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Reducing Disparities by way of a Cancer Disparities Research Training Program

Lee S. Caplan, MD, MPH, PhD,
Morehouse School of Medicine

Tabia H. Akintobi, PhD, MPH,
Morehouse School of Medicine

Tandeca King Gordon, Med,
Morehouse School of Medicine

Tiffany Zellner, MPH, CPH,
Morehouse School of Medicine

Selina A. Smith, PhD, MDiv, and
Medical College of Georgia

Daniel S. Blumenthal, MD, MPH
Morehouse School of Medicine

Abstract

Background—For minority populations, there is a continuing disparity in the burden of death and illness from cancer. Research to address this disparity should be conducted by investigators who can best understand and address the needs of culturally diverse communities. However, minorities are under-represented in health-related research. The goal of this project was to develop and evaluate an approach to motivating and preparing master’s degree students for careers dedicated to cancer disparities research.

Method—A Cancer Disparities Research Training Program (CDRTP) was initiated in 2010. The program consists of coursework, practicum experiences, and research opportunities. Assessment of the curriculum is based on monitoring achievement of evaluation indicators and included a mixed-method approach with included both quantitative and qualitative approach.

Results—In its first three years, the program graduated 20 trainees, all of whom were minorities (18 African Americans and two Asians). When asked about career goals, two-thirds of the trainees indicated interest in pursuing careers in research in cancer prevention and control. The trainees expressed high satisfaction with the courses, instructor, materials, and curriculum. Although trainees had suggestions about course details, evaluations overall were positive. Across focus groups, three recurrent themes emerged regarding activities to enhance the trainee experience: having a wider variety of topics, more guest speakers, and field trips.

Conclusion—The CDRTP was intended to recruit students – primarily African Americans – into research on prevention and control of cancer disparities. Although final evaluation of the program’s overall outcome will not be available for several years, this preliminary evaluation indicates early program success.

Keywords

cancer prevention; cancer disparities; minority researchers; training; curriculum

INTRODUCTION

The US population is currently more racially and ethnically diverse than at any time in the nation's history (US Census Bureau, 2011). According to the 2010 U.S. Census, racial and ethnic minority groups compose 36.3% of the population. These groups include African Americans, Latinos, American Indians or Alaska Natives, Asian Americans, and Native Hawaiians or Pacific Islanders. There is a continuing disparity in the burden of death and illness experienced by minority populations (Shavers, et al. 2005). More than 80% of these deaths fall within the major health areas of heart disease/stroke, homicide/accidents, cancer, infant mortality, cirrhosis, and diabetes.

The overall African-American cancer death rate is greater than that for all other ethnic groups, and the disparity, as measured by the Black: White cancer-related mortality ratio, continues to be large (American Cancer Society, 2013). For all cancer sites combined, African American men have a 20% higher incidence rate and a 31% higher cancer death rate than White men, whereas African American women have a 6% lower incidence rate but a 15% higher death rate than White women. For nearly all cancer sites, incidence and death rates are consistently higher for African Americans than for Whites and other racial/ethnic groups. African Americans also have the shortest five-year survival rate of any US racial/ethnic group.

Explanations for these inequalities relate to disparities in socioeconomic status, including income and education; to economic barriers to early detection and treatment services; and to the impact of racial discrimination on these factors (Blackman and Masi, 2006; Wheeler, et al. 2013; Gerend and Pai, 2008; Hirschman, et al. 2007; and Du, et al. 2008). Relative to 10% of Whites, 28% of African Americans live below the poverty line (DeNavas-Walt, et al. 2012). Poor and uninsured people are more likely to be diagnosed later, receive substandard clinical care and services, and die of disease.

Although increased resources for research into health disparities are needed, resources alone cannot resolve these disparities (Yancey, et al. 2006 and Meyer, et al. 2013). A significant portion of the research should be conducted by investigators who can understand and address the needs of culturally diverse communities, as there is no substitute for the innate knowledge of a culture combined with strong research skills (Pasick, et al. 2003). Underrepresented minority researchers bring unique perspectives to solving persistent disparities in their communities. This is true for the development of appropriate research goals, concepts, study designs, measurement tools, intervention strategies, analytic approaches, and interpretation, as well as for the acceptance of study methods and findings in the communities for which they are intended. Therefore, African Americans, including doctoral-level and master's level researchers, should be represented in accordance with the demographics of cancer disparities.

Although under-representation of African Americans, Latinos, and American Indians is common within all professions, the problem of minority under-representation in health professions is of particular concern. In addition to less access to health care, public health, and preventive services among under-represented minorities, under-representation of these racial and ethnic groups in the health care workforce may be a contributing factor to health disparities. There is a need to increase the numbers of minority scientists, particularly in academic medicine. In 2011, only 21.5% of faculty members in U.S. medical schools were members of a minority group, with only 2.9% being African American (Association of American Medical Colleges, 2012). In addition, more than 30% of White faculty members were full professors relative to less than 20% for any minority group. Only 11.3% were African Americans. Approximately one-third of African American medical school faculty members work at historically black institutions. Most majority institutions, including many that are involved in federally-funded health disparities research, have only a small number of African-American and Latino researchers. Academic public health programs situated at historically black colleges and universities (HBCUs) can be utilized to address and reduce racial and ethnic health disparities. The proportion of minorities in health-related research is less than in the health service professions and substantially less than in the US population (National Academy of Sciences, 2000). In NIH-funded research, the disparities are also evident. There are significant disparities in National Institutes of Health (NIH) R01-funding probability for Black applicants (13.2 percentage points less likely, $P < .001$), compared to White applicants. In fact, only 1.4% of R01 applicants identified as Black (Ginther, et al. 2011). In addition, the percentage of African American or Black applicants who applied for grants in the basic sciences was 1%, compared to 64.6% for White applicants (National Institutes of Health, 2012). Furthermore, despite comprising 12.6% of the US population in 2010, African Americans or Blacks accounted for only 1.1% of NIH principal investigators receiving research project grants, compared to Whites who comprised 72.4% of the US population and accounted for 71% of NIH principal investigators receiving research project grants. A significant disparity persisted even after controlling for education, country of origin, training, employer characteristics, previous research awards, and publication record (National Institutes of Health, 2012).

In 2010, more than 30% of students enrolled in U.S. Schools of Public Health identified themselves as racial/ethnic minorities (Hartman, et al. 2011). These minority students have historically not been provided the impetus and support to pursue doctoral training and careers in research (Pasick, et al. 2012). In 2010, the ethnic breakdown of new students enrolled in doctoral programs in US schools of public health was 67.9% White, 11.5% African American, 7.4% Hispanic, 12.2% Asian, 0.5% American Indian/Alaska Native, and 0.4% Native Hawaiian/Pacific Islander; the breakdown for the general population was 72.4% White, 12.6% African American, 16.3% Hispanic, 4.8% Asian, 0.9% American Indian/Alaska Native, and 0.2% Native Hawaiian/Pacific Islander (Association of Schools of Public Health, 2011).

Various programs funded by the federal government have goals of increasing research on racial/ethnic diversity in medicine and health-related fields, and many of these programs deal specifically with cancer (Yancey, et al. 2006; Pasick, et al. 2003; Pasick, et al. 2012; Association of Schools of Public Health, 2011; Kelly, et al. 2006; Michalek and Johnson,

2004; Waterbor, et al. 2002; Dores, et al. 2006; Le Gardeur and Lopez-S, 2000; Heimburger, et al. 2000; Ashley, et al. 2000; Le Gardeur, et al. 1993; Huth, 1991; and Costanza and Gaw, 1987). However, few programs are targeted to minority master's level students to encourage them to pursue further training and/or careers in research on cancer prevention and control (Yancey, et al. 2006; Pasick, et al. 2003; Pasick, et al. 2012). The goal of the present project was to develop and evaluate an approach to motivating and preparing master's degree students for careers partly or entirely dedicated to research on cancer disparities. Although graduates of the program are not likely to become independent investigators without further training, the program does represent an important component of the pipeline to doctoral education. Further, graduates can make important contributions to cancer disparities research by working as members of research teams. The program was developed, implemented, and evaluated at the Morehouse School of Medicine (MSM), a historically Black medical school that has a long history of training minority health professionals and researchers.

METHODS

With support from a National Cancer Institute R25 cancer education research grant, a Cancer Disparities Research Training Program (CDRTP) was initiated in 2010 and continues to function at this time. The MSM IRB reviewed the project and deemed it to be exempt from human subject concerns. Each year, first-year students from the MSM Master of Public Health (MPH) program and fellows from the MSM Master of Science in Clinical Research (MSCR) program were recruited to participate in the program which could accommodate a maximum of 10 trainees per year. There were five students accepted into the program in year one, six in year two, and nine in year three.

The program consists of three components: coursework, practicum experiences, and research opportunities. In order to graduate the program and obtain a certificate in cancer prevention and control, it was necessary to complete all three components (see Figure 1). The coursework, developed by the study team specifically for the training program, included two two-credit courses, one in cancer epidemiology and one in cancer prevention and control. MSM faculty members delivered lectures, as did guest experts from Emory University, the Centers for Disease Control and Prevention (CDC), the American Cancer Society (ACS), and Children's Health Care of Atlanta. Grant funds were used to pay the tuition and fees for the two courses, but not to pay for the practicum experiences and research opportunities.

The Cancer Epidemiology course provides the trainees with an overview of the concepts and tools fundamental to the understanding, design, and conduct of cancer epidemiology studies. A theoretical framework is presented, providing an overview of the biology of cancer as well as the major epidemiologic concepts relating to cancer epidemiology. The major cancer sites, breast, lung, colon, prostate, cervix, and skin, are described and reviewed in relation to incidence and mortality, risk factors, and methodological issues involved in studying these cancers. Major risk factors for cancer, including tobacco, nutrition, infections, and environmental exposures are presented. During the course, trainees are expected to acquire effective skills to critique cancer epidemiologic literature and to draft a proposal to evaluate a specific exposure-disease hypothesis. They are also expected to be aware of and to understand the methodologic issues in cancer studies that make the epidemiology of cancer

different from that of other diseases, the pathophysiology of cancer, and major cancer patterns and trends in the US and internationally. Throughout, disparities in cancer incidence, mortality, and survival rates are emphasized.

The Cancer Prevention and Control course covers the spectrum of cancer control, from surveillance to epidemiology to intervention research, including levels for the individual, family, community, and society. The concepts of cancer prevention, screening, and survivorship are examined. Several areas of prevention, including tobacco, nutrition, and physical activity are presented, highlighting research on health promotion and cancer prevention. Trainees are expected to become familiar with the major cancer sites and their modifiable risk factors and preventive factors. Approaches to reducing disparities in cancer incidence, mortality, and survival rates are a focus of the course. The practicum experiences are based on the model implemented in the MSM Master of Public Health (MPH) program, in which a three-month practicum experience of 40 hours per week for a total of 360 hours is a requirement for all students, regardless of prior experience or training. The Cancer Prevention and Control Practicum in the CDRTP meets this MPH requirement.

The practicum experiences are designed to enhance the understanding and application of knowledge and research findings in cancer disparities to public health settings by providing an opportunity to gain practical experience, at an appropriate level and content, in the field of cancer prevention and control. Participation in the practicum experiences provides trainees with the opportunity to integrate and apply knowledge acquired through classroom learning in a work environment related to public health cancer prevention and control, allowing them to observe and learn from professionals in the field. This experience is designed to encourage, enhance, and support the effective use of the worksite experience as an integral part of the education and training of future cancer researchers. It provides a structured, supervised work experience to strengthen the skills of new graduates, making them more competent when joining the workforce. Practicum experience opportunities are made available in a variety of settings, including the ACS, the CDC, and the MSM Prevention Research Center. The extent to which the practicum includes attention to disparities varies according to the practicum site and to the specific projects on which the students are working. Examples of the practicum experiences had by the trainees included “An Integrated Public Health Experience Addressing Community Health, Education, and Policy;” “Assessing Food Access and Availability in an Urban, Low-Income Neighborhood: Implications for Colorectal Cancer Risk;” “Association between Attributes of Acculturation and Cervical Cancer Screening Knowledge and Utilization among Haitian Women in South Florida;” and “Weight Change as a Predictor of Physical Activity Among African American women: Implications for Breast Cancer Recurrence.”

The research opportunities are based on the models used in the MSM MPH and MSCR programs, in which the experience is a requirement for all students, regardless of prior experience/training. The research opportunities are designed to enhance the learning experience of trainees by having them apply the principles and methods learned during coursework in the preparation of a research manuscript and/or thesis. Participation provides trainees the opportunity to design and implement an original research study in which they demonstrate their ability to examine selected issues related to cancer prevention and control,

review the relevant scholarly and professional literature, develop a research question that they would like to study, collect data or use secondary data, perform data analysis, and write a publishable manuscript or thesis based on this work. The purpose of this research opportunity is to ensure that trainees have the opportunity to become effectively involved in cancer prevention research. Examples of the research projects conducted by the trainees included “Effects of physical activity on symptoms of Depression and Fatigue among African American Breast Cancer Survivors;” “Factors Associated with the Utilization of Dental Services and the Awareness of Increased Oral Cancer Risks among Newly Incarcerated Adults in Georgia;” “Assessing Food Access and Availability in Metropolitan Atlanta: Implications for Colorectal Cancer Incidence;” “Access to Health Information Technology in Adult Survivors of Childhood Cancer;” “Effects of Attributes of Acculturation on Cervical Cancer Knowledge, Beliefs and Screening Utilization Among Haitian Women in South Florida;” and “Weight Change as a Predictor of Physical Health, Functioning and Activity Among African American women: Implications for Breast Cancer Recurrence.”

Assessment Approach

Assessment of the curriculum was based on monitoring achievement of evaluation indicators. Quantitative assessment included the establishment of a database to track demographics of trainees and included data from a profile completed by each trainee upon entry into the program. A qualitative approach, through focus groups, was used to assess trainees’ satisfaction, experience, and recommendations for the program.

Quantitative measures—Trainee satisfaction surveys were developed and administered at the end of each two semesters when the trainees completed their coursework. Surveys were adapted from others previously developed for use in the MSM MPH and MD programs. Satisfaction was ranked on a five-point Likert scale of Strongly Agree to Strongly Disagree. These assessments were conducted by analyzing frequencies associated with Likert scale and open-ended responses. Data analysis was conducted using PASW SPSS 18.0.

Qualitative measures—Three trainee focus groups were held at the end of the final course for each cohort, with an average of 3–8 participants per group. Focus group discussions provided an opportunity to gather the perspectives of the trainees based on their experience during the classroom component of their training. Trainees were asked about their experiences, skills developed, and recommendations for the CDRTP.

Members of the evaluation team of the CDRTP conducted the focus groups, in which trainees were encouraged to be open in their responses. All trainees were given the opportunity to participate. Of the 20 trainees who completed the program, 13 chose to participate in the discussions. Data derived were analyzed manually by two raters to identify trends and emergent themes based upon participant feedback. Overarching themes, responses mentioned most frequently, and recommendations were summarized in a report to program staff. Analysis was preceded by transcription of interviews conducted. Interviews were manually coded by at least two researchers. Once responses were independently coded,

evaluation team members met to consolidate findings toward thematic analysis (Braun and Clarke, 2014). Instances of theme discrepancy were discussed until a consensus was reached. Key themes were determined following coder consensus to inform analysis of the results.

RESULTS

As seen in table 1, in its first three years, the program has graduated 20 trainees, all of whom are minorities (18 African Americans and two Asians). There were 15 women, and five were men. Of the graduates, 15 were MPH students and 5 were MSCR fellows. The areas of concentration for the MPH students included epidemiology, environmental health, and global health. Trainees were offered the option of completing either the courses only or the cancer-related practicum only or the cancer-related research experience only or any two of the components only, in which case they would not receive a cancer prevention and control certificate. However, all but one trainee elected to complete the entire program: two courses, practicum, and research experience in cancer. In addition, a journal club in which most trainees participated was developed.

Quantitative—Eighteen trainees responded to the demographic profile questionnaire administered upon entry to the program (see table 2). Of these, twelve indicated that they had some exposure to or experience in cancer prevention and control other than the CDRTP. This included research conducted previously or concurrently with the CDRTP and various courses and conferences. One trainee had worked as a pediatric oncologist in Pakistan. When asked about career goals, eleven of the 18 indicated an interest in pursuing a career in cancer prevention and control research, although none mentioned disparities. Seven of the 15 MPH students mentioned pursuing a doctoral degree, either a PhD or an MD degree, although all indicated a desire to enter a career in research. Three of the five MSCR fellows already had a medical degree.

Satisfaction surveys, administered to trainees at the end of each semester, gauged satisfaction with the Cancer Epidemiology course and the Cancer Prevention and Control course. The 20 trainees completed 40 satisfaction surveys, representing survey administration at the end of each of two semesters of coursework. Overall, trainees expressed high satisfaction with the courses, instructor, materials, and curriculum. For each area, more than half of the trainees strongly agreed that there was congruence between course description and content, clear expectations, and relevant course materials. Of the trainees, 77.5% agreed that they were satisfied with all aspects of the course. Eighty-five percent (85%) agreed that materials were relevant and easy to understand, and 82.5% agreed that the instructors answered questions in a complete and clear manner. The same proportion agreed that the cancer epidemiology course stimulated their interest in cancer epidemiology.

Qualitative—Focus groups were conducted to identify trends and emergent themes related to the trainees' course experiences, perspectives, and recommendations. The focus groups offered the trainees an opportunity to provide input regarding the format of the two courses, topic areas, and course organization. The trainees had suggestions about the details of the courses – for instance, the time at which the courses were offered, additional cancers (such

as leukemia and lymphoma) that might be discussed, and the need for a more complete syllabus. Overall, the evaluations were positive, and trainees agreed that little needed to be changed.

The following summarizes the topics of the focus groups and presents selected responses of the participants representing themes that were identified.

Course expectations—When asked to describe how their experience compared to their expectations, most respondents stated that their experience in the course met or exceeded their expectations. One trainee shared the following insight: « ...It is really interesting that different scientists come here and share their experience, their knowledge and we don't get this in other subjects. I mean, the subject [in other courses] is just taught by one subject matter expert, but here you have an exposure to different scientists from CDC or the American Cancer Society... »

Most Important Concept—When asked to indicate the most important concept that they learned, responses centered on increased knowledge related to types of cancers, prevention modes, and racial/ethnic risk factors. One trainee stated: « Because of the knowledge gained, I could talk to others about racial disparities when it comes to cancer. »

Course Enhancements—Three themes recurring across focus groups related to activities to enhance experiences of the trainees. These included having a wider variety of cancer lecture topics, inviting more guest speakers, and taking field trips. Suggestions for expanded course content included covering additional cancer sites, cancers associated with environmental factors, cancer rates in the U.S. versus other countries, cancer treatment and recovery, and cancer disparities. Their request for more guest lecturers was not only for lecture variety, but also as a way to network with leaders who potentially would share their experiences and establish relationships beyond the course. By having lecturers with different backgrounds and expertise, trainees felt they could learn a broader range of topics, and, if interested in similar work, could begin to negotiate practicum, thesis, or job placement. One trainee stated the following potential related to engaging with guest lecturers:

“They invite you to know them, too. So they say come or call me or, you know, they involve you. So if you get a chance, you go there, talk to them, [and they] assist you. So you get more experience with creating a network, as you say.”

Many trainees expressed the desire for learning to take place outside the classroom. Trainees suggested field trips, site visits, and attending conferences/presentations. Site visit suggestions included the CDC, the ACS, and Children's Healthcare of Atlanta.

Course Recommendations—When asked for recommendations regarding the course content or teaching/learning methods, changing the timing of the two courses and adding a special focus on general epidemiology, which would apply to the topic of cancer the foundational epidemiologic principles which the trainees were already taught in the required introduction to epidemiology course, were recommended most. With respect to course timing, trainees had various suggestions, including changing the time of day of the course. Further, they suggested offering the course once a week in a three-hour block versus twice a

week for an hour and a half, to allow for topics to be discussed in more detail without a pause. One trainee said: « I think it was better as it was before with just one a week with a longer [class of] three hours... The lectures were able to go more in depth for those three hours. There's more time for question and answers 'cause they weren't rushing through the presentation. I feel like sometimes the presenter would feel like they were rushing through or they wouldn't be able to cover all the content they wanted to present. »

With regard to adding more content on general epidemiology to the cancer epidemiology course, trainees in all focus groups recommended this addition. One trainee stated:

« It didn't reflect the true epidemiology course. It kind of reflected a cancer prevention course, but it wasn't like an epidemiology course. » « When we think of Epi, it's more so us learning how to do calculations or maybe us learning how to use different software like Epi Info, stuff like that...I don't know that and that's important. ...that's something we should know if we're going out there trying to say that we're advanced entry level cancer epidemiologists, you know seeking different internships and fellowships. That's the least that we should know. We should definitely know software. »

We evaluated the program by contacting graduates by telephone to learn about their current activities and future plans. The average length of time between graduation and telephone follow-up was approximately two years and varied among the graduates. Indicators of success included publications, pursuit of doctoral degrees, and employment in research positions involving cancer disparities research.

Of the 15 MPH graduates, we were able to contact 11; of the five MSCR graduates, we were able to contact three. There has been one manuscript published, and there is one manuscript in preparation. One MPH graduate was enrolled in a PhD program (conducting research on triple-negative breast cancer), two were applying to PhD programs, two were applying to medical school, and one was applying for fellowships. Four MPH graduates were working in the field of cancer research, three as researchers and one as a manager. The remaining MPH graduate was applying for jobs in cancer research. Two of the three MSCR graduates were conducting cancer research (one in colorectal cancer and the other in prostate cancer) and the third is searching for a cancer research position.

DISCUSSION

The goal of this program was to guide master's level trainees into careers in research on cancer disparities. While the achievement of this goal cannot be fully evaluated for several more years, as many of the graduates search for jobs in order to earn income and pay back their loans, there are positive indicators in this preliminary evaluation. In fact, our preliminary results are in line with the results of the successful program in California entitled "The Minority Training Program in Cancer Control Research (MTPCCR) (Yancey, et al. 2006; Pasick, et al. 2003; and Pasick, et al. 2012). Among the graduates of our program, nearly 50% expressed interest in pursuing a doctoral degree, while 30% of alumni of the MTPCCR are currently enrolled in or have already completed doctoral programs. A key result from our program was that at least 40% are either currently performing cancer

research or are planning to do so, and about 60% expressed an interest in doing cancer prevention and control research. These results compare favorably with those of the more established MTPCCR, for which 88% of alumni reported involvement in cancer research. Since disparities were the focus of our program, it seems most likely that, for those graduates who do become active in research in cancer prevention and control, their research will address disparities. Although trainees did not mention disparities on the questionnaires, some did discuss disparities in the focus groups. Impact evaluation has recently begun as the evaluators of the CDRTP have launched an alumni survey to assess professional and education outcomes that participants attribute to their experience in the program.

It should be recognized that 15 of the 20 trainees were working toward an MPH, which is not a research degree. Those who are accepted to a PhD program will likely conduct research on cancer prevention and control. Those who are accepted into an MD program may eventually perform research or may limit their work to medical practice. Those whose terminal degree is an MPH may find work in a research program, but are unlikely to lead a research team or to serve as the principal investigator on a research project.

There was concern that some trainees would take the two courses simply because the grant paid for their tuition and textbooks, not because they were truly interested in cancer prevention and control. Nevertheless, all but one who enrolled participated in the entire program, including the practicum and research components, even though they were expected to pay tuition for those components.

All of the focus groups included the recommendation for increased content of general epidemiology; this was particularly voiced by the cohort of the Fall 2013 focus group. This class was the first to move through the MPH program as a generalist degree, without concentrations, although the program had earlier included more epidemiology. Thus, a student previously in the program would have had options for more focused instruction in this discipline and its practice. Based on focus group responses, trainees thought that the Cancer Epidemiology course would provide a stronger base in epidemiology than it did. The CDRTP addressed that concern by including more content on methodological issues in cancer epidemiology in the Fall 2014 course. In addition, the CDRTP also addressed the desire of many trainees to have field trips built into the curriculum. One session in the Fall 2014 course took place at the national office of the ACS in Atlanta. The trainees were given two lectures by ACS scientists, an overview of current activities at the ACS, and a tour of the facility.

CONCLUSION

The CDRTP was intended to recruit students – primarily African Americans – into research on prevention and control of cancer disparities. Although a final evaluation of the program will not be available for several years, a preliminary assessment indicates that the program is being successful.

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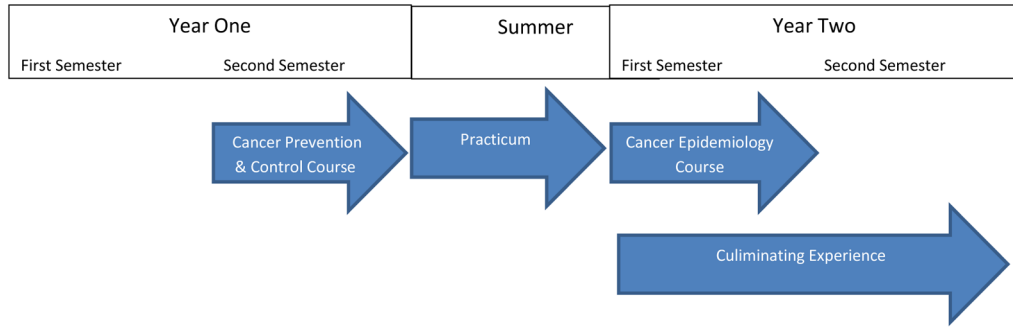


Figure 1.

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Table 1

Demographic Characteristics

		Total N=20
		N (%)
Race	Black/African American	18 (90%)
	Asian	2 (10%)
Gender	Female	15 (75%)
	Male	5 (25%)
Current Degree Program	Master of Public Health (MPH) Student	15 (75%)
	Master of Science in Clinical Research (MSCR) Student	5 (25%)
Full CDRTF Program	Yes	19 (95%)
	No	1 (5%)

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Table 2

Demographic Profile Questionnaire

		Total N=18
		N (%)
Highest Level of Education Completed	Bachelor's Degree	15 (83%)
	Graduate Degree	3 (17%)
Previous Cancer Prevention and Control Experience	Yes	12 (67%)
	No	6 (33%)
Five-Year Career Goals	Cancer Prevention and Control Research	11 (61%)
	Pursue Doctoral Degree	7 (39%)

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