Four Dates, One Future: Founding Editorial for the University of Toronto Journal of Public Health

Daniel A. Harris, Jean-Paul R. Soucy, David J. Kinitz, Kuan Liu, A. A. Rajendran, Shelby L. Sturrock, Kate St. Cyr, Rebecca Christenson

Dalla Lana School of Public Health, University of Toronto, Toronto, Canada

E-mails: daniel.harris@mail.utoronto.ca; jeanpaul.soucy@mail.utoronto.ca; david.kinitz@mail.utoronto.ca; kuan.liu@mail.utoronto.ca; aa.rajendran@mail.utoronto.ca; shelby.sturrock@mail.utoronto.ca; kate.stcyr@mail.utoronto.ca; rebecca.christenson@mail.utoronto.ca

Abstract

For nearly 150 years the University of Toronto has integrated public health into its teaching and research. From early lectures in sanitation (1871) to the discovery of insulin (1921), the University of Toronto's rich history is reflected in its prominence as a global leader in public health research and education. Therefore, it is fitting for the University of Toronto to host an academic journal of public health that showcases both high-impact scholarship and public health practice. Founded in 2020, the University of Toronto Journal of Public Health has an ambitious, yet essential, vision: to foster the next generation of public health researchers and practitioners in order to improve population health nationally and globally. In this editorial, we honour the diverse and complementary nature of the fields of biostatistics, epidemiology, health policy and practice, and social and behavioural health sciences by highlighting an important historical date from each. We reflect on these milestones within a historical and contemporary context, and conclude by considering the importance of each discipline for the future of public health in Canada and abroad.

Introduction

Public health practice has long been recognized for its exceedingly broad scope, which has only broadened over time.¹ The field builds upon the foundation of hygiene, as waste disposal is one of the first issues facing an inchoate civilization. Of course, this impulse is far older than humanity. Even ants have learned to sequester their waste, and one species of leaf-cutting ant has specialized individuals that do nothing but pile waste outside of their nests.² Public health as a discipline is *old*.

What began as an enterprise focused on sanitation and hygiene has given way to a more expansive paradigm encompassing the determinants of health from the societal to the molecular, and every level in between.³ Such an amorphous discipline as public health is difficult to confine to one definition, but Acheson's is perhaps the most

widely used: "the art and science of preventing disease, prolonging life and promoting health through the organized efforts of society."⁴

Many events contributed to informing our contemporary understanding of public health. From John Snow's quest to remove the pump handle from a cholera-contaminated well, to the British Empire's mandate to spread smallpox vaccination across the globe, to Sara Josephine Baker's quest to diminish infant mortality in America, particularly among the urban poor, these stories capture the imagination and foreshadowed the expansive, multidisciplinary practice of public health of today.

The mission of the *University of Toronto Journal of Public Health* is to foster the next generation of public health researchers and practitioners in order to improve population health nationally and globally. The four areas of our journal represent our

attempt to capture the main pillars of public health: biostatistics, epidemiology, health policy, and social and behavioural health sciences (SBHS). Public health is fundamentally an applied discipline and as such it is our duty to preserve institutional memory and learn from our past. Therefore, in this inaugural issue, we the editors would like to highlight one important date corresponding to each of these pillars, recognizing that these are only a few of many significant moments in our collective histories and narratives. These dates adorn the full version of our logo, itself a reference to Florence Nightingale's famous rose diagram of the causes of mortality in the British Army during the Crimean War (**Figure**).

Figure. Inspired by Florence Nightingale's rose diagram of mortality during the Crimean War (1853-1856), the *University of Toronto Journal of Public Health* (UTJPH) logo is adorned with influential dates from the four disciplines represented within the journal: Biostatistics (1937); Epidemiology (1854); Health Policy (1964); and Social and Behavioural Health Sciences (1848). The fifth pillar represents the inaugural year of the UTJPH (2020).

Biostatistics

Kuan Liu

Biostatistics is a dynamic and collaborative scientific discipline that is concerned with the acquisition, analysis, and interpretation of biological data. Since its establishment, biostatistics has played a central role in the practice of medicine and public health, particularly in the subfields of

epidemiology, health services research, and pharmaceutical research.⁵

A key historical milestone of biostatistics is the development of the concepts and principles of randomization and experimental design. First created for agriculture field experiments by Sir Ronald Aylmer Fisher in 1920s and 1930s, randomization and experimental designs were later introduced into clinical medicine by Sir Austin Bradford Hill in 1937, via a series of articles published in *The Lancet*.⁶⁻⁹ The work from Fisher and Hill, especially Hill's groundwork in 1937, pioneered the development of modern randomized controlled trials, which top the evidence pyramid as the "gold standard" approach to evaluate the efficacy and safety of treatments and interventions across a wide landscape of medical and public health research.

Looking to the future, biostatistics will continue to evolve as new methods develop in response to advancements in technology as well as social changes. For example, in recent years, there has been a shift in drug discovery and development towards personalized medicine, introducing new biostatistical challenges in analyzing medical imaging data and high dimensional genomic data along the way. Biostatistics is an exciting, problem-driven field with a rich history of significant contributions to scientific discovery and will continue to be at the forefront of multidisciplinary research in health-related fields in the years to come.

Epidemiology

Jean-Paul R. Soucy

In early September of 1854, a terrible outbreak of cholera burned through London's Soho district. While the prevailing wisdom held that the epidemic was caused by bad air, the physician John Snow became convinced that an unseen contaminant of water was truly responsible (germ theory was still a few years away). By studying the pattern of cases and interviewing those afflicted, Snow traced the source of the infection to the water pump on Broad Street. Importantly, he was able to convince the Board of Governors to

remove the pump handle, though they remained skeptical of his theory of contaminated water.

While this action probably occurred too late to have a major effect on the contemporary outbreak (though it likely prevented a second wave),¹⁰ the value here lies in the decision itself rather than its outcome. John Snow modelled epidemiological principles by developing an explanation of the distribution of cholera in Soho based on observation and community engagement rather than superstition. Crucially, he paired empirical observation with action, convincing the local institution in charge of public health to act on sound scientific reasoning rather than long-standing prejudices.

John Snow exemplified an approach that contemporary readers will recognize as the foundation of epidemiology—observing the distribution of disease in space and time in an effort to identify risk factors and ultimately inform interventions, policy, and practice. As global causes of death shifted toward chronic disease, this approach would be applied to heart disease, cancer, and all manner of ill health. The population health perspective, stemming from the realization that large gains in overall health could be achieved through small modifications in population-wide risk factors, was useful in crafting effective strategies once risk factors were identified.¹¹ Today, modern epidemiological practice has grown to encompass determinants at all levels—societal, individual, and molecular—but remains rooted in the wisdom gained at the Broad Street pump.

Health Policy and Practice

A. A. Rajendran

Health policy is a powerful tool that has the potential to transform the health and well-being of entire populations, but what *is* policy and what comprises *health* policy? Much like the field of public health generally, health policy's deeply multidisciplinary nature complicates a single, unified definition. Political scientists have proposed numerous definitions for public policy, ranging from pithy catchalls (e.g., "anything a government chooses to do or not to do") to the more fulsome:

the choosing of goals and the method by which they can be realized given the power available to a political actor or group of actors.^{12,13} *Health* policy is more specific and encompasses the "decisions, plans, and actions" that are used to accomplish healthcare objectives.¹⁴ This includes policies pertaining to population health, which can be further classified as *public health* policies. On a related but different hand, health system policies tackle goals related to reducing total healthcare expenditures and increasing healthcare quality, while also ensuring an equitable distribution of healthcare benefits and costs.¹⁵ Although numerous examples of health policies exist, the 1964 tobacco control report represents a seminal contribution to the field and an illustrative example of public health policy.¹⁶

Throughout World War I, The Great Depression, and World War II, the yearly per capita number of smoked cigarettes grew from under 200 to nearly 4,500 in the United States.^{17,18} Smoking was commonplace, fashionable, and cigarette manufacturers often partnered with physicians in various marketing campaigns to gain public trust.¹⁹ However, the 1964 U.S. Surgeon General's Smoking and Health report initiated a cascade of smoking-related policies and legislation in the United States and other developed nations, with the Federal Cigarette Labeling and Advertising Act of 1966 being just one example.^{16,17,20,21} Despite influence exerted by the tobacco industry, policy changes were progressively instituted and smoking rates gradually declined.¹⁷ It has been estimated that between 1964 and 2012, eight million smoking-related deaths were prevented, amounting to 157 million years of life saved in the United States – a clear demonstration of public health policy's potential.²²

As was the case with the Surgeon General's report and subsequent policy response, policy creation and implementation often require balancing an array of competing interests from a variety of actors and stakeholders. This is particularly relevant in the circumstances we find ourselves in today. The COVID-19 pandemic has fundamentally altered the way in which we live our lives, and physical

distancing policies are just one way in which governments have responded. Although these measures seem to be effective, the projected benefits have been pitted against the potential consequences for large-scale economic and social well-being. Future avenues of public health policy research include examining the impact of COVID-19 policies on various dimensions of population health, from the most proximal to those still years to come.

Social and Behavioural Health Sciences

David J. Kinitz

In his report on the 1848 typhus epidemic, physician Rudolf Virchow advocated for the importance of revolutionary social reconstruction in eliminating endemic infections. He dismissed the simplistic causal relationship between pathogen and disease, acknowledging instead that a range of structural factors contribute to variability in an individual's vulnerability to illness.²³ From a position of privilege, Virchow drew particular attention to the precarious environmental and social circumstances that put marginalized and historically oppressed populations at increased risk of poor health. This is just one notable milestone in the history of the SBHS, a field which has seen important contributions from a range of philosophers, sociologists, and researchers as diverse as the populations that they study.

SBHS is an interdisciplinary field of public health that aims to understand the role and relationship between structural and social relations, as well as individual level behaviour, in producing health and illness.^{24,25} *Context*, namely through the analysis of global, socio-cultural, economic, and political structures, is at the core of SBHS. Health and illness are inextricably linked *within* these structures and therefore reflects their value systems – systems that have historically centered heterosexist, cissexist, racist, and classist principles.

SBHS is critical in its approach and spans methodological boundaries (qualitative and quantitative) to challenge assumptions and power relations

within public health practice and policy. The field has a strong tradition of social justice and recognizes the role of dominant paradigms in public health and the biomedical sciences in promulgating health inequities. SBHS scholars draw on theory to understand health and the social world, including both macro and middle-range theories such as political economy and the Health Belief Model, respectively.

SBHS scholarship is inherently invested in the operation and production of power through the dialectics of structure and agency with the aim of bringing about social change.²⁶ Scholars and researchers from sociological and behavioural traditions draw upon this rich history to understand the social determinants of health inequities in contemporary times.²⁷ SBHS engages with these traditions to inform *all* types of policy, from housing, to antidiscrimination, to urban planning, and everything in between. Health and well-being are woven within all of these structures and thus must be considered as such in order to improve the human condition.

Conclusion

These dates and stories represent important events in the evolution of each discipline and the field of public health. Today, we are tasked with picking up where they left off, bringing with us the wisdom and courage to think unconventionally and to lead with empathy, equity, and intention.

While the purpose of this founding editorial is to provide our readership with a prominent historical event for each pillar, we would be remiss if we described only *certain* elements of our history. To truly advance population health we must confront, reconcile, and seek to actively repair the legacies of inequity that have become ossified in our political, economic, and social institutions. Public health requires a sensitivity to the origins of knowledge and the reproduction of historical practices that perpetuate inequities and systematically advantage certain populations, while disadvantaging others. We, public health researchers and practitioners, need to be reflective and reflexive about

who is contributing to knowledge and who has the power to mobilize knowledge. The UTJPH commits to be an active and participating member in such pursuits; a commitment soon to be reflected in its rich collection of publications, dedication to knowledge translation, and mission to train the next generation of public health scholars and practitioners. As a testament to our diverse and ever-changing history, we will regularly update our logo to feature new dates, dates that depict stories of both success and failure, as it is only through understanding our history can we better our future.

The UTJPH welcomes submissions from public health researchers and scholars of all career stages and who work in local, national, and international contexts. This inaugural edition of conference abstracts highlights the diversity of public health and broad scope of the UTJPH. Please join us on our journey and mission to improve population health and train the next generation of public health scholars and practitioners.

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