

Journal of Health Disparities Research and Practice

Volume 12, Issue 4

2018

Article 10

2019 STEP-UP SPECIAL ISSUE

Training Underrepresented High School Students as a Strategy to Increase Diversity in the Biomedical Research and Health Professions Workforce

Dolores E. Caffey-Fleming, MS, MPH*

Lourdes Guerrero, EdD, MSW[†]

Keith C. Norris, M.D., PhD[‡]

*

†

[‡]Department of Medicine, David Geffen School of Medicine, University of California, Los Angeles

Copyright ©2018 by the authors. *Journal of Health Disparities Research and Practice* is produced by The Berkeley Electronic Press (bepress). <https://digitalscholarship.unlv.edu/jhdrp>

Training Underrepresented High School Students as a Strategy to Increase Diversity in the Biomedical Research and Health Professions Workforce*

Dolores E. Caffey-Fleming, MS, MPH; Lourdes Guerrero, EdD, MSW; and
Keith C. Norris, M.D., PhD

Abstract

This manuscript introduces the abstracts from the University of California, Los Angeles Coordinating Center.

KEYWORDS: Underrepresented students; high school research; mentors; STEP-UP

*The STEP-UP HS program is supported by the National Institute of Diabetes and Digestive and Kidney Diseases of the National Institutes of Health, Grant number: R25DK113659.



Journal of Health Disparities Research and Practice
Volume 12, STEP-UP Special Issue, Summer 2019, pp. 16-19
© 2011 Center for Health Disparities Research
School of Public Health
University of Nevada, Las Vegas

Training Underrepresented High School Students as a Strategy to Increase Diversity in the Biomedical Research and Health Professions Workforce

Dolores E. Caffey-Fleming, MS, MPH, Program Coordinator

Lourdes Guerrero, EdD, MSW

Keith C. Norris, M.D., PhD, Department of Medicine, David Geffen School of Medicine,
University of California, Los Angeles

Coordinating Center: University of California, Los Angeles

INTRODUCTION

*"No written word, no spoken plea can teach our youth what they should be,
Nor all the books on all the shelves, it's what the teachers are themselves." Author
unknown*

The biomedical and health sciences and medical therapeutics in the U.S. are at a crossroads. Despite remarkable advances in recent decades the U.S. suffers from some of the worst health outcomes among developed nations such as infant mortality (45th in the world), longevity (43rd in the world), and preventable deaths (#19 of 19 developed nations) (Central Intelligence Agency [CIA]a, 2018; CIAb, 2018; Nolte & McKee, 2012). This has led to broad calls for health and health care reform, including but not limited to rethinking the preparation of the next generation of biomedical and health science professionals (Davis, 2005). While much of the focus on research training for underrepresented persons has targeted undergraduate and graduate training, expanding the investments even earlier on to capture talent in a larger pool of low SES and minority investigators thereby capturing many bright minds early on and enhancing the pool of promising young scientists in our nation.

The Nobel physicist Carl Wieman has suggested that we focus more on Science, Technology, Engineering and Mathematics (STEM) talent development instead of STEM talent selection which would allow us to capture a much larger pool of highly talented underrepresented persons (Mervis, 2013). By focusing on early talent identification and development with support over time he feels we could more substantively advance the preparation and ultimately inclusion of underrepresented persons to contribute to the national biomedical/health sciences landscape. This is critical given the emerging evidence of diversity to improve the quality and effective

Journal of Health Disparities Research and Practice Volume 12, STEP-UP Special Issue,
Summer 2019

<http://digitalscholarship.unlv.edu/jhdp/>

Follow on Facebook: Health.Disparities.Journal

Follow on Twitter: @jhdp

17 Training Underrepresented High School Students as a Strategy to Increase Diversity in the Biomedical Research and Health Professions Workforce
Caffey-Fleming, Guerrero, and Norris

dissemination of biomedical sciences (Denson & Chang, 2009; Leung, Maddux, Galinsky, & Chiu, 2008; Satcher, 2009).

Low numbers of success were noted for racial/ethnic minority biomedical/health scientists applying for NIH R01 funding compared to White peers, and this disparity has continued with little improvement over time (Ginther et al., 2011; Valantine & Serrano, 2017). Without the appropriate strategic investments in development, training and mentoring of future generations of talented underrepresented persons, the United States is unlikely to capture the wealth of local talent nor likely to achieve the national goal of increased diversity in the biomedical and health professional workforce as a key strategy for improving the health of the nation (Commission, 2003; National Institutes of Health [NIH], 2012; Schroeder, 2007; Sullivan, 2005). Expanding the investments earlier on to capture talent in a larger pool of underrepresented persons is essential to overcoming these disparities, and enhancing the scientific productivity of our nation. Indeed, the concept that great minds think alike has been challenged as the benefits of team science have become more evident with teams benefiting from great minds that think differently to accelerate innovations (Hong & Page, 2004).

Research training and mentoring programs for underrepresented high school students is particularly pertinent because these programs are able to help to fill the gaps created by inequities in the public education system that disproportionately affect low income and minority communities. Prescient to this conceptual approach, the National Institutes of Health (NIH) National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK) initiated a high school student summer research program that supported 26 underrepresented high school students across 13 states. The students worked in research labs or clinical public health settings in their local community and were exposure to scientific research in the NIDDK mission areas. Originally administered through Howard University starting in 1995, the program was relocated to Charles R. Drew University of Medicine and Science (Drew) in 2001. As the newly reconfigured NIH/NIDDK/Drew National High School Student Summer Research Apprentice Program (NHSSSRAP), student participation was expanded in Hawaii, Alaska and Puerto Rico as well as increased numbers in the “lower 48 states”, reaching over 75 students a year.

As the program matured there was the establishment of on-line training in responsible research, research ethics and laboratory safety prior to beginning the program to ensure each student had a solid foundation prior to joining their summer team where additional directed training was provided before beginning their summer experience. In 2007, the NIDDK reorganized and further expanded the program by creating the NIH/NIDDK Short-Term Education Program for Underrepresented Persons (STEP-UP Program). This created three Coordinating Centers to more effectively support students across the nation and subsequently expanded to 4 centers. The present sites include the University of Hawaii, Manoa, Stanford University, University of Nevada, Las Vegas and University of California, Los Angeles where the former Drew PI now resides. The goals of the program remained the same with the focus on training in the mission areas of NIDDK. The addition of the University of Hawaii, Manoa allowed for a greater presence of high school research experiences in Hawaii including many of the less populated islands, and expansion to the Pacific Islands such as Guam, Saipan and America Somoa. The Stanford University, University of Nevada, Las Vegas and University of California, Los Angeles coordinating centers have provided support for expanding the program on the US mainland, Alaska, and Puerto Rico. The program now supports

Journal of Health Disparities Research and Practice Volume 12, STEP-UP Special Issue,
Summer 2019

<http://digitalscholarship.unlv.edu/jhdrp/>

Follow on Facebook: Health.Disparities.Journal

Follow on Twitter: @jhdrp

18 Training Underrepresented High School Students as a Strategy to Increase Diversity in the Biomedical Research and Health Professions Workforce

Caffey-Fleming, Guerrero, and Norris

over 100 students a year and includes students from all U.S. territories. Future directions include the long-term evaluation of students using the methodologies such as those developed through the NIH-funded Diversity Program Consortium Coordination and Evaluation Center at UCLA (Guerrero et al., 2017; McCreath et al., 2017). The STEP-UP Program coordinating center at UCLA is led by Keith Norris, MD, PhD and Lourdes Guerrero, ED, MSW and Dolores Caffey-Fleming, MS, MPH.

Keywords: Underrepresented students, high school research, mentors, STEP-UP

ACKNOWLEDGEMENTS

The STEP-UP HS program is supported by the National Institute of Diabetes and Digestive and Kidney Diseases of the National Institutes of Health, Grant number: R25DK113659

REFERENCES

- Central Intelligence Agency [CIA]a. (2018). Country Comparison: Infant Mortality, 2017. Retrieved from <https://www.cia.gov/library/publications/the-world-factbook/rankorder/2091rank.html>
- Central Intelligence Agency [CIA]b. (2018). Country Comparison: Life Expectancy at Birth, 2017. Retrieved December 1, 2018, from <https://www.cia.gov/library/publications/the-world-factbook/rankorder/2102rank.html>
- Commission, E. (2003). *The costs and benefits of diversity* (Rep.). Kent, UK: Centre for Strategy and Evaluation Services.
- Davis, K. (2005). Toward A High Performance Health System: The Commonwealth Fund's New Commission. *Health Affairs*, 24(5), 1356-1360. doi:10.1377/hlthaff.24.5.1356
- Denson, N., & Chang, M. J. (2009). Racial Diversity Matters: The Impact of Diversity-Related Student Engagement and Institutional Context. *American Educational Research Journal*, 46(2), 322-353. doi:10.3102/0002831208323278
- Ginther, D., Schaffer, W., Schnell, J., Masimore, B., Liu, F., Haak, L., & Kington, R. (2011). Race, ethnicity, and NIH research awards. *Science*, 333(6045), 1015-1019. doi:10.1126/science.1196783.
- Guerrero, L. R., Ho, J., Christie, C., Harwood, E., Pfund, C., Seeman, T., . . . Wallace, S. P. (2017). Using collaborative approaches with a multi-method, multi-site, multi-target intervention: Evaluating the National Research Mentoring Network. *BMC Proceedings*, 11(S12). doi:10.1186/s12919-017-0085-69
- Hong, L., & Page, S. E. (2004). Groups of diverse problem solvers can outperform groups of high-ability problem solvers. *Proceedings of the National Academy of Sciences*, 101(46), 16385-16389. doi:10.1073/pnas.0403723101
- Leung, A. K., Maddux, W. W., Galinsky, A. D., & Chiu, C. (2008). Multicultural experience enhances creativity: The when and how. *American Psychologist*, 63(3), 169-181. doi:10.1037/0003-066x.63.3.169
- McCreath, H. E., Norris, K. C., Calderón, N. E., Purnell, D. L., Maccalla, N. M., & Seeman, T. E. (2017). Evaluating efforts to diversify the biomedical workforce: The role and function of the Coordination and Evaluation Center of the Diversity Program Consortium. *BMC Proceedings*, 11(S12). doi:10.1186/s12919-017-0087-4

Journal of Health Disparities Research and Practice Volume 12, STEP-UP Special Issue,
Summer 2019

<http://digitalscholarship.unlv.edu/jhdrp/>

Follow on Facebook: Health.Disparities.Journal

Follow on Twitter: @jhdrp

19 Training Underrepresented High School Students as a Strategy to Increase Diversity in the Biomedical Research and Health Professions Workforce

Caffey-Fleming, Guerrero, and Norris

- Mervis, J. (2013). Transformation Is Possible if a University Really Cares. *Science*, 340(6130), 292-296. doi:10.1126/science.340.6130.292
- National Institutes of Health [NIH]. (2012). *Draft report of the Advisory Committee to the Director Working Group on Diversity in the Biomedical Research Workforce* (Rep.). Bethesda, MD: National Institutes of Health.
- Nolte, E., & Mckee, C. M. (2012). In Amenable Mortality—Deaths Avoidable Through Health Care—Progress In The US Lags That Of Three European Countries. *Health Affairs*, 31(9), 2114-2122. doi:10.1377/hlthaff.2011.0851
- Satcher, D. (2009). Embracing Culture, Enhancing Diversity, and Strengthening Research. *American Journal of Public Health*, 99(S1). doi:10.2105/ajph.2009.159749
- Schroeder, S. A. (2007). We can do better--improving the health of the American people. *The New England Journal of Medicine*, 357, 1221-1228. doi:10.1056/NEJMsa073350
- Sullivan, L. W. (2005). Missing Persons: Minorities in the Health Professions, A Report of the Sullivan Commission on Diversity in the Healthcare Workforce. *The Sullivan Commission*, 1-208. Retrieved from <http://health-equity.lib.umd.edu/id/eprint/40>
- Valantine, H., & Serrano, E. (2017). *Working Group on Diversity in the Biomedical Research Workforce*(Report on the Progress of Activities). Bethesda, MD: National Institutes of Health.