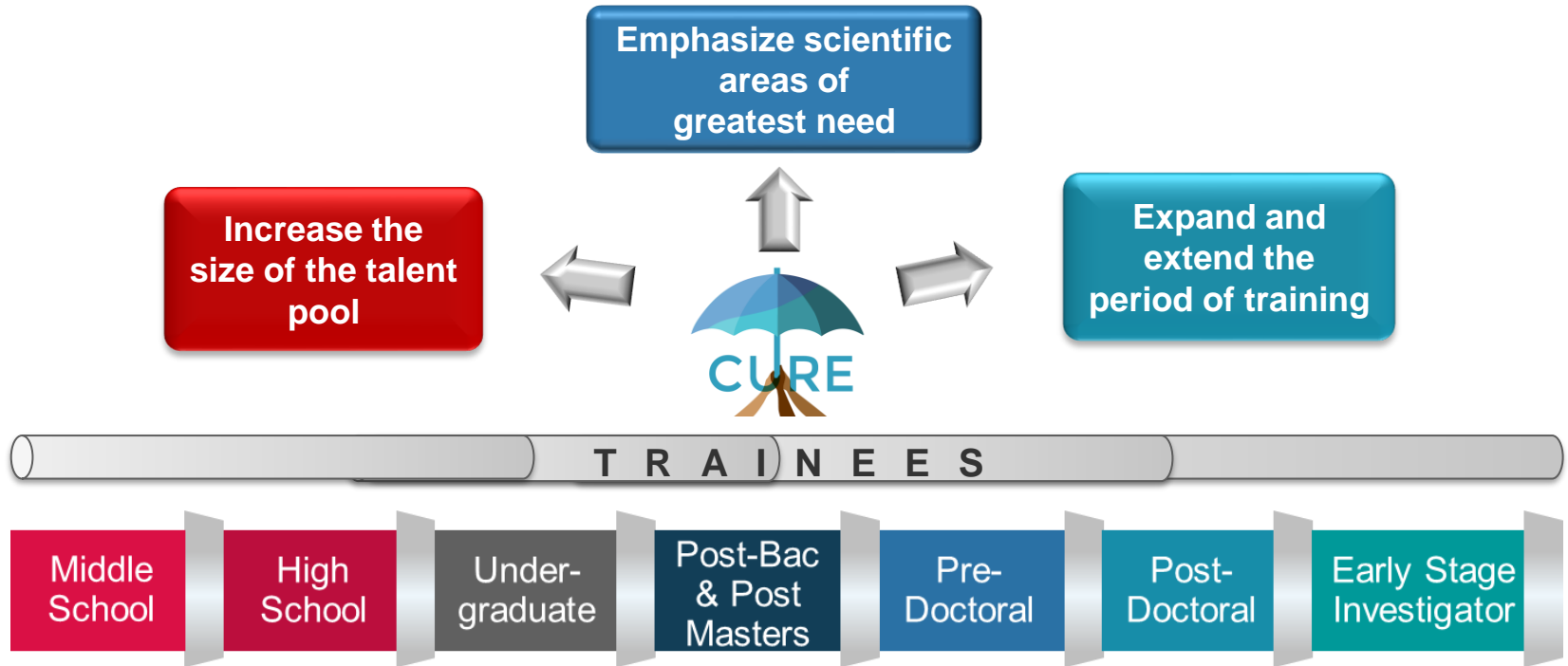


NCI Youth Enjoy Science (YES) Research Education Program (R25) Re-issuance of RFA-CA-21-020

*Belem G López, PhD & Sangeeta Ghosh, PhD
NCI Center to Reduce Cancer Health Disparities*

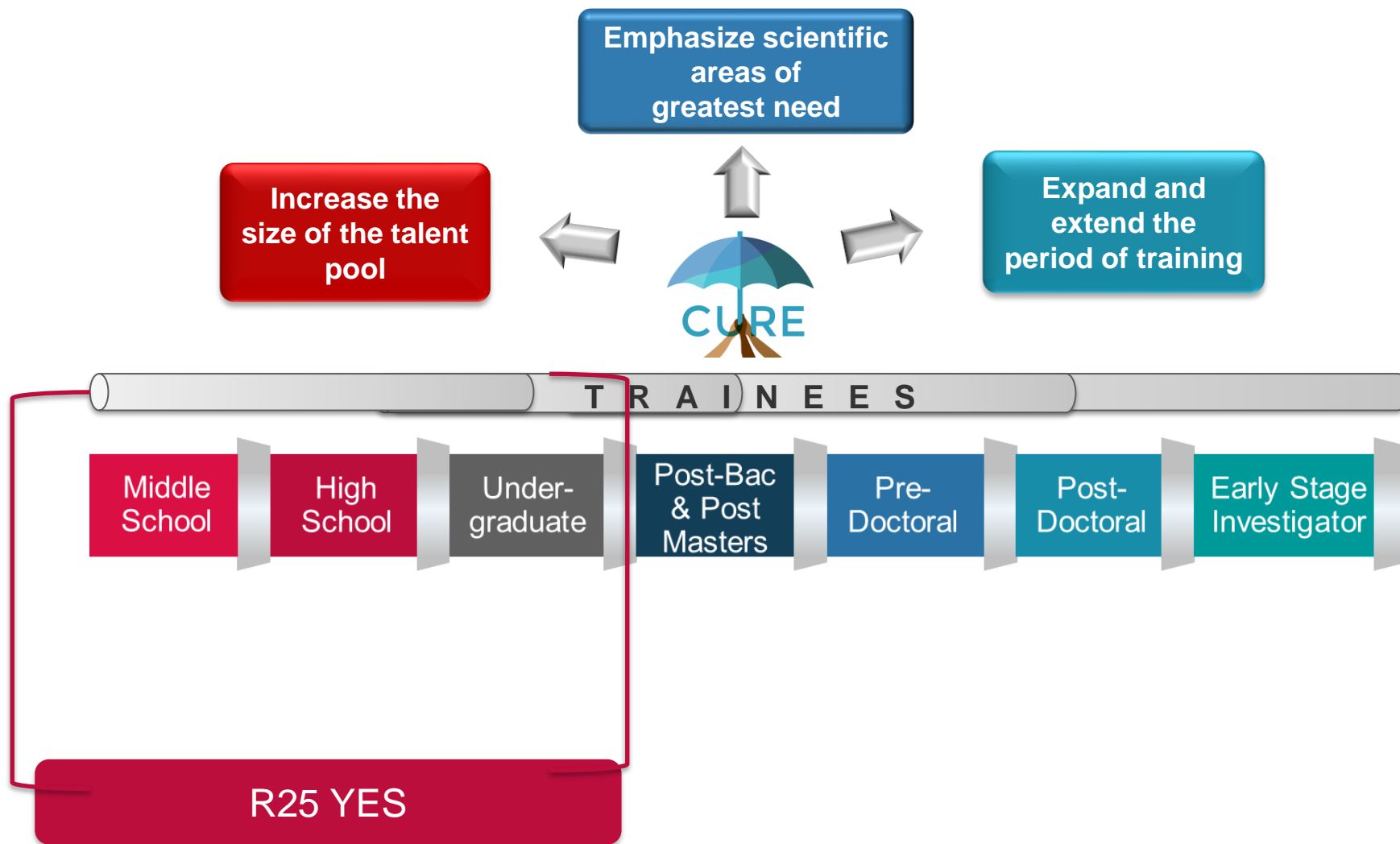


Continuing Umbrella of Research Experiences (CURE)





Continuing Umbrella of Research Experiences (CURE)





R25 YES Purpose & Objectives



YES promotes effective **early intervention strategies** to engage students from **diverse** backgrounds and their teachers in cancer research

Research
Experience



Curriculum &
Methods



Outreach



Inspire interest in biomedical sciences and cancer research, **help envision** cancer research as a **career path**, **strengthen** practical research and **career skills**

[Notice of NIH's Interest in Diversity \(NOT-OD-20-031\)](#)



Research Experience

- **Individual, mentored research experience for high school students and more senior students**
- **Strong mentoring support**
- Not limited to the bench, but **includes all aspects of the cancer research** enterprise, such as basic, behavioral/population, clinical and translational
- Research may take the form of bench research, bioinformatics or computational research, community-based research, behavioral intervention research and others



Curriculum & Methods

- Education tools for students
- Teacher/faculty participants develop activities to bring back to classroom
- **Cancer focus: all education should be tied to cancer relevance**





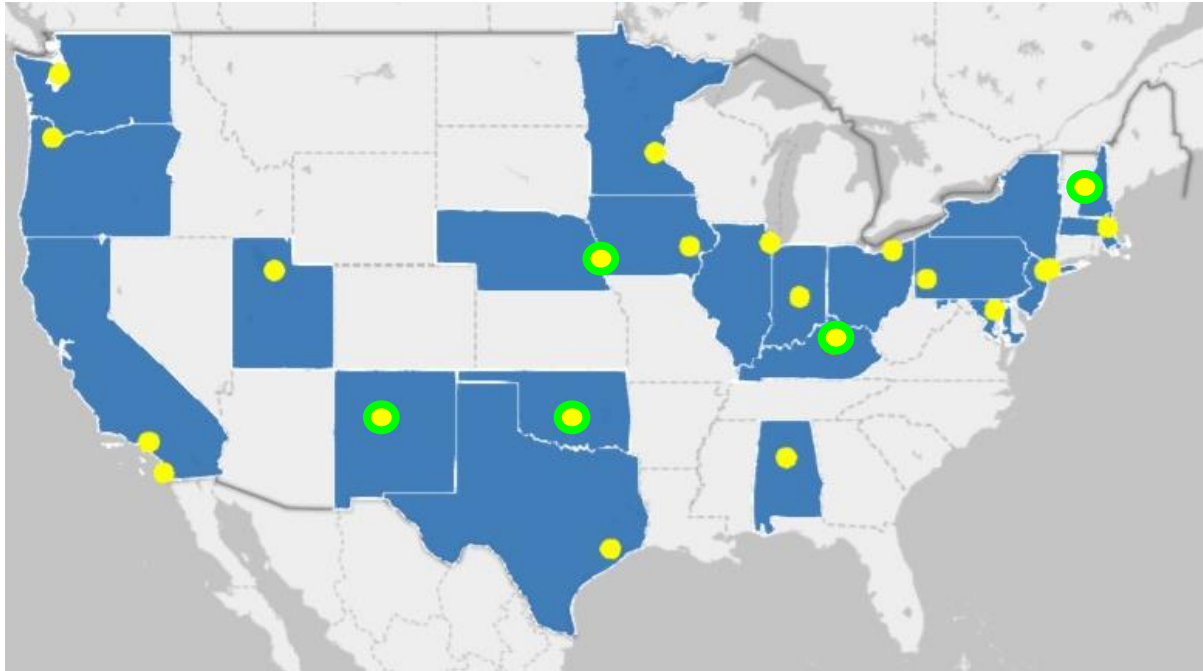
Outreach

- **To students:**
 - Introduce middle school students to cancer research in organized and systematic fashion
 - Increase awareness of the YES and facilitate recruitment
 - Enhance understanding of significance of Research Experiences
 - Strengthen career skills

- **By students:**
 - Education and dissemination of cancer-related information to family and community
 - **Meaningfully engage families, teachers, and communities**



Success Rate of the R25 YES (FY2017-2023)



- States with R25 YES
- R25 YES Zipcode
- R25 YES in IDeA States



212 applications



27 awards

Fiscal Year	Submission	Award	Type 1 Success Rate	Type 2 Success Rate	Overall Success Rate (%)*	Impact Scores
2022	32	5	11%	50%	16%	10-13
2023	35	6	13%	50%	17%	10-13, 18
2024	32	*	*	*	*	*
*pending decision						



Program Assessment of R25 YES RFA (2018-2023)

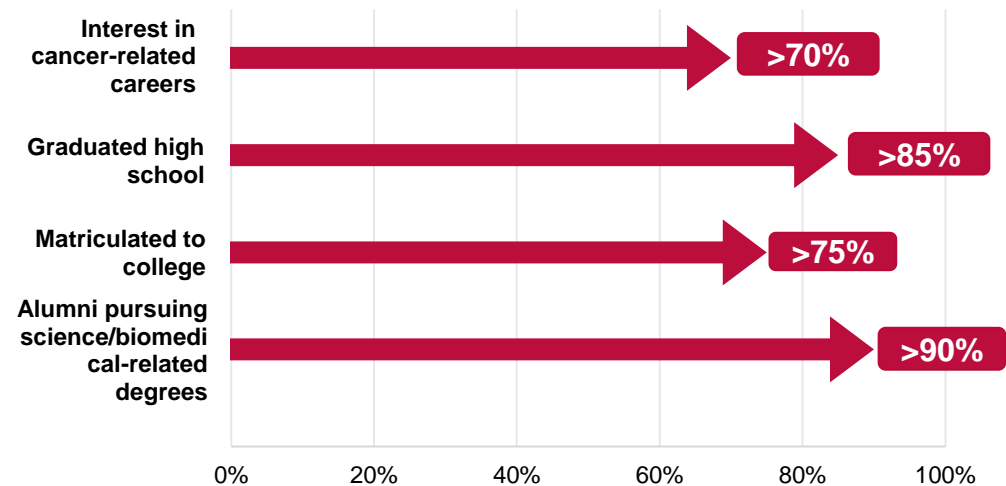
- ***Goal 1: Create & maintain programs to engage grades 6-12 &/or undergrads from URM in cancer research experiences***
- ***Goal 2: Develop cancer educational tools for students & developed novel instructional approaches to improve science teaching***
- ***Goal 3: Enhance science/health education, dissemination of biomedical, behavioral, & clinical research and expose students to various aspects of cancer research***

Program Assessment of R25 YES RFA (2018-2023)

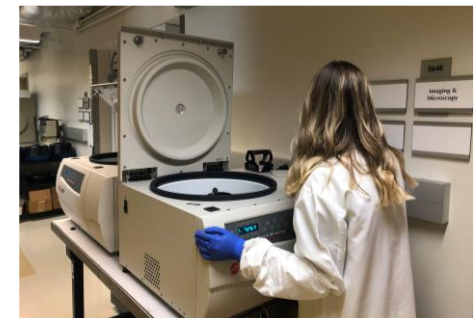
- **Goal 1: Create & maintain programs to engage grades 6-12 &/or undergrads from URM in cancer research experiences**

- **2,584 total students trained** (middle school, high school, undergraduate students)
- **Alumni pursuing science/ biomedical-related degrees:**
 - ✓ are in medical school and some have graduated and started medical residency programs
 - ✓ are in pharmacy school
 - ✓ are cancer biology doctoral programs
 - ✓ are in physician assistant (PA) programs and some finished PA school

Academic Outcomes Across R25 Programs*

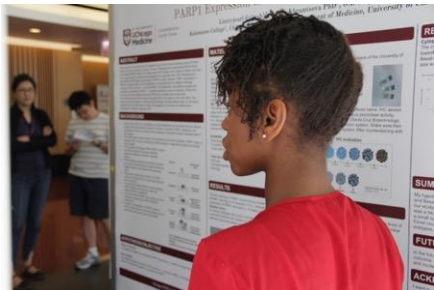


*Based on the grants that have completed a full 5year funding cycle



Program Assessment of R25 YES RFA (2018-2023)

- **Goal 2: Develop cancer educational tools for students & developed novel instructional approaches to improve science teaching**
 - Cancer Biology undergraduate major
 - Courses on oncogenes, tumor suppressors, hallmarks for cancer, and cancer health disparities.
 - Cancer Discord social media virtual learning environment
 - Cancer curriculum provided experiential training in Social Determinants of Health and multiple levels of cancer causation, cancer health equity, clinical research and the importance of conducting community-relevant work
 - Teacher trainees developed curriculum on stomach cancer and inherited cancer
 - Teachers received research experience in wet labs
 - Several PIs published a special issue in STEM Outreach



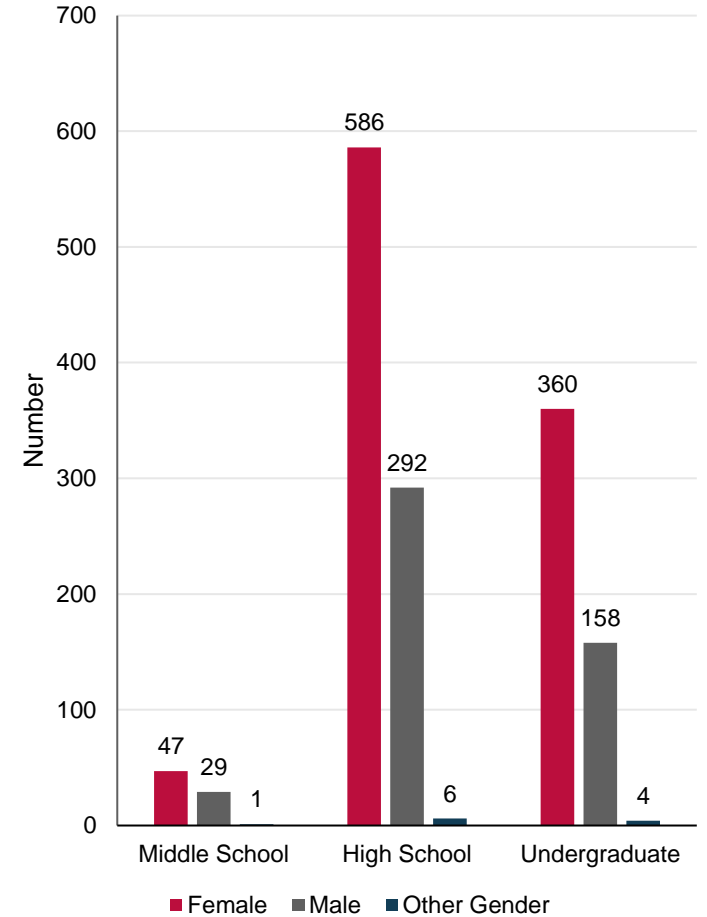
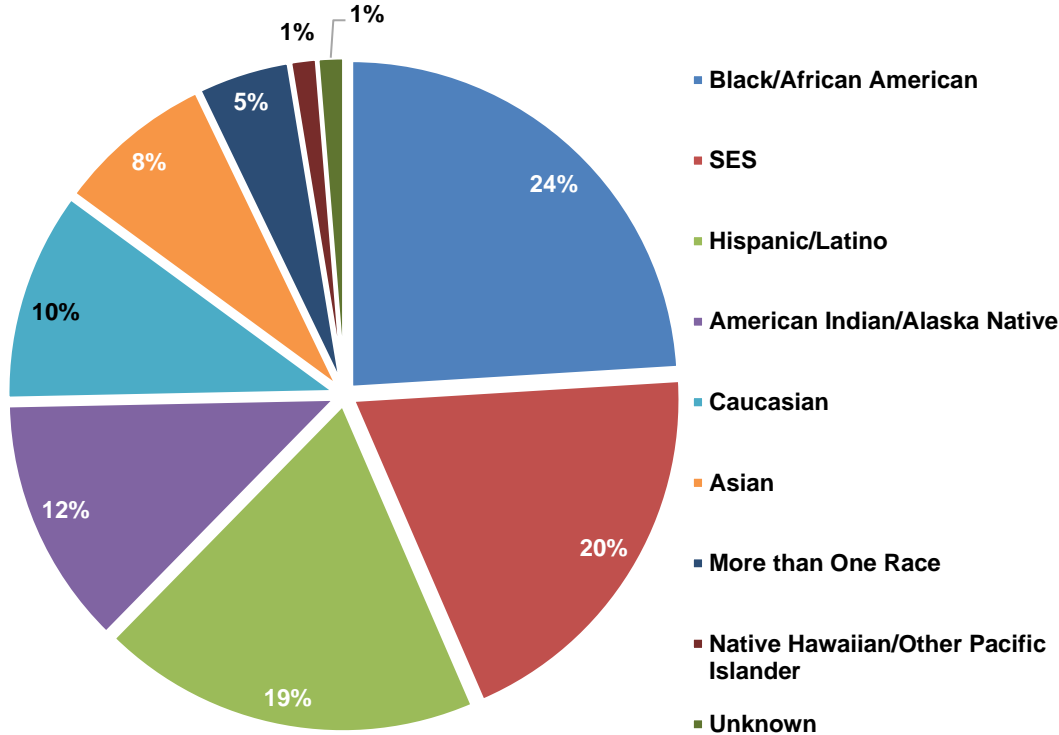
Program Assessment of R25 YES RFA (2018-2023)

- **Goal 3: Enhance science/health education, dissemination of biomedical, behavioral, & clinical research and expose students to various aspects of cancer research**
 - Developed Talking Circle sessions in the Cancer Primer Course that keep parents informed with regular updates
 - Use of Arnstein's ladder to empower communities to take agency in program organization and operations to promote durable change and support the success of scholars
 - Outreach to both elementary and middle school trainees and families about cancer concepts
 - Significant increase in knowledge of cancer research skills and critical thinking skills
 - Significant increase in knowledge of cancer risk factors and disparities





Assessment: A Look at the YES Program FY 2018-2023



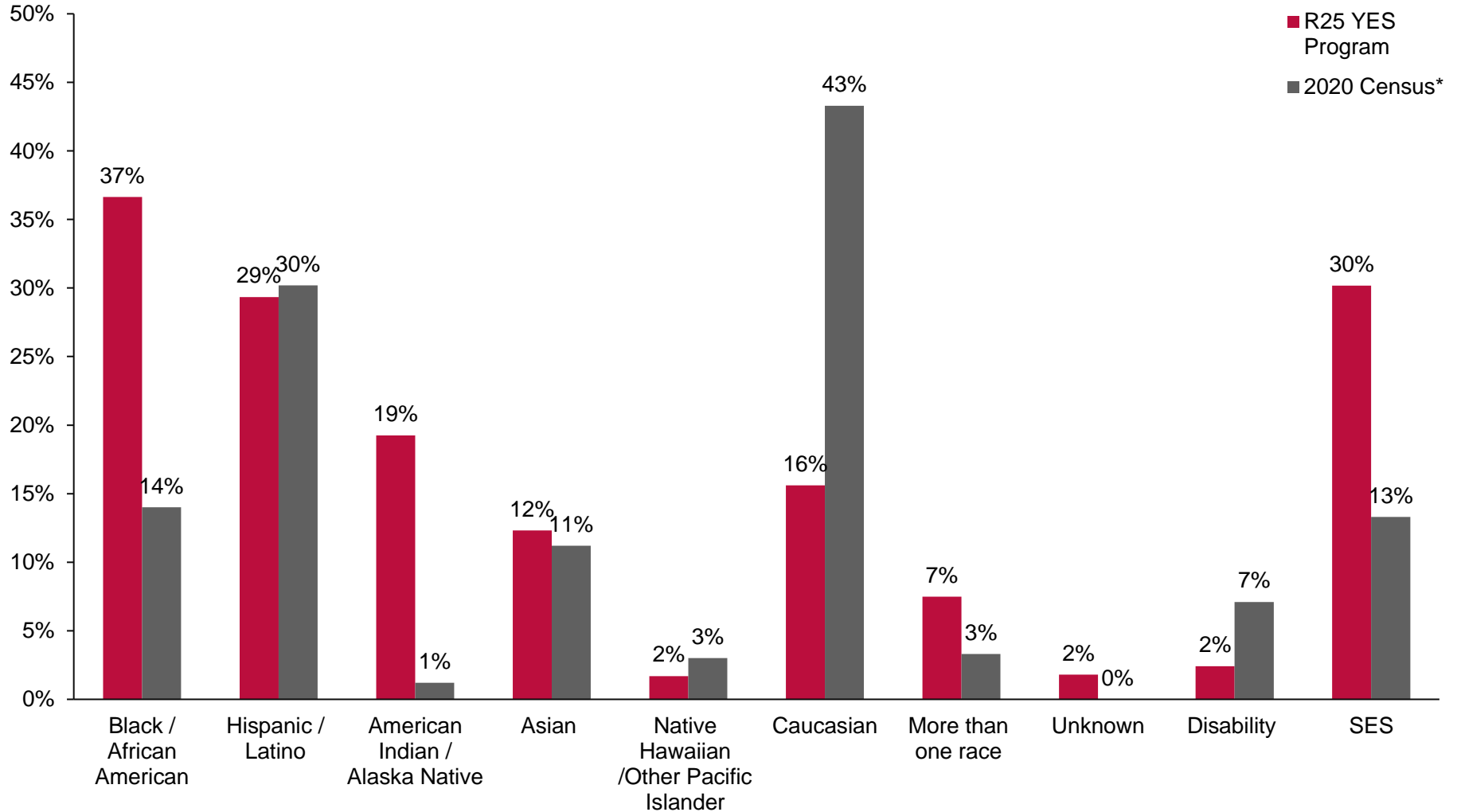
Middle School Teachers	High School Teachers	Undergraduate Faculty
8	72	34

Highly Selective: minimum of 4% Admission Rate








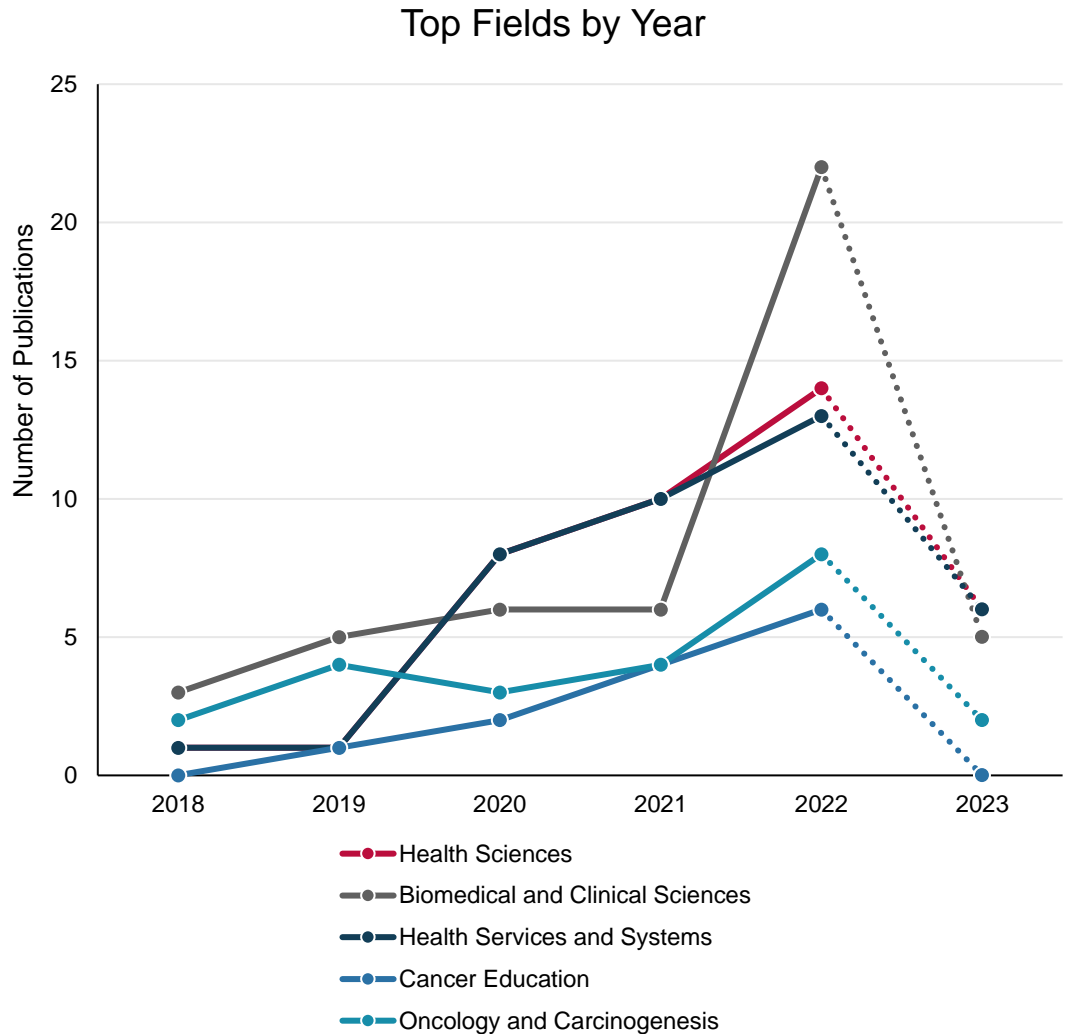
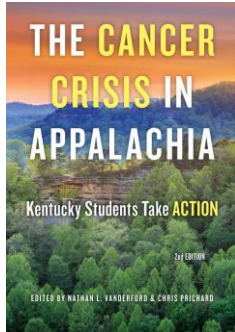
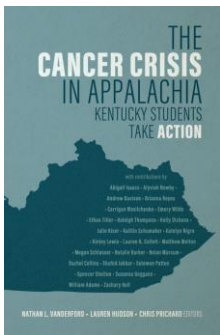
Assessment: A Look at the YES Program FY 2018-2023

Trainee Diversity



⚡ R25 YES Scientific Impact

-  88 publications
-  1 special journal issue
-  2 edited volumes on cancer crisis
-  7 podcasts on cancer
-  3 TV features





National Attention



UChicago YES students on CAN TV



UMD-Baltimore trainees featured in PBS documentary



Dr. Jill Biden and Queen Letizia of Spain visit YES program at Columbia University



Dr. Anthony Fauci chats with R25 YES trainees at Fred Hutch



R25 YES Reissuance Justification

- The R25 YES aims to enhance the pool of individuals from underrepresented backgrounds interested in pursuing a career in biomedical and cancer research via early intervention strategies.
 - **Engage** grades 6-12 or undergraduate students from underrepresented populations and teachers and undergraduate faculty members in cutting edge cancer research experiences
 - **Increase** the number of YES applications and awards from across the nation, especially from states that receive less funding from NIH





NCI has allowed R25 YES to be successful

- Geographical reach across the United States, which embraces cultural variation
- Provides cancer research training resources to URM MS and HS students
- Providing innovative programming in community outreach to bring cancer awareness and to reduce cancer health disparities
- Exemplary support of Native American trainees and PI
- Students reaching key academic milestones (HS graduation; College & graduate school acceptance)



Community Outreach & Engagement



Indigenous Research (IResearch) MS & HS Club

\$ Budget for R25 YES RFA

- Request multi-year RFA (3 years)
 - ~40 applications per year
 - Up to twelve (12) awards (Type 1 and Type 2) total (4 awards per year).
 - Each award ≤\$400K direct costs (\$432K in Total Cost) per year up to 5 years
- **Estimated Cost for Total Project Period (FY 2025 – FY 2031): up to \$25,920,000** total costs

	FY2025	FY2026	FY2027	FY2028	FY2029	FY2030	FY2031
# of Awards (Type 1 & Type 2)	4	4	4				
# of Type 5 Awards		4	8	12	12	8	4
Budget (Total Cost)	\$1,728,000	\$3,456,000	\$5,184,000	\$5,184,000	\$5,184,000	\$3,456,000	\$1,728,000
Estimated Cost for Total Project Period	\$25,920,000						



Influence of the R25 YES Program

“provides a great resource and perspective of **how to effectively build a meaningful pipeline that converges cancer education outreach and fruitful science opportunities** for the underrepresented community”

-Professor at Presbyterian College in South Carolina who follows R25 YES publications



“I learned that I have a **passion for science**. I know a lot of **people who look like me are one the least represented.**”

-R25 YES trainee at the Fred Hutch Cancer Center



“I am reminded of the **profound impact the UPMC Hillman Cancer Center Academy** has had on my life”

-R25 YES trainee at the University of Pittsburgh





Influence of the R25 YES Program



“I think the **program is well set up**, in terms of **encouraging under-represented, especially Native-Americans** in that, it provides stipend. And what I realized is that that’s a **huge component for underrepresented minority who's not day-to-day exposed to science from early on.**”

-R25 YES **Native American mentor** at University of Nebraska Medical Center

“**Motivated by our YES grant**, our paper shows that the high rates of lung and colorectal cancer in Appalachian KY are associated with a higher percentage of the population that have not completed high school and that lack basic literacy. **The paper highlights the need to enhance educational attainment in Appalachian Kentucky as a means of improving the cancer outcomes in the area.** We are helping improve the education and health/cancer literacy of students and their families in Appalachian Kentucky **through YES.** Our hope is that not only will we motivate and prepare our students to pursue biomedical careers, but we will also have an impact on our students and their family’s cancer outcomes. **Thus, the importance of YES!**”

-R25 YES PI at University of Kentucky





Pre-BSA Reviewer Meeting

Minor Comments

If I am high school student- how will I apply for one of these

How are we making high schools and colleges aware of this- being in Nebraska (there is a program at University of Nebraska Omaha)- not sure many high schools know about it

Is there a reason, why there are so few male participants...the gender variations are so mixed- female over male

Clarification

Each program has a defined application and selection process.

Each program has a robust recruitment & engagement plans with select local high schools & colleges

This variation speaks to the lack of role models, lack of access, and lack of programs like YES. This also speaks to the continued risk URM males encounter in biomedical and cancer research education.



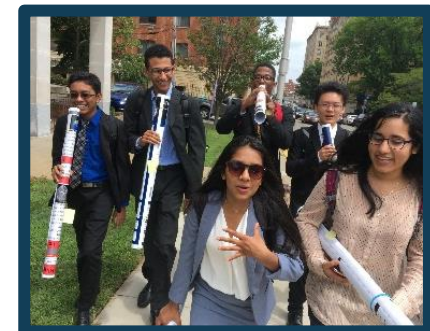
Pre-BSA Reviewer Meeting

Program Impact

- Precision education uses personalized curriculum to increase student engagement & educational attainment
- Enthusiastic about the high impact on the
 - Engaging community in cancer research
 - Increasing awareness of cancer risk factors
 - Reducing cancer health disparities

Health Behaviors

Enhance the pool of individuals from underrepresented backgrounds across the U.S. interested in pursuing a career in biomedical and cancer research via early intervention strategies.



Thank you!



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