

UMSAEP UM-UWC-Wits Partnership Report

9/01/2022

Submitted by Dr. Kate Trout

Department of Health Sciences, School of Health Professions, University of Missouri-Columbia.

University of Missouri: Dr. Gillian Bartlett-Esqilant Professor, Associate Dean for Population Health and Outcomes Research, University of Missouri-Columbia

University of the Western Cape Host: Prof. Julian May Professor, Director of the Centre of Excellence for Food Security University of Western Cape (UWC)

University of the Witwatersrand Host: Prof. Shane Norris, Professor, Developmental Pathways for Health Research Unit, Center of Excellence for Human Development, University of the Witwatersrand

A. Overview

Thanks to the travel support from the UMSAEP Linkage program and data collection support from the Centre of Excellence in Food Security, Dr. Gillian Bartlett and I spent a month on a scholarly exchange in South Africa. During our stay, we explored collaborations and opportunities with the University of Witwatersrand and the University of Western Cape to strengthen implementation science for maternal and child health (MCH). We spent 1 week in Johannesburg and visited the Developmental Pathways for Health Research Unit at the Baragwanath Hospital in Soweto, which houses the largest, longest standing child and adolescent cohort in Africa (Birth to Twenty cohort). In addition, we met with researchers and conducted key informant interviews. Then, we were stationed in Worcester to establish a new research team to conduct focus groups in the community and conduct additional key informant interviews. The focus group sessions in Worcester were supported in conjunction with the Centre for Excellence of Food Security. We spent the last two weeks of our exchange in Cape Town conducting preliminary data analyses, establishing collaborations with the two universities, and conducting an implementation science workshop. The primary focus of our scholarly exchange was to explore MCH needs from diverse stakeholder perspectives and engage in community-based participatory research with a particular focus on water, sanitation, and hygiene (WASH) and breastfeeding. As part of our culminating activity, Gillian conducted an Implementation Science workshop for faculty and students from both institutions with my assistance. The overarching aim of our visit was to scope the current work being conducted, understand community and stakeholder perspectives, and learn about existing data environments across the two universities that support work for leveraging big data resources. Specific outputs included numerous research contacts outlined below, an implementation science workshop, planning for grant proposals, and a manuscript in preparation.

B. Background and Proposed Aims

Despite South Africa's efforts through multiple programs (social grants; health services, micronutrient supplements, exclusive breastfeeding support) they still face significant mortality and an unmovable prevalence of childhood stunting. In South Africa the persistent burden of stunted children remains unchanged and malnutrition among women of reproductive age is increasing. Stunting, also known as chronic malnutrition, can arise from the cumulative effects of undernutrition and infections during childhood and even before birth. Nearly 30 percent of children under the age of 5 years are nutritionally stunted in South Africa, a prevalence that has remained unchanged for over three decades. This is particularly worrisome since the right to access sufficient food and nutrition is embedded in sections 26 and 27 of the South African Constitution of 1996, and South Africa has

consistently adopted and implemented strategies that have reduced stunting in other countries. This places South Africa as an outlier when compared to other upper-middle-income countries regarding the ability to significantly impact stunting outcomes. Malnutrition is estimated to be an underlying factor in nearly 60% of children's deaths in South Africa. A new way of looking at a complex interplay of multiple factors over the first 1000 days period is urgently needed to identify barriers and facilitators to improve the effectiveness of intervention and policy efforts. In addition, the COVID-19 pandemic has exacerbated childhood malnutrition and nutrition-related mortality due to steep declines in income, availability and affordability of nutritious foods, and disruptions to health, nutrition, and social protection services, especially in low-income and middle-income countries (LMICs).

There is a critical need for strategically built Big Data resources for maternal and child health (MCH) in South Africa to track and monitor the effectiveness of current policies and programs. To date, much of the MCH data throughout Africa have been siloed in clinical and social science disciplines. The scientific community needs meaningful data resources that can develop predictive models capable of identifying individuals in need of tailored strategies through modifiable levers. We propose the following qualitative study to identify strategic priorities for maternal and child health (MCH) Big Data in South Africa by identifying multi-dimensional and modifiable explanatory variables underlying MCH outcomes from diverse health stakeholders. The specific aims of this research is as follows:

Aim 1a. Identify and characterize multi-dimensional and modifiable explanatory variables underlying heterogeneous MCH outcomes (mortality, malnutrition related to stunting, and mental health) across two South African provinces.

Aim 1b. Identify and characterize multi-dimensional and modifiable explanatory variables impacted by the COVID-19 pandemic underlying heterogeneous MCH outcomes (mortality, malnutrition related to stunting, and mental health) across two South African provinces.

Aim 2. Deliver a workshop on implementation science to determine barriers and facilitators for Big Data resources, interventions, and policies that support heterogeneous MCH outcomes (mortality, malnutrition related to stunting, and mental health) in South Africa through deliberative stakeholder consultations.

C. Status of Proposed Objectives

Aim 1a. Identify and characterize multi-dimensional and modifiable explanatory variables underlying heterogeneous MCH outcomes (mortality, malnutrition related to stunting, and mental health) across two South African provinces.

After a preliminary analysis of key informant interviews and focus group sessions, the key findings are as follows:

- Malnutrition and employment are key priorities of the community.
- Informal housing structures most often lack refrigeration to store food and/or even breastmilk. Nutritious, shelf-stable food will be important in addressing food insecurity in informal housing structures.
- Lack of education was a major reason for negative nutrition, breastfeeding, and health outcomes of mothers and children cited by key informants and community members.
- Participants and key stakeholders reported alcohol consumption and smoking is prevalent among pregnant women.
- Unplanned children exacerbate poverty and food insecurity. In fact, during the pandemic termination of pregnancies increased. There is a need for family planning services.
- Breastfeeding barriers:

- Returning to work was a prominent reason that mothers discontinued exclusive breastfeeding.
 - Mental health and lack of spousal support by male partners were widely reported as major reasons that hinder mothers' perceived ability to breastfeed. Domestic abuse and spousal abandonment after pregnancy were the two most common reasons that male partners negatively impacted a mother's mental health. Fathers and male partners acknowledge the lack of support provided by male partners. Father led activities should be considered in future breastfeeding interventions.
 - House crowding and an absence of privacy were cited as other reasons for discontinuing breastfeeding.
 - Lack of refrigeration hinders the ability of mothers to express and store breastmilk, especially when returning to work.
 - Several participants mentioned that some women express and discard "bad milk" when a woman has bad thoughts or has a bad day. This should be explored further as a cultural barrier to breastfeeding.
 - Breastfeeding mothers most often get their information for their elders, which is often outdated. For example, they are still recommending that HIV positive women feed formula only without breastfeeding. This was also reported by the fathers.
 - Porridge and water are often fed to infants as young as two weeks old. The most common reasons were that either they thought the baby wasn't getting enough breast milk, or their baby was crying and they thought the baby didn't want their breastmilk.
 - Mothers reported that they often feel like they are bad mothers if they can't continue to breastfeed. They said healthcare workers tell them that breastfeeding is the only option, but they aren't supported when they have challenges.
- WASH related barriers to breastfeeding and infant feeding:
 - Women did not view water consumption as an important aspect for breastfeeding, because they are told by elders that they must drink lots of ginger beer and tea in order to breastfeed. More education is needed regarding the importance of hydration and adequate water consumption while breastfeeding.
 - Mothers often only have one bottle to feed formula or breastmilk, which negatively impacts the ability to clean bottles between uses. Key informants and the community reported infrequent washing and sanitization of the bottles between uses (eg. Every two weeks). Some reasons were that the load shedding prohibited heating water for sanitizing, no heat sources in the home, and having to transport water. One participant reported they use an empty juice box because they did not have a bottle.
 - Water sources are often located outside of the home, remain unpredictable, and not always clean. A father reported, "We do have water but when the taps are off and the water returns, the color of the water will change and the water will not be clean."
 - Education and intervention efforts need to approach cleaning and covering water containers. Most participants reported that water containers are covered only half of the time, and they are infrequently washed.
 - Community members and key informants believe that mixing formula with unsafe water is a contributing factor of infant diarrhea.
 - Some gaps in hygiene were identified. Some participants said that they must borrow soap from a neighbor's house. Cleaning breasts before feeding was not readily practiced.
 - **Solution:** Key informants and the community said that educational interventions are needed to overcome barriers to maternal and child health.
 - **Solution:** The community would like to see educational workshops delivered in community settings (eg. Community Center) to support breastfeeding mothers.

- **Solution:** Male-led workshops could help educate fathers and male-partners on strategies to support mothers and babies.
- **Solution:** Mothers would like government support to have more than one baby bottle in the household.
- The healthcare system is overwhelmed and lacks to capacity to provide adequate breastfeeding education to mothers, including in pre- and post-natal periods. Future efforts should consider workshops delivered in community settings, such as community centers or places of worship.
 - Long waiting lines exist at public clinics, starting from 6 am. If patients are into the clinic by 10 am, then they will not be seen and have to come back another day.
 - Multiple services are not provided once in the clinic. For example, if a mother is coming in for a checkup, she can't also get vaccinations for her children.
 - Mothers and elder caregivers reported that it does little good to go to the clinic in the pre-natal period. Statements were made such as "They [nurses] only touch my belly. They don't do a scan or any tests. It does no good to go to the clinic. I don't learn anything."
- Clinical data environments remain weak and fragmented, and largely paper-based. A few clinical departments are leveraging RedCap. Standardized digitized data collection methods are needed, such as an electronic health record platform. However, a main concern of healthcare providers is time and training to implement in workflow processes.
- Community-based participatory research is needed to mobilize and strengthen community partnerships.
- HIV is still a source of stigma in communities, and participants were apprehensive to manage their own health record on their phones because of privacy concerns. The most cited concern is someone can steal their phone, and people getting access to their health [HIV] status.
- Mobile Health interventions may have low feasibility because of limited data, gaps in service, and sharing phones with others. **Solution:** However, participants thought that a WhatsApp group would be an effective way to share information.

Aim 1b. Identify and characterize multi-dimensional and modifiable explanatory variables impacted by the COVID-19 pandemic underlying heterogeneous MCH outcomes (mortality, malnutrition related to stunting, and mental health) across two South African provinces.

After a preliminary analysis of key informant interviews and focus group sessions, the key findings are as follows:

- COVID-19 severely impacted MCH health. The most pronounced was job security and food security, especially for children as a result of school closures. Government assistance grants were not enough to support families' needs.
 - One father reported, "R350 [for the grant] did not feed the families. They called it a relief grant which was not helping at all."
 - Another father reported, "Government had rules that said no work no pay."
- Many places were closed during the pandemic, making it more difficult to purchase food (especially in the informal setting).
- There has been an increase in terminated pregnancies due to the pandemic, further underscoring the importance for family planning in the post-pandemic period.
- Fathers reported that "pregnant women were not protected during lockdown."
- In some cases, researchers reported that breastfeeding improved after the pandemic because it became more difficult to afford formula.

- Several community participants reported that breastfeeding was more difficult because of the mental stress.
- Not only the community was impacted by the pandemic, but the local research facilitators have also been out of work since the beginning of pandemic. Academia needs to consider strengthening relationships with local facilitators that support research activities, because they were largely left behind after the start of the pandemic.

Aim 2: Deliver a workshop on implementation science to determine barriers and facilitators for Big Data resources, interventions, and policies that support heterogeneous MCH outcomes (mortality, malnutrition related to stunting, and mental health) in South Africa through deliberative stakeholder consultations.

The Implementation Science Workshop was delivered in a hybrid format, and was attended by 45 faculty and staff across three institutions (30 in person and 15 online), including the University of the Western Cape (UWC), University of Cape Town, and University of Witwatersrand. The workshop was hosted by the national Center of Excellence in Food Security, and the School of Public Health at the UWC. The workshop described theory and methods in implementation science for identifying community-driven key challenges and solutions for Maternal and Child Health (MCH) in South Africa. The workshop underscored the importance of engaging the community and underrepresented groups to strengthen research and outreach activities. We discussed the major risk factors of infant and child malnutrition, and explore perceptions about the impact of the Wash, Sanitation, and Hygiene (WASH) environment on exclusive breastfeeding in the first 6 month of life. The participants identified strengths and weaknesses of current approaches to improve MCH outcomes within the context of existing national policies and infrastructure. The workshop followed a format of deliberative dialogues where participants will be encouraged to discuss not only barriers and facilitators in this area but prioritize implementation/action points. The dialogues were moderated and facilitated by Dr. Gillian Bartlett, an implementation science expert, with assistance from Dr. Kate Trout, an MU content expert. The session will include a short expert presentation of challenges in the area followed by a Q&A. After a short break, the group moved into an open discussion based on several key points. The session concluded with a summary presented by the moderators. The entire session including wrap up took 2 hours.

D. Timeline

1) Pre-trip introductions and organization

a) University of the Witwatersrand

i) ***Randomized controlled trials being conducted in Soweto called HeLTI.*** This RCT starts preconception and spans, pregnancy, infancy and childhood. Wiedaad is based in Community Paediatrics and was instrumental in the updating of the Road to Health book in SA, which is the foundation for the maternal and child health programme in SA. Wiedaad has extensive knowledge around breastfeeding practices/research/needs etc in SA.

- Wiedaad Slemming
- Pentecost, Michelle
- Catherine Draper
- Khuthala Mabetha
- Larske Soepnel

They are all based in Johannesburg, except for Cathi which is based in Cape Town and Michelle in the UK.

- ii) ***Breastfeeding and Public Health.*** Sara conducted her PhD around breastfeeding in SA and is an amazing researcher with extensive health communication and public health expertise and is based at the School of Public Health in Jhb.
 - Sara Nieuwoudt
- iii) ***COMACH***—Formative co-creation work with mothers and CHWs around digital solutions around maternal and child health is conducted across 4 sites in South Africa.
 - Sonja Klingberg
 - Melissa Densmore
- iv) ***Nurturing Care Framework.*** Alessandra is based in Jhb and leading a RCT during infancy in Soweto grounded in the nurturing care framework.
 - Alessandra Prioreschi
- v) ***Soweto Baby WASH. Rihlat and Doug are the key researchers driving the WASH agenda in Soweto with innovative research.*** Baby WASH.
 - Douglas Momberg
 - Rihlat Said-Mohamed
- vi) ***CoE Food Security and Human Development collaboration on WASH.*** Doug, Lee, and Rihlat have worked with Julian on the Soweto Baby WASH (SBW) study which was a project partially funded by among others, the two CoE's; Food Security and Human Development. Sara has a long-standing relationship with us at DPHRU, and has most recently co-supervised a masters student with myself and Rihlat working on the breastfeeding data from the SBW study. Luti has done some incredible mixed-methods work around barriers and facilitators around breastfeeding between birth and 6 months postnatally in Soweto.
 - While not yet explicitly linked with WASH, this is something the group is keen to explore using existing metrics.

Kate received the Soweto Baby Wash codebook and sample collection table to explore use of the secondary dataset to test hypotheses with qualitative scoping study conducted in Worcester during our time in South Africa. As discussed, this may act as a platform for us to explore some of the emerging hypotheses, using existing data albeit in a relatively small sample.

- Doug Momberg
- Lee Voth-Gaeddert
- Rihlat Said Mohamed
- Sara Nieuwoudt
- Lutricia Moagi

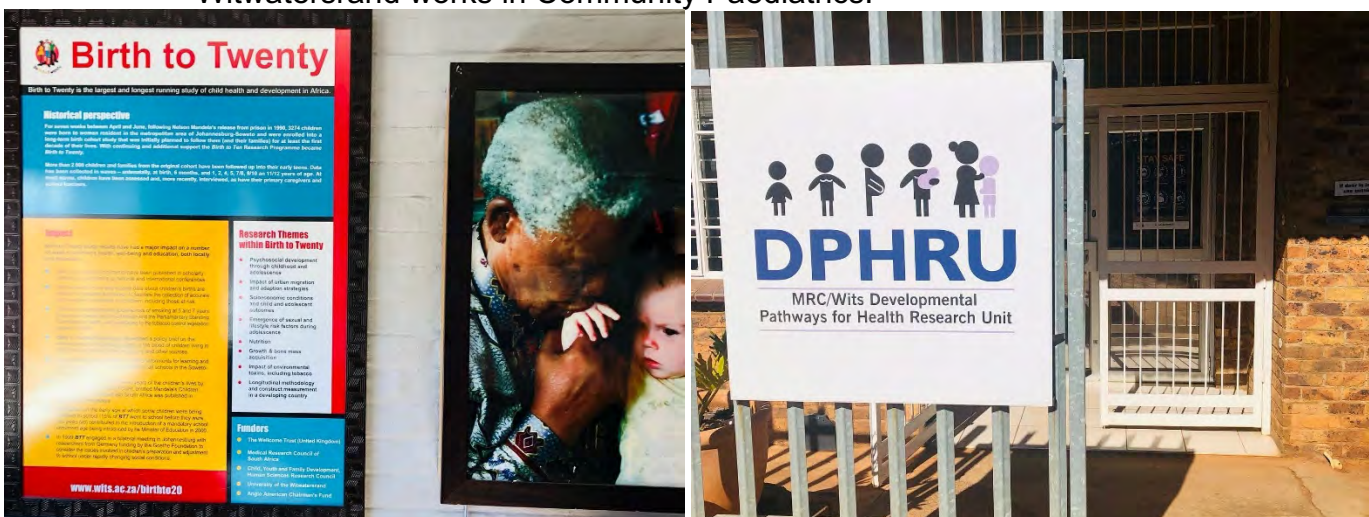
b) University of the Western Cape

- i) ***Chantell Witten.*** Chantell has a PhD in Nutrition from the North-West University/Center of Excellence for Nutrition in South Africa and by profession is a dietitian registered with the Health Professionals Council of South Africa (HPCSA). Chantell extensively helped coordinate facilitation of our study in Worcester. Chantell's PhD dissertation was a mixed-methods prospective cohort study titled 'Mothers' breastfeeding experiences and practices: An explorative mixed methods study in the sub-district of Tlokwe, North West Province, South Africa'.

- ii) **Adriane Petersen:** Dietitian in Worcester. Facilitating recruitment.
- iii) **Jackie Saaiman:** Lima Foundation (NGO) for rural development in Worcester.
- iv) **Esther:** Local data collector/focus group facilitator.
- v) **Michelle Eichinger:** Geospatial Scientist for Urban Development. Eichinger, M.A.
- vi) **Tristan J Görgens:** Provential Government stakeholder
- vii) **Rina Swart:** Helped to organize Implementation Science Workshop, School of Public Health.
- viii) **Elizabeth Egieyeh:** Recruitment for pharmacists/nurses that deliver MCH services in pharmacies.

2) Partnership Visit and Data Collection: July 11th-August 5th, 2022

- a) Monday, July 11th, 2022. Attended INPreP Final Dissemination Workshop, University of Witwatersrand (see Appendix A).
 - i) In this dissemination workshop, we heard from four teams about their findings on improving maternal and child nutrition in communities in Burkina Faso, Ghana and South Africa. The presenters covered their methods and findings on conducting community engagement and qualitative approaches, economic investment cases, policy and systematic reviews, the epidemiology of nutrition status and piloting interventions. The workshop is led by Profs Kate Ward and Shane Norris (U of Wits; partner).
 - ii) **Recruitment of participants for Key Informants.** Recruitment and scheduling of 5 key informants.
- b) Tuesday, July 12th, 2022. Tour Developmental Pathways for Health Research Unit (DPHRU) at the Chris Hani Bara Academic Hospital, Soweto.
 - Overview of projects provided by Larske Soepnel, a post-doctoral fellow involved in several projects.
 - Tour provided by Yusuf Guman, the DPHRU centre manager in Soweto.
 - Health system scoping with Professor Kebashni Thandrayen at University of the Witwatersrand works in Community Paediatrics.



Images 1 & 2: The Developmental Pathways for Health Research Unit at the Baragwanath Hospital in Soweto, which houses the largest, longest standing child and adolescent cohort in Africa (Birth to Twenty cohort)

- c) Wednesday, July 13th, 2022. Conducted key informant interviews and visited the Wits College of Public Health
- d) Thursday, July 14th, 2022. Conducted key informant interviews.
- e) Friday, July 15th, 2022. Commute to Worcester, Western Cape
- f) Monday, July 18th, 2022. Established and trained a new research team for data collection in Worcester.
 - i) Musa and Esther served as local facilitators. Esther Nqakala is from Zwelethemba and would be able to offer insight into the “young child” landscape in this area due to her involvement with the Nourished Child project facilitated by the SAFL. She had worked as a field data collector for Stellenbosch for 12 years. Esther coordinated recruitment, and conducted mother and elder caregiver focus groups. Musa conducted the fathers focus group session.
 - ii) Chantell Witten, part of the Centre of Excellence in Food Security and a faculty at the University of Free State, brought two experienced data collectors. Bulelwa and Bongeka are Xhosa-speaking facilitators, and were charged with translating and transcribing sessions.
 - iii) We held a data collection training session to ensure quality and consistency of data collection.
 - iv) Took a tour of the area of recruitment, which included small formal homes and informal housing structures. Took a tour of a typical home, including WASH facilities.



Image 3: Informal setting where data collection took place.

- g) Tuesday, July 19th, 2022. Focus group data collection & Informant interviews
- h) Wednesday, July 20th, 2022. Focus group data collection & Informant interviews.

- i) Meeting with Government Official, Adriane Peterson. She works as a Dietitian in a public hospital.
- i) Thursday, July 21nd, 2022—Informant interviews, and study debrief with local facilitators.



Images 4-8. Local field data collection team and delivering sandwiches to study participants and community members in Worcester.

- j) Friday, July 22, 2022—Commute to Cape Town.
- k) Saturday, July 23, 2022—Traditional Braai at **Prof. Mongi Benjeddou’s house**. Mongi conducts Precision Medicine, including Pharmacogenomics and Development of Individualized Drug Therapy for Sub-Saharan African Populations. **Meeting with Samuel and Elizabeth Egjeyeh.**
- l) Monday, July 25th, 2022. Meeting with Julian May to debrief about data collection in Worcester.
- m) Tuesday, July 26th-August 1st, 2022
 - i) Independent data validation of transcripts.
 - ii) Preliminary data analysis.
 - iii) Coordinate and workshop planning.
 - iv) Key informant interviews.
 - v) Visit UWC and meet with colleagues in pharmacogenomics, precision health, and public health.



Image 9: Prof. Mongi Benjeddou's lab for Precision Medicine.



Image 10 & 11: Samuel Egieyeh's laboratory in the School of Pharmacy.

- n) Tuesday, August 2nd, 2022—Meeting with Alan Christoffels about the South African National Bioinformatics Institute (SANBI). Implementation Science Workshop at UWC (see Appendix B for flyer).





Images 12 & 13: Pictured (left to right) Samuel Egieyeh, Kate Trout, Alan Christoffels, and Gillian Bartlett-Esquilant at the South African National Bioinformatics Institute (SANBI).



Image 14: Gillian Bartlett-Esquilant conducting Implementation Science Workshop

- o) Thursday, August 4th, 2022. Meeting with Doug Momberg (U of Wits) and Julian May (CoE Food Security) regarding Baby WASH study and breastfeeding collaboration.
- p) Friday, August 5th, 2022—Depart for U of Missouri

Appendix A. INPreP Dissemination Workshop



INPreP Final Dissemination Workshop

11th July 2022

| INPreP Final Dissemination Workshop Agenda | | |
|--|--|---------------------|
| Time GMT+1 | Item | Lead |
| 13:00-13:10 | Welcome and introductions | Kate Ward |
| 13:10-13:35 | Nanoro presentation (20 minutes presentation + 5 minutes questions) | TBC |
| 13:35-14:00 | PRICELESS presentation (20 minutes presentation + 5 minutes questions) | Aggie and team |
| 14:00-14:25 | Navrongo presentation (20 minutes presentation + 5 minutes questions) | TBC |
| 14:25-14:45 | Break (20 mins) | |
| 14:45-15:10 | DPHRU presentation (20 minutes presentation + 5 minutes questions) | Shane Norris |
| 15:10-15:35 | Southampton presentation (20 minutes presentation + 5 minutes questions) | TBC |
| 15:35-15:55 | Discussion | Polly Hardy-Johnson |
| 15:55-16:00 | Closing words | Kate Ward |



YOU ARE INVITED TO AN IMPLEMENTATION SCIENCE WORKSHOP

KEY CHALLENGES AND SOLUTIONS
FOR MATERNAL AND CHILD HEALTH
(MCH) IN SOUTH AFRICA

THIS IS A HYBRID SESSION



DSI-NRF
Centre of Excellence
in Food Security

02 August (13:00 - 15:00)

Venue: School of
Public Health, UWC
Room 1A



UNIVERSITY of the
WESTERN CAPE

ZOOM REGISTRATION

Session Facilitators:

Dr. Gillian Bartlett, University of Missouri

Dr. Kate Trout, University of Missouri



