Building Better Pathways to
Health Professions Workforce Diversity

A Framework for Academic Health Centers

Executive Summary

Pipeline and pathway programs developed at academic health centers provide critical support for aspiring learners from traditionally underserved populations to enter the health professions and careers in the biomedical sciences. The *AAHC Pipelines to Pathways Initiative* seeks to identify and share success factors for such programs. The *Initiative* is led by the Association of Academic Health Centers (AAHC) Chief Academic Officers (CAOs) executive leadership group in partnership with the AAHC Sullivan Alliance.

This report, *Building Better Pathways to Health Professions Workforce Diversity: A Framework for Academic Health Centers*, was undertaken by AAHC as part of the AAHC Pipelines to Pathways Initiative.

A core goal of the *AAHC Pipelines to Pathways Initiative* is to provide a framework to expand access to the breadth of health professions careers for learners from diverse backgrounds. While individual health professions colleges can offer pre-applicants various avenues to learn about health professions career opportunities, these discipline-focused colleges that are within an academic health center have the potential for more significant engagement and results. Academic health centers can devise seamless opportunities to engage aspiring learners in ways that accomplish two critical aims.

First, academic health centers can develop strategies that coordinate their colleges to function collaboratively and engage aspiring learners in productive, interactive exposure to foundational knowledge-building experiences that are shared across the health professions. These strategies can include mentoring opportunities and informative conversations and resources for the learner, learner family members, and academic advisors along the K-12 or K-14 continua. For learners, the benefit of such experiences is visualization and exploration of multiple *pathways* that variously converge into a specific health sciences career opportunity.

Second, early outreach in the K-12 curriculum can be crucial for mentoring aspiring learners who are underrepresented in the health professions and who may be socioeconomically less able to risk either the cost or delayed time to degree completion. The college sponsor has invested faculty and staff time in aspiring learners and their supporters and has expended resources to develop what has gone into the aspirant's toolkit and preparation for entry. For an individual college, the success or failure of a *pipeline* program may be the resultant identification of the aspiring learner as a subsequent applicant admitted to the entering class of that discipline. It is difficult for college-based project or program leaders to justify the expense without identified measures of success and quantifiable outcomes that support the college mission. For colleges based within academic health centers, a pathways approach to engaging aspiring learners can create a seamless yet multi-faceted curriculum for aspiring learners, enabling more variety of offerings or more frequency of offerings at times and locations (or through modalities) that are easier to deliver and easier for learners to access as individuals or within a planned cohort.

With the belief that academic health centers are well positioned to leverage a *pathways* approach to underrepresented minority (URM) recruitment into STEM health careers, a workgroup of the AAHC

CAO executive leadership group commissioned a series of in-depth interviews with AAHC and AAHCI member practitioners who lead and manage pipeline and pathway programs in academic health centers. The goal was to produce a viable framework for creating and sustaining successful pathways into STEM health professions. A more immediate aim of the interviews was to produce experiential data and evidence to inform a pathways model. This report identifies and shares insights from the interviewees about success factors for such programs.

The report presents findings, conclusions, and Key Takeaways based on program details and insights that came out of specific interview questions. Insights the practitioners shared—viewed individually— may inform and improve the practices, procedures, and policies that sustain URM STEM recruitment of aspiring learners and prepare them to succeed as applicants and thrive in the education program of their chosen health profession field. In addition, the value added by these insights—viewed collectively—may offer academic health centers, their K-16 school partners, and other community-engaged partners and stakeholders a more cohesive way to invest in STEM recruitment and the success of URM aspiring learners.

The report lays out findings, themes, and suggested actions. The detailed findings are discussed in specific sections:

1. **Pathway Programs: A Significant Component in an Institutional Strategy to Advance Diversity, Equity, and Inclusion**

   Strategically, in the support of diversity, equity, and inclusion (DEI) goals, there is potential value in integrating pathway programs into overall institutional programming, rather than treating them as discretionary programming by a project or college (not a component of the academic health center's core work).

2. **Many Types of Partnerships can Strengthen Pathway Programs**

   Commitment by institutional leaders to activities that facilitate aspiring URM student entry to STEM health professions can facilitate the development and sustainability of productive partnerships with other public, private, government, or community organizations in pathway programs. These partnered relationships, in turn, can strengthen the institution's capacity to further its mission, especially as it relates to DEI goals.

3. **Evolving Administrative Structures for Pathway Programs**

   As institutions devote more attention and resources to DEI work, there may be value in consolidating the management of separate STEM/URM programs in one office, or under one umbrella function, that includes strong ties to the institution-wide DEI office (if that office is not the host administrative structure).

4. **Faculty Members Are Strongly Motivated to Engage in Pathway Programs**

   It is in an institution's best interest to publicize faculty and college collaboration to provide STEM opportunities generally and STEM/URM opportunities specifically. Such collaborations may contribute to faculty retention and allow them to engage further other internal colleagues and external audiences.

5. **Funding: Sources and Institutional Strategy**

   Identifying a baseline operating budget and an array of funding sources to defragment grant-funded or college-funded pathways/pipeline programs requires budget planning for the efficient deployment of operating monies, discretionary dollars, or donor-generated funding that can address any unique needs of URM aspiring learners interested in STEM/health careers.

6. **Engage Parents and Community Leaders in Pathway Programs**

   Making education more accessible to underrepresented populations requires investment with greater intentionality to ensure that faculty, staff, or leader time is deployed to accomplish systemic outreach that engages parents, K-12/14 student advisors, and community leaders in ways that demonstrate that pathway programs are intentional and durable and not incidental or opportunistic or short-term projects. Intentional projects can still evolve as priorities change, but the communication pathways within the academic health center and the K-12 school systems, and with parents/guardians of aspiring learners, should be structured for participatory on-going engagement.

7. **Keeping Learners Engaged in Pathway Programs can Disrupt The "Leaky Pipeline" Challenge**

   Academic health center leaders can consult with pipeline/pathway program practitioners who have faced the challenge of a "leaky pipeline" and engage their assistance to fully assess the package of supports they provide. Pipeline programs frequently offer aspiring learners enrichment activities, experiences, mentoring, and other support that help mitigate disparities in the resources available (through home, school, or community opportunities) to students from underrepresented backgrounds.

8. **Defining and Developing Metrics and Data Collection to Measure the Efficacy of Pathway Programs**

   Academic health center leaders can assist with the development of a better framework for metrics that includes quantitative and qualitative data. Consistent metrics, relevant to the institutional mission and strategic aims, could make pipeline and pathway program analytics more robust and, ultimately, could inform productive program improvements.

9. **Early K-12 Participants**

   Engaging with aspiring learners at earlier points along the K-12 continuum can help young learners envision a pathway into a health profession (or biomedical sciences). Simultaneously, pipeline/pathway programs may bring health education resources to communities for K-12 learners that also provide accessible and easy to understand information for parents and classroom teachers that can increase health literacy more broadly. Many communities are in need of such information but have no mechanism to acquire it other than through personal healthcare. Increasing health-related knowledge dissemination would enable academic health centers to offer an invaluable public service.

10. **Pathway Programs: Catalysts for Curricular and System Structural Reform to Advance DEI**

    Academic health centers may be able to draw broad lessons from intentional review of pipeline/pathways work to help identify and inculcate principles of diversity, equity, and inclusion. Taking a community practice approach can complement other sectors, e.g., admissions practices; curriculum development; or faculty, staff, and student awards.

Findings from the interviews offer compelling examples and Key Takeaways from the experiences of these practitioners that may further inform how academic health centers can invest in and incorporate a pipeline to pathways transition and gain additional value from lessons-learned that can be applied to desired outcomes within their mission. Insights from the interviews are offered as seeds that may help academic health center leaders to grow and cultivate a cohesive and collaborative framework that supports the entry and success of aspiring URM learners interested in STEM/health careers.

The AAHC Chief Academic Officers and AAHC Sullivan Alliance pipelines to pathways working group believes that academic health centers are uniquely positioned to leverage the advantage of a STEM/health careers pathways framework. We propose that such a framework, driven by academic health center collaborative leadership, offers benefits to aspiring learners and their advocates. It also offers tangible benefits to the academic health center faculty, staff, students, and pipeline program leaders at the same or lower institutional financial cost and lower psychological cost than current discretionary or single discipline pipeline initiatives, which can struggle to achieve sustainability and meaningful quantitative outcomes tied to institutional mission-specific metrics.

If you find these ideas worthy of further exploration, we encourage you to share your discoveries or questions. For more information, contact AAHC at: **programs@aahcdc.org**.

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A core goal of the **AAHC Pipelines to Pathways Initiative** is to provide a framework to expand access to the breadth of health professions careers for learners from diverse backgrounds. While the academic home for each area of the biosciences and healthcare disciplines may consider recruiting into a "pipeline" routed to a specific field, an academic health center, by definition, includes at least two and frequently multiple career pathways.

Academic health centers can devise seamless opportunities to engage aspiring learners in ways that connect them productively to interactive exposure, mentoring opportunities, and experiences that help youth—and their parents and (pre-collegiate) advisors—visualize and explore routes into the health sciences. Toward that end, the *Initiative* conducted a survey of selected academic health centers to reflect on their experiences.

This report summarizes shared perspectives as a framework for creating and sustaining successful pipeline and pathway programs. The aim is to advance the conversation that shapes future initiatives for individual academic health centers to adopt or adapt as they grow and expand the pathways that support diverse learners in the pursuit of education and careers in the health professions and biomedical sciences.

Initial Case Studies

The **AAHC Pipelines to Pathways Initiative** launched with a series of invited **Case Studies in Academic Health Center Best Practices**. Academic health center CAOs were invited to deconstruct and reflect on experiences developing or engaging with pipeline and pathways initiatives within their university and community. Each case study offers a snapshot that showcases a specific pipeline or pathway program developed at individual academic health centers in the United States. Each case study details a specific challenge, the institution's response, key takeaways, and outcomes. The **AAHC Academic Health Center Best Practices Case Studies: Connecting Pipelines to Pathways for Health Equity** are available online.

Survey Overview: Pathway Leadership Interviews

Expanding upon the initial case studies, AAHC commissioned a series of in-depth interviews with practitioners who lead and manage pipeline and pathway programs in academic health centers. The aim of the interviews was to discern both success factors and stumbling blocks that affect the work of individual academic health centers in developing, managing, and sustaining pipeline and pathway programs.

Interviewees were asked to describe their programs in detail, including an outline of the learner experience in a given program. Interviewees described how learners are recruited for such programs, and how participation is sustained over time. The interviewees spoke to the engagement in the programs of faculty members, learners' families, and community leaders and organizations. They also described how given programs are funded and administered, and how program success and progress are measured. A set of broad questions at the end of each interview asked program directors to reflect on notable lessons from their work and to frame aspirations for the future of their programs. The interview protocol and interviewee names and institutions can be found in the appendices of this report.

Pipeline And Pathway Programs: Overview

Broadly speaking, the programs that the interviewees described shared the goal of supporting learners from diverse and traditionally underserved populations who aspire to pursue education that will lead to productive careers in health and science. In addition to this shared aim, each program presented unique characteristics that may offer a robust menu of opportunities to advance a pathways approach at academic health centers where individual discipline-based colleges and programs must tailor what fits a successful pathway from pre-applicant to accepted and matriculated learner. Examples of diversity in program approaches and goals include:

- **Keck School of Medicine at the University of Southern California:** supports a **cascade of programs** that serve students from elementary grades through medical school to help recruit, retain, and increase the number of underrepresented students and to encourage students from underrepresented populations to pursue careers in health and science .

- **Vanderbilt University:** supports the **Vanderbilt Undergraduate Clinical Research Internship Program**, which gives college students interested in a career in medicine the opportunity to engage in both research and clinical patient care at an academic health center. The multi-year program provides opportunities for students to conduct research under a mentor at Vanderbilt and engage in observational experiences during medical school. Support also includes resources to help learners take the MCAT and apply to medical school.

- **Howard University:** provides pipeline programs that include the **Center of Excellence**, based in the College of Pharmacy, which is designed to strengthen the national capacity to train underrepresented minority students in various health profession fields. Activities include outreach to local schools and community colleges and summer enrichment programs for high school and undergraduate students seeking additional exposure to health professions programs.

- **The Florida Alliance for Health Professions Diversity Scholars Program:** supports an eight-week intensive research program that provides research opportunities in health equity for young students from underrepresented and underserved populations.

- **The University of Nebraska Medical Center (UNMC):** offers several programs that help students get a jump-start on a career in healthcare. For example, the Rural Health Opportunities Program (RHOP) helps recruit, educate, and graduate Nebraskans who are committed to returning to the state's rural areas to practice healthcare. A free summer

enrichment program helps strengthen the academic proficiency and career development of students, including from groups underrepresented in the health professions, and prepare them for success in health profession schools. The UNMC High School Alliance gives high school juniors and seniors an opportunity to take college-level courses in preparation for careers in healthcare.

- **The Northern Ontario School of Medicine (NOSM):** focuses on diversity, inclusion, and advocacy for health equity, and seeks to educate healthcare professionals to practice in Indigenous, Francophone, rural, remote, and underserved communities. Toward that goal, the pathway program [CampMed](#) brings teenagers to NOSM's campuses (virtually during the COVID-19 pandemic) to learn more about careers in the health sciences. The camp has inspired a number of youths to matriculate at NOSM.

- **Eastern Virginia Medical School:** supports a pipeline program called the [Health Sciences Academy](#) that offers high-school students from underrepresented populations an introduction to careers in the medical field.

- **Lake Forest College and Rosalind Franklin University of Medicine and Science:** partner in the [Health Professions Program](#), which includes a core of health-related courses and opportunities for exploration as well as joint degree programs.

- **The University of British Columbia Faculty of Medicine:** assists learners who self-identify as First Nations, Métis, and Inuit with student support that includes Medicine Cousins, a mentorship program that pairs Indigenous medical students at various levels with Indigenous learners at an earlier stage in their medical education.

Insights And Findings

The interviewees described innovative programs and the unique factors and interests that the sponsoring academic health center was able to identify and address in service to the community of pre-professional learners, faculty, staff, and community stakeholders. These factors and interests not only led to a program's creation, they also enabled shared progress, meaningful results, and sustained operations. In addition to successes, the interviews also provided insight into areas where program administrators shared observations across the interviews about both room for improvement and opportunities for future growth. Most revealing from the interviews were lessons learned and a number of common themes about practices that contribute to the ongoing success of pipeline and pathway programs.

The insights the practitioners shared—viewed individually—may inform and improve the practices, procedures, and policies that enable pipeline/pathway programs to be sustained, and to potentially thrive at individual academic health centers. In addition, the value added by these insights—viewed collectively—may offer academic health centers and their community partners and stakeholders something more. These interviews demonstrate that there is a broader palette of opportunities to engage college, university, business, government, and other community partners. From these engagements arise greater possibilities to ensure that diverse and talented learners have pathways into the science, technology, and healthcare professions, and have the mentors to guide them toward exciting and rewarding careers.

Pathway Programs: A Significant Component in an Institutional Strategy to Advance Diversity, Equity, and Inclusion

One insight arising consistently from the interviews is that academic health centers and their leaders increasingly view and value pathway programs as a key strategy in their work to diversify student populations and to help ensure more equitable access to education in medicine and the health professions for learners from traditionally underserved groups. Pathway programs have particularly risen in visibility at institutions in the wake of growing equity movements and related initiatives. Universities and academic health centers strive to do more in the areas of diversity, equity, and inclusion (DEI) and view pathway programs as an effective means to achieve those goals.

One interviewee framed this new recognition for pathway programs in this way:

> " *Over the last year and a half, this type of work has received a great deal of attention because of what is happening across the country. Early on, that focus may not have been there—say in 2011, when we first started. But I would certainly say that for sure now, and within the last few years [that has changed significantly].* "

One practical result of this new visibility and appreciation for pathway programs, that interviewee noted, is that "sunsetting any of these programs is not a concern of mine, because we all know that they're so desperately needed."

Having community liaisons and/or embedded partners who are academic health center affiliates living in the community is crucial. An interviewee suggested that institutional partners, such as corporations, local government entities, and community groups, show increased appreciation for pathway programs as a means to meet their goals of supporting learners from underserved backgrounds.

> " *We are leading a network of community partners that includes businesses and different governmental organizations. It's through the broader network that we're getting buy-in for how we can create opportunities for the students who are coming from underserved backgrounds. We need to create diversity, and we need to create equity in the educational system. We're realizing that we want our matriculants to look like the youth that are coming from our community.* "

Opportunities To Enhance Programs And Practices

The increased recognition of pathway programs as effective, practical strategies to implement institutional goals for DEI may present new opportunities for administrators to be more intentional in the development, management, and support of such initiatives. Strategically, in the support of DEI goals, there might be value in inculcating pathway programs more directly into overall institutional programming rather than treating them as additional programming outside an academic health center's core work.

Key Takeaways

- Assess how well the academic health center integrates its pathway programs as an integral component of its overall diversity, equity, and inclusion goals and strategies.
    - > If necessary, make organizational and operational changes to better align pathways work with DEI goals.
- Create structures that enable piecemeal and ad hoc pathway programs within the academic health center to benefit from better integration and coordination across programs.
- Create structures that enable pathway programs in the academic health center to connect and interrelate with DEI work across the institution writ large.
- Be intentional about communicating leadership's commitment to pathway programs in the context of the academic health center's DEI goals.
    - > Demonstrate leadership commitment with funding, appropriate staffing, and related resources.

Many Types of Partnerships Can Strengthen Pathway Programs

Pathway program leaders recognized that partners are essential in advancing the efficacy and effectiveness of pathway programs. However, the type of partner with whom pathway programs engage can differ significantly from program to program, and from institution to institution.

Some institutions formed partnerships with other colleges and universities through articulation agreements. Howard University's partnerships with local community colleges were one channel through which Howard attracts students into the pipeline for careers in the health professions. The Vanderbilt University Undergraduate Clinical Research Internship Program accepted participants from minority-serving institutions, including Spelman College and Fisk University, with which Vanderbilt had formal agreements. Eastern Virginia Medical School also had articulation agreements with local colleges and universities, including historically black institutions.

Forming and sustaining relationships with K-12 schools are often also critical components of pathways partnerships. Howard University, for example, created linkages with middle schools and several high schools in the Washington, DC area that create a pipeline to help guide young students to Howard's professional programs in the health sciences. To be successful, such partnerships can require a considerable investment of time and resources. Program leadership at Howard described the extent of their work to sustain relationships with partners:

> " *One of the things that we did with the middle schools and high schools was to have each school identify a liaison. We had regular meetings with the liaisons as well as with the leadership of the [pathway] program on the Howard campus. We also did site visits where we went to visit with them to get a sense of what experience the students were having and to answer any questions, whether it was from teachers or administrators or even parents, about the different activities. We also provided either directly to the school or to the liaison a small stipend to help them purchase supplies or otherwise help in the conduct of the various programs. Some institutions allowed the liaison to receive that as an additional stipend for their participation.* "

Businesses can also be critical partners in pathway programs. As one example, Horizon Therapeutics provided $500,000 in scholarships at Lake Forest College to help economically disadvantaged students and students of color pursue their education in the college's joint Health Professions Program with Rosalind Franklin University of Medicine and Science.

The Lake Forest/Rosalind Franklin joint program is an example of an effective partnership that supports a distinctive undergraduate/graduate level pathway program. As described below by an interviewee, each institution benefited in unique ways, as did the local workforce:

> " *Rosalind Franklin is uniquely graduate health professions. Lake Forest College is uniquely undergraduate with a strong foundation in liberal arts. Rosalind Franklin needed to be able to influence students well in advance of admitting them into our graduate level programs. Lake Forest College needed a way to attract students and prepare them for health profession careers that are largely at the graduate level. What we're discovering is that with rapidly evolving changes in healthcare, more and more of the skills that our health professionals need to navigate this new healthcare landscape and also to lead are grounded in strong liberal arts foundations. Skills such as persuasive communication; flexibility and innovative thinking; team practice; situational leadership; situational thinking; and awareness of all the intersections between policy, lifestyle, and social support structures and how those intersect with health and well-being. This partnership that we created is a win for our universities. It's a win for our students. It's a win for the future health profession workforce and the communities that we serve.* "

Pathway programs can also benefit from partnerships with community agencies and offices. The James H. Quillen College of Medicine at East Tennessee State University, for example, worked with community leaders on ways to help train and retain more physicians as part of broader workforce development initiatives. Local governments provided funding to the university for initiatives in the college of medicine. The college of medicine's aim was to grow and develop those partnerships and evolve them in ways that create a dedicated infrastructure and funding source to help the school serve its communities.

Opportunities To Enhance Programs And Practices

While many institutions have established productive partnerships in support of their pathway programs, there may be opportunities, even abundant opportunities, to expand such relationships. Especially in light of heightened interest across society in seeking better ways to ensure diversity, equity, and inclusion, existing partners may be motivated to expand existing partnerships; and potential partners may be more open to establishing wholly new relationships with institutions. Commitment to such activities on the part of institutional leadership can help pathway programs find and sustain more productive partnerships—relationships that, in turn, can strengthen the institution and help it work to pursue its mission, especially as it relates to DEI goals.

Evolving Administrative Structures for Pathway Programs

Institutions manage their pathway programs in a variety of ways. A typical, perhaps traditional, structure is to appoint a staff member in the school of medicine or another school in the health professions to be the director of such programs. Often, these directors were the individuals who initiated and developed a given pathway program. This model is common:

> " *The programs that we have had have been managed typically out of a health professional college. We do not have a centralized office to oversee and to implement these pipeline programs. In the case of pharmacy, the College of Pharmacy managed the two programs that were implemented in pharmacy. I actually served as the program director. I was a faculty member in pharmacy, and when I transitioned in terms of my administrative responsibilities [to provost and chief academic officer], another faculty member was assigned the responsibility of overseeing the program in conjunction with the dean. Another program, although it is open and available to students from all of the health professional programs, is managed administratively by the Office of the Dean in the College of Dentistry.* "

Another common model, in the sample of interviewees, at academic health centers is that of maintaining a separate office—specific to pathways management or more broadly devoted to support institutional goals for diversity and equity—to manage and administer pathway programs. Such offices had multiple staff members reporting to a director or vice president.

We also found examples of institutions that had multiple pipeline/pathway programs where administration for the different programs was not centralized or interconnected with mutually aligned goals, but was based in different offices within the academic health center and functioned independently of one another.

There are signs that another model is emerging, in which pathways work is more closely aligned with newly established institution-wide offices and leadership positions that focus exclusively on the institution's DEI goals. Several of the institutions interviewed for this report said they were working to evolve new working relationships for a management approach that merged responsibility for pipeline/pathway programs administration from a base in an office within the school of medicine or other professional school to, at a minimum, shared responsibility with a relatively new institution-wide DEI office.

Faculty Members Are Strongly Motivated to Engage in Pathway Programs

Given that faculty in academic health centers are notoriously pressed for time, it might follow intuitively that pathway programs find it difficult to engage faculty members in their work. On the contrary, we found that, in general, pathway programs had little trouble recruiting and retaining faculty participation.

Interviewees overall reported strong ongoing interest on the part of faculty in volunteering to participate in pathway programs. Interviewees suggested that many faculty members were genuinely and deeply interested in advancing diversity and inclusion in their institutions and in supporting efforts that help learners from underrepresented populations to pursue and succeed in education in the health professions. At some institutions, interest was so strong that there was the equivalent of a waiting list for faculty who wished to engage in helping pathway programs. Some faculty found the programs to be important enough that they contributed financially to the programs.

One interviewee characterized her experience with faculty involvement:

> " *[Pathway] programs are so popular [with faculty] that we're at the point now that we don't actually have to encourage them to participate. We've got to figure out funding to get more students because we don't have enough students for [every faculty member] who's interested. And I think that speaks to just the success of the program as well as the faculty really being interested.* "

Another interviewee offered this perspective:

> " *We've done a good job and have the support of faculty who are, I think, very passionate and are leaders and champions for this effort, and that seems to be growing. I think it's almost contagious when one person is so passionate about this that it just generates a great deal of interest on the part of other faculty.* "

Similar observations came from a third interviewee:

> " *It has not been a hard sell to get faculty members to engage in the program, whether those be faculty members who self-identify with the communities in which we're working, or those that are allies...to the program. The reason they like to participate in our programs is because they're working directly with students who represent the communities in which they're from. They see the role of mentorship as important.* "

That interviewee cited one potential impediment to faculty involvement, saying that "faculty members from equity-deserving groups are often called upon to provide support in a number of areas." Serving as a volunteer for these initiatives, when central institutional support is lacking or when such service is not highly regarded for promotion, tenure, or other professional recognition, can contribute to what underrepresented minority (URM) faculty have dubbed as the "minority-tax." By comparison, when such contributions are recognized as furthering the recruitment, community outreach, and engagement, or institutional service mission, both the URM faculty members and the sponsoring university may experience a value-added return on invested time. For contemporary academic health centers and their colleges, the ROI and value-added metrics are potentially significant.

Opportunities To Enhance Programs And Practices

Pathway programs seem to be one place where faculty and administrators routinely work together successfully and productively. It is in an institution's best interest to publicize such collaborations broadly to both internal and external audiences. Lessons drawn from faculty work in pathway programs can inform model strategies for successful institution/faculty collaboration in other areas.

Key Takeaways

- Assess the extent and depth of faculty commitment to pathway programs at your institution:
    - > What broader lessons for institutional operations can be drawn from that engagement?
    - > Consider whether faculty interest in and support for pathway programs can be a model for faculty participation in other academic health center initiatives.
- Consider incentivizing and recognizing faculty for their participation in pathway programs as part of the academic health center's strategy for meeting its diversity goals.
- Publicize faculty engagement in pathway programs as a practical manifestation of the academic health center's commitment to public service and community outreach.

Funding: Sources and Institutional Strategy

Funding for pathway programs typically comes from a mix of sources, including the sponsoring institution and philanthropic grants and gifts. Not surprising, the sentiment that more could be done with additional funding and focus was prevalent.

Institutional funding typically draws from tuition revenues or clinical revenues and filters to the programs through institutional budgets. An example of one such model noted:

> " *All of the programs are no cost to the students and no cost to the schools that we're working with. We have had some gifts in the past, but we do not have any grants right now. This is all institutional funding. It's not from tuition, it's from clinical revenue. Clinical revenue is what funds just about everything you get to do these days.* "

Grant funding mixed with institutional resources has supported other pathway programs. One model was described as follows:

> " *[One of our programs is funded by HRSA; another is funded by the Robert Wood Johnson Foundation.] Each program has significant components whereby they require cost-sharing. The amount of cost-sharing varies from program to program. [E]ven though the programs are grant-funded, there is a significant portion that the university also has to support. That may be in the form of faculty salaries. It may be in the form of supporting travel, supplies, books, and other materials that students may need. Or it may be in the form of supporting stipends or compensation for graduate and professional students who are also serving as mentors or instructors for some of the programs.*
>
> *The challenge is being able to financially sustain those programs if external funding were to no longer continue. So, there are some elements that we have institutionalized. In terms of staffing with several of the programs, for example, the grant may provide half of the funding but the institution is supporting the other half. The institution makes a commitment to support elements of the program it does help in terms of institutionalizing them, but these programs, as you could imagine, are expensive. To have a student on campus during the summer, provide meals, provide housing, provide teaching and instruction, without [asking them to share the] costs, pay for a number of social events or trips to different locations—in each case there is a related expense that must be covered.* "

One interviewee noted that they leveraged success in their programs by receiving funding from both internal and external sources. They found this helped their programs succeed and thrive over time.

> " *[Our funding] is a mix of internal funding with grants. We have good core funding. We have good full-time positions, people that can develop professionally....[In terms of funding] that is guided by a formula that is integrated into our general operations. I think that's a huge benefit.* "

Opportunities To Enhance Programs And Practices

Competition for funding in academic health centers is heated today and will likely remain so. Nonetheless, if institutions are serious about supporting and sustaining pathway programs, they may need deeper attention to identifying an array of funding sources for pathway programs. Requiring programs to subsist solely or mainly on grant funding may not be a viable strategy for strong, productive programs that contribute substantively to meeting institutional goals. Institutions may want to seek ways to prioritize and allocate more funding for pathway programs in core operating budgets. In addition, institutions may want to direct their fundraising operations to focus more energy on raising philanthropic support for pathway programs.

Engage Parents and Community Leaders in Pathway Programs

As institutions work more diligently to connect with and recruit students from underrepresented populations, parents and community leaders can play a large role in helping students map their way to higher education and decisions about career directions. The interviews showed a deepening desire on the part of institutions and pathway programs to engage more directly and more deeply with parents and community leaders. Directors of pathway programs were quick to say that more work is needed in this regard. At the same time, they acknowledged that outreach to parents and community leaders requires a significant commitment of time and energy. For programs already stretched for resources, engaging in that outreach may be daunting or difficult.

Nonetheless, there were examples of institutions working toward meeting this challenge. One institution, for example, connected routinely with parents of learners:

> *We connect with parents in several ways. Because we have involved high school and, in some cases, middle school students, in many such cases they've had to have permission from their parents or guardians to participate, particularly in the summer enrichment activities. We've required the signature and the approval of a parent or guardian in receipt of the application. Once a student has been selected, we had a required orientation for parents so that they would be aware of what program activities would be taking place. And we also use that as a means to garner their support, in terms of making sure the students were aware of the rules and the guidelines and they were aware that the parents had signed off on certain requirements and expectations. We use that both to keep the parents informed and also to try to make sure we had their support in terms of any rules that needed to be emphasized and reinforced. During the course of the program, families are kept up to date on the various activities that were taking place. And then at the end of each of the programs we've had a closing ceremony. And families were invited to participate and celebrate in that activity as well.*

One institution with a new pathway program established a panel of community members, guided by an official charter, to help guide their work:

> *We've created an entire model around how we're conducting the work to support the underserved students. We brought together a group of community leaders. We developed a charter. We've been working for nearly a year now and we've been meeting as frequently as every two weeks to at least once a month. The overall number of people involved is somewhere close to 20, representing different constituencies. We have representation in the work we're doing and leadership from African American members of the community and Hispanic or Latinx members of the community. It's interesting how they're shaping some of the pipeline programming that we're developing.*

" We certainly know that financial resources are going to be needed to support our underserved students. Our financial aid folks are in the process of building a module on what's a good rate of return on your investment in higher education. This module can be shared electronically. Once it's produced, our community leaders will identify parents from the community who will learn this and then go out into the community and teach other parents. This is just one example of how that community partnership network is coming together on a focused goal, and we're getting some pretty innovative approaches as a result of so much input from various sectors. "

A Canadian institution that sought to attract more individuals from Indigenous populations to the health professions engaged in regular outreach with community leaders:

" Our main point of interaction with community leadership is through meetings and reporting verbally. Just a month ago, we delivered a verbal report to the Chiefs Assembly, which is about 54 chiefs from one region of our territory. So, we meet people where they're at, and how they want to be communicated to. Some of that is going and giving a presentation to all the chiefs when they're together. But to the point, we have very close relations [with local communities]. We have what's called local community coordinators in 42 First Nations in their area. They gather annually and always on their agenda is me presenting where we're at, getting input from them. When we hear from a community that something isn't working [in a pathway program], it's in those forums that that typically happens. "

Opportunities To Enhance Programs And Practices

Parents and community leaders in traditionally underrepresented populations can play a strong role in student decisions about their career directions and learning pathways. Institutions interested in making education more accessible to those populations may want to invest more time and other resources in systemic outreach strategies that engage parents and community leaders. Such outreach may need to be more explicitly promoted as an institutional priority. Deeper effort may also be needed to ensure that a commitment to such outreach is not a "one-off," but rather is supported and sustained over time.

Key Takeaways

- Commit the academic health center to a priority of achieving better connections with parents and community leaders/groups [from typically underrepresented communities].

- Assess the status and effectiveness of your institution's connections with and outreach to parents and community groups.

  > Identify which of these connections can be strengthened.

  > Identify how such connections can be strengthened, including input from parents and community groups.

  > Make sure that the institution has the right lines of communications with parents and community groups; and that communication is frequent, consistent, and reciprocal.

  > Allocate the necessary resources to realize effective communication with parents and community groups.

Keeping Learners Engaged in Pathway Programs: The "Leaky Pipeline" Challenge

Among the pathway program directors that we interviewed, some reported that they had little trouble keeping learners enrolled and engaged in their programs. This was particularly true in cases where programs focused on students already in medical school, or on undergraduate students who were intent on pursuing a career in the health professions.

In other cases, however, the "leaky pipeline," or the problem of student attrition from pathway programs, was a challenge. In part, that challenge often had to do with the demands that learners have in their lives outside of their engagement in pathway programs. As was described by one interviewee:

> " What has been challenging, I think, is always adequate time to plan and execute these programs and retaining students who, especially when you're talking about high school students, may have competing priorities. Frequently it can be a challenge with that group, that cohort, to ensure that they retain their focus on this because of competing demands on their time or priorities during that time in their life. "

Another program director made this related observation:

> " Some of the challenges for students from disadvantaged backgrounds, as you might imagine or already know, are really things that would be difficult for us as an organization to address—loss of income, needing to get a job or a second job. Some of the social determinants that really impact these populations can easily influence attrition, so I think that's one that we probably need better ways to address. "

Personal support for learners was critical:

> " I think it's really important early on...for [learners] to feel a connection to someone in the program. We stress that mentors need to be trustworthy and have a sense of cultural humility so that they understand the varying needs and the competing demands that many of these students have. That's really important early on. "

Many pathway programs worked hard to provide cultural support, including helping students who may be living outside their cultural framework for the first time to feel more comfortable in their new surroundings. Two of the program directors interviewed said they or colleagues sometimes served the role of counselor for students who were, in essence, homesick, or who needed a leave of absence to attend a family funeral or similar event. Other program directors spoke of helping learners in need to connect, when needed, with members of their group, such as a tribal elder.

One program developed a mentoring program that connects high school students with college-age learners. That program also provided stipends to program participants. Another program director said student scholarship and financial aid needs were among the factors that were critical to keeping students engaged in pathway programs. That interviewee said her institution expanded "academic and resiliency support that leads to academic success," and provided early mentorship and career developmental support for all four years students were in the program.

Student support also extends to efforts to recruit students to pathway programs. Interventions in early K-12 may be designed to help young learners envision and start to map their own path to education and a career in the health professions. Practical supports might include work to help the student do well on the MCAT or in understanding opportunities for financial support for their education.

Opportunities To Enhance Programs And Practices

Learners from underrepresented populations may need a more robust set of supports to help them thrive in pathway programs. Programs that face the challenge of a "leaky pipeline" may want to fully assess the package of supports that they provide for learners and may want to enrich those supports. Tools include scholarships, stipends, mentorships and, in general, more personal attention to understand learners "where they are" in order to tailor those supports to individual learner needs.

Key Takeaways

- Take steps to fully understand the support that students from underprivileged backgrounds need.
- Audit the range and effectiveness of current supports that your institution provides.
  - > Make sure pathway programs are offering the right mix of supports (e.g., preparation for MCAT, help navigating financial aid, etc.)
- Seek input from current students and alumni about what does and does not work and what additional supports might be needed.
- Offer cultural support that meets learners "where they are."
- Commit to providing the necessary resources to provide a rich set of student supports.
- Consider including academic health center student volunteers to connect with and provide cultural support for younger learners in the program.
- Provide platforms for ongoing support of peer-to-peer communities among learners.

Defining and Developing Metrics and Data Collection to Measure the Efficacy of Pathway Programs

Our interviews suggested that when it comes to measuring results of pathway programs, institutions have done a fair job of collecting basic input data, such as the number of participants. One interviewee described the imperative around metrics in this way:

> " I think the intentionality around evaluation and assessment has to be a high priority. And what are the tools? How are you going to assess outcomes? And what is success? I think success has to be more than getting the person from the pipeline just to your medical school. That might be ideal but getting them to any medical school or biomedical research graduate program, or going into some other health profession, I think should be part of metrics. "

When asked what metrics they used regarding pathway programs, most interviewees reported that their programs collected basic data about the number of students enrolled at any given time. Some programs surveyed participants at program-appropriate intervals, such as completion of an academic term or the end of a programmatic activity. Some programs applied survey instruments to program alumni, often with the goal of determining how many of those served by the program actually matriculated in an academic program related to the health sciences and how many completed such programs and went on to serve in health careers. Metrics can be in-depth to follow careers:

> *For all of our pathway programs, surveys or questionnaires are provided at the end of each term, or end of each programmatic period. For instance, with our undergraduate program, we look at how many of those students go on. We keep track of them—did they stay on the science track, those types of things. So, we measure all of these things, and especially with the undergrad students. We send annual Qualtrics surveys that ask 'Where are you now? What are you doing? Have you published the work that you did at [our institution]? Are you maintaining contact with your preceptor?' We also ask about life events, 'Are you married? Any children?' Things like that. So, we track them. We know exactly where students are. And it's always rewarding. When we see students go through our pathway programs, where they may have participated in our undergraduate program, and now they're in a residency program at our institutions—that's awesome to see.*

Another metric model annually collected and reported data on program participant outcomes:

> *We created a mechanism to track students who had participated, and this was something that we also had to report on an annual basis. How many students who participated, for example, went on to complete their undergraduate degree. How many students who participated went on to be admitted to a health professional school. And as the ultimate outcome was to have students graduate from health professional schools and enter those professions, how many students eventually went on to complete health professional school, whether it was here or at another institution. A number of initiatives were put in place to help us try to track those outcomes.*

Interviewees said they typically reported such findings to deans and top leadership in the academic health center as well as to offices of diversity and inclusion. Admissions departments often also collected relevant data about participants in pathway programs.

The interviews also suggested that more work is needed to develop metrics and approaches to collecting data that can assess the ultimate efficacy of pathway programs in terms of outcomes to influence program improvements. There was interest in tracking qualitative outcomes:

> *We need to spend some time improving our qualitative metrics. We have had students do an evaluation at the end of an event. We've been tracking some of the 'what's worked' and 'what hasn't worked.' Has it changed there from beginning to end? That pre- and post-task data. This is an area in which I'm working nationally with my colleagues, to see how we can improve our metrics in this type of work. Because it isn't just about the numbers, right? If we're only looking at numbers, it's not telling the full story because we're working to influence a change in curriculum, in research, in policy and decision-making. And that's harder to have metrics on. Not impossible, but I think it's harder.*

Opportunities To Enhance Programs And Practices

Broadly speaking, there is room for improvement in the metrics that are used to measure success in pathway programs. While approaches to basic quantitative metrics are now widely in place, they could be applied more consistently, and basic methodologies can be refined in some institutions. A certain degree of intentionality on the part of institutional leadership about developing a better framework for metrics, including qualitative data, could help make program analytics more robust and, ultimately, could inform productive program improvements.

Key Takeaways

- Audit the current metrics that your institution uses to assess the efficacy of pathway programs.
- Decide what additional metrics (qualitative and quantitative) could be monitored to help inform improvements in pathway programs.
- Map a new, more comprehensive set of metrics for pathway programs and decide how they will be used to inform future practice improvements.

Early K-12 Participants

While many pathway programs are designed to serve high-school programs, undergraduates, and students already in medical school and other graduate level professional programs, a number of the programs we surveyed sought to intervene with learners much earlier in their K-12 experience.

One case in point is the Office of Diversity and Inclusion at the Keck School of Medicine at the University of Southern California (USC). That institution aimed to recruit, retain, and increase the number of underrepresented students enrolled in the study of medicine at USC while also providing counsel to high school and undergraduate students in the surrounding communities through health and science fairs, tutoring, and mentoring programs. Under that umbrella, for example, the school sponsored Educaciòn Primero, an initiative in which medical students met monthly with 4th and 5th graders at Eastman Elementary School in East Los Angeles, planting seeds of interest in higher education as well as providing education about health. The program culminated with "Graduation Day at Keck" for the elementary students. In another initiative–the Hippocrates Circle Program, a collaboration that included local school districts, medical schools, physicians from the Southern California Permanente Medical Group, and Kaiser Permanente sponsorship—medical students helped middle school students envision careers as physicians through talks, campus tours, and mini-medical workshops. Another initiative, the USC Med-COR (Medical Counseling, Organizing, and Recruiting), offered a comprehensive academic enrichment program for Latino, African American, and other minority high school students living in the inner-city communities of Los Angeles County. Yet another initiative, Bridging the Gaps, provided research opportunities to outstanding undergraduate students from populations that have been historically underrepresented as physicians, physician scientists, and biomedical scientists. Students conducted research for eight weeks in various research settings, shadowed physicians, and attended seminars and didactic sessions in statistics and physiology.

Our interviews found some institutions also sought to engage with students relatively early in the K-12 pipeline, as this example shows:

> " Because we established linkages going from middle school to high school to community colleges, the interaction varies based on the level. For example, with the high schools, we had helped those schools either create or supported science and health professional education clubs. We set up opportunities for our students to participate in tutoring and mentoring. With the middle schools we created or helped to support health professions clubs. And we would send faculty and students to those middle schools to meet with students and teachers and counselors to help better inform them about opportunities in health professional education, especially at [our institution]. During the summers, we provided summer enrichment programs. Students became aware of the program if they were enrolled at one of the middle schools or high schools where we had those relationships established or they were participating in the clubs that were a part of the program. "

Two other interviewees reported on similar work:

> " *[We're] working with the community to target junior-high-level students in the public school system here, and predominantly students that would be considered underrepresented in healthcare professions. [As part of that work] we have been speaking with local churches in the African American community and formalizing a relationship with those students at the junior high level. We have partnered with the local science center to put on science camps for grades seven and eight as well as high school. The high school ones are a bit more career-focused but the youth ones or ones for grades seven and eight are largely about fun exposure to health sciences.* "

Opportunities To Enhance Programs And Practices

As the examples captured here attest, some academic health centers saw inherent merit in engaging with learners who are relatively early in the K-12 pipeline. To help inspire interest on the part of young learners in careers in medicine and the other health professions, there may be opportunities for broader outreach to students in middle or even elementary school—catching those learners, as it were, when they are presumably more impressionable than older students might be. Such programs can help young learners envision their own pathway to a career in health. Simultaneously, many such programs bring critical health education to communities and populations that are often very much in need of such information, providing an invaluable public service.

Key Takeaways

- **Assess how well your institution reaches out to learners across the K-12 experience.**
- **Identify gaps in your institution's connections with learners in K-12.**
- **Determine how your institution's outreach to K-12 can be comprehensive and strategic.**
- **Map a new plan for outreach to K-12.**
- **Assess how outreach to K-12 can dovetail with and complement the academic health center's goals for community service and health-based outreach.**

Pathway Programs: Catalysts for Curricular and System Structural Reform to Advance DEI

One of the most powerful findings from our interviews was that insights drawn from work via pathway programs is prompting some institutions to review their traditional practices, in terms of both administrative structures and ways of working, as well as in terms of the curriculum in the health professions. Included in that self-analysis was new interest in listening closely to voices that previously might not have been often heard in C-suites of academic health centers. The impetus for this self-reflection had roots in the discovery process that many institutions have undergone showing they need to do more to support and advance diversity, equity, and inclusion in the health professions and, more broadly, the development of health solutions that serve traditionally underrepresented populations. Part of that awareness was sparked by the Black Lives Matters movement and the resultant related conversations across society and many institutions, including those in higher education.

A director of pathway programs at a Canadian institution spoke candidly and in depth to that institution's gradual evolution in thinking:

" I think the pandemic gave us a time for reflection. One of the programs that we were known for was our summer camps for junior high school students, indigenous, and African Nova Scotian students. Those were seen as huge successes. And I always worried that they were not. We saw these students for five days, that's it. There might be an email or a newsletter that went to them throughout the year, but there was no other connection with them. So, here you are in grade eight or nine, you meet us for one week in the summer and we're supposed to change your life, change your view? That's not going to happen, right? So, the pandemic allowed us to say, 'We've put a lot of money into camps, a lot of energy, yet we're not going to see any change because we don't know where those students are afterwards.'

So, what we did is said, 'How do we engage with learners in the schools, in their communities? How do we provide more of that holistic connection?' So, partnering with community groups, partnering with the schools, instead of going in and having to be the lead and having our flag in the school, we can be part of what's already in place and complement it.

Another thing is that we're an old university. We have some very strong colonial structures. So, if we want to change them, and if we're asking these questions, then we need to be willing to truly change. And that means giving up some of our power and our authority as a school, as a medical school. And that's hard. To be specific, one example is admissions. Our local indigenous community, the Mi'kmaq people, have been saying to us, 'You have almost no, over the years, almost no indigenous Mi'kmaq-status students who've gone through your program and graduated as physicians from [our institution]. Yet, they're going to other parts of Canada and graduating. You need to understand what the problem is. And some of those problems are around admissions.'

And so, we're having some of those really serious conversations. And I see the lack of comfort on both sides, but particularly my side of the table. Which is the way we've done it as a medical school. And now we're having to say, 'Maybe there are different ways of doing it.' And that's going to create a lack of comfort.

We have very, very strong leadership in our national indigenous health networks that have clearly articulated 'this is what we need to be successful. We need these changes, not just in admissions, but in curriculum and in mentorship and in residency.' So, I think that's the other piece. It's not just that we're listening, it's that who we're listening to is giving us some clear direction, not just telling us what's wrong. "

The director of pathway programs at a U.S. medical school noted how that institution was wrestling with related concerns:

" I think we're in a unique time right now, but really this openness to understanding that the diversity that we talk about [today] is achievable if we recognize that we're in the situation we're in now because of past exclusionary practices. We have long focused on this myth of meritocracy, that there are so few people from [traditionally underserved] backgrounds that we need to support, and it's been very much centered on deficits that people might have, as opposed to looking at the institutional infrastructures that have really created an environment of exclusion. And so, I think that we have opportunities to really look at the structures and the policies. And the ways that we assess [student learning]. And will there be those opportunities to do a more holistic assessment and really value things like being able to communicate and interact with patients as much as we value scores on a physics test. So, I think that those are both opportunities and challenges because it's a whole new way of thinking about things. "

At one Canadian institution, work to better serve diverse populations led to more open admissions policies:

> *We're more interested in meeting people where they're at. Rather than the institution defining what is needed and then the applicant changing who they are to fit in, we're more interested in us being fluid and changing to meet the applicant where they are. That includes mature recruitment. So, we've had graduates in their 50s.*

At the same institution, work around DEI also informed development of curricular innovations:

> *We've just created new curriculum streams. The first two are the Rural Generalist Pathway and the other is the Indigenous People's Health and Wellness Stream. Next year the Francophone Health Stream will launch. These are akin to majors. You still meet your competencies for medical school, but the learning experiences are focused in indigenous placements within the settings. Essentially, it's to say, 'If you know coming in that you want to be a physician for indigenous communities, then there is a curriculum stream that is a bit more focused on what your career goals are then the general medical program.'*

Work with corporate partners prompted a medical school in the U.S. to rethink its curriculum in the context of the workplace skills that employers said they needed:

> *The other message that we're getting [relates to] the rapid evolution in healthcare. Our health system partners are telling us, 'Look, we've got artificial intelligence, it's going to be doing a lot of the diagnosing in the future. What we really need are folks who have the ability to really think on their feet, be flexible, be innovative, help us chart the future of what the healthcare delivery models should look like, help us more effectively communicate with our patients and improve patient satisfaction and improve patient compliance, help us more effectively teach patients how to stay well.'*

Opportunities To Enhance Programs And Practices

Institutions may be able to draw broad lessons from pathways work that could help inculcate principles of diversity, equity, and inclusion in institutional practice beyond pathway programs, for example, curriculum and admissions practices. Because change in such fundamental practices can be difficult and often encounter resistance, institutions will have to be intentional about wanting to tease out broader lessons from pathways work and be willing to at least consider implementing the kinds of reforms that such findings might suggest. Broadly speaking, institutions interested in exploring these kinds of reforms may have to be open to engaging in deep and potentially challenging conversations with diverse communities. Institutions willing to take such bold steps could find they pay off inestimably in informing richer practices that help advance the institution's goals around DEI.

Key Takeaways

- Audit current curricula to assess responsiveness to and support for DEI.
- Identify what curricular improvements or new curricula are needed to support DEI.
  - > e.g., do select courses offer students adequate insights into communities and cultures where they will be working as health professionals?
- Pilot-test and integrate curricular reforms based on advancing DEI.
- Assess admissions policies and procedures to ensure that they work effectively to attract students from underprivileged backgrounds.
  - > Make necessary changes to ensure better alignment between admissions and academic health center goals for DEI.

Additional Insights

Our interviews provided a number of insights that did not quite rise to the level of a full finding, but that nonetheless merit consideration in the context of pathway programs and DEI work.

- *More focused work is needed to attract men to pathway programs and health professions.* Asked about her aspirations for the future of the pathway program she managed, one director said "I'm really trying to think of creative ways to bring more African American and Latinx males into the fold. Because we're losing them. Something is just not working for them. I've been entertaining working with various mentorship-type programs and partnering with groups [in our city] that target males. I want to really work on that—increasing the number of males from diverse populations in a pathway to professional school."

- *More coordination and interaction in pathway programs and practices is needed between health profession schools.* Most of the interviewees were centered in medical schools and their work largely focused on expanding the pipeline of diverse students to the study of medicine. Still, many of the interviewees saw a need for better coordination with other professional schools in the interest of expanding the pursuit of careers across the health professions by learners from traditionally underserved populations. Several interviewees spoke of broadening their focus in pathway programs beyond recruiting future medical students to include work to attract diverse learners to other healthcare professions as well. One interviewee cast that aspiration in an interest to better expand diversity in the increasingly interprofessional practice of healthcare.

- *More flexibility in support of medical students should be considered.* At least one institution from among those we interviewed started to provide more flexibility for its medical students. That institution broadened the focus of its pathway work beyond just getting diverse students into medical school; in the interest of training more diverse healthcare providers overall, they considered it a success if a participant in a pathway program opted instead to pursue a career in a different health profession. They supported the decisions of medical students who decided to switch direction to pursue education in different schools of health. Separately, that institution sometimes paid for a trip home for students from underrepresented populations who miss their home communities.

- *Implementing pathway programs needs innate flexibility.* Some institutions recognized that "top-down, one-size fits all" delivery of pathway programs may not work for all learners. As one pathways director said, "Needing to be flexible is something that we learned early on. It might make sense [from an administrative standpoint] for us to have a really fixed program with set times, but that really doesn't work if we don't have at least some aspects of the program that can be done asynchronously and that have the flexibility to accommodate different [learner] needs."

- *Ensure that mentors in pathway programs have cultural understanding of the populations with whom they work.* Framing the core of this finding, one interviewee said "We need to make sure that the mentors have some experience working with people from these backgrounds or are from diverse backgrounds themselves, so that they have a level of understanding and ability

to connect across different cultures. I think that's really as important as some of the actual programs." For another interviewee, part of this issue focused on practical considerations, such as helping a learner from a diverse background find a hairdresser in a region where such services might be hard to locate.

- *Demonstrate the value of pathway programs to participants.* Institutions and program sponsors may recognize the value of pathway programs, but there is a need to articulate that value directly to participants. One program director said, for example, that his institution connected participants in pathway programs with admissions directors for health professions schools specifically so that those learners could gain a better sense of the skills they needed to develop and demonstrate in order to be admitted to such programs. Similarly, that program was intentional about connecting participants in pathway programs with current students and alumni of professional schools who could share their own experiences in relatable ways for participants.

- *Consider broadening the definition of "diverse."* One interviewee spoke to an interest in expanding eligibility for participation in pathway programs to learners who "may be disadvantaged from a socioeconomic background perspective," and to "first-generation college students" from regions where learners might not routinely consider careers in medicine or the health professions. Another interviewee spoke of the challenge of reaching potential program participants in small, remote communities. Interviewees also suggested that other populations, such as the LGBTQ+ community, might also benefit from targeted pathway programs. Interviewees also noted that other communities for which pathway programs might be appropriate may be identified in the future.

- *Remain persistent in articulating support for and sustaining pathway programs.* Several interviewees said institutions needed to be more intentional in committing resources of time, money, and staff to pathway programs—consistently and over time—and intentional to learning better strategies for managing such programs. "I think you have to have a dedicated leader who has protected time to do this work," one program director said, "and the program has to be appropriately resourced with program managers and support staff. I think those are really fundamental, foundational. That maybe seems expected but certainly sometimes we hear about other programs where this is just something that's being done on the side." Looking back in time, one interviewee said his institution had not been very effective in managing some of its pathway programs and had been too quick to abandon them when they did not produce desired effects very quickly.

- *Pathway participants can benefit from an adult leader in the program who holds them accountable.* Students in middle school and high school may not be sufficiently focused and self-motivated to conduct themselves productively in pathway programs. With that in mind, some programs appointed an adult staff member who mentored young learners, articulated expectations for them, helped them hone their communications skills, and supervised them in ways that could help them achieve successful results from their participation.

Conclusion

Research for this project showed a perhaps uneven record of accomplishment for pathway programs. Many institutions have struggled to establish the right kinds of programs for the learners they wished to reach. Many institutions similarly struggled to sustain such programs over time. However, many institutions supported high-quality pathway programs for considerable periods of time, sometimes decades. Further, many programs produced a steady stream of qualified candidates from diverse populations for medical school and other professional graduate programs in health and health sciences.

The fact that many pipeline/pathway programs exist and new ones come online regularly underscores both the need for such support and the ongoing interest of academic health centers to enroll more diverse learners. Concomitantly, the recent focus on the need to nurture and advance equity for all, as well as the embrace of DEI goals across institutions of higher learning, is driving even deeper interest in such interventions. If we assume that such trends will continue, such circumstances constitute something of a mandate for all academic health centers to engage in meaningful pathways work.

Academic health centers at some point may look beyond current programs toward evolving needs that can be met with evolving support. An interviewee framed those hopes in this compelling way:

> " *I always dream that I will work myself out of a job. I've been in this job for 14 years and I'm just starting to see some [meaningful reforms] come to light. That's exciting, but I do hope that I work myself out of a job. I hope that in time we have a curriculum that is truly inclusive of all of our communities, and that our student body and our faculty are also inclusive of our communities. But I think the biggest thing that I hope, regardless of whatever gaps we have, is that we continue to have an openness to the conversation and to influencing change. Because if we stay as whatever we are, if we just say, 'Oh, we've done our job and we're done,' that will be really sad. We always need to be evolving and changing to meet the needs of society. That's what medicine and health are all about, right? So, it should always be reflective and should always be informed, not just by evidence, but also by community-based participation.* "

Appendix A

Interview Structure

By offering aspiring learners a wider range of health professions education through pathway programs, it is possible to illustrate the breadth of opportunities in fields that complement and partner with physicians. This initiative will look at such initiatives in practice, seeking to glean lessons about what works to make such programs successful, and what some pitfalls might be. It will also tackle more broadly the issue of expanding access and opportunities for learners from diverse backgrounds, as well as connecting them to learning, mentoring, and identity formation experiences in the health sciences.

1. What

a. **Please briefly summarize your institution's pipeline/pathways work to expand access and opportunities for learners from diverse backgrounds.**

   i. What programs/initiatives do you currently support? (Please provide a little descriptive detail and particulars about the pathway program(s) you want to discuss with AAHC.)

   ii. What kinds of learners are typically involved?

   iii. What activities are involved?

   iv. What requirements do you have for learners to be involved?

   v. For how long are learners involved?

2. Who - Organizational Structure

a. **Who leads these initiative(s)?**

   i. In what office(s) are they based?

   ii. Is this an established office or was it created specifically for this purpose?

b. **What is the title of the top leader?**

   i. To whom does this person report?

   ii. Do you have an organizational chart?

c. **Is the office that oversees this initiative(s) located in or does it target a specific school (e.g., Medicine, Dentistry) or is the effort interdisciplinary across health professions/schools? If the latter, which colleges are involved?**

   i. Regardless of how the initiative(s) are structured administratively, how do the colleges within the academic health center work collaboratively on creating pathways into the health professions?

   ii. Have faculty been encouraged to engage in your programs?

      1. If so, in what ways - e.g., outreach, instruction, program design, mentoring, other activities?

d. **What is(are) your funding source(s)?**

   i. Do you offer scholarships at any stage?

   ii. Do you offer paid work opportunities that introduce "pathway" students to knowledge, skills, or behaviors (professionalism) that can enhance their standing as applicants to your programs?

3. Recruiting Learners

a. **How do you disseminate information about your programs to learners?**

    i. Are there recruitment events where information is shared with community stakeholders?

    ii. How do community stakeholders (e.g., parents of children K-12; school districts/ teachers; faith organizations; local clubs serving youth and so forth) learn about your pathway programs into/for health professions education?

    iii. Do you have follow-up programs in place as part of your outreach (e.g., for identified students, for participating students, for alumni of the program)?

b. **In your program(s), or in promoting your program, how have you engaged family members of learners in the pipeline/pathway initiative or in recruiting learners to such initiatives? What worked well? What didn't work well?**

c. **In your program(s), or in promoting your program, how have you included other key adult influencers in the lives of these students, such as their teachers or advisors? What worked? What didn't work?**

4. Program Sustainability

a. **How do you track the outcomes of your programs?**

    i. How (and to whom) do you report program outcomes?

b. **How do you sustain program funding and interest?**

c. **Have you experienced the "leaky pipeline"? (attrition of learners) What lessons have you learned from that?**

5. Final Questions

a. **Stepping back for a moment to review all of your work in this area as well as your aspirations----**

    i. What would you say works well and what have you tried that hasn't worked?

    ii. Where do you see yourself along the continuum from a pipeline to pathway approach?

    iii. Going forward, what do you see as your biggest opportunities and biggest challenges? What are your aspirations for the future?

    iv. What else do you want us to know about your pipelines/pathways work?

Appendix B

Interviewees

Dalhousie University	Shawna O'Hearn	*Director, Global Health, Dalhousie University Faculty of Medicine*
East Tennessee State University	David Linville, MD, EdD	*Executive Vice Provost for Academics and Health*
Eastern Virginia Medical School	Ronald Flenner, MD	*Associate Dean for Medical Education*
Howard University	Anthony K. Wutoh, PhD, RPH	*Provost and Chief Academic Officer*
Northern Ontario School of Medicine	Joseph LeBlanc, PhD	*Associate Dean of Equity and Inclusion, Director, Indigenous Affairs Unit, Assistant Professor of Indigenous Health*
Rosalind Franklin University of Medicine & Science	Sandra L. Larson PhD, CRNA, APRN, FNAP	*Vice President of Partnerships, Associate Professor in the Department of Nurse Anesthesia, Rosalind Franklin University of Medicine and Science*
	Shubhik DebBurman, PhD	*Disque D. and Carol Gram Deane Professor of Biological Sciences, Chair of Neuroscience, Chair of Pre-Health Advising, Chair of the Health Professions Program, Lake Forest College*
Sullivan Alliance Florida Alliance	Cynthia Harris, PhD	*Served as key leader for Florida Alliance for Health Professions Diversity (FAHPD), Associate Dean and Director, Institute of Public Health, College of Pharmacy and Pharmaceutical Sciences, Florida Agricultural and Mechanical University (FAMU)*
	Penny A. Ralston, PhD	*Professor, Dean Emeritus & Director, Center on Better Health and Life for Underserved Populations, Florida State University*
	Marchelle Dunston-Lawrence	*Heart of the student scholars program, Administrative Assistant, Institute of Public Health, College of Pharmacy and Pharmaceutical Sciences, Florida Agricultural and Mechanical University (FAMU)*

University of British Columbia	James Andrews	*Indigenous Student Initiatives Manager*
University of Nebraska Medical Center (UNMC)	Dele Davies, MD, MHCM	*Senior Vice Chancellor for Academic Affairs and Dean for Graduate Studies*
University of Southern California	Joyce M. Richey, PhD	*Associate Professor of Clinical Physiology & Neuroscience, Associate Dean for Diversity and Inclusion (Education), Chief Diversity Officer*
Vanderbilt University	Consuelo Wilkins, MD	*Senior Vice President and Senior Associate Dean for Health Equity and Inclusive Excellence*