

The Public Health Practitioner of the Future

The requisite capacities and capabilities of the public health practitioner of the future are being driven by multiple forces of change, including public health agency accreditation, climate change, health in all policies, social media and informatics, demographic transitions, globalized travel, and the repercussions of the Affordable Care Act.

We describe five critical capacities and capabilities that public health practitioners can build on to successfully prepare for and respond to these forces of change: systems thinking and systems methods, communication capacities, an entrepreneurial orientation, transformational ethics, and policy analysis and response.

Equipping the public health practitioner with the requisite capabilities and capacities will require new content and methods for those in public health academia, as well as a recommitment to lifelong learning on the part of the practitioner, within an increasingly uncertain and polarized political environment. (*Am J Public Health*. 2017;107:1227–1232. doi:10.2105/AJPH.2017.303823)

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 See also DeSalvo, p. 1205.

In the April 2016 issue of *AJPH*, DeSalvo et al. proposed a “Public Health 3.0” upgrade to “boldly expand the scope and reach of public health” as a means of addressing social determinants of health, the high cost of health in the United States and the country’s relatively low ranking in terms of life expectancy, and persistent gaps in health status.¹ The necessary components of this upgrade would include enhanced leadership (with local public health agency directors being the “lead health strategists” in their communities); new partners (elected leaders, businesses, people from sub-populations at the greatest risk for poor health); accreditation (of governmental health agencies); technology, tools, and data; new metrics of success; and an adequate and reliable funding stream. In his Shattuck Lecture in 2015, Frieden described a future of public health that involved closer working relationships with clinical medicine, particularly regarding the prevention, control, and treatment of infectious and chronic diseases.²

In a recent editorial³ and review⁴ on macro trends affecting public health practice, we identified several “forces of change” that are exerting an impact on current governmental public health practice: the 2010 Patient Protection and Affordable Care Act (ACA), public health agency accreditation,

climate change, health in all policies, social media and informatics, demographic transitions, and globalized travel. We also described possible approaches to measuring, tracking, and understanding the effects of these forces of change on public health practice, including the use of evidence-based public health, practice-based research, and policy surveillance.

Here we describe five critical capacities and capabilities that public health practitioners can build upon to successfully prepare for and respond to these forces of change. After a brief description of these capacities and capabilities, we provide additional commentary on what they will mean for public health academia, taking into consideration the Framing the Future initiatives of the Association of Schools and Programs of Public Health⁵ and the revised accreditation criteria of the Council on Education for Public Health (CEPH).⁶ The earlier-cited articles on forces of change were written and accepted for publication prior to the 2016 US presidential election; however, although the forces of change are themselves evolving under the new

administration, we believe that the five capacities and capabilities we describe will remain relevant and critical for the public health practitioner of the future.

REQUIRED CAPACITIES AND CAPABILITIES

Our five critical capacities and capabilities are as follows: systems thinking and systems methods, communication capacities, an entrepreneurial orientation, transformational ethics, and policy analysis and response.

Systems Thinking and Systems Methods

Three decades before Peter Senge popularized “systems thinking” in *The Fifth Discipline*, René Dubos described systems thinking, without naming it, in his discussion of the internal and external environments related to human diseases: “Any event in the outer world which impinges on an individual modifies, however indirectly and slightly, the balance between his various organs and functions”^{7(p122)}; moreover,

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any factor that upsets the equilibrium of [the] internal and external environments can become a determinant of diseases. As all components of both systems are interrelated, any disturbance in either of them—even though minor and not damaging in itself—can set in motion secondary effects which become destructive to the organism.^{7(pp110–111)}

In the past two decades we have seen other descriptors or aspects of systems thinking, for example as it applies to the interaction of multiple diseases within a population (syndemics)^{8,9} or to research frameworks that offer a “novel solutions-oriented approach to complex problems” (the intervention-level framework).^{10(p1270)}

Bringing systems thinking further into the current and future work of the public health practitioner requires an understanding of how systems thinking is being supported by a variety of systems methods. Common among these methods are social network analysis, system dynamics modeling, and agent-based modeling.¹¹ Social network analysis, probably the most commonly applied method among the three, focuses on the relationships among sets of actors that may include individuals or agencies. Network analysis allows users to visualize a network and employ statistical tools to model relationships (e.g., do certain network characteristics predict strong collaboration?).

Arising from management science, system dynamics modeling is based on the notion that complex system behaviors (e.g., prevalence of an infectious disease) result from the interrelationships of feedback loops, stocks (e.g., people, disease counts), and flows (e.g., incidence rate) within a bounded system. Computer simulations

are used to vary the properties of a system as a means of estimating the effects of proposed interventions or policies.

In agent-based modeling, computer simulation is used to study complex systems from the “bottom up” by examining how the individual or organizational elements of a system (agents) function as a result of their properties, environment, and interactions. In public health, agent-based modeling has been used most frequently to study infectious disease epidemics and the dynamics of disease transmission, and its integration of geographical information systems and social network information has allowed greater visualization of systems modeling.

Communication Capabilities

Every generation seems to lay claim to the “information generation” moniker. For the public health practitioner of the future, it is less about the nuts and bolts of communication platforms themselves (Twitter feeds, Facebook walls, blog posts)—the “how” of communications—and more about the “why.” That being said, although 91% of local health departments have access to smartphones and at least basic Internet services are almost universally available, the “what” of communications remains a challenge for many; for example, access to research libraries or online full-length journal articles continues to be limited.¹² Purposeful communications must be paramount, because otherwise it will simply not be possible to manage, digest, or make use of the enormous amount of information available. The current climate of distrusting and even vilifying traditional media

(i.e., newspapers, television, and radio) will further challenge the public health practitioner’s choice of communication platforms.

Public health, Teutsch and Fielding surmised, is ultimately a “knowledge organization,” and the information it seeks to communicate must be able to rise above “the cacophony of voices” in ways that are effective and credible.^{13(pp295–296)} This will necessitate identifying new educational competencies, as “the older models of health education are inadequate.”^{13(p296)} In the context of translating research into practice and policy, Woolf et al.¹⁴ labeled new educational competencies “strategic communications” and emphasized the critical importance of defining the target audience, developing the correct message, and using this process as the basis for selecting the appropriate medium to use:

The most effective communication efforts are not a distraction from, but instead are seamlessly integrated into, the lives of their target audiences, reaching them where they are, considering the people, places, and media they interact with daily, and understanding the information sources and formats they trust.^{14(p472)}

Teaching these new methods of communication, especially sifting “noise” from “substance,” will require new approaches to curriculum design for those in academics (e.g., partnering with academic programs in communication and information). It will also require new training modalities for the current public health workforce.

Entrepreneurial Orientation

Entrepreneurial orientation, which has its roots in

management business philosophy, can be characterized as a multidimensional construct of organizational behavior, with measures of proactiveness, innovativeness, and risk taking.¹⁵ In the health arena, this three-factor entrepreneurial orientation scale has been used in studies involving not-for-profit hospitals, health care executives, health care staff, nursing home management, and, most recently, the use of electronic health records to improve treatment of substance use disorders.^{16,17} In many ways, entrepreneurial orientation relates to concepts that should be familiar to the public health practitioner.

Proactiveness is an important element of strategic thinking. The concept of innovativeness in entrepreneurial orientation relates to similar constructs in implementation science, particularly harkening to Everett Rogers’ seminal work in *Diffusion of Innovations*.¹⁸ Risk taking, particularly in often risk-averse governmental agencies, is perhaps the most unfamiliar of the three entrepreneurial orientation dimensions vis-à-vis public health practice.

Achieving an entrepreneurial orientation will push the education and training of the future public health practitioner outside the usual domain; entrepreneurial orientation is much more likely to be a focus of business courses. Currently, however, there are 27 accredited schools or programs of public health that provide a dual or joint MPH/MBA,¹⁹ and they may be incubators of innovations in the application of entrepreneurial orientation concepts in public health practice. This is not to advance the notion that public health simply needs to be run like a business to be successful; rather, it is a push to use certain skills, techniques, and approaches that have been successful in other

TABLE 1—Requisite Capacities and Capabilities of the Public Health Practitioner of the Future

Capacity or Capability	Cross-Cutting Areas and Relevant Public Health Domains for Public Health Undergraduate Education	Critical Core Content for a 21st-Century MPH Degree	Critical Core Content for a 21st-Century DrPH Degree	Examples of Opportunities for Achieving Foundational Competencies ^a
Systems thinking and systems methods	Systems thinking: students should have an introduction to the factors, including socioeconomic, behavioral, biological, and environmental factors, that affect human health and contribute to health disparities; they should also have an introduction to the fundamental characteristics and organizational structures of the US health system and differences between that system and those in other countries	Systems thinking regarding the dynamic interactions among actors, sectors, and organizations with which public health professionals interact to achieve health improvements	Effects of local, state, tribal, regional, national, and global trends, complexities, and interdependencies on health systems and the various factors that influence dynamic health situations and future population health outcomes; characteristics of complex systems, the role and power of system stakeholders, system-level interventions, and systems thinking tools	Integrating systems thinking with systems methods (e.g., agent-based modeling) across the core public health curriculum and partnering with practitioners to make this integration applicable in real-world settings
Communication capacities and capabilities	Networking: students should have an introduction to the basic concepts of public health-specific communication, including technical and professional writing and the use of mass media and electronic technology	Public health-specific communication and social marketing, including technical and professional writing and the use of mass media and electronic technology	Communication strategies for disseminating both evidence-based practices and practice-based evidence on health policies and practices to diverse audiences to inform and influence individual and community behavior and organizational and community policies; communication with people and communities across the entire range of academic and health literacy levels	Designing, implementing, and evaluating a population-based project, program, or intervention that makes use of social media as both a platform for communication and a tool for public health education and promotion
Entrepreneurial orientation	Critical thinking and creativity: students should have an introduction to the concepts of population health and the basic processes, approaches, and interventions that identify and address the major health-related needs and concerns of populations	Concepts of project implementation and management, including planning, budgeting, human resources, assessment, and evaluation	Foundations of organizational behavior, dynamics, design, and theories to develop effective organizations and methods to diagnose and evaluate organizational problems and strengths; research drawn from multiple sources for the design of innovative approaches to creating or enhancing programs, policies, and systems that improve population health and create the evidence base for practice	Establishing interprofessional educational teams with academic programs in business, economics, and management science to enhance core public health curricula

Continued

settings to advance the practice of public health. How can the public health practitioner be proactive in addressing newly emerging communicable diseases, be innovative in designing campaigns to improve influenza vaccination, or better understand risk taking when aligning with community

partners to address health inequities?

Transformational Ethics

Public health practitioners have been inculcated with concepts of transformational leadership during the past two decades, and greater

attention has been focused on the ethics of public health practice (e.g., through attention to health equity); we bring these concepts together in describing transformational ethics. It will not be enough for the public health leader to understand, facilitate, translate, and create the evidence

base for public health; every action must be amplified, ameliorated, and contextualized through transformational ethics, or every positive step in population health will be met with negative repercussions for subpopulations (i.e., what will benefit the most may hurt those already most in need).

TABLE 1—Continued

Capacity or Capability	Cross-Cutting Areas and Relevant Public Health Domains for Public Health Undergraduate Education	Critical Core Content for a 21st-Century MPH Degree	Critical Core Content for a 21st-Century DrPH Degree	Examples of Opportunities for Achieving Foundational Competencies ^a
Transformational ethics	Ethical decision making as related to oneself and society: students should have an introduction to basic concepts of legal, ethical, economic, and regulatory dimensions of health care and public health policy and the roles, influences, and responsibilities of the different agencies and branches of government	Biological, environmental, socioeconomic, behavioral, cultural, and other factors that affect human health, influence the global and societal burden of disease, and contribute to health disparities; legal, ethical, economic, and regulatory dimensions of health care and public health policy; the roles, influences, and responsibilities of the different agencies and branches of government; approaches to developing, evaluating, and advocating for public health policies	Human rights frameworks and principles as a foundation for ethical practices and decision making; ethical concepts and principles related to public health and the strategies for identification and analysis of ethical issues	Assessing the effects of structural bias at the organizational, community, and societal levels that gives rise to health inequities and applying the Public Health Code of Ethics ²⁴ in formulating ethics-based approaches to achieving health equity
Policy analysis and response	Health policy, law, ethics, and economics: students should have an introduction to basic concepts of legal, ethical, economic, and regulatory dimensions of health care and public health policy and the roles, influences, and responsibilities of the different agencies and branches of government	Legal, ethical, economic, and regulatory dimensions of health care and public health policy; the roles, influences, and responsibilities of the different agencies and branches of government; approaches to developing, evaluating, and advocating for public health policies	Evidence-based policy development, analysis, and translation processes, including the role and impact of scientific information, legal and regulatory approaches and constraints, ethical issues, and varied stakeholder interests	Assessing multiple dimensions of the policy-making process, including the roles of ethics and evidence; advocating for political, social, or economic policies and programs that will improve health in diverse populations; evaluating policies with respect to their impact on public health and health equity; identifying new ways of communicating about policy that are better tailored to political ideology

^aRevised accreditation criteria of the Council on Education for Public Health.

Another way of framing this is simply that population health improvements may be accompanied by worsening health inequities unless the public health practitioner of the future conceptualizes public health (writ large) as social justice. More than 40 years ago, John Bryant merged the Rawlsian concept of justice with Nicholas Rescher’s formulations on distributive justice to propose a principle of health care system development: “Whatever health services are available should be equally available to all. Departures from equality of

distribution are permissible only if those worst off are made better off.”^{20(p709)}

Although Bryant’s conceptualization of health as social justice was applied in the framework of international health service development (particularly in low-income/low-resource countries), it can serve as a model for transformational ethics in public health practice: whatever improvements can be made in the health of the public should be made equally for all; departures from equality of opportunity, access, and outcomes are permissible only if health

inequities are lessened. Had the necessary investments been made in drinking water infrastructure in Flint City, Michigan, 20 years ago—which, no doubt, would have required a greater investment in the communities in greatest need—would the city be experiencing the even more costly impact of lead intoxication now?

Policy Analysis and Response

Among the most important skills of the public health practitioner of the future will be

the ability to identify and analyze policy changes and their impact in the context of uncertainty. Consider the shifts that are occurring vis-à-vis the earlier-described forces of change as this commentary is being written:

- The Affordable Care Act: the ACA is on the precipice of being repealed and replaced.
- Public health agency accreditation: with the largest proportion of local health departments serving rural populations that are predominantly White and represent a significant

segment of the disaffected, antigovernment electorate, will there be sufficient drive to elevate the governmental presence in health?

- Health in all policies: market forces, with deregulation and governmental restraint, are already overriding considerations about health (e.g., the Keystone Pipeline).
- Climate change: those in several executive cabinet positions (secretaries and other top administrators) deny the very existence of climate change or refuse to accept the human role.
- Demographic transitions: one glance at county-level presidential voting will immediately drive home the fact that there has been a transition to a predominantly urban–rural demographic divide.

The facts behind these forces of change, however, will remain: 20 million people have received health insurance under the ACA; climate change is affecting the public's health, and some states are taking action despite federal priorities; and the United States will become a minority–majority nation before 2050 regardless of newly imposed immigration policies. Thus, whatever shifts these facts rest on, public health practitioners must have the ability to anticipate and identify policy changes and then respond appropriately.

In public health practice, new events (e.g., new or emerging communicable diseases) are anticipated and identified by establishing surveillance systems; the same must be done for policy. Federal and voluntary agencies have already developed policy surveillance systems that address tobacco, alcohol, and school-based nutrition and

physical education,²¹ and most recently a sentinel surveillance system has been established to detect the effects of policy changes on public health practice.²² Identifying policy changes through these surveillance systems, and responding effectively and appropriately despite an uncertain environment, will require the public health practitioner to meld all of the skills described here: systems thinking and analysis, communications, transformational ethics, and the entrepreneurial orientation components of proactiveness, innovativeness, and risk taking.

EQUIPPING FOR THE FUTURE

Preparing the public health practitioner of the future will require new and different content in the academic public health curriculum. Fortunately, for the past several years, the public health academic community has been undergoing its own version of future forecasting, most notably in the Framing the Future efforts of the Association of Schools and Programs of Public Health.²³ What began as a reimagining of the MPH degree and curriculum expanded to include rapidly growing undergraduate public health programs and majors and a new urgency in refining and clarifying doctoral-level preparation in public health (especially for the DrPH degree).

Closely following these efforts to bring public health academia into the 21st century is the work of CEPH in revising its accreditation criteria.⁶ Notable among these revisions is a forward-looking set of expected competencies for graduates at all levels.

We believe that the critical content areas from Framing the Future and the revised CEPH competencies match up well with what we have described as the necessary capacities and capabilities of the public health practitioner of the future (examples are provided in Table 1).²⁴

New professional development and training approaches are also needed for practitioners already in the workforce. Only between one fifth and one third of public health practitioners report having undergone formal (academic) public health training.²⁵ Therefore, a large need exists for addressing these forces of change in ongoing workforce capacity-building programs. The accreditation standards of both the Public Health Accreditation Board (for governmental public health agencies) and CEPH (for schools and programs of public health) will be important drivers for meeting the current workforce's training and educational needs.

CONCLUSIONS

The public health practitioner of the future will require new skills, knowledge, and abilities, as well as new ways of conceptualizing, to successfully attend to the many forces of change affecting her or his practice environment. A harsh reality, however, is that practice will take place in the context of uncertainty, including uncertainty over the role of the public health practitioner as the “chief community health strategist.” Equipping the public health practitioner with the requisite capabilities and capacities will require, in turn, new content and methods for those in public health academia. It will also require a recommitment to

lifelong learning on the part of the practitioner. *AJPH*

CONTRIBUTORS

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