Faculty/Presenter Disclosure

• Drs. Zamora-Kapoor and Sinclair have no relevant financial relationships with the manufacturer(s) of commercial services discussed in this CME activity.

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• Drs Zamora-Kapoor and Sinclair do not intend to discuss any unapproved/investigative uses of commercial products/services in this presentation.
Infant-feeding practices and the gut microbiome of American Indian and Alaska Native infants

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Structure of this presentation

1. Purpose
2. Background
3. Research questions
4. Specific aims
5. Methods
6. Preliminary findings
7. Next steps
Purpose

1. To clarify the role of breastfeeding in the gut microbiome of American Indian and Alaska Native (AI/AN) infants.

2. To determine the role of breastfeeding in obesity outcomes.
Background

1. AI/ANs have the highest prevalence of obesity in the country.
Background

2. AI/ANs have one of the lowest rates of breastfeeding initiation in WA state.

<table>
<thead>
<tr>
<th>Race/ethnicity</th>
<th>N</th>
<th>% Breastfeed</th>
<th>OR</th>
<th>95%CI**</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-Hispanic White</td>
<td>32,342</td>
<td>93</td>
<td>1.00</td>
<td>(ref)</td>
</tr>
<tr>
<td>Non-Hispanic Black</td>
<td>2,094</td>
<td>88</td>
<td>0.65</td>
<td>(0.57-0.75)</td>
</tr>
<tr>
<td>Hispanic</td>
<td>4,723</td>
<td>91</td>
<td>1.08</td>
<td>(0.97-1.21)</td>
</tr>
<tr>
<td>Asian</td>
<td>2,966</td>
<td>92</td>
<td>0.76</td>
<td>(0.66-0.88)</td>
</tr>
<tr>
<td>American Indian</td>
<td>1,073</td>
<td>84</td>
<td>0.57</td>
<td>(0.48-0.68)</td>
</tr>
<tr>
<td>Pacific Islander</td>
<td>316</td>
<td>83</td>
<td>0.50</td>
<td>(0.37-0.68)</td>
</tr>
</tbody>
</table>

* Random sample of 45,017 Washington State birth certificate controls from a separate study; 1445 with missing race. **Adjusted for maternal age, parity, and year of delivery.
Background

3. Previous research has shown the benefits of breastfeeding:
   - Physiological.
   - Emotional/psychological.
   → previous studies did not include AI/ANs.
How the practice of breastfeeding can contribute to physical health? Through the gut microbiome.
   - Prevents allergies and inflammation.
   - Prevents unhealthy weight gain.
Research questions

1. Is there a link between breastfeeding and the gut microbiome of AI/AN infants?
2. If this link exists, can the low rates of breastfeeding initiation help us explain the high prevalence of overweight and obesity?
Specific Aims

• Aim 1: Explore possible differences in attitudes of AI/AN mothers who are currently breastfeeding and those who are formula-feeding their infants.

• Aim 2: Examine the dietary and physical activity habits of AI/AN breastfeeding and formula-feeding mothers; and

• Aim 3: Assess the feasibility of collecting fecal samples to analyze the yield, quality, and gut microbiome of AI/AN infants that are breastfed or formula-fed.
## Methods

<table>
<thead>
<tr>
<th>Specific aims</th>
<th>Data collection</th>
<th>Analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Aim 1:</strong> Explore possible differences in attitudes of AI mothers who are currently breastfeeding and those who are formula-feeding their infants.</td>
<td>Focus groups and CDC Neonatal Questionnaire.</td>
<td>Qualitative analysis.</td>
</tr>
<tr>
<td><strong>Aim 2:</strong> Examine dietary and physical activity habits in AI breastfeeding versus formula-feeding mothers.</td>
<td>CDC Project First Diet History Questionnaire, and WHO Global Physical Activity Questionnaire.</td>
<td>Quantitative analysis.</td>
</tr>
<tr>
<td><strong>Aim 3:</strong> Assess the feasibility of collecting fecal samples to analyze the yield, quality, and gut microbiota of infants’ from AI breastfeeding and formula-feeding mothers.</td>
<td>Stool sample collection protocol.</td>
<td>DNA sequencing.</td>
</tr>
</tbody>
</table>
Preliminary findings

Focus group questions:
1. What have you heard about the benefits of breastfeeding?
2. What have you heard about the benefits of formula-feeding?
3. What influenced your decision to breastfeed or formula-feed your child?
4. In what ways did your culture influenced your decision to breastfeed or formula-feed?
5. What are some of the challenges that women face when they decide to breastfeed?
6. Were you told to change your diet or other habits while you were breastfeeding or formula-feeding your child?
7. Were you told to change your physical activity habits while you were breastfeeding or formula-feeding your child?
8. What advice about feeding would you give to a first-time expecting mother?
Preliminary findings

Benefits of breastfeeding:

• “stronger immune systems, less allergies, less risk for obesity”.
• “it helps mums lose baby fat quicker”
• “It helps mums and babies bond”
• “breastfeeding reduces ear infections”
• “breastfeeding decreases rates of SIDS”
• “less distance to walk [in the middle of the night], because you don’t have to walk to the kitchen, the baby is right there”
• “it made me feel powerful, close to my child, because it was something that only I could provide”
Preliminary findings

Benefits of formula-feeding:

• “someone else can feed the baby while you sleep or work”
• “for ladies that have a lot of food sensitivities, formula allows them not to change their diet”
• “for my youngest, I had to supplement my baby with formula because I wasn’t producing enough milk”
• “formula-feeding is good to prevent stigma in the workplace; stigma around having to find the time to pump and the space”
• “it is a big hassle to go back to work when you need to pump; I had back pain because I had to carry my pump and my milk everywhere”
• “some friends told me that your boobs look better when you don’t breastfeed”
Preliminary findings

What influenced your decision to breastfeed or formula-feed?

- “Some mothers turn to formula because they don’t have the support of their family, or their significant others”
- “Embarrassment. I was too embarrassed to do it in public”
- “With your WIC checks, if you are breastfeeding, you get more food. So when I came around to it, I wanted to breastfeed because of my family and culture, but also for financial reasons”
- “Teen mums cannot go back to school if they are breastfeeding”
- “Some women think that their boobs are going to get saggy”
Preliminary findings

The role of culture:

• “I grew up in an area where everyone breastfed. My cousin was on the front page of a newspaper breastfeeding”
• “Breastfeeding seemed like a normal thing to do”
• “My dad was around telling me: ‘This is part of your culture’”
• “I remember seeing pictures of my elders breastfeeding and I always thought it was important”
• “If my elders tell me, that’s what it is; I know that they are guiding me in the right way”
• “I was always told that it is important to breastfeed, everyone in my family told me”
Preliminary findings

Challenges of breastfeeding:

• “cracked nipples, the baby is biting you”
• “it’s a hard balance; ideally, breast is best, but you also have to feed the rest of your family”
• “your boobs seem to explode at night”
• “you have to put in work to do it”
• “at one point, I wondered: am I going to make more money working and buying formula or staying at home and living on food stamps?”
• “my milk didn’t come right away and that was stressful, and I noticed that when I was stressed, I produced less milk”
Preliminary findings

• Challenges of breastfeeding:

“I had two very different experiences with my kids: with the first one, I was really poor, I had no health insurance, and [when I went to the hospital to give birth] they just wanted me out of the hospital. No nurse came to give me any advice, and nobody talked to me about breastfeeding. Luckily I had a family that cared and I knew about the importance of breastfeeding. With my second, I had health insurance and [when I gave birth] all these nurses came in, with the lactation consultant. It was so different. The way I was treated and the information I was given changed based on my socioeconomic status”
Preliminary findings

Dietary or physical activity recommendations:

• “continue taking your pre-natal vitamins”
• “nothing specific, just eat healthy, don’t eat junk food”
• “don’t drink, or pump and dump”
• “eat fish, stay hydrated”
• “I remember that, when my baby started eating more, I had to keep eating, it was like being in a marathon, so that I could produce all the breast milk that he needed”
Preliminary findings from focus groups

Suggestions for new mums:
• “breastfeeding is natural, but it’s not easy”
• “stress-reduction techniques”
• “get reusable pads, because you will leak”
• “bring an extra sweater everywhere”
• “have a plan, stick to your plan, advocate for yourself, because I was treated like I had no idea about how to be a mum”
• “don’t feel guilty if you cannot breastfeed”
Next steps

- Publications:
  - Methods paper (handout).
  - Outcomes paper (in progress).

- Grant funding:
  - Submit a larger application to compare breastfeeding and non-breastfeeding AI/AN mothers to other populations.

- Dissemination of findings:
  - Conduct workshops for expecting and new mothers to disseminate the health benefits of breastfeeding, its challenges, and the resources available.
Thank you!

Comments/suggestions?

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