The SARS-CoV-2 Pandemic: Real-Time Training and Service for Preventive Medicine Residents

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ABSTRACT

The 2020 SARS-CoV-2 pandemic created a unique opportunity for Public Health/General Preventive Medicine (PH/GPM) and Occupational and Environmental Medicine (OM) residents to contribute to pandemic public health response activities. We surveyed all 18 Health Resources and Services Administration (HRSA)–funded PH/GPM and OM residency program directors to evaluate program and resident involvement in pandemic response activities from January 1 through June 30, 2020. Of 116 residents, 110 (95%) participated at some level in the response activities including screening/testing, contact tracing, surveillance, data analysis, incident command, provider support, reopening, direct patient care, education, and risk communication. Residents' response activities were in multiple settings, such as state, local, and federal health agencies; hospital systems; long-term care facilities; academic centers; local businesses and labor unions; Federally Qualified Health Centers; homeless shelters; and clinics. Residents' participation was facilitated by their training in public health, epidemiology, the care of patients and populations, and emergency preparedness. Programs should continue to promote these experiences and key roles that PH/GPM and OM residents can play, as this leadership is a necessity for the successful navigation of future major public health events. As the pandemic continues, evaluation of residents' experiences will help guide longer-term changes to program curriculum and partnerships. Many trainees' contributions and expertise met both educational and service goals and therefore should be integrated into ongoing pandemic response work in PH/GPM and OM programs.

KEY WORDS: COVID-19, Health Resources and Services Administration, pandemic, Preventive Medicine residency, SARS-CoV-2, service, training

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The Health Resources and Services Administration (HRSA)–supported Preventive Medicine (PM) Residency Training Grant program currently supports 15 residency programs in Public Health and General Preventive Medicine (PH/GPM) and 3 residency programs in Occupational and Environmental Medicine (OM). Two of these programs (one PH/GPM and one OM) are located at the same university, for a total of 17 grants that fund 18 residency programs.[1]

Residency programs in these specialty areas equip physicians with core competencies in the domains of public health, PM, and the medical care of populations. The SARS-CoV-2 pandemic has generated enormous demand for physicians who possess such competencies, as well as unique specialty-specific real-time educational and training opportunities that otherwise were available only through simulation activities.

Residents in PH/GPM and OM are well suited for pandemic response activities because of competencies they acquire through the unique blend of training they receive in public health, epidemiology, the care of patients and populations, and emergency preparedness, as outlined in the residency program requirements promulgated by the Accreditation Council for Graduate Medical Education (ACGME).[2] Subsequent board certification in PM by the American Board of Preventive Medicine further attests to a physician's expertise and competencies that are relevant to addressing public health emergencies.[3] The SARS-CoV-2 pandemic has highlighted the need for training of physicians in these skill areas[4-6]—training that makes it possible for PH/GPM and OM residents to respond to such emergencies even in the midst of residency training that helps prepare them for careers and leadership in protecting populations from major health threats.[7] This article reports on a survey of the current HRSA-funded PH/GPM and OM residency program directors for the purpose of characterizing their programs' and residents' activities and contributions in response to the SARS-CoV-2 pandemic.

Methods

Program directors from the 18 HRSA-funded PH/GPM (n = 15) and OM (n = 3) residency programs responded to an open-ended survey regarding resident activities related to SARS-CoV-2 pandemic response from January 1 through June 30, 2020. Survey topics were derived from ideas submitted by e-mail and from a group discussion by program directors. Ten specific topics were selected for inclusion: screening/testing; contact tracing; surveillance; data analysis; incident command; provider support; reopening; direct patient care; education; and risk communication. The option of "other" topics also was included (Table).

For each topic/activity, the respondent was asked to record information in 4 areas: the number of residents involved in the activity; the organizational location of the activity (eg, health department, academic medical center, clinic); a description or example of the residents' work; and comments on lessons learned, new partners, and implications for the residency curriculum going forward. The survey was available in a shared spreadsheet that allowed multiple users to respond simultaneously. After the deadline for data entry, the responses were reviewed, grouped into common themes, and recorded.

Results

The aggregate number of residents in the 18 programs was 116, of whom 110 (95%) participated in SARS-CoV-2–related responses. Residents' roles were embedded in multiple levels of the response, such as state, local, and federal health agencies; local hospital systems; and educational institutions.

The majority of programs worked in the areas of screening and testing, surveillance, contact tracing, and risk communication (Table). Activities in these categories addressed organization of testing sites, development of operating practices, tracking tools, testing protocols, return-to-work policies,[8] and contact tracing processes. The majority of programs also involved residents in development of surveillance systems for academic medical centers, state and local health departments, and local businesses, and in tracking of positivity rates and preparing for surge testing and health care needs.

Programs and their residents provided substantive support to their home academic centers, sponsoring health systems, local and state health departments, and community groups through data analysis, assuming leadership roles in incident command, and providing program planning/leadership and support advising about reopening of business, educational, and congregate care facilities. Examples included developing statistical models, tracking racial/ethnic disparities, monitoring special populations (eg, persons who were homeless, persons in long-term care facilities, and health care workers), developing materials to support providers' transition to virtual care, surveying best practices for clinical care in inpatient and outpatient settings, and providing technical assistance and site visits for reopening and staffing.

Some residents had direct responsibility for patient care in primary care, specialty care, and inpatient settings and, relatedly, were involved in expanding

TABLE
Programs and Activities Involving HRSA-Supported Preventive Medicine Residencies in Response to the SARS-CoV-2 Pandemic

Category	Setting (Public Health, Health System, Clinical Setting, Community)	Description
Screening/testing 12 programs 28 residents	Veterans Affairs Medical Center, state and/or local public health departments, health system, academic medical center, hospital, community-based organizations, long-term care facilities	Organized testing sites—developed standard operating procedures, monitored inventory; screened and tested individuals; developed tracking tools; developed testing protocols; tracked persons exposed and released to return to work; tracked persons experiencing homelessness
Contact tracing 14 programs 43 residents	State and/or local public health departments, health system, academic medical center	Implemented contact tracing for employee health occupational medicine clinic, returning travelers and deceased cases (through next of kin); participated as part of state epidemiology team performing outbreak investigation; staffed surge teams that performed contact tracing
Surveillance 10 programs 24 residents	State and/or local public health departments, health system, academic medical center, long-term care facility, community health center	Monitored cases and deaths; tracked test results and managed data for long-term care facilities; organized surveillance system for health care workers; assisted with implementation of CDC's state-based hospitalization surveillance system; automated information sharing; completed case reports for multisystem inflammatory syndrome in children
Data analysis 11 programs 25 residents	State and/or local public health departments, health system, long-term care facilities	Performed statistical modeling to predict cases and death rates; analyzed system-level case data; analyzed data on hospitalized patients to identify racial/ethnic disparities; contributed to coronavirus disease 2019 (COVID-19) research studies
Incident command 13 programs 30 residents	State and/or local public health departments, health system	Participated in incident command for health systems and health departments; designed and implemented shelter and clinic for persons experiencing homelessness; established hotline (for state or health system); participated in state-level response addressing COVID-19 in nursing home facilities
Provider support 13 programs 39 residents	State and/or local public health departments, health system, long-term care facilities, outpatient-based clinical setting	Provided educational presentations to health care providers; developed handouts for clinics on testing; developed online support services; supported human resources by developing materials for job modifications due to high-risk medical conditions; developed new pandemic response rotation; developed materials to support clinic/providers' transition to virtual care; participated on "strike teams" to perform site visits to skilled nursing facilities; served as consultants to public health teams for medically complex patients; performed survey of best practices for persons experiencing homelessness; developed guidance for dentists; developed personal protective equipment guidance
Reopening 10 programs 27 residents	National organizations (American Academy of Pediatrics), state and/or local public health departments, health system, long-term care facilities, outpatient-based clinical setting, local businesses (day care center, art museum, shelter services)	Provided technical assistance to various community organizations on infection prevention/control and steps to reopen; served on task force for travelers going out of country; developed materials to educate employees on safe reopening practices; developed plans to allow visitors in skilled nursing facilities; participated in briefings for local phased reopening; supported American Academy of Pediatrics chapter on schools reopening; served on task force for safe reopening of outpatient practices; developed guidance for schools and summer camps; developed prevention processes with unionized grocery workers
Direct patient care 11 programs 36 residents	Veterans Affairs Medical Center, academic medical center, outpatient-based clinical setting (occupational/nonoccupational, people experiencing homelessness, local public health clinics, primary care)	Provided telehealth visits for patients with COVID-19 symptoms; developed COVID-19 risk-reduction measures for primary care and specialty clinics; increased time in regular primary, specialty and inpatient care; provided testing and isolation monitoring; provided employee health and return-to-work guidance after testing/screening; reported test results to patients

(*continues*)

TABLE
Programs and Activities Involving HRSA-Supported Preventive Medicine Residencies in Response to the SARS-CoV-2 Pandemic (*Continued*)

Category	Setting (Public Health, Health System, Clinical Setting, Community)	Description
Education 12 programs 35 residents	State and/or local public health departments, health system, academic medical center, school of public health, hospital, long-term care facilities, community health center	Presented webinar/training on personal protective equipment and motivational interviewing for other medical trainees; supervised and developed curriculum for other medical workers and staff; developed Web platform, technical assistance and care protocols for congregate living; developed testing and return-to-work question and answer guidelines for clinicians; developed written and Web-based patient education materials; advised clinicians about COVID-19 risk reduction
Risk communication 13 programs 39 residents	State and/or local public health departments, health system, outpatient-based clinical and mental health care settings, community-based organizations	Developed employee communications; provided risk education for special populations; provided manager and employer training on reopening safety; provided new refugee education on COVID-19; provided medical direction and risk communication for isolation hotels; participated in media communications
Other 6 programs 8+ residents	CDC and Prevention, state and/or local public health departments, academic medical center, community-based organizations	Assisted with development of international travel advisory; advised on long-term care personal protective equipment and planning; supported faculty and residents to integrate with state health officials through all listed programs (data analysis, education, patient communication); led outbreak investigation; improved data quality on deaths; improved employee stress assessment

Abbreviation: CDC, Centers for Disease Control and Prevention.

telehealth and capacity for using virtual platforms for asynchronous work. The residents also provided education to a variety of groups in several settings, including patients; nongovernmental organizations and advocacy groups; medical students; residents and fellows of other medical specialties; physician staff at academic centers, Federally Qualified Health Centers, and public health departments; and in virtual training environments (eg, Coursera, webinars, graduate public health classes).

Of note, several residents served at leadership levels in the response, such as serving as part of incident command structures, developing programs and policies to address the pandemic, and developing new clinics and educational programs. Some program directors noted that residents increased the visibility of the specialty among health system leaders who previously were unaware of the skills and capacity developed in this training.

Discussion

The varied roles and activities performed by HRSA-funded PH/GPM and OM residents during the SARS-CoV-2 pandemic highlight the importance of this training as physicians in pandemic response, health service evaluation, leadership, and the care of populations in a Graduate Medical Education (GME) program.[9] This specialty, while unique in its focus on population and community health, is also distinguishable by its capability to complement the roles of other medical specialties to provide individual patient care. Despite these strengths, few hospitals fund these programs, and PH/GPM and OM residency training has not been maximized to support the public health and medical capacities required for meeting the challenges of present and future public health crises. The current level of federal (HRSA) grant funding that supports PH/GPM and OM residency training is $7.299 million and has been awarded to only 18 of the 66 total US PH/GPM and OM programs.[10] The specialty has pioneered a "Train-in-Place" approach, which allows a higher output of graduating residents per unit of grant dollars spent, as resident training sites remain a source of employment,[11] but reform of GME funding mechanisms is required to ensure that this funding meets the national population health needs.[12]

Early in the pandemic response, the ACGME identified relevant priorities for all GME training programs during the pandemic. The ACGME's Residency Review Committee (RRC) for PM issued guidance in response to the COVID-19 pandemic regarding flexibility in activities that counted as direct patient care during the pandemic, including providing telephone guidance to patients and providers; creating decision support tools; and participating in clinical-based research activities.[13]

Implications for Policy & Practice

- The essential roles and activities performed by HRSA-funded PH/GPM and OM residents during the SARS-CoV-2 pandemic underscore the importance of the PM GME residency specialty and especially its necessary role in helping ensure the health of US communities.
- Federal support for the training of PM specialists and for public health infrastructure is critical in light of the ongoing and future anticipated crises that will threaten the public's health.
- As the pandemic continues to evolve, all PH/GPM and OM residents and program directors should review the activities documented in this report to ensure resident skills and training opportunities are being fully utilized and continue to provide benefit to the SARS-CoV-2 pandemic response.
- Strong training and practical experiences in pandemic response helps in preparing PH/GPM and OM residents to take leadership roles in clinical and public health settings.

The flexibility provided by the RRC enabled residency programs and their residents to provide and augment services in great need in both public health and direct patient care as described in this article. At the same time, however, there existed the requirement for ensuring the safety and oversight of residents participating in response activities, including, for example, the provision of adequate personal protective equipment (PPE), supervision, and enforcing the limit of maximum duty hours (80 hours per week). Our findings show that these HRSA-funded residents were able to play a role in ensuring the safety of coworkers by training in use of PPE, implementation of workforce protection protocols, and development of safe quarantine, isolation, and return-to-work protocols.

As the pandemic continues, evaluation of residents' experiences will help guide longer-term changes to program curriculum and partnerships. Many trainees' contributions and expertise met both educational and service goals and therefore should be integrated into ongoing pandemic response work in PM programs. It is important to recognize that other non–HRSA-funded programs likely achieved similar success in implementing critical PM tasks during the pandemic. Although only HRSA-funded programs were surveyed for this article, it is important to recognize that other PH/GPM and OM programs likely achieved similar success in implementing critical PM tasks during the pandemic.

Conclusions

HRSA-funded PH/GPM and OM programs were able to provide significant programmatic and leadership resources at the time of the SARS-CoV-2 pandemic onset. In jurisdictions in which these programs are located, the rapid reassignment of PH/GPM and OM residents in support of pandemic response activities enabled residents to immediately put into practice skills acquired in training in multiple response categories and settings. During this pandemic, residents' unique skills were especially helpful in activities involving pandemic response and public health administration, while also of benefit in direct patient care and complementary to activities of residents in primarily clinical specialties. As the pandemic evolves, the residents can also draw upon their specialty-specific skills in vaccination to promote public awareness; acceptance; and equitable access, distribution, and administration. The lessons learned by PM residents during the current pandemic response will equip them to lead and act in future public health emergencies.

The ongoing SARS-CoV-2 pandemic illustrates the substantial expertise and capacity needed to counter emerging infectious diseases and other public health threats. Ensuring the public's health is a critical function of government and communities that necessitates commensurate resources to ensure preparedness and response capacity. Physicians trained in PH/GPM and OM are key to helping ensure this capacity.

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