



Training in Public Health Informatics and Technology Leveraging a Multi-institutional Partnership Model and Emphasizing Experiential Learning

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Abstract

Keywords

- ▶ public health
- ▶ education
- ▶ professional training
- ▶ workforce
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- ▶ informatics
- ▶ diversity
- ▶ partnerships

Background and Objective Though public health is an information-intense profession, there is a paucity of workforce with Public Health Informatics and Technology (PHIT) skills, which was evident during the coronavirus disease 2019 (COVID-19) pandemic. This need is addressed through the PHIT workforce program (2021–2025) by the Office of the National Coordinator for training and to increase racial and ethnic diversity in the PHIT workforce. The objective is to share details on the Training in Informatics for Underrepresented Minorities in Public Health (TRIUMPH) consortium, funded by the PHIT workforce program.

Methods The TRIUMPH consortium is a collaboration between academic and practice partners with a commitment to training 879 students in PHIT. The Schools of Public Health and Nursing at the University of Minnesota, Jiann-Ping Hsu College of Public Health at Georgia Southern University, Morehouse School of Medicine, and Public Health Informatics Institute offer PHIT training through various programs. Academic institutions focus on student recruitment, developing courses/curriculum, and granting degrees/certificates, and the role of practice partners is to support experiential learning through internships/practicums.

Results The TRIUMPH consortium is progressing toward its goals, with 692 students (79%) already trained in a PHIT modality as of December 2023. The learners comprise diverse race/ethnicity, including White (48%), Black/African American (32%), Asian

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(10%), White Hispanic (5%), American Indian/Alaska Native (2%), and Black Hispanic (1%). Numerous internships have been completed in settings ranging from state/local public health agencies to health care delivery systems. Diversity initiatives were supported by partnering with existing programs (e.g., the AMIA First Look program and the Nursing Knowledge Big Data Science conference).

Conclusion This consortium model is an excellent approach to informatics training and sharing expertise across partners. It provides scalability and broader geographic outreach while presenting opportunities to students from underrepresented backgrounds. Lessons learned have implications for overall informatics training (e.g., partnerships models, promoting racial/ethnic diversity).

Background and Significance

Public health agencies support surveillance of numerous communicable infections, chronic diseases, risk factors, cancer, vaccination services/tracking, and environmental assessments.¹ These are evidence-based and data-driven services dependent on informatics and exchanging data with various public health stakeholders.² Given that public health is an information-intensive enterprise, a robust information infrastructure is essential to counter current and future public health threats³ by facilitating data exchange and interoperability within various entities in the public health ecosystem and between clinical care and public health.³ This will also ensure timely, complete, and granular data leading to information that is actionable,⁴ assist in addressing health disparities and inequities,^{5,6} and population-level decision-making.⁷ Many informatics functionalities (e.g., electronic data exchanges, standardized reporting, analytics)⁸⁻¹⁰ were vital during the coronavirus disease 2019 (COVID-19) pandemic¹¹ and are increasingly important in a globally interconnected world.

The National Commission to Transform Public Health Data Systems¹² advocates for a robust public health data system to identify problems, allocate resources, and promote health equity. Just developing information systems and tools may not be adequate. A public health workforce trained in informatics and motivated leadership is critical for effectively leveraging modern information technology (IT) to enhance public health services and decision-making.^{13,14} An informatics-savvy health department is needed, requiring informatics competencies all across the board ranging from workers, managers, and executive leadership.¹⁵⁻²⁰ The Council of State and Territorial Epidemiologists points to informatics as a growth area in public health,²¹ along with meeting the needs of the Data Modernization Initiative²² by the Centers for Disease Prevention and Control. The Public Health Workforce Interests and Needs Survey highlights data and informatics skills gaps in the current workforce.²³ Unfortunately, less than 1% of the public health workforce have informatics roles, though it is a key factor for a strong public health system. This glaring absence of a strong information infrastructure²⁴ and informatics-savvy workforce was brought to light during the COVID-19 pandemic²⁵ and also

starkly reilluminated the health disparities in the United States.

The Public Health Informatics and Technology (PHIT) Workforce Development Program²⁶ funded by the Office of the National Coordinator for Health Information Technology (ONC) aims to tackle the issue of informatics workforce shortage in public health. The objectives are to share details on one of the ONC-funded recipients, the TRaining in Informatics for Underrepresented Minorities in Public Health (TRIUMPH) consortium.²⁷ The overall aims of the current case study are to convey information on PHIT training and lessons learned by the TRIUMPH consortium and to advocate for the ongoing need for PHIT education.

Context and Approach

Public Health Informatics and Technology Workforce Development Program

The PHIT Workforce Development Program's intent is multi-fold and aims to strengthen U.S. public health IT efforts and to increase the representation of underrepresented communities within the public health IT workforce, along with increasing the capacity of minority-serving institutions to train underrepresented minority students²⁶ (refer to **Fig. 1**). Cooperative agreements worth \$75 million were awarded to 10 recipients by ONC for PHIT workforce development. Five thousand individuals are expected to be trained through these 10 sites/consortia focused on individuals from underrepresented backgrounds. One of the funding requirements was a consortia approach to training comprising academic, public health, and community-based partners. The consortia include Historically Black Colleges and Universities, Hispanic Serving Institutions, Asian American and Native American Pacific Islander Serving Institutions, and other institutions of higher education. The recommended PHIT curriculum²⁶ offered by the various recipients focuses on relevant topics: health equity, data aspects of outbreak investigations, public health emergency preparedness/response, public health reporting, standards, and interoperability, collating multiple data, public health analytics, and public policy, among others. One of the key aspects of this workforce development initiative is the emphasis on experiential learning and gaining real-world

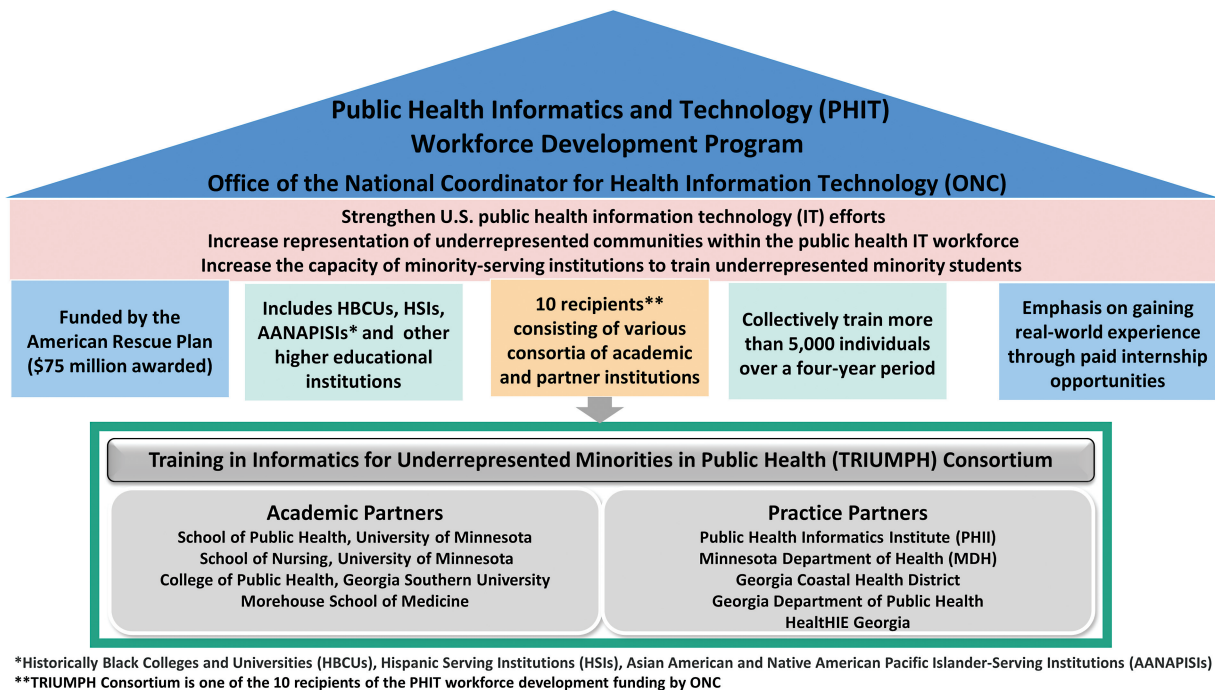


Fig. 1 Public Health Informatics and Technology (PHIT) Workforce Development Program.

experiences through paid internships. The program aims to make a lasting impact on health equity by creating sustainable professional PHIT pathways for underrepresented minority students and trainees.

Training in Informatics for Underrepresented Minorities in Public Health (TRIUMPH) Consortium

The TRIUMPH consortium²⁷ is one of the 10 recipients of the PHIT workforce development. It is a collaboration between academic and practice partners (refer to [Fig. 1](#)). The Schools of Public Health²⁸ and Nursing²⁹ at the University of Minnesota, Jiann-Ping Hsu College of Public Health at Georgia Southern University (GSU),³⁰ Morehouse School of Medicine (MSM),³¹ and Public Health Informatics Institute (PHII)³² offer various PHIT trainings. The academic institutions focus on student recruitment, developing courses/curriculum, formal PHIT-focused education, and granting degrees/certificates, and the role of practice partners is to support experiential learning through internships/practicums. The consortium operates on a collaborative model with shared leadership across the Schools of Public Health and Nursing at the University of Minnesota. The commitment is to train 879 students from September 2021 through September 2025, and a partnership approach is followed with the sharing of resources across the members (refer to [Fig. 2](#)). Some unique aspects of the TRIUMPH consortium are collaboration with the leading biomedical informatics association (American Medical Informatics Association [AMIA])³³ and providing support to an informatics pathway, the AMIA First Look Program.³⁴ Another distinct collaboration is with the Nursing Knowledge Big Data Science (NKBDS) conference³⁵ to introduce PHIT in workshops and to support racial and ethnic diversity. One of the important features to point out about TRIUMPH is the special emphasis

on pathways to public health and PHIT for American Indians (AIs). This led to the hiring of a student coordinator for AI students and collaboration with the Indigidata workshop to provide student support. [Fig. 2](#) represents the above characteristics of the TRIUMPH consortium. A current state evaluation through a Strengths, Weaknesses, Opportunities, Threats (SWOT) highlights the successes and challenges to date and provides a framework for the consortium moving forward.

Results

The TRIUMPH consortium is making progress toward its commitment to PHIT training. [Table 1](#) presents the various courses and programs (MPH in Health Informatics, PHIT certificate, PHIT concentration, PHIT courses) that have been developed and launched by the educational institutions. The academic programs comprise newly developed courses to fit PHIT program needs, adapting existing ones by updating content and including other PHIT-relevant courses. Content was shared among consortium members through program plans and syllabi for various course offerings. Apart from the time and expertise to create the content, all of these needed to be approved by various organizational curriculum committees and obtain institutional-level approval (i.e., approved by the Regents at the University of Minnesota or University System of Georgia, in the case of GSU). The institutions leveraged the consortium by sharing general guidance around approval processes and subsequently templates/flyers, etc., for program marketing. The PHII is focused on training and upskilling the current public health workforce. This is complementary to the workforce training offered by Magnolia Area Health Education Center in collaboration with GSU. An earlier version of the online course by PHII titled “Designing and Managing Public

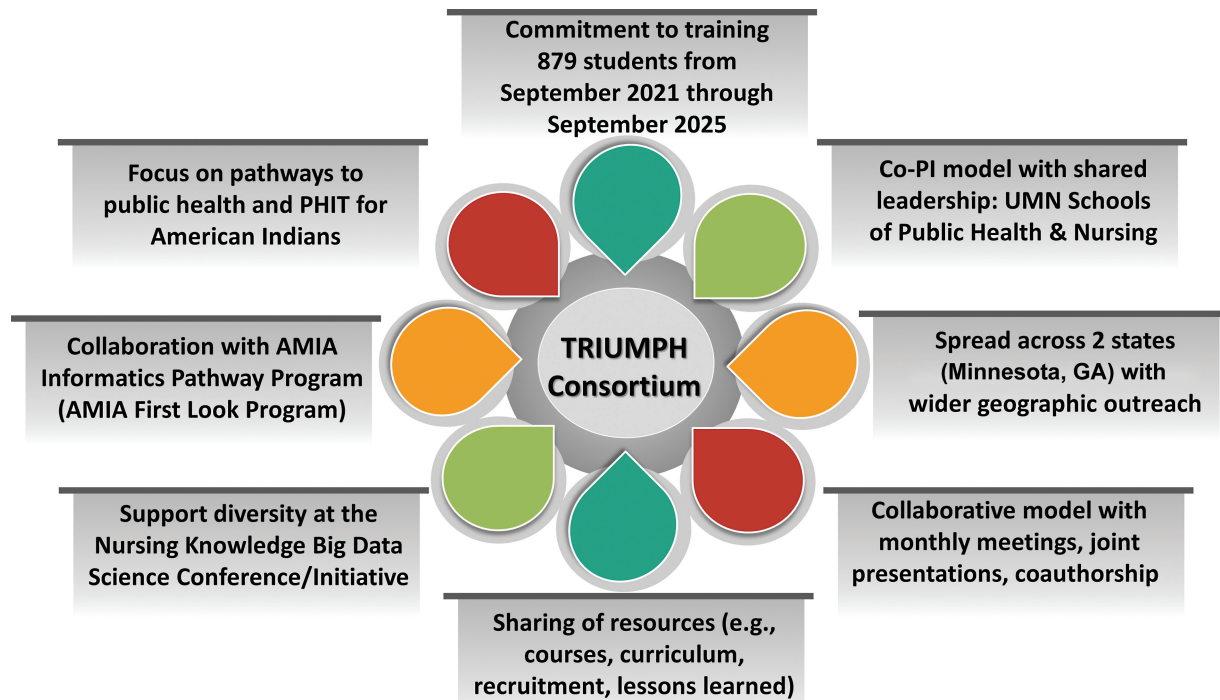


Fig. 2 Key characteristics of the TRIUMPH consortium. AMIA, American Medical Informatics Association; GA, Georgia; PHIT, Public Health Informatics and Technology; TRIUMPH, Training in Informatics for Underrepresented Minorities in Public Health.

Table 1 Trainings offered by Training in Informatics for Underrepresented Minorities in Public Health partners

Institution	Informatics trainings offered (Public Health focus)	Description
University of Minnesota School of Public Health	<ul style="list-style-type: none"> ● Foundational PHIT course (graduate level) 	<ul style="list-style-type: none"> ● New course developed for PHIT program ● Graduate level (2 credits) ● Offered fully online ● Focuses on topics such as public health information systems, interoperability, current PHIT initiatives ● Co-taught with the UMN School of Nursing
	<ul style="list-style-type: none"> ● PHIT-focused practicums for MPH students 	<ul style="list-style-type: none"> ● Repurposed existing applied practice experience (APEX) to focus on PHIT ● Workbook was created for guiding students to focus on informatics aspects of the project/practicum ● Supported with stipend from PHIT funds
University of Minnesota School of Nursing	<ul style="list-style-type: none"> ● Foundational PHIT course (graduate level) 	<ul style="list-style-type: none"> ● New course developed for PHIT program ● Graduate level (2 credits) ● Offered fully online ● Focuses on topics such as public health information systems, interoperability, current PHIT initiatives ● Co-taught with the UMN School of Public Health ● Considered an interprofessional learning experience for the students
	<ul style="list-style-type: none"> ● Population Health Informatics and Technology certificate 	<ul style="list-style-type: none"> ● Newly developed certificate program ● Approved by the Regents of the University of the Minnesota ● Fully online ● Postbaccalaureate program ● 12 credits including the foundational PHIT course noted above ● Includes a practicum component supported with stipend from PHIT funds

(Continued)

Table 1 (Continued)

Institution	Informatics trainings offered (Public Health focus)	Description
Georgia Southern University Jiann-Ping Hsu College of Public Health	<ul style="list-style-type: none"> ● MPH in Public Health Informatics 	<ul style="list-style-type: none"> ● Newly developed MPH program ● Approved by the University System of Georgia ● Fully online program ● 42 credits ● Comprised of newly developed courses, adapted courses to meet PHIT needs and existing courses
	<ul style="list-style-type: none"> ● PHIT courses (undergraduate, graduate, and doctoral) 	<ul style="list-style-type: none"> ● New courses developed which can be taken as part of MPH program noted above or as electives
	<ul style="list-style-type: none"> ● PHIT-focused practicums and preceptorships 	<ul style="list-style-type: none"> ● Repurposed existing applied practice experience (APEX) to focus on PHIT ● Supported with stipend from PHIT funds
	<ul style="list-style-type: none"> ● PHIT training for current public health workforce 	<ul style="list-style-type: none"> ● Expansion of prior partnership with Magnolia Area Health Education Center ● Offers PHIT training in various modalities (workshops/bootcamps/webinars) to current public health workforce
Morehouse School of Medicine	<ul style="list-style-type: none"> ● PHIT course(s) ● Curricular modifications made to existing Biostatistics Laboratory ● PHIT concentration (<i>under development</i>) 	<ul style="list-style-type: none"> ● New course developed for PHIT program (Data and Black Community) ● Graduate level (3 credits) ● Offered in-person (synchronous) ● Highlights the crucial issue of data bias, particularly pertinent to the Black community in context of automated algorithms, predictive models, and Artificial Intelligence systems
Public Health Informatics Institute	<ul style="list-style-type: none"> ● PHIT trainings for current public health workforce through Designing and Managing Public Health Information Systems: 8 Steps to Success course 	<ul style="list-style-type: none"> ● Significant updates to an earlier version of the 8-step course to PHIT program and current public health landscape ● Offered fully online ● Synchronous component includes interactive weekly sessions with faculty and course attendees ● Asynchronous component with various modules for self-paced learning

Abbreviation: PHIT, Population Health Informatics and Technology.

Health Information Systems,” was updated significantly to align with the current public health landscape and included interactive weekly sessions with faculty and course attendees.

As of December 2023, the TRIUMPH consortium has 692 students and is on track to complete the goal of 879 students by September 2025 (refer to ▶Fig. 3). This aligns well with the overall ONC program timeline as the grant duration is from September 2021 through September 2025. As ▶Fig. 3 portrays, one of the academic partners (Jiann-Ping Hsu College of Public Health at GSU) was successful in the launch of its brand new MPH in Public Health Informatics (online) program accompanied by good student recruitment. As noted earlier, racial/ethnic diversity initiatives were supported by partnering with existing programs such as the AMIA First Look program and the NKBDS conference. The learners (as of December 31, 2023) are diverse, comprising White (48%), Black/African American (32%), Asian (10%), White and Hispanic (5%), AI/Alaska Native (2%), Black and Hispanic (1%), Mixed race (1%), and Prefer not to answer (1%).

Given the importance of experiential learning and the program’s focus on gaining real-world experiences through

internships, practicums, and preceptorships, efforts were made to create these opportunities and offer them to students. These were paid and the amount was determined based on the federal predoctoral training stipend rate, credit load, and time devoted to the internship. ▶Table 2 lists the various academic options (practicum, Applied Practice Experience [APEX]) through which an internship was offered, the internship process, the various sites/settings, select feedback from mentors and the key output from these experiences. It displays the breadth of internships across public health agencies, health care delivery systems, and other nonprofit organizations involved in PHIT work and has served as a launchpad for career advancement. The UMN School of Public Health developed a PHIT workbook for students to synthesize key informatics aspects from their internships. ▶Table 3 presents the evaluation conducted to date through institutional venues (student rating of teaching at UMN) and feedback solicited through postcourse assessments. It portrays both positive input and also suggested program enhancements. This feedback is discussed during monthly consortium meetings as needed to solicit ideas for

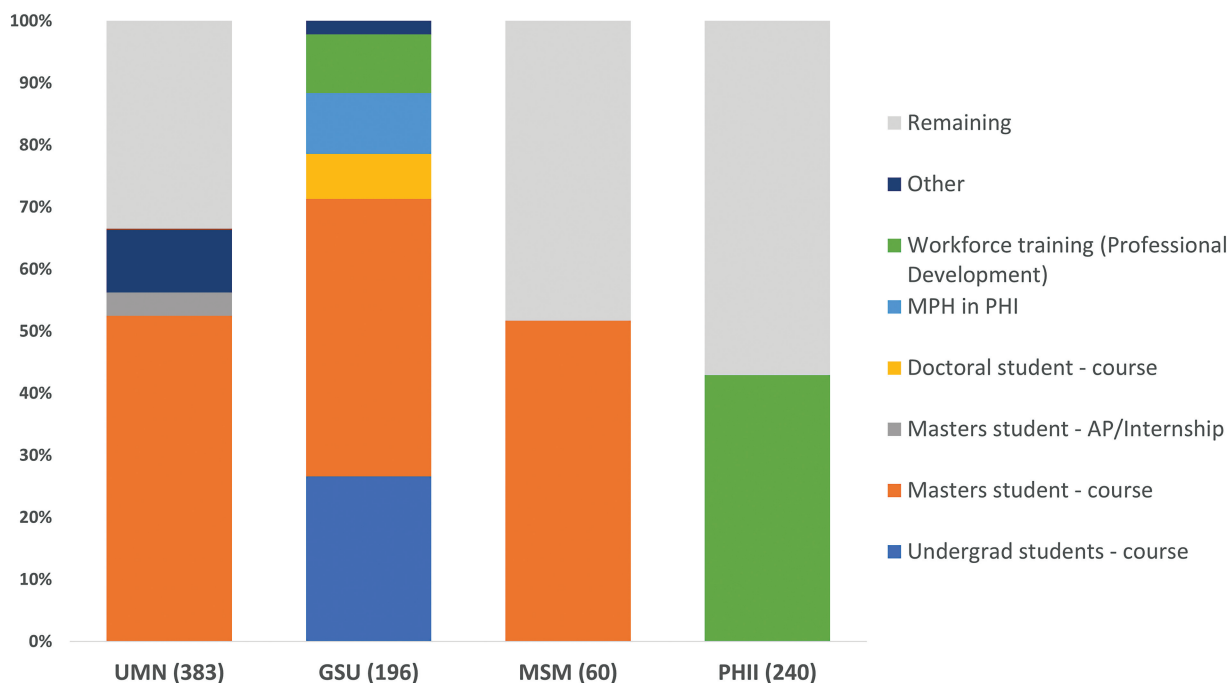


Fig. 3 TRIUMPH progress dashboard for PHIT training. GSU, Georgia Southern University; MSM, Morehouse School of Medicine; PHII, Public Health Informatics Institute; PHIT, Public Health Informatics and Technology; TRIUMPH, Training in Informatics for Underrepresented Minorities in Public Health.

improvement. Other topics that are routinely discussed during the consortium meetings comprise tips/referrals for student placements for internships, current issues, lessons learned, recent challenges and successes across didactics, and practicum/internships.

Discussion

Current large-scale Health Informatics and Technology policies^{36,37} and the National Academy of Medicine³⁸ underscore the need for interoperable information systems. Recent recommendations from reputable entities emphasize the need to transform the U.S. public health system to protect health and achieve health equity. These include the U.S. government accountability report,³⁹ the Building Back Better report,⁴⁰ and AMIA policy briefs and papers.^{11,41} All emphasize investing in the public health workforce and the importance of informatics-savvy staff as a key pillar to support data-driven and equitable public health. This underscores the value offered by the various ONC-funded PHIT workforce development programs.

Some unique aspects of the TRIUMPH consortium include a multidisciplinary core team including many with PHIT expertise, strong connections with operational public health, and an interest in PHIT research to make contributions to the field. The consortium has been cognizant of sustainability from the start with key programs (PHIT certificate at UMN, PHIT concentration at MSM, and MPH in Public Health Informatics at GSU) being well-integrated into existing academic structures, instead of a one-off grant effort. Another key aspect is leveraging the unique position of the PHIT program in a nursing educational ecosystem, which brings

PHIT offerings to a different set of learners interested in this topic. The new organizational partnerships for internships/practicums will be appealing for student recruitment and future jobs. The consortium leadership has been proactive in developing collaborations with other PHIT consortia through joint research work and presentations, leading to exchange of ideas and partnerships of mutual benefits to PHIT programs.

Lessons Learned

One of the hurdles in launching the programs was the various layers of approvals required at the department/School/University levels and the time and effort needed to make this happen. This resulted in delays in the development of courses/programs, lag in marketing, and subsequent cascading effects impacting student recruitment. Despite a consortium model, the academic partner sites were functioning as independent entities due to issues with academic credit transfer across institutions. Securing internships was dependent on faculty time adding to their workload, due to the lack of an internship coordinator position at UMN programs. There are significant challenges in being hired by public health agencies due to the fact that PHIT skills are not congruent with the current job postings, accompanied by bureaucratic red tape with job postings and overall hiring practices. Given the movement toward public health modernization and the growing need for PHIT skills, informatics should be included as a core competency in the accreditation criteria for Schools and Programs of Public Health.⁴² The last two require advocacy and changes to procedures and policies to make an impact, but definitely needed for PHIT growth and sustainability. — **Table 4** presents a synthesis of lessons

Table 2 Sample informatics internships to provide experiential learning

Internship type	Internship process	Sample internship sites/settings	Select feedback from mentors	Key outputs
Graduate level, UMN School of Nursing Practicum (2 credits over a semester)	<ul style="list-style-type: none"> Newly created internships to meet PHIT needs Newly created process for student stipends with PHIT funds Utilized existing practicum to tie to academic credits Will be continued to be offered through the practicum process for nursing students and as independent credit offering for other students Projects were created by faculty by matching interests to potential mentors and sites No formal application process, but decisions made after discussions/meetings 	<ul style="list-style-type: none"> Minnesota Department of Health Mayo Clinic Health System (Rochester) University of Minnesota Medical Center Planned Parenthood, North Central States Pthreeg.ai (HIT consultancy firm) 	<p>“Collaborating with our academic partners to provide applied practice experiences in public health informatics is a key component in developing skilled workforce in informatics and data science. An informatics savvy workforce is critical to the future of public health as work toward achieving our objectives for data modernization.”</p> <p>“Having students integrated into public health surveillance system activities has helped in showcasing the amount of work behind providing a single number or simple answer and the importance of understanding the impact a small change in data interoperability can make.”</p>	<ul style="list-style-type: none"> Accepted posters in regional and national conferences (e.g., 2024 AMIA Clinical Informatics Conference, 2024 Midwest Regional Nursing Society Annual Conference) Strengthened profile to apply for CDC Public Health Informatics Fellowship Program and was accepted to the program Motivation to pursue the DNP Nursing Informatics degree
Graduate level, UMN School of Public Health Applied Practice Experience (APEX), Summer semester	<ul style="list-style-type: none"> Available to all MPH students with an informatics interest Required to complete the PHIT workbook Newly created process for student stipends with PHIT funds Utilized existing applied practice experience to tie to academic credits No formal application Student interest and projects tracked by the project manager 	<ul style="list-style-type: none"> Minnesota Department of Health Office of Native American Health U.S. Department of Health and Human Services, Administration for Strategic Preparedness and Response Ecumen (nonprofit senior services organization) Hennepin County Department of Public Health Hennepin County Central Administration Scientific Technologies Corporation (Phoenix) 	<p>“The student was able to identify appropriate ways to leverage the data in the software to identify interventions. She is professional and able to articulate her objectives very well... Her work was effective and impactful.”</p> <p>“The student learned a lot about crisis mapping and was able to contribute to mapping some rural areas in his home country that were previously unmapped in the organization's databases.”</p>	<ul style="list-style-type: none"> Completed project(s) to meet the site requirements Strengthened profile to apply for CDC PHI fellowship program Secured a job using skills gained
Graduate level, GSU Jiann-Ping Hsu College of Public Health, APEX (3 credits)	<ul style="list-style-type: none"> Supported by an internship coordinator Priority of paid internships/APEX for MPH in PHI students Available to all MPH students with an informatics interest Newly created process for student stipends with PHIT funds Utilized existing applied practice experience to tie to academic credits No formal application 	<ul style="list-style-type: none"> Gwinnett, Newton, Rockdale Public Health Rosalynn Carter Institute Georgia Department of Public Health OphyCare (digital health infrastructure organization) University of Florida Health-Center for Health Equity and Engagement Research 	<p>“Having an intern is an affordable solution to aid in bolstering the local public health labor force crisis. Through this experience, we strive to better prepare new graduates and early career professionals with critical on-the-job competencies for when they advance into and through the workforce.”</p>	<ul style="list-style-type: none"> Selected as a Class 7 fellow in Applied Public Health Informatics with the Council of State and Territorial Epidemiologists Featured as a successful PHIT practicum project in 2023 ONC Annual Meeting

Abbreviations: AMIA, American Medical Informatics Association; APEX, Applied Practice Experience; CDC, Centers for Disease Prevention and Control; CSTE, Council of State and Territorial Epidemiologists; GSU, Georgia Southern University; ONC, Office of the National Coordinator for Health Information Technology.

Table 3 Select comments from assessments and suggestions for program enhancements

Value addition of PHIT training	
University of Minnesota Joint offering by Schools of Public Health and Nursing ● Foundational PHIT course (PubH 6718/NURS 6881)	- "I enjoyed this course and learned a lot in a short period of time." - "The practical assignments were really a great learning tool." - "I very much enjoyed the assignments in which we got to apply the materials in an activity such as the deduplication and design gathering requirements and SQL query; they were very beneficial. More of these types of assignments if possible would be great experiences."
Georgia Southern University Jiann-Ping Hsu College of Public Health ● Health Informatics and Decision Making PHIT Course (PHLD 9231) ● Public Health and Healthcare Information Systems Course (PHIN 7702 01F) ● Health Informatics Course (HSPM 7236 01F)	- "This course has opened my eyes to issues related to interoperability challenges in the U.S. healthcare system and other parts of the world. As a public health professional, understanding this issue is very helpful. Dr. Shah's course materials, such as published papers and a textbook, are very helpful. I enjoyed reading these materials thoroughly. This is an excellent course!!" [PHLD 9231] - "All of the materials provided for this course and required helped me gain a stronger understanding of health informatics and how they are utilized. Also, I gained a better sense of how these systems improve the overall healthcare system in my everyday life, working for a Public Health system." [PHLD 9231] - "This was a great class and helping me to learn the importance of reviewing and reading data. Furthermore, the class helped me see the different tests needed to determine certain outcomes and data privacy. The health terminology quizzes were good way to learn medical terminology especially for someone who doesn't have a medical background." [HSPM 7236 01F]
Morehouse School of Medicine ■ Data and the Black Community course (MPH 630)	- "I love that it focuses on the data and algorithms that reflect disparities in communities." - "The class would benefit social and behavioral students more than epidemiology students."
Public Health Informatics Institute course ■ 8 steps to success	- "It was elegantly designed with the right mix of contributors and PHII facilitation. I have a much clearer vision of what my role is now as an informatician and our team's function within the agency."
University of Minnesota PHIT internship ■ NURS 7109 practicum	- "Coordinating projects with external partners involves a great deal of uncertainty. I think both instructors helped me manage these uncertainties and navigate appropriate scoping for my project."
PHIT pathways programs	
2023 AMIA First Look Program	- "I would recommend the program to others" - "I would consider a career in informatics"
2023 Nursing Knowledge Big Data Science Initiative	- "Broadened understanding of technologies and uses of data and informatics" - "It helped me look more into informatics and how I can further research the subject."
Suggestions for curriculum and program enhancements	
UMN PHIT course ● (PubH 6718/NURS 6881)	"I think having some direct exposure through practicum or group activities with a State or Local Health Department would give a deeper perspective into PHIS."
PHII 8-steps course	"Perhaps further discussion about data equity and how to ask the right questions to get the correct data when designing information systems."
UMN PHIT internship ● NURS 7109 practicum	"Provide clear communication about the topics and requirements."

Abbreviations: AMIA, American Medical Informatics Association; COVID-19, coronavirus disease 2019; ONC, Office of the National Coordinator for Health Information Technology; PHII, Public Health Informatics Institute; PHIT, Public Health Informatics and Technology; TRIUMPH, Training in Informatics for Underrepresented Minorities in Public Health.

learned to date by the TRIUMPH consortium through a SWOT framework and highlights some of the successes and challenges. The numerous strengths listed highlight the vibrancy of the consortium partners which will be needed to offset the weakness and act upon the perceived opportunities and

threats. This SWOT analysis will be used as guidance to determine future consortium priorities.

There are limitations to this case study on the TRIUMPH consortium, one of which is that this is a single example, and so the approach and results may not be generalizable. The

Table 4 Current state of strengths, weaknesses, opportunities, and threats

Strengths	Weaknesses	Opportunities	Threats
Internal to TRIUMPH consortium and inclusive of all academic and practice partners		External to TRIUMPH consortium and influenced by regional/national factors	
Secured funding from ONC for creation of PHIT training programs	Funding restrictions on expenses that are covered, including noncoverage for tuition	Increasing awareness of the need for an informatics-savvy workforce in public health	Accreditation criteria for the Schools of Public Health are not updated to recognize the need for informatics education in public health
Established PHIT courses and PHIT programs in academic institutions	Numerous approval processes at department/college/university level to develop and deliver training programs	A huge influx of funding for public health data modernization which includes workforce	PHIT workforce funding by ONC is a one-time influx of dollars triggered by pandemic
Sustainable presence of PHIT courses/programs through institutional and leadership approvals	Limited awareness of the importance of public and population health informatics training	Advocacy by creation of a Public Health Informatics and Technology Competency Model in partnership with the U.S. Department of Labor	Lack of dedicated national funding for PHIT training
Developed a model of stipend-supported informatics learning experiences through practicums/internships	Competing priorities for PHIT content as regular versus elective course offerings	National efforts to create standard position descriptions for public health workforce	Changing attitudes and laws around diversity and equity work threatens work and its continuation
Created a network of mentors and sites to support future student learning experiences/practicums	Lack of mechanisms for paid practicums after PHIT grant	Potential to increase interest and awareness in public health leadership on the importance of informatics	Hiring issues due to misalignment between PHIT skills and job postings
Generated PHIT interest across a wide base of students across various programs	Project timeline is not long enough to demonstrate impact	Chance to build on current interest to lay the path for PHIT workforce development (e.g., better salaries, updated competencies, academic pathway)	Lack of interest in a public health career due to low salaries, lack of esteem, and political polarization of public health
Receipt of very positive feedback on courses and project-based learning experiences	Cumbersome mechanisms to support (funding/other) practice partners and mentors	Build upon the data literacy skills that were stimulated while dealing with the COVID-19 pandemic	Decentralized, and fragmented public health structure leading to variability in PHIT capabilities and workforce capacities
Demonstrated success of some students who recently completed PHIT training	Academic partners functioning as independent entities due to issues with credit transfer across institutions		
Dedicated faculty with PHIT expertise and public health experience	Lack of dedicated student/internship coordinator for PHIT training		
Unique position in a nursing program with PHIT training to a different set of interested learners			
Structured approaches to partnership (e.g., monthly meetings, sharing of course syllabi/program plans, tips for student placements)			
Collaborations with other PHIT consortia through joint research work and presentations leading to exchange of ideas and partnerships of mutual benefits to PHIT programs			

Abbreviations: COVID-19, coronavirus disease 2019; ONC, Office of the National Coordinator for Health Information Technology; PHIT, Public Health Informatics and Technology; TRIUMPH, Training in Informatics for Underrepresented Minorities in Public Health.

Note: Noted by TRIUMPH Consortium Partners as of April 2024.

academic and practice partners, their training programs and approaches to collaboration are unique to this consortium. The 10 recipients of the federal PHIT workforce development

program have different characteristics (e.g., size of the main recipient institution, number of students being trained, number of partners, approaches to student internships,

geographic reach). Funding is a big driver and informal partnerships to boost PHIT capacity may operate differently. Nevertheless, this consortium model needs to be evaluated and scaled up further to boost PHIT training to meet the increasing demands of an informatics-savvy workforce in public health.

Conclusion

This consortium model is a great approach to informatics training and for sharing expertise across partners. It offers scalability in terms of better geographic outreach, and also in offering various options to underrepresented students. One of the Healthy People 2030 objectives under consideration is to enhance the use and capabilities of informatics in public health (PHI-R06).⁴³ Numerous approaches need to be explored to scale-up informatics capacity and this partnership model spread across institutions is an option for consideration. Lessons learned have implications for overall informatics training (e.g., partnerships models, promoting racial/ethnic diversity, sustainability, accreditation criteria revision, revisiting hiring practices in public health).

Clinical Relevance Statement

An informatics-savvy workforce in public health is essential for the success of various PHIT initiatives that are being implemented to decrease the burden of provider reporting in health care. A modernized information infrastructure in public health supported by PHIT-trained staff has important implications for robust public health surveillance. This partnership model can be utilized for informatics training in other domains including clinical/nursing informatics.

Multiple-Choice Questions

1. What are some of the top workforce issues relevant to informatics in public health?
 - a. Lack of an informatics-savvy workforce
 - b. Less than 1% in public health informatics-related roles
 - c. Limited training options focused on public health informatics
 - d. Lack of racial/ethnic diversity in the workforce
 - e. All of the above.

Correct Answer: The correct answer is option e. One of the reasons that public health was overwhelmed during the COVID-19 pandemic was issues related to workforce along with an outdated public health information infrastructure. In order for initiatives such as the Data Modernization Initiative in public health to be successful, the workforce issues need to be addressed. The background provides the relevant contextual information.

2. What is the advantage of pursuing a partnership model for providing informatics training?
 - a. Sharing of resources for training and student recruitment

- b. Scalability of training by providing many options
- c. Collaborate on approaches to increase racial/ethnic diversity in workforce
- d. Build a wider professional network for students
- e. All of the above.

Correct Answer: The correct answer is option e. There are numerous benefits to a partnership model for informatics training, and this is shared in various sections of the manuscript across results and discussion. This partnership model can be utilized for informatics training in other domains including clinical/nursing informatics.

Protection of Human Subjects

Not applicable as this case study focuses on education and not research.

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Conflict of Interest

None declared.

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