



Mod4PH Research Highlights Episode 5 Transcript: NACI Guidelines for Economic Evaluation of Vaccination programs in Canada

Welcome to the Mod4PH research highlights. This is a public health podcast produced by the National Collaborating Centre for Infectious Diseases. My name is Wendy Xie, and I am NCCID's modelling knowledge translation project manager. This episode will be one of several episodes for this Mod4PH series, where we showcase mathematical modelling concepts and research for public health.

Today, we will be speaking to Man Wah Yeung and Dr Beate Sander about the recently published Guidelines for the Economic Evaluation of Vaccination Programs in Canada, produced by the National Advisory Committee on Immunizations, or NACI. Man Wah is a Senior Health Economist at the Public Health Agency of Canada and Beate is a Canadian Research Chair in Economics of Infectious Diseases, Senior Scientist at the Toronto General Hospital Research Institute, and a Professor of at the University of Toronto. Man Wah and Beate are two of many experts who have worked together to create these guidelines on how to conduct economic evaluations of public health intervention strategies.

This episode will provide an overview of the NACI Health Economics Guidelines, and how they can be used to inform best practices and promote standardized and high-quality evidence for public health decision making.

Wendy – Hello to everyone listening in, and welcome to Man Wah and Beate, thank you both for joining us today.

Beate – Thanks so much for having us today.

Man Wah – Thanks Wendy.

Wendy – It's great to have both of you here. Let's start with a quick introduction of the NACI Guidelines for Economic Evaluation of Vaccination programs in Canada – Man Wah, would you please give an overview of what the guidelines are and who the target audience is (or who the end-users are)?

Man Wah – That sounds good. I'll start by introducing who NACI is first before we jump into the guidelines. So NACI stands for the National Advisory Committee on Immunization, and it's an external advisory body that provides public health advice related to vaccines for the prevention of disease. It's a committee that comprises of Canadian experts in infectious diseases, in immunology, geriatrics, nursing, pharmaco-economics, public health, epidemiology, and social sciences. And so this committee in the past, the scope had traditionally included recommendations that were based off of safety, efficacy, immunogenicity, effectiveness, and burden of disease for their decision-making.

But as of 2019, the NACI mandate is being gradually expanded to include other factors, such as cost-effectiveness in their decision-making. And so this is where the guidelines come in. Our guidelines for economic evaluation of vaccination programs in Canada, they support NACI's expanded mandate, of course. And as health economists, we use economic evaluations to study the concept of cost-effectiveness.

So our guidelines provide recommendations on how to conduct economic evaluations of vaccines in Canada. They start from how to conceptualize the decision problem, to how to report, and in total there are 15 chapters that cover various topics like study populations, perspectives, time horizon, uncertainty,



and equity, etc. And the intent is to inform best practices for consistency and credibility, and also to suggest future direction for methodological research.

And overall the guidelines promote standardized and high quality evidence for decision-making in Canada. And so the guidelines are catered towards researchers who conduct economic evaluations as well as to the end-users, like policymakers, who use this generated evidence for various program implementation decisions.

Wendy – As Man Wah mentioned, economic evaluations are necessary to examine the cost-effectiveness of public health interventions such as vaccination. Beate, would you please elaborate on why thinking about cost-effectiveness is important and how decision-makers can use this information?

Beate – Absolutely. So I kind of just want to say in economic evaluation, as Man Wah mentioned, we often talk about cost-effectiveness or cost-utility analysis, basically indicating that we consider both. So we look at health outcomes and the resource utilization or cost that's related to a specific intervention. And in our case here we talk about vaccines.

So essentially, we are comparing costs and consequences or outcomes of different interventions. And so that gets at value for money, which is really important for decision-makers in the context of limited resources, which is always the case like, we never have an unlimited budget to spend on anything. So we really want to make sure that the interventions that we spend our money in gives us the best value for money overall.

Wendy – Why was the development of these guidelines necessary, and how are these different from other guidelines for economic evaluation in use right now, such as the ones published by the World Health Organization in 2019?

Beate – When we looked at the guidelines that already out there - we have the WHO guidelines (or the guidelines by the World Health Organization), they are specific for vaccines, but they are not specific to Canada. And it's really important to have the local context for this type of evaluation. Another guideline is a Canadian guideline by the Canadian Agency for Drugs and Technology in Health. Those are Canadian guidelines, and they're intended to be broad - they are not specific for vaccines.

We are interested in having guidelines that are specific for vaccines, because vaccines are different and infectious diseases are different in that there's a broader impact. It's different to other health technologies like drugs or devices in that the intervention or vaccines could affect both vaccinated and unvaccinated individuals, right? So the more people are vaccinated, for example, that will also protect people who did not get the vaccine if we reach what we call herd immunity, or community immunity. There are externalities that are very vaccine-specific, like community immunity, but also age-shifting of diseases or serotype replacements or disease eradication. So there are issues that are specific for vaccines and infectious diseases that we don't have in chronic diseases. And then they can also have a large non-health impact. Some of the ones that we touch on in our guidelines are productivity. So, for example, similar to other diseases, if you can prevent the disease, like you don't get sick this winter with influenza, then you will have increased productivity. So you'd be able to work or do the activities that you usually do.

There are also effects on, for example, education. We could improve educational outcomes if we prevent infectious diseases that have severe long-term sequelae, like neurologic damage that would impact education, for example, measles or meningitis, so there are different infectious diseases that would have this type of outcome. And all the way to the environment, so if we reduce antibiotic use because we have



vaccines, and we prevent infectious diseases that would usually be treated with antibiotics, then we would expect to see decreased levels of antibiotics in the environment.

So basically, there are broader impacts, specifically related to infectious diseases and vaccines that we want to capture in our economic evaluation. Because if we don't, we would undervalue our vaccination program. And so the guidelines that we've developed present detailed information, how we actually go about incorporating these population level effects into our economic evaluations.

Wendy – Thank you Beate. There are 15 sections in the guidelines which address different aspects of an economic evaluation, and unfortunately, we don't have time today to go through each one. If you could only highlight three sections of the guidelines, what would they be?

Beate – So we'll highlight 3 sections - I highlight them because I'm really proud that we have them in it and I'm really excited about it and it's different to some other existing guidance. So one is perspective, and the other is that and impact inventory table and I think I will let Man Wah speak to that. But I will start with the topic I'm really excited about, which is equity.

So generally our equity chapter or our equity recommendation encourages researchers to consider and characterize distribution of impacts. So what that means is, basically, if you look at how health is distributed in the population, then we notice, or we know it's not equally distributed. So, some populations have more health, or, you know, for example, measured in terms of life expectancy, than other population groups. And so, when we have an intervention, this intervention could impact the distribution of health in our population and so it may improve it, or it could potentially also make it worse.

So what we are saying in this guidelines is that we want to include equity - so we want to quantify the distribution of health prior to the vaccine, and what we would expect, how the distribution of health will look after implementation of a vaccination program, so that the decision-maker could consider, for example, specifically tailored vaccination programs and can deliberate on this type of issue.

I also want to mention that this is consistent with the expanded mandate of NACI that Man Wah already spoke about, in that we should consider equity in the context of our EEFA framework, where EEFA stands for ethics, equity, feasibility and acceptability. So that's a very new development in terms of considering equity in economic evaluation. So there's still a lot of methods development that's actually going on in the field of health economics. And so we are not requiring an equity-informative economic evaluation, but we would like to see it. So it's very, very high on the wish list of what we would like to consider when NACI makes the deliberations on immunization programs.

Wendy – Okay so that's one section on equity, which I agree is very important. Man Wah, would you please go over perspectives and impact inventory?

Man Wah – Sure- in terms of perspectives, as many of us know, the perspective in an economic evaluation refers to the viewpoint that's adopted. It speaks to what type of costs and what type of consequences should be included in the economic evaluation. So, for instance, a patient perspective can look at the costs and consequences incurred just by the patient, so this could be out-of-pocket costs when the patient needs to park at the hospital for an appointment, but this out-of-pocket parking cost would not be included from a healthcare payer perspective, because for the payer or the government in the case of universal health care, they would not be paying for that parking. So there are various types of perspectives. The broadest perspective is called the societal perspective, and that reflects the full range of



social opportunity costs. So, for instance, it could include productivity losses that arise from a patient who is no longer able to go to work because of their particular illness.

For our guidelines we recommend two perspectives as reference cases. The first perspective is the publicly funded health system perspective. And the second perspective is the societal perspective. For the first perspective we ask researchers conducting the economic evaluation to include costs and consequences that are experienced both by the vaccinated individual and the unvaccinated individual. And this is because, as Beate had alluded to, there are these externalities with infectious diseases. So because of disease transmission, the individual vaccinated is not the only person being affected. In our guidelines, we also recommend that the costs and consequences incurred by the health system should be incorporated in this first recommendation. Some of these health system costs may include publicly funded healthcare services, future related and unrelated healthcare costs, program costs funded by public health, as well as intervention-related costs such as through vaccine doses and administration.

For our second recommendation, which is to conduct an economic evaluation from the societal perspective, we would ask researchers to capture all the consequences and costs from the health system perspective as well as those that fall outside of the publicly funded health system. So these may include direct out-of-pocket costs for patients, losses in productivity, consumption, education, social services, community services, and the environment. We also ask researchers to think about the longer term impacts such as the effect of childhood illness on an individual's neurodevelopmental impairment, educational achievement, and subsequent long-term productivity and consumption. So all of these different types of impacts are listed in what we call the impact inventory table. And this was something that was adopted from the US Second Panel on Cost-effectiveness and we have modified their table to include the broader impacts and to include any vaccine-specific impacts.

Wendy – Thank you so much, we've reached our last question, and I would just like to ask you both to give us your final thoughts about the implications of these guidelines for public health research and decision making.

Beate – Thanks so much, Wendy, for giving us this opportunity. So I think I have to reiterate my excitement about having the guidelines because it really allows us now to bring standardized, high quality, economic evidence to NACI's deliberation on vaccination decisions at the federal level, and that applies specifically for recommendations that NACI makes at the population level. I'm also excited about the specific chapters that we already highlighted - equity, and also the broader perspectives, because I hope that it kind of moves the field forward in kind of conducting economic evaluations that consider those broader impacts. And with this in mind, I hope also that the guidance will be more broadly used by researchers and analysts to conduct economic evaluations for vaccines in Canada, whether or not it's for NACI although NACI is our primary audience.

Man Wah – I completely agree with Beate in terms of how exciting this work is, and we really look forward to seeing the downstream effects and how it will impact our different stakeholders. So, for instance, with the provinces and territories: On one hand, we recognize that NACI recommendations are not binding for provinces and territories, but we've consistently heard feedback from them that they look to NACI advice, and they recognize the importance of having this health economics capacity being built up at the federal level, and that they can leverage this expertise when they are going back to their own ministries and to their own public health and making decisions about program implementation and so forth. So, cost effectiveness is a huge component in terms of this type of decision-making. So, we're



excited that the guidelines are now available, and they are going to be providing credible and standardized information for different stakeholders, such as the provinces and territories, to use.

Wendy –That’s all we have time for today, thank you Man Wah and Beate for joining us to talk about these new guidelines for economic evaluation and how they are important for public health programming in Canada.

Beate – Thanks so much Wendy, this was fun.

Man Wah – Thanks again.

This concludes our conversation with Man Wah Yeung and Beate Sander on the new Guidelines for the Economic Evaluation of Vaccination Programs in Canada, produced by the National Advisory Committee on Immunization. You can find a link to these Guidelines on the same page where this podcast episode is posted on the NCCID website, under webcasts. If you have any other questions about this episode or would like another math modelling concept or researcher featured on this podcast series, please write to us at nccid@umanitoba.ca.

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