



4 Health and Wellness: Public Health Surveillance

Summary

Nova Scotia's public health surveillance system is not adequate. An effective surveillance system provides information on trends and outbreaks of disease and guides improvements in long-term health for citizens. Although the Department of Health and Wellness has made improvements in recent years, significant changes are still needed to move Nova Scotia to an adequate public health surveillance system. Current information systems have limited functionality because they do not enable detailed analysis of disease data. The surveillance system does not address other areas of public health such as indicators of overall population health.

In 2006, a Department-prepared report noted that public health information systems were a source of inefficiency and vulnerability. This has not changed. The current system to report specific diseases has limited functionality and we found errors and omissions in data.

After years of involvement in a national project to develop an IT system for public health, Nova Scotia withdrew from the project in 2010. Three years later, there is still no comprehensive surveillance system. Our 2008 recommendation that the Department implement an electronic immunization registry has not been addressed.

The Province must also move towards surveillance of population health information. Rather than just examining why a person got sick, modern public health surveillance considers how to improve the overall health of the population. Currently, this information is ad hoc at best.

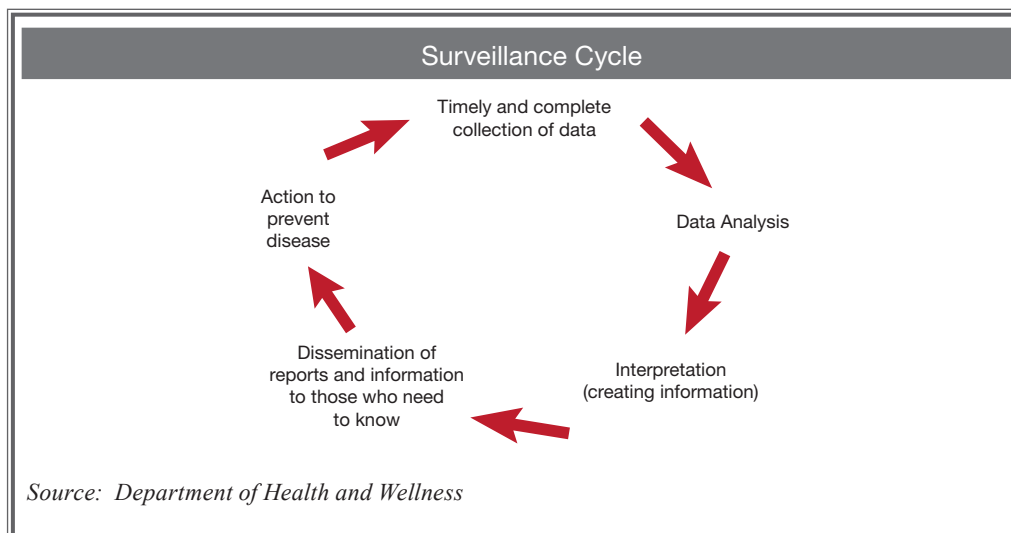
Progress addressing deficiencies identified in the Department's 2006 report on public health has been slow. Proactive leadership will be needed to ensure the Province addresses deficiencies. Implementing the recommendations in this report is an important step in moving towards an adequate public health system which supports programming, provides information on disease and helps improve overall population health.

Despite these issues, there have been improvements in recent years. Lab and epidemiological capacity have improved. The lab network has plans to deal with increased testing requirements of busy times such as during an outbreak, and the Province now has more epidemiologists. Recent developments such as public health standards and detailed protocols help identify what the future public health system should look like. However, there is no implementation plan detailing how these changes will be achieved; we recommended such a plan be developed immediately.

4 Health and Wellness: Public Health Surveillance

Background

- 4.1 Surveillance is a core function within public health. It is a continuous cycle of data collection, analysis, interpretation, and reporting, followed by public health action to prevent disease and improve health overall. An appropriate, modern public health surveillance system should be capable of helping to protect the province in the case of an outbreak while also helping to improve long term population health. Without adequate surveillance systems the province will be ill-equipped to deal with disease outbreaks and unable to identify programs and approaches that will lead to an overall healthier population.



- 4.2 Public impact from the surveillance system is most noticeable during outbreaks or epidemics of communicable diseases. Health officials rely on the surveillance system to identify the disease initially, monitor progress of the outbreak, and track the cause, allowing public health officials to prepare a plan of action. An inadequate surveillance system exposes any jurisdiction to a higher level of risk that a potentially dangerous situation could go unnoticed, or that the public health system would lack sufficient information to deal with an outbreak.
- 4.3 The Health Protection Act assigns responsibility to establish guidelines and standards for health protection programs to the Minister of Health; the Chief Medical Officer of Health is responsible to develop a surveillance plan for notifiable diseases and conditions. The diseases and conditions for which



labs, physicians and others must notify public health are documented in Regulations. The Department of Health and Wellness has established Nova Scotia Surveillance Guidelines for Notifiable Diseases and Conditions which details the objectives, responsibilities, case definitions, timing and nature of notification, data collection forms, and required reporting for notifiable diseases.

- 4.4 At Health and Wellness, the Population Health Assessment and Surveillance division is responsible for surveillance through public health and the Chief Public Health Officer. District health authorities collect surveillance data through carrying out front-line public health responsibilities. The districts are also involved in other aspects of the surveillance cycle at a local level, including data analysis and interpretation. The extent of this analysis role is limited depending on the level of expertise in each district.
- 4.5 District health authorities are required to collect case data on notifiable diseases (such as salmonellosis, mumps or hepatitis C) for entry in a computerized database administered by the Department. The Health Protection Act requires labs, doctors, nurses, administrators at long term care facilities, and others to notify public health when they become aware of instances of notifiable disease.
- 4.6 The concept of public health surveillance extends beyond notifiable disease to include monitoring population health indicators; however, historically this has not been a focus of the Department. Chronic disease, social determinants of health, injuries and other areas are all referred to as non-notifiable disease work. Examples of these indicators, include growth and development of children, tobacco and alcohol use, and socio-demographics. In addition, there is a long list of preventative health practices which can be included in surveillance activities such as immunization rates, levels of physical activity, healthy eating, sexual habits, and breast feeding. All of these indicators can be useful in assessing programs and informing policy decisions.
- 4.7 In 2006, the Department reviewed public health in Nova Scotia. The *Renewal of Public Health in Nova Scotia: Building a Public Health System to Meet the Needs of Nova Scotians* identified 21 actions required for the system. A mid-course review reported on the progress to date in February 2012. This review identified many areas in which public health surveillance still required significant improvements. These concerns will be discussed later in this chapter.



Audit Objectives and Scope

- 4.8 In the summer of 2013, we completed a performance audit of public health surveillance at the Department of Health and Wellness. This included surveillance of notifiable diseases and conditions and other population health indicators.
- 4.9 The purpose of the audit was to determine whether Nova Scotia's public health surveillance system is adequate to:
- identify and assess outbreaks and trends of notifiable diseases and conditions; and
 - provide meaningful information on population health indicators.
- 4.10 The audit was conducted in accordance with section 18 and 21 of the Auditor General Act and auditing standards adopted by the Chartered Professional Accountants of Canada.
- 4.11 The objectives of the audit were to assess:
- whether the objectives and goals of public health surveillance are adequately defined and communicated;
 - whether the Department of Health and Wellness provides adequate oversight of public health surveillance conducted at the district and local levels;
 - the Department's processes to ensure the data obtained through public health surveillance activities is timely, accurate and complete;
 - the Department's process to determine the list of notifiable diseases and conditions for Nova Scotia, and whether Nova Scotia complies with national reporting requirements;
 - how the Department determines which reports to prepare and their distribution;
 - the adequacy of the Department's assessment of lab capacity;
 - whether the Department is addressing epidemiologist capacity; and
 - whether Nova Scotia is conducting adequate surveillance of population health indicators and using that information to inform policy decisions.
- 4.12 Certain audit criteria for this engagement were adapted from Accreditation Canada – Standards for Public Health Services (Qmentum Program 2010)



and the Nova Scotia Surveillance Guidelines for Notifiable Diseases and Conditions. Other criteria were developed by our Office. The audit objectives and criteria were accepted as appropriate by senior management at public health.

- 4.13 Our audit approach included interviews with management and staff at the Department of Health and Wellness and nine district health authorities as well as review of documentation and testing notifiable disease case files for compliance with Department regulations, policies and procedures. We conducted our audit in the spring and summer of 2013, using case data from 2011 and 2012.

Significant Audit Observations

Governance of the Public Health System

Conclusions and summary of observations

Although public health has made improvements in recent years, significant changes such as those recommended in the 2006 Renewal Report have been slow. More recently, public health standards and detailed draft protocols were developed. Although these documents provide some guidance for public health, including assessment and surveillance, district health authority staff told us there is uncertainty regarding the direction of the public health system. Health and Wellness does not have clearly defined and well-communicated goals and objectives for public health surveillance. The Department needs to use the momentum from recent developments to move the system forward at a faster pace; overall goals and objectives must be established and communicated. The public health leadership team needs to take an active role to ensure everyone is working towards a common vision of public health in the future.

- 4.14 *Public health and overall health care system* – Public health is defined by the Department of Health and Wellness website as “*the art and science of improving and protecting health and preventing illness, injury and diseases through the organized efforts of society.*”
- 4.15 The preventive nature of public health often results in impacts which may not be seen until years in the future. Outcomes are longer-term. For instance, the benefits of a campaign to promote more physical activity may not result in clear and measurable benefits for many years. Other areas of the health care system have tangible impacts which are more easily measured. For example, the number of hospital beds created or the reduction in wait times are both concrete and results may be seen over a shorter term.



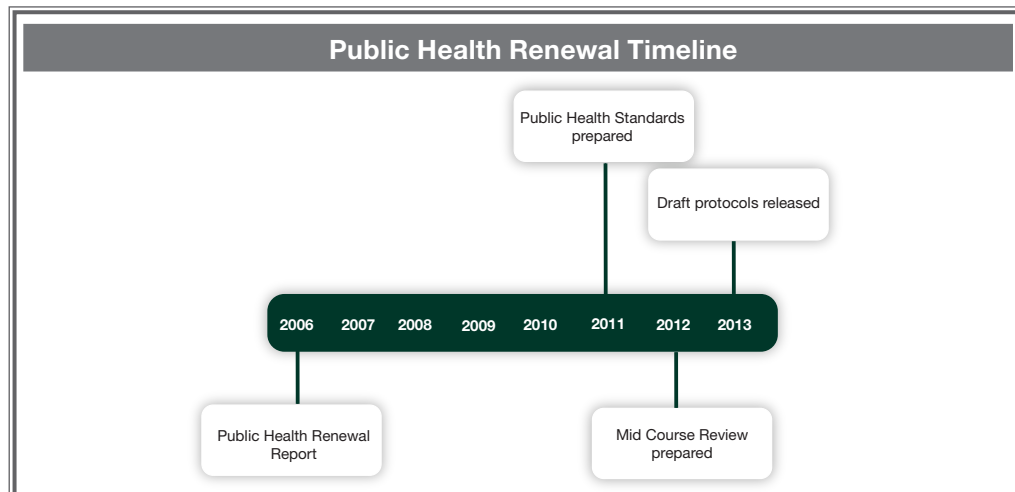
- 4.16 Although the outcome of investments in public health may not be immediately measurable, an effective and efficient public health system will improve the overall health of the population in the long term, potentially reducing the burden of future health care costs. It is the responsibility of the leadership group within the public health system to make the case for supporting public health initiatives by clearly explaining the needs and benefits of investing in public health.
- 4.17 *Public health review* – In 2006, the Department of Health Promotion and Protection (has since merged with Health to create the Department of Health and Wellness) issued a comprehensive review of public health in Nova Scotia titled *The Renewal of Public Health in Nova Scotia: Building a Public Health System to Meet the Needs of Nova Scotians*. It identified the core functions of public health as: population health assessment, health surveillance, health promotion, disease and injury prevention, and health protection. The Report was completed, in part, due to the SARS outbreak and resulting reports addressing public health in Canada. It identified several areas for improvement to renew the Province’s public health system.
- 4.18 In February 2012, the Department of Health and Wellness assessed its progress towards addressing the recommendations from The Renewal Report. The review identified a lack of progress with regards to surveillance and the need for continued investment to support the system. It also identified significant concerns with the state of public health’s information technology infrastructure. Surveillance system improvements, including better IT systems, are discussed throughout this chapter.
- 4.19 *Standards and protocols* – Public health standards were established in 2011. Rather than providing detailed requirements which the system must meet, these standards are high level statements documenting the direction of public health in the future. For example, “*Public health strives to improve the health of the population overall and reduce health inequities among populations.*” The standards mark a shift in emphasis in the strategic direction of public health as it moves its focus to overall populations rather than on individuals, working towards a better understanding of the situations and factors that allow people to be healthier rather than focusing on how to manage a person who is sick. This approach is intended to ultimately result in a healthier population.
- 4.20 The Department intends to work towards the changes outlined in the standards over a five-year period. Draft protocols have been developed. These provide more detailed information to implement the standards. They address areas such as planning and priority setting, partnerships, and program delivery. Examples of protocols include the following.



- *“Conduct assessment and surveillance of notifiable diseases and conditions in a manner which allows the identification of differences in local areas...”*
- *Seek to influence the establishment and implementation of healthy public policies at federal, provincial and local levels to improve social determinants of health in order to improve the health of the population and reduce health inequities.”*

4.21 The protocols were released to the public health community in June 2013. They have been accepted by public health senior leadership but have not yet been approved by Department management. These protocols are a significant step towards the public health system envisioned in the Public Health Renewal document. They outline key steps which public health must take but more detailed action plans are needed to implement change and align public health programming and systems with the protocols. To maintain momentum, an implementation plan must be developed quickly to ensure action is taken to bring the protocols into practice across the province.

4.22 *Lack of progress* – The Renewal Report was prepared in 2006, resulting in the standards in 2011 and draft protocols in 2013. The report described a public health system which needed significant change. Similarly, in our 2008 audit of Communicable Disease Prevention and Control, we recommended an immunization registry be developed; there has been no progress to date. Public health management acknowledge that a new information system which addresses the need for a registry, as well as a more robust surveillance system, is needed. Department management told us they are looking for a consultant to examine possible system solutions. This persistently slow pace is concerning. Senior leadership within public health and the Department of Health and Wellness must move the system forward with a greater sense of urgency to ensure Nova Scotia has a public health system capable of protecting the province in the case of an outbreak while also helping to improve long term population health in Nova Scotia.





- 4.23 Implementing the new approach envisioned in the standards and protocols will require more strategic leadership across the province. Significant capacity and skills exist within the district health authorities at the senior leadership level, including Medical Officers of Health. While the ultimate responsibility may lie with the Chief Public Health Officer, the expertise across the province will be invaluable to help move the system forward and ensure a consistent understanding at both provincial and district levels.

Recommendation 4.1

The Department of Health and Wellness should expedite the approval process and move forward with the public health protocols in a timely manner.

Department of Health and Wellness Response:

DHW agrees with this recommendation. The internal DHW process for approval of the protocols is currently underway. Direction for approval of the protocols will be sought from the new provincial government.

Recommendation 4.2

The Department of Health and Wellness should develop a plan to implement its public health protocols following approval. The plan should include detailed timelines and involve input from stakeholders impacted by the new protocols.

Department of Health and Wellness Response:

DHW agrees with this recommendation. The protocols describe the work of Public Health and represent a shift in the emphasis of this work rather than a dramatic change in direction. The shift has already begun in some areas (geographic and/or programmatic) as opportunity and partnerships have arisen. Once the protocols are approved, DHW will continue to work with District Health Authorities (Districts) and community partners to provide guidance and support for system-wide implementation of the protocols, including timelines.

- 4.24 *Need for information systems* – Better information systems and more complete data will be important to achieving the public health protocols. Both the standards and protocols identify the need for surveillance data and information. More detailed information will be required regarding non-notifiable disease public health indicators (such as demographic information or socio-economic status) and notifiable diseases and conditions (including incidence and immunization rates) to assist staff in understanding and assessing public health responses and programs. Given the limitations of the current information system, a comprehensive public health information system covering communicable disease surveillance, outbreak management, non-disease surveillance and an immunization registry is needed.

- 4.25 *Goals and objectives* – Although the Department has completed significant work in developing the standards and draft protocols, there are still no clearly



defined and well-communicated goals and objectives related to non-notifiable disease indicators. Within the district health authorities and at the provincial level, there is a consistent understanding that the draft protocols will guide surveillance work going forward but clear, specific goals and objectives for public health surveillance are necessary.

- 4.26 District health authority staff expressed concerns regarding the overall vision for Nova Scotia public health surveillance. Staff were unclear regarding goals and objectives, often stating that provincial goals would be at a higher level than local goals. A clear, defined vision with goals and objectives would help ensure surveillance activities address needs at both provincial and district levels and would ensure staff at all levels understand the intended direction of the system.
- 4.27 Measuring performance is important in providing feedback to management at both the Department and districts on whether surveillance targets and milestones are being met and the intended outcomes are being achieved. The lack of defined goals and objectives makes measuring performance challenging as there is nothing against which to measure performance.

Recommendation 4.3

The Department of Health and Wellness should clearly define and communicate goals and objectives for surveillance of non-notifiable disease indicators.

Department of Health and Wellness Response:

DHW agrees with this recommendation. Historically, Public Health surveillance efforts in Nova Scotia have focused on notifiable diseases and conditions. As a result, goals and objectives for this aspect of surveillance are articulated in the Nova Scotia Surveillance Guidelines for Notifiable Diseases and Conditions, and well communicated within the public health system.

Given Public Health's shifting emphasis from individuals to populations, and a greater focus on addressing the determinants of health, Public Health acknowledges the need to enhance surveillance of non-notifiable disease and determinants of health.

An initial step in this direction is the development of a provincial health profile report by July 2014, and accompanying statement of the goals and objectives of this surveillance activity. This report will provide a description of the health of the Nova Scotia population.

As surveillance activities for non-notifiable diseases and conditions expand, goals and objectives will be identified.



Data Quality And Information Systems

Conclusions and summary of observations

The Department's surveillance system is not adequate to meet the Province's needs. The current notifiable disease surveillance system (ANDS) is considered obsolete and has limited functionality in certain areas. For example, the system cannot record sufficiently detailed data for epidemiological analysis; this makes it more challenging to understand increases in specific diseases or outbreaks. Staff often have to rely on paper files. Additionally, we found numerous errors in the information recorded in ANDS which could make meaningful analysis more challenging. Despite years of involvement in a national project, Nova Scotia effectively has no immunization registry. Significant information system improvements are needed.

Surveillance Information Systems

- 4.28 *Current system* – A Department of Health and Wellness report on the status of the province's public health system in 2012 indicated serious concerns with the state of the information technology systems.

“Immunization records continue to be held on cards and an information system for communicable disease surveillance, investigation and control has not been implemented. This situation is a major source of inefficiency and vulnerability. With the decision to not pursue implementation of Panorama, an alternative public health information system needs to be selected, funded and its implementation supported. While immunization and communicable disease control information needs are the most urgent, the information management needs of other public health programmatic areas also need to be addressed.” (Source: Renewal of Public Health in Nova Scotia – Mid Course Review)

- 4.29 The Department uses a system called ANDS to track notifiable diseases and conditions as well as school immunization. This system was developed by the Public Health Agency of Canada for its purposes. The Agency allows the Province to use this system. While the system is adequate for tracking basic notifiable disease case data, it has numerous deficiencies as a provincial surveillance system.
- 4.30 Department management told us the ANDS system is considered obsolete. They noted it is becoming more difficult to resolve issues as the system is no longer supported and the IT expertise needed is becoming harder to find. We found ANDS contains minimal data fields and cannot capture and analyze case detail at a sufficient level. For example, it does not include notifiable disease risk factors which are needed for complete epidemiological analysis.



Staff at multiple districts told us they often rely on paper files instead. This is concerning; the need to rely on paper files and the associated delays this can cause was identified as a deficiency of Ontario's public health system during the 2003 SARS outbreak. If Nova Scotia were to face an outbreak of similar severity, it is unclear how the current system would handle it.

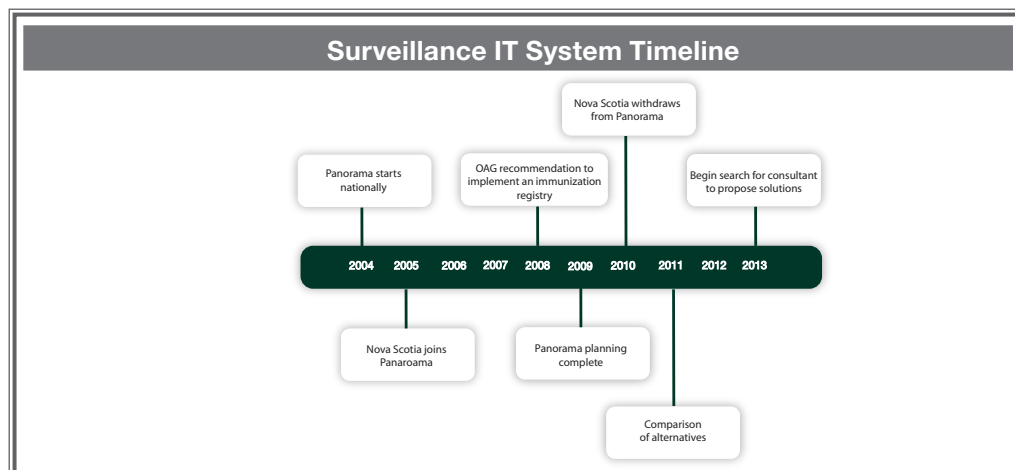
- 4.31 ANDS has limited reporting capabilities. A separate query program is needed to report and analyze data. Since the ANDS system is not owned by the Province, Nova Scotia has limited ability to make changes.
- 4.32 The inadequacy of the provincial information system to support surveillance work is highlighted by the efforts required by Capital District Health Authority to conduct surveillance work.
- 4.33 In order to have access to adequate data for analysis purposes, Capital Health maintains its own spreadsheet while also entering duplicate information into the ANDS system. Capital Health's public health management told us ANDS is not capable of tracking and reporting the depth of data required for meaningful analysis, such as risk factors and detailed geographic location. Most districts, including Capital Health, rely on paper files to obtain more information for in-depth analysis.
- 4.34 Due to the lack of an appropriate provincial system, Capital Health utilizes free software which was originally designed to support outbreak management in developing nations. While it is encouraging to see Capital Health taking steps to enhance its surveillance activities, this emphasizes the state of the current system. It has created an environment in which districts must develop ad hoc systems on their own, resulting in a piecemeal, disjointed provincial surveillance system. A similar scenario was identified as a contributing factor to the challenges faced while investigating and managing the 2003 SARS outbreak in Ontario.
- 4.35 *Potential impact of poor systems* – The lack of an adequate information system to track communicable diseases, immunizations and other surveillance factors was identified as a contributing factor in the public health failures during the 2003 SARS outbreak in Toronto. The systems were not adequate to handle an outbreak and in some cases relied on paper files for analysis. Similarly, Nova Scotia's system is inadequate and relies on paper files for thorough analysis.
- 4.36 As discussed later in this chapter, public health faces constant pressure to attract and retain qualified staff, particularly epidemiologists. We are concerned the lack of adequate information systems may pose an additional challenge for staffing. Epidemiologists are in demand; the failure to provide staff with the basic technological tools necessary to complete their work may be a problem for the Nova Scotia public health system moving forward.



- 4.37 *Panorama* – The Panorama project started nationally in 2004 when the Federal government funded Canada Health Infoway to support the development of a Canada-wide public health surveillance system. Nova Scotia began looking at this option as early as 2005, and by March 2009, had completed the planning phase to adopt Panorama. Nova Scotia played a significant role in the early years of this project, but after completing the planning phase, decided to put the project on hold. Public health management at Health and Wellness told us this was due to both the financial pressures involved with the project and continued delays nationally in getting a functional program. In 2010, Nova Scotia decided to withdraw from the project.

- 4.38 By that time the Province had spent approximately \$1.3 million on the Panorama project but determined it would be better to walk away from this investment. Department staff believed there might be other programs which could meet public health’s needs. In 2011, the Department compared three programs: the most recent version of Panorama, a new program called Atlas, and the current patchwork system of programs in use by public health. At that time, the only information on Atlas was a company-prepared briefing. The Panorama review was based on a week-long testing process attended by two Department staff members. While the review suggested Atlas was a more appropriate size and a cheaper option, it also concluded that further study was necessary.

- 4.39 As of October 2013, the Department is seeking a consultant to determine the needs and best solutions available for a new surveillance IT system. Public health management told us capital requests must be submitted to central government far in advance. Department management said it would likely be 2015-16 before implementation of a new system could begin. We are concerned with this timeframe. As discussed earlier, progress in public health has been slow. The need for an appropriate public health surveillance system has existed for many years. The Province must decide which system meets public health surveillance needs and move forward with a plan to implement that system immediately.





Recommendation 4.4

The Department of Health and Wellness should identify an appropriate information system for public health surveillance and work with Treasury Board Office to implement the system in a timely manner.

Department of Health and Wellness Response:

DHW agrees with this recommendation. Public Health agrees with the audit's assessment of the inadequacy of our current electronic information systems.

In October 2013, a Public Health information system planning and assessment project was initiated. The project will document information needs and requirements for Public Health business areas including Communicable Disease Prevention and Control, Population Health Assessment and Surveillance, Healthy Development and Healthy Communities. The project will identify options for information system(s), propose how these options fit with existing e-health systems, and provide recommendations for implementation in the short term (1 year), medium term (3 years) and long term (5+ years). The project will be completed by March 2014 and will result in a DHW submission of a 2015/16 Tangible Capital Asset (TCA) request to the Treasury Board for implementation of the information system solution.

Implementation of the recommended solution will be dependent upon the success of the TCA request.

4.40 *Immunization registry* – Our audit of Communicable Disease Prevention and Control in February 2008 included the following recommendation: “*The Department of Health Promotion and Protection should implement an electronic immunization registry for Nova Scotia.*” At that time, the Department acknowledged the need for a registry in its response to our audit chapter.

“Nova Scotia is adopting the Panorama application province wide. The planning phase was completed in March 2007. The department is now preparing for implementation to begin in fiscal 08-09. It is anticipated this phase will take approximately two to three years to complete. It is also anticipated, given the current national project time lines, that front line public health staff in Nova Scotia will be using the Panorama application by late 2008 or early 2009”

4.41 Almost six years after our report, Panorama has been abandoned and no replacement has been selected. Some immunization information is recorded in ANDS but the records are incomplete and issues identified during our 2008 audit regarding completeness of information reported by doctors remain unresolved. Management at public health acknowledged the current situation is not adequate.



- 4.42 Without a comprehensive immunization registry, a true understanding of the state of immunization in the Province is not available. This limits the Department's ability to manage outbreaks of vaccine-preventable disease, identify susceptible populations, and provide immunization policy guidance through epidemiological analysis.

Recommendation 4.5

The Department of Health and Wellness should implement recommendation 4.5 from our February 2008 Report to develop an electronic immunization registry.

Department of Health and Wellness Response:

DHW agrees with this recommendation. In October 2013, a Public Health information system planning and assessment project was initiated. The project will document information needs and requirements for Public Health business areas, including immunization. The project will identify options for information system(s), propose how these options fit with existing e-health systems, and provide recommendations for implementation in the short term (1 year), medium term (3 years) and long term (5+ years). The project will be completed by March 2014 and will result in a DHW submission of a 2015/16 Tangible Capital Asset (TCA) request to the Treasury Board Office for implementation of the information system solution.

Implementation of the recommended solution will be dependent upon the success of the TCA request.

ANDS Data Testing

- 4.43 *Notifiable disease case testing* – We tested 260 notifiable disease case files from all district health authorities to assess the completeness, accuracy and timeliness of ANDS notifiable disease case data. We also tested to ensure required forms were completed and information entered in the system. While we did not have any issues with the timeliness of the information reported, we did identify a number of files in which the information in the paper file did not match the information recorded in ANDS.
- 4.44 20% (51) of the files we tested had blank fields or errors in the information recorded in ANDS. We are concerned by the lack of accuracy in recording data in ANDS as it suggests a lack of attention to detail by public health staff responsible for data entry. We understand that none of the errors we found would currently affect reporting from the ANDS system. However, public health staff told us that notifiable disease data needs to be very detailed to be useful. Having accurate data in ANDS could facilitate moving this data to a new system to provide some historical information. As improved systems are implemented, it is important for everyone in the public health system to



ensure all data is entered completely and accurately into the surveillance IT system.

Recommendation 4.6

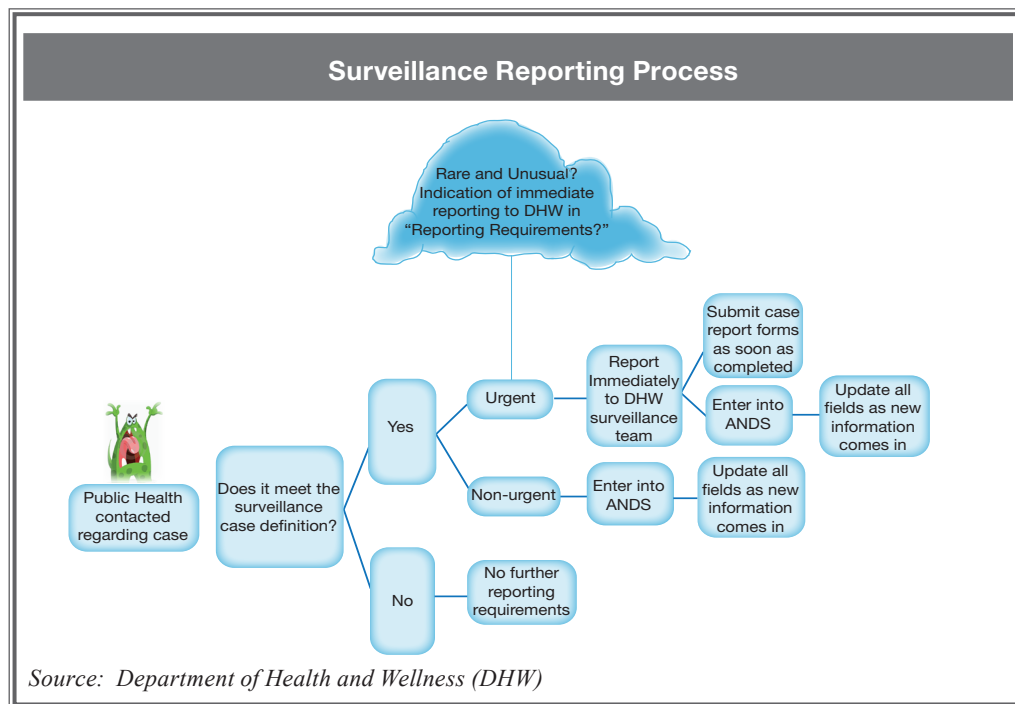
The Department of Health and Wellness should require district health authority staff to implement a quality check to ensure completeness and accuracy of ANDS data fields.

Department of Health and Wellness Response:

DHW agrees with this recommendation. In order to enhance data quality, Public Health staff at DHW routinely identify and inform District Public Health staff of data quality issues.

By July 2014, DHW will require District Public Health staff to implement a data quality check process.

4.45 *Timeliness of case notification* – The Nova Scotia Surveillance Guidelines for Notifiable Diseases and Conditions document which diseases must be reported to public health and provide timeframes for reporting. Doctors and others (e.g., nurses, lab practitioners) are legally required to report these diseases to public health officials under the Health Protection Act. Certain notifiable diseases require that public health be notified and the information entered in ANDS immediately. Other notifiable diseases are entered in ANDS the following day. The ANDS system operates with a one-day delay; once case data is entered it is available across the province the following day. We did not note any issues related to timeliness in our case file testing.





- 4.46 *Completeness of case notification* – Management in the Population Health Assessment and Surveillance division at the Department told us they are confident with the completeness of notifiable disease and condition reports. Management said they have a good relationship with reporting labs. They rely on confirmed lab reports and notification from physicians and others. The Department has a poster titled *It's the Law* to remind doctors and others of the legislated requirement to report. We recognize there are practical limitations for assuring completeness of case reporting and are satisfied management has taken reasonable steps to help address this issue.
- 4.47 *Monitoring* – Regular monitoring of surveillance programs and activities ensures that programs are having the intended impact and functioning appropriately. In Nova Scotia, districts collect information on notifiable diseases and are supposed to validate that data. Our detailed testing of ANDS records showed a significant number of errors, primarily incomplete data fields. We realize these errors would have little impact on the population health analysis in place at this time and we are aware that the current data validation process is not designed to capture errors at this level of detail. However, we feel it is important for both the Department and the DHAs to address these problems to ensure the data in the system is complete and accurate. Recommendation 4.6 earlier in this chapter addresses these concerns.
- 4.48 Surveillance of non-notifiable disease programs is limited. The Department has acknowledged that this is an area they are currently behind on. Work has started to develop measures to evaluate these types of programs and senior management within public health have indicated this is something they will continue to work on. As the Department moves forward with collecting this information, it will be important to develop goals and expectations to ensure data is accurate and collection processes are operating as intended. Surveillance of non-notifiable disease indicators is addressed later in this chapter.

Data Analysis and Reporting

Conclusions and summary of observations

We found that notifiable disease reporting has improved in recent years. Enhancements include the inclusion of rates/100,000 people, and expected number of cases by district health authority based on historical data. Monthly reports are provided to public health stakeholders, while annual reports are available publicly. Although there is frequent contact between the epidemiologists who develop notifiable disease reports and end users of those reports, there is no process to assess user needs. We recommended the Department address this by periodically



reviewing the reports with users to ensure their needs are met. Provincial reporting of notifiable disease information to the federal government is voluntary; Nova Scotia participates in this reporting.

- 4.49 *Notifiable disease reporting* – The Department’s Population Health Assessment and Surveillance division issues monthly reports on notifiable diseases to public health officials in Nova Scotia; annual reports are made available publicly. Both reports include information on the number of the notifiable diseases by district health authority. More recently, the reports have also included notifiable disease rates/100,000 people, and monthly reports include expected disease rates based on historical data by district. Many of the district public health workers we spoke with noted these additions are positive improvements in reporting. However, many also indicated the level of detail is still not sufficient for epidemiological requirements. More specific details on location, population-wide socio-economic history, and other risk factor information would be extremely valuable in analyzing increases in disease rates and designing solutions to help improve overall population health.
- 4.50 We assessed annual and monthly reports for accuracy and completeness and found no issues. The issues noted previously regarding testing of ANDS data would not have impacted the type of information included in these reports. We also reviewed other public health reports during our audit but did not verify the source data was accurate. Examples of other reports include a weekly Respiratory Watch report along with an annual influenza report, both of which are public reports. In addition, PHAS conducts enhanced surveillance and has issued reports on other topics as needed, including Lyme disease and HIV/AIDS.
- 4.51 There is no formal process to periodically assess user reporting requirements. Users include district epidemiologists, Medical Officers of Health and front line public health workers. Epidemiologists in the Department’s Population Health Assessment and Surveillance division review data and trends to help identify reporting priorities based on professional judgment and experience. They rely on the fact that preparers and users of the reports are in frequent contact and have an opportunity to communicate any issues concerning surveillance reporting. We believe formally reviewing stakeholder needs would help to ensure reporting meets user requirements and remains relevant.

Recommendation 4.7

The Department of Health and Wellness should periodically review notifiable disease and condition reporting to ensure reports continue to meet user needs.



Department of Health and Wellness Response:

DHW agrees with this recommendation. Currently, stakeholder feedback on reports is conducted in an ad hoc manner. By October 2014, DHW Public Health will establish a formalized process for seeking feedback from stakeholders, including: Medical Officers of Health, Provincial and District Public Health staff, Infectious Disease Expert Group, and the Provincial Laboratory.

Additionally, Public Health has established a process for periodically reviewing and updating the list of Notifiable Diseases. The next review is scheduled to occur by April 2014.

- 4.52 *Threat assessment* – The Population Health Assessment and Surveillance division assesses notifiable disease and condition threats on an ongoing basis. Provincial activity may be identified using ANDS, as well as the electronic lab reporting system. The Canadian Network for Public Health Intelligence is a Federal program which monitors national and international threat information. It provides alerts related to events and outbreaks of provincial or national concern. Additionally, there are provincial and national communicable disease committees which also assess potential threats.
- 4.53 *Notifiable disease list updates* – Public health has a process for maintaining the provincial list of notifiable diseases and conditions. The list was last updated, through a change in regulations, in April 2012. The Department has a Notifiable Disease Working Group which is responsible for reviewing, recommending and implementing changes to the list and case definitions of notifiable diseases and conditions.
- 4.54 *Notifiable disease reporting to Federal authorities* – Provincial reporting of notifiable diseases to the Federal government through the Public Health Agency of Canada is voluntary. We found the province provided information every May for the previous year during our audit period. In addition, there is a Memorandum of Agreement between Nova Scotia and the Government of Canada regarding the placement of a Public Health Agency field surveillance officer at the provincial Department of Health and Wellness to support enhanced surveillance of HIV/AIDS, sexually transmitted infections and other notifiable diseases. We found regular data sharing specified in the memorandum was fulfilled in the audit period. We also found the province responded to the Public Health Agency’s ad hoc requests for data.
- 4.55 *Field surveillance officer position vacancy* – The Public Health Agency of Canada field surveillance officer position as outlined in the memorandum with the Agency has been vacant since February 2013. The reporting requirements in the agreement are being fulfilled by provincial Department staff. While we understand the relationship between the Population Health Assessment and Surveillance division and the Agency is one of mutual benefit, provincial staff have taken on additional responsibilities while this position has been vacant.



Recommendation 4.8

The Department of Health and Wellness should work with the Public Health Agency of Canada to fill the field surveillance officer position under the terms of its memorandum of agreement with the Agency.

Department of Health and Wellness Response:

DHW agrees with this recommendation. As the Field Surveillance Officer (FSO) is a Public Health Agency of Canada employee, the Agency's Human Resource hiring processes are being followed. Since the position became vacant in February 2013, DHW has maintained regular contact with the Agency to highlight the importance of filling this position, to get updates on the hiring process, and to request participation in the hiring process.

The timeline for filling of the FSO position is dependent upon the Public Health Agency of Canada hiring process, which are outside the control of DHW.

Laboratory And Epidemiological Capacity

Conclusions and summary of observations

The Department of Health and Wellness assessed lab capacity in the Provincial Public Health Lab Network and made changes to address potential challenges of high volumes such as during an outbreak. Management at the Department and in labs across the Province told us they believe these changes allow the lab network to support public health surveillance functions as well as respond to a surge in demand. The Department has also taken steps to improve epidemiological capacity and address vacancies. Several districts now have epidemiological support available within their district.

- 4.56 *Provincial Public Health Laboratory Network of Nova Scotia* – Lab testing for communicable diseases is performed by the Provincial Public Health Laboratory Network of Nova Scotia. Public health labs are located across the province, with the main lab located at the QEII Health Sciences Centre in Halifax. When a notifiable disease is identified in a lab, the Public Health Lab Network forwards the results to the appropriate contact at the Department or applicable district health authority where further actions may be taken depending on the notifiable disease.
- 4.57 *Laboratory capacity* – Surveillance activities relating to notifiable diseases rely on results from lab testing to identify positive cases for reporting purposes. Since lab services support public health surveillance of notifiable diseases, it is important for the Department to ensure lab capacity is sufficient to assist public health surveillance efforts.



- 4.58 The Public Health Lab Network completed an assessment of lab capacity in 2009. This assessment determined that the capacity of the Network to assist in surveillance activities of notifiable diseases is adequate. Management and staff told us there is a strong working relationship between the Provincial Public Health Laboratory Network and the Department. This relationship assists in identifying and responding to non-routine notifiable disease cases or trends.
- 4.59 Our July 2009 audit of Pandemic Preparedness identified concerns with whether lab capacity could meet the needs of the province in a pandemic or other high-volume situation. We reviewed the Network's 2009 assessment of lab capacity and discussed the issues with management. We found all parties believe the Public Health Lab Network is prepared to deal with a surge in testing capacity requirements. Testing procedures were altered based on the assessment to focus on higher risk cases in times of heavier volume. Lab management indicated this change has been accepted in labs across the country and has reduced the risk of capacity problems in an outbreak scenario.
- 4.60 *Epidemiological capacity* – Epidemiologists play an integral role in the surveillance cycle. Data analysis, interpretation and reporting are all completed by epidemiologists. Therefore, an effective public health surveillance system must have adequate epidemiological capacity to conduct these functions. Since the draft public health protocols will put a greater focus on total population health, sufficient epidemiological capacity will become even more important.
- 4.61 Nova Scotia has traditionally had difficulty attracting and retaining epidemiologists. Epidemiologists are in high demand across Canada and in the past, salaries in Nova Scotia were considered low. The Department has recently taken steps to improve its ability to attract and retain epidemiologists by having the positions reclassified to a higher pay level.
- 4.62 As of September 2013, the Department's Population Health Assessment and Surveillance division had four full-time epidemiologists employed by the Province. Although there were three epidemiologists in the past, two of those were often placed with the province by the Public Health Agency of Canada. These individuals took direction from the Agency and could be reassigned at any time to deal with issues elsewhere in the country. The recent provincial hires represent an improvement in epidemiological capacity in the Province.
- 4.63 Several district health authorities also have epidemiologists on staff, either through direct employment with the district, sharing one position between multiple districts, or through placement of Public Health Agency of Canada employees. The four districts currently without epidemiologist expertise indicated they are in the process of recruiting for a shared service position.



Additional Surveillance Efforts

Conclusions and summary of observations

Surveillance of non-notifiable disease indicators is limited. There are some situations in which non-notifiable disease surveillance occurs, typically related to specific programs. Department staff acknowledge that improved surveillance data is needed. A common list of population health indicators was approved in March 2013. The Department needs to move forward with collecting and reporting on non-notifiable disease indicators.

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- 4.64 *Non-notifiable disease surveillance* – Modern public health systems should include a focus on a broader range of surveillance areas, including indicators such as obesity, alcohol consumption, and breast feeding rates. Historically, the emphasis has been on notifiable disease surveillance. Public health staff at the Department and in districts saw this as a deficiency which must be addressed. Reporting of population health indicators is usually on an ad hoc basis and does not always involve Department public health surveillance staff. For instance, we were told addiction services collected alcohol and tobacco use data related to its programming.
- 4.65 The lack of adequate surveillance information can create challenges for some program areas. For example, while breastfeeding rates and duration are considered important indicators, the Department has no data on breastfeeding duration. Similarly, public health plays a role in Thrive!, a government-wide strategy to improve the health of Nova Scotians. In order to assess this program, in-depth population health information will be needed.
- 4.66 As discussed earlier, public health standards and recently-developed protocols outline the direction that public health intends to move towards in the future. The protocols include non-notifiable disease indicators for analysis, priority setting and monitoring. In order to provide information on these areas, detailed data will be required which may not currently exist. This ties back to the need for improved public health information systems discussed earlier in this chapter.
- 4.67 *Community Health Profile Network* – In 2011, a group comprised of Department and district health authority public health representatives was formed to help develop a list of common non-notifiable disease indicators, with a focus on the social determinants of health. The indicators were finalized in March 2013; initial reporting is expected over the following year. Management told us that the data available may not be at a sufficiently detailed level to appropriately analyze population health matters.



Community Health Profile Network			
	Indicator	Data Source	
Who we are	Population by age-group	Statistics Canada Census	
	Selected socio-economic statistics (SES Index) maps	Nova Scotia Community Counts	
	Life expectancy at birth	Statistics Canada Census	
	Citizenship/immigration	Statistics Canada Census	
What affects our health	Current smoker	Canadian Community Health Survey	
	Heavy drinking	Canadian Community Health Survey	
	Active/moderately active physical activity	Canadian Community Health Survey	
	Fruit and vegetable consumption	Canadian Community Health Survey	
	Expenditure >30% household income on rent	Statistics Canada Census	
	Food security	Canadian Community Health Survey	
	How healthy are we	Health-adjusted life expectancy at birth	Statistics Canada Census
		Stress	Canadian Community Health Survey
BMI - adult - overweight/obese		Canadian Community Health Survey	
Lone parent (psychosocial deprivation)		Statistics Canada Census	
Low income		Statistics Canada Census	
Less than grade 12 education		Statistics Canada Census	
Diabetes prevalence		Nova Scotia Diabetes Care Program	
Injury limitation		Canadian Community Health Survey	

* The table above provides a sample of the Network's indicators.

Recommendation 4.9

The Department of Health and Wellness should implement its plans to collect and report non-notifiable disease indicators and work toward obtaining the more detailed data needed to analyze indicators.

Department of Health and Wellness Response:

DHW agrees with this recommendation. The development of a provincial health profile report is underway. The report format, outline of the report contents and the data analysis plan have been drafted. The report will provide a description of the health of the Nova Scotia population through reporting of disease and condition indicators other than notifiable disease indicators. The process of developing the report will assist in identifying limitations and gaps in data. This provincial health profile report will be completed by July 2014.



- 4.68 *Access to data* – Some of the data useful in non-notifiable disease surveillance originates from the Department of Health and Wellness’ Business Intelligence Analytics and Privacy group. This includes information from the Canadian Community Health Survey, Statistics Canada, and other sources. Public health management told us they have had issues obtaining data from this group in a timely manner. For example, data requested for a public health indicators pilot project took nearly a year to receive.
- 4.69 Since assessment and surveillance is a core public health function, access to required data is important. Information which already resides in the Department should be made available to public health as needed for analysis. Moving forward, this will be increasingly important as public health standards and protocols are implemented with an increased emphasis on the surveillance data related to social determinants of health.

Recommendation 4.10

The Department of Health and Wellness should require that all data held in, or accessible by, the Department be available to the Population Health Assessment and Surveillance team as required.

Department of Health and Wellness Response:

DHW agrees with this recommendation. DHW Public Health is working with internal partners to access required data, while adhering to privacy policies. To date, Canadian Community Health Survey (CCHS) data has been made available to Public Health.