Pioneer Baby & eMOMS™ – Improving health among pregnant and postpartum populations in rural Kansas with an urban connection

PRESENTED BY: **Lisette T. Jacobson, PhD, MPA, MA**
Associate Professor
Dept. of Population Health
Dept. of Obstetrics & Gynecology-Wichita
Email: ljacobson@kumc.edu

Linda Jordan Photography, Wichita, Kansas

March 9, 2023

Research reported in this presentation is supported by the National Institute of Diabetes and Digestive and Kidney Diseases of the National Institutes of Health under Award Number K01DK113048

Presenter Disclosures

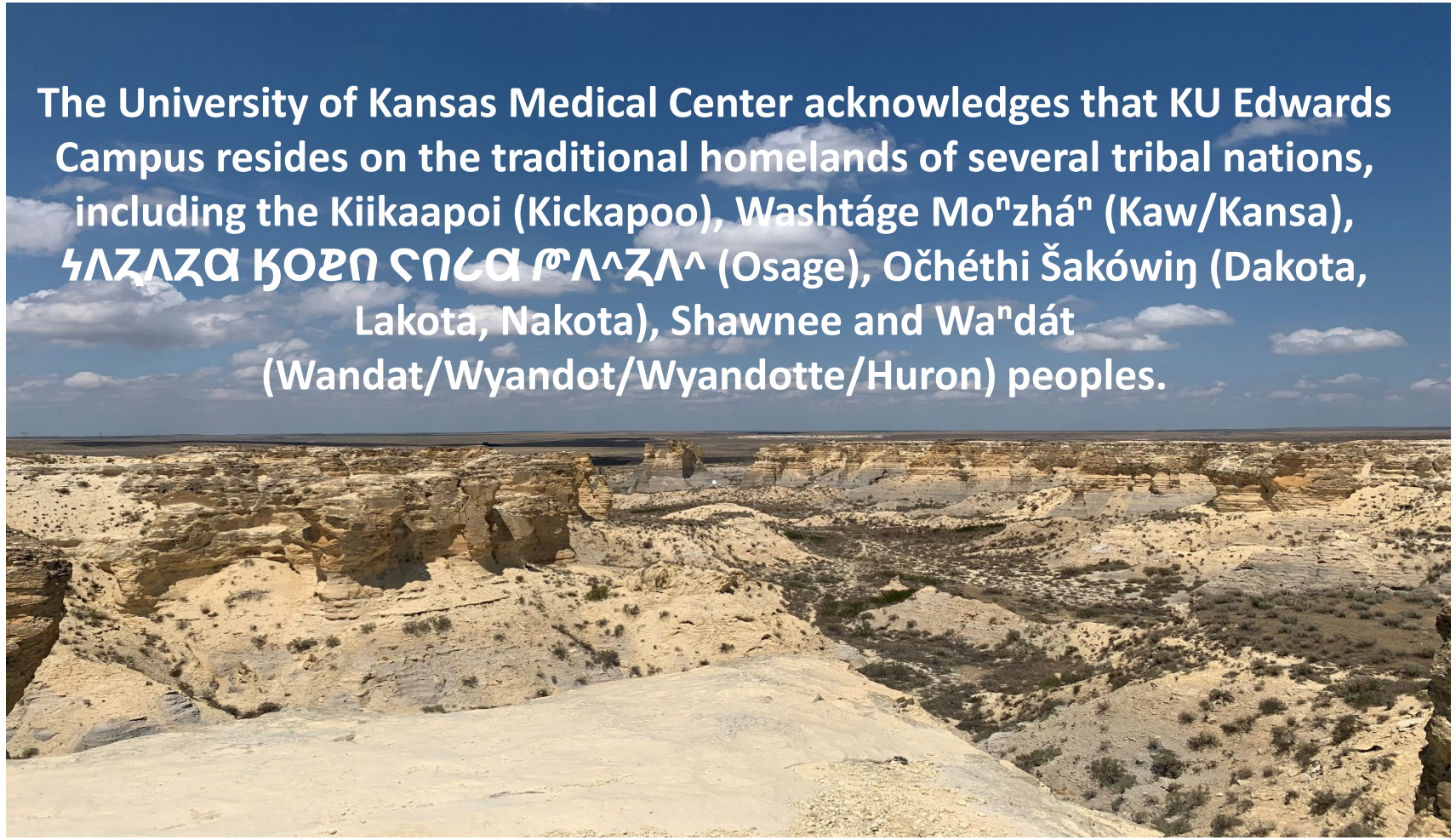
Lisette T. Jacobson, PhD, MPA, MA

The following personal financial relationships with commercial interests relevant to this presentation existed during the past 12 months:

- No relationships to disclose

KU SCHOOL OF MEDICINE WICHITA
The University of Kansas

Land Acknowledgement



KU SCHOOL OF MEDICINE WICHITA
The University of Kansas

Learning Objectives

- To discuss a collaborative partnership to help improve health outcomes among underrepresented pregnant populations

- To describe an innovative community-driven approach to reach underrepresented pregnant populations with educational programs, resources, and support

Overview

- **Pioneer Baby – Southwest rural Kansas**
  - Background – Gestational diabetes mellitus
  - Maternal morbidity & mortality
  - Timeline
  - Key studies & projects

- **What is the eMOMS™ study?**
  - A feasibility, 3-arm, randomized controlled trial (RCT)
    - Designed to improve postpartum weight retention and lactation
- **Overarching Goal:**
  - Improve pregnancy and birth outcomes among reproductive age individuals in rural and urban Kansas

Gestational Diabetes Mellitus

- Gestational diabetes mellitus (GDM) - Increasing rate nationally, currently at ~7-9%
  - Of these people, 20% have a subsequent diabetes diagnosis (Casagrande, Linder, & Cowie, 2018)
- GDM risk factors - Advanced maternal age, family history of diabetes, being non-White, higher parity, previous GDM, high pre-pregnancy body mass index (BMI), poor diet, inactivity
- Pre-pregnancy BMI ≥30 major risk factor for GDM
  (Fair, Ford, & Soltani, 2019; Much et al., 2014; Nguyen et al., 2019)
- 3 out of 10 U.S. women have pre-pregnancy BMI ≥30 (Centers for Disease Control and Prevention Behavioral Risk Factor Surveillance System, 2021; Driscoll & Gregory, 2020; Hales, Carrol, Fryar, & Ogden, 2020)
- GDM and BMI ≥30 → Adverse pregnancy & birth outcomes: pregnancy loss, pre-eclampsia, emergency c-section, congenital anomalies, depression, reduced lactation, prematurity, maternal and infant death (Hansen & Moloney, 2020; Neggers, 2016)

Barriers for reproductive age people in rural areas

Complications of GDM increased for rural people due to:

"Touching the Clouds" photographed by Steven Marler in Stafford County

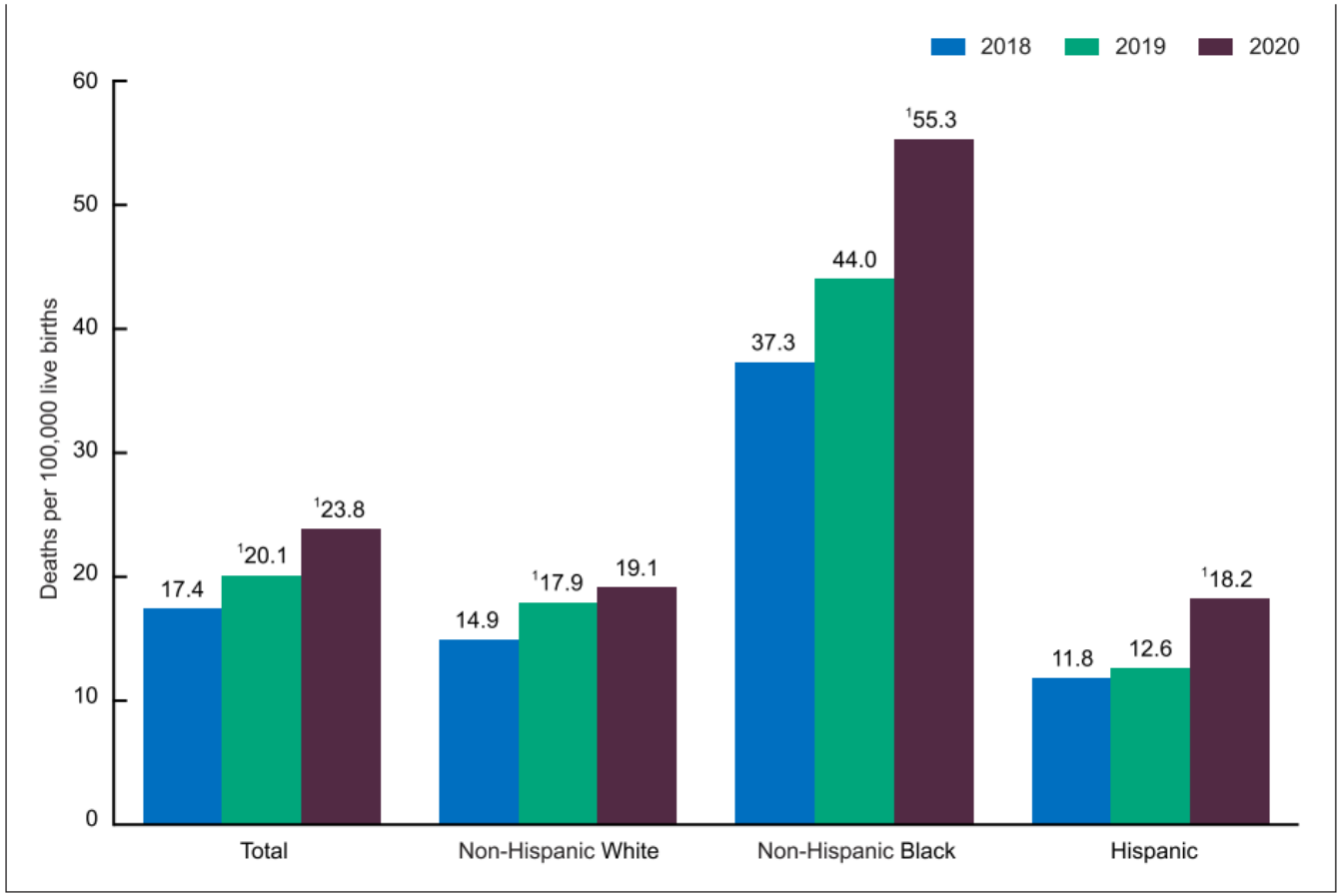
- Limited access to OB healthcare services
  (ACOG, 2014; Gallagher et al., 2013; Rayburn, Richards, & Elwell, 2012; Ross, 2013)
- Increased likelihood of low birth-weight babies and pre-term delivery
  (Blumenshine et al., 2010; McElroy et al., 2012; Strutz et al., 2012)
- Long drive times to hospitals
  (Hung et al., 2016; Meyer et al., 2016; Rayburn et al., 2012; Chandler, 2002)
- Late entry into prenatal care
  (Hung et al., 2016; Meyer et al., 2016; Rayburn et al., 2012; Chandler, 2002)
- Low breastfeeding rates
  (Jacobson et al.,2015; Grubesic & Durbin, 2017; Hamilton & Tarasenko, 2020)

KU SCHOOL OF MEDICINE WICHITA
The University of Kansas

Maternal morbidity and mortality in the U.S.

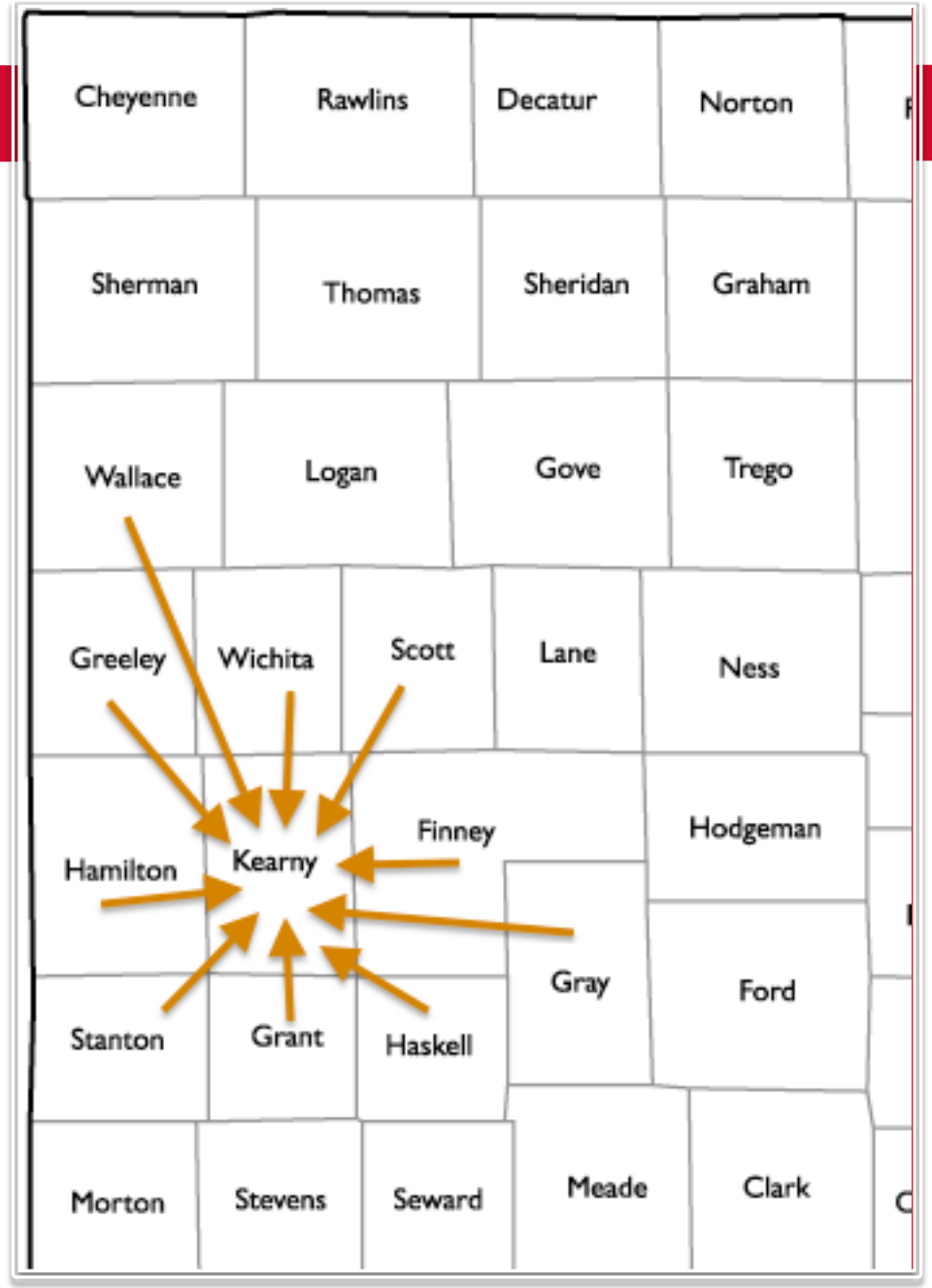
- All factors combined → Increasing trend in maternal morbidity and mortality with rural individuals, individuals of color, and individuals with low income at increased risk of pregnancy-related death (Hoyert, 2022; Hansen & Moloney, 2020; Neggers, 2016)
- Between 1987-2020, U.S. pregnancy-related mortality tripled, from 7.2 to 23.8 maternal deaths per 100,000 live births (Hoyert, 2022)

Figure 1. Maternal mortality rates, by race and Hispanic origin: United States, 2018–2020



[1]Statistically significant increase in rate from previous year ($p < 0.05$).
NOTE: Race groups are single race.
SOURCE: National Center for Health Statistics, National Vital Statistics System, Mortality.

KU SCHOOL OF MEDICINE WICHITA
The University of Kansas



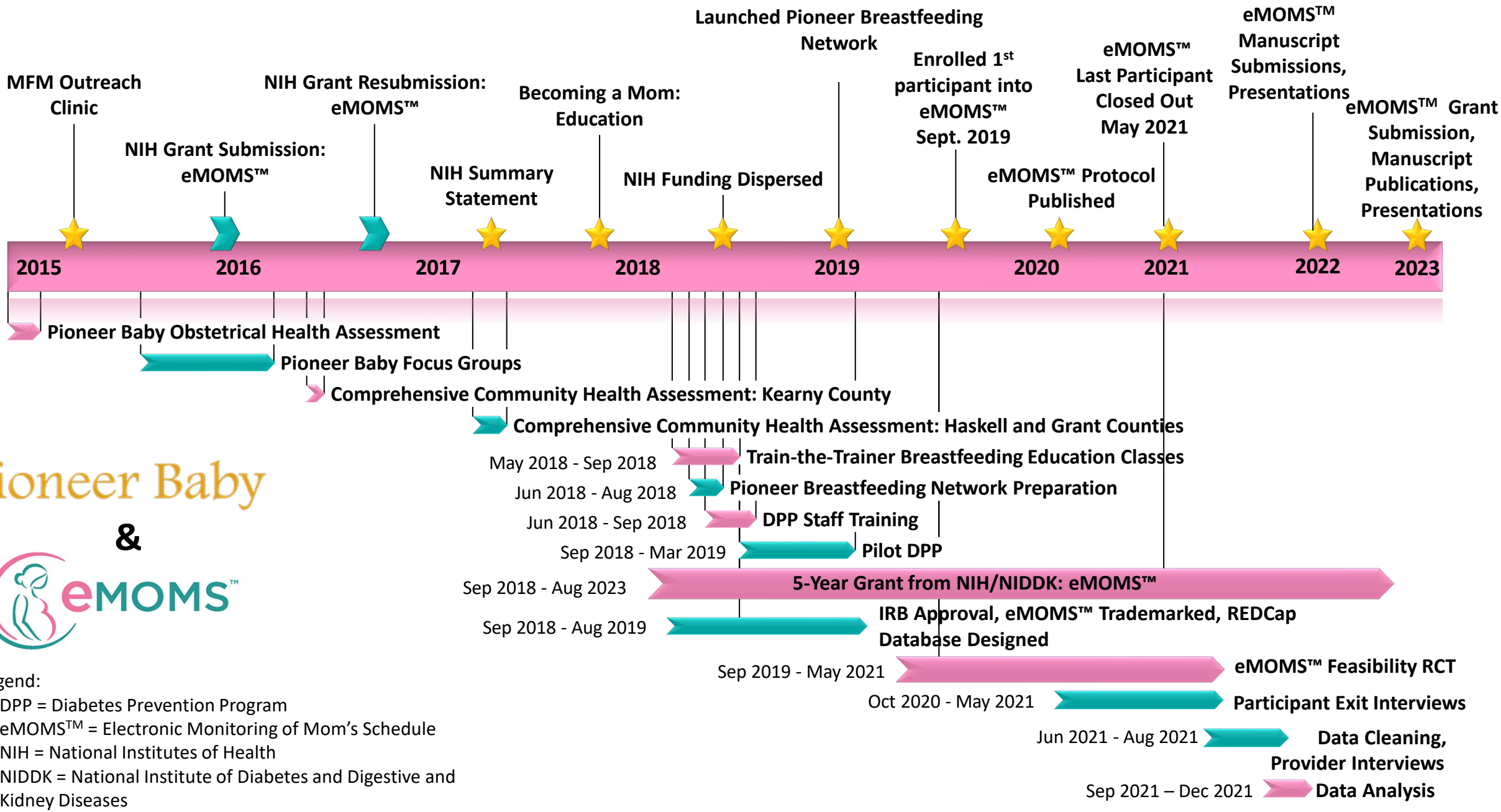
- Critical access full-spectrum hospital located in rural southwest Kansas
- About 200 deliveries per year
- Serves 11 counties, 22 nationalities
- High rate of pregnancy complications including gestational diabetes mellitus (GDM): 11% vs. ~6% nationally (DeSisto, Kim, & Sharma, 2014)

KU SCHOOL OF MEDICINE WICHITA
The University of Kansas

Pioneer Baby and our population of interest

Four phases to reach Pioneer Baby's overarching goal to improve pregnancy and birth outcomes -

- Phase 1 - 3 (2015-2017) – Studies/projects:
  - Health assessment of obstetrical population
  - Outreach clinic: Maternal-fetal medicine
  - Follow-up focus groups
  - Community health assessments in rural Kansas counties
  - "Becoming A Mom" - Prenatal education provided by state
- Phase 4 (2018 – Present) – Intervention programming: eMOMS^{TM} study



Pioneer Baby

&

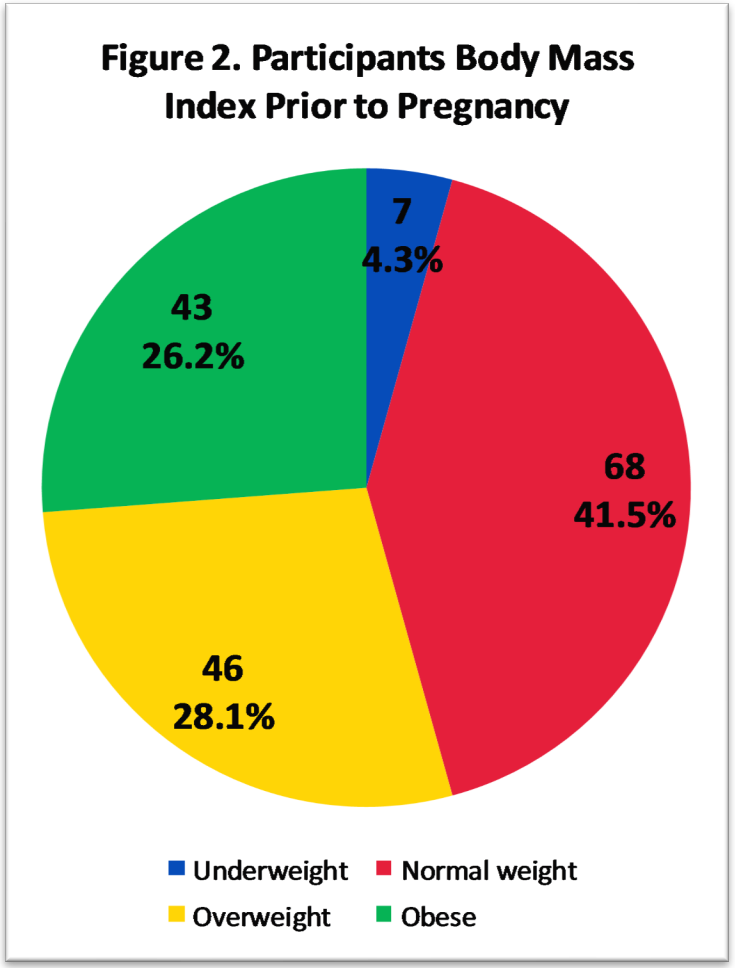
eMOMS™

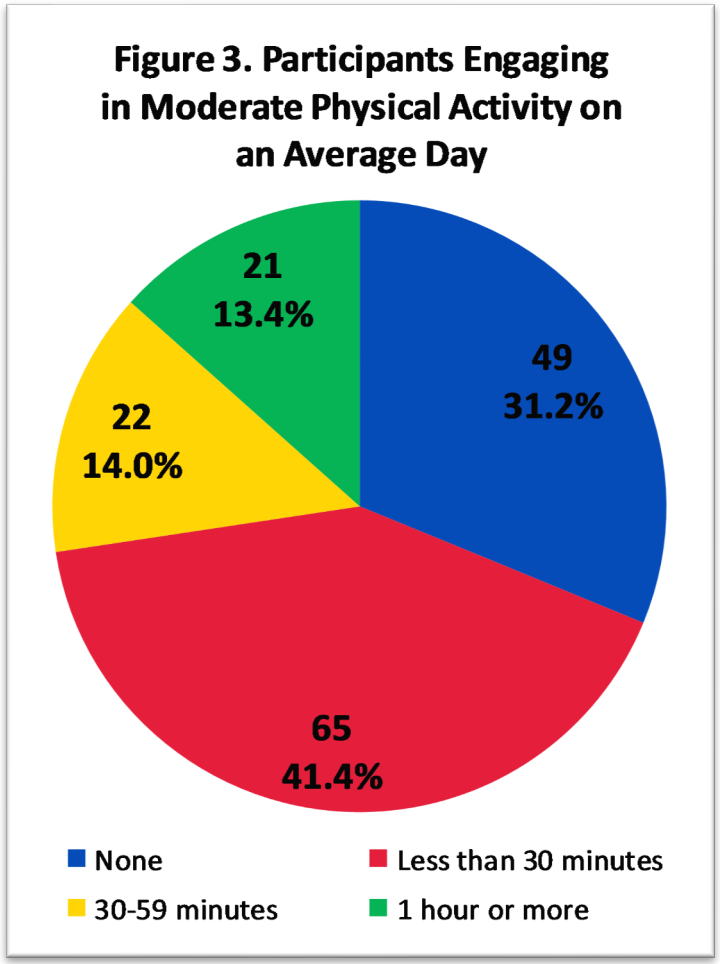
Legend:

- DPP = Diabetes Prevention Program
- eMOMS™ = Electronic Monitoring of Mom's Schedule
- NIH = National Institutes of Health
- NIDDK = National Institute of Diabetes and Digestive and Kidney Diseases
- RCT = Randomized Controlled Trial

Health assessment of obstetrical population

- **Study Purpose**: To learn about characteristics & health behaviors of rural, pregnant people
- 185 Surveys distributed (response rate: 96%)
- Survey: English & Spanish
- Demographics (N = 177)
  - Non-Hispanic White (45.8%)
  - Hispanic (50.3%)
  - 18-25 y/o (48.6%)
  - Some high school (20.5%), HS (30.7%)
  - <$25,000/yr. (54.2%)
  - WIC enrolled (51.7%)
- Immediate family history of diabetes (30.5%)





Jacobson LT, Duong J, Grainger DA, Collins TC, Farley D, Wolfe M, Dong F, Anderson B. Health assessment of a rural obstetrical population in a Midwestern state. *Journal of Pregnancy and Child Health*. 2016;3(2).

KU SCHOOL OF MEDICINE WICHITA
The University of Kansas

Outreach clinic: Maternal-fetal medicine

- High-risk obstetrical care to rural pregnant people: 2015-2022
- Collaboration: Ascension Via Christi Hospitals Wichita, Inc.
- Maternal-fetal medicine specialist and sonography staff from Wichita metro

- In-person once a month, followed up with telemedicine and shared in the continuing education of local rural healthcare providers
- LGA rate decreased from 28% in 2015 to 17% in 2018

KU SCHOOL OF MEDICINE WICHITA
The University of Kansas

Follow-up focus groups of obstetrical population

Study purpose -
To gain in-depth information from rural, pregnant people on what they value in a health promotion program

Key findings –

- Demographics (N = 35)
  - Non-Hispanic White (41.4%)
  - Hispanic (55.2%)
  - Age: 18-25 (42.9%), 26-35 (46.4%)
  - Some high school (34.5%), high school graduate (17.2%)
  - WIC enrolled (72.4%)
  - Earn < $25,000/yr. (48.3%)

Overarching Themes
Limited availability of programs that focus on physical activity, nutrition, and lactation support during and after pregnancy
Need to improve health communication on physical activity, nutrition and fetal movement/kick counts
Need for support group during and after pregnancy
Mixed emotions about overall use of technology
Peer education on all topics throughout all sessions

Jacobson LT, Zackula R, Redmond ML, Duong J, Collins TC. Pioneer baby: suggestions for pre- and postnatal health promotion programs from rural English and Spanish-speaking pregnant and postpartum women. *Journal of Behavioral Medicine.* 2018;41(5):653-667.

KU SCHOOL OF MEDICINE WICHITA
The University of Kansas

Community health assessment (Johnston & Jacobson, 2016, 2017)

- **Objective**: Assess knowledge, beliefs and perceptions of health information, health care resources, and social services among multiple economic sectors in the community
- **Setting**: Largest communities within three rural southwest Kansas counties (Kearny, Haskell, Grant)
- Survey: English & Spanish

Key findings -

- Response rate
  - At city level – Ranged from 62% to 90%
  - At county level – Ranged from 49% to 65%
- Within top 5 health priorities:
  - High-risk obstetrical care
  - Weight management coaching
- Within top 10 health priorities:
  - Diabetes prevention support
  - Professional lactation support
  - Nutrition/diet counseling

Phase 4 – Summary findings for long-term intervention programming

- Summary findings from all studies/projects:
  - Majority of pregnant people high pre-pregnancy BMI, limited exercise, family history of diabetes
  - Half of respondents were of low socio-economic status and self-identified as Hispanic
  - Limited access to health promotion programs and lactation support services
  - Top health priority: Weight management coaching

- Demonstrated need for <u>long-term</u> health behavior change

KU SCHOOL OF MEDICINE WICHITA
The University of Kansas

Phase 4 – Framework for long-term intervention programming

Diabetes Prevention Program (DPP) – Evidence-based program, reduces the risk of developing type 2 diabetes by 58% through effective diet, exercise, and behavior modification counseling (Knowler et al., 2002)

- Evidence to support use of DPP to reduce postpartum weight
  (Ferrara et al., 2011; Nicklas et al., 2014)
- Evidence suggests lactation duration associated with:
  - Lower incidence of developing diabetes
  - Reduction of maternal postpartum weight
  - Resetting of maternal metabolism after pregnancy

(Gunderson et al., 2012, 2015; Chouinard-Castonguay et al., 2013; Binns et al., 2016; Kirkegaard et al., 2016; Martin et al., 2015; Stuebe & Rich Edwards, 2009)

KU SCHOOL OF MEDICINE WICHITA
The University of Kansas

Gap in literature

No studies on role of lactation support combined with an efficacious weight loss program to reduce postpartum weight, thereby reducing progression to type 2 diabetes after pregnancy

eMOMS Study design

- Intervention: Combined lactation with the evidence-based, efficacious Diabetes Prevention Program (DPP), 12-months long, with individual health coaching
- A feasibility, unmasked, parallel randomized controlled 3-arm trial
- Registered at ClinicalTrials.gov, Identifier: NCT04021602

Overall goal: Test the feasibility of a combined lactation, DPP-based program in a cohort of rural and urban people with BMI ≥ 25 followed during pregnancy through 6 months postpartum

eMOMS™

KU SCHOOL OF MEDICINE WICHITA The University of Kansas

Three study arms:

- eMOMS1 - DPP & lactation & health coaching
- eMOMS2 - DPP & health coaching
- eMOMS3 - Health coaching only

Program content: Evidence-based educational videos on lactation, nutrition, and physical activity delivered via Facebook

Specific study aims:

1. Quantify interest in use of the DPP-lactation support program among target population
2. Measure weight loss, hemoglobin A1C, and duration of lactation through 6 months postpartum among target population

eMOMS™

KU SCHOOL OF MEDICINE WICHITA The University of Kansas

eMOMS Recruitment and retention

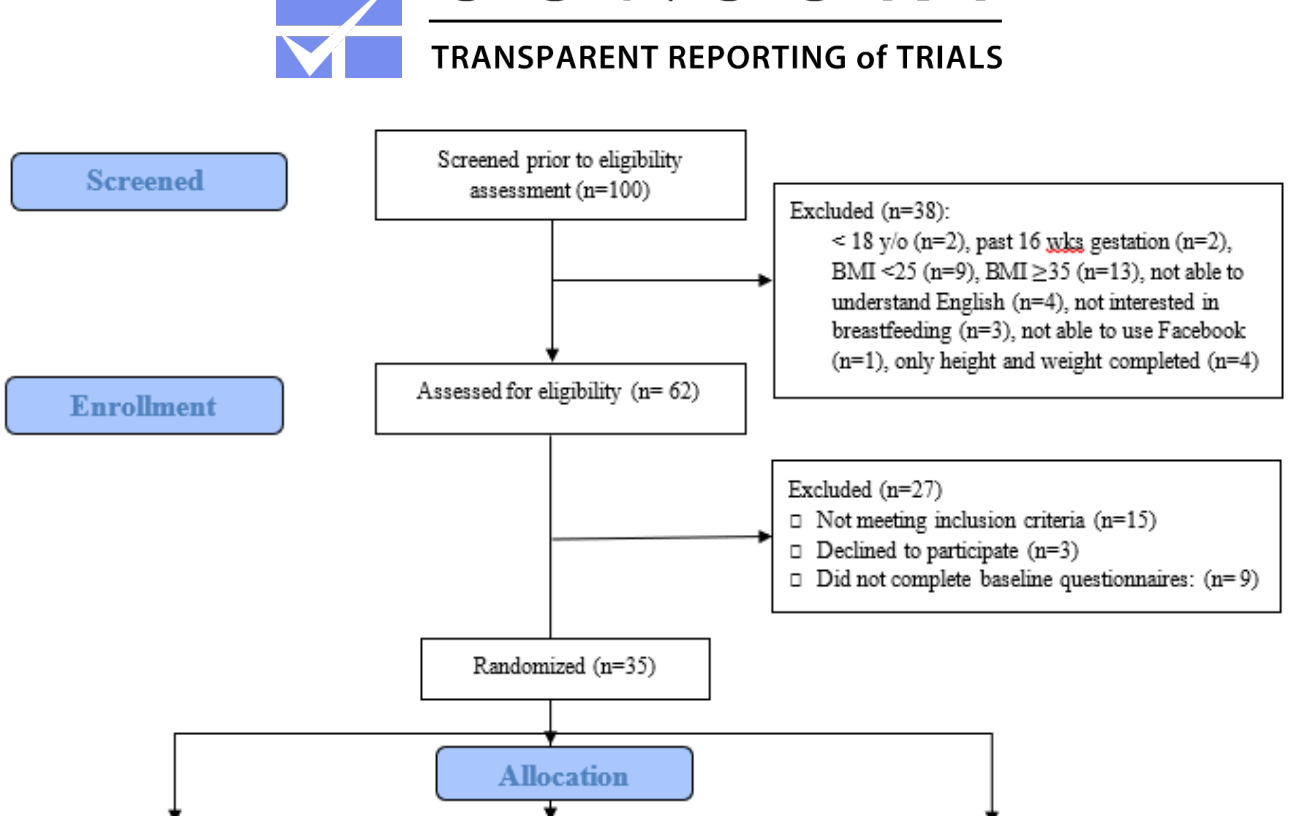
- Study eligibility criteria: Intended to obtain a study population with a low likelihood of developing pregnancy complications
- Recruitment: Sept. 2019 – Dec. 2020
  - Screened: 100 individuals
  - Randomized: 35 individuals
- Program completion rate: 74%
- Demographic characteristics for all participants:

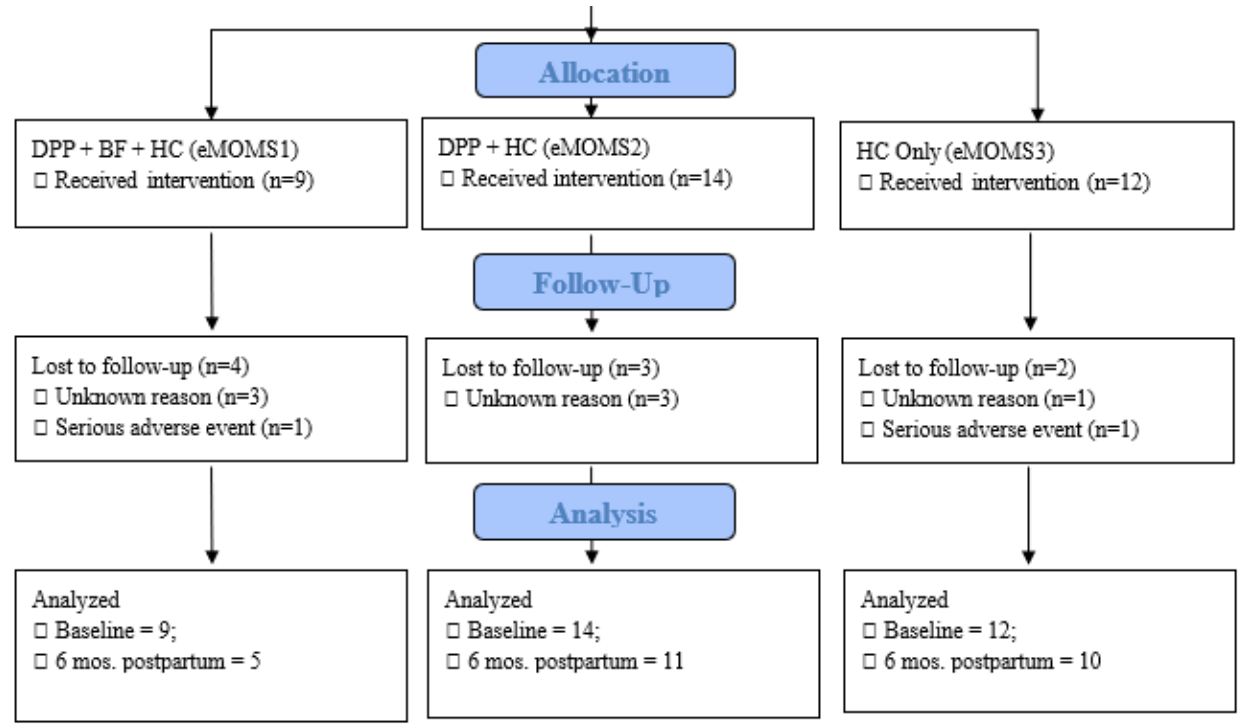
✓ 13.0 (±2.5) weeks gestation
✓ mean pre-pregnancy BMI 29.7 (±3.0)
✓ mean age 27.5 (±5.7) years
✓ 65.7% non-Hispanic White
✓ 20% WIC
✓ 54.3% high school degree/some college
✓ 62.8% household income <$50K
✓ 91.4% urban
✓ 40% immediate family member w. diabetes
✓ 40% nulliparous

KU SCHOOL OF MEDICINE WICHITA
The University of Kansas

CONSORT

TRANSPARENT REPORTING of TRIALS





Results

Description (median, IQR)	DPP+LC+HC (n =5)	DPP+HC (n =11)	HC (n=10)
Maternal Weight (in lbs)			
Baseline	160 (150, 170)	173 (160, 175)	183.5 (170, 194)
6 Months	164.4 (164, 186)	171 (160, 193)	194.9 (179.7, 210.2) (n = 8)
Maternal Weight Retention (in lbs)			
Baseline – 6 Months PP	9 (4.4, 12.6)	7.7 (9.4, 15.8)	12.9 (8.9, 22.6) (n = 8)
Maternal HbA1c			
Baseline	5.2 (4.7, 5.4) (n = 3)	5.2 (4.8, 5.8)	5 (5.0, 5.2) (n = 9)
6 Months PP	5.3 (5.2, 5.4)	5.4 (5, 5.7)	5.1 (5.0, 5.2) (n = 8)
Mean Arterial Blood Pressure			
Baseline	85 (82, 85.3)	90.7 (77.7, 94.0)	89.7 (86.7, 95.3)
6 Months PP	92.7 (87.3, 94)	91.3 (81.3, 98.7)	90.8 (85, 95) (n = 8)
Lactation (in weeks)			
Any Breastfeeding	3 (1.4, 26)	12 (6, 26)	26 (1.4, 26)
Exclusive Breastfeeding	1.4 (0.4, 26) (n = 3)	8 (1.4, 12) (n = 10)	19 (2.2, 26) (n = 8)

With 5,000 bootstrap samples:

- **Mean weight retention** from baseline to 6 mos. postpartum: 8.9 lbs. (3.6, 13.7) for DPP+LC+HC; 8.1 lbs. (-4.0, 21.7) for DPP+HC; and 16.5 lbs. (9.1, 25.5) for HC only
- **Mean lactation duration** through 6 mos.: 11.3 weeks (1.3, 21.2); 14.9 weeks (9.9, 20.0); and 16.7 weeks (9.4, 23.3) for each group respectively

KU SCHOOL OF MEDICINE WICHITA
The University of Kansas

Next Steps…

eMOMS™

Pioneer Baby

Linda Jordan Photography, Wichita, Kansas

- Completed evaluative study on intervention uptake among pregnant populations – manuscript under review with Preventive Medicine Reports
- Completed semi-structured, exit interviews with study participants – manuscript under review with American Journal of Health Promotion
- In process of completing our main outcomes manuscript
- Next step: A large-scale, multi-site, randomized controlled trial testing intervention efficacy with a larger sample of ethnically/racially diverse, rural pregnant populations

KU SCHOOL OF MEDICINE WICHITA
The University of Kansas

Pioneer Baby & eMOMS™ – A Collaborative Partnership

Ascension Via Christi

KU School of Medicine
The University of Kansas

Kearny County Hospital
Family, Friends, Neighbors

Kansas Breastfeeding Coalition, Inc.

Wichita State University

Kansas Department of Health and Environment

March of Dimes

Kansas Maternal & Child Health

KU Endowment
The University of Kansas

KU School of Medicine Wichita
The University of Kansas

Acknowledgments

- Christie Befort, PhD
- Ed Ellerbeck, MD
- David Grainger, MD, MPH
- Patty Kluding, PhD
- David Robbins, MD
- Judy Stern, PhD
- Michael Wolfe, MD
- Key team members: Jolynn Dowling, MSN, APRN, NNP-BC, IBCLC; Faith Hampton, MS3; Sidney Meeker, BS
- Statisticians: Hayrettin Okut, PhD, Rosey Zackula, MA
- Administration, staff, healthcare providers & community partners at Kearny County Hospital in Lakin
- Administration, staff, healthcare providers & community partners at Ascension Via Christi St. Joseph in Wichita
- Kansas Breastfeeding Coalition, Inc.
- KUSM-W Department of Pediatrics, Center for Research for Infant Birth and Survival (CRIBS)
- All study participants and their families

Funders: National Institute for Diabetes and Digestive and Kidney Diseases (NIDDK), Kansas Department of Health and Environment Bureau of Family Health & Bureau of Health Promotion, March of Dimes, KU Endowment Association, Kearny County Health Care Foundation

Everyone else who has contributed to these projects!!!

KU SCHOOL OF MEDICINE WICHITA
The University of Kansas

Thank you for your time!!!

Questions???

References

American Congress of Obstetricians and Gynecologists. ACOG Committee Opinion No. 586: Health disparities in rural women. Obstetrics and gynecology. 2014;123(2 Pt 1):384-8.

Bandura A. Self-efficacy mechanism in human agency. The American psychologist. 1982;37(2):122-47.

Bandura A. Human agency in social cognitive theory. The American psychologist. 1989;44(9):1175-84.

Bellamy L, Casas JP, Hingorani AD, Williams D. Type 2 diabetes mellitus after gestational diabetes: a systematic review and meta-analysis. Lancet. 2009;373(9677):1773-9.

Binns C, Lee M, Low WY. The Long-Term Public Health Benefits of Breastfeeding. Asia Pac J Public Health. 2016;28(1):7-14.

Blumenshine P, Egerter S, Barclay CJ, Cubbin C, Braveman PA. Socioeconomic disparities in adverse birth outcomes: a systematic review. American journal of preventive medicine. 2010;39(3):263-72.

Casagrande SS, Linder B, Cowie CC. Prevalence of gestational diabetes and subsequent Type 2 diabetes among U.S. women. Diabetes research and clinical practice. 2018;141:200-8.

Catalano PM, Shankar K. Obesity and pregnancy: mechanisms of short term and long term adverse consequences for mother and child. BMJ (Clinical research ed). 2017;356:j1.

Chandler D. Late entry into prenatal care in a rural setting. The Journal of Midwifery & Women□s Health. 2002;47(1):28-34.

Chen, J. (2021, February 17). 20 Facebook stats to guide your 2021 Facebook strategy. Retrieved Sept. 17, 2021, from https://sproutsocial.com/insights/facebook-stats-for-marketers/

Chouinard-Castonguay S, Weisnagel SJ, Tchernof A, Robitaille J. Relationship between lactation duration and insulin and glucose response among women with prior gestational diabetes. European journal of endocrinology / European Federation of Endocrine Societies. 2013;168(4):515-23.

DeSisto CL, Kim SY, Sharma AJ. Prevalence Estimates of Gestational Diabetes Mellitus in the United States, Pregnancy Risk Assessment Monitoring System (PRAMS), 2007-2010. Preventing Chronic Disease. 2014;11:E104.

Domanski G, Lange AE, Ittermann T, Allenberg H, Spoo RA, Zygmunt M, et al. Evaluation of neonatal and maternal morbidity in mothers with gestational diabetes: a population-based study. BMC pregnancy and childbirth. 2018;18(1):367.

Driscoll AK, Gregory ECW. Increases in Prepregnancy Obesity: United States, 2016-2019. NCHS data brief. 2020(392):1-8.

Feghali MN, Abebe KZ, Comer DM, Caritis S, Catov JM, Scifres CM. Pregnancy outcomes in women with an early diagnosis of gestational diabetes mellitus. Diabetes research and clinical practice. 2018;138:177-86.

Ferrara A, Hedderson MM, Albright CL, Ehrlich SF, Quesenberry CP, Jr., Peng T, et al. A pregnancy and postpartum lifestyle intervention in women with gestational diabetes mellitus reduces diabetes risk factors: a feasibility randomized control trial. Diabetes care. 2011;34(7):1519-25.

Gallagher A, Liu J, Probst JC, Martin AB, Hall JW. Maternal obesity and gestational weight gain in rural versus urban dwelling women in South Carolina. The Journal of rural health : official journal of the American Rural Health Association and the National Rural Health Care Association. 2013;29(1):1-11.

References (2)

Glasgow RE, Harden SM, Gaglio B, Rabin B, Smith ML, Porter GC, et al. RE-AIM Planning and Evaluation Framework: Adapting to New Science and Practice With a 20-Year Review. Frontiers in public health. 2019;7:64.

Grubesic TH, Durbin KM. Breastfeeding Support: A Geographic Perspective on Access and Equity. J Hum Lact. 2017;33(4):770-80.

Gunderson EP, Hedderson MM, Chiang V, Crites Y, Walton D, Azevedo RA, et al. Lactation intensity and postpartum maternal glucose tolerance and insulin resistance in women with recent GDM: the SWIFT cohort. Diabetes care. 2012;35(1):50-6.

Gunderson EP, Hurston SR, Ning X, Lo JC, Crites Y, Walton D, et al. Lactation and Progression to Type 2 Diabetes Mellitus After Gestational Diabetes Mellitus: A Prospective Cohort Study. Annals of internal medicine. 2015;163(12):889-98.

Hamilton WN, Tarasenko YN. Breastfeeding Practices in Georgia: Rural-Urban Comparison and Trend Analyses Based on 2004-2013 PRAMS Data. The Journal of rural health : official journal of the American Rural Health Association and the National Rural Health Care Association. 2020;36(1):17-26.

Hansen A, Moloney M. Pregnancy-Related Mortality and Severe Maternal Morbidity in Rural Appalachia: Established Risks and the Need to Know More. The Journal of rural health : official journal of the American Rural Health Association and the National Rural Health Care Association. 2020;36(1):3-8.

Harreiter J, Dovjak G, Kautzky-Willer A. Gestational diabetes mellitus and cardiovascular risk after pregnancy. Women's health (London, England). 2014;10(1):91-108.

Hoyert DL. Maternal Mortality Rates in the United States, 2019. NCHS Health E-Stats. 2021.

Hung P, Kozhimannil KB, Casey MM, Moscovice IS. Why Are Obstetric Units in Rural Hospitals Closing Their Doors? Health services research. 2016;51(4):1546-60.

Jacobson LT, Collins TC, Lucas M, Zackula R, Okut H, Nazir N, et al. Electronic Monitoring of Mom's Schedule (eMOMS): Protocol for a feasibility randomized controlled trial to improve postpartum weight, blood sugars, and breastfeeding among high BMI women. Contemporary Clinical Trials Communications. 2020;18:1-10.

Jacobson LT, Duong J, Grainger DA, Collins TC, Farley D, Wolfe M, Dong F, Anderson B. Health assessment of a rural obstetrical population in a Midwestern state. *Journal of Pregnancy and Child Health.* 2016;3(2).

Jacobson LT, Twumasi-Ankrah P, Redmond ML, Ablah E, Hines RB, Johnston J, et al. Characteristics associated with breastfeeding behaviors among urban versus rural women enrolled in the Kansas WIC program. Maternal and child health journal. 2015;19(4):828-39.

Jacobson LT, Zackula R, Redmond ML, Duong J, Collins TC. Pioneer baby: suggestions for pre- and postnatal health promotion programs from rural English and Spanish-speaking pregnant and postpartum women. *Journal of Behavioral Medicine.* 2018;41(5):653-667.

Johns EC, Denison FC, Norman JE, Reynolds RM. Gestational Diabetes Mellitus: Mechanisms, Treatment, and Complications. Trends in endocrinology and metabolism: TEM. 2018;29(11):743-54.

Kessler RS, Purcell EP, Glasgow RE, Klesges LM, Benkeser RM, Peek CJ. What does it mean to "employ" the RE-AIM model? Evaluation & the health professions. 2013;36(1):44-66.

References (3)

Kirkegaard H, Stovring H, Rasmussen KM, Abrams B, Sorensen TI, Nohr EA. How do pregnancy-related weight changes and breastfeeding relate to maternal weight and BMI-adjusted waist circumference 7 y after delivery? Results from a path analysis. The American journal of clinical nutrition. 2014;99(2):312-9.

Knowler WC, Barrett-Connor E, Fowler SE, Hamman RF, Lachin JM, Walker EA, et al. Reduction in the incidence of type 2 diabetes with lifestyle intervention or metformin. N Engl J Med. 2002;346(6):393-403.

Martin J, MacDonald-Wicks L, Hure A, Smith R, Collins CE. Reducing postpartum weight retention and improving breastfeeding outcomes in overweight women: a pilot randomised controlled trial. Nutrients. 2015;7(3):1464-79.

McElroy JA, Bloom T, Moore K, Geden B, Everett K, Bullock LF. Perinatal mortality and adverse pregnancy outcomes in a low-income rural population of women who smoke. Birth defects research Part A, Clinical and molecular teratology. 2012;94(4):223-9.

Meyer E, Hennink M, Rochat R, Julian Z, Pinto M, Zertuche AD, et al. Working Towards Safe Motherhood: Delays and Barriers to Prenatal Care for Women in Rural and Peri-Urban Areas of Georgia. Maternal and child health journal. 2016;20(7):1358-65.

Neggers YH. Trends in maternal mortality in the United States. Reproductive toxicology (Elmsford, NY). 2016;64:72-6.

Nicklas JM, Zera CA, England LJ, Rosner BA, Horton E, Levkoff SE, et al. A web-based lifestyle intervention for women with recent gestational diabetes mellitus: a randomized controlled trial. Obstetrics and gynecology. 2014;124(3):563-70.

Office on Women's Health. Your Guide to Breastfeeding. Available at: https://www.womenshealth.gov/patient-materials/health-topic/breastfeeding

Ovesen PG, Jensen DM, Damm P, Rasmussen S, Kesmodel US. Maternal and neonatal outcomes in pregnancies complicated by gestational diabetes. a nation-wide study. The journal of maternal-fetal & neonatal medicine : the official journal of the European Association of Perinatal Medicine, the Federation of Asia and Oceania Perinatal Societies, the International Society of Perinatal Obstet. 2015:1-5.

Rayburn WF, Richards ME, Elwell EC. Drive times to hospitals with perinatal care in the United States. Obstetrics and gynecology. 2012;119(3):611-6.

Robitaille J, Grant AM. The genetics of gestational diabetes mellitus: evidence for relationship with type 2 diabetes mellitus. Genetics in medicine : official journal of the American College of Medical Genetics. 2008;10(4):240-50.

Ross R. Fifteen-year outcomes of a rural residency: aligning policy with national needs. Fam Med. 2013;45(2):122-7.

Ryan RM, Deci EL. Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. The American psychologist. 2000;55(1):68-78.

Saydah SH, Chandra A, Eberhardt MS. Pregnancy experience among women with and without gestational diabetes in the U.S., 1995 National Survey Of Family Growth. Diabetes care. 2005;28(5):1035-40.

Strutz KL, Dozier AM, van Wijngaarden E, Glantz JC. Birth outcomes across three rural-urban typologies in the Finger Lakes region of New York. The Journal of rural health : official journal of the American Rural Health Association and the National Rural Health Care Association. 2012;28(2):162-73.

Stuebe AM, Rich-Edwards JW. The reset hypothesis: lactation and maternal metabolism. Am J Perinatol. 2009;26(1):81-8.