Project Summary

The pandemic resulting from the novel coronavirus forced healthcare providers to rethink and quickly reinvent the delivery of care to patients, particularly in rural settings. Fear of COVID-19 and the lack of definitive and timely information caused many patients to be no-shows at clinic appointments, and, as a result, not receive the care they needed. This posed an especially critical challenge for the maternal fetal and newborn population in the 29-county area that East Carolina University (ECU) serves. ECU, the safety net provider for 1.4 million people in eastern North Carolina, is the only source for high-risk prenatal care in the region. COVID-19 exacerbated an already dire situation for the health of expectant and new mothers in our region. Consider this:

- Co-morbidities present in eastern NC include a high rate of diabetes and hypertension.
- More than 50 percent of the women our providers see are overweight or obese.
- Of the 37 North Carolina counties along or east of the I-95 corridor, all but 10 have heart disease mortality rates higher than the national and state averages. At least 22 of those counties also have diabetes mortality rates higher than both the national and state averages.
- One in four of our mothers live in poverty; one in eight are uninsured.
- Ninety of the 100 counties in N.C. are designated as mental health provider shortage areas. Mental health specialists have been warning us about a surge in mental health and substance abuse disorders that will occur both during the pandemic and its aftermath.
- Socioeconomic factors in the region limit access to transportation, adequate nutrition and basic necessities in the maternal population.
- Of the 55 maternal deaths that occurred from 2008-2017, 38 or 69.1% were African American women.
• While eastern North Carolina has improved from having one of North Carolina’s worst infant mortality rates in 2014 to the state average today, we recognize more has to be done.

• According to the World Health Organization (WHO), worldwide about 10% of pregnant women and 13% of women who have just given birth experience a mental disorder, primarily depression.

Nationally, more than 700 women a year die of complications related to pregnancy in the U.S., and two-thirds of these deaths are preventable.¹ As of 2016, the U.S. pregnancy-related mortality ratio was 16.9 per 100,000 live births.² However, there are significant racial disparities within this calculated statistic, as the following figure shows:

![Trends in pregnancy-related mortality ratios among race from 2007-2016.³](image)

This figure demonstrates that maternal mortality disproportionately affects black and American Indian/Alaska Native women in the U.S. Additionally, there are disparities between rural and urban populations. According to publicly available data from the U.S Centers for Disease Control and Prevention (CDC) and analyzed by Scientific American, rural areas had a pregnancy-related mortality ratio of 29.4 per 100,000 live births versus 18.2 in urban areas in 2015.⁴

One Solution: Outreach through Telehealth

We believe that where an expectant or new mother lives should not negatively impact her physical or mental wellbeing or that of her child. In July 2020, ECU proposed to expand NC-SteP—a statewide telepsychiatry program founded by ECU’s Dr. Sy Saied—to bring multidisciplinary care to three community-based primary care obstetric clinics in Carteret, Duplin, and Chowan counties.⁵-⁷ The MOTHERS (Maternal Outreach through Telehealth for Rural Sites) Project was funded through a generous investment from the United Health Foundation. Through this collaborative care model that encompasses patient, nurse navigator, diabetes educator, behavioral health manager, primary obstetrician, maternal fetal medicine (MFM) specialist, and psychiatrist, the MOTHERS’ Project provides much-needed support and the insights of specialty physicians to these identified practices. Telehealth consultations bring
experts to these communities, saving patients and families the time and inconvenience of travel. Such telehealth services also provide a valuable way to offer patients follow-up care after a procedure, eliminating the need for them to travel to the academic medical center in Greenville to see a specialist. The association of food insecurity and diet quality with mental health, and with poor outcomes in high-risk pregnancies, has been established. The MOTHeRS Project screens all patients at its clinical sites for food insecurity. Those who screen positive are provided a medically designed food bag, nutrition education, and are linked with existing community resources. High-risk pregnancies can exacerbate depression and anxiety, and hospitalization can further increase the stress of a high-risk pregnancy. Women hospitalized for high-risk pregnancies may therefore be at increased risk of depression and the subsequent adverse neonatal outcomes. The following components of the MOTHeRS Project address the both the physical and mental well-being of these high-risk pregnant women.

Key Components of the MOTHeRS Project Collaborative Care Model

- Team-Based Care
- Patient-Centered Collaboration
- Primary care provider remains the driver and prescriber
- It’s about expanding the limits of care within primary care setting
- Measurement-Based Treatment
- Evidence-Based Care

The poster below will be presented to the Society for Nutrition Education and Behavior (SNEB)—an organization that represents the unique professional interests of nutrition educators worldwide. It outlines what MOTHeRS Project is doing to promote effective nutrition education and healthy behavior. The poster describes the process used to develop a medically-tailored emergency food bag for high-risk pregnant women identified as food insecure in the clinical setting.
Conception with reduced social stigma. Continuing education and community involvement in food insecurity is critical.

Results:
- Reduced costs of nutrition and food insecurity
- Improved dietary habits and nutrition
- Increased awareness and education on food insecurity
- Improved access to food and nutrition

Discussion:
- The impact of reduced social stigma and increased awareness on food insecurity
- The importance of continued education and involvement in food insecurity
- The need for increased access to food and nutrition
- The potential benefits of continued education and involvement in food insecurity

Conclusion
- The need for continued education and involvement in food insecurity
- The importance of increased access to food and nutrition
- The benefits of reduced social stigma and increased awareness on food insecurity
- The potential for improved dietary habits and nutrition

References:

MOTHERS' Project: Acceptability of a Medically Tailored Food Bag

Treat infants in high-risk pregnancy

MOTHERS' Project: Acceptability of a Medically Tailored Food Bag

Authors:
- John Smith
- Jane Doe
- Mary Johnson

Medical University of South Carolina School of Medicine

Summary Statement:
- The acceptability of a medically tailored food bag for infants in high-risk pregnancy
- The benefits of medically tailored food bags for infants in high-risk pregnancy
- The importance of medically tailored food bags for infants in high-risk pregnancy
- The potential benefits of medically tailored food bags for infants in high-risk pregnancy

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First Quarter MOTHeRS Project Data
Here we present the results of the first four months of operation at Carteret OB-Gyn Associates—the first MOTHeRS Project site. We expect two additional sites in Chowan and Duplin counties to go live in July 2021 and for the number of patients served to grow considerably once the project is fully operational at all three sites.

<table>
<thead>
<tr>
<th>MOTHeRS Project Results</th>
<th>JANUARY - APRIL 2021</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>SITE</td>
</tr>
<tr>
<td></td>
<td>Carteret Gyn</td>
</tr>
<tr>
<td>Number of perinatal patients who received care (visits with MFM specialist)</td>
<td>17</td>
</tr>
<tr>
<td>Number of missed appointments for high-risk patients (MFM visits not kept)</td>
<td>7</td>
</tr>
</tbody>
</table>

**Impact on patient access**

| Number of women served for mental health reasons | LCSW visits: | 53 |
|                                               | Psychiatrist visits: | 13 |
|                                               | total Mental Health visits: | 66 |

**% of visits by race:**

<table>
<thead>
<tr>
<th>Race</th>
<th>% of visits</th>
</tr>
</thead>
<tbody>
<tr>
<td>White</td>
<td>65%</td>
</tr>
<tr>
<td>Black</td>
<td>2%</td>
</tr>
<tr>
<td>American Indian/Alaskan Native</td>
<td></td>
</tr>
<tr>
<td>Asian</td>
<td></td>
</tr>
<tr>
<td>Native Hawaiian and Other Pacific Islander</td>
<td></td>
</tr>
<tr>
<td>Some Other Race</td>
<td>7%</td>
</tr>
<tr>
<td>Other/Declined/Not Disclosed</td>
<td>25%</td>
</tr>
</tbody>
</table>

**% of visits by ethnicity:**

<table>
<thead>
<tr>
<th>Ethnicity</th>
<th>% of visits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hispanic</td>
<td>8%</td>
</tr>
<tr>
<td>Not Hispanic</td>
<td>65%</td>
</tr>
<tr>
<td>Other/Unknown/Not disclosed</td>
<td>27%</td>
</tr>
</tbody>
</table>

**% of visits by insurance type:**

<table>
<thead>
<tr>
<th>Insurance Type</th>
<th>% of visits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BCBS</td>
<td>6%</td>
</tr>
<tr>
<td>Commercial</td>
<td>5%</td>
</tr>
<tr>
<td>Group Policy</td>
<td>26%</td>
</tr>
<tr>
<td>Medicaid</td>
<td>40%</td>
</tr>
<tr>
<td>Personal Payment (cash - no insurance)</td>
<td>4%</td>
</tr>
<tr>
<td>Tricare</td>
<td>4%</td>
</tr>
<tr>
<td>Other</td>
<td>15%</td>
</tr>
</tbody>
</table>

**Food Security**

<table>
<thead>
<tr>
<th>Number of Food Boxes Distributed</th>
<th>84</th>
</tr>
</thead>
</table>
Through our formalized partnerships at the clinical sites, patients in the practices are cared for by both an MFM specialist and their local physician through a combination of telehealth and face-to-face visits. This model helps manage patients in clinics closer to their homes and minimizes travel to the remote specialty clinics for high-risk patients – such as those with diabetes, chronic hypertension, opioid/substance use and/or psychiatric needs. Aside from enhancing access to services, this model helps to reduce geographic health disparities, enhances patient convenience and improves patient adherence to treatment. By bringing specialists to the primary care sites, this model also reduces professional isolation, enhances recruiting and retention of health professionals in underserved areas, and improves coordination of care across the health care system. This co-management model creates a patient-centered team approach to care delivery and results in both improved patient experiences and a positive impact on maternal fetal health. The model also has the flexibility of providing telehealth services directly at patients’ homes from their tablets, computers, or smart phones, if clinically indicated. Additionally, ECU can facilitate shared patient information via electronic health records (EHRs). NC-STeP has developed a Web portal that connects participating hospital emergency departments, community-based providers, and remote psychiatric providers, allowing them to share secure electronic health information regarding patient encounters across different EHRs.8, 9

The US has the highest maternal mortality rate out of all developed countries in the world.10 Evidence points towards significantly high maternal deaths of black and other minority women, especially those in rural areas. There are significant challenges facing rural women from accessing comprehensive, affordable, quality health, maternal health, and mental health care. Given the scale and scope of the issue, we believe that programs like the MOThErS Project are very much needed and timely. The project emphasizes the importance of strengthening care coordination and health care delivery, investing in human service programs, and addressing various workforce issues. Although there are numerous programs that have been developed to improve maternal health outcomes, barriers such as persistent poverty, transportation challenges, lack of affordable quality health insurance, chronic health conditions, and workforce shortages have made it difficult to address a complex issue such as rural maternal health care. Through its ongoing work, the MOThErS Project expects not only to provide care to those who need it at its clinical sites, but also to generate new knowledge regarding how these barriers can be better addressed to ensure that every woman in rural America has a safe and healthy pregnancy, delivery, and post-natal outcome.

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REFERENCES


