

Methodology

This paper is one of three derived from a larger review of literature on the 2009 H1N1 influenza pandemic and its impact on Indigenous people in Canada published from the start of the pandemic in 2009 to October 2014. Literature for this larger review was identified first through the use of PubMed, Medline, and Google Scholar. Additional literature was identified from the bibliographies of retrieved publications. The search strategy combined any of the terms 'Aboriginal,' 'First Nations,' 'Inuit,' 'Metis,' 'Métis' together with the term 'H1N1.' Publications could be either peer or non-peer reviewed, and based on original research or a review of the literature. Publications were included in the review if they:

- focused exclusively on Indigenous peoples (First Nations, Inuit and/or Métis) and their experiences with the H1N1 virus;
- focused on the general population but included Indigenous ethnicity as a variable and undertook some analysis at this level;
- were case studies involving primarily Indigenous patients; and
- focused on lessons learned from Indigenous experiences during the pandemic that could inform public health responses to influenza pandemics in the future.

Publications were excluded if they simply presented an accounting of the number of Indigenous patients within a sample but provided no analysis for this population. They

were also excluded if their focus was primarily on other types of influenza. Of the 116 publications that met the search criteria, 45 were deemed to be relevant to the larger review. Of these, 17 included lessons learned from the public health response to the 2009 H1N1 influenza pandemic in Indigenous communities and implications for pandemic planning. This paper summarizes the key challenges which emerged during the pandemic response in Indigenous communities and the recommendations for effectively addressing these challenges in future pandemics.

Challenges in responding to the 2009 H1N1 influenza A pandemic in First Nations, Inuit and Métis communities

Canada experienced two waves of the 2009 H1N1 influenza pandemic, the first occurring from April to August and the second occurring from the end of August to January of 2010 (Stoops, 2012). Indigenous populations were disproportionately represented in H1N1 influenza cases and were especially vulnerable to severe health outcomes. However, the burden of infection was not evenly distributed across both waves of the pandemic or across all communities, regions, and population groups. Although more Indigenous people were admitted to hospital during the second wave compared to the first, they accounted for proportionally more H1N1 influenza cases during the first wave compared to the second (Helferty et al., 2010, Green et al., 2013; Mostaço-Guidolin et al., 2011, 2012). Of the three specific populations, Inuit were especially over-represented during

the first wave, First Nations were especially over-represented during the second wave, and Métis were consistently under-represented in both waves (Helferty et al., 2010). Further, the research also showed a strong association between geographic isolation of Indigenous communities and severe H1N1 influenza outcomes (Green et al., 2013; Mostaço-Guidolin et al., 2011, 2012; Morrison et al., 2014; Janjua et al., 2012, 2012; Thompson et al., 2012).

The early arrival and speed at which the H1N1 influenza spread in Indigenous communities highlighted a number of significant challenges in responding to this public health emergency. Spence and White (2010) noted major breakdowns in the provision of services by governments in some First Nations communities, including shortages of supplies, inadequate health care, and insufficient training. There were also issues related to a lack of leadership, communication and information sharing, and coordination among various levels of governments (Charania & Tsuji, 2012; 2011b). In particular, the research highlighted the need for the federal government to provide leadership and coordination in responding to pandemic crises, as well as the ability of government representatives, public health practitioners and community leaders to work together to develop and implement interventions that will work within their communities (Charania, 2011; Charania & Tsuji, 2011a).

Charania (2011) and Charania and Tsuji (2011a) undertook a qualitative analysis of perspectives from three northern Ontario First Nation



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community stakeholders regarding the pandemic response in their communities. Their study highlighted the challenges of providing adequate access to health services in northern and isolated communities, including a lack of human resources and a shortage of equipment (especially for severely ill patients requiring ventilation). As well, there were a number of controversial decisions made by the federal government which they argue contributed to the high degree of severity of H1N1 infection in these communities, including the decision to delay sending masks, respirators and hand sanitizers early in the outbreak. The authors point out that these delays were not merely administrative, as they reflected systemic racism and perceptions that are disconnected from reality. For example, a federal government decision to delay sending alcohol-based hand sanitizers to communities on the grounds that First Nations people might ingest

it (Spence & White, 2010) is an example of ongoing structural racism and stigmatization which continues to pervade some sectors of the government and health services.⁴ In another example, Charania and Tsuji (2012) report that federal civil servants sometimes had perceptions about First Nations communities that were disconnected from the realities these communities face, including an unwillingness to accept there was no running water or there were unmet housing needs (Charania & Tsuji, 2012). Other decisions, like sending body bags to First Nations communities rather than the supplies needed to reduce the impact and spread of H1N1 influenza, and the ways in which risk was communicated to Indigenous people, left many community residents feeling less valued (Driedger, Cooper, Jardine, Furgal, & Bartlett, 2013; Charania & Tsuji, 2012). Entrenched perceptions and misconceptions about Indigenous peoples and

communities and insensitivity by public health officials in responding to pandemic emergencies can act as significant barriers to improving the health and well-being of Indigenous peoples and underscore the need for cultural competency training at all levels of the health sector, from health practitioners, to administrators, to decision-makers, and to those who set health policy.

Effective and timely surveillance is necessary for accurately tracking, planning and responding to diseases (PHAC & HC, 2010; Pollock et al., 2012). While surveillance was improved during the 2009 H1N1 influenza pandemic, allowing for a better estimation of disease severity and methods to examine the immune mechanisms behind the disease (Juno et al., 2012; PHAC & HC, 2010), several issues relating to surveillance were identified in the literature that impacted the response to the pandemic in Indigenous

⁴ See for example, discussion by Loppie, Reading, and de Leeuw (2014) on manifestations of structural racism within Canada's justice and health care systems.

communities. In their review of the public health response to the 2009 H1N1 influenza pandemic, the Public Health Agency of Canada and Health Canada (2010) noted the challenges PHAC experienced with respect to its surveillance capacity, “including both a lack of real time data on key epidemiological variables and epidemiological resources to review surveillance data” (p. 31). The challenges associated with inconsistent reporting of Indigenous ethnicity and clinical details in laboratory-confirmed cases across multiple jurisdictions, hospital databases, and public health systems in Canada highlighted the need for streamlining data sets to allow for “stratification of health regions, age, gender, ethnicity, time for initial care, and the type of and duration of health resources used for the management of infection” (Richardson, Driedger, Pizzi, Wu, & Moghadas, 2012, p. 5). This type of information allows for the effectiveness and cost-effectiveness of various intervention measures to be more readily assessed. In some northern isolated communities, especially in Nunavut, public health records are still largely paper-based rather than electronic, which resulted in problems with maintaining health records and surveillance (Richardson et al., 2012). The lack of a comprehensive public health surveillance system resulted in an incomplete and inconsistent national picture and thus less timely decision-making (PHAC & HC, 2010). In addition, Spence and White (2010) noted the lack of leadership in disseminating key information on pandemics to First Nations, including communication issues related to privacy laws, which prohibited authorities from sharing confirmed

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or suspected cases on reserve with Indigenous leaders. These challenges highlighted the importance of effective national reporting and data-sharing infrastructures and approaches across federal, provincial/territorial and local governments.

Despite these challenges, there were some successes with respect to the pandemic response. The lower hospitalization rate for Indigenous people in BC compared with other provinces, for example, has been attributed to the BC government’s development, in consultation with the First Nations Health Council and other First Nations stakeholders, of a comprehensive First Nations pH1N1 Action plan early in the outbreak. The plan included a pre-positioning strategy that saw diagnostic kits sent to 21 remote First



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Nations communities to expedite diagnosis and care (Daghofer, 2012; see also Office of the Provincial Health Officer, 2010). A similar strategy was also implemented in the Yukon and six other provinces. Some First Nations communities showed resiliency and the capacity to respond in a pandemic emergency. For example, Pollock and colleagues (2012) highlighted the strong level of coordination among multiple levels of government in one First Nations community which resulted in the mobilization of additional health staff and resources, daily monitoring of patient numbers, and effective infection control measures. Likewise, Xiao et al. (2013) attributed the swift action on the part of public health officials and community leaders combined with aggressive antiviral therapy for likely reducing

the epidemic “several-fold” and preventing adverse outcomes from H1N1 infection in one isolated First Nations community (p. 1414).

The public health response to the pandemic in Indigenous communities revealed the need to develop innovative prevention and mitigation strategies that address the unique characteristics of Indigenous communities that may affect their ability to respond to a public health emergency. These include shared responsibility for the delivery of health care services (federal, provincial, and First Nations governments); inadequate social policies and insufficient federal funding which have been detrimental to primary health care service delivery, community level surveillance, and housing; and inadequate infrastructure for transporting supplies and resources (Charania & Tsuji, 2011a, p. 565). Indigenous communities may lack access to the resources they need to protect themselves against pandemics

like the H1N1 influenza, including economic wealth, adequate supplies of food, and clean running water (Mousseau, 2013; Krishnamurthy, 2013). In addition, there are cultural and social norms which influence the spread of influenza, including strong social ties, multigenerational households, and the importance of ceremonial gatherings which can result in greater exposure to infection (Mostaço-Guidolin et al., 2013; Mousseau, 2013).

Recommendations for Pandemic Planning, Response and Communication

This section outlines recommendations for pandemic planning that are derived from the literature. These recommendations emerged from the challenges encountered in responding to the 2009 H1N1 influenza pandemic and the factors that have been identified as contributing to the

spread and severity of H1N1 influenza among Indigenous peoples, particularly in remote and isolated First Nations communities. The recommendations are grouped into three categories: preventive planning, effective emergency response, and communication.

Preventive Planning

The literature highlighted the need for pandemic planning to include not only strategies for responding in an emergency, but also strategies aimed at preventing individuals from becoming ill in the first place. Recommendations here focus on addressing some of the underlying inequities that increase the vulnerability of disadvantaged populations to infectious illnesses like influenza pandemics, as well as the early treatment of such illnesses among vulnerable populations.

Indigenous communities also often lack access to the resources they need to protect themselves against pandemics like the H1N1 influenza, including economic wealth, adequate supplies of food, and clean running water (Mousseau, 2013; Krishnamurthy, 2013).



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One theme emerging from the literature is that in order to prevent outbreaks like the 2009 H1N1 influenza pandemic, efforts must be made to address the socio-economic disadvantages that many Indigenous communities face. This includes:

- focusing efforts on improving housing conditions in First Nations communities (Charania & Tsuji, 2011a; Pollock et al., 2012);
- guaranteeing equal access to

- the social and material goods that are necessary for protecting against infectious diseases like H1N1 influenza (e.g. clean running water and hand sanitizers) (Krishnamurthy, 2013; Pollock et al., 2012; Spence & White, 2010);
- integrating community empowerment with programs designed to reverse the social conditions that are at the root of health inequalities (Mousseau, 2013);
- adapting policies to prioritize scarce health care resources so that disadvantaged populations are not further disadvantaged (Mousseau, 2013); and
- developing policies in a culturally appropriate manner and in equal partnership with Indigenous communities, empowering them to be actively involved in implementing prevention strategies (Mousseau, 2013).

Prioritizing groups for protective measures like vaccination is a key aspect of preventive planning. This involves identifying those populations that are most vulnerable to health issues like H1N1 influenza, such as Indigenous people living in isolated and remote communities. While this can be a challenge, Spence and White (2010) suggest one strategy is to consider using the Community Well-being Index (CWB) developed by the Department of Indigenous Affairs and Northern Development Canada as a means of identifying the most vulnerable communities. The CWB utilizes four socio-economic indicators that have been associated with health inequities to assess the well-being of communities. Spence and White suggest that communities with scores in the bottom third as determined by the CWB would be the most vulnerable to infectious diseases like H1N1 influenza and thus should be targeted with early and aggressive prevention and treatment measures, including priority vaccination and timely distribution of antiviral drugs to not only individuals who are infected, but also to anyone they have close contact with (Xiao et al., 2013; Pollock et al. 2012; Fanella et al., 2011; Zahariadis et al., 2010). Thompson et al. (2012) also argued that since “individuals who are not already connected to health services are less likely to be vaccinated,” a greater effort must be made to provide “acceptable, low-threshold opportunities for education and administration of vaccines” in order to maximize the reach of targeted vaccination campaigns (p. 69).

One of the key findings that emerged from the literature is that disease control strategies in rural and remote Indigenous communities must be significantly different from those in urban centres (Mostaço-Guidolin et al., 2011).





The H1N1 influenza pandemic highlighted the barriers posed by lack of health care infrastructure, equipment, and personnel in accessing health care.

Effective emergency response

One of the key findings that emerged from the literature is that disease control strategies in rural and remote Indigenous communities must be significantly different from those in urban centres (Mostaço-Guidolin et al., 2011). Not only must strategies strongly emphasize the reduction of disease transmission through measures to prevent individuals from becoming ill in the first place, they must also include measures to slow the spread of infection once illness has been detected (Mostaço-Guidolin et al., 2013; Mousseau, 2013). Recommendations under the ‘Effective emergency response’ category focus on ensuring resources and supplies are distributed in a timely fashion; improving access to health care; improving multi-government collaboration and coordination; improving surveillance; and implementing public health interventions that are aimed at ensuring rapid diagnosis, early treatment, and aggressive mitigation

of the spread of influenza pandemics like H1N1 in vulnerable populations.

The 2009 H1N1 influenza pandemic response highlighted some challenges in the timely transportation of resources and supplies (including masks, respirators, antivirals, and hand sanitizers) to isolated communities and emphasized the need to ensure there is a continuous store of pandemic supplies on hand. To ensure this, Charania and Tsuji (2011a, 2011b) recommended that special care be taken to ensure that shipments of antivirals have long expiry dates so they can be stockpiled; that all levels of government collaborate to develop a plan for adequately transporting and stockpiling supplies during a pandemic; and that an emergency fund be established so that disadvantaged First Nations communities are able to purchase the supplies they need for disease outbreaks. The latter is especially important given that individuals living in impoverished

communities cannot be expected to pay for the supplies they need to prevent the spread of infection or mitigate the severity of it. They also recommended that all levels of government collaborate to re-evaluate resource distribution plans. Kumar et al. (2009) recommended that feasible methods be explored to optimally expand and deploy ICU resources to meet the increased demand for ICU care in pandemic situations, given that remote and isolated First Nations communities do not have the same level of access to health services that urban residents have.

The H1N1 influenza pandemic highlighted the barriers posed by lack of health care infrastructure, equipment, and personnel in accessing health care. Several recommendations emerged from the literature to address these types of challenges. First, health care personnel should not be allowed to take pre-approved vacation time during periods of a pandemic

emergency (Charania & Tsuji, 2012). Second, efforts should be focused on recruiting a full-time, permanent complement of nurses who have the training necessary to prepare them for the demanding nature of their jobs and the cultural nuances and values of Indigenous peoples and communities (Charania & Tsuji, 2011a, 2012). Charania and colleagues also recommended that pandemic plans include a strategy for deploying an interdisciplinary team of health care professionals specializing in respiratory therapy, mental health, disease education, and post-pandemic psychological debriefing in affected communities. In addition, funding and human resources should be secured by government officials for an alternative care site that can provide care when health care facilities become overwhelmed; this should occur before the next pandemic alert and be detailed in community pandemic plans (Charania & Tsuji, 2011a).

Given the distinct characteristics of Indigenous communities that

contribute to vulnerability, health sector responses to pandemics must be swift and aggressive. Population-specific strategies such as rapid diagnostic interventions at the initial stages of a community outbreak (Charania & Tsuji, 2013), early treatment of ill individuals and prophylaxis of close contacts (Mostaço-Guidolin et al., 2013), and aggressive antiviral treatment in those communities that are most vulnerable (Xiao et al., 2013) must be implemented. In addition, there is a need to amend the criteria for intensive care admission and allocation of ventilators so that underlying principles of utility and efficiency are balanced with those of need and equity, so that marginalized populations are not disadvantaged further (Kaposy & Khraishi, 2012; Silva et al., 2010).

Breakdowns in the provision of health services during the 2009 H1N1 influenza pandemic, particularly in First Nations communities, highlighted the need to improve multi-government

collaboration and communication. Charania and Tsuji (2011a, 2011b) noted the need for all levels of government to collaborate in developing consistent guidelines, while Richardson and colleagues (2012) recommended that a mechanism be developed for effectively communicating guidelines, policies, responsibilities and strategies between all levels of the health care system and communities. However, the strongest theme that emerged in the literature was the need to develop community-level pandemic plans that are suited to the local context so as to ensure effective implementation of measures. For this, communities must be involved in pandemic planning (Driedger, Maier, Sanguins, Carter, & Bartlett, 2014; Charania & Tsuji, 2011a, 2011b, 2012). As Silva et al. (2010) noted, including those who are marginalized and are at greater risk of severe manifestations of influenza in pandemic planning will help establish trust and ensure compliance with public health measures. Community residents

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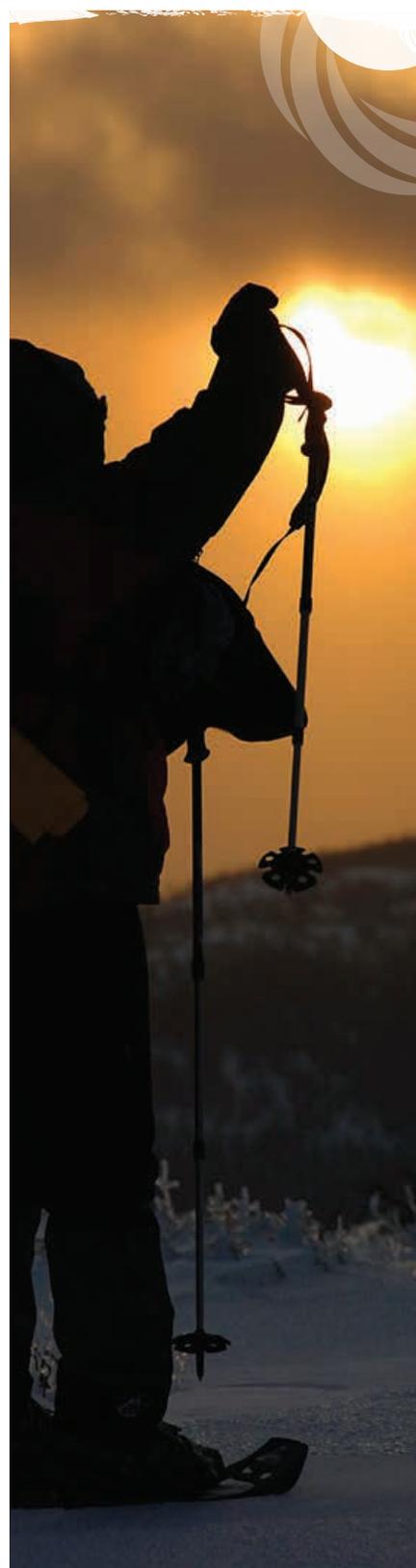
are also best able to identify the resources available in their communities and the barriers they might face in implementing recommended mitigation measures (Charania & Tsuji, 2011b, 2013). Community pandemic plans should include both pharmaceutical and non-pharmaceutical interventions, and incorporate respect for local values and culture, as well as First Nations holistic approaches to health (Charania & Tsuji, 2011b; Mousseau, 2013). They should also incorporate plans to manage mass fatalities (Charania & Tsuji, 2011b). Finally, Mousseau (2013) recommends using a number of public engagement methods to gain a broader understanding of the community's views for pandemic planning.

While surveillance could be considered adequate for the general Canadian population, and likely was improved during this pandemic emergency, there were certainly areas for improvement with regards to Indigenous populations; in particular, continuing concerns with regard to inequities in service provision (such as inadequate information technology in rural and remote regions), jurisdictional fragmentation of health care services which extended to a lack of coordination between various surveillance bodies, and inconsistent data collection, especially the use of Indigenous status identifiers in health data. These issues have been problematic in the past and remain problematic in the present for enhancing our understanding of the health of Indigenous peoples.

Several recommendations were made for improving surveillance as a result of the 2009 H1N1 influenza pandemic experience. Health Canada

One of the failings of the 2009 H1N1 influenza pandemic response in Canada, especially during the first wave of the pandemic, was that information received in Indigenous communities was often misleading, contradictory, or inconsistent.

and the Public Health Agency of Canada (2010) recommended that agreements be finalized to share surveillance information across jurisdictions in future pandemics. Second, they argued for the need to establish appropriate mechanisms to facilitate the rapid conduct of critical research that could inform decision-making in the event of urgent public health threats. This includes developing a standardized process to rapidly set research priorities during a pandemic, establishing a contingency fund to initiate rapid research funds, ensuring there is human resources capacity to coordinate and administer rapid research projects, and developing a mechanism to rapidly provide funding for project proposals in an emergency. Lastly, they argued for the need to refine approaches for conveying complex scientific information in ways that are useful to those who need it for planning and decision-making (pp. 32-33).



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Communication

One of the failings of the 2009 H1N1 influenza pandemic response in Canada, especially during the first wave of the pandemic, was that information received in Indigenous communities was often misleading, contradictory, or inconsistent. A number of recommendations were identified in the literature for ways to improve the development and communication of risk messages so that they are imparted more effectively. Driedger et al. (2014) summarized some characteristics derived from the general literature that they consider essential to effective risk communication, including:

- Messaging must be clear and consistent, and employ a variety of mediums.
- Timing is critical. For example, if it occurs after the peak of the pandemic, the message will not resonate with much urgency among the public.
- A targeted approach that takes into consideration community realities and challenges is better than a one-size-fits-all approach.
- In communities which have historically been marginalized and where trust may be lacking, messages must be credible so as to build trust as well as instruct and inform.
- Communities must be equal partners in pandemic planning so as to mitigate historical power imbalances and “add greater legitimacy to communications, supply health systems with culturally appropriate community knowledge, and identify potential challenges and barriers in reaching the community” (p. 115).
- Messages should be delivered by local, or in-community, representatives so they resonate more with community members.

However, in their evaluation of one component of a targeted H1N1 messaging campaign for particularly at-risk Métis in Manitoba, they found that other factors need to be considered as well. This targeted messaging campaign was developed with many of the general characteristics identified in the literature as essential for successful risk messaging. The entire campaign was developed through a strong

partnership that existed between the Manitoba Métis Federation (MMF) and Manitoba Health, and involved delivering 2,500 flu kits to communities, collaboration on a targeted informational mail-out sent to the entire MMF registry, and a door-to-door messaging campaign carried out by MMF Community Liaison Department staff. Driedger and colleagues (2014) evaluated the door-to-door component and found that it fell short of its goals, as most residents were not aware that the campaign had ever taken place. They noted several possible reasons for the strategy's lack of effectiveness, including that the timing of the campaign was too late (it had occurred once pandemic activity was already in decline); that health messengers were limited in their ability to develop any educative or relationship building role because the communicators of the message were not health professionals; and there were challenges in maximizing their reach to households as a result of conducting the campaign during the winter. Driedger et al. (2014)

concluded that in order for such a targeted approach to be effective, there is a need to consider not only the timing of message delivery and any transportation and/or climate barriers that may impede the delivery of the message, but also the need to adapt the communication process to better incorporate a health expertise component so that the communicator of the message is not simply perceived as being an administrator of a survey.

Charania and Tsuji (Charania, 2011; Charania & Tsuji, 2011a, 2011b, 2012, 2013) also highlight a number of recommendations with respect to the content of the message and the ways in which it is communicated. In terms of how best to communicate the message, they recommended that one reliable source (e.g. regional First Nations Inuit Health Branch) could funnel all information so that there is one consistent message; that the message be delivered by local and Indigenous leaders rather than federal or provincial senior leads; and that community and culturally

appropriate educational health campaigns be initiated to increase community awareness about aspects of the pandemic and compliance with mitigation measures. In terms of message content, they recommended that a better effort be made to incorporate 'community-level' voices in risk messages; that messages be positioned within a post-colonial context for First Nations, Inuit and Métis audiences; that disseminating information that is sensationalized, causes unnecessary panic, singles Indigenous people out, stigmatizes them or makes them feel less valued than other groups, be avoided; and that groups considered a priority for drugs or vaccinations be given a reason for this prioritization and that the term 'priority group' be avoided in communicating these reasons. Some of these same recommendations are echoed by the Public Health Agency of Canada and Health Canada in their 2010 report on lessons learned from the H1N1 influenza pandemic.



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Conclusion

What is clear from these recommendations is that pandemic planning must be tailored for the unique characteristics of Indigenous communities so that there can be a more effective public health pandemic (and other emergency) response in the future. These recommendations include working to alleviate the many social and economic inequities that increase Indigenous peoples' vulnerability to infectious diseases and severe outcomes; considering the challenges that Indigenous communities face in implementing intervention strategies within their communities in pandemic planning; improving surveillance mechanisms through better coordination between surveillance bodies and

standardization of reporting requirements; ensuring better communication and collaboration by all parties in a multi-jurisdictional environment; and responding early and aggressively in a pandemic crisis. If measures are in place so that all communities, regardless of location and material resources, are able to quickly access supplies and health services; if there are clear established guidelines for policy and practice, and these guidelines are practical within the context of the unique characteristics of the communities in which they operate; if various levels of community and government know their roles and responsibilities; and if there are clear lines of communication, Indigenous communities will be better situated to deal with future pandemic crises quickly and effectively.

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In 2013 the six National Collaborating Centres for Public Health initiated a two-year project on Influenza and Influenza-Like Illness (ILI). As part of this collaborative project, the NCCAH produced three reports in order to understand how influenza, such as the 2009 H1N1 pandemic, is particularly experienced by Indigenous populations in Canada; the knowledge gaps in the epidemiological research related to influenza and Indigenous peoples; and how public health responses can be better tailored to the unique needs and characteristics of Indigenous peoples and communities. The three papers in this series include:

1. The 2009 H1N1 influenza pandemic among First Nations, Inuit and Métis peoples in Canada: Epidemiology and gaps in knowledge
2. Determinants of the prevalence and severity of influenza infection in Indigenous populations in Canada
3. Pandemic planning in Indigenous communities: Lessons learned from the 2009 H1N1 influenza pandemic in Canada



Additional NCC documents in this series are available at: <http://nccid.ca/collection/influenza/>

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