INTRODUCTION AND BACKGROUND
South Africa has one of the world’s highest rates of HIV transmissions in the world (19.9%, UNAIDS, 2015). Men who have sex with men (MSM) are identified as a vulnerable group because they experience disproportionately high incidences of the virus when compared to the general population. The Centers for Disease Control and Prevention (CDC) developed a funding initiative to address these vulnerable populations globally through its Key Population Implementation Science (KPIS) program. This grant was awarded to South Africa’s Health and Science Research Council (HSRC, the country’s “NIH equivalent”). The institute contracted Professor Travis Sanchez and leaders of Emory University’s Center for Programming, Research, and Innovation for Sexual Minorities (PRISM Health) to design and implement an intervention that would concentrate efforts towards reducing HIV transmission throughout the nation. This group intends to confront, and ideally uncover, strategies to reduce two major obstacles that arise for HIV-positive MSM in South Africa.

Despite the fact that South Africa is the only country in Africa to legalize same-sex marriage, MSM and HIV-positive individuals in South Africa experience stigmatization for their sexual identities as well as HIV status, which stigma has been found to inhibit engagement in HIV prevention practices among MSM.1 Secondly, while anti-retroviral therapies (ART) present great promise for suppressing the virus and reducing transmission, they are only effective when the HIV-positive individuals use the medicine on a daily basis. Given the experience of stigma for this vulnerable population, such adherence can be challenging, and therefore interventions must be explicitly tailored to the community’s needs in order to have impact. To this end, the original KPIS protocol in 2014 proposed a reminder/survey system to MSM delivered via text messages on cell phones. This strategy proved ineffective, mostly due to the fact that text messages in South Africa are costly for individuals to use.

In May 2015 PRISM Health proposed a different tactic that would employ 18 “Peer Navigators” (PN) across South Africa who are gay/bisexual-identified and HIV-positive to counsel, provide HIV testing, and administer ART to other HIV-positive individuals. These PN will work in six different cities at the metropole of each major province in the country and provide not only nationwide care but additionally allow for comparative analysis between each city. Additionally, Port Elizabeth was the first city to be introduced to the intervention as of January 2016, and the remaining five cities will be sequentially exposed to the intervention over the next 18-20 months. This stepped-wedge design will allow for evaluation of the program to occur in Port Elizabeth and other cities exposed early on. Programming will be subsequently modified/improved before implementation in the cities scheduled thereafter.

In addition to targeting the unique identities of a vulnerable population, the PN utilize a newly-developed app delivered through CommCare technologies. CommCare has significant experience working with HIV projects in South Africa as well as CDC-funded projects across Africa more broadly. The app has been used to identify and track patients living with HIV, provide behavior change counseling messages, and improve HIV-related follow-up adherence. It has other functions as well, including
the ability to complete forms offline and upload when connected to Wi-Fi, and to schedule text-message reminders for PN if participant call-back appointments are entered. All data entered into these forms is privacy protected, secured, and stored on CommCare’s HIPAA-compliant servers. Equally if not more important, the app was developed by a team of local stakeholders and was designed explicitly to be user-friendly and culturally relevant to MSM of South Africa.

PN can download the app from any android smartphone, access participant information, and enter data. PN can record contacts with participants, schedule reminders for themselves, store participant contact information and record participant responses about their ongoing care experiences. As such, PRISM Health will still collect the same participant-provided information on care experiences that would have been collected with the text-message system, but will now collect this data through the already-planned interactions with PN as well as important program implementation data such as frequency and success rates in contacts with PN. This information will help to better understand, monitor, and evaluate the PN component of the intervention. We believe that this innovative client relationship management software has the potential to be a scalable part of the PN component of the intervention and applicable to other global contexts with high HIV prevalence as well as other marginalized/vulnerable populations.

SUMMER 2016 EVALUATION
As part of this undertaking, Medical Anthropologist Marcel Foster was recruited onto this team as a Masters of Public Health student who could lead an evaluation of the intervention to assess the program’s effectiveness. Foster reached out to Law School student Creighton McMurray, as well as students in the Nursing (Eugenia Apau) and Medical schools (Meera Shah), to incorporate a comprehensive review of the medical, ethical, and programmatic challenges that the PN as well as the staff of HSRC face in implementing the intervention program. This interdepartmental team is currently applying for Emory University’s Global Health Institute funding, which would provide $12,000 ($3,000 per student) total for travel, visa, housing, and per diem expenses for the
four students undertaking the research—as well as extramural funds from the PRISM Health to cover additional expenses for cost of living in South Africa.

In terms of addressing the Health Innovation Program goals, Foster (Public Health), McMurray (Law), and Sanchez aim to achieve these six primary objectives through the summer project:

1. Assess the number of contacts the PN managed to reach as well as general utility of the app for management of their clients
2. Assess, document, and code aspects of PN/client engagement: what are common qualitative themes that the PN share in their positions and intervention implementation? How does their experience translate into evaluating the overall program?
3. Assess what role the app played in the impact of the intervention program thus far
4. Recommend and implement changes to the app as a result of the above findings
5. Assess legal issues that arise for PN as well as communication systems that exist between PN and clients. Evaluate and determine whether IRB and the HIPAA requirements that are met for this project align with South African legal practices
6. Analyze and make recommendations on how current legal systems/complexities are in place within South Africa that bolster and/or hinder the impact of this intervention program

The first goal seeks to gauge the raw numbers generated from the CommCare app in order to view input from the PN and initialize comparisons of community engagement among MSM HIV-positive clients from the previous text-message strategy that was implemented in 2014. The second goal will contextualize the metrics extracted from the CommCare app and impart a larger picture of the challenges and success that the PN face in terms of delivering the intervention. The third goal will consider the utility of the mobile app: do the PN find it user-friendly? How reliable are the data that it is collecting? How does it compare to other methods of data collection systems (e.g., check-boxes on paper, computer-based programs) in terms of ease-of-use and efficiency?

The fourth goal will depend on the above research and result in direct changes to the app itself. Foster, with professional experience in mobile phone health programs (mHealth) and formal training through Emory University’s Computer Science program, will apply direct changes/upgrades to the systems based on the feedback and discoveries of this analysis. The penultimate and final goals will depend on the expertise of McMurray, who in addition to his current studies in law earned a Masters of Arts in Medical Ethics, and investigate the legal/ethical context of South Africa’s unique laws.

**METHODS**
The methodology for this evaluative research will be carried out through five approaches:

1. Compare and calculate metrics extracted from data entered into the CommCare system by PN
2. Design of a survey targeted for the PN who were hired as part of this intervention
3. Qualitative interviews with PN and the site coordinator (who manages the PN)
4. Direct modifications of the app based on research findings
5. Literary reviews of current law practices and implementation
By downloading CommCare metrics, the team will immediately be able to investigate the number of clients that PN reached and conduct baseline comparisons between this program and the earlier initiative that utilized text-messages. This analysis will provide data on the impact of the program thus far, and will serve as invaluable information for future research on the program’s overall effect. In addition to numerical analytics output through the CommCare app, Foster will work with PRISM Health to develop a survey that will be conducted through qualitative interviews with the PN, HSRC site managers, and no more than twenty additional critical stakeholders identified by HSRC staff (e.g., physicians, nurses). These structured interviews will address the challenges/successes confronted in executing this intervention and reveal programmatic, logistical, and technological facets. All PN each each city will be interviewed even if the intervention has yet to begin in their particular city (via phone or Skype) in order to assess local diversity in perceptions of sexuality, HIV care, and stigma that the PN may have experienced/witnessed as self-identified gay/bisexual men who are HIV-positive. These conversations will be coded and digitized for comprehensive reporting. The results will provide directions to the initiative (in subsequent intervention cities in South Africa) as to what changes can and should be applied to the app technology by Foster and other researchers.

Finally, McMurray will lead research and tailor qualitative interviews to better understand the legal/ethical context of this intervention. In addition to carrying out extensive research through the library and online resources at Emory School of Law, McMurray will tailor questions for the PNs to explore the following questions: how have stigmatizing experiences continued in South Africa despite the fact that it is the only country on the continent to sanction same-sex marriage? Does working for the HSRC put you at increased risk in terms of potential stigmatization? These questions will contextualize the research of the intervention and the interviews will also be qualitatively coded as part of the final analysis.

ANTICIPATED RESULTS
A formal report will be completed by September 2016, and supplied to the CDC as well as HSRC as part of the evaluation and monitoring of the first phase of this intervention project. This report will produce preliminary analysis for the subjects specified below:

- How does the qualitative data reveal the HSRC site manager and PN’s perspectives on what things the CommCare app were most/least conducive to managing their contacts and assisting them in their intervention goals
- What elements of this project, overall, help/hinder the PN’s work and the quality of their interactions with clients
- What legal and ethical contexts were discovered through the interviews, and can these findings be attributed to the challenges and/or successes of the intervention?
- Based on the above findings, what recommendations would be provided for mHealth HIV intervention in other global locations (e.g., Nairobi, Kenya)

The results extracted from the above questions will have immediate coverage given the demands for evaluation reports to be communicated to the HSRC and CDC. Beyond these stakeholder documents, two manuscripts for submission to peer reviewed scientific
journals will be generated from this research. Foster is already meeting with Professor Sanchez and other PRISM faculty members to identify and frame the research for his Masters of Public Health Thesis. Another team-member for this initiative who is not included in the Health Innovation Program application (Meera Shah, M.D. Candidate) will also use this experience and research as part of her “Discovery Project,” which is a required report as part of fulfilling the degree requirements for the MD. Foster’s thesis will be prepared for peer-review, with the intent to publish, as Foster already published two peer-reviewed publications as first author as an undergraduate in Anthropology. In addition to formal writings, the total five team-members will present at Nursing, Public Health, Law, Medical, and HIV-related conferences on the findings of this particular initiative.

HEALTHCARE DELIVERY AND PROJECT SIGNIFICANCE
This project aims to identify and contextualize the challenges and catalysts of HIV-interventions for a vulnerable population. In its development of client relationship management software, it not only contributes an innovative app but additionally does so by targeting a marginalized group on the African continent. This initiative explicitly aims to provide evaluation and improvements on these aims not only from a programmatic and technological standpoint but from a legal/ethical context as well. As part of this goal, meticulous reporting will be disseminated on the precise aspects of the intervention’s efficiency and effectiveness.

The advantage of the stepped-wedge Design implemented sequentially through the six cities of South Africa is that the challenges/advantages that the team identifies in Port Elizabeth can be applied to the subsequent interventions in other cities. Additionally, this design allows for future researchers of PRISM Health and affiliates to evaluate whether or not the team’s recommendations advanced the intervention for the PN and program as a whole. This future evaluation will report the direct healthcare delivery for the HSRC and South African at-risk clients. Finally, the publications and presentations disseminated by the team of five will hopefully encourage other technological and civic-engagement initiatives for other vulnerable populations across the globe.


Figures

Figure 2: Malaria Consortium inSCALE APE CommCare Application (2015): https://www.commcarehq.org/exchange/ec2419ce01e7b509602dc11733b05404/info/ Accessed January 15, 2016