

The Future of Public Health: How the COVID-19 Pandemic Affected a Public Health Educational Pipeline

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Background

The Summer Research Internship Program and Research Experiences for Undergraduates (REU) Program at the Louisiana State University Health Sciences Center in New Orleans (LSUHSC-N.O.) provide research experiences for medical students, undergraduates, and high school students. The programs cultivate students' interest in pursuing research or practice careers in the biological and health sciences.

Figure 1: Summer Research Internship Program and Research Experiences for Undergraduate (REU) Program aims



Effects of the COVID-19 pandemic:

- Increased knowledge and appreciation for the field of public health among the general public
- Decreased in-person internship opportunities worldwide
 - Many training programs were temporarily canceled.
- LSUHSC continued their funded internship program during the height of the pandemic using a virtual format (Sims et. Al, 2022; Erickson et. Al., 2022).
 - Projects were conducted remotely under the supervision of LSUHSC faculty mentors and their staff.
 - High school, undergraduates and medical students accepted in SRI and REU programs engaged in data-based research (e.g., bioinformatics, biostatistics, epidemiology) and virtual seminars and workshops.

Hypothesis: The pandemic changed participants' interest in public health research and pursuing public health careers.

Specific aims: 1) Determine if pandemic-related public health awareness increases the number of interns conducting research with LSUHSC School of Public Health (LSUHSC-SPH) mentors. 2) Assess the participants' post-internship knowledge during the pandemic compared to pre-pandemic, and career interest in public health.

Methods

Pre- and Post-Internship Questionnaires

Interns completed anonymous Pre-internship questionnaires with qualitative and quantitative questions that produced formative and summative (impact/outcome) metrics. Years 2014 (when NSF funding began and thus a larger sample size) to 2022 were evaluated.

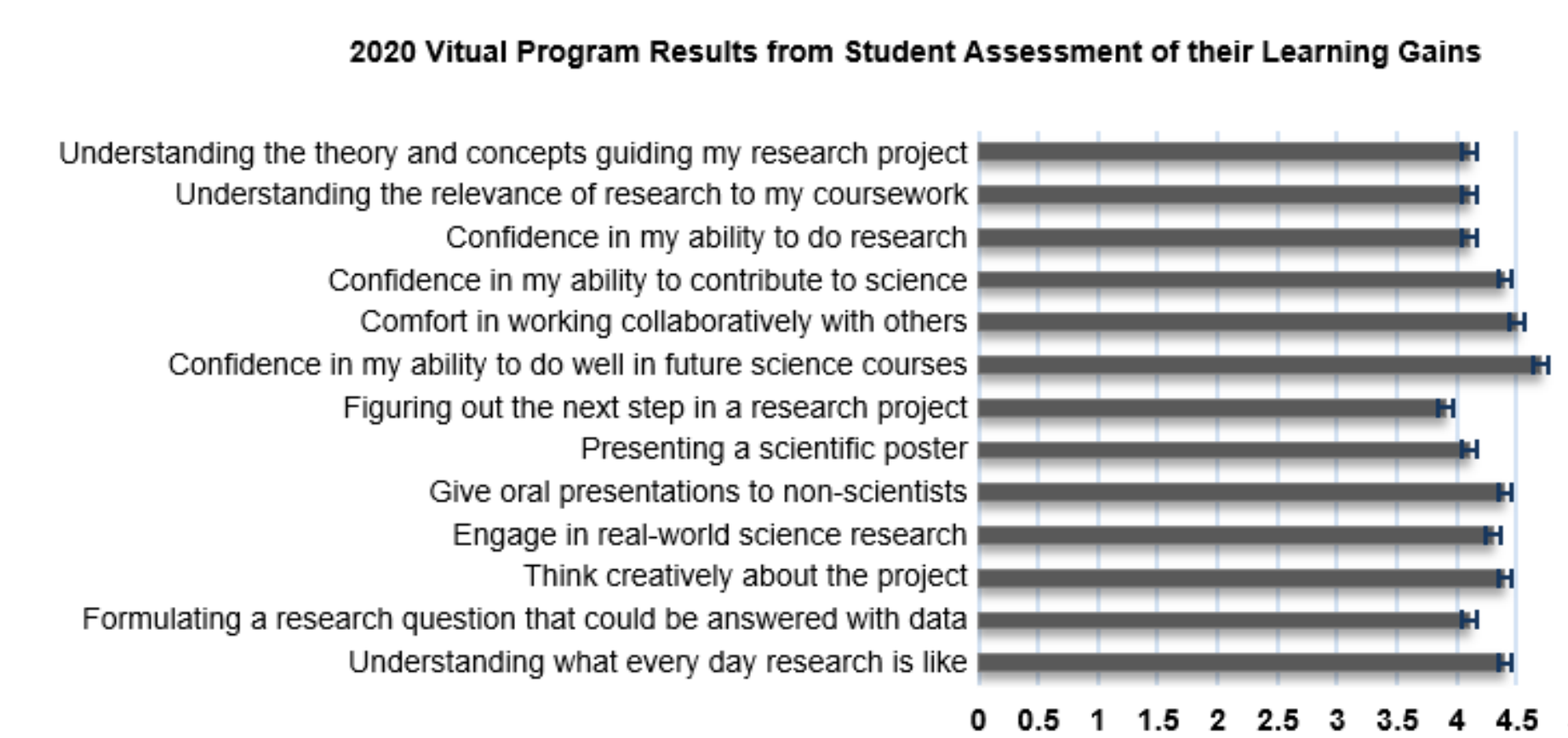
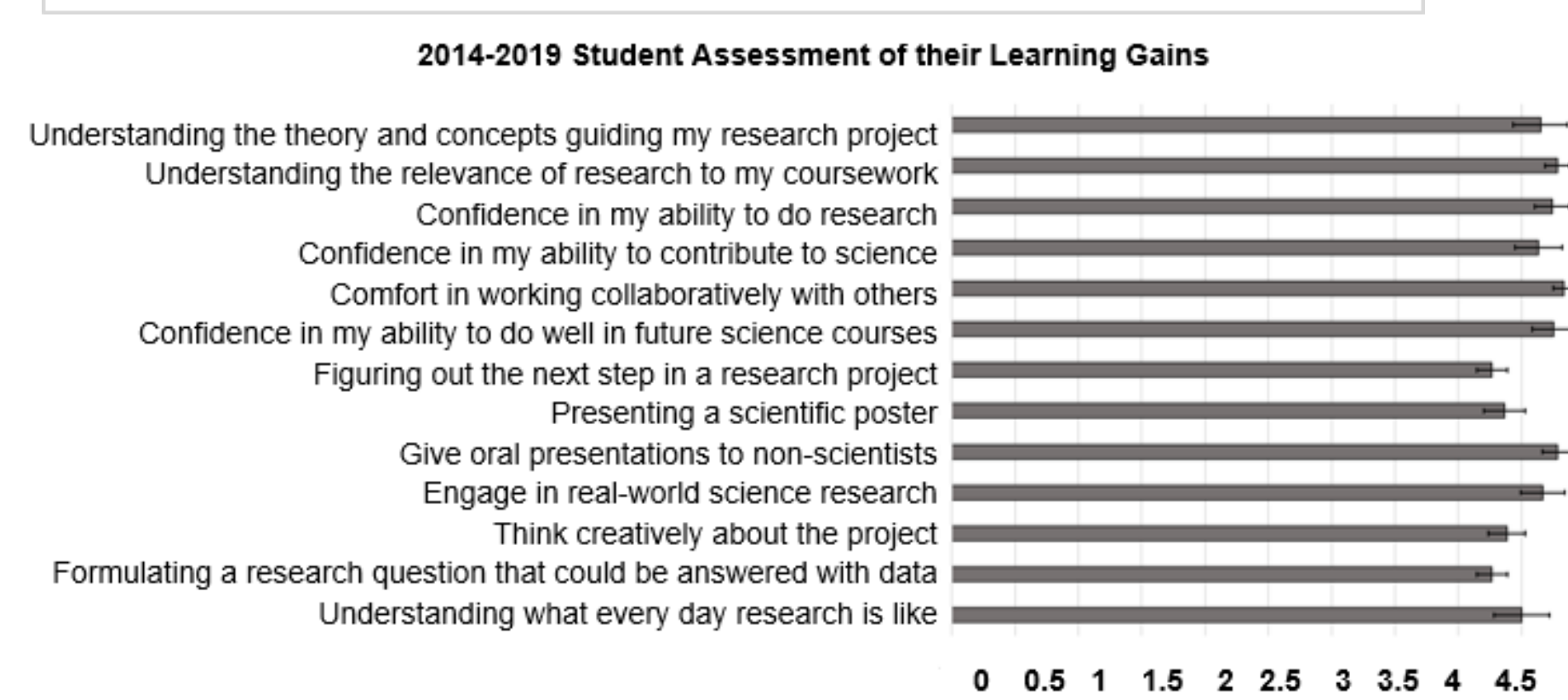
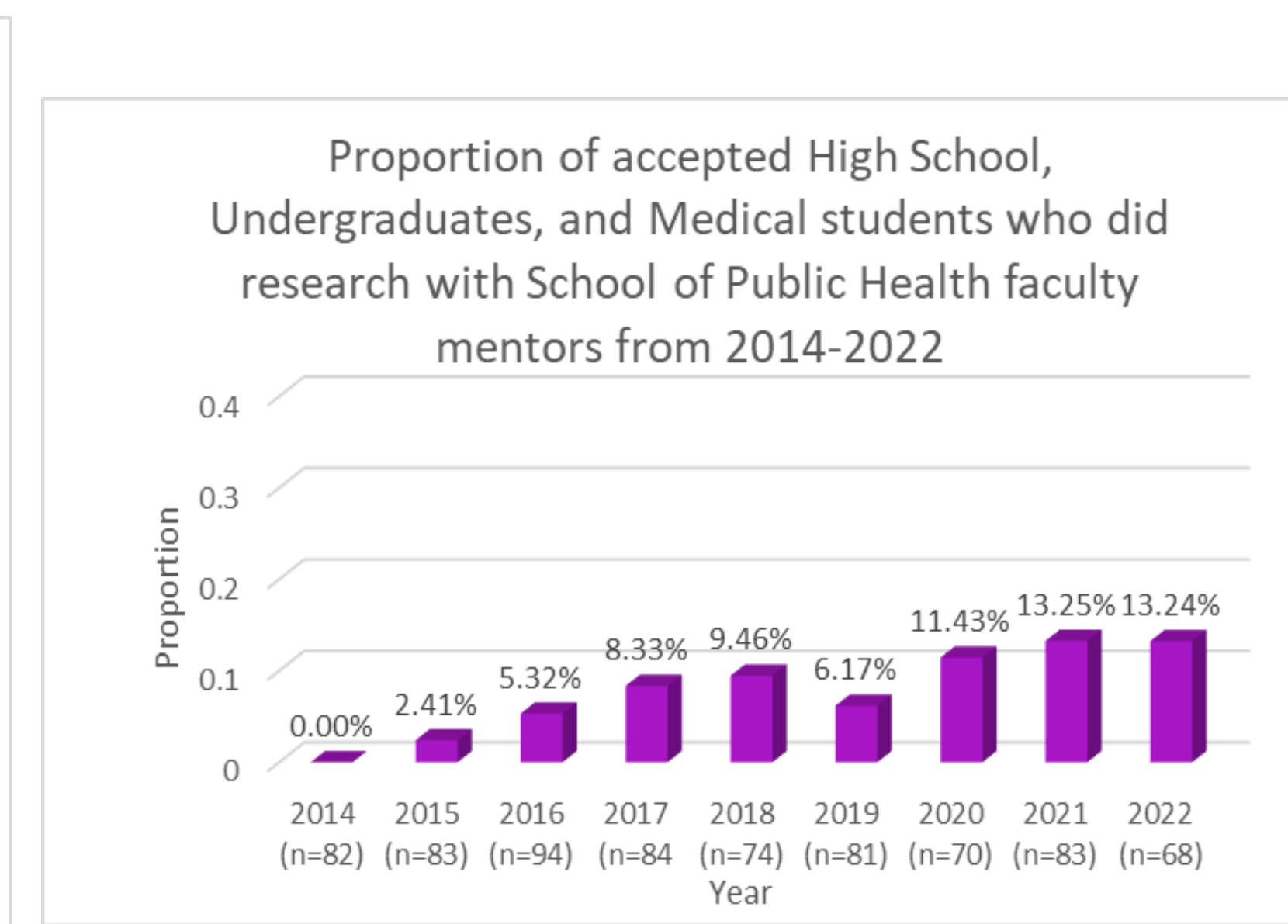
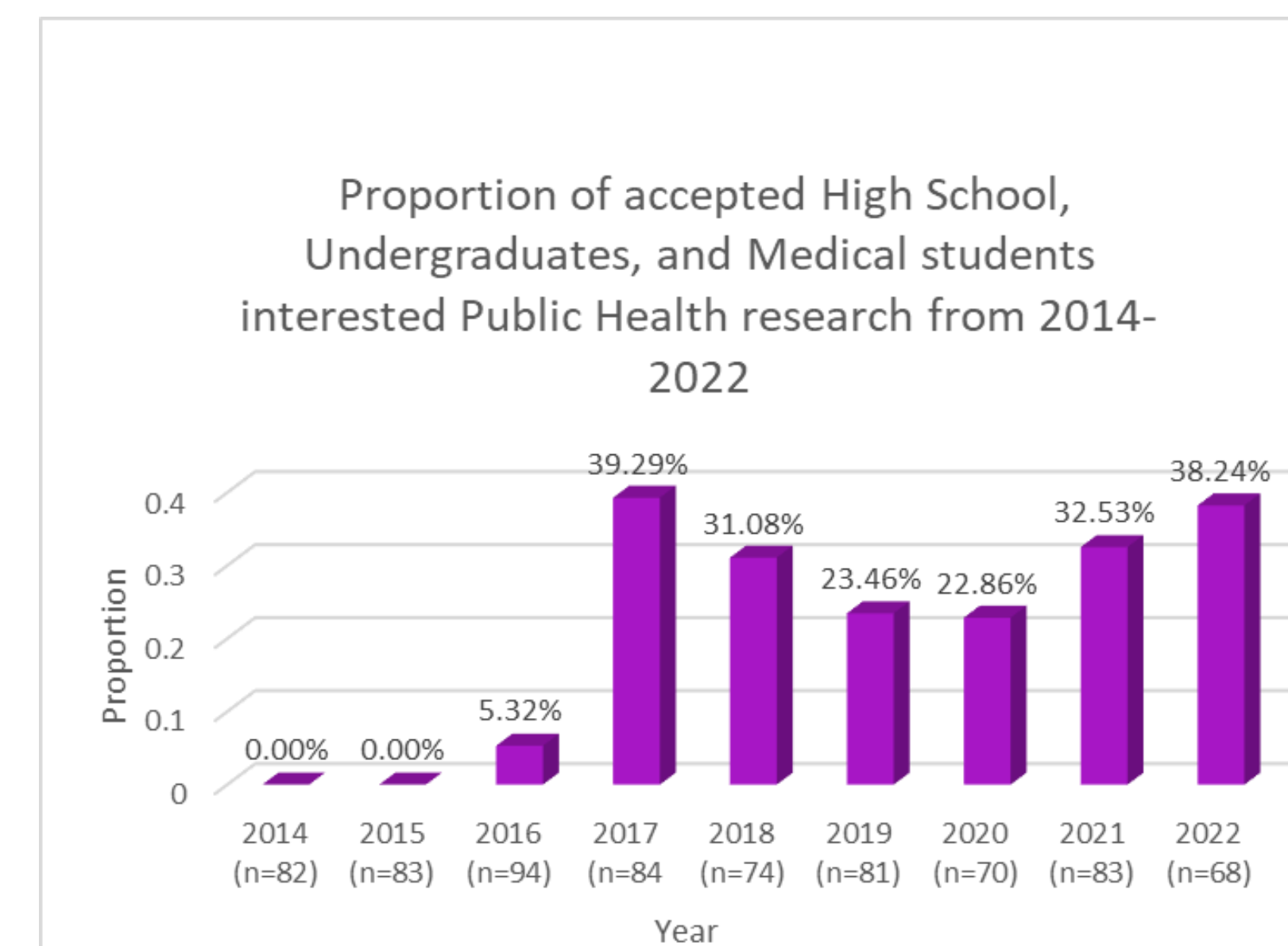
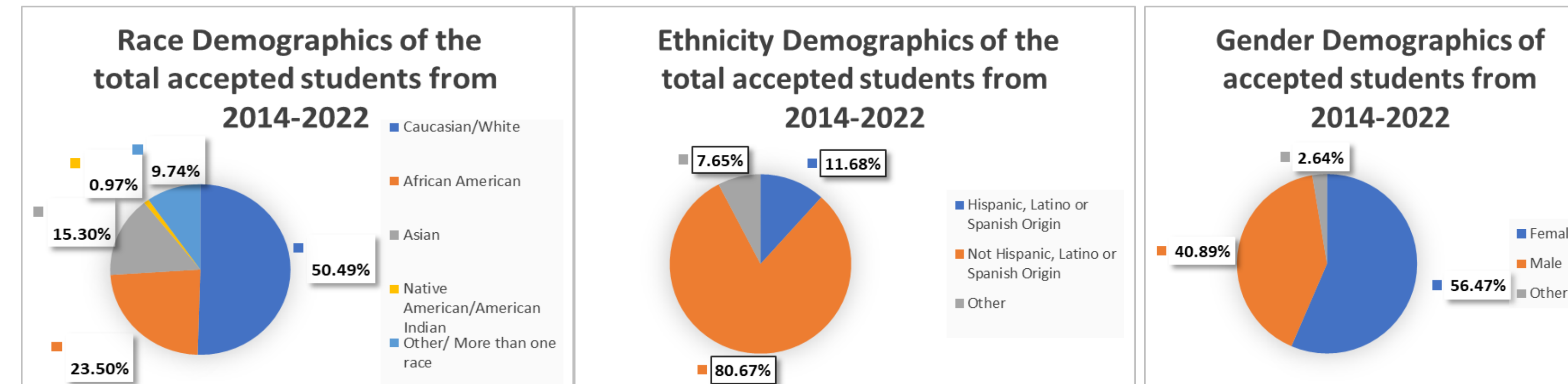
The Pre-Internship questionnaire included demographics, current academic and research interests, and expected academic and professional trajectories. Eight weeks after program end, trainees completed the Post-Internship questionnaire, which included the same measures. A description of the assessments is below:

- Goal Attainment Scale.** Measured trainees' career goals related to pursuing a career in healthcare research.
- Research Appraisal Inventory (RAI) and The Student Assessment of Learning Gains (SALG).** Assessed trainees' self-confidence in conceptualizing, designing, and analyzing a research study. This tool used a Likert scale from 0 to 5 with 0=No Confidence and 5=Total Confidence (or SALG, 0 to 6) to measure students' self-confidence in their ability to conduct research. The RAI has been tested for internal reliability and validity in various studies and has strong psychometric properties. The SALG is required by the NSF.

Participants

- Informed consent was obtained from all participants in this study. All instruments and procedures were approved by the LSUHSC IRB #4188.

Results



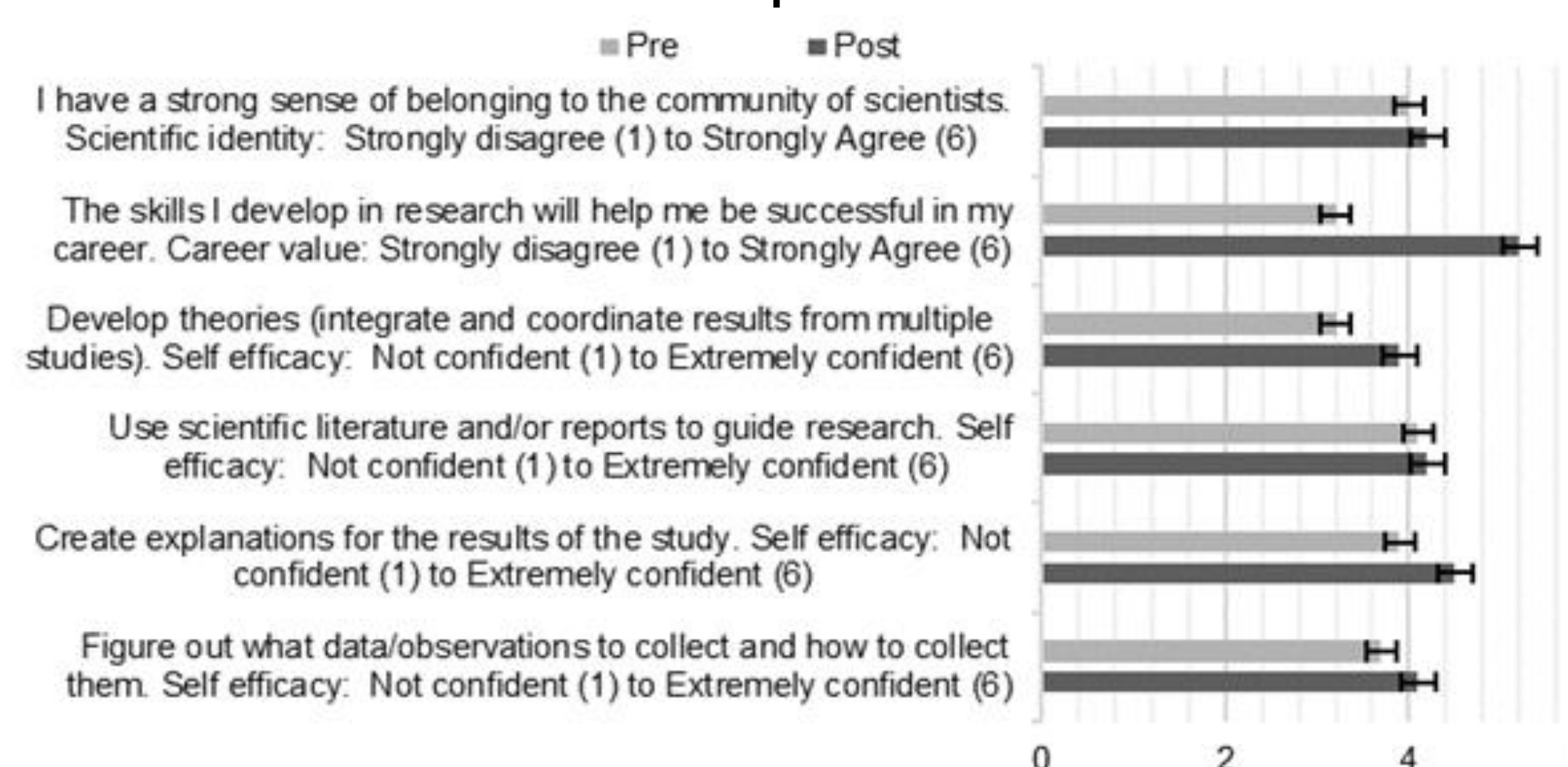
Sample results from 2014 to 2019 are summarized. Upon completion of the program, participants gained:

- familiarity with research work
- confidence in carrying out research tasks
- formulating a hypothesis
- communicating to scientists and non-scientists.

2014-2019 results were separated from 2020 to compare the effectiveness of the Virtual Program in providing a meaningful research experience.

Although not as comprehensive as on-campus research, the 2020 Virtual Summer Program demonstrated that students were nevertheless able to conduct hypothesis-based research and gain confidence in analyzing data, understanding their project, and presenting their data at the virtual scientific poster session.

2020 Pre and post evaluations



Examples of Public Health Research Projects		
Student Academic Level	Project Title	Mentor's LSUHSC- School of Public Health Program
High School	"Health Behavior Differences between African-American and White Breast Cancer Survivors"	Behavioral & Community Health Sciences
High School	"Smoking and Mental Health: Associations between Adolescent E-cigarette Use and Feelings and Behaviors toward Suicide"	Behavioral & Community Health Sciences
Undergraduate	"Addressing the Complexity of Orphan Drug Pricing"	Health Policy & Systems Management
Undergraduate	"Potential Health Impacts of New Orleans Drinking Water Lead Levels and Effectiveness of Prevailing Interventions"	Environmental & Occupational Health Sciences
Medical School	"Predictors of Post-Operative Complication following Total Hip and Knee Arthroplasty"	Biostatistics
Medical School	"Association of Alcohol Use on Prevalence of Ophthalmic Diseases"	Epidemiology

Qualitative data collected from the Post-internship Questionnaire reflect the positive impact the programs had on the career trajectory of trainees.

"I really enjoy making positive change in the field of health disparities. This summer confirmed my passion for this."

"I would like to possibly look into the future of pursuing and MD/MPH thanks to this program because I enjoyed the work experience as a whole."

"I really enjoyed my experience... My mentor was very helpful and has ignited a passion for tobacco prevention research."

Conclusions

Preliminary data demonstrate that the COVID-19 pandemic increased participants' interest in public health research and pursuing public health careers.

Specific aim 1:

- The interns' interest in conducting public health-related research increased from 0% in 2014 to 38.24% in 2022.
- The percent of students who successfully conducted research with LSUHSC-SPH faculty members increased from 0% in 2014 to 13.24% in 2022.
- The SRI and REU programs' partnership with the School of Public Health is reflected by the increased interest and mentorships in 2017, followed by a decrease in 2019.
- From 2020 to 2022, a surge in public health interest and projects with LSUHSC-SPH mentors was observed.

Specific aim 2:

- Despite the remote nature of the 2020 Virtual Program, the students reported above-average confidence in all training components.
- The diversity of the participants demonstrates the increased career interests across a variety of populations in the biomedical fields, especially public health.
- Results indicate an increase in trainees' confidence and excitement to pursue a career in biomedical sciences and public health.
- Results further demonstrate the potential for research training programs to impact diverse trainees' career trajectory by creating unique and immersive research experiences.

Future directions:

- Additional students conducted public health-related research (e.g., health disparities, epidemiology, health policy, biostatistics) with faculty members from the Schools of Medicine and Graduate Studies, which were not included in the present study. Further investigation on the nature of the additional projects is warranted.
- Statistical analysis will be performed to determine the impact this program has on the field of public health on the participants.
- Tracking of alumni will determine the long term impact of this program on the participants' career trajectories.

References

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- Erickson OA, Cole RB, Isaacs JM, Alvarez-Clare S, Arnold J, Augustus-Wallace A, Ayoob JC, Berkowitz A, ..., Tsien F, Dolan EL. "How Do We Do This at a Distance?!" A Descriptive Study of Remote Undergraduate Research Programs during COVID-19. *CBE Life Sci Educ.* 2022 Mar;21(1):ar1. doi: 10.1187/cbe.21-05-0125. PMID: 34978923; PMCID: PMC9250374.