

Engaging Interns and Fellows in Development of a STEM Program for High School Students

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Overview

The New Jersey Public Health and Environmental Laboratories (PHEL) has a five-tiered approach to Workforce Development. Outreach to students and post-graduates makes up three of the five tiers: the Internship program in collaboration with Rutgers University and The College of New Jersey, the fellowship program in collaboration with Association for Public Health Laboratories (APHL) and Centers for Disease Control and Prevention (CDC), and S.T.E.M. (Science Technology Engineering and Math) outreach to high school students.

COVID 19 has impacted all three efforts:

- Halting the internship program for one year
- Boosting fellowship efforts through partnership with APHL
- Halting outreach to younger students

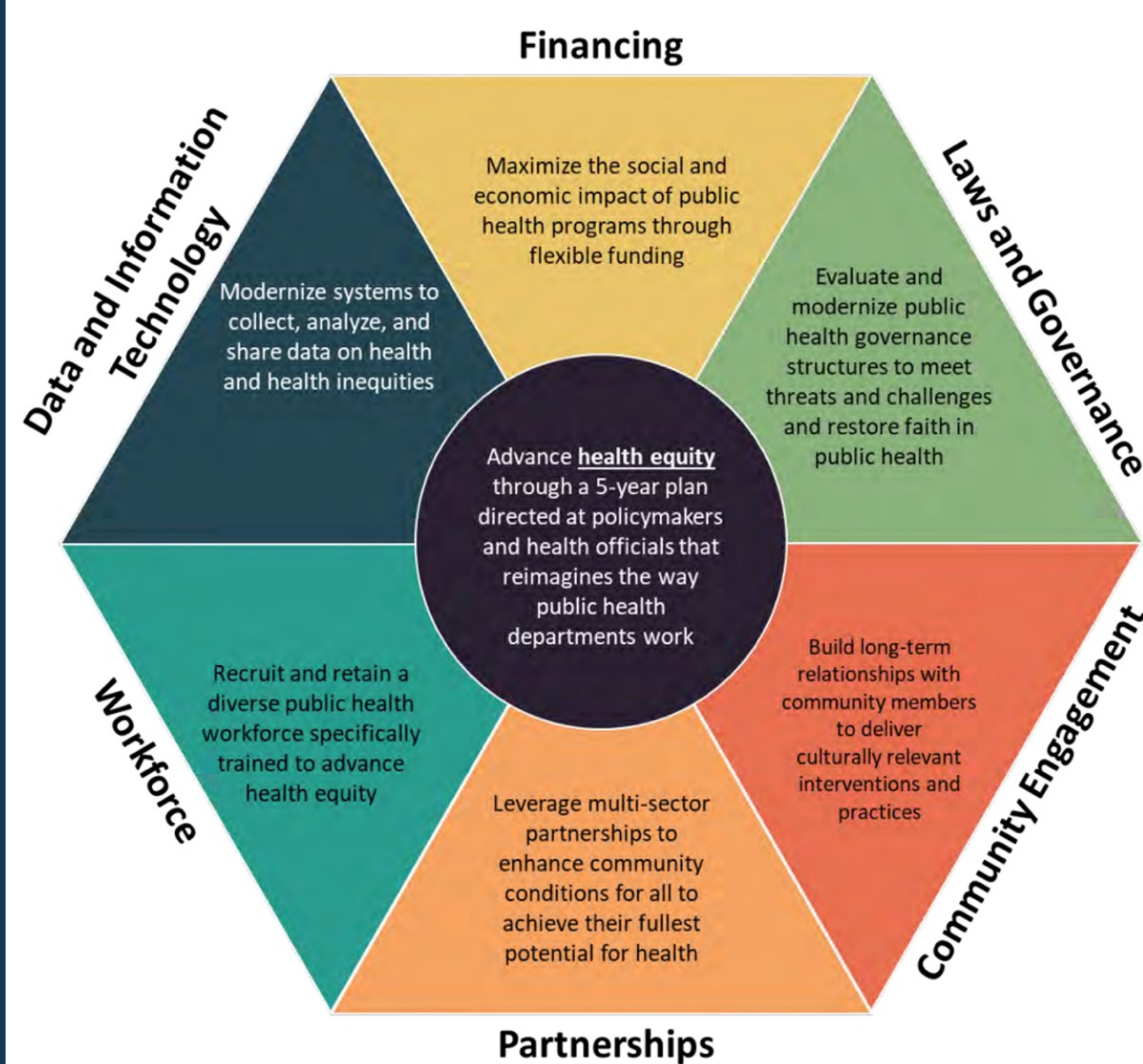
By the time COVID restrictions had been lifted:

- The internship program rebounded
- The fellowship program was thriving, through APHL partnership
- The need to revisit our S.T.E.M. outreach to younger students, with a structured approach was evident.

Interns were recruited to research STEM efforts in New Jersey and nationally and to initiate partnerships for an integrated approach. Partners within state government and local agencies were identified and joint efforts proposed. The concept of S.T.E.M. was defined and an integrated approach to S.T.E.M. activity development identified. The CDC Public Health Infrastructure grant NOA# 6 NE11OE000055-01-02 and the ELC Supplemental Enhancing grant NOA #6 NU50CK000525-01-04 are supporting these efforts.

Driving Forces

Public Health Forward: Workforce Recommendations



Action #1: Invest in the recruitment and retention of a **diverse and inclusive governmental public health workforce.**

Action #2: Improve hiring and promotion policies and processes to ensure high-quality public health services.

https://bipartisanpolicy.org/download/?file=/wp-content/uploads/2021/12/BPC_Public-Health-Forward_R01_WEB.pdf

New Jersey Data

Table 1: US and NJ 2020 Census Data

Self Identifies as	US	NJ	NJ/US
White, alone	61.6%	55.0%	0.89
Hispanic alone	18.7%	21.6%	1.15
Black, alone	12.4%	13.1%	1.05
Asian, alone	6.0%	10.0%	1.67
Total	98.7%	99.7%	

<https://www.njlm.org/384/2020-Census-Information>

Table 2: Sample NJ College Enrollment Data

College Enrollment	NJ Census	Bergen CCC	Rutgers University	Princeton University
White, alone	55.0%	33%	32%	38%
Hispanic alone	21.6%	37%	17%	10%
Black, alone	13.1%	7%	9%	8%
Asian, alone	10.0%	10%	27%	23%
Total	99.7%	87%	85%	79%

<https://www.njspotlightnews.org/2023/07/how-diverse-are-nj-colleges-universities/>

Potential Partners??

S.T.E.M. Programs Intern Researched

- The College of New Jersey
- New Jersey Institute of Technology
- Stevens Institute of Technology
- Rowan University
- Rutgers, New Brunswick campus
- Princeton University
- New Jersey City University
- Montclair University
- **Rutgers Medical School S.M.A.R.T. Program***
- <https://njms.rutgers.edu/smart/>

Other Partners Intern Researched:

- APHL – program materials
- CDC – program materials
- TRIO - USDOE funded Upward Bound programs
- Boys and Girls Club
- Prior to COVID, PHEL partnered successfully with the Rutgers S.M.A.R.T. program, however travel time from Newark to Trenton for students was a hardship



DISCIPLINE
SCIENCE
TECHNOLOGY
ENGINEERING
MATHEMATICS

Selected Partners

Selected Partners :

Mercer County STEM Council

- Are connected to the underserved students
- Share STEM goals with PHEL
- Invite PHEL to participate on Council
- Provide logistics and administrative support for PHEL onsite events
- Value the PHEL contribution to their individual STEM programs
- Programs serve students in the county

• **Mercer County STEM Council:** Boys and Girls Club of Mercer County, Mercer County Community College, MillHill of Trenton, Rutgers University, TCNJ and industry partners

• **NJ Upward Bound TRIO Programs:** Passaic County Community College, Rutgers University – New Brunswick, Rutgers University – Newark, Kean University, Mercer County Community College, Ramapo College, Rowan University



Integrated Program Design

- **Develop** 5 one-hour hands on activities for a one-day summer event for HS students
- **Incorporate** ALL 4 STEM disciplines into EACH activity
- **Focus on** data science, genomics and instrumentation
- Fellows and new scientists to **create** activities
- **Prepare** informational materials for take home
- **Utilize** AI for design guidance
- **Research** APHL and CDC Resources



Next Steps

- Create a PHEL STEM Committee with a Fellow/New Scientist as Chair
- Develop relationships with ALL Mercer County STEM Council members – site visits
- Design activities/develop program
- Develop SWAG
- Schedule and deliver event



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