Article from
Health Watch
October 2017
Issue 84

At the Intersection of Public Health and Actuarial Practice

By Barbara Zabielski

In 2016, the Society of Actuaries (SOA) began a formal collaboration with the Centers for Disease Control and Prevention (CDC).[1] The partnership is set within the CDC's 6|18 initiative,[2] but both actuaries and public health professionals could benefit from far more extensive interaction.

Actuaries would benefit from greater awareness of public health concepts, including the consensus that social determinants of health[3] are the most significant predictors of health outcomes. More excess mortality in the United States, for instance, is attributable to poor education, racial segregation, low social support, income disparities, individual-level poverty, and area-level poverty together than to smoking and obesity combined.[4] Moreover, the social determinants are emerging as parameters in areas of actuarial practice. For example, adjustment for social determinants was incorporated into a risk-based Medicaid payment model developed in part by Dr. Arlene Ash,[5] a member of the SOA Public Health Task Force.

A substantial portion of the costs borne by payers also comes from treating chronic conditions that are amenable to preventive interventions. According to the Institute of Medicine, cases of heart disease and type-2 diabetes could be reduced by about 80 percent through simple changes in diet and exercise habits alone.[6] These are things public health can effectively address.[7]

At a minimum, a deeper partnership with actuaries would provide public health professionals with new insights into insurance practices from insiders who have been involved in health care delivery and financing for decades. Actuaries' unique perspectives might be leveraged in utilizing limited resources more effectively, for example, in the development of strategies for maximizing health care quality while protecting risk-bearing organizations. Interviewee Matt Varitek mentioned in a 2009 essay how premium adjustments might be used to incentivize healthy behaviors.[8] The need for actuarial input in such innovations is practically self-evident.

Actuaries could also assist in efforts to make a case for increased public health funding. Despite the fact that most of the sharp rise in life expectancy in the United States during the 20th century was due to things like infectious disease control, motor vehicle and occupational safety regulations, vaccination programs and screening for treatable cancers,[9] people still tend to attribute it to advancements in medical technology.[10] Actuaries could play a key role in persuading citizens and policymakers that public health investments are crucial and cost effective.

Despite actuaries' major role in the U.S. health care system, even a basic overview of the field wasn't included in my formal public health education. It wasn't until I was approached to coordinate this interview that I began to understand who actuaries are and what they do. Now that I know a bit more, the idea of collaboration between the public health and actuarial professions is both exciting and obvious.

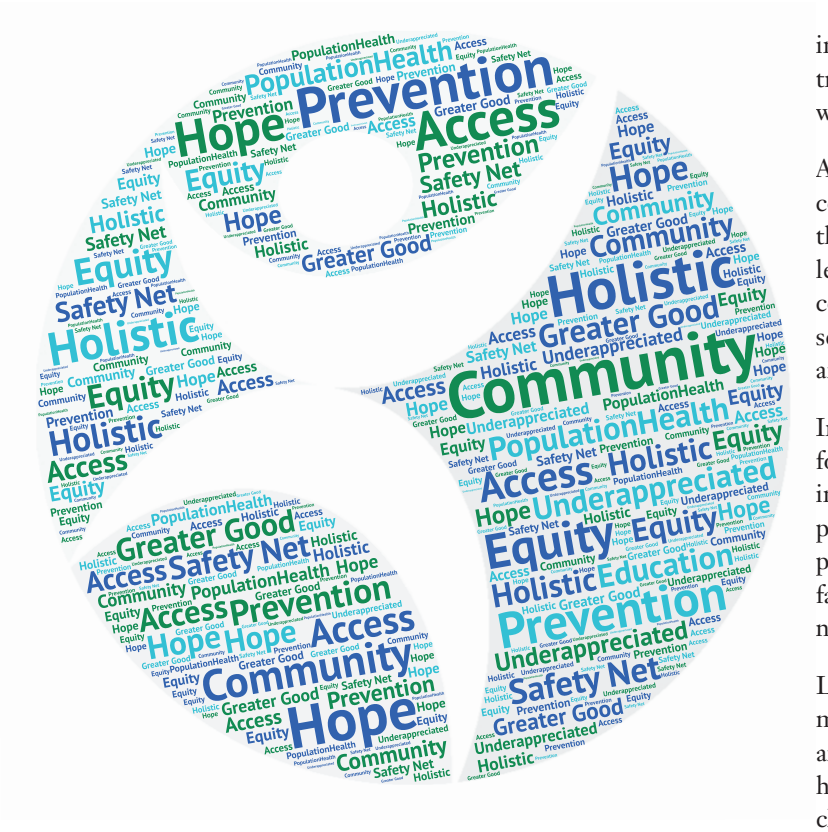
The following is an edited written interview with two actuaries and a public health professional on issues related to the intersection between the actuarial and public health fields. I hope it will broaden your understanding of what public health is and inspire you not only to support—but even join in and become a part of—what we in the public health profession are doing to promote the health of every member of our communities.

Sara, tell us what this strategic initiative is all about.

Sara Teppema: The SOA Health Section Council recognized the need for actuaries to expand their view of health beyond traditional medical care delivery and financing. At the same time, SOA staff and section volunteers had begun to forge a partnership with the CDC,[11] creating the need for a more structured and strategic approach.

The goal of the task force is to create that structure through a two-phase approach. The first is to educate actuaries on the various concepts, disciplines, initiatives and research that fall under the umbrella of public health, and why they are important to us professionally and as citizens in our communities. This education includes articles (like this one!), meeting sessions, and our newly created Health Section subgroup.[12]

The second phase is to turn our focus outward, bringing actuarial insights to the public health community, through both our work and volunteering. We will work with partners like the CDC, the American Lung Association and others to identify ways we might be of help. An early observation is that we seem to be especially effective in helping public health professionals and researchers "translate" their work for a payer audience. We also hope to find ways to connect actuaries to community or other organizations that may benefit from volunteering at the individual level.



What inspired you to get involved?

Sara Teppema: I became interested in the field of public health through my interest in health care equity and ethics.

Lisa Macon Harrison: In North Carolina, we are fortunate to have an actuary, Julia Lerche, working at the state's Department of Health and Human Services. Julia connected me to the SOA and is helping in general to connect the dots across the practice of public health, the costing of public health services and the role our state's Medicaid approach may play in providing resources in the future.

What do you mean by the term "public health"?

Sara Teppema: It's a well-defined discipline, but the simplest explanation I've heard is the people and infrastructure that work to keep us healthy and safe.

Lisa Macon Harrison: The definition of public health has evolved over time, from Public Health 1.0 to 2.0, and now to 3.0.[13] In part, the evolution reflects the responsiveness of public health to changing needs. Public Health 1.0, post–Industrial Revolution, focused on the prevention and detection of diseases through things like immunizations, screening programs, and sanitation. By the mid-1980s, state agencies had gone in separate directions that made public health harder to speak about in general terms. There were new public health threats, including HIV/AIDS, along with the daunting challenge of trying to provide safety-net services for vulnerable populations while contending with the growing burden of chronic diseases.

A 1988 report by the Institute of Medicine lamented that the country "has lost sight of its public health goals and has allowed the system of public health activities to fall into disarray."[14] This led to Public Health 2.0, which included the development of a common set of goals and a commitment to focus on ten essential services [15] plus the three core functions of assessment, assurance, and policy development.

In the 21st century, we are moving into Public Health 3.0, which focuses on the many things that determine health. Research indicates that quality clinical care accounts for only about 20 percent of health outcomes and health behaviors for around 30 percent, with roughly 50 percent related to social and economic factors and the physical environment—the "social determinants" of health.[16]

Local health departments focus increasingly on the social determinants of health as they work to improve community health and reduce health disparities. Something we agree on in public health is that, genetics aside, people should have reasonably equal chances of enjoying good health. Achieving that kind of equity means moving beyond the notion that individuals are entirely responsible for their health-related behaviors and recognizing that the environment exerts considerable influence over people's behaviors and their exposures to various health risks.

Merriam-Webster defines public health as "the health of people in general and the science of caring for the people of a community by giving them basic health care and health information, improving living conditions, etc."[17] It's the "etc." where the nuance lies. Public Health 3.0 gives expression to that. Public health is at its best when it responds to the unique needs and concerns of individual communities.

Matthew Varitek: Public Health 3.0 seems particularly relevant to actuaries in the Medicaid space. Requirements around access to care are a focal point of contracting agreements with Medicaid Managed Care Organizations. Some Medicaid programs show interest in considering social determinants in rate setting and risk adjustment. Medicaid actuaries can help demonstrate the long-term value of short-term investments by helping to quantify influences like environmental and social factors on health care utilization and costs, especially for programs that cover people for longer durations than observed in the commercial space.

Lisa, as a public health professional, what do you think of when you think of public health?

Lisa Macon Harrison: Working on the front lines of public health in a rural community, I think first of a competent, compassionate, dedicated public health workforce. It's incredible what a few nurses, social workers, nutritionists, health educators and environmental health specialists who really care can accomplish. It sounds hyperbolic, but public health workers really do change the world one community at a time.

Certainly, the work also includes a tremendous amount of less-inspiring duties—things every agency (both private and public) has to deal with, like budgets, communications, human resources, legal questions and politics. I think the hardest thing about public health is probably how much politics influences our ability to accomplish our work.

Public health work is full of nuance and challenge, and your best hope is ultimately to leave a legacy of influence for a better future—not always easily measured or something in which leaders and funders can find instant gratification. Delayed gratification is key to public health and, in my view, why so few dollars are invested in prevention and public health services.

A lot of actuaries talk about "population health" today. How is that different than "public health"?

Matthew Varitek: I draw a distinction between "population health," which describes aggregated health outcomes for any subset of the total populace, and "public health," which describes efforts to prevent disease and promote healthy behaviors across the entire populace.

Sara Teppema: Population health has different meanings to different people. Besides Matt's definition, some actuaries think of population health as a way of looking at health care delivery and costs, in which a provider is asked to be accountable for the health (and costs) of a population. As advanced as this view may seem, it is still comparatively narrow and cost-centric.

Kindig and Stoddart[18] proposed the following definition of population health: "the health outcomes of a group of individuals, including the distribution of such outcomes within the group." Their article provided an "a-ha!" moment for me, defining population health not only in terms of the population's health *outcomes* but also in terms of the many *determinants* of those outcomes. The authors noted that because much of what determines health (e.g., education, income and medical care) was still "outside of public health authority and responsibility," population health extended beyond what public health at that time could address. Now, Public Health 3.0 has incorporated that notion of population health into a broader, emerging vision of public health.

We make strides in public health across generations, not congressional terms.

How/where does public health intersect with Medicaid? Medicare? Commercial payers? Health systems and providers?

Sara Teppema: It's not so much an intersection as the foundation of the health of the populations that these entities serve. When public health infrastructure is strong, health care delivery and costs become more predictable.

Lisa Macon Harrison: Public health depends a tremendous amount on payers, health systems, and providers. Half of local health departments in North Carolina offer primary care in addition to maternal and child health programs, family planning services, and other more typical health department services. Much of our preventive work is funded through reimbursements from Medicaid, Medicare, and private insurers.

We recognize that social determinants of health need to be addressed, but we haven't yet found a way to pay for that through Medicaid, Medicare or private payers. People are also talking a lot about moving from volume-based to value-based care, but we're still stuck at a point where the policies and payment models have not evolved.

Matthew Varitek: Public health is improved as the number of people without health coverage is reduced. Medicaid expansion was a primary driver of the drop in the uninsured rate since 2013. Some aspects of the Medicaid benefit package are oriented toward improving public health. For decades, Medicaid programs have covered early and periodic screening, diagnostics, and treatment for children. Recent years have seen enhanced efforts to provide preventive services for adults. Smoking cessation programs are an example of a benefit that is intended to improve the health of one population but has an ancillary benefit—reducing nonsmokers' exposure to secondhand smoke—that improves public health. Discussions concerning repeal and/or replacement of the Affordable Care Act center on the number of people who would lose coverage, or the potential impact to premiums for exchange policies, but the potential cumulative impact to public health—and therefore to health care costs—is even larger.

Why should actuaries expand their perspective to include modern public health concepts?

Lisa Macon Harrison: Public health saves money and saves lives. It's far wiser to purchase a $300 air-conditioning unit for

a child's bedroom than to pay for a $3,000 visit to the emergency room for a breathing treatment. It's likewise far cheaper to fund effective diabetes prevention programs than to pay to treat diabetes. According to the CDC, the costs associated with medical care, lost work and lost wages for people with diabetes is upward of $245 billion in the United States.[19] At the same time, hospitals, health centers and health departments have been forced to cut diabetes prevention programs because there is still no mechanism to pay for evidence-based preventive approaches. Why is this? It is still so much easier in this country to find ways to pay for disease treatments than for disease-preventing interventions. We need both.

Matthew Varitek: More people receive health insurance coverage through Medicaid than any other single source, and no other single payer covers a population with a more diverse risk profile. Some of Medicaid's members—whether elderly, living with disabilities or certain genetic conditions, or children from stressed environments—are among the most vulnerable to extreme health events. These members may therefore be among the first to benefit directly from investments that focus on improving public health.

Actuaries today may be missing some of the public health levers that can be used to manage their populations' health care costs. Why are they important to the practicing health actuary?

Sara Teppema: Imagine if our public health infrastructure failed and communities stopped ensuring safe drinking water or lifted smoking bans or ceased immunization programs. We would see a significant decline in health and quality of life.

Matthew Varitek: We should at least be mindful of negative impacts to public health, like changes in air or water quality that could lead to increased incidence of asthma attacks, cancer or other forms of poisoning. As Lisa mentioned, preventive measures that are not delivered by medical providers, whether an air-conditioning unit for an individual or an upgraded municipal water system, may result in savings of health care expenses that far outweigh the cost of the preventive effort.

What constraints are there on the financing of public health initiatives?

Lisa Macon Harrison: There are so many! One of the most frustrating is the short-term nature of so much of it. Funders often place the responsibility for sustaining programs at the local level after an initial brief funding cycle, and many even stipulate a sustainability plan to receive funds. Yet in poor rural areas, it is nearly impossible just to cover the basic costs of staff, equipment, and infrastructure, much less sustain interventions that show promising results.

Since funding often depends on federal leadership and relationships between federal and state governments, both predictable and unpredictable swings occur in the amounts and durations of funding for mandated services such as communicable diseases services, vital records maintenance and environmental health services. Funding is generally even less dependable for interventions like opioid overdose reduction initiatives, obesity prevention programs and HIV prevention activities.

It's worth noting that only about 3 percent of the nearly 2.6 trillion spent by the United States on health care goes to public health.[20] In many states, funding remains uneven, unpredictable and unstable, even though the best investments in public health are long-term ones. We make strides in public health across generations, not congressional terms.

What might be done to overcome some of those constraints?

Matthew Varitek: The Arizona Smokers' Helpline is funded through a state tax on tobacco products. More recently, certain goals of Arizona's Medicaid value-based purchasing initiatives, such as a target percentage of program members receiving a flu shot, improve public health by reducing everyone's exposure to contagious diseases.

Lisa Macon Harrison: Consistency, flexibility and more effective ways to measure impact over time will help. But until more people understand the value of public health and what it does for every individual, family, group and community, it will be difficult to make those levers of change stick. Actuaries helping advocate and educate could go a long way!

A better, more accurate approach to the costing and the value of public health services is also needed. It would be helpful to have federal and state policies dictating minimum amounts of funding per capita for public health. Creative approaches like the tobacco tax initiative Matt mentioned are another potential funding solution.

Sara Teppema: Public health initiatives tend to be cost-assessed in terms of things like return-on-investment ratios, such as those presented in the 2017 Trust for America's Health report.[21] Large or regional health plans might be convinced to contribute funds to public health programs if they could see their value expressed in terms of projected cost savings PMPM. Actuaries might prove uniquely able to contribute to the cause of improving public health by helping public health professionals make their findings more accessible to payers.

If practicing actuaries are interested in getting involved in public health in their communities, where can they get started?

Lisa Macon Harrison: Many local health directors are so busy dealing with the daily grind that poring over financial data to share important points with county commissioners becomes very difficult. Offer to help your local health department director by writing a letter to legislators outlining the financial benefits of providing public health service or making relevant comparisons to other legislative districts and outlining needs. Actuaries could really help with those kinds of projects and with advocating for increased and more consistent funding.

Sara Teppema: Start with a local community health organization that does work that you believe in. It doesn't have to be a fancy job title, although these organizations would probably love to have actuaries on their boards and finance committees. I volunteer as a cashier at a secondhand shop that supports a community clinic in my town. Contact your county or state public health department and ask for organizations that might need help. Get involved on public health issues you care about, and you will make a difference. ■

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MORE ABOUT PUBLIC HEALTH

By Jim Mange

You can find more information through your local or state health department, the American Public Health Association (APHA[1]), the U.S. Department of Health and Human Services (HHS[2]), the National Association of County and State Health Officials (NACCHO[3]), the Centers for Disease Control and Prevention (CDC[4]) or the National Institutes of Health (NIH[5]).

For a more in-depth exploration of a variety of public health issues, consider the books listed in "Thomas Frieden Recommends the Best Books on Public Health"[6] or Goodread's list of popular public health books.[7]

For a brief history of the evolution from Public Health 1.0 to 2.0 and 3.0, read Public Health 3.0: Time for an Upgrade.[8]

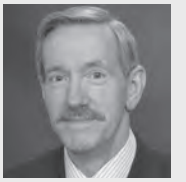
To gain greater appreciation for how the public sector environment influences the success or failure of public health managers and workers, such as how goals are set, progress measured, change managed and funding constrained, check out *The First 90 Days in Government: Critical Strategies for New Public Managers at All Levels.*[9]

To explore public health issues that are a little closer to home for many actuaries such as estimating the health and economic effects of the U.S. health delivery and financing systems, look into the writings and presentations of Glen Mays.[10]

If your curiosity about the social determinants of health has been piqued, check out the PBS Series "Unnatural Causes,"[11] or look into the writings and lectures of Sir Michael Marmot, Chair of the Commission on Social Determinants of Health of the World Health Organization (WHO). Examples include a 2006 lecture, Health in an Unequal World,[12] and a video of his 2014 lecture to the WORLD.MINDS Annual Symposium, Social Determinants of Health: From Research to Policy.[13]

In November 2016, Health Affairs published a themed issue built around the culture of health.[14] Members of the Health Section can access that and other issues of Health Affairs.[15]

Finally, consider joining the Health Section's new subgroup on public health.[16] There will be monthly conference calls on public health topics with both actuarial and non-actuarial presenters. You can contact Dee Berger at *lberger@soa.org* with questions about joining the subgroup. ■



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