



HealthWorks Academies Background

By 2020 our nation will face an insufficient workforce of healthcare professionals coupled with unprecedented demand, unsustainable cost and dynamic industry trends and innovation.

Who we are:

HealthWorks Academies is a 501 c 3 nonprofit organization dedicated to engaging and developing next generation talent in the health sciences.

HealthWorks Academies has three goals to:

1. Create a national pipeline of students who will progress into professional health science careers
2. Encourage diversity in our talent pipeline of health science professionals
3. Combine the necessary leadership, emotional, and social skills with technical Competencies and standards so that participants will be positioned to best serve the industry and improve patient experience, contain cost and improve health outcomes

Our talent development pipeline program combines a custom STEM curriculum, inclusive of problem based learning, social and emotional learning, professional development, broad industry career shadowing, leadership skills for grades 9-12 and a long term mentor program that extends to graduate education. Our program is designed to be implemented in any high school (public, private, charter or religious) in any geographic location (urban, suburban or rural) in 48 states.

We are proud to have launched our model in Philadelphia with the support and collaboration of Rothman Orthopaedic Institute.

We have seen transformational change in the healthcare industry. This change will continue. The need for professionals in every aspect of the field is both critical and urgent. Schools need partners in industry to help inform students' career choices, industry trends and academic pathways to reach their greatest potential.



The Challenge: What are the key questions we need to address?

While we have made great strides in bringing STEM education to high schools nationally, we have experienced a decline in students completing STEM education in college. The implications for meeting the demand of professionals in healthcare and life science is both critical and urgent. At a time when our nation will encounter the following, consider the implications when:

- our senior population grows and people live longer (both Baby Boomers and Millennials) placing increasing demands on healthcare systems (10,000 American citizens turn 65 every day)
- healthcare cost is rising unsustainably (estimated to reach 20% of GDP by 2020)
- chronic disease is on the rise (diabetes, cardiovascular disease, hypertension, stroke)
- our healthcare workforce is aging (by 2020, 33% of physicians will be older than 65)
- students completing STEM career paths in college is on the decline
- the lack of diversity in professional health sciences has a multitude of implications, not the least of which is healthcare equity and access together with disparities in care and treatment
- the intersection of technology and healthcare drives new industry trends, data collection and analytics, artificial intelligence, predictive analytics, healthcare delivery and payment models to name just a few advances

We are facing a perfect storm of high demand, changing demographics, emerging trends, decreasing supply of professionals and unsustainable cost in a supply and demand economy.

Healthcare is currently a three trillion dollar industry and growing. Not only will this workforce shortage impact cost and access, but health outcomes can be expected to decline with delays in diagnosis and treatment.

This has a national implication for both industry and families.

As care and treatment are delayed, workers spend more days out of work. More time out of work may impact family's financial support. While families struggle to make ends meet, greater demand is placed on family caregivers which impacts the caregiver's ability to work, further impacting family finances as well as workplace productivity.



Key questions:

1. How do we interest students in professional health science careers?
2. How do we introduce students to these careers and prepare them to succeed in a dynamic industry environment for careers that are sustainable and prepared for successful progression to career ladders throughout their work lifetime?
3. How do we bring diversity (racial, ethnic, socioeconomic, geographic...) to the professional workforce in the health sciences?
4. How do we close the access and equity gap that exists due to lack of cultural competency in the professional health sciences?
5. How do we prepare our future health science workforce with leadership skills, to combine the necessary leadership, emotional, and social skills with technical competencies and standards so that participants will be positioned to best serve the industry and improve patient experience, contain cost and improve health outcomes?
6. How do we create a model that can be nationally accessible, cost effective and longitudinally tracked?

Why does it matter? What scientific discoveries, innovations, and desired societal outcomes might result from investment in this area?

Healthcare is a three trillion dollar industry in the U.S. From direct patient care (diagnostic, therapeutic, rehab and custodial care) pharmaceuticals, medical devices, health systems operations, insurance, education and research, the industry is an economic force that serves everyone. Everyone, at one time or another, is a consumer.

While the industry is in need of transformation, securing our workforce should be a number one priority. Without a robust, qualified workforce accessible by all, we face a future of stunted innovation, declining access, eroding health outcomes and unsustainable cost. Are we, as a nation, willing to accept this future?

We live in a supply and demand economy. While healthcare currently consumes 18% of GDP currently, we are on target to consume 20% of GDP in 2020. One fifth of GDP spending in healthcare means less spending for social programs, less for military spending, less for infrastructure development and repair. It is an unsustainable trajectory that will continue to grow as our senior population grows in number, chronic disease continues to rise, and while innovation in healthcare continues to provide advances in diagnosis and treatment, it comes at an additional cost. Of course, innovation depends on a supply of innovators, all while our greatest asset, our professional workforce, ages out and while the numbers of students entering the system decline.



For example, while one third of the nation's physicians will reach retirement age by 2020. Those retiring are typically white, typically male. Students currently graduating from medical school are white, Asian, Indian and 51% of medical school graduates are women. Black and Hispanic medical school graduates have not increased and remain low even as general populations continue to rise.

Healthcare disparities continue in clinical medicine. While it can be argued that the disparities are unintentional, how can we make decisions directing policy and procedure when we lack representation at the decision making table and a shortage of diverse talent to build relationships and foster communication? Black and Latino populations continue to rise without meaningful representation in the healthcare professional workforce. Social determinants of health have informed us of how important these factors are in improving health outcomes. Having a culturally competent workforce, meeting patients of every background "where they are" builds trust, engagement, empowerment, adherence and compliance when creating patient centered treatment plans and impacting patient outcomes.

Children from low income families must traverse difficult hurdles to access education that puts them on par with children of families with greater resources. Access to post-secondary education is harder to achieve and more difficult to complete when (1) access to high performing education programs is unachievable (2) students don't have role models or mentors in professional health sciences regardless of socioeconomic (3) students don't have access to industry to experience career opportunities that are a match for their skill set and interest and inspire them to reach their greatest potential.

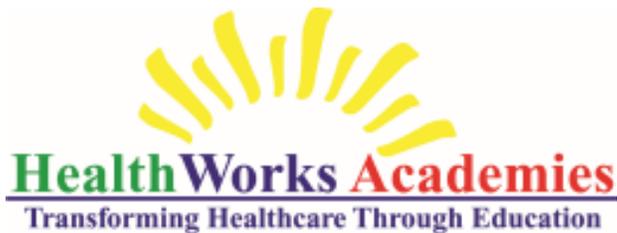
As Marian Wright Edelman quotes, "You can't be what you can't see"
If children of all backgrounds don't have the experience, the academic preparation and the role models and mentors in this dynamic industry we will continue this downward spiral that begs the question "Who will do the work?"

The Solution: If we invest in this area, what would success look like?

An investment in this area is critical to our healthcare ecosystem.

The HealthWorks Academies Model:
Access to success:

Starting with a cohort of students within a high school beginning in grade 9 and continuing through grade 12, with students who have expressed an interest in health science careers and demonstrate academic proficiency of grade C and above:



- (1) Provide a custom designed comprehensive STEM curriculum approved in 48 states, centered in problem based learning (PBL) where students learn by doing and develop problem solving and critical thinking skills, the curriculum is embedded with social and emotional learning (SEL) where students learn self-awareness, self-management, responsible decision making, relationship skills, social awareness and leadership skills such as communication, ownership of the whole, commitment to excellence and teamwork.
- (2) Professional development is provided to teachers, counselors and administrators so that SEL becomes a part of the culture in the school.
- (3) Curriculum is approved nationwide for implementation in any high school- public, private, charter, religious, in urban, suburban and rural regions with our next generation model targeted to reach Native American reservations and students located on military bases.
- (4) Teachers in the program schools deliver content with the guidance of our professional development program throughout the school year.

Providing teachers with lesson plans embedded with PBL, SEL and providing daily lesson plans for the entire engagement, students from challenged school districts have academic equality and preparation for post-secondary education success.

- (5) Work with a broad range of industries in healthcare (clinical medicine, biopharma, medical devices, health policy, public health, research, education, finance, law and behavioral health) to provide career shadowing opportunities for students from grades 9 through 12 where they experience the work environment, learn about the industry, meet professionals in many different departments, observe the work product, learn about academic pathways, career ladders and emerging industry trends.

Students shadow (on average) 40 careers per academic year providing a broad context for the selection of post-secondary academic pathways.

- (6) Match students with mentors when they express an interest in a particular career pathway, working with them from high school through graduate education. Working with industry mentors provides students with industry experience while working with industry mentors prepares students for careers, emerging industry trends and develops a pipeline of industry talent while also preparing students for the culture of the company.



The mentor program begins in high school and continues through graduate education.

- (7) Longitudinally track a multitude of data points from high school through graduate education and use this information to continue to develop a better program, include more students and increase progression of students to industry. This information provides great value to identify where we create impact and to learn about the unique needs of different populations of students across the nation.

The Impact:

Our initial work began with KIPP Philadelphia Preparatory Academy and an eighth grade class at Broad Street and Lehigh Avenue in Philadelphia, Our goal was to increase awareness in health science careers in an afternoon program. We centered our theme on the study of Diabetes, something each of the students had experience with either through their own health or that of a family member. By educating the student in the etiology of Diabetes Types I and II, and the body systems the disease impacts, we then brought in professionals to talk about their career, academic pathway, and industry and research trends. The students experienced careers from cardiology, ophthalmology, nephrology, Diabetes nurse manager, neurology, cardiovascular nurse educator and students in medical school. Myths and assumptions were dispelled, and the students had a new appreciation for the professionals and career opportunities and attainment at this early stage of our development.

We then worked with Delaware County Technical School and a state funded grant for career awareness. Working with both the Folsom campus and students located on five hospital campuses for this program, we developed career experience with Rothman Institute, The Science Center and Wistar Institute for 89 students. They learned about each institution's mission from the delivery of clinical medicine and clinical research, incubator and investment in early stage pharmaceutical and medical device companies and their development to fully functioning organizations with over 100 employees, to research in vaccines and cutting edge research in the treatment of cancer. In learning about these organizations, students were able to shadow a myriad of career professionals, witness their work in the context of the workplace, and learn the academic pathway and industry trends.

Our curriculum was developed and our professional development program was prepared which allowed us to launch our full program with Kensington Health Science Academy to test all aspects of our program. Providing professional development for 42 teachers, counselors and administrators, we launched our one year pilot program with 35 students. The teachers were delighted to find that every lesson plan was provided saving them countless hours throughout the school year. The lesson plans were



rigorous and exciting as teachers embarked on a new program and students became active learners in PBL and SEL and STEM. Students were engaged and inspired by the experience.

Pricing to Schools:

Schools benefit from student engagement that increases grades, retention, and attendance and increased the likelihood of graduation, college acceptance and completion. Schools that include the HealthWorks Academies program have a competitive advantage for student engagement as well as a recruitment tool for student enrollment.

To provide the program, HealthWorks Academies charges the schools \$50,000 per year for 25 students, including professional development for up to 35 teachers, counselors and administrators. The commitment is for grades 9 through 12, a four year commitment.

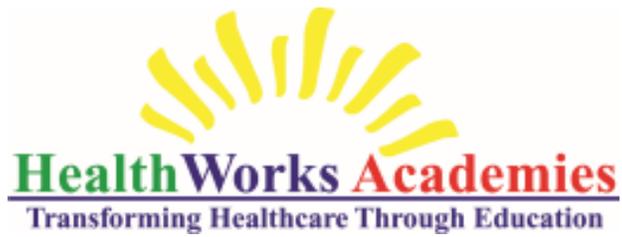
Our financial projections indicate financial stability with the implementation of our program in 14 schools. Our plan is to use excess funds to provide a 50% scholarship to schools whose students are qualified to receive the free or reduced school lunch program.

HealthWorks Academies has a commitment to include students for whom this program would otherwise be cost prohibitive, but who possess the ability and commitment to enter a professional health science career, and can bring cultural competency to the industry.

Why is this the right time to invest in this area?

It's never the wrong time to do the right thing. Technology has allowed us to expand the reach and depth of information in ways we might not have dreamed of only a few years ago. By implementing this program we have the opportunity to reach students across the country to provide high quality, comprehensive STEM curriculum to students regardless of the academic performance and resources of their school, thereby leveling the playing field for all students to be academically prepared for and progress to professional health science careers.

This program provides the industry career shadowing that schools typically do not have the resources to provide, and the long term mentoring to ensure that students have a professional resource to stay on track, graduate on time, are aware of emerging industry trends and to guide them to reach their greatest potential.



Longitudinal tracking allows us to know where students are going, where they are needed and the opportunity to fill the gap.

The HealthWorks Academies program is designed for quality, scale and affordability so that cost, quality education and career experience are never barriers to entry.