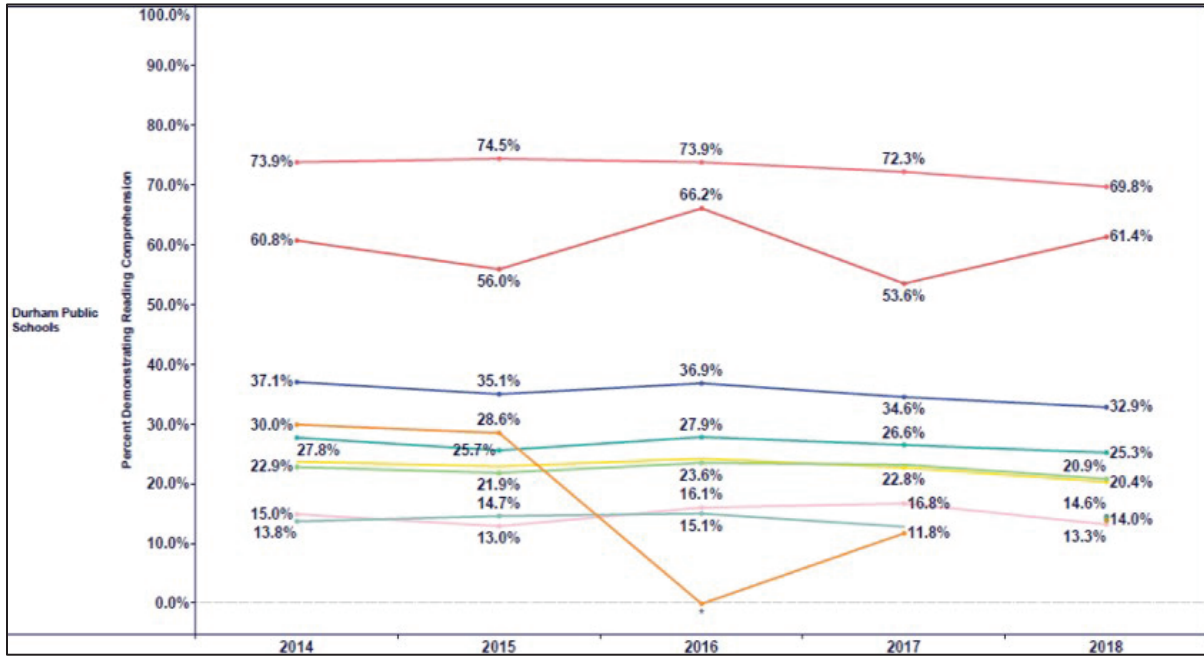
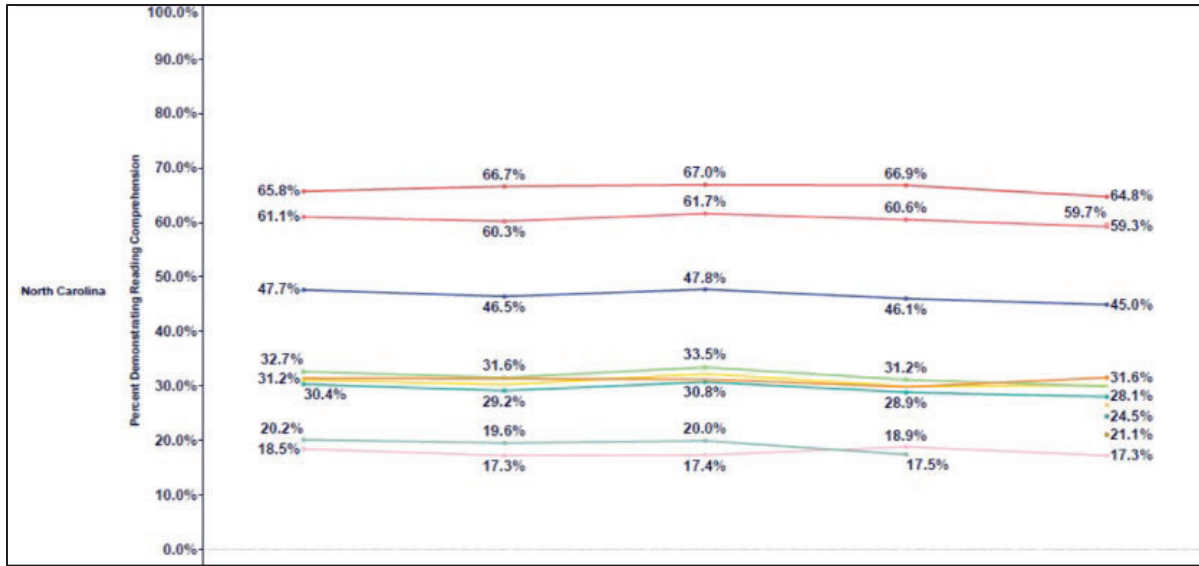
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APPENDIX D.1.A SOCIAL DETERMINANT OF HEALTH ANALYSIS APPENDICES

Appendix A. Percent of Third Grade Students Scoring College and Career Proficiency on Third Grade End of Grade Assessments for Reading in North Carolina and Durham County by Subgroups



## APPENDIX D.2 NUTRITION PROGRAM ANALYSIS

### Introduction:

Obtaining a quality education is imperative for student success. Quality education means that each student has the same opportunity to learn skills needed to further their education and succeed in proficiency for grade level each year (Team Leverage, 2023). Students on Free and Reduced Lunch are more likely to struggle with literacy, which can negatively impact adulthood. The ability to obtain quality education depends on differing socioeconomic factors, leaving minority students disproportionately impacted by inequities within the K-5 school system, with Hispanic and African American children proficiently reading below grade level (Grown in Durham, 2021).

Studies have found that eating habits and healthy behaviors connect to academic achievement (CDC, 2022). Hispanic and black students make up most of the K-5 population in Durham public schools and face inequities in their learning due to food insecurity (DCO, n.d.). Because of this, it's likely our demographic is not obtaining the necessary nutrients at home. We aim to address nutrition education to better the health and literacy of students with additional after-school support.

### Evidence Based Nutrition Policy or Program:

Durham County contains a population of 332,680 individuals. Of that population, 19.1% of children live in poverty, 20% of children under 18 are food insecure, and post-COVID-19 districts in Durham have seen a 4.8% decline in K-12 enrollment, with only 25% of 3rd graders producing proficient test scores (Promising, 2023). An after-school program that provides an additional meal and implements nutrition education into the curriculum may be the answer for children in Durham County.

To address inequities within literacy for students from CC Spaulding and Y.E. Smith schools, we are aiming to implement an after-school Read and Feed Program in North Carolina that allows students the ability to obtain tutoring, covering basic elementary subjects, nutrition education, and securing a full nutrient-dense meal to better their learning abilities. The goal of Read and Feed is to “Provide underserved elementary students with mentors who help children develop their literacy skills and provide them with nutritious meals...” (Annual Report, 2017). The meal, which will cover requirements set by MyPlate, will allow students to be more attentive, retain more information, and give them an incentive to participate in the program (Brody, 2017) (See Appendix A). The after-school program is currently implemented in Wake County, with 78% of students enrolled in the program creating an “improved reading attitude or confidence” and having successfully served over 13,000 meals to the



students (Read and Feed) (See appendix B.). Due to the success in Wake County public schools, we believe this program would benefit the students at CC Spaulding and Y.E. Smith schools by creating supplementary outlets for learning and accessing food.

#### Evidence Based Outcomes:

The CDC states that “nutrition education is a vital part of a comprehensive health education program” because it allows students to make healthy choices for themselves (CDC, 2023). In addressing short-term outcomes and the impacts of those outcomes on minority children in Durham, North Carolina, we will use nutrition knowledge as our marker in the Pilot study to confirm we are integrating the correct curriculum to create a noticeable impact on overall nutrition knowledge.

Throughout this program, we will test our short-term objective, which states that by month six, at least 25% of students from CC Spaulding and Y.E. Smith schools will gain nutrition education in the Read and Feed program, and that after two years, 40% of students will see an increase in their nutrition knowledge. The goal is to measure with qualitative and quantitative methods whether a Read and Feed program would improve nutrition knowledge and overall literacy by providing students with an additional meal during tutoring. In our pilot study, a survey will first be conducted with families in our control group to gauge the need and interest in the program.

In conducting a qualitative analysis, we will have students from both elementary schools take a short exam consisting of basic nutrition-related questions regarding MyPlate, food groups, etc., as well as basic math, reading, language, and science questions, prior to entering the program, students will then complete the same exam at the end of the school year. We will use this data to compare students’ knowledge before and after implementing the Read and Feed program to measure the success of the program and further investigate the role nutrition and nutrition education play in overall literacy.

We will then quantify the results by having students from our comparison group complete the same exam. In comparing the results, we estimate that those in our control group will have improved literacy, increased nutrition knowledge, and greater incentive to stay in the program.

#### Evidence Based Implementation Strategies and Activities:

In implementing our program to address nutrition education and overall literacy for students, we will provide tutoring and after-school meal services to low-income, public school students grades K-5 in two of Durham’s public Elementary schools, CC Spaulding, and Y.E. Smith. The two schools rank lowest in test score

proficiency, with 5% of students from CC Spaulding performing “at least proficient in math, and 8% in reading” (C.C. Spaulding, n.d.), and 8% of students at Y.E. Smith performing “at least proficient in math and 12% in reading” (Y.E. Smith, n.d.). We will compare our results with neighboring Durham public schools not participating in the Read and Feed program to measure the success of implementation.

In implementing the Read and Feed program, there are differing factors that will impact the success of the program, which include meal allocation, educational material, teachers, volunteers, transportation, and other resources that will need to be obtained prior to pilot implementation to make sure the curriculum and program measures follow the program agenda. For meals, we propose that the schools work directly with Durham Co-op Market to obtain donated fresh meals for students, creating a beneficial community relationship.

Participation will vary with open enrollment throughout the school year. We hope for a steady increase in participation, with as many students as possible participating in the program by the end of year two. We are accepting students from first to fifth grade and will aim to have the program three days a week at the beginning of the program. Tutoring and meal services will be held at schools after school hours and conducted by substitute teachers and volunteers, and drivers will be available to provide transportation means if necessary. We will need prior approval from the Read and Feed program director to ensure we have the resources for successful implementation.

All levels of the socioecological framework will be addressed in this program, as individual students will accept assistance to increase nutrition knowledge and overall literacy levels. Students will collaborate with volunteers, teachers, and peers to gain knowledge, while communities will work to provide their time and money to the program. Local non-profits will play a role in helping to fund the program and keep track of the success rates, ultimately benefiting the culture in Durham County by improving the quality of life and economic prosperity by creating a more well-prepared working class and an overall increase in the community’s health and literacy.

#### Community Partners:

The Community partners in the Read and Feed program will play an integral role in the development and success of each student. The program relies on volunteers in North Carolina, including tutors, drivers, meal pick up/drop off volunteers, material deliverers, fundraising efforts, etc. A volunteer-based program can be challenging to implement, especially for areas like Durham that may lack the resources and volunteers to get the program up and running. Volunteers will include parents, students from UNC, community members, and teachers. In adjusting for

this, we will hire substitute teachers to aid in the education process for the program and will rely on grant funding and funding from local non-profits. Because the community will benefit from a quality educational system, we hope that volunteers will choose to partner with our program to better the community.

Budget:

The budget to implement the Read and Feed program in Durham public schools will be \$281,000, which includes the cost of the program director, who will oversee and apply functions at both CC Spaulding and Y.E. Smith schools, the site coordinator, who will provide direct assistance to schools in making sure the program is running accordingly, substitute teachers who will work with volunteers to educate students, educational material, grant writers to assist with funding efforts, travel expenses, and recruiting and training volunteers. The total in-kind expenses will make up 23% of the budget, based on support from funders and volunteers, with the hope of increasing in-kind expenditures after year two (See Appendix C.).

Conclusion:

The Read and Feed program has multiple advantages in promoting literacy for minority children in Durham County, such as giving children accessible learning opportunities, improving retention and absorption of education material, increasing nutrition knowledge, providing transportation, and giving children an incentive to learn by providing an additional meal in school. The program has succeeded in Wake County, which shows that communities in North Carolina can support this type of program. However, disadvantages do present themselves in that most of the program functions with the aid of volunteers and relies on funds from grants and nonprofits to provide meals for the children and the resources to tutor. Although we will heavily recruit volunteers and make community members aware of the potential benefits the program will have on improving education quality for students in Durham County, there are still potential risks in a volunteer-based program.

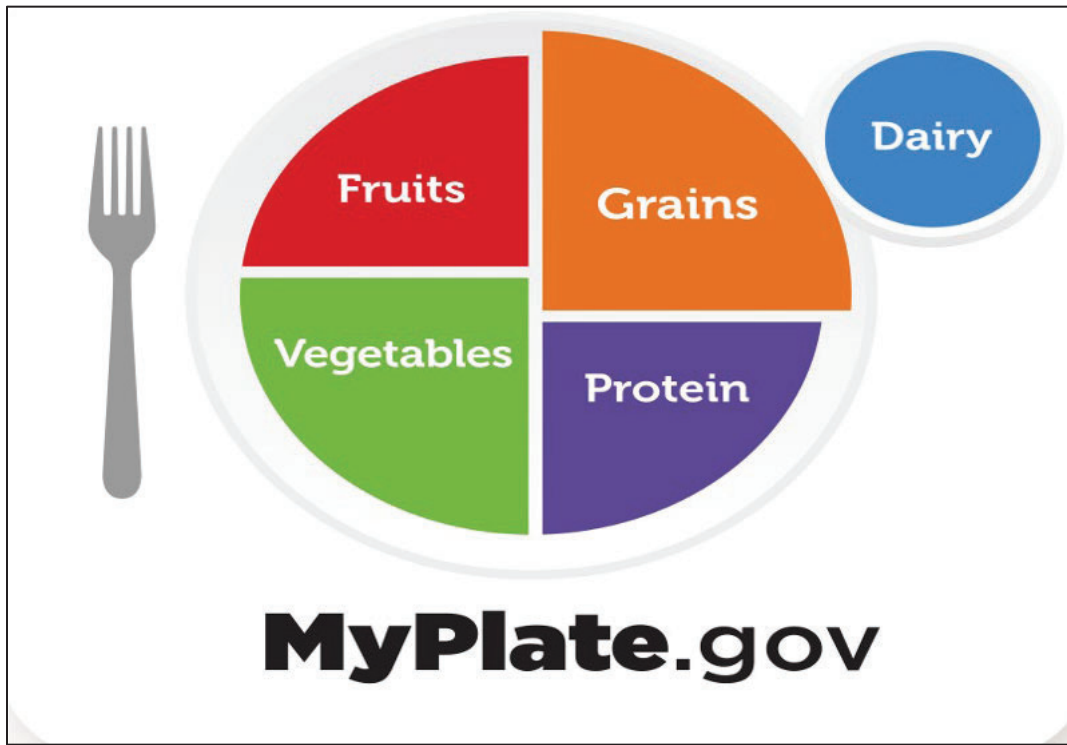
The values we prioritize in our pilot program are accessibility, equity, and community relationships. Trade-offs include providing transportation means to bring students home, food pick-ups, survey creation, and marketing and advocating materials for the program in the community.







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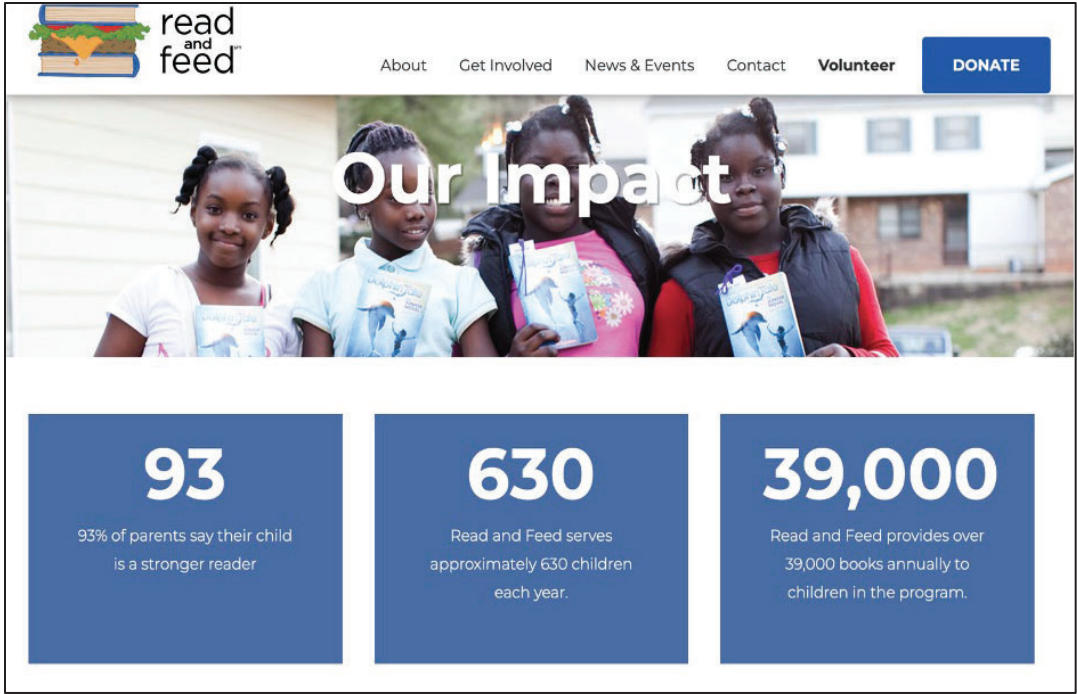
APPENDIX D.2.A NUTRITION PROGRAM ANALYSIS APPENDICES

Appendix A. MyPlate Model



 <p><b>MyPlate</b></p> <p>The benefits of healthy eating add up over time, bite by bite. Small changes matter. <i>Start Simple with MyPlate.</i></p>	 <p><b>Fruits</b></p> <p>Make half your plate fruits and vegetables: focus on whole fruits.</p> <p><a href="#">Learn more</a></p>	 <p><b>Vegetables</b></p> <p>Make half your plate fruits and vegetables: vary your veggies.</p> <p><a href="#">Learn more</a></p>
 <p><b>Grains</b></p> <p>Make half your grains whole grains.</p> <p><a href="#">Learn more</a></p>	 <p><b>Protein Foods</b></p> <p>Vary your protein routine.</p> <p><a href="#">Learn more</a></p>	 <p><b>Dairy</b></p> <p>Move to low-fat or fat-free dairy milk or yogurt (or lactose-free dairy or fortified soy versions).</p> <p><a href="#">Learn more</a></p>

Appendix B. Impact Statistics



The image is a screenshot of the Read and Feed website. At the top left is the logo, which consists of a sandwich icon and the text "read and feed". To the right of the logo is a navigation menu with links for "About", "Get Involved", "News & Events", "Contact", and "Volunteer". A blue "DONATE" button is positioned to the right of the navigation menu. Below the navigation is a large photograph of four young girls of African descent, each holding a book. The text "Our Impact" is overlaid in large white font on the photograph. Below the photograph are three blue rectangular boxes, each containing a large white number and a short paragraph of text describing the impact.

Impact Statistic	Description
93	93% of parents say their child is a stronger reader
630	Read and Feed serves approximately 630 children each year.
39,000	Read and Feed provides over 39,000 books annually to children in the program.

Appendix C. Program Budget

Description	Year 1 of Budget	Year 2 of Budget	Total % of Budget
<b>Personal Expenses</b>			<b>77% of budget</b>
Program Director	\$80,000	\$80,000	
Site Coordinator (One for each school)	\$50,000	\$50,000	
Substitute Volunteers	\$2,400.48	\$2,400.48	
Food from Market	- (in-kind)	- (in-kind)	
Education material  Books Paper Notebooks Writing Utensils Laptops for Instruction	\$3,000	\$3,000	
Writer	\$71,000	\$71,000	
Travel (Gas)	\$10,000	\$10,000	
Volunteer (recruitment process)	\$2,000	\$2,000	
Cooking Plates Utensils Cleaning supplies	- (in-kind)	- (in-kind)	<b>23% (budget for in-kind expenditures)</b>
Training Services	-(In-kind)	-(In-kind)	
Drivers	- (in-kind)	- (in-kind)	
Tutors	-(In-kind)	- (In-kind)	
<b>Budget Categories</b>		\$7,000	
Total Program Cost	\$281,000	\$281,000	
Total overhead costs/ Incidentals	\$15,000	\$15,000	



### APPENDIX D.3 EVIDENCE BASED EVALUATION PLAN

#### Introduction:

The SDOH of focus is education access and quality in Durham County, specifically analyzing increased literacy levels and enhanced learning capabilities for students in two of Durham's elementary schools when a nutrient-dense meal and nutrition education is offered during after-school tutoring. Literacy initiatives are imperative to a student's success and the community in which they reside, especially in elementary school, as "early literacy is a crucial part of a child's development," it not only gives them confidence but "enhances vocabulary, builds important communication skills, and gives them the tools they need to be successful in school and in life," (Literacy, 2019). In addition, nutrition plays a role in a student's ability to retain information and "directly affects mental capacity among school-aged children," if given the correct nutrients, students are better prepared to learn (Healthy, 2019). However, minority students, who make up nearly 96% of the enrollment at both schools, face food insecurity, and as a result, their literacy is disproportionately impacted (CC, n.d; Y.E, n.d).

To address this, we aim to integrate the Read and Feed program into two of Durham's public Elementary schools, CC Spaulding, and Y.E. Smith. Students can sign up to receive after-school tutoring three days per week, in addition to receiving nutrition education, and a quality meal from a local market. Participation will be determined by the number of students who show interest in the program, with the hope that participation will increase throughout the first two years. Those participating will take an initial comprehensive literature examination to determine baseline literacy standings and will repeat said exam approximately one school year after enrolling in the program to measure the success of the program on literacy level. Students aged 5-7 will be given a variation of the comprehensive literature examination that includes observational questions and picture representations of curriculum.

A survey will be mailed home to each child prior to the beginning of the year to gauge the need and interest in the program. From there, we can examine the scope of potential enrollment and work to adjust allocated resources if needed. Students will then be able to enroll in the program with a parent's signature one week into classes; students grades K-5 in Y.E. Smith and CC Spaulding who sign up will begin the program two weeks after the start of the school year. The program aims to allow any student looking to enroll the opportunity to be in the program, and depending on initial participation interest, increased marketing or increased resources and funding may be needed.

Evidenced Based Evaluation Plan/ Study Design/data collection:

In addressing the long-term objective that by two years, 40% of students from CC Spaulding and Y.E. Smith schools will see an increase in their nutrition knowledge in the Read and Feed program, we will use an observational evaluation method to collect data on the number of students obtaining nutrition knowledge from the initial enrollment. We will then collect data via a nutrition-related survey given to all students prior to program implementation and then will repeat that survey one year after enrollment, and again after the two-year mark from initial enrollment. This survey will contain questions regarding comfortability and confidence in nutrition-related material, including healthy food choices, foods to avoid or foods to have in moderation, fats, carbohydrates, proteins, sugars, etc. Teachers and tutors will be required to disperse the surveys during the last week of school and the site coordinator will collect the data to determine if the program increased nutrition knowledge for students after one year and if the program successfully increased nutrition knowledge for 40% of the student population from each school by year two. For students K-2, teachers will be required to present a variation of the survey to include pictures, graphics, and other mnemonic devices that younger children respond to and are better tested with.

The Read and Feed program will be available to tutor basic subjects such as Math, English, Science, and History, as well as incorporate nutrition education within the curriculum to promote nutrition knowledge and health literacy. The program will be held three days per week, Monday, Wednesday, and Friday after school, and be one hour in length. The program will be open to enrollment for any student, whether receiving food assistance or not, and depending on the needs of students K-5 in the two selected schools, these hours may increase if resources allow. Students will be given a nutrient-dense meal at the beginning of the tutoring session to help with concentration as food impacts a student's mental capacity. Transportation will also be provided to students once the program is over.

Sample and sampling strategy:

The sample size will include any students' grades K-5 who enroll in the program via the initial survey from Y.E. Smith and CC Spaulding schools in Durham County. Students who choose to participate will be our experimental group, with a comparison group of those from neighboring Durham public schools who are not participating in the Read and Feed program. The control group will help us identify the benefits of the Read and Feed program in terms of implementing a nutrient-dense meal and nutrition education into tutoring practices and its relation to literacy level. The goal is to determine if the Read and Feed program improves capacity of learning with

the addition of a meal during tutoring, if it improves nutrition knowledge with the inclusion of nutrition education, and if it increases literacy levels for two underperforming schools.

Specific measures:

In assessing the outputs of the program, they will include survey completion by 80% or more of participating students by the end of the first year, survey results indicating at least 40% of students have gained confidence in nutrition material, obtaining 25 trained volunteers for each school by month three, developing partnerships with two additional local non-profits by month four, and connecting with an additional local market for produce by month two. Outcomes after two years will include increases in students obtaining nutrition education, increased nutrition knowledge, improved literacy, increased access to nutrient-dense meals, and greater incentive to stay in the program long-term. The outcomes will be measured by the nutrition survey at the one and two-year marks to determine student confidence level and understanding of nutrition education second, by examining students' class grades at baseline and then comparing them one year into the program, and lastly, by measuring the number of students participating in the program by the end of two years compared to the start of the program.

Timing:

Community partner engagement will be imperative to this program, beginning in early July before the start of the school year, allowing ample time to gauge interest by teachers and outsource enough volunteers for the program. Evaluation will begin at baseline and then two years after the program when data is collected to assess the effectiveness and the changes needed for the program to continue successfully long-term. Progress will be defined by the number of students with an increase in nutrition knowledge, obtaining an additional meal after school, and a meaningful increase in literacy level. If the program shows limited progress after the evaluation period, a stakeholder meeting will be held in which solutions will be discussed to increase success. Solutions may include increased marketing, transportation means, volunteers, funding, and potential for classroom materials and an additional meal to be sent home with students.

Analysis Plan:

In analyzing this program qualitative and quantitative statistics will be used to examine the success of program implementation. In examining the success of the program, we will evaluate the number of students' who have nutrition knowledge before entering the program and then again after two years of being in the program. We aim to measure the number of students obtaining nutrition education and their increased confidence in nutrition

learning material after being in the program for six months. The descriptive statistics include looking at the mean number of students who feel confident in their nutrition knowledge, the mean number of students gaining nutrition knowledge from the program, the mean number of students who procured a nutrient-dense meal through the program, and the mean number of students who had an increase in overall literacy after enrolling in the program. Challenges may present themselves as students will need to be supervised and teachers proactive about disseminating surveys and monitoring students during the examination process. Students may refuse to take the survey or may struggle to take examinations in a classroom setting. To mitigate any challenges, there must be a constant line of communication with teachers, volunteers, and site coordinators to promote a nurturing environment for students and to make accommodations that allow participating students to perform to the best of their ability. Surveys will be tailored to fit the differing ages in the program, which will include feedback from teachers on how to best test each grade level successfully.

#### Sources of funding:

Funding for the Read and Feed program will be attained through grant funding, donations, and funding from local non-profits, specifically the Durham Children's Initiative, the Triangle Community Foundation, and Communities in Schools. As the success of the program increases, we hope to reach more local non-profits that share our goal of bettering education quality and access for all students.

#### Data use and dissemination:

The data will be used to understand the effectiveness, the downfalls, and the improvements needed to the program to make it as successful and productive as possible. Once the data is analyzed and any improvements made, it is our hope that this program will expand to surrounding Durham public schools. Community partners will be highly involved in all aspects of this program and kept up to date on findings and changes needed to better promote the Read and Feed program and to make the community aware of the benefits it will instill.

#### Conclusion:

In collaborating with community partners, we will be able to provide students with an effective program built on culture and equity. By providing children with an additional meal after school to help increase their mental capacity, in addition to nutrition education, it is our hope that this program will increase health equity within the populations most impacted. This interdisciplinary research program is integral to improving public health in Durham County and will help decrease the literacy gap between minority children and their peers.

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## APPENDIX E: MIRIAM WIENER INDIVIDUAL APPENDICES

### APPENDIX E.1 SOCIAL DETERMINANT OF HEALTH ANALYSIS – Durham County, North Carolina

#### Background:

Social determinants of health (SDoH) are nonmedical factors that influence health outcomes – economic policies, development agendas, social policies, racism, and political systems – that shape the conditions of daily life (*Social Determinants of Health at CDC*). These often-invisible intergenerational factors have led to a lower life expectancy and lower quality of life among low-income populations compared with high-income populations (Adler NE, et al, 1994). Socioeconomic status (SES) is linked to virtually all SDoH (U.S. Department of Health and Human Services., n.d.) and is associated with the extent to which individuals and communities can access material resources such as quality education, along with the social capital that accompanies it.

In total, SES and the SDoH account for upwards of 60% of health outcomes (Marmot M, Allen JJ, 2014). Health inequities can only be fully understood within their historical and sociocultural contexts rather than in terms of the culpability of the victims themselves. In other words, health inequities are rooted in far more than health behaviors; instead, inequities must be recognized as a form of intergenerational oppression, both from external forces and from the internal consciousness that results from these forces. Any effort to overcome inequities must involve a deep awareness of – and a strong commitment to improving – the upstream SDoH.

It has been shown that educational attainment improves health both directly and indirectly through work and economic conditions, social-psychological resources, and a healthy lifestyle (Ross CE, Wu CL, 1995). Compared with the poorly educated, well-educated individuals are less likely to be unemployed, more likely to work full-time, have fulfilling, subjectively rewarding jobs, high incomes, and low economic hardship. Full-time work, fulfilling work, high income, and low economic hardship in turn significantly improve health in all analyses. The well-educated report a greater sense of control over their lives and their health, and they have higher levels of social support – both associated with better health outcomes. Education has become the principal pathway to financial security, stable employment, and social success (Baker, 2014). At the same time, American youth have experienced increasingly unequal educational opportunities that depend on the schools they attend, the neighborhoods they live in, the color of their skin, and the financial resources of their parents.

The chronic stress of living in impoverished conditions can overwhelm a child’s stress response systems, causing what has been referred to by the American Academy of Pediatrics as “toxic stress” (Garner AS, et al., 2012).

Toxic stress affects a child’s brain architecture and increases the risk of developing poor physical, behavioral, socio-emotional, and cognitive health (Shonkoff JP, et al., 2012). It can also lead to a range of chronic illnesses well into adulthood, including heart disease, substance abuse, and depression (Braverman, 2009). The American Academy of Nursing published several position statements on the need to address SDoH and poverty-related issues in early childhood and its impact on child health (Garner AS, Shonkoff JP; Committee on Psychosocial Aspects of Child and Family Health; Committee on Early Childhood, Adoption, and Dependent Care; Section on Developmental and Behavioral Pediatrics, 2012).

#### Geographic and Historical Context:

Durham County, North Carolina is governed by an elected board of county commissioners, with various duties and authorities, including long-range planning for county needs, establishing new programs and departments, and determining the level of local current expense funding for public school systems in the county. Lower access to quality education in certain sections of Durham County contributes to the crisis of health disparities in the county (*Miseducation | Durham Public Schools, n.d.*).

The Durham Public School District serves 34,200 students (*Miseducation | Durham Public Schools, n.d.*). District racial composition is 47% black, 29% Hispanic, and 18% white (Ibid). The “Segregation Index” between black and white students is high (Ibid). The 2019-2020 North Carolina Racial Equity Report Card reports that: 1) Black students were 3.9 times more likely than white students to receive a short-term suspension; 2) Statewide, 29.9% of all juvenile referrals to the criminal justice system came from schools, down significantly from 45.1% in the 2018-2019 RERC – however, black students remain disproportionately impacted, accounting for 49.0% of all incidents being referred to the criminal justice system compared to 35.2% among white students; 3) While 54.5% of students in North Carolina schools are people of color, only 23% of teachers are. A diverse school staff is one way to help equalize opportunities for students of color.

#### Priority Population:

The pre-K-3rd grade black public-school population of Durham County is our priority population in terms of addressing upstream SDoH in the earliest years of educational attainment. This population was chosen because it has been shown that the most significant predictor of academic success and earning power is reading proficiency by third grade (*2021 County Data Dashboard, n.d.*). Since more than two out of five children in North Carolina do not



read at grade level at the end of third grade, and particularly taking into account the persistent racial disparities in Durham County, our priority population must be addressed – and fast.

Newly released student performance data from the North Carolina Department of Public Instruction (NCDPI) shows the gap between proficiency levels for White and Black students is increasing (Kummerer, 2022). Due to these gaps and disparities, DPS launched a five-year strategic plan that focused on five priorities (Durham County Department of Public Health, 2020): increasing academic achievement; providing a safe school environment that supports the whole child; attracting and retaining outstanding educators and staff; strengthening school, family, and community engagement; and ensuring fiscal and operational responsibility. In Durham County, only 44% of children scored proficient in third-grade reading, compared to 82% of children in Camden County. In Durham County, racial disparities are shockingly stark, with only 36.8% of black children scoring proficient in 3rd-grade reading, compared with 76.8% of white children.

#### Measures of SDoH:

Two of the most accurate measures of educational access and quality among racial and ethnic minorities in Durham County are literacy (short-term) and diabetes prevalence (long-term): 1) Literacy is considered the most accurate measure of educational access and quality and is potentially more reflective of SES than years of schooling among black and low-income whites (Dotson VM, Kitner-Triolo MH, Evans MK, Zonderman AB, 2009; Sisco S, et al., 2015); 2) Diabetes affects racial and ethnic minorities and low-income populations disproportionately (Golden SH, Brown A, Cauley JA, et al., 2012), where the age-adjusted incidence of diagnosed diabetes (see Appendix 1) is associated with educational level in a stepwise pattern (Hill JO, Galloway JM, Goley A, et al, 2013).

Diabetes incidence is highest (10.4 per 1,000 persons) for adults with less than a high school education, 7.8 per 1,000 persons for those with a terminal high school education, and 5.3 per 1,000 persons for those with more than a high school education (Centers for Disease Control and Prevention, 2017). Diabetes prevalence in the adult U.S. population is similarly inversely associated with educational level in a stepwise pattern. In the U.S., the age-adjusted prevalence of diagnosed diabetes is 12.6% for those with less than a high school education, 9.5% for those with a high school education, and 7.2% for those with more than a high school education (Centers for Disease Control and Prevention, 2017). Having a college education is associated with the lowest odds of diabetes (Borrell LN, Dallo FJ, White K, 2006). Temporal trends in diabetes prevalence at different levels of education show increasing disparities in prevalence associated with educational attainment (Beckles GL, Chou CF, 2016). The risk

of diabetes-related mortality demonstrates a gradient from lowest to highest education level. Compared with adults with a college degree or higher, having less than a high school education is associated with a twofold higher mortality from diabetes (Saydah S, Lochner K, 2010).

Rationale/Importance:

Despite making up only 41 percent of the child population, black and Hispanic children account for 63 percent of North Carolina's children living in poverty (*Communities for the Education of Every Child NC*, n.d.). Despite years of efforts at the policy and advocacy level, black, Hispanic, and American Indian/Alaska Native (AI/AN) students continue to score below their peers on standardized tests (Ibid). The discrepancies in test-based outcomes are a product of both internal and external factors that have systemically denied equality of opportunity to all students within North Carolina public schools. On average, and most significantly, students affected by racial discrimination are provided fewer opportunities to succeed (Ibid): Students of color are overexposed to novice teachers and teachers with fewer qualifications. Black students are 58 percent more likely than their white peers to be taught by a novice teacher. North Carolina's current teacher workforce has only about 20 percent teachers of color, while more than half of the state's students are students of color. Students of color are underrepresented in honors and advanced classes and overrepresented in special education. AI/AN, black, and multiracial students in North Carolina are far more likely to be suspended than their white classmates. And when they are suspended, black students face substantially longer suspensions than their classmates.

Disciplinary Critique:

As a public health leader, I recognize the importance of taking into account the “elephant in the room” when addressing racial disparities in health outcomes in Durham County – racial disparities exist against a backdrop of historical trauma, extremely high rates of poverty, and reduced access to quality education, also known as “educational segregation.” Outreach projects in youth communities that target educational access and quality require a deep understanding of the root cause of diseases such as diabetes since health-focused policies targeting “diet and exercise” alone have been utilized for decades to no avail. County Commissioners must not be afraid to seek out creative, fresh, and perhaps never-before-utilized upstream techniques to accomplish our goal of improved health outcomes for every resident of Durham County. Clearly, educational access and quality is the most important first step to mitigating the intergenerational trauma that led to higher rates of poverty and increased prevalence of prediabetes and diabetes in the lower SES communities of Durham County.

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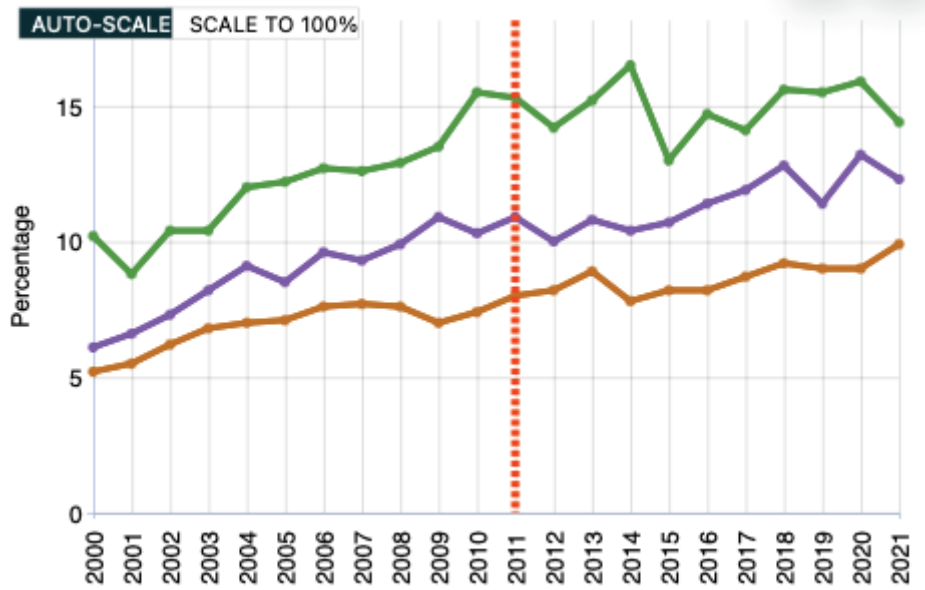
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APPENDIX E.1.A: SOCIAL DETERMINANTS OF HEALTH ANALYSIS APPENDICES

Appendix E.1.A.1: Percentage Diagnosed Diabetes (2000-2021) Based on Education, North Carolina

Adults Aged 18+ Years, Age-Adjusted Percentage, North Carolina



Education

Percentage for 2021

- < High School - 14.4
- High School - 12.3
- > High School - 9.9

*United States Diabetes Surveillance System*

## APPENDIX E.2: COMMUNITY PARTNER ANALYSIS

### Introduction:

Education improves health directly and indirectly (Ross CE, Wu CL, 1995) and is considered one of the primary “social determinants of health” (SDoH), nonmedical factors such as built environment, political policies, and racism that are often invisible but have the power to shape quality of life (*Social Determinants of Health at CDC*). There is a significant correlation between lower socioeconomic status (SES), reduced educational access over the short term, and reduced health outcomes over the long term (Garner A.S., et al., 2012). For example, the chronic stress of living in poverty can lead to what has been referred to by the American Academy of Pediatrics as “toxic stress” (ibid). Toxic stress negatively impacts brain architecture in the early developmental years and increases the risk of poor physical, behavioral, socio-emotional, and cognitive health (Shonkoff JP, et al., 2012). It can also lead to a range of chronic illnesses well into adulthood, including heart disease, substance abuse, and depression (Braverman, 2009).

Despite making up 41 percent of the child population in North Carolina, children of color account for over 63 percent of children living in poverty (*Communities for the Education of Every Child NC*, n.d.), with discrepancies in educational access and quality and test-based literacy outcomes far below state averages. Students of color in North Carolina are 58 percent more likely than their white peers to be taught by a novice teacher, are underrepresented in honors and advanced classes, and the teacher workforce includes only 20 percent of teachers of color while more than half of the students are of color (ibid).

Proficiency in 3rd-grade reading is considered one of the most accurate measures of educational access and quality and is potentially more reflective of SES than years of schooling (Dotson VM, et al., 2015). In Durham County, 44 percent of children scored proficient in 3rd-grade reading compared with the state average of 47 percent, and racial disparities are shockingly stark – only 36.8 percent of black children scored proficient in 3rd-grade reading compared with 76.8 percent of white children (Public School Review, n.d.); a vivid illustration of the “system archetype” – public health frameworks that provide an overview of complex systems behavior – known as *Success to the Successful*, whereby one causal loop reinforces positive outcomes for one party and the other loop reinforces negative outcomes for the other party (Ramaswamy, n.d.). As predicted in the *Success to the Successful* model, newly released student performance data from the North Carolina Department of Public Instruction shows that the gap in proficiency levels between black and white students is steadily increasing (Kummerer, 2022).

### Community Partner Mapping and Analysis:

To address inequities in educational access and quality in Durham County, our public health team will convene a diverse group of stakeholders to design and implement a pilot program in two Durham County elementary schools, YE Smith and CC Spaulding, chosen for their low 3rd-grade reading proficiency scores combined with the reduced SES of their student populations. Our stakeholder engagement approach will be twofold: 1) Afterschool tutoring offered for every K-3 student with volunteer tutors from the Duke University Office of Durham and Community Affairs, utilizing the existing administrative talent base, resource pool, and infrastructure of “Read and Feed” nonprofit organization, which currently utilizes an evidence-based literacy protocol for elementary school students in counties throughout the state; and 2) Tap into the well-established network of the Durham County Black Farmers, together with the nutrition coordinator for the Durham County Public School District, the Restaurant Association of Durham County, and a farm-to-school liaison from the North Carolina Department of Agriculture, to strategize and implement a nutritious afterschool meal program with a target goal of 20 percent locally-grown produce in every meal.

### List of Selected Stakeholders and their Affiliated Organizations: Appendix I

The problem of childhood literacy in low-resourced school districts is complex and requires an equally complex set of viewpoints to define and address the issue. Therefore, our leadership team will select stakeholders with a unique and broad base of perspectives and experiences (see Appendix I) related to both childhood literacy and food access. Stakeholder viewpoints span the educational, business, agricultural, governmental, non-profit, and community sectors.

### Rationale for Proposed Partners: Three Leadership Teams:

We will establish three co-design teams (see Appendix I): 1) A *Project Leadership Team* (PLT) consisting of Julie Munoz, Dylan Mathews, Miriam Wiener, and Grace Ourada, that will meet weekly to discuss project updates, leverage points to enhance the efficacy of the program, and engagement strategies to best support educational access and quality; 2) A taskforce of key specialists from within the community to be known as the *Durham Literacy Taskforce* (DLT) consisting of a farm-to-school liaison hired by the North Carolina Department of Agriculture for coordinating legal hurdles, strategizing and assisting with funding, and ensuring that all meals and produce meet quality standards set by the USDA; a representative from the Black Farmers Coalition of Durham County; the current Nutrition Coordinator from the Durham County School District; a representative from the



Restaurant Association of Durham County; Program Coordinator from Read and Feed; Director of Educational Programs from the Durham Literacy Center; and a faith-based representative from End Hunger Durham. The DLT will meet monthly throughout the life of the two-year pilot program for technical advice, messaging, fundraising, marketing, legal strategy, policy assistance, and community outreach; and 3) A *Community Focus Group* (CFG) of parents, students, and teachers from YE Smith and CC Spaulding Elementary Schools, together with student literacy tutors from the Jumpstart Literacy Program at the Duke University Office of Durham and Community Affairs, local community members, and at least one representative from the Durham County School Board, that will meet quarterly to provide data on awareness of childhood literacy, nutritional needs, feedback on the program, and to evaluate the impacts as a result of the selected intervention. Ongoing communication and engagement will occur between the PLT, DLT, and CFG via a monthly “*Durham County Nourishing Literacy*” newsletter distributed to all three teams and the community at large.

#### Facilitators and Barriers:

Effective interventions are not without their own shortcomings and challenges, and our PLT will need to be aware of – and fully prepared to address – any potential obstacles created by the selected stakeholders. Specialists and community leaders have rigorous schedules which will limit their time, and while all team members have endorsed the proposed intervention, their level of involvement will be sporadic. Further, stakeholders will have their own priorities and ideas as to how to implement change, including biases, political ideologies, and prior interactions with community members that might potentially skew their ability to remain objective throughout the implementation process. Finally, competing financial interests may play a part for certain stakeholders such as the Durham Literacy Center, which serves an older demographic compared with our program, but utilizes similar, potentially conflicting funding sources.

#### **Partner Worldview #1:**

*Parent of a 2nd grader in Y.E. Smith Elementary with low reading proficiency (Community Focus Group).*

*Root Definition: A system to read at grade level by receiving “whole person” care in a warm, nurturing environment in order to fit in with peers, excel academically, and achieve full potential in life.*

*CATWOE (See Appendix II): Worldview: Strategies for improving academic performance should go hand-in-hand with nurturing the “whole child”; academic providers should acknowledge the status and authority of parent(s), as well as the financial hardships of families. Transformation: Diagnosis and treatment of learning disability together with nutritionally dense, tasty, child-friendly meal provisions, leading to academic improvements from the inside-out; Customers: Tutors, teachers, meal providers,*

*farmers, and school administrators; Actors: Farmers, DPSD Nutrition Coordinator, Farm-to-School Liaison from NCDA, Restaurant Association of Durham, Program Director from Read and Feed, Volunteer Tutors and Senior Program Coordinator from Duke Office of Durham and Community Affairs; Owner: Y.E. Smith Elementary School; Environment: Local neighborhoods and homes.*

**Partner Worldview #2:**

*Program Director, Read and Feed Nonprofit Organization (Durham Literacy Taskforce).*

*Root Definition: A system to give elementary school students in low-resourced communities an appreciation for reading by providing tutoring and nutritious meals in a nurturing environment in order to strengthen literacy skills by 3rd grade.*

*CATWOE (See Appendix II): Worldview: The built environment of a child -- food access, structural violence, access to healthy role models -- is every bit as important as evidence-based academic tools for improving literacy over the long-term; Transformation: A system to give elementary school students in low-resourced communities an appreciation for reading by providing tutoring and nutritious meals in a warm, nurturing environment in order to strengthen literacy skills by 3rd grade; Customers: K-3 students, parents, and school administrators; Actors: Read and Feed volunteers and employees; Owner: Project Leadership Team; Environment: Environment: Schools and tutoring centers.*

Summary:

Comparing these two stakeholders, it seems clear that they are both working in the best interest of the child. However, the parent takes on a more “global” perspective regarding literacy, one in which peer approval and overall wellness take center stage. This insight might have otherwise been overlooked.

Conclusions:

To sustainably address educational inequities in Durham County, our PLT will engage stakeholders across multiple community sectors in order to ensure that numerous strengths, talents, and community resources are brought to the table. Childhood literacy is a “wicked problem” that requires deep systems change in order to address the built environments that drive a lack of reading proficiency at the 3rd-grade level. In addressing systems change, our PLT will need to focus on creative and perhaps never-before-utilized solutions, since interventions utilizing tutoring alone have been employed with little impact (Ferguson, et al., 2007). Including stakeholders from peripheral sectors such as farming, the faith community, and the restaurant industry, our team strives to address literacy from numerous angles.

Gaining an understanding of leadership theory – and the leadership styles that animate it – will assist all stakeholders within PLT, DLT, and CFG in executing the project successfully. There are four leadership theories: trait theory, role theory, contingency theory, and behavioral theory (Rice, n.d.). These theories are animated by a number of leadership styles, including coaching, autocratic, bureaucratic, and transformational (MindTools.com).

Behavioral theory encourages “out of the box” or “cutting-edge” leadership and is ideal for addressing academic underperformance in low-resourced communities (ibid). Utilizing creative techniques such as after-school meals paired with nurturing mentorships to “feed the body and the brain” (Noonan, 2016) requires a forward-thinking mindset to establish goals from a “bigger-vision” perspective (Rice, n.d.). Our three teams will utilize behavioral theory to employ democratic, participatory styles of leadership that rely on intrinsic motivation – the idea that things are worth doing for their own sake. In other words, our team will be committed to actively engaging the community and showing stakeholders that we truly care – thereby establishing trust, one of the Nine Principles of Community Engagement (ibid).

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**APPENDIX E.2.A: COMMUNITY PARTNER ANALYSIS APPENDICES**

**Appendix E.2.A.1: List of Selected Stakeholders and their Affiliated Organizations**

***Members***

*Farm-to-School Liaison*

*Farmer Representative/Food Distribution*

*Restaurant Representative/Meal Distribution*

*Board Representative*

*Parent Representatives*

*Nutrition Coordinator*

*Program Director*

*Volunteer Tutors*

*Senior Program Coordinator*

*Faith-Based Representative*

*Director of Educational Programs*

***Organization***

*North Carolina Department of Agriculture*

*Black Farmers Coalition of Durham County*

*Restaurant Association of Durham County*

*Durham County School Board*

*YE Smith and CC Spaulding Elementary Schools*

*Durham Public School District*

*Read and Feed Organization*

*Duke Office of Durham and Community Affairs*

*Duke Office of Durham and Community Affairs*

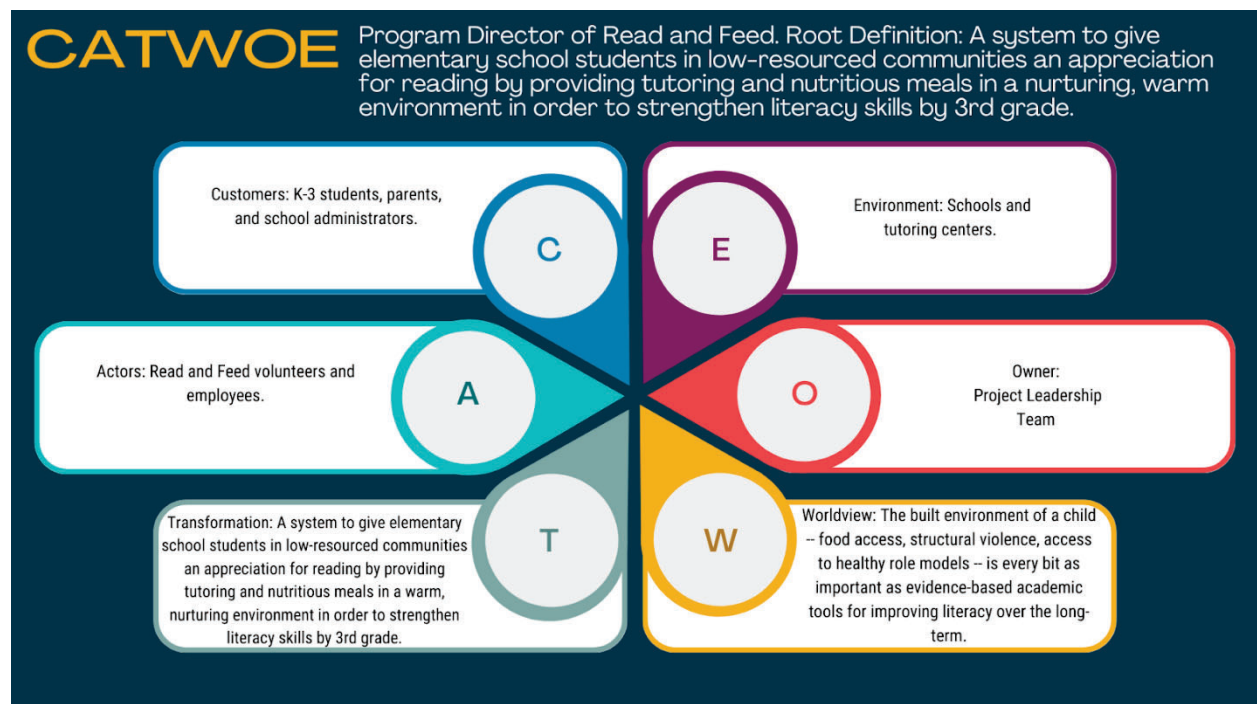
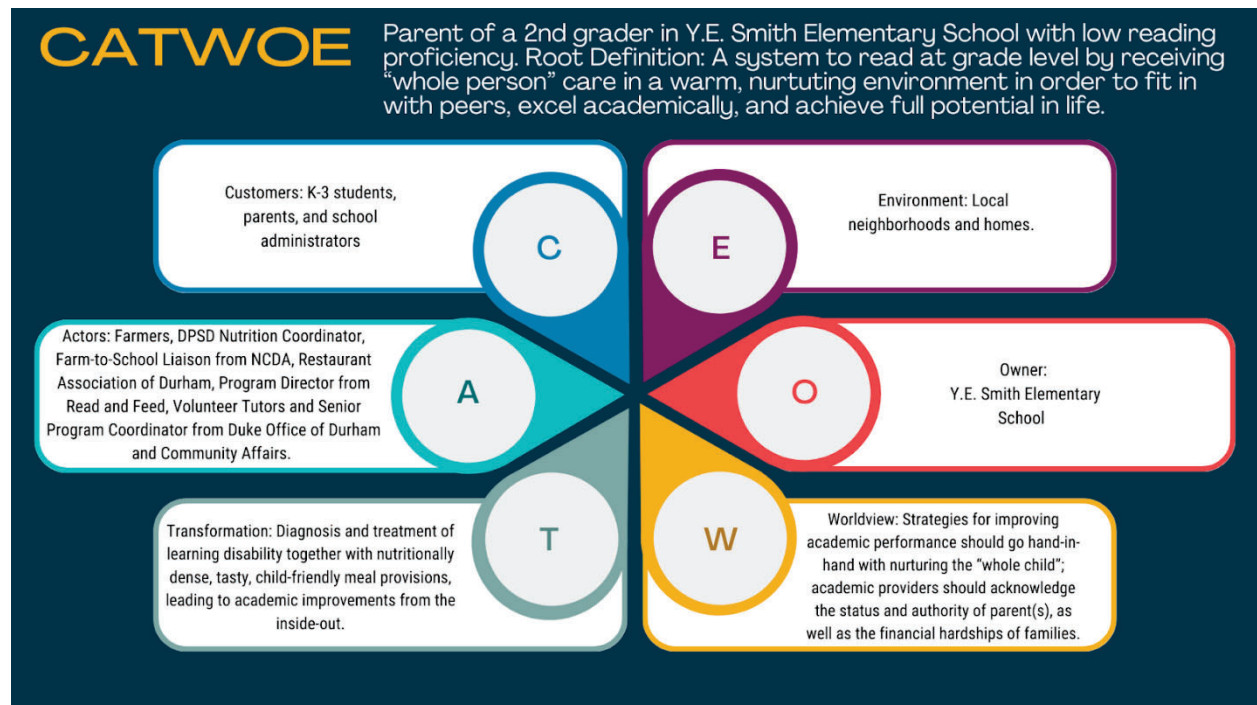
*End Hunger Durham*

*Durham Literacy Center*

**Appendix E.2.A.2: Key Stakeholders in Three Leadership Teams**

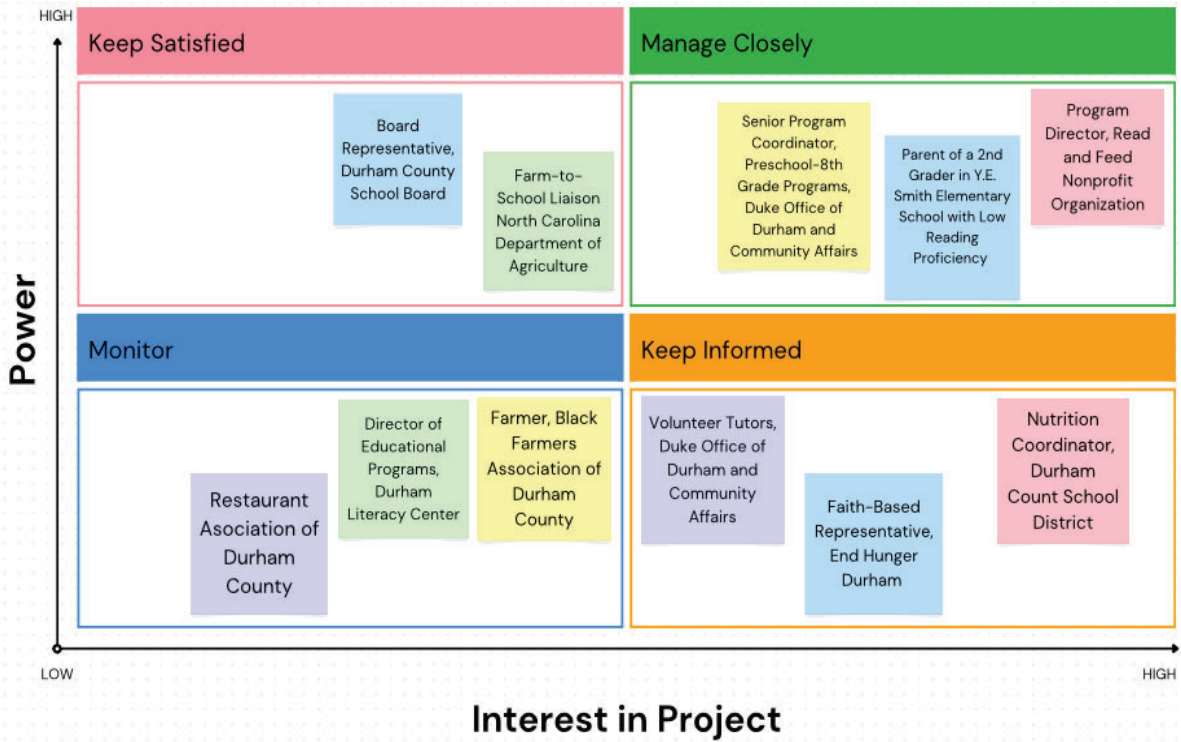
<b>Co-Design Team:</b> Project Leadership Team (PLT) Durham Literacy Taskforce (DLT) Community Focus Group (CFG)	<b>Farm-to-School Liaison</b> North Carolina Department of Agriculture (DLT)	<b>Parent of a 2nd Grader</b> in Y.E. Smith Elementary School with Low Reading Proficiency (CFG)	<b>Program Director,</b> Read and Feed Nonprofit Organization (DLT)	<b>Farmer, Black Farmers Association of Durham County (DLT)</b>	Julie Munoz, MPH Dylan Mathews, MPH Miriam Wiener, MPH Grace Ourada, MPH (PLT)
<b>Co-Design Role</b>	Promotes the interests of farmers, school children, food distributors, and the USDA. Provides insight into food quality standards, legal requirements, and governmental funding sources for meal allocation programs.	Provides ongoing insight into best practices for the academic, emotional, and physical health needs/preferences of underachieving youth in low resourced Durham County communities.	Promotes the interests of academic providers and students, and provides evidence-based tutoring and consultation services to strengthen literacy skills by 3rd grade.	Provides culturally relevant resources and strategies for providing afterschool meals for under-resourced students in Durham County, potential barriers to success, including low socioeconomic status, food access, lack of traditional farming knowledge among youth.	Uses co-design to heal and empower the community in order to build trust over time and connect the community to our team and other facilitators in a way that will be viewed as respectful, collaborative, and impactful over the long term.
<b>Design Justice Principle</b>	<i>"We center the voices of those who are directly impacted by the outcomes of the design process."</i>	<i>"Everyone is an expert based on their own lived experience, and... we all have unique and brilliant contributions to bring to a design process."</i>	<i>"We work towards non-exploitative solutions that reconnect us to the earth and to each other."</i>	<i>"Before seeking new design solutions, we look for what is already working at the community level. We honor and uplift traditional, indigenous, and local knowledge and practices."</i>	<i>"We use design to sustain, heal, and empower our communities, as well as to seek liberation from exploitative and oppressive systems."</i>
<b>Engagement</b>	Consulted Informed	Responsible Accountable	Responsible Accountable	Responsible Accountable	Responsible Accountable

**Appendix E.2.A.3: CATWOE Analysis of Partners #1 and #2**





**Appendix E.2.A.4: Power Analysis Grid**



## **APPENDIX E.3: ENGAGEMENT AND ACCOUNTABILITY PLAN**

### **Statement of Purpose:**

In Durham County, only 44 percent of children scored proficient in 3rd-grade reading compared with the state average of 47 percent, and racial disparities are shockingly stark – 36.8 percent of black children scored proficient in 3rd-grade reading compared with 76.8 percent of white children (Public School Review, n.d.); a vivid illustration of the system archetype, Success to the Successful, whereby one causal loop reinforces positive outcomes for one party and the other loop reinforces negative outcomes for the other party (Ramaswamy, n.d.). As predicted in the Success to the Successful model, newly released student performance data from the North Carolina Department of Public Instruction shows that the gap in proficiency between black and white students is steadily increasing (Kummerer, 2022).

To address this gap in proficiency, our Project Leadership Team (PLT) will convene a diverse group of stakeholders to co-design and implement an afterschool literacy program in two Durham County elementary schools – YE Smith and CC Spaulding – identified for their low 3rd-grade reading proficiency scores combined with the reduced socioeconomic status of their student populations. The program will provide one-on-one tutoring and a nutritious, hot meal featuring fresh produce grown by the Black Farmers of Durham County – both provided in a supportive, nurturing environment. The goal of the 2-year pilot program is to increase reading proficiency scores by a minimum of 25 percent and, if successful, to scale to other schools throughout Durham County and beyond.

### **Rationale:**

Education improves health directly and indirectly (Ross CE, Wu CL, 1995) and is considered one of the primary “social determinants of health” (SDoH), nonmedical factors such as built environment, political policies, and racism that are often invisible but have the power to shape quality of life (Social Determinants of Health at CDC). Proficiency in 3rd-grade reading is considered one of the most accurate measures of educational access and quality and is potentially more reflective of socioeconomic status (SES) than years of schooling (Dotson VM, et al., 2015).

### **Community Partner Selection: Read and Feed:**

Stakeholder viewpoints are diverse, spanning the educational, business, agricultural, governmental, non-profit, and community sectors. We will establish three co-design teams: 1) A Project Leadership Team (PLT) consisting of Julie Munoz, Dylan Mathews, Miriam Wiener, and Grace Ourada, that will meet weekly to discuss

project updates, leverage points to enhance the efficacy of the program, and engagement strategies to best support educational access and quality; 2) A taskforce of key specialists from within the community to be known as the Durham Literacy Taskforce (DLT) consisting of a Program Coordinator from Read and Feed; a farm-to-school liaison hired by the North Carolina Department of Agriculture to coordinate legal hurdles, strategize and assist with funding, and ensure that all meals and produce meet quality standards set by the USDA; a representative from the Black Farmers Coalition of Durham County; the current Nutrition Coordinator from the Durham County School District; a representative from the Restaurant Association of Durham County; Director of Educational Programs from the Durham Literacy Center; and a faith-based representative from End Hunger Durham. The DLT will meet monthly throughout the life of the two-year pilot program for technical advice, messaging, fundraising, marketing, legal strategy, policy assistance, and community outreach; and 3) A Community Focus Group (CFG) of parents, students, and teachers from YE Smith and CC Spaulding Elementary Schools, together with student literacy tutors from the Jumpstart Literacy Program at the Duke University Office of Durham and Community Affairs, local community members, and at least one representative from the Durham County School Board, that will meet quarterly to provide data on awareness of childhood literacy, nutritional needs, feedback on the program, and to evaluate the impacts as a result of the selected intervention. Ongoing communication and engagement will occur between the PLT, DLT, and CFG via a monthly “Durham County Nourishing Literacy” newsletter distributed to all three teams and the greater Durham County community.

As one of the first steps in our community partner selection process, the PLT will identify and personally reach out to three employees within the Read and Feed nonprofit organization who are currently working in schools identified as “High-Interest Schools” (HIS) schools; schools that were previously underperforming on 3rd-grade literacy assessments but have since reached their target literacy goals following the Read and Feed intervention. These key HIS stakeholders – selected for their close relationships with low-resourced student communities and their high level of commitment to educational access and quality – will be invited to take a leadership role within the DLT and assist our PLT in the co-design, planning, implementation, and evaluation stages of our pilot program, providing expert perspectives on K-3 literacy in low-resourced communities and assisting our team in measuring the sustainability and scalability of the program long-term. Our PLT will consult with these HIS stakeholders in closed-group formats and separately and confidentially, to determine the most pressing and impactful first steps to implement. Further, these HIS stakeholders will liaise between the DLT, CFG, and PLT on a monthly basis

throughout the duration of the program in order to provide technical advice and feedback on program messaging, assist in tracking progress, provide training, assist with community focus groups, and participate in community outreach activities and social media strategy. All HIS proposals and ideas will be submitted to the DLT, CFG, and PLT for final approval.

Influential Factors:

The problem of childhood literacy in low-resourced school districts is complex and requires an equally complex set of viewpoints to define and address the issue. Therefore, our leadership team will select stakeholders with a unique and broad base of perspectives and experiences related to both childhood literacy and food access. However, effective interventions are not without their own shortcomings and challenges, and our PLT will need to be aware of – and fully prepared to address – any potential obstacles our selected stakeholders encounter. Specialists and community leaders have rigorous schedules that will limit their time, and while all team members have endorsed the proposed intervention and are deeply engaged, their level of attendance at regular meetings may be sporadic. Further, stakeholders will have their own priorities and ideas as to how to implement change, including biases, political ideologies, and prior interactions with community members that might potentially skew their ability to remain objective throughout the implementation process. Finally, competing financial interests may play a part for certain stakeholders such as the Durham Literacy Center, which serves an older demographic compared with our program, but utilizes similar, potentially conflicting funding sources.

To logistically move forward as a coalition, our public health leadership team will consist of Julie Munoz, Dylan Mathews, Miriam Wiener, and Grace Ourada, coordinating within a shared framework of values that align with the values of the communities we serve. Our vision for the two-year pilot is to improve the lives of young people in Durham County and be an example for other literacy initiatives in similar communities throughout North Carolina. Our mission is to identify and solve complex educational disparities in a sustainable, scalable manner. We hope to achieve this by stimulating and supporting research, education, training, and service within the Read and Feed framework in collaboration with our partners. Building mutual trust and commitment within our team and in the communities that we serve is the “engine” that empowers our leadership; humility, generosity, and social justice are “drivers” – the principles that will guide our meetings and all of our collaborative interactions with stakeholders.

Accountability for the program will be structured as follows: 1) The PLT will be responsible for coordinating and engaging stakeholders. It will implement the engagement and accountability plan and ensure the

project is meeting deadlines and operating on budget; 2) Read and Feed will be accountable for using their afterschool program structure to implement program activities; 3) School administrators will be accountable for delegating the correct resources – time, place, school staff – for the program; Parents and students will be accountable for making sure that K-3 children are signed up, attending, and participating in the program; 4) End Hunger Durham will facilitate food to schools through partnerships with faith-based organizations; 5) The Black Farmers Association will be a key partner in providing local produce; 6) The Durham County School Board will be responsible for providing the infrastructure to run the program; 7) the Community Affairs office will help supply tutors for Read and Feed; 8) The Durham Literacy Center will consult and inform about literacy resources in the county; 9) The Nutrition Coordinator and Dietician will consult on healthy foods to be offered for students; and 10) The liaison through the North Carolina Department of Agriculture will consult and remain informed about decisions affecting the farm-to-school food pipeline.

#### Engagement Methods:

To sustainably address educational inequities in Durham County, our PLT will engage stakeholders across multiple community sectors in order to ensure that numerous strengths, talents, and community resources are brought to the table. Childhood literacy is a “wicked problem” that requires deep systems change in order to address the built environments that drive a lack of reading proficiency at the 3rd-grade level. In addressing systems change, our PLT will need to focus on creative and perhaps never-before-utilized solutions, since interventions utilizing tutoring alone have been employed with little impact (Ferguson, et al., 2007). Including stakeholders from peripheral sectors such as farming, the faith community, and the restaurant industry, our team strives to address literacy from numerous angles. Gaining an understanding of leadership theory – and the leadership styles that animate it – will assist our PLT in leading the execution of the project successfully. Utilizing creative techniques such as afterschool meals paired with nurturing mentorships to “feed the body and the brain” (Noonan, 2016) requires a forward-thinking mindset to establish goals from a “bigger-vision” perspective (Rice, n.d.). Our PLT will utilize behavioral theory to employ democratic, participatory styles of leadership that rely on intrinsic motivation – the idea that things are worth doing for their own sake. In other words, our PLT will be committed to actively engaging the community and showing stakeholders that we truly care – thereby establishing trust, one of the Nine Principles of Community Engagement (ibid).

#### Improvement Plan:

Given that this initiative focuses on the collaboration of various parties with differing backgrounds and specific goals, it is vital that we establish an approach to ensure that ethical leadership is exercised throughout all stages of the work. In order to best organize and foster a culture of collaboration among our stakeholders, we will establish overarching standards for conduct among all project teams. In the early stages of establishing our three project teams, we will hold an all-project meeting where standards for conduct, determination of sanctions, and means for resolving conflicts will be discussed. It is imperative that all key stakeholders are involved in this initial meeting because it will ensure that expectations are clear among all parties and will allow for collaboration among all stakeholders. In subsequent meetings, we will discuss the ways in which all parties can best communicate differences, but the overall standard for conduct will have already been set.

PLT will act as a facilitator to navigate disagreements and keep discussions on-topic and constructive. To accomplish this, we will utilize the “Six Thinking Hats” method. Disagreements not solved through discussion will employ the “Fist-to-Five” voting method to manage conflict in an ethical, equitable manner. To ensure responsible and accountable decision-making, we will establish a core group of members within each goal, including representation from each of the stakeholders considered responsible and accountable for that goal. Refer to the RASCI table in Appendix I for an outline of the responsible and accountable parties for each project goal. By establishing a core group that is split by goal, we will ensure that each goal is progressing and on target with our project timeline. This will also enable us to diplomatically address issues on a smaller scale with representatives from each stakeholder group.

Accountability Partners in MOU:

Given that one of our primary stakeholders is Read and Feed, the MOU for this stakeholder is particularly important and sets the tone for all partnerships between PLT, DLT, and CFG. This MOU (see Appendix IV) also serves to outline expectations and goals as shown in Appendix III. Our PLT ultimately aims to foster collaboration among existing organizations that are dedicated to improving the overall health and literacy of low-resourced student populations in Durham County while spearheading life-changing initiatives for this demographic.

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**APPENDIX E.3.A ENGAGEMENT & ACCOUNTABILITY PLAN APPENDICES**

**Appendix E.3.A.1: RASCI Table**

<b>Goals</b>	<b>Goal 1:</b> Increase 3rd-grade literacy by 25% over a two-year period.	<b>Goal 2:</b> Provide K-3 students nutritious after-school dinners Mon-Thurs, containing a minimum of 25% locally grown produce.
<b>Responsible</b>	<b>Project Leadership Team</b>	<b>Project Leadership Team</b>
<b>Accountable</b>	<b>Read and Feed Program School Administrators Parents/Caregivers K-3 Students</b>	<b>Read and Feed Program School Administrators Parents/Caregivers K-3 Students</b>
<b>Supportive</b>	<b>End Hunger Durham Black Farmers Association Durham County School Board</b>	<b>End Hunger Durham Black Farmers Association Durham County School Board</b>
<b>Consulted</b>	<b>Duke Office of Durham and Community Affairs Durham Literacy Center DPS Nutrition Coordinator DPS Registered Dietitian</b>	<b>Duke Office of Durham and Community Affairs Durham Literacy Center DPS Nutrition Coordinator DPS Registered Dietitian</b>
<b>Informed</b>	<b>North Carolina Department of Agriculture</b>	<b>North Carolina Department of Agriculture</b>

### Appendix E.3.A.2: Results-Based Accountability Plan

#### Conditions of Collective Impact: “Isolated Impact vs. Collective Impact”

- Common Agenda:
- Connect multiple sectors and professions that provide the support, services, and infrastructure to promote K-3rd-grade literacy in low-resourced communities.
- Coordinate existing support and services to avoid duplication of efforts, identify gaps, and increase access to services and support to those who need it.
- Engage at least one new literacy sector or other community support organization in collaborative efforts to support childhood literacy.
- Enhance at least one existing relationship with a literacy sector partner.
- Create or join a multi-sector coalition, committee, or council that addresses childhood literacy.
- Engage in or lead policy, systems, and/or environmental change to improve childhood literacy in low-resourced communities.
- Shared Measurement:
- 3rd-grade literacy assessments are mandated for all public elementary schools. These data will assist us in measuring our results, and our team will review and strengthen the program guidelines to ensure it addresses the specific literacy needs of children in low-resourced communities.
- Identify one priority around childhood literacy in low-resourced communities.
- Conduct an environmental scan to identify community programs that are already addressing the literacy needs of children in low-resourced communities – and specifically the priority that was identified.
- Establish a mechanism for ongoing input of key stakeholders in low-resourced communities to identify needs and inform future assessment processes and policy developments in these demographics.
- Collect, analyze, and disseminate data from the pilot program.
- Mutually Reinforcing Activities
- In-person convenings, advisory committee conference calls, conference presentations, case study reports, monthly newsletters, webinars, classes, Vision and Action Plans created by our PLT in collaboration with the DLT and CFG.
- Continuous Communication
- Develop messaging or communication strategies and tools to engage stakeholders and/or improve visibility of literacy programs and services in low-resourced communities.
- Increase awareness of existing services and facilitate referrals to improve access.
- Backbone Support Organizations
- Who will convene the group?
- YE Smith and CC Spaulding Elementary Schools
- Read and Feed Nonprofit Organization

**Appendix E.3.A.3: Accountability: Performance Measures and Population Indicators**

Accountability	Population Indicator for the Issue	How Change will be Measured
<p>1. Population                  2. Results                  3. Indicators: data development agenda                  4. Baselines                  5. Story behind the baselines                  Info/Research Agenda (Causes)                  6. Partners                  7. What works Info/Research Agenda (Solutions)                  8. Action plan                  9. Budget</p>	<p>Improving literacy outcomes among K-3 students.</p>	<p>Increase 3rd-grade reading proficiency by 25% in each of the two service areas chosen for their low 3rd-grade reading proficiency scores combined with the reduced SES of their student populations and identified as “High-Interest Schools” (HIS) via Community Focus Group (CFG) outreach in each area by May 2024.</p> <p>Increase funding for nutrition services by 10% through existing Read and Feed programming to provide afterschool meals for every K-3 student by May 2024.</p> <p>Purchase one transportation vehicle for each of the two service areas identified as “High-Interest Schools” (HIS) for meal and produce deliveries (two vehicles in total by May 2024).</p>

## Appendix E.3.A.4: MOU

### MEMORANDUM OF UNDERSTANDING BETWEEN THE PUBLIC HEALTH LEADERSHIP TEAM (PLT) AND READ AND FEED (RAF) NONPROFIT ORGANIZATION

#### 1. PARTIES AND PURPOSE

- a. The purpose of this MOU is to: affirm the mutual interests shared by both parties which include investing in the literacy, health, nutrition, well-being, and dignity of the K-3rd grade population of North Carolina. This will be accomplished through the sharing of resources, information, and services.

#### 2. PARTNERSHIP PRINCIPLES

- b. We are collectively guided and inspired by our vision of achieving ideal student health and literacy in the North Carolina K-3rd grade population.
- c. We ensure to uphold an equity lens around literacy in program development, facilitation, and implementation.
- d. We are committed to upholding consistent, reliable communication between both parties. This includes regular communication to relay the status of our projects and the utilization of a project management tool to ensure milestones are being met.
- e. We are committed to maintaining transparency regarding internal and external decision-making, the strategy by which resources are allocated, and dissemination of program findings between both parties.
- f. The primary mode of communication between both parties will be e-mail. Meetings will largely be held on Microsoft Teams in light of the COVID-19 pandemic and member schedules. On-site meetings may be held, based on a vote by both parties.

#### 3. SCOPE OF ACTIVITIES & GOALS

- g. RAF and PLT will collaboratively review and modify existing “inequitable” educational policies that are discriminatory against low-resourced students in grades K-3, in order to improve literacy outcomes among this demographic.
- h. RAF and PLT will convene on a monthly basis to provide updates and monitor progress on existing projects.
- i. RAF and PLT will identify areas for improvement in the current educational lesson plan to ensure that quality measures around literacy in low/resourced communities are being met.

#### 4. ACTIVITY AGREEMENTS

- j. We, both parties, agree to extensively discuss all pertinent topics prior to enacting any decisions.
- k. We will refer to a pre-established conflict resolution plan in the event of a disagreement between both parties.
- l. We agree to continuously modify and improve the MOU in light of new developments and information as deemed necessary.

#### 5. ACCOUNTABILITY PLAN

5.1 Improving literacy outcomes among K-3rd grade elementary school students in Durham County through the implementation of the following goals:

- m. Increase 3rd-grade reading proficiency by 25% in each of the two service areas chosen for their low 3rd-grade reading proficiency scores combined with the reduced SES of their student populations and identified as “High-Interest Schools” (HIS) via Community Focus Group (CFG) outreach in each area by May 2024.
- n. Increase funding for nutrition services by 10% through existing Read and Feed programming to provide 400 additional in-home and 200 additional congregate/group meals by May 2024.
- o. Purchase one transportation vehicle for each of the two service areas identified as “High-Interest Schools” (HIS) for meal and produce deliveries (two vehicles in total by May 2024).

#### 6. RENEWAL, TERMINATION, AND AMENDMENTS

- p. The duration of the MOU is two years from the date of the last signature.
- q. The duration of this MOU can be lengthened with the written approval of each party.

- r. This MOU can be terminated with reasonable cause or if there is a breach of contract. If a termination is requested, the reason must be submitted to the other party through a written notice provided 75 days prior to the termination of the agreement.

**7. CONTACTS**

- s. The Agency Director of Read and Feed will serve as its primary contact.
- t. Grace Ourada will serve as the PLT's primary contact.

*In witness thereof, the parties have offered their signatures hereto:*

Agency Director, Read and Feed

Signature \_\_\_\_\_

Date \_\_\_\_\_

Grace Ourada, Public Health Leadership Team Representative

Signature \_\_\_\_\_

Date \_\_\_\_\_