A Look into Community Health Medicine During a Pandemic

Q&A with Dr. Christina Bancej, Chief of Influenza and Emerging Respiratory Infections at the Public Health Agency of Canada

BY BAYONLE AMINU

Dr. Christina Bancej is the Chief of Influenza and Emerging Respiratory Infections at the Public Health Agency of Canada. She earned a BSc (Hons) in Physics and Biology at York University in Toronto, Ontario during which she received an undergraduate National Science and Engenieering Research Council (NSERC) award for genetics research. For her master's degree in Epidemiology and Biostatistics at McGill University, she examined the intersection of work and health in immigrant women, and at the same time, was involved in Statistics Canada's longitudinal study, the National Population Health Survey, until mid-2010. During that time, she also worked at the Jewish National Hospital in Montreal conducting health services research in the emergency department, looking at factors contributing to overcrowding and readmissions. After her master's, she worked at the Laboratory Center for Disease Control (LCDC), the public health arm of Health Canada, researching pesticides and their impact on maternal-child health and reproductive health, particularly in farming populations. She obtained her PhD in the same program as her master's, studying nicotine dependence and tobacco control in youth, while working at the newly created Public Health Agency of Canada.

What influenced your career choice, and what were the key events that led you to your current position as Chief, Influenza and Emerging Respiratory Infections at the Public Health Agency of Canada (PHAC)?

The choice of my career was more of a gradual unfolding of who I was. I was interested in math and sciences, and my parents were involved in the sciences. My father was in forestry and engineering, my mother was a laboratory technician in a public health laboratory, and she always talked about microbiology, tuberculosis, and related things. I knew that I would have a career in the sciences because I had always been interested in health and research, so I pursued an undergraduate in the basic sciences. I ended up going into epidemiology to apply methodological

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contribute to human health. When I first started, I thought that my interests were broad, but they were relatively narrow. Hence, during my master's degree, my view of what could be done with epidemiology and human health determinants became much broader. At this point, I knew that I wanted to build my methodological foundation in epidemiology and that I wanted to get a doctoral degree, but I wanted to first get better at identifying the research questions that are most important to society. These research

questions were not the ones that I was able to come up with on my own. So, I think the researchers' agenda in public health needs to be something that is not just the aim of individuals or scientists – as remarkable as they might be, and many of whom I admire, but rather more of a collective endeavor. From reading an annual report from the LCDC, I loved that the organization was uniquely positioned to investigate certain health-related issues, which was the sort of work that I felt I could not do anywhere else, including an academic or university environment. A couple of years in, I started my doctorate studies, a family, and continuing to work at the newly created Public Health Agency of Canada at that time, where I was working on chronic disease matters on cancer screening.

My work on chronic disease surveillance and epidemiology subsequently expanded from the narrow focus on diabetes and cardiovascular disease to neurological, musculoskeletal conditions, mental illness and health. It was definitely a very exciting time. Around 2014, I had not had a lot of exposure to communicable/infectious disease epidemiology. My major step in that direction would have been on human papillomavirus because I was working on cancer screening at the time, with a vaccine in the pipeline that could prevent the onset of cervical cancer, a significant cancer globally in terms of women's health. In 2014, West Africa had a multi-country outbreak that constituted a public health emergency of international concern for Ebola Virus Disease. The PHAC was looking for people to work in the emergency operations center in planning and logistics in various areas, so I took an assignment to work there for many months. I felt a calling to do something more active than scanning our policies and how the epidemic was unfolding.

The opportunity came up to be assigned as a scientific contributor to the mission for the Global Outbreak Alert and Response Network (GOARN) of the World Health Organization (WHO), and that was my introduction to field epidemiology in infectious diseases — my couple of months in the emergency operations center and subsequent mobilization to Guinea. I worked at the National Coordination Center in Guinea and learned more about emergency management and how an Incident Management System (IMS) functions. I also worked in the field doing case finding and contact tracing in affected areas. When I was in West Africa, WHO was conducting the vaccination trials of a vaccine against Ebola that our National Microbiology Laboratory developed here in Canada, with vaccine shipments submitted to the WHO, and that vaccine was being tested. So, when I came back to Canada, I decided I wanted to know more about vaccines and moved to PHAC's Infectious Disease Prevention and Control Branch. I had an excellent foundation in pharmacoepidemiology in my master's and doctoral training at McGill, but I had not really applied it yet. Vaccines are drugs, and post-market surveillance of vaccines is a main aspect of pharmacoepidemiology. While I was working on vaccine safety, there was a need, and I had the interest to help build up the Influenza team in Influenza and Emerging Respiratory Infections, so I took that on in addition to vaccine safety. When the Influenza team grew, I left the vaccine safety behind, but I still support other colleagues in that area. I have been doing influenza and emerging respiratory infections epidemiology ever since — something I definitely see myself doing for the next 15 years, if not more.

What does your average day look like, and what excites you most about your work?

Even prior to coronavirus, my day usually starts with a scan of the situational intelligence from event-based surveillance from platforms like the Global Public Health Information Network (GPHIN). I also follow so many credible blogs and listservs like the PROMED from the International Society of Infectious Diseases, and an independent blog called Avian Flu Diary owned by a retired paramedic named Michael Coston. I follow those because they are often early and often right about what is going on, so I pay attention to those because it is an informal network of intelligence. I do look at research scans and summaries of some of the key journals; we have some formalized processes to check, track this information, and assess it to decide actions. The balance of my day is routine surveillance, collaboration

on surveillance, and epidemiologic research or longer-term capacity issues. Sometimes I am reactive by responding to action requests; you never know what might come up, and that can be a double-edged sword, interrupting me from the important work that I'm doing today, on the other hand, it's this constant feedback of what is important to the public, to the news media, to the minister of health or parliamentarians. So, it is good tension, I would say, that we have these things.

Your publication at the beginning of the pandemic in 2020 reported on respiratory syncytial virus (RSV) vaccine readiness in Canada. Has your focus shifted in response to the pandemic? Has this impacted any other projects that were formerly in the works?

It is not like we are singularly focused on COVID-19, but I would say my focus has shifted somewhat, as has that of our surveillance partners, but I see it as more of a temporary shift. You know, hospitals, primary care practices, research networks, surveillance networks, all of them have really shifted to focus on similar insurgencies as the COVID-19 pandemic is a global public health emergency. It has also been interesting to see how the COVID-19 pandemic and the unprecedented stringent public health measures have radically changed the landscape and the circulation of respiratory infectious diseases. That said, I have still been working on RSV vaccine readiness. The burden and impact of RSV, especially on infants and children, is still incredibly high, but with the low circulation and public health measures this year, normal circulation is not happening, but this will resume; we will not be on lockdown forever. My program does continue to do the laboratory surveillance for RSV, and I still am working with surveillance networks like the Canadian Pediatric Society's Immunization Monitoring Program ACTive (IMPACT) network, on RSV vaccine readiness and analysis. We have been in touch over the last several months, almost weekly, and I have also been working with global partners through the WHO RSV surveillance global pilot. The shift has changed because COVID-19 is a priority, but other essential pieces of public health are continuing and really must continue. So, the RSV vaccine readiness is one of those, influenza surveillance is another, influenza pandemic preparedness is another that needs to be continued; just because we have a COVID-19 pandemic does not mean that the threat of an influenza pandemic or any other type of outbreak disappears.

How do you think the journalistic media and social media technology, in general, influenced the current pandemic when compared to others in the past?

I am saying this certainly from an observer's perspective, not as an expert; what I noticed with the SARS-CoV-2 is that it really opened things up for citizen scientists. The journalistic media has really pushed transparency which I think is an excellent thing. However, it has also complicated the communications, for example, the definition of official government sources or official sources — the Canadian government, governments worldwide, or organizations like WHO always have to give a list of reliable sources for vaccination information. I think this list expanded quickly with COVID-19, and new reputable/reliable players came into the picture. The definition of official government sources has really changed; the first announcement of person-to-person transmission of SARS-CoV-2 did come from the WHO, from their Western Pacific regional office, via Twitter. That, to me, was quite a surprising change. I am not directly involved in the PHAC's monitoring of COVID-19, but we also use a the GPHIN, which is an event-based surveillance platform that scans global news media and crawls through it all every day and picks up infectious disease threats or health-related threats. GPHIN did find the news media announcements of the atypical pneumonia in Wuhan back in December of 2019, later identified as COVID-19. But GPHIN uses news media; it has not evolved to include social media. Inclusion of social media and ways of analyzing that would have to be incredibly complex enough to separate a signal from noise, but it does need to be done, although we are not just quite there yet. In terms of the journalistic media, I think it has been that positive in terms of opening things up for citizen scientists, pushing transparency, putting data out there in the open. However, my word of caution is that data is not meant to be only analyzed, it needs to be interpreted within the theoretical foundation and the approach grounded

in statistics and statistical theory.

Have opportunities changed for students (high school or undergraduate) interested in public health/epidemiology?

I think that the opportunities over the last 15 years have changed enormously. I have seen master's in public health programs spring up very high-quality programs in several universities, and the field of data science and bioinformatics have also grown. There are newer technologies that allow us to work with big data; public health has been impacted by the growth/explosion of technology in the same way or more so than other fields, as we have always been working with big data before the technology was even there. I think that the advantage is that epidemiology can bring a science-based approach grounded in the principles of statistics to data analytics. In big data analytics, the substance of public health, community, and population medicine can be disconnected from statistical theory at times. Therefore, although the opportunities have changed and grown, it is not all about technology; it is also really about having the theoretical foundation underpinning the field of public health, data analytics, biostatistics, and so on. The two together can be incredibly powerful.

What advice would you give to undergraduate and graduate students interested in pursuing a similar career path?

I would say that for students who have a methodological inclination and an interest in community health/medicine, I think they have enormous potential to contribute to the field and that they should go for it. Try it out, understand and grow in your knowledge of the science, use the methods as a foundation, explore different experiences because they will constantly bring you back to test your methodological foundation.

That has been such a pleasure for me – being a constant learner. As a new graduate in the field of public health, bioinformatics, or molecular epidemiology, this is all relatively a new science. So, you can innovate, contribute to the progress and knowledge base, so keep doing that sort of call and response: of coming back to the methods, and seeking out new/relevant questions on which to apply them.

"Explore your interests, do not be afraid to be a beginner, start again and again"