Improving Collaboration Between Public Health and Medicine: A Timely Survey of Clinician Public Health Knowledge, Training, and Engagement

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Abstract

Objective: To assess the core knowledge of health indicators, federal health programs, and public health functions in practicing clinicians along with perceptions of their education and engagement with public health.

Patients and Methods: A paper survey in booklet form was administered to attendees at 2 general medical conferences in May 2019. The survey was divided into 5 sections: knowledge of health systems and policy, knowledge of public health concepts and function, public health engagement, public health education, and demographics.

Results: One hundred two surveys were received from 402 attendees (response rate, 24.3%). Most were male (56%), older than 50 years (51%), and physicians (86%). Respondents had a fairly good knowledge of federal health programs (77%) and public health functions (84%), but less than half had a personal interaction with public health in the past 2 years (45%) or were aware of how to work with public health organizations in their community (46%). Only a few respondents rated their public health training as good or excellent during their primary degree (7%) or graduate medical education (15%), and most (75%) were interested in learning more about public health and health policy.

Conclusion: Respondents had generally good foundational knowledge of federal health programs and public health functions, although some gaps were identified. Inclusion of health policy and public health topics in continuing medical education would be well received by clinicians. To improve collaboration between public health and medicine, public health should personally engage clinicians more and explain how they can work together to improve population health.

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The recent coronavirus disease 2019 (COVID-19) pandemic has brought an acute awareness about public health and its important role in maintaining the health of the US population to both the public and the medical community. It is widely acknowledged that before the current outbreak, the practices of medicine and public health have often worked in separate silos with less than ideal collaboration. The sudden and urgent need for close public health and medicine partnership to combat the COVID-19 pandemic has highlighted the importance of having a systematic and well-developed infrastructure connecting the 2 fields. Several major medical professional societies and respected health care organizations have called for a closer collaboration, if not integration, between public health and medicine to improve population health outcomes. Although there has been widespread acknowledgment of the benefits of working together, the progress toward successful integration has been slow.

To successfully collaborate and improve health indicators at both an individual and a population level, physicians require a foundational understanding of the working structure,
functions, and policies affecting public health. We identified only 3 studies that assessed various aspects of practicing physician knowledge of federal health programs and public health functions. A 2009 publication of urgent care providers reported that only 19% were aware of the requirement to report clinically diagnosed pertussis and most were not familiar with the subsequent actions of public health in addressing reported cases. A survey of physicians in Tennessee revealed that only 53% of attending physicians were familiar with which diseases required reporting and the timeline for reporting them. Finally, a survey of otolaryngologists revealed a fair level of knowledge of the Patient Protection and Affordable Care Act (ACA) with some specific knowledge gaps.

Considering the paucity of information characterizing baseline physician public health knowledge, we surveyed clinicians about their understanding of federal health programs and public health functions as the foundational knowledge needed to best engage with their public health partners. We also queried respondents about their previous public health education during training, their level of engagement with local public health, and their interest in continuing medical education (CME) about health policy and public health.

PATIENTS AND METHODS

This pilot study was determined to be exempt from institutional review board review. To our knowledge, there is no validated survey or assessment tool that measures the broad foundational knowledge of US health policies and public health structure and function in practicing clinicians. We began by writing questions about federal health systems and insurance programs, health indicators, and public health structure and function that we deemed were the practical knowledge physicians need to ideally engage local public health and address social determinants of health. Several published guidelines on public health competencies for physicians and other clinicians include knowledge of health systems and public health structure and function among a broad array of competencies. We sought the input of 3 experts (1 internal and 2 external to our institution) in the fields of health policy and medical education in the early stages of questionnaire development. An initial draft of the survey was administered to a sample group of general internists in the Division of General Internal Medicine at our institution. We then narrowed the questions to key topics we felt represented the desirable practical knowledge for practicing clinicians to best engage public health and advocate for their patients while being mindful of the length of the survey. Feedback from this sample group was incorporated into a second draft of the questionnaire, which was then administered to members of the Division of Preventive, Occupational, and Aerospace Medicine at our institution. The results from this last group who had expertise in preventive medicine were used to modify further and create the final survey.

The final version of the survey was divided into 5 areas (see Appendix, available online at http://www.mcpiqojournal.org): (1) knowledge of health systems and policy, (2) knowledge of public health concepts and function, (3) public health engagement, (4) public health education, and (5) demographics. The format of knowledge questions included multiple choice, yes/no, and true/false. Assessment of previous public health education used Likert scales for levels of agreement. The survey was printed in a booklet and then distributed to attendees at 2 national internal medicine conferences in May 2019 with a registered attendance of 100 and 320, respectively. In one conference, the survey was administered at the registration desk. At the other conference, the organizers invited participants to complete the survey that was available outside the meeting room. Completed surveys were collected in person. A pen was offered to respondents as a token of appreciation for participation. Study data were entered into Research Electronic Data Capture (REDCap) and analyzed with descriptive statistics by using the Microsoft Excel.

RESULTS

Study Population

The survey was administered at 2 national internal medicine conferences in May 2019. The total number of participants was 420, with 102 responses received (response rate, 24.3%). Eighty-four respondents (82%)
completed all the knowledge questions. The characteristics of the survey respondents are noted in Table 1. Most were male (54 of 96 [56%]), with 51% (49) older than 50 years and 82% (79) having 11 or more years in practice. Most respondents were physicians (83 of 97 [86%]), 78% (74) of whom had received their medical degrees in the United States. About 8% (8) of respondents were advanced practice registered nurses, and 5% (5) were physician assistants. Six percent reported having a master’s degree in public health. Practice type varied, with 44% (34) in private practice and 31% (24) at an academic center. Approximately, one-fifth (21) of the respondents practiced in a rural community and 59% (60) practiced in a small- or medium-sized city.

Knowledge of Health Systems and Policy

Respondents were knowledgeable about most aspects of the ACA (weighted average, 84.1% correct) except for the removal of a lifetime cap on medical spending by insurance, which only 62% (62) answered correctly (Table 2). Similarly, respondents understood the ACA’s role in decreasing the uninsured rate (83 of 100 [83%]) and that most uninsured people are US citizens (90 of 99 [91%]); however, fewer (72) knew that most uninsured households do have at least 1 full-time worker (73%).

When evaluating common health status indicators, 94% (83) were aware that the

| TABLE 1. Demographic Characteristics of Survey Participants (N=102) |
|-------------------------|------------------|----------------|
| Characteristic          | Respondents | n | %  |
| Sex                     |              | 96 |     |
| Female                  | 42          | 43.8 |
| Male                    | 54          | 56.3 |
| Age (y)                 | 96          |    |     |
| 20-30                   | 5           | 5.2 |
| 31-40                   | 17          | 17.7 |
| 41-50                   | 13          | 13.5 |
| 51-60                   | 26          | 27.1 |
| 61-70                   | 23          | 24.0 |
| >70                     | 0           | 0.0 |
| Professional degree type| 97          |    |     |
| MD                      | 80          | 82.5 |
| DO                      | 3           | 3.1 |
| APRN                    | 8           | 8.3 |
| PA                      | 5           | 5.2 |
| Other                   | 1           | 1.0 |
| Years in practice       | 96          |    |     |
| 0-5                     | 18          | 18.8 |
| 6-10                    | 9           | 9.4 |
| 11-20                   | 16          | 16.7 |
| >20                     | 63          | 65.6 |
| Clinical degree obtained in the United States | 95 | 74 | 77.9 |
| Additional graduate degree (master’s/PhD) | 102 | 15 | 14.7 |
| Practice setting        | 101         |    |     |
| Outpatient primary care | 55          | 54.5 |
| Outpatient and inpatient primary care | 12 | 11.9 |
| Academic generalist    | 8           | 7.9 |
| Hospitalist/inpatient practice | 9 | 8.9 |
| Medical specialty practice | 8 | 7.9 |
| Surgical specialty practice | 0 | 0.0 |
| Not currently in practice | 5 | 5.0 |
| Practice type           | 78          |    |     |
| Solo practice           | 6           | 7.7 |
| Group private practice  | 28          | 35.9 |
| Hospital owned          | 0           | 0.0 |
| Federally qualified health center | 9 | 11.5 |

*Population 20,000-100,000.

*Population 100,000-300,000.

*Population >300,000.

| TABLE 1. Continued |
|---------------------|------------------|----------------|
| Characteristic      | Respondents | n | %  |
| Veterans Administration | 0   | 0.0 |
| Academic medical center | 24 | 30.8 |
| Practice location   | 101         |    |     |
| Rural               | 21          | 20.8 |
| Suburban            | 10          | 9.9 |
| Small city/large town | 32 | 31.7 |
| Medium city         | 28          | 27.7 |
| Large city          | 10          | 9.9 |

Knowledge of Health Systems and Policy

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When evaluating common health status indicators, 94% (83) were aware that the
United States spends more on health care per person than do other high-income countries, 85% (74) knew that life expectancy in the United States was not among the top 5 countries, and 75% (65) knew that infant mortality in the United States was not ranked among the best 3 nations.

Regarding knowledge of federal health insurance programs, participants were less knowledgeable about Medicare and Medicaid than the ACA. Particular areas of weakness were the source of payment for long-term custodial nursing home care (31 out of 86 [36%] selected Medicare instead of Medicaid), which benefits different parts of Medicare cover (57 out of 86 [66%] answered correctly), and how many Americans receive Medicaid (only 16 out of 88 [18%] of respondents had the correct answer).

Interestingly, although a small sample size precluded formal statistical analysis, there did
not appear to be a substantial difference in knowledge of health systems and policy when analyzing sex, age, practice type, and practice location. There is a suggestion of knowledge differences between those trained in the United States and clinicians trained outside the United States (Table 3).

### Knowledge of Public Health Concepts and Function

There was good knowledge overall of social determinants of health; however, 40% (34 of 86) incorrectly included personality traits (Table 4). Ninety-one percent (81 of 89) understood that these determinants contribute substantially more to health outcomes than do medical interventions.

Only 60.7% (54) of those surveyed understood that it is not the primary function of public health to be the medical provider of last resort or to be a medical safety net. Most understood the function, depth, and breadth of the Centers for Disease Control and Prevention (CDC) capabilities, but 64% (56) incorrectly thought that the CDC was a regulatory agency. About a quarter of respondents (23 of 88 [26%]) did not think that the CDC was involved with occupational safety and environmental health. A substantial percentage of the respondents (29 of 87 [33%]) were unaware that public health authorities can have access to protected health information for the purpose of preventing or controlling disease or injury.

Respondents generally scored highly on surveillance activities by public health. Almost all (82 of 86 [95%]) correctly identified a requirement to report reportable diseases to public health; 99% understood the purpose of surveillance and that vital statistics are used to track morbidity and mortality trends (98%). There was somewhat less familiarity with the Behavioral Risk Factor Surveillance System (70 of 85 [82%]) and influenza surveillance (69 of 87 [79%]).

Common functions of state health departments were fairly well understood, but there was less knowledge about public health’s regulatory function over hospitals and nursing homes (61 of 87 [70%]) and maintenance of birth, death, and marital certificates (68 of 87 [78%]). Common functions of local health departments were well understood, but 47% (41 of 87) thought that health departments performed fire safety checks, which is usually the purview of the local fire department.

In looking at the data stratified by subgroups, there did not appear to be a difference in performance on questions about public health structure and function between sexes, age group, location of medical training, practice type, and practice location (Table 3).

### Table 3. Stratified Results According to Participant Characteristics

| Subgroup variable | Health systems and policy domain (percent correct) | Public health structure and function domain (percent correct) |
|-------------------|---------------------------------------------------|-------------------------------------------------------------|
| **Sex**           |                                                   |                                                             |
| Female            | 76.8                                              | 87.8                                                        |
| Male              | 78.4                                              | 86.9                                                        |
| **Age (y)**       |                                                   |                                                             |
| <50               | 75.0                                              | 88.0                                                        |
| >50               | 78.8                                              | 86.9                                                        |
| **Medical school location** |                               |                                                             |
| United States     | 79.0                                              | 87.7                                                        |
| Outside the United States | 72.1                                              | 88.1                                                        |
| **Practice type** |                                                   |                                                             |
| Academic          | 79.0                                              | 88.5                                                        |
| Nonacademic center| 76.9                                              | 87.0                                                        |
| **Practice location** |                                               |                                                             |
| Medium/large city | 80.1                                              | 89.7                                                        |
| Rural/suburban/small city | 75.9                                              | 86.0                                                        |
| Question                                                                 | Respondents | Correct answers | Percent correct |
|-------------------------------------------------------------------------|-------------|----------------|-----------------|
| Which of the following are considered social determinants of health?    |             |                |                 |
| Housing and environmental surroundings                                   | 88          | 85             | 96.6            |
| Income stability                                                         | 88          | 87             | 98.9            |
| Access to food                                                           | 87          | 86             | 98.9            |
| Personality traits                                                       | 86          | 52             | 60.5            |
| Social integration                                                       | 87          | 73             | 83.9            |
| Social determinants of health contribute substantially more to health outcomes than medical interventions | 89          | 81             | 91.0            |
| The US public health system's main purpose is to serve as a safety net and provide medical care for the poor | 89          | 54             | 60.7            |
| Which of the following are true of the CDC?                              |             |                |                 |
| Available 24/7 to respond to public health emergencies                   | 88          | 84             | 95.5            |
| With other federal agencies, responds to natural disasters and bioterrorism | 89          | 77             | 86.5            |
| A regulatory agency that oversees public health activities of public and private organizations | 88          | 32             | 36.4            |
| Activities include global disease protection with staff working in many countries outside the United States | 87          | 78             | 89.7            |
| Activities include occupational safety and environmental health          | 88          | 65             | 73.9            |
| Has a helpline to answer questions from the public and professionals      | 89          | 85             | 95.5            |
| Which of the following are true of public health surveillance?           |             |                |                 |
| The Reportable Disease List is a list of diseases in each state that health care providers and medical facilities are legally obligated to report to the health department | 86          | 82             | 95.4            |
| Surveillance programs are in place to detect epidemics, health problems, and changes in health behaviors | 87          | 86             | 98.9            |
| The influenza surveillance system uses reports from physicians about how much influenza-like illness they are seeing each week | 87          | 69             | 79.3            |
| The Behavioral Risk Factor Surveillance System is a telephone survey conducted annually regarding health behaviors and chronic health conditions | 85          | 70             | 82.4            |
| Vital statistics are used to detect mortality and morbidity trends       | 87          | 85             | 97.7            |
| Functions of a state health department typically include which of the following? |             |                |                 |
| Maintenance of birth, death, and marital certificates                    | 87          | 68             | 78.2            |
| Licensing and regulation of hospitals and nursing homes                  | 87          | 61             | 70.1            |
| Investigation of infectious disease outbreaks                            | 87          | 81             | 93.1            |
| Collecting data on the incidence or prevalence of infectious diseases and chronic disease | 86          | 80             | 93.0            |
| Maintain public health laboratories capable of screening all newborns for >30 inherited and congenital disorders | 86          | 75             | 87.2            |
Public Health Engagement

Only 45% (43 of 96) of respondents had a personal interaction with their local health department in the previous 2 years, whereas 68% (65 of 96) had received written or electronic communication from either a local or a state health department. Only 46% (44 of 95) agreed or strongly agreed that they were aware of opportunities to work with public health organizations in their community (see the Figure).

**TABLE 4. Continued**

| Question                                                                 | Respondents | Correct answers | Percent correct |
|--------------------------------------------------------------------------|-------------|-----------------|-----------------|
| Local health department activities typically include all of the following:|             |                 |                 |
| Immunization clinics                                                     | 87          | 84              | 96.6            |
| Fire safety checks in public buildings                                   | 87          | 46              | 52.9            |
| Licensing and inspection of food service establishments                   | 87          | 75              | 86.2            |
| Testing water for drinking and swimming                                   | 87          | 79              | 90.8            |
| Helping to draft local policies and ordinances to improve the health of the community | 87 | 86 | 98.9 |
| Assessing the health needs of the community and creating an action plan | 87          | 86              | 98.9            |
| HIPAA allows public health authorities to receive protected health information without authorization for the purpose of preventing or controlling disease, injury, or disability | 87 | 58 | 66.7 |

CDC = Centers for Disease Control and Prevention; HIPAA = Health Insurance Portability and Accountability Act.

**FIGURE.** Aspects of public health engagement by percentage of respondents. PH = public health.
Public Health Education

Only 7% (7) of respondents rated their public health education during their primary medical degree program as either “good” or “excellent,” and one-third characterized it as “poor.” Somewhat more (14 of 91 [15%]) felt they received “good” or “excellent” training during graduate medical training (residency or fellowship). Three-quarters of the respondents (72 of 96) agreed or strongly agreed that they would be interested in learning more about public health and health policy in CME conferences (Table 5).

| Question                                                                 | Respondents | n  | %    |
|--------------------------------------------------------------------------|-------------|----|------|
| I have had a personal interaction with the local health department in the past 2 y | 96          | 43 | 44.8 |
| I have received written or electronic communication from the local or state health department in the last year | 96          | 65 | 67.7 |
| I am aware of opportunities to work with public health organizations (“agree” or “strongly agree”) | 95          | 44 | 46.3 |
| I rate my public health education in primary degree training as “good” or “excellent” | 96          | 7  | 7.3  |
| I rate my exposure to public health topics in residency/fellowship as “good” or “excellent” | 91          | 14 | 14.6 |
| I am interested in learning about public health and health policy at continuing education conferences | 96          | 72 | 75.0 |

DISCUSSION

Our study was prompted by a concern that clinicians’ knowledge of federal health programs and the structure and functions of public health was suboptimal and could be hampering collaboration and engagement with public health. Our survey of attendees at 2 general medical conferences in the spring of 2019 yielded mixed results. Participants had a fairly good baseline knowledge of federal health programs, health indicators, and public health functions, but areas of substantial knowledge gaps were identified, particularly with regard to federal health programs. Respondents had limited interaction with their local health departments and were not familiar with how to engage with local public health. A minority felt that their public health education was good or excellent, but with curriculum changes in the past 5 years, a younger group of physicians may feel differently.

To our knowledge, this is the first study to assess broad foundational health system and public health knowledge and a self-assessment of public health education in practicing physicians. The importance of including public health and health systems topics in medical training has been recognized by leaders in both undergraduate and graduate medical education.11,17-20 Since 2010, the Liaison Committee on Medical Education, the accrediting body for allopathic medical schools, has required inclusion of public health and preventive medicine in the curriculum.21 In 2013, the American Medical Association (AMA) spearheaded an effort to transform medical education and update the curriculum to “ensure medical school graduates can effectively translate and apply the basic and clinical sciences to become physicians who meaningfully improve patients’ health at the individual, community and population level.”22 The goal of the Accelerating Change in Medical Education program was to go beyond the 2 pillars of basic and clinical sciences initiated by the Flexner Report more than a century ago and develop a third pillar that they titled “Health Systems Science.” Health Systems Science encompasses 6 core curricular domains: health care structures and processes, health care policy, economics and management, clinical informatics, population health, value-based care, and health system improvement.23

There are only a few assessments of medical school and residency public health training in the literature, with most published before
the changes advanced by the AMA in 2013. Existing studies have found a wide variation in the amount of health policy education contained in curricula but were broadly felt to be suboptimal.\textsuperscript{24-27} In 2008, the Association of American Medical Colleges surveyed graduating medical students about the adequacy of education in health systems, health policy, and public health. One-third of the students felt that their public health education was inadequate, and 46.9\% felt health policy instruction was inadequate.\textsuperscript{11} In the studies that assessed knowledge, medical students exhibited substantial gaps with regard to understanding health care systems and health policy.\textsuperscript{27-29} A 2018 study of public health coursework in the curricula of Florida medical schools found variation in subjects covered and time allotted but overall increased public health content.\textsuperscript{21} A 2019 survey by the Association of American Medical Colleges found that 30.2\% of graduating medical school seniors planned to participate in public health activities during their careers, a notable increase from 25\% in 2015.\textsuperscript{30} These trends suggest that the AMA’s steps to transform medical education may be having a positive effect.

Although progress is being made in medical education, our survey provides a preliminary assessment of the state of public health knowledge, engagement, and previous education of practicing clinicians. To increase collaboration between medicine and public health with the goal of improving the health of communities, clinicians should understand the core functions of public health and how reporting, tracking, and responding to trends in chronic and infectious diseases, policy development, health promotion, and access to care affect the health of their patients. The survey results indicate that clinicians have a fairly good knowledge of the ACA and health indicators, with some gaps in knowledge with regard to Medicare and Medicaid. Respondents were largely familiar with public health functions, but many incorrectly believe that the primary function of local health departments is to serve as the safety net medical provider in their community (39\%). Although assurance of medical services is 1 of the 10 essential functions of public health,\textsuperscript{37} direct patient care by local public health departments has been declining over the past 30 years.\textsuperscript{32-34} This is likely due to a combination of funding pressures, growing complexities of providing medical care and navigating reimbursement, and the competing pressures of delivering on other core public health functions. A 2016 survey of local health departments found that only 11\% provided comprehensive primary care, 29\% housed well child clinics, and 27\% offered prenatal clinics. However, 60\% or more had programs providing vaccinations and the screening and treatment of tuberculosis and non–human immunodeficiency virus sexually transmitted diseases.\textsuperscript{34} Although about one-third of the survey respondents were unaware that public health authorities can access protected health information, it is likely that many legal aspects of public health, such as emergency powers and access to Health Insurance Portability and Accountability Act–protected records for public health purposes, will be better appreciated after experiences with the COVID-19 pandemic.

Approximately one-third of our survey respondents felt that their public health and health policy education was poor. Given that 51\% (49) of our respondents were older than 50 years, they likely had not been exposed to the new curricula. New graduates may have a different view of their educational experience.

Engagement with local public health departments was relatively low. Less than half of those surveyed had a personal interaction with their local health department in the previous 2 years. In spite of having more frequently received written or electronic communication, less than half knew how to meaningfully work with public health organizations in their community. A survey by the New York City Health Department of practicing physicians in 2009 to 2010 found that physicians generally valued the information they received from public health, but were not aware of important resources provided by the health department. The authors recommended more frequent and timely outreach to physicians along with use of technology by local health departments to better engage physicians.\textsuperscript{35} Ten years later, our survey findings indicate that clinicians are still
uncertain about how public health can help them with their patients, which similarly suggests that more active outreach by local public health, beyond written and electronic communications, would be beneficial in improving this understanding.

This pilot study was limited by a small sample size of family practice and internal medicine clinicians. Practitioners from urban and suburban areas were underrepresented. These sampling issues prevented an in-depth statistical analysis of the other variables collected.

Our study was challenged by the lack of a validated survey instrument to assess the knowledge and public health engagement of practicing clinicians. From the outset, we acknowledged that this survey could not be a comprehensive assessment of practitioner knowledge of these topics. We attempted to balance the competing tensions of assessing baseline health systems knowledge and conceptual understanding of public health functions while limiting the length of the survey to improve our completion rate. For future surveys, the questions about public health functions may need refining to more accurately discriminate knowledge levels, increase content regarding public health’s role in chronic diseases, and concentrate more on vital functions, such as emergency powers, particularly in light of the current COVID-19 outbreak.

Incomplete surveys appeared to follow a pattern that may have been due to a mechanical issue in which 2 pages of the booklet sometimes stuck together or may have reflected an avoidance of the more difficult knowledge questions. Accordingly, the denominator used for the calculation of results depended on how many answered that specific question. Had we included the total number of surveys returned as our denominator for all calculations, the percent correct would have been at least 10% less for several of the knowledge questions. Thus, the results tend to overestimate participants’ knowledge.

Lastly, 6% of survey respondents had degrees in public health that likely biased results favorably on the knowledge questions.

Future investigations might include a larger sample size and more diverse types of practitioners. Our study examined the clinician side of this partnership. A similar assessment of public health practitioners’ understanding of health systems, clinical structures, and the types of services clinicians need help with to improve population health would also be helpful and guide future program development. Surveying clinicians about their understanding and engagement with public health after experience with the COVID-19 pandemic may inform future efforts to improve collaboration.

**CONCLUSION**

The call for closer collaboration between public health and clinical medicine has been a part of the medical dialogue for more than 30 years. Although there have been substantial inroads toward this goal in medical education and some successes at the community level, we have not achieved broad-based and systematic integration between the 2 fields. We postulate that to achieve successful collaboration and improve health indicators, there should be some foundational understanding of each other’s functions and capacities. Health policy and public health, like medicine, are dynamic fields. Maintaining competency will require that the medical community integrate more health policy and public health topics into CME courses for practicing clinicians. Three-quarters of our survey respondents indicated an interest in attending CME programs in public health. We have found that using a current public health “hot topic,” such as the recent measles and vaping outbreaks, provides a good vehicle to engage conference attendees on public health concepts. Strategic use of CME could bridge existing knowledge gaps and improve public health engagement.

It is likely that the COVID-19 pandemic has increased the awareness of physicians and the general public about the function and vital importance of public health to our nation’s health. Our survey results suggest that more active outreach by local health departments to the medical community, beyond written and electronic communications, may help clinicians better understand how they can work with public health. We hope that the current crisis will reinvigorate support
for increasing public health infrastructure and capacity. Increased funding could provide resources for public health to engage actively with clinicians in addressing long-standing important drivers of health indicators outside of an infectious disease emergency, such as social determinants of health and other contributors to chronic disease.

**SUPPLEMENTAL ONLINE MATERIAL**

Supplemental material can be found online at: [http://www.mcpiqojournal.org](http://www.mcpiqojournal.org). Supplemental material attached to journal articles has not been edited, and the authors take responsibility for the accuracy of all data.

**Abbreviations and Acronyms.** ACA = Patient Protection and Affordable Care Act; AMA = American Medical Association; CDC = Centers for Disease Control and Prevention; CME = continuing medical education; COVID-19 = coronavirus disease 2019

**Potential Competing Interests:** The authors report no competing interests.

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**REFERENCES**

1. Kuo AA, Thomas PA, Chilton LA, Mascola L; Council on Community Pediatrics and Section of Epidemiology, Public Health and Evidence. Pediatricians and public health: optimizing the health and well-being of the nation’s children. Pediatrics. 2018;141(2):e20173848.
2. American Academy of Family Physicians. Integration of primary care and public health (Position Paper). https://www.aafp.org/about/policies/all/integrateprimarycareandpublichealth.html. Accessed October 22, 2018.
3. American College of Physicians. Strengthening the Public Health Infrastructure in a Reformed Health Care System. Philadelphia, PA: American College of Physicians; 2012. Policy Paper.
4. Beitsch LM, Brooks RG, Glasser JH, Cogle YD Jr. The medicine and public health initiative: ten years later. Am J Prev Med. 2005;29(3):149-153.
5. Institute of Medicine. Primary Care and Public Health: Exploring Integration to Improve Population Health. Washington, DC: The National Academies Press; 2012.
6. Linde-Feucht S, Coulouros N. Integrating primary care and public health: a strategic priority. Am J Public Health. 2012;102(suppl 3):S310-S311.
7. Koo D, Felix K, Dankwa-Mullan I, Miller T, Waalen J, A call for action on primary care and public health integration. Am J Public Health. 2012;102(suppl 3):S307-S309.
8. Staez CJ, Gesteland PH, Allison M, et al. Urgent care providers’ knowledge and attitude about public health reporting and pertussis control measures: implications for informatics. J Public Health Manag Pract. 2009;15(6):471-478.
9. Fill MM, Murphree R, Pettit AC. Healthcare provider knowledge and attitudes regarding reporting diseases and events to public health authorities in Tennessee. J Public Health Manag Pract. 2017;23(6):581-588.
10. Rocke DJ, Thomas S, Puscas L, Lee WT. Physician knowledge of and attitudes toward the Patient Protection and Affordable Care Act. Otolaryngol Head Neck Surg. 2011;145(2):229-234.
11. Maeshiro R, Johnson L, Koo D, et al. Medical education for a healthier population: reflections on the Flexner Report from a public health perspective. Acad Med. 2010;85(2):211-219.
12. Allan J, Barwick TA, Cashman S, et al. Clinical prevention and public health curriculum framework for health professions. Am J Prev Med. 2004;27(5):471-476.
13. Clinical prevention & population health curriculum framework. Association for Prevention Teaching and Research website. https://www.teachpopulationhealth.org/. Accessed November 16, 2020.
14. Morley CP, Rosas SR, Mishori R, Jordan W, Jarris YS; Family Medicine/Public Health Competencies Work Group, Prunuske J. Essential public health competencies for medical students: establishing a consensus in family medicine. Teach Learn Med. 2017;29(3):255-267.
15. Harris PA, Taylor R, Thieke R, Payne J, Gonzalez N, Conde JG. Research Electronic Data Capture (REDCap)—a metadata-driven methodology and workflow process for providing translational research informatics support. J Biomed Inform. 2009;42(2):377-381.
16. Harris PA, Taylor R, Minor BL, et al. REDCap Consortium. The REDCap consortium: building an international community of software partners [published online ahead of print May 9, 2019]. J Biomed Inform. https://doi.org/10.1016/j.jbi.2019.103208.
17. Koo D, Thacker SB. The education of physicians: a CDC perspective. Acad Med. 2008;83(4):399-407.
18. Gorski P, Kuo A. Community pediatrics: navigating the intersection of medicine, public health and social determinants of children’s health. Pediatrics. 2013;131(3):e263-268.
19. Policy priorities to improve our nation’s health: how medical education is changing. Association of American Medical Colleges website. https://www.aamc.org/system/files/2/472906-howmedicalizeducationischanging.pdf. Accessed April 14, 2020.
20. Association of American Medical Colleges. Teaching Residents Population Health Management. Washington, DC: Association of American Medical Colleges; 2019.
21. St. Onge JE, Cari AM, Horgan VE. Integration of public health in LCMC accredited medical schools in Florida: a survey based study. Cureus. 2019;11(7):e5213.
22. Skoczylak SE, Hawkins RE, Lawson LE, Starr SR, Borkan JM, Gonzalo JD; AMA Education Consortium. Preface. In: Health Systems Science. 1st ed. Philadelphia, PA: Elsevier; 2017.
23. Accelerating change in medical education: creating the medical schools of the future. American Medical Association website. https://www.ama-assn.org/education/accelerating-change-medical-education/creating-medical-schools-future. Accessed February 27, 2020.
24. Mou D, Samaa A, Sethis R, Menyman R. The state of health policy education in U.S. medical schools. N Engl J Med. 2011;364(10):e19.
25. Patel MS, Lyppson ML, Davis MM. Medical student perceptions of education in health care systems. Acad Med. 2009;84(9):1301-1306.
26. Calanotti JS, Papiel DK, Duwell MM, Price JH, Miles JC. Public health training in internal medicine residency programs: a national survey. Am J Prev Med. 2014;47(5 suppl 3):S360-S367.
27. Emili S, Nagurney JM, Mok E, Prislin MD. Attitudes and knowledge regarding health care policy and systems: a survey of...
medical students in Ontario and California. CMAJ Open. 2014; 2(4):E288-E294.

28. Agrawal JR, Huebner J, Hedgecock J, Seghal AR, Jung J, Simon SR. Medical students’ knowledge of the U.S. health care system and their preferences for curricular change: a national survey. Acad Med. 2005;80(5):484-488.

29. Winkelman TNA, Antiel RM, Davey CS, Tilburt JC, Song JR. Medical students and the Affordable Care Act—uninformed and undecided. Arch Intern Med. 2010;170(20):1603-1605.

30. Medical school graduation questionnaire: 2019 all schools summary report. American Association of Medical Schools website. https://www.aamc.org/system/files/2019-08/2019-gq-all-schools-summary-report.pdf. Accessed November 16, 2020.

31. Defining Public Health Practice: 25 Years of the 10 Essential Public Health Services. Environmental Scan; 2019. https://phnci.org/uploads/resource-files/Defining-Public-Health-Practice-25-Years-of-the-10-Essential-Public-Health-Services.pdf. Accessed October 25, 2020.

32. Hsuan C, Rodriguez HP. The adoption and discontinuation of clinical services by local health departments. Am J Public Health. 2014;104(1):124-133.

33. National Association of County and City Health Officials (NACCHO). Local Public Health Agency Infrastructure: A Chartbook. Washington, DC: NACCHO; October 2001.

34. National Profile of Local Health Departments. National Association of County and City Health Officials (NACCHO) website. https://www.naccho.org/resources/lhd-research/national-profile-of-local-health-departments. Accessed April 14, 2020.

35. Parton HB, Perlman SE, Koppaka R, Greene CM. Putting public health into practice: a model for assessing the relationship between local health departments and practicing physicians. Am J Public Health. 2012;102(suppl 3):S333-S335.