

THE ROLE OF PUBLIC HEALTH PARTNERSHIPS IN THE SUCCESS OF THE JACKSON HEART STUDY UNDERGRADUATE TRAINING AND EDUCATION CENTER

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Background: The Jackson Heart Study (JHS) is a single-site prospective epidemiologic investigation of cardiovascular disease (CVD) among African Americans from the central Jackson, Mississippi area. The study is a collaboration between Jackson State University (JSU), University of Mississippi Medical Center (UMMC), Tougaloo College (TC), and the Mississippi State Department of Health (MSDH). The JHS Undergraduate Training and Education Center (JHSUTEC) at TC was developed to increase the numbers of college-aged African American students entering public health and health-related fields. To achieve this goal, the UTEC designed the Jackson Heart Study (JHS) Scholars program.

Methods: JHS Scholars are required to take additional classes and participate in public health and/or biomedical research. The scholars engage in research locally during the academic year. However, many scholars participate in research outside of the Jackson Metropolitan area during the summer. Because of this, national collaborators were needed to act as mentors and hosts.

Results: Since the inception of the JHSUTEC, more than 15 collaborations have been formed that have shared resources and student successes. As of May 2018, more than 150 students have successfully completed the JHS Scholars program and many have continued into careers in public health, biomedical research, and medicine. Since 2004, JHS scholars have published 29 papers and 15 scholars have received diversity supplements.

Conclusion: Collaborative activities and public health partnerships have contributed to the success of the JHSUTEC program and have served as a pathway of entry into STEM fields for minority students. *Ethn Dis.* 2020;30(1):41-46; doi:10.18865/ed.30.1.41

INTRODUCTION

The purpose of this article is to present the impact of public health partnerships with an undergraduate training and education center affiliated with a population-based study of cardiovascular disease (CVD) on the public health workforce in Mississippi and beyond. The Jackson Heart Study (JHS) is a single-site prospective epidemiologic investigation of CVD among African Americans in the Jackson, Mississippi metropolitan area, comprising Hinds, Madison and Rankin Counties from which 5306 study participants were recruited between September 2000 and December 2004. It has been funded on a continuing basis since its inception in 1999 by the National Institutes of

Health (NIH)/National Heart, Lung and Blood Institute (NHLBI) and the National Institute on Minority Health and Health Disparities (NIMHD).

The JHS Undergraduate Training and Education Center (UTEC) is one of six centers that comprise the JHS. Three are training centers located at three partnering academic institutions: Graduate Training and Education Centers (GTEC) at Jackson State University (JSU) and University of Mississippi Medical Center (UMMC); and the UTEC at Tougaloo College (TC), the sole undergraduate center. The other three centers are: a Community Engagement Center under the auspices of the Mississippi State Department of Health (MSDH); and Field and Coordinating Centers, both at UMMC. The aims of the JHS are to: “establish a single-site epidemiological study of African American men and women; identify risk factors for the development and progression of CVD; build research capabilities in minority institutions; and, attract minority students to careers in public health and epidemiology.”¹ The specific objectives of the UTEC are to: 1) strengthen the base of participating students’ knowledge of science and mathematics; 2) provide innovative programs,

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research opportunities, and mentorship to stimulate and nurture students' interest in science and research; 3) produce publications and informational articles on educational topics for broader audiences; and 4) encourage students to pursue further training for future biomedical careers.²

In a publication related to educating public health professionals for the 21st century, the Institute of Medicine (IOM) recommended that all undergraduates should have ac-

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cess to education in public health "to ensure a well-educated public health workforce."³ A previous IOM report called for a more formal interaction between public health academic settings and public health practice.⁴ According to Caron and others, "Practical experiences offered through partnerships between public health academicians and public health practitioners can complement the traditional classroom education, thus helping to make both graduate and undergraduate students more in-

vested in the role of public health in the community."⁵ Ruffin envisioned that "The inclusion of minority institutions will increase the diversity of America's scientific workforce as well as empower minority communities to improve their health status through participation in health research."⁶ TC was the perfect site to demonstrate a public health partnership model, comprising formal agreements and informal relationships with collaborators locally and nationwide. TC is a predominately, historically African American liberal arts college with an enrollment of approximately 1,000 students located adjacent to the Jackson, Mississippi city limits in Tougaloo, Mississippi. The college offers a bachelor's of science and bachelor's of arts degrees and has long been noted for the accomplishments of its graduates. In the initial technical proposal in 1998, TC stated its profound commitment to public health and epidemiology, especially as it related to minorities and rural populations in Mississippi. TC indicated that it was "ready and eager to prepare health professionals who have a vision of their role that extends beyond curing specific illnesses" and envisioned its aim as helping its students focus on population health for African Americans. Thus, TC's commitment is to provide an important and vital link to preparing health professionals who are aware of and concerned about public health for the next century.⁷

The JHSUTEC at TC designed two programs to achieve the aims of attracting minority students to careers in public health and epidemiology and to specifically involve students in hands-on experiences to create an

interest in public health careers. One was a Summer Outreach Program for High School students that focused on the STEM subjects of science, language arts and mathematics (SLAM). The other was the undergraduate JHS Scholars' Program. Twelve TC second semester freshmen who meet eligibility criteria are selected each academic year as JHS Scholars (JHSS) and are required to participate in a supplemental curriculum focused on public health throughout their matriculation at TC. Included in the curriculum is an emphasis on hands-on learning experiences through Summer Research Internships (SRI). In order to provide meaningful placements for JHSS, UTEC needed local and national collaborators to serve as mentors and hosts. As described by Carman and others, "Partnership opportunities between academia and practice exist in formal agreements and informal relationships."⁸ Similarly, formal and informal collaborations with institutions and agencies with a public health focus became the JHSUTEC TC public health partnership model.

METHODS

Public health partnerships are an integral component in increasing the public health workforce and have been utilized to meet the specific objectives of the UTEC. The JHS curriculum involves both didactic and "hands on" approaches to prepare scholars for graduate training and careers in public health. The didactic approach involves scholars being provided with foundational knowledge about public health through four JHS-sponsored

Table 1. Roles of partnership participants

UTEC Program Administrators	National Collaborators	UTEC Students
Contact collaborators regarding research opportunities	Mentor student for academic year and/or summer research placement	Participate in research and other scholarly activities
Follow up with collaborator(s) and mentor(s) once the student begins	Provide an evaluation of the student	Develop an abstract and poster/oral presentation
Provide the collaborator(s) and mentor(s) update of student success	Assist student in developing an abstract and poster/presentation	Present at scientific conferences both locally and nationally

courses. During the sophomore year, “Introduction to Public Health and Epidemiology” and “Biostatistics” are required during the fall and spring semesters. In the fall of the junior year, JHSS are required to take “Research Methods in Public Health.” The final required course, “Ethics, Medicine, and Technology,” may be taken in the spring semester of any year before the scholar graduates.

The hands-on or applied approach involves collaborations between UTEC, its centers, public health agencies, and/or schools to provide research opportunities for JHSS. Scholars participate in three years of mentored research experiences and attend colloquia where guest speakers are sometimes scholar graduates who hold positions in medicine, public health, biomedical research and related areas who also serve as powerful role models for currently enrolled scholars. Included in the curriculum is an emphasis on hands-on learning experiences through SRI.

Some collaborations are informal partnerships or Documented Non-Contractual Collaborators (DNC), while others are more formal partnerships and are called Documented Contractual Collaborations (DCC). DNCs are usually established summer research programs to which JHSS ap-

ply and which may or may not have in place a mechanism for sharing the Scholars’ expenses during the internship. As of 2019, UTEC had informal partnerships with 65 DNCs. The roles are illustrated in Table 1.

The DCCs are funded R25s and other training grants to promote summer research particularly for underrepresented minority students. The relationships that TC has with the DCCs are more formal and extend beyond a letter of support to include more specific goals of the liaison. DCCs may have designated slots for JHSS to participate in their summer research programs.

The UTEC has three DCCs: Brown University; Brigham and Women’s Hospital Summer Training in Academic Research and Scholarship (STARS); and the American Heart Association (AHA) Historically Black Colleges and Universities (HBCU) Scholars Program. TC and Brown University (Brown) have a more than 50-year relationship that was initiated during the civil rights movement.⁹ The TC/Brown partnership includes: an early identification program for pre-med students and students interested in pursuing a master’s in public health (MPH) degree; training, mentoring and support for underrepresented minority

students from undergraduate through advanced graduate training programs through the Leadership Training Alliance;¹⁰ and interfacing with the Minority Health and Health Disparities International Research Training Grant (MHIRT) Program to provide the opportunity to participate in global research and work side-by-side with public health faculty members. In 2014, a dual campus course, “Maternal and Child Health Care,” taught via distance learning technology alternately at Brown and TC was added to the TC/Brown partnership features. The course was co-taught by investigators from the JHS and professors in the School of Public Health at Brown.

In 2010, TC, through the JHS, partnered with the Brigham and Women’s Hospital (BWH) to: “provide short-term research practice experiences in Boston in CVD-related research to underrepresented health professional students affiliated with the JHS, and to provide a co-mentoring system in both Boston and Mississippi to ensure improvement of research skills through regular advisory and evaluative activities; provide academic, experiential and social enrichment activities to expand the knowledge base, and sense of community necessary for academic participation and contribution; and provide op-

portunities for peer-mentoring to enhance learning through teaching.”¹¹

In 2015, TC became the first HBCU in Mississippi to partner with the AHA to assist them in recruiting participants for the AHA HBCU Initiative. In each academic year, two TC students are selected and paired with a local investigator to participate in research on CVD. As an additional component of this DCC, in 2016, the principal investigator (PI) of the UTEC was selected to join the AHA’s-Tobacco Regulation and Addiction Center A-TRAC. This two-year fellowship provided training in Tobacco Regulatory Science (TRS) and mentoring in professional development and academic writing. These collaborations led to an invitation for TC to participate in the AHA Atrial Fibrillation Strategically Focused Research Network (AHA AF SFRN), which is an intensive two-year career development fellowship for early career investigators in translational AF research.

The JHSS coordinator informs JHSS of summer research opportunities early in the fall semester of their sophomore year. This includes information on type of research and deadlines. Scholars may apply to summer research programs at JHS-affiliated institutions, DNCs, or DCCs. Once the scholar is accepted into a summer internship position, the UTEC scholar coordinator contacts the mentor and ensures that he/she was aware of UTEC’s expectations of both the trainee and the mentor and of the evaluation and paperwork requirements. At the end of the summer internship, scholars submit an abstract of their research that involved their mentor, with a description of their summer experience. The mentor submits an evaluation of the quality of the scholar’s work. The JHSS coordinator is responsible for collecting data on the scholars’ summer research intern experiences while the tracking assistant enters pertinent

data into the Research Electronic Data Capture (REDCap) database.

Statistics

Descriptive data are collected annually on JHSS in a REDCap database, inclusive of hometown, ACT score, sex, age, and major area of study. Data also include information on graduation plans, institutions attended, degrees earned, position in the workforce, honors and awards, and undergraduate publications and presentations. These data are used in semiannual and annual reports.

RESULTS

UTEC began with one DCC, Brown University, and now has two additional formal collaborators. UTEC has partnered with more than 65 DNCs since 2002. Each year JHS UTEC Scholars have engaged in summer research at DCCs

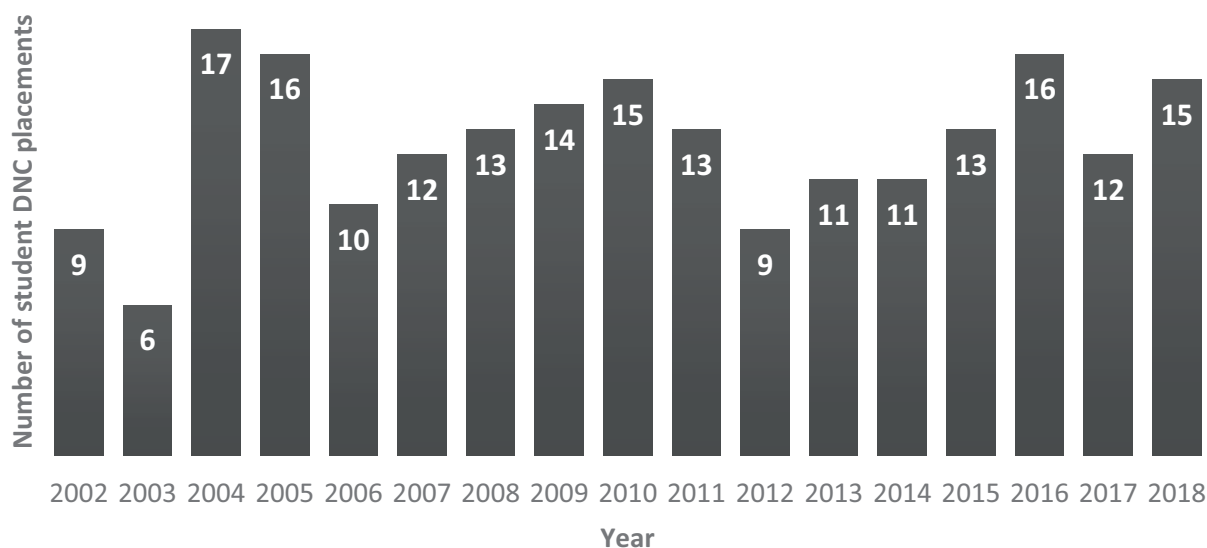


Figure 1. Scholars placed with documented non-contractual collaborators, 2002-2018

and DNCs. From 2002 to 2018, scholar placements with DNCs averaged 13. The range was 6 in 2002 to a high of 17 in 2004 (Figure 1).

The availability of DNCs varied, depending on the availability of DCC positions. These public health partnerships have resulted in 29 published articles co-authored by JHSS, three of whom are first author. Scholars have also been active in scientific presentations at both local and national conferences. Ten scholars were awarded NHLBI Diversity Supplements to pursue graduate training.

Between 1999-2019 degrees earned by JHSS included: 65 (33%) professional degrees; 29 (15%) PhD degrees in sciences; 17 (9%) dual degrees; and 23 MPH (12%) degrees (Table 2).

DISCUSSION

The JHS UTEC at TC is innovative because it is not a public health academic setting. Yet, it has prepared undergraduate students for entry into public health careers for 20 years, thus demonstrating a best practice model of combining traditional classroom activities with hands-on practical activities related to public health practice in the community. According to Caron and Sherrer, undergraduate students who engage in public health partnerships transition into the workforce more easily and with a wide array of experiences and knowledge that is immediately useful.^{5,12} Approximately 100 JHSS have entered the public health, biomedical research, and health professional workforce. Public health partnerships have en-

Table 2. Degrees obtained and graduate or professional program enrollment status of Jackson Heart Study scholar graduates, 1999-2019, N=197

Status of Graduated JHS Scholars	N ^a	%
Completed professional degrees	65	33
Completed PhD degrees in sciences	29	15
Completed dual degrees: MD/MPH, MD/PhD; MPH/DrPH	17	9
Master's in public health degree	23	12
Masters in sciences	14	7
Graduate degrees in non-science majors	14	7
Scholars enrolled in graduate/professional education	35	18
Total	197	100

a. Numbers do not represent individual scholars as some scholars received multiple degrees.

abled UTEC to address the specific aims of building research capabilities in minority institutions and, attract minority students to careers in public health and epidemiology. In implementing public health partnership activities, the UTEC PI and coordinator of the JHSS program

to support undergraduate underrepresented minority (URM) students' research experiences. Since TC JHSS are predominately URM, and primarily African American, they often provide the diversity and inclusion sought by some partnering entities.

RECOMMENDATIONS

Three recommendations have emanated from our work: 1) Small liberal arts colleges, like TC, should partner with academic institutions with public health programs, and with local health departments to provide interested students with the opportunity to explore the role of public health in the community and subsequently enter a public health career; 2) Public health partnerships should be expanded to include non-governmental agencies (NGOs) and community-based organizations (CBOs) in addition to departments of health; and 3) Universities and colleges should expand activities that promote awareness of the role of public health in URM communities in order to promote a legacy of health equity vs a history of health disparities.

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have, since 1999, engaged in perpetually building collaborative partnerships with public health agencies and associations as advocated by the Public Health Foundation Council on Linkages Between Academic and Public Health Practices.¹³ The UTEC PI and JHSS coordinator collaboratively build and nurture networks with other academic institutions, some which have training grants available

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CONFLICT OF INTEREST

No conflicts of interest to report.

AUTHOR CONTRIBUTIONS

Research concept and design: White, Harris, Srinivasan; Acquisition of data: Mohamed; Data analysis and interpretation: Henderson, Mohamed; Manuscript draft: White, Henderson, Harris, Srinivasan; Statistical expertise: White, Harris; Acquisition of funding: White, Harris; Administrative: White, Henderson, Harris, Mohamed, Srinivasan; Supervision: Henderson, Srinivasan

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