

## Essential Skills for Public Health

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It has been over 150 years since John Snow used basic epidemiologic techniques to identify the contaminated water responsible for causing the cholera epidemic. Much has changed since, notably life expectancy in developed countries has increased by over 30 years, and infant and child mortality has fallen dramatically. For example, a century ago approximately one-in-five Canadian children would not have survived to school age. We are rapidly approaching what some view as the top of our biological average lifespan.

So, is our work done? In many ways we're just starting.

The advent of antibiotics, antivirals, and vaccines have created an illusion that we can conquer infectious diseases. It is true that we have made remarkable progress; however, new and emerging pathogens, antibiotic resistance, infectious causes or facilitators of chronic disease, and the reality that many serious infections still have no recognized cause mean there will likely always be much work to do. There are also chronic diseases and injury to consider, as well as questions of how we can practically apply our knowledge of social determinants to create better health equity.

While the fundamental skills of public health: epidemiology, surveillance, prevention, and health promotion will continue to evolve, the fundamentals are still as relevant as they were a century ago. Nonetheless, it seems to me increasingly obvious that all that I learned in my training, while necessary, was not sufficient. Even more so, some things that were taught were plainly wrong, including varying aspects regarding the workings of the brain, immunity, and genetics. So, what then do I believe will be the essential skills for Public Health practitioners to succeed in this century?

There are of course the specific expertise and skills required to be a Public Health professional in a technical field such as epidemiology, health promotion, etc. However, in this commentary I will focus on the core skills and approaches that are valuable for anyone working in the field.

We tend to remember stories and related facts more easily than lists of facts on their own. Hence the value of case-based learning, and the sharing of stories and experience from which others can learn. A Master's program cannot hope to go into depth in all the areas that will prove valuable, and, in any case, we may not remember them when the time comes. The endeavor of a Master's, however, is a time to establish a pattern for life-long learning and good decision making which are essential for a successful career.

### **ASSESSING AND USING EVIDENCE**

We live in an increasingly complex, inter-related world. The internet and social media have made information and research ever more accessible. Unfortunately, it does so with little

discrimination as to whether what is claimed is true or not. Scientific Research has offered systematic ways to better understand our world, but it is not without limitations. So, how then do we make reasonable decisions about what is most likely correct? Critical thinking and discernment are essential in assessing the quality of evidence (knowing how to weigh evidence from different sources) to come to a reasonable conclusion. While we often call research findings “proof”, this is only true until better evidence comes along.

The probability of something being true increases substantially if other research, observational evidence, experience, and logical rules of causation all point in the same direction. Then one can certainly have better confidence, but we can typically only reference some of these criteria for any given problem.

As essential as Randomised Control Trials (RCTs) are in assessing new pharmaceuticals or procedures, they tell us little about our complex world and relationships, or individual variability in response. A simple example is a review of RCTs that look at the efficacy of antiviral treatment in seasonal flu outbreaks but is not predictive of their utility in a pandemic. While at one level they are the same disease, in reality they are very different. In pandemic flu, a novel virus can cause rapid overwhelming infection, so the ability to stop or slow viral replication can be life-saving. Whereas in seasonal flu, primed immune systems are already responding - anti-virals offer only a minimal advantage. It would be unethical to do an RCT with anti-virals in a pandemic; however, other non-RCT evidence gathered during the actual pandemic of H1N1 in 2009 illustrates how effective it was. One of many examples from Canada refers to young pregnant women being five times as likely to die during the spring outbreak. We mounted a campaign during the summer with physicians and the public to assure easy access to anti-virals with the emergence of flu symptoms. Despite many cases occurring in the fall, there were no reported deaths in pregnancy. Similarly, after the reintroduction of anti-virals in Northern communities, the need for medivacs to ICUs in the south essentially stopped, which also corroborated the experience of many pediatricians and ICU doctors. Additionally, local knowledge may explain why a statistical difference exists that contrasts with a researcher’s conclusions that were based upon their own experiences and assumptions. Knowing how to assess different types of evidence and being able to critically read the literature is important whatever we do.

As many of the situations we face are novel, or have little available research, there is a skill in being able to make good decisions in the absence of substantial evidence. This may be done by drawing upon the available information and experience, referencing analogous situations, and validating the decision by consulting other sources. Otherwise, we can be paralyzed, waiting for more evidence, which may never come. In the meantime, not making a decision is a decision, often to the detriment of those at risk. It is important for all decisions to be intentional and supported with logical reasoning, including the situations when not making a decision is the best course of action. It is always worth remembering that findings which fall outside the statistical norm are simply unlikely, but most certainly do exist. They are worth at least paying attention to, and if there are enough of them, questioning our initial assumptions.

When things don’t quite add up, it is important to investigate. For example, a complaint about residents in a group home being forced to defecate in buckets outside, which were then emptied over the fence, seemed implausible. However, a walk around the fence proved the complaint. I have always found it useful to get out of the office, to meet people, to see the situations and conditions directly, to develop a context, and to trust because it allows for enhanced information sharing that can help to expose the truth in each situation.

### LEARNING FROM HISTORY AND STORY TELLING

The history of Public Health is rich with examples of both success and failure.

It is essential to document, remember, and learn from both. Post-event evaluations are important, but even more so is to track what was done to address them. For example, following the Naylor and Senate Reports on SARS, which led to establishing the Public Health Agency of Canada, recommendations were followed, acted upon as appropriate, and tracked, in the hopes that we would not repeat the same mistakes. This then became the policy for other events, like the Listeria outbreak and Pandemic H1N1. Goethe is often quoted as saying that 'those who forget their history are condemned to repeat it'. We seem to go through cycles, whether as individuals or societies, of recognizing a problem, diagnosing and treating it, succeeding, and then, when we succeed, forgetting the process that was necessary for our success.

Fewer of us remember the packed pediatric wards with what are now vaccine preventable diseases; the iron lungs and rehab wards for polio; or, the brain damage from measles or whooping cough. Just as with the advent of antibiotics, the illusion that the next medical breakthrough will be the panacea, has risked ignorance of the fundamentals that make for health and wellbeing. History also teaches us a lot about calculated risk and trade-offs. In our risk-averse culture too often decision makers are afraid to solve a problem unless there is a way to account for all the potential side effects. Even if the problem is big and the side effect small, if they don't take on the issue they can rationalize it was not their issue to address in the first place, and, hence, nor will be the side effects. Change for the good cannot happen without some risk taking, and the incremental improvements have benefitted us all. However, if we must account for every small 'what if', little progress will be made.

Life-long learning includes not only our own history, but also that of other cultures and societies. Work pertaining to international development has much to teach us, including the value of appropriate technology and the sad legacy of colonialism. In Canada, the tragic history of colonial injustices inflicted upon Indigenous communities, including the legacy of residential schools, requires that one be knowledgeable in what it means to practically achieve reconciliation. This includes being able to understand and apply trauma informed policies and practice, and to learn from the rich culture and traditions that have sustained communities for millennia in the Americas.

We not only need to learn from the successes and the failures embedded in our history, but we must also then continue to tell the stories.

### POLICY AND PROGRAM PLANNING AND IMPLEMENTATION

Whether in medicine, or policy, or other remedies, a decision-making maxim that I live by is to seek solutions that are the *least intrusive, most effective, and come with the fewest side effects*.

Skill in characterising an issue, weighing the options, and finding and mapping out solutions is critical in long term success. Policy, program planning and management, strategic thinking, advocacy, proposal writing, and the program implementation process are all fundamental to its success.

Much of the issues faced in Public Health are complex, have no simple solutions, nor guarantee a likelihood success. We pursue them because they have important impacts or risks and we are constantly seeking ways to improve health and wellbeing and reduce inequities. This requires the ability and desire 'not to be right, but to get it right', which requires broad thinking, engaging others, and a clear plan. When that plan gets thrown off, as it will, the aptitude is in the ability to

rapidly access new options and continue movement towards the objective. Too often we see a disconnect between the various necessary steps. For example, researchers often get frustrated when their research, which after many years of investigation finally identifies a possible solution, is not quickly implemented. Somehow, not realizing that the effort to plan and implement the research may only be a fraction of what is required to move towards drafting policy, receiving funding, and implementing programs.

Evidence may be necessary for good decisions, but it is not sufficient. Implementation and sustainability are the more complex and challenging parts of the process. Instead, too often seemingly simpler solutions are chosen, which have little impact, or there is no commitment to long-term solutions that are needed to see an effect. The clinical counterpart is if we were only willing to provide one dose of penicillin to treat strep throat, we would conclude that treatment was a waste of time.

Thinking through and being able to articulate what it will take, what other options there are, how it can be done, and the associated risks and benefits in a coherent and concise way is critical to moving from idea to action.

### **WORKING WITH, AND INFLUENCING OTHERS**

Most of the impact of Public Health comes not from what we can manage or control, but how we influence others. Whether enhancing understanding, changing behaviour, or rewriting policy, we are successful through persuasion not force. A great many of us think that all we would need is to have the ear of a Minister, Deputy, or other political/organizational leader, if only for a moment, to implement the meaningful change for which we hope. It is also terribly clear how much relationships and effective communication matter to successful change. Who do we respect or trust? If we were to communicate our point louder or more forcefully will that change the mind of another? What about that elevator speech? Why, then, are some people more effective at getting ideas across?

The elevator speech, if it's a pitch, will likely not be heard. Being more forceful also usually entrenches the opposite view. When confronted in that way most people go to a 'happy place', and hope the interaction will not last long, rather than change a long-held belief.

It is not enough to have a compelling case. A receptive environment is a necessity, and, even if a Minister is on board, there are many ways in which the course of action may be diverted. Change requires something of a popular consensus, or at least sufficient numbers of those who understand, want to do it, and have the ability. Effectively building coalitions is critically important to address issues we can better do collectively. They will form and reform, depending on the issue and common interests of the people. Having skills that involve working with others, leading from within, supporting others, sharing credit, assuming responsibility, developing respect, and all the other characteristics that build good teams, are essential to success both inside and outside our institutions.

At the core, the one thing that we have, that no one else can take away, is our integrity. But we ourselves can give it up, and once gone it is almost impossible to recover.

While there are indeed a multitude of requisite skills, there are a few principles I have found helpful in chairing a range of coalitions, inter-sectoral, and intergovernmental processes or simply in working collaboratively with other organizations.

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- **Respect:** We cannot influence who or what we do not respect. We don't need to like another or want to take them out to dinner, but if we don't respect their position or understand where they are coming from we are unlikely to get anywhere.
- **Make it Practical:** It is not enough to outline the problem. Have practical solutions or approaches upon which can be acted.
- **Have something to offer:** It can be quite compelling to be given an offer and explore the possibility of willingly contributing rather than a request to do something more than the status quo with limited resources.
- **Rule of Three:** Often organizations, groups, or committees get bogged down trying to find agreement. I find it helpful to categorize issues as follows:
  - Those that we essentially agree on, we do.
  - Those that we may differ on a bit, but not enough to oppose, we do.
  - Those that we likely will never agree on, we don't ignore, but we don't let them become more than 5-10% of our time and focus.

We need not agree on everything to work effectively on what we do.

### CONCLUSION

In this commentary there are many skills I have intentionally not mentioned that are specific to parts of public practice, and there are others equally important that a short commentary cannot hope to even touch on. The framing of issues and approaches in social determinants and One Health, requires practical approaches to programs and policies. Assessing and using evidence correctly, applying the lessons of history, policy writing, planning, managing programs, and collaboratively working with others, are important skill sets required to improve health and wellbeing and reduce inequities. Finally, Public Health practitioners have much to learn and contribute to the fundamental process of reconciliation with Canada's Indigenous population.

As the climate warms and we see more natural disasters, effects on social migration, and economies, and as social cohesion is threatened by growing inequalities and the political climate changes, the skills of Public Health practitioners will be needed more than ever. I have often referred to Public Health as a 'Team Sport'; therefore, if we are to truly succeed, is there really any expertise we can do without?