Consortium on Law and Values in Health, Environment & the Life Sciences
2019 Student Proposal: Emily Groene (groe0074@umn.edu)
Risk Factors for Infertility and Barriers to Treatment in Tanzania

Risk Factors for Infertility and Barriers to Treatment: Examining the contributions of gonorrhea and stigma to infertility in central Tanzania

BACKGROUND AND SIGNIFICANCE:
This study seeks to understand the role of Neisseria gonorrhoeae in infertility in Tanzania and to explore the role of stigma as a barrier to STI diagnosis and STI treatment and infertility treatment. This proposal requests funding for field work to collect medical record and survey data at the Dodoma Christian Medical Center (DCMC) in Dodoma, Tanzania in July-Sept 2019.

Infertility affects more than 70 million couples worldwide, with the majority of cases concentrated in developing countries. Infertility can have serious emotional and social consequences, particularly in societies where childbearing is highly valued. Paradoxically, infertility rates may also be very high where fertility rates are also high (high fertility contexts). This is especially true in the area considered the infertility belt of Africa, spanning from Gabon in the west to Tanzania in the east, where rates of infertility are higher and infertility is highly stigmatized. Approximately 2.5% of women in Tanzania experience primary infertility, which means they have never had children, and 18% of women experience secondary infertility, the inability to have more children. There is a known biological link between sexually transmitted infections (STIs), pelvic inflammatory disease, and infertility. However, the degree to which sexually transmitted infections contribute to infertility has not been examined in high fertility contexts. In fact, concerns about infertility are currently greatly overshadowed by policy and research focused on and promoting fertility reduction in high-fertility contexts.

Neisseria gonorrhoeae is one of the most common sexually transmitted infections in Tanzania, but routine screening is only required for syphilis and HIV. Often asymptomatic, untreated N. gonorrhoeae infection in women is more likely to result in pelvic inflammatory disease or tubal factor infertility. There is a strong body of evidence that stigma is a barrier to HIV testing and treatment, which we would like to investigate with regard to N. gonorrhoeae. Almost 400 women per month seek treatment for infertility at DCMC; however, many more women are not being seen for infertility treatment. In this study, we seek to understand barriers to N. gonorrhoeae diagnosis and treatment, as these barriers can increase the spread of N. gonorrhoeae and increase the burden of infertility.

STUDY AIMS:

1) Examine the role that N. gonorrhoeae plays as a risk factor for infertility at a referral hospital in central Tanzania, among women presenting for treatment, when compared to other women presenting at the hospital for other conditions.

Hypothesis: a history of gonorrhea infection will be positively associated with infertility.

2) Examine the role of stigma as a barrier to testing and treatment for N. gonorrhoeae and other STIs. We will look at stigma as a barrier to STI testing and treatment compared to other established barriers in the literature, including knowledge (lack of awareness), emotional (anxiety about treatment harms, worries about treatment success) and logistic barriers (cost, transport).
**Hypothesis:** stigma is a more commonly cited barrier to STI testing and treatment compared to other barriers.

3) Examine the role of stigma as a barrier to infertility treatment, compared to knowledge, emotional and logistic barriers. Stigma has been identified as a barrier to infertility treatment in other contexts.10

**Hypothesis:** stigma is a more commonly cited barrier to infertility treatment compared to other barriers.

**STUDY METHODS:** We propose administering an intake survey of known risk factors for infertility to women and their partners presenting at the Dodoma Christian Medical Center. We will also examine STI test results that are collected as part of infertility diagnosis to confirm previous or current N. gonorrhoeae infection among both women and their partners. We will analyze data on the risk factors gathered in the survey in a logistic regression statistical model to understand which factors contribute the most to infertility in Tanzania. These risk factors will include: age, previous or current STI infection, other bacterial genital infections, prior obstetric complications, genetic risk (infertility among family members), age at first sex (sexual debut), diet, alcohol consumption behavior, smoking behavior, and toxic substance exposure.11–17

Questions about barriers to STI testing/treatment and infertility treatment will be administered as part of the intake survey to patients. We will hold focus groups of women attending the clinic as well as practitioners will be held to inform the survey development. We will evaluate the role of social stigma as a barrier to healthcare-seeking for STIs and infertility in Tanzania. The same intake survey administered to women presenting at the clinic will include questions about the role of social stigma (from the community or healthcare system), emotional barriers (anxiety about treatment harms, worries about treatment success, psychological stress), and logistical barriers (cost, transport) in their decision to get tested for STIs or to seek attention for infertility.

**Significance and Innovation:** The broader goal of this study is to provide information to promote interventions to respond to the burden of infertility in one of the parts of Africa most affected by the issue. This study has the potential to inform future health programming and awareness campaigns to improve quality of life for women affected by infertility. We expect this study to provide beneficial information for clinicians serving Tanzanian patients as well as health policymakers and other health actors in the infertility belt to best tailor their prevention and treatment efforts.

**Contribution to interdisciplinary work:** This study relies on interdisciplinary work in the areas of demography, public health, and medicine to address an understudied health issue with broad social and economic implications.

**Study Timeline:**

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<tr>
<td>Activity</td>
<td>Survey development and IRB approval (UMN &amp; Tanzania IRBs)</td>
<td>Survey pilot testing</td>
<td>Survey administration and biomarker collection</td>
<td>Data cleaning and analysis</td>
<td>Draft and submit CLV Report</td>
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<td>Timeline</td>
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Investigator biographies:

Emily Groene, MA (PI). I am a third-year PhD student in the Division of Epidemiology and Community Health in the School of Public Health at the University of Minnesota, Twin Cities. Dr. Shalini Kulasingam is my faculty advisor. I currently work as a research assistant providing support for Integrated Public Use Microdata Series - Performance Monitoring and Accountability survey (IPUMS-PMA), an international survey on family planning and reproductive health. I was excited to work with Dr. Kulasingam because of her expertise in infectious disease and her ongoing collaboration with Dr. Charles Majinge of the Dodoma Christian Medical Center in Dodoma, Tanzania. I have experience in reproductive and sexual health having worked with Dr. Kulasingam's human papillomavirus (HPV) and cervical cancer modeling group. I also have experience with qualitative research: I worked on a study of HPV vaccine hesitancy among parents, health providers, and community stakeholders as part of a federally funded HPV vaccination environmental scan for the state of Minnesota. My ongoing research projects include analyses of determinants of unmet need for family planning in Ethiopia and cost-effectiveness research on Zika prevention strategies. I have over six years of experience abroad working as a Peace Corps Volunteer in Bulgaria and a humanitarian and a global health worker in East, West and Central Africa. My long-term research interests involve identifying the contribution of sexually transmitted infections to infertility and adverse birth outcomes in both low and high fertility contexts.

Shalini Kulasingam, PhD, MPH (advisor/co-I). Dr. Kulasingam is an associate professor in the Division of Epidemiology and Community Health at the University of Minnesota’s School of Public Health. Dr. Kulasingam is an infectious disease epidemiologist who specializes in HPV, cervical cancer, cancer screening, vaccines, and decision and cost-effectiveness modeling. She has expertise in infectious diseases, with a focus on sexually transmitted infections and risk factors for sexually transmitted infections. Dr. Kulasingam has partnered with the Dodoma Christian Medical Center since 2015, where she has provided expertise in mobile cervical cancer screenings, community health workshops for regional health officers and carried out research on adolescent reproductive health. Dr. Kulasingam has a high commitment to mentoring students to conduct quality research and was recently awarded the Excellence in Advising Award because of her teaching and mentorship abilities and her ability to guide aspiring public health professionals to accomplish their goals.

Dr. Charles Majinge, MD, PhD (co-I). Dr. Majinge is the Medical Director of the Dodoma Christian Medical Center, a referral hospital that serves a population of 95,000 patients in Central Tanzania in 2017. Dr. Majinge is a renowned obstetrician and gynecologist in Tanzania and serves as adjunct professor of obstetrics and gynecology at the University of Minnesota's Medical School. He has over four decades of experience in medical practice and served as the Director General at Bugando Medical Centre from 2000-2014; he was recently appointed by the Tanzanian President Magufuli to serve as the Board Chair of Muhimbili National Hospital in Dar es Salaam. Dr. Majinge and Dr. Kulasingam have collaborated since 2015 and have completed a student-led study of risk factors for sexually transmitted infection among Tanzanian adolescents in partnership with community health workers. He provided essential guidance on the study.
implementation and assisted with logistical support. He is a national expert on infertility and has requested our support to collaborate on a study of risk factors for infertility. He and his colleagues have provided critical feedback on the study design and proposal development for the project proposed for this grant application.

Carie Cox, PhD, MPH (co-I). Dr. Cox is an Assistant Professor in the Department of Public Health at St. Catherine University’s Henrietta Schmoll School of Health in St. Paul, Minnesota. Dr. Cox has a PhD in Population, Family, and Reproductive Health and specializes in family planning – both contraceptive use and infertility – in sub-Saharan Africa. She has a strong methodological background in the measurement of infertility and quality of infertility care in low- and middle-income countries. She is an experienced teacher of quantitative and qualitative research methods and on sexual and reproductive health topics in sub-Saharan Africa and among African born populations in the United States. Her expertise in confirmatory factor analysis in mixed methods research and qualitative study design will inform questionnaire development for this study. She has extensive experience working in sub-Saharan Africa, including as part of the Peace Corps in Cameroon, as well as research experience in Ghana, Malawi, and Tanzania.
References:


# Consortium on Law and Values in Health, Environment the Life Sciences
## Proposed Budget

**Project Title:** Risk Factors for Infertility and Barriers to Treatment: Examining the contributions of gonorrhea and stigma to infertility in central Tanzania

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<tr>
<th>Category &amp; Instructions</th>
<th>Justification</th>
<th>Amount</th>
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<tr>
<td>1 Your stipend</td>
<td>Lodging in Dodoma $200/month x 3 months, $600</td>
<td>$600</td>
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<td>2 Speaker honoraria (for colloquia)</td>
<td>N/A</td>
<td>$0</td>
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<tr>
<td>3 Supplies &amp; Services</td>
<td>Survey printing and survey administration by trained interviewers, $500&lt;br&gt;Survey participant incentives/staff training incentives (African fabric) ~400 subject x $4 each, $1600</td>
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<td>4 Equipment</td>
<td>N/A</td>
<td>$0</td>
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<td>5 Travel</td>
<td>Travel to/from Tanzania (RT flights $1700 to Dar es Salaam), $1700&lt;br&gt;Travel to/from Dodoma (RT flights $300 to Dodoma from Dar es Salaam), $300&lt;br&gt;Worker visa, $300&lt;br&gt;IRB submission in Tanzania $2000</td>
<td>$4,300</td>
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**TOTAL BUDGET**

$7,000

### Other funding

**Funding source**

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<th>Amount</th>
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<tr>
<td>Thesis Research Travel Grant (submitted, pending response)</td>
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in Health, Environment & the Life Sciences
2018-19 Proposal Cover Page

Applicant Information

Applicant name(s): Emily Groene

Email: groe0074@umn.edu

Project title: Risk Factors for Infertility and Barriers to Treatment: Examining the contributions of gonorrhea and stigma to infertility in central Tanzania

Department: Epidemiology and Community Health
College: School of Public Health

Degree program: Epidemiology PhD

Faculty advisor: Shalini Kulasingam, PhD, MPH
Faculty advisor email: kulas016@umn.edu

Dept. Head: Dianne Neumark-Sztainer, PhD, MPH, RD
Dept. Head’s email: neuma011@umn.edu

Dean: John R. Finnegan Jr., PhD
Dean’s email: sphdean@umn.edu

How did you hear about this funding opportunity?

☐ ACCU  ☐ Consortium website  ☐ The Brief  ☐ Dept. email/newsletter  ☐ Around the AHC  ☐ OVPR Internal Funding Opportunities  ☐ Law Council email  ☒ Other

Funding

Total amount of funding requested: $7000

Executive summary (maximum 200 words)

Infertility has serious emotional and social consequences, especially in contexts where fertility is highly valued. Paradoxically, both high fertility rates and high infertility rates occur in the infertility belt of Africa, spanning from Gabon in the west to Tanzania in the east. This is true in Tanzania, where 2.5% of women are unable to have any children. Neisseria gonorrhoeae is a highly common sexually transmitted infection (STI) in Tanzania. Untreated N. gonorrhoeae infections can result in pelvic inflammatory disease, which causes infertility. This interdisciplinary study will collect primary data through surveys and medical records to examine the relationship between N. gonorrhoeae and infertility using methods from epidemiology and population studies. We also will employ a mixed methods design to describe stigma as a barrier to STI treatment and testing and infertility treatment in Tanzania. This innovative study meets a critical need to address an understudied health issue that has a profound impact on families in the infertility belt.

Approvals

Check all appropriate approvals required for your proposal. It is not necessary to have all approvals at the time of proposal submission; however, approvals must be obtained prior to receipt of funding. If you have applied for approval but have not yet received it, indicate that below.

IRB  ☒ Yes  ☐ No  ☐ NA  ☐ Application pending

Other  ☐ Yes  ☐ No  ☐ NA  ☐ Application pending  Specify:

Checklist—for reviewer use

☐ The proposal is 1000 words or less excluding budget, biographies, references and citations.

☐ The proposal includes a work plan with a specific timeline using months or quarters to identify work to be done and completion dates.

☐ The proposal includes a 1-2 paragraph biography of the applicant and all co-investigators.

☐ The budget form is complete including the funds sought for this project, other pending applications for this project, and the amount/source of matching or other funds.

☐ The applicant’s faculty advisor is copied on the application email. Professional students w/o advisors check No Advisor.

☐ All necessary approvals are pending or received.