

**RECEIVED**

**COLLEGE of CHARLESTON**

**UNDERGRADUATE RESEARCH AND CREATIVE ACTIVITIES**

**Application Cover Page**

**Application for Summer Undergraduate Research with Faculty (SURF) Grant**

**Applicants should refer to the SURF Program Description and Guidelines and the SURF Application Check List to ensure a complete application.**

**Incomplete applications will not be considered for funding.**

Impact of Imbalanced Community Sex Ratio on Acquisition of HIV and other

**PROPOSAL TITLE:** Sexually Transmitted Diseases among African-Americans

**PRIMARY MENTOR APPLICANT\*:**

**NAME:** \_\_\_\_\_

**CofC Email:** \_\_\_\_\_

**Department:** HEHP \_\_\_\_\_

**Faculty Status:**

- Tenured/Tenure-track
- Instructor
- Visiting
- Adjunct
- Other (please specify \_\_\_\_\_)

**UNDERGRADUATE APPLICANT\*\*:**

**NAME:** \_\_\_\_\_

**CofC Email:** \_\_\_\_\_

**CofC ID Number:** \_\_\_\_\_

**Primary Major:** Public Health \_\_\_\_\_

**Current Enrollment Status:**

- Full-time (12 hours or more)
- Part-time (less than 12 hours)

\*Please note in the guidelines the eligibility criteria for faculty mentors and limits on number of grants per faculty mentor.

\*\*If more than one student will work on a project, separate applications must be submitted for each student.

**SECONDARY MENTOR APPLICANT:**

**NAME:** \_\_\_\_\_

**Institutional Affiliation:** \_\_\_\_\_

**Department:** \_\_\_\_\_

**Title:** \_\_\_\_\_

**Email:** \_\_\_\_\_

## Project Information Page

**REQUESTED DATES OF PROJECT SUPPORT (mm/dd/yy):** From 05/25/15 To 08/03/15

**TOTAL AMOUNT REQUESTED FROM URCA:** \$ 5,000

1. Does the proposal involve research on human subjects?  Yes  No  
If yes, status of the **IRB** request (no funds can be awarded without **IRB** approval):  
 Submitted  Approved
2. Does the proposal involve research with live vertebrate animal subjects?  Yes  No  
If yes, status of the **IACUC** request (no funds can be awarded without **IACUC** approval):  
 Submitted  Approved
3. Have student or faculty applicants received URCA support for this or any other project since September 2013 or do they currently hold funding through the URCA program?  
 Yes  No  
If yes, which type?  SURF  MAYS  RPG  AYRA  
If the applicant holds funding in the current cycle, specify name of applicant and award amount:
4. Does the student have another proposal under consideration by URCA during the current cycle?  Yes  No  
If yes, what type of grant proposal is it?  SURF  MAYS  RPG  AYRA
5. Does the faculty mentor have another proposal under consideration by URCA during the current cycle?  Yes  No  
If yes, what type of grant proposal is it?  SURF  MAYS  RPG  AYRA
6. Is there another internal proposal current or pending for this research/creative work?  
 Yes  No  
If yes, please list the source(s) as well as amount of request and dates of award:
7. Is there an external proposal current or pending for this research/creative work?  
 Yes  No  
If yes, please list the source(s) as well as amount of request and dates of award:
8. Does the project involve biohazards or other safety issues?  Yes  No
9. Does the project have potential for copyright or invention?  Yes  No

**FERPA WAIVER**

The Family Educational Rights and Privacy Act (FERPA) of 1974 establishes the rights of students with regard to educational records. The act makes provision for inspection, review and amendment of educational records by the students and requires, in most instances, prior consent from the student or their parent/guardian if under the age of 18 for disclosure of such records to third parties. The consent must be in writing, signed and dated by the student and must specify records to be released, reason for release, and the names of the parties whom such records shall be released. The act applies to all persons formerly and currently enrolled at an educational institution. Access to educational records does not give permission to make changes to the student's record. For more information visit:

<http://www2.ed.gov/policy/gen/guid/fpco/ferpa/index.html>

**I hereby give permission for the College of Charleston Undergraduate Research and Creative Activities personnel and committee members to obtain**

- **information concerning my academic transcript**
- **information concerning my academic advising notes**
- **information concerning my in-class performance and grades**

**This waiver will be in effect as long as I am a student at the College of Charleston, or seeking the services of faculty and staff on the College of Charleston campus.**

**Signatures (Required for All participants):** Please read the SURF Guidelines prior to signing this page. Signatures below indicate awareness of and intention to follow appropriate Program, FERPA Waiver, Departmental, School, College and State rules and regulation for conducting projects, travel, and expenditure of funds.

Undergraduate Applicant:  \_\_\_\_\_   
Signature Date

Faculty/Mentor Applicant:  \_\_\_\_\_   
Signature Date

Faculty/Mentor Applicant: \_\_\_\_\_  
Signature Date

**Chair:** I acknowledge that the above student and faculty mentor(s) are applying for URCA Funding and that the funds for successful proposals will be transferred into the departmental R & D account for dispersal based on the budget included in this proposal.

Chair:  \_\_\_\_\_   
Signature Date

## Proposed Budget Table

	I	II	III	IV	V
	SURF Funding Requested*		Dept/School Other Internal Support for Project	External Support for Project	Total Cost of SURF Project (Add Columns I-IV for each row)
	For Use Prior to June 30	For Use After July 1			
<b>A. Student Salary (taxable amount)</b>	\$1,750	\$1,750			\$3,500
<b>B. Faculty Salary (taxable amount)</b>	\$750	\$750			\$1,500
<b>C. Student Travel**</b>					0
<b>D. Faculty Travel**</b>					0
<b>E. Supplies &amp; Materials</b>					0
<b>F. Other</b>					0
<b>G. Total Costs Per Column (Add values from cells A-F for each column)</b>	\$2,500	\$2,500	0	0	\$5,000
<b>TOTAL SURF REQUEST: (Add values from cells G-I + G-II)</b>	\$5,000				

COLLEGE of  
CHARLESTON

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UNDERGRADUATE RESEARCH  
AND CREATIVE ACTIVITIES

**Summer Undergraduate Research with Faculty (SURF) Grant Application**

**PART II**

**To be submitted electronically as a PDF to [urca@cofc.edu](mailto:urca@cofc.edu) by 5pm,  
February 2, 2015**

**Part I and Part II of the application must be submitted in order to be considered for  
funding. Part I of the application can be accessed at [www.urca.cofc.edu](http://www.urca.cofc.edu).**

**PROPOSAL TITLE:** Impact of Imbalanced Community Sex Ratio on Acquisition of HIV and  
Sexually Transmitted Diseases among African-Americans

**PRIMARY MENTOR APPLICANT:** [REDACTED]

**UNDERGRADUATE APPLICANT:** [REDACTED]

**SURF Application Instructions**

A complete description of the application requirements and instructions can be found on the  
URCA website ([www.urca.cofc.edu](http://www.urca.cofc.edu)) in the SURF Description and Guidelines handbook.

**1. STUDENT STATEMENT OF INTENT**

I intend to continue my research project on the Impact of Imbalanced Community Sex Ratio on Acquisition of HIV and other Sexually Transmitted Diseases (STD) among African Americans. I began this research with ██████████ as my Independent Study in the Spring 2015 semester. I am dedicated to this research project and eager to see where it leads. If I obtain the SURF grant to continue research during Summer 2015, I will be fully committed to the research project. I will not have a job outside of the research project, nor will I take any summer classes.

My academic goals are to graduate from the Honors College and continue my studies in the College of Medicine at the Medical University of South Carolina or the University of North Carolina at Chapel Hill. My career goals are to be a primary care physician around an underrepresented area. I plan not to limit my duties to the typical physician tasks, but encourage health policy changes to combat common health disparities and start health initiatives to promote health living. I am specifically concerned with the factors that contribute to childhood obesity and STDs.

My participation in this research project will provide an abundance of knowledge in relation to the demographic and other factors that influence adverse health outcomes. By continuing with this research project, I will gain skills in the practice of public health principles, specifically epidemiology and biostatistics, which will directly relate to my public health career goals.

I intend to not only continue this research through Summer 2015, but beyond into the 2015-2016 academic year. I will participate in the dissemination process. I will write in conjunction with my faculty mentor, ██████████, two articles to be submitted to scholarly journals. I will submit an abstract for a poster presentation of research findings at the American Public Health Association (APHA) annual meeting in November 2015.

## **2. NON-TECHNICAL PROJECT ABSTRACT**

In 2008, the rate of new HIV diagnoses among adults and adolescents in the United States (US) was nine times greater among blacks (73.7 diagnoses per 100,000) than among whites (8.2 per 100,000) (1). This black-white disparity is particularly stark among women. Despite accounting for less than 14.0% of the US female population in 2008 (3), blacks accounted for 66.7% of new HIV diagnoses among women in 2008 (1). Of women who contracted HIV through heterosexual contact living in 2007, 63.5% were black and 18.6% white, a prevalence ratio of 3.4 (1). Several studies have hypothesized a link between certain community level factors and the occurrence of HIV among black women (4, 5-22). ‘

One such community level factor is the community sex ratio, which is defined as the ratio of men to women in a given geographic area (12). Prior research has shown that sex ratios in predominantly black areas are substantially more imbalanced (i.e., fewer men than women) than sex ratios in predominantly white areas (12). The purpose of this project is to assess the impact of the community sex ratio as well as other demographic variables, including income, education, and racial distribution, on the acquisition of HIV and other STDs in South Carolina counties. This research will provide greater insight into the factors that contribute to HIV and STD incidences, and possibly lead to the development of more effective preventive interventions.

## **3. PROJECT DESCRIPTION**

### **(a) Technical Abstract**

Of women who contracted HIV through heterosexual contact living in 2007, 63.5% were black and 18.6% white, a prevalence ratio of 3.4 (1). Several studies have hypothesized a link between certain community level factors and this disparity in the occurrence of HIV among black and white women (4,5-22). One such community level factor is the community sex ratio, which is defined as the ratio of men to women in a given geographic area (12). The purpose of this project is to assess the impact of the community sex ratio as well as other demographic variables, including income, education, and racial distribution, on the acquisition of HIV and other STDs in South Carolina counties.

Multiple iterations of the community sex ratio will be calculated at the county level. Demographic variables such as educational attainment, income, and racial distribution and rates of HIV and STD diagnoses will also be calculated at the county level. Statistical analyses will be performed to confirm or reject the hypothesis that an imbalanced community sex ratio (i.e., substantially fewer men than women in a community) is associated with the acquisition of HIV and STDs. Correlation between county average sex ratios and county-level HIV and STD rates will be calculated. In order to ascertain the drivers of variability in county-level HIV and STD rates, linear regression analyses – with county-level HIV and STD rates – as the dependent variable and sex ratios as the independent variable – will be conducted. County-level demographic variables will be controlled for in the regression analyses.

### **(b) Project Objectives and Expected Outcomes**

The overarching hypothesis of this project is that community sex ratios are correlated with rates of HIV and STD diagnoses at the county level in South Carolina. The objectives of

this research project are to calculate and analyze community sex ratios and other demographic variables for South Carolina counties. The correlation of the community sex ratio and other demographic variables will be examined for statistically significant patterns. County-level rates of HIV and STD diagnoses will be characterized and then assessed for the presence or absence of association of the county-level sex ratios and rates of STD and HIV diagnoses. These data will be used to determine drivers of variability in HIV and STD diagnoses across counties.

The research team's long-term objectives are to pursue similar analyses at the regional and national levels. Community sex ratios and rates of STD and HIV diagnoses will be calculated and analyzed. The current and future research will provide greater insight into the factors that contribute to HIV and STD incidences, and possibly lead to the development of more effective preventive interventions.

**(c) Project Significance**

Several studies have hypothesized a link between certain community level factors and the occurrence of HIV among black women (4, 5-22). One such community level factor is the community sex ratio, which is defined as the ratio of men to women in a given geographic area (12). Women may partner with males they otherwise would not partner with if there were a more balanced sex ratio.

Prior research has shown that sex ratios in predominantly black areas are substantially more imbalanced than sex ratios in predominantly white areas (12). This research project will provide insight into the impact of imbalanced community sex ratios on county-level rates of HIV and STD diagnoses in South Carolina.

This information is important to obtain because the spread of HIV and STDs is a major public health concern. This research could provide significant information on the factors that contribute to HIV and STD incidences, therefore leading to more effective intervention and preventive measures. Specifically, knowledge about the impact of imbalanced community sex ratios on the acquisition of HIV and STDs can provide information to policy-makers to design and implement interventions aimed at reducing the black-white disparity in HIV and STD diagnoses and the incidence of HIV and STDs overall.

**(d) Methods of Work**

The means of the research will be primarily electronic. Data for calculation of sex ratios and other demographic variables will be derived from the American Community Survey (ACS) 2008-12 five-year sample. All data will initially be at the census tract level. The data from census tracts in each county will then be combined to calculate composite, county-level measures. County-level rates of HIV and STD diagnoses in 2012 will be derived from data collated by the South Carolina Department of Health and Environmental Control (DHEC).

Multiple iterations of the community sex ratio will be calculated. First, an overall sex ratio measure will be created that encompasses males and females of all races and ethnicities of all ages. Next, additional age-specific sex ratios will be calculated (i.e., 18 years and older, 18 to 44 years). Third, race-specific sex ratios accounting only for black men and women will be calculated for the same age groups (0+ years, 18+ years, and 18-44 years). Each of these ratios will be calculated for every census tract in each South Carolina County. County-level ratios, weighted by the population of each census tract, will then be calculated for each county. Census



tract level data will be derived from the American Community Survey (ACS) 2008-12 five-year sample.

Statistical analyses will be performed to confirm or reject the hypothesis that an imbalanced community sex ratio (i.e., substantially fewer men than women in a community) is associated with the acquisition of HIV and STDs. Correlation between county average sex ratios and county-level HIV and STD rates will be calculated. In order to ascertain the drivers of variability in county-level HIV and STD rates, linear regression analyses will be conducted. For these analyses, HIV and STD rates will be considered as the outcome, or dependent, variables while sex ratios will be considered as the exposure, or independent variables. We will control for certain county-level demographic variables such as income distribution, educational attainment, and race/ethnicity. Descriptive statistics will be calculated and linear regression analyses will be performed using SAS® version 9.3.

██████████ and ██████████ are conducting analyses of similar data in the Spring 2015 semester. These data are focused specifically on Charleston County, SC. This research will serve the methods of the research proposed for Summer 2015. Given the nature of the data used for both the Spring and Summer projects, it is anticipated that submission to the College of Charleston Institutional Review Board (IRB) will not be required. The expected product of the combined research projects is two manuscripts to be submitted to scholarly journals and an abstract for oral or poster presentation at the annual meeting of the American Public Health Association (APHA) in November 2015.

**(e) Faculty Mentor and Student Participant Roles**

The proposed research dovetails well with ██████████ ongoing research agenda, which focuses on the association of psychosocial, societal, and structural determinants with the occurrence of HIV, STDs, and other infectious diseases, especially in socially marginalized populations. The manuscripts and presentation, which will result from this project, also fit well with ██████████ research agenda and publication for tenure and promotion as well as ██████████ long-term career aspirations.

██████████ and ██████████ will meet on regular basis (minimum of one meeting per week, on average) to ensure that work on this project progresses toward completion in a timely fashion. It is anticipated that ██████████ will lead efforts to update relevant literature sources and to identify, download, and collate relevant data. In addition to serving in an advisory capacity, ██████████ will take a more active role in performing the proposed statistical analyses. Both members of the research team will participate extensively in preparing the proposed manuscripts and conference presentation. It is anticipated that ██████████ will take the lead in writing the Introduction and Methods sections of both papers while ██████████ will lead writing of the Results and Discussion sections.

**(f) Current and Pending Support**

The SURF grant will provide the necessary funds for the student to be able to conduct the proposed research project at the College of Charleston during Summer 2015. There are no current additional sources of funding for the project.

**(g) Student Development**

██████████ will benefit greatly from her work on this project. The methods employed extend concepts and skills that she learned in ██████████ Biostatistics class (HEAL 395) in Fall 2014 and is currently learning in his Epidemiology class (HEAL 350). Through regular meetings, ██████████ will gain insight into the design, execution, and successful completion of scholarly research. This will serve her well in future endeavors in terms of skill – and resume – development.

**(h) Project Dissemination**

Outside of the Summer Undergraduate Research and Creative Activities Poster Session, this work will drive the writing of two manuscripts to be submitted to scholarly journals as well as an abstract to be submitted for consideration as oral or poster presentation at the annual meeting of the American Public Health Association (APHA) in November 2015. The College of Charleston and the SURF program will be acknowledged for their support at all poster sessions and in the research article.

**(i) Student Involvement in Application Process**

I first encountered ██████████ when she was a student in my Biostatistics class (HEAL 395). She was an exemplary student and piqued my interest when she approached me regarding potential collaboration on a research project. We talked extensively about how to shape our proposed approach. Based on this discussion, ██████████ led completion of most sections of this application. Regardless of the outcome of this proposal, I hope to continue my research collaboration with ██████████ through the duration of her undergraduate career and beyond.

**4. FACULTY INFORMATION**

**(a) Previous Students**

Fall 2012

- ██████████ (graduated, current status unknown): In Fall 2012, I served as independent study advisor for Ms. ██████████, who worked with Water Missions International to conduct an assessment of the effectiveness of water, sanitation, and hygiene (WASH) promotion programs in three communities in Haiti. This project was interrupted by a hurricane, which interrupted the mobile telephone network, over which the text message-based survey was to be conducted.

Spring 2013

- ██████████ (graduated, current status unknown): I served as independent study advisor for ██████████, who designed and implemented an evaluation of the association between hand hygiene promotion programs and illness-related absences in four schools in Florence and Williamsburg Counties, SC.
- ██████████ (graduated, currently applying to MPA program at Clemson University): I served as independent study advisor for ██████████ who designed an innovative method