February 2019

ACCESS TO EMERGENCY HEALTH SERVICES

An independent audit report

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OFFICE OF THE
Auditor General
of British Columbia

CONTENTS

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The Honourable Darryl Plecas
Speaker of the Legislative Assembly
Province of British Columbia
Parliament Buildings
Victoria, British Columbia
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Dear Mr. Speaker:

I have the honour to transmit to the Speaker of the Legislative Assembly of British Columbia the report, *Access to Emergency Health Services.*

We conducted this audit under the authority of section 11(8) of the *Auditor General Act* and in accordance with the standards for assurance engagements set out by the Chartered Professional Accountants of Canada (CPA) in the CPA Handbook – Canadian Standard on Assurance Engagements (CSAE) 3001 and Value-for-money Auditing in the Public Sector PS 5400.

Carol Bellringer, FCPA, FCA
Auditor General
Victoria, B.C.
February 2019

The Office of the Auditor General of British Columbia would like to acknowledge with respect that we conduct our work on Coast Salish territories. Primarily, this is on the Lkwungen-speaking people's (Esquimalt and Songhees) traditional lands, now known as Victoria, and the W̱SÁNEĆ people's (Pauquachin, Tsartlip, Tsawout, Tseycum) traditional lands, now known as Saanich.

AUDITOR GENERAL'S COMMENTS

Carol Bellringer, FCPA, FCA
Auditor General

Emergency health services are first aid or other health care that is provided outside of a health facility, without delay, to save lives or prevent or alleviate serious harm or pain. These services are often someone's first point of contact with the health-care system in an emergency situation.

In B.C., British Columbia Emergency Health Services (BCEHS) is responsible for the delivery, co-ordination and governance of emergency health services, including call intake and dispatch. BCEHS' goal is to ensure that in every community across the province, patients receive timely and appropriate access to emergency care when required. Paramedics provide emergency health services at the scene, en route by ambulance to hospital, and during patient transfers between hospitals. In addition, with the consent of BCEHS, fire department first responders provide basic life-saving interventions at the scene as part of a co-ordinated response.

In this audit, we concluded that BCEHS had effectively managed access to ambulance and emergency health services in some areas. However, we found that its performance against key targets for patient care needs improvement, and co-ordination of access to emergency health services with fire departments needs to be strengthened.

We found that BCEHS sometimes takes longer than it would like to, to reach patients where time matters. This increases the risk that some patients do not receive the care they need, when they need it.

We also found that access to emergency health services varies depending on where you live, with fewer or no paramedics trained to provide advanced care in rural and remote communities. Evaluating its advanced care coverage across the province would help BCEHS to determine whether it is sufficiently meeting the needs of patients.

Overall, BCEHS understands where it's succeeding and where it needs to improve. It's in the midst of a transformational change of its service to

AUDITOR GENERAL'S COMMENTS

better match its resources to patient needs. This includes an increase to the number of paramedics and ambulances as well as the introduction of a new dispatch approach, with the goal of shortening response times for patients who need the care most.

BCEHS is also pursuing alternatives to traditional emergency response for patients who don't require transport to a hospital. This includes options such as providing medical advice over the phone, transporting patients to a health service, such as a clinic, or having a paramedic provide treatment in the home or community.

With respect to co-ordinating access to emergency health services, fire department first responders play an essential role in supporting BCEHS to provide the quickest possible response to patients requiring time-critical care. Improved co-ordination with fire departments would support consistent application of medical standards, information sharing, and improvements to patient care.

There are several challenges to improving co-ordination. Fire department first responders are employed by local governments, while BCEHS is part of the provincial government. Further, BCEHS and some municipalities have different views on how fire department first responders can best support BCEHS in providing effective access to emergency health services. Support from the provincial government may be needed to improve co-ordination.

I would like to thank everyone at BC Emergency Health Services for their support and assistance during our work on this audit. A special thank you to the paramedics and first responders we met with for their professionalism and contributions to this audit, and for the services they provide to the people of British Columbia.

Carol Bellringer, FCPA, FCA
Auditor General
Victoria, B.C.
February 2019

REPORT HIGHLIGHTS

BRITISH COLUMBIA EMERGENCY HEALTH SERVICES (BCEHS) HAS:

4,000+ staff

4 helicopters

500 ambulances

3 dispatch centres

183 stations

7 airplanes

2018

BCEHS responded to **500,000+** pre-hospital events & completed **90,000+** inter-hospital transfers.

BCEHS **DIDN'T CONSISTENTLY** MEET ITS TARGETS for timely, quality care.

BCEHS transforming service **TO BETTER MATCH** resources to patient needs across B.C.

ACCESS TO emergency health services VARIES DEPENDING WHERE YOU LIVE.

BCEHS **co-ordination** with fire department first responders NEEDS STRENGTHENING.

SUMMARY

Emergency health services are first aid or other health care provided outside of a health facility without delay. These services can preserve an individual's life or prevent or alleviate serious harm or severe pain. The quality and timeliness of the care that patients receive at the scene of an emergency and on their way to the hospital can shape their longer-term outcomes.

Provision of emergency health services

British Columbia Emergency Health Services (BCEHS) paramedics provide emergency health services, from basic emergency care to advanced care for a variety of life-threatening conditions and specialized infant, child and perinatal care. Emergency health services are also provided by fire department first responders, who support BCEHS by providing basic life-saving interventions for patients requiring time-critical care. BCEHS call-takers and dispatchers—the first point of contact in medical emergencies—provide a wide variety of support to callers over the phone, such as CPR instruction for cardiac arrest and critical information on childbirth.

BCEHS is responsible for the delivery, co-ordination and governance of emergency health services. BCEHS is the only organization in the province authorized by legislation to provide emergency health services; however, BCEHS can and does consent to other organizations, primarily fire departments, providing these services as part of a co-ordinated response. These agencies provide emergency health services with the written consent of BCEHS and under terms specified by BCEHS.

In 2017/18 BCEHS spent $478 million and employed over 4,000 staff, including paramedics, call-takers and dispatchers, to support the delivery of emergency health services.

What we looked at

We carried out this audit to determine whether BCEHS has effectively managed access to ambulance and emergency health services across the province. Our audit was province-wide and focused on BCEHS performance in the pre-hospital environment. We examined BCEHS performance measures for response times and clinical care, performance against those measures, and changes planned or underway to improve services. The audit also examined BCEHS co-ordination with fire department first responders.

What we concluded

We found that BCEHS had effectively managed access to ambulance and emergency health services in some areas, but that performance against key targets for patient care needs improvement, and co-ordination of access to emergency health services with fire departments needs to be strengthened.

SUMMARY

What we found

BCEHS monitors its performance in providing emergency health services

BCEHS had appropriate measures and had monitored them to understand its performance. BCEHS performance measures include response times for high-acuity events, which are the most time-sensitive, as well as measures focused on clinical quality for certain life-threatening conditions.

Targets for timely, quality care were not consistently met

One of BCEHS's performance measures—response times for high-acuity events—reflects its ability to attend to medical events where time matters to the patient's outcome. We found that BCEHS achieved its response-time targets for high-acuity events in rural and remote areas but was substantially below its response-time target in urban areas. Urban areas account for 86% of all high-acuity 9-1-1 medical events. When response-time targets are not met, patients may not be receiving care when they need it. BCEHS has produced an action plan identifying a variety of strategies and actions to improve its services by 2020.

BCEHS has developed and tracks several clinical quality indicators across three life-threatening conditions: cardiac arrest, stroke and a serious type of heart attack called ST-segment elevation myocardial infarction (STEMI). We found that a key target for cardiac arrest—return of spontaneous circulation obtained—was met at the provincial level. Further, a recent study found an improving trend in out-of-hospital cardiac arrest survival in urban areas in B.C. However, BCEHS performance for most other clinical quality indicators were below target.

Access to service varies, depending on location in the province

Patient experiences with pre-hospital care will vary, depending on where the patient is relative to where resources are located. Some patients in rural and remote areas can experience a lower level of service than their urban counterparts because of:

- longer times for paramedics and first responders to reach patients
- longer distances to appropriate hospital care
- fewer or no advanced care paramedics

Patients in communities without advanced care paramedics will have fewer medical interventions available to them at the scene of an emergency and on the way to the hospital.

BCEHS uses performance results to improve timeliness and quality of patient care

We found that BCEHS monitored and analyzed its results, and that it had several initiatives underway to change service delivery to improve patient care:

- community paramedicine
- new paramedic positions
- clinical response model
- secondary triage
- treat and release

SUMMARY

Co-ordination of access to emergency health services needs improvement

BCEHS works with fire departments through a number of avenues: dispatchers notify fire departments of medical events, paramedics and first responders work co-operatively together in providing patient care, and BCEHS staff meet with municipal and fire department staff.

However, we found that BCEHS collaboration with fire departments had not resulted in a co-ordinated approach to emergency health services across the province. Emergency health services provided by fire department first responders were not subject to medical oversight by BCEHS, BCEHS and fire departments did not share data with each other, and consent agreements with some local governments were not in place. The absence of a co-ordinated approach increases the risk of inconsistent application of medical standards, limits understanding of the care provided and the opportunities for improvement, and increases the risk that first responders are not deployed to match patient needs.

BCEHS faces challenges in achieving a co-ordinated approach to accessing emergency health services across the province. BCEHS is not the employer of first responders and cannot compel fire departments to participate as first responders, enter into agreements or adhere to medical direction. Also, the capacity to provide first responder services varies widely across the province's many fire departments. Furthermore, BCEHS has not reached agreement with some municipalities on how fire department first responders can best support BCEHS in providing access to emergency health services. Because of these challenges, as well as the different levels of government involved, support from the provincial government may be needed to improve co-ordination.

SUMMARY OF RECOMMENDATIONS

WE RECOMMEND THAT BRITISH COLUMBIA EMERGENCY HEALTH SERVICES (BCEHS):

1. review its performance management framework to identify additional indicators for timeliness and clinical quality.

2. determine an appropriate level of pre-hospital advanced care coverage that considers patient need, and implement strategies to achieve that level.

3. improve transparency and accountability by publicly reporting on its targets and performance.

WE RECOMMEND THAT THE MINISTRY OF HEALTH:

4. work with local governments and BCEHS to ensure that BCEHS can implement a co-ordinated approach to pre-hospital care that results in:
    - medical oversight, to the extent appropriate, across agencies to ensure that patient care meets acceptable medical standards
    - data-sharing between agencies to better understand whether patients are getting the right medical interventions at the right time
    - signed agreements outlining the roles and responsibilities of fire departments, including the level of care provided
    - confirmation that first responders are being notified of events where they can best contribute to patient care

RESPONSE FROM BC EMERGENCY HEALTH SERVICES AND THE MINISTRY OF HEALTH

BC Emergency Health Services (BCEHS) wishes to thank the Office of the Auditor General for its work reviewing the ways BCEHS has effectively managed access to ambulance and emergency health services across the province. The audit sheds light on some of the challenges BCEHS has been facing for some time and acknowledges the progress we have made in the last few years.

BCEHS recognizes the value of the Auditor's insights into areas where additional focus may further impact our patients' experiences in a positive way.

BCEHS initiated a comprehensive Action Plan through the period of the audit and we are now in the final quarter of its second year, and later this spring year three will begin. In that time, BCEHS has added more paramedics, dispatch centre staff, and ambulances and we continue to increase resources where they are needed most. This includes 119 paramedic positions, more than 100 specialized paramedic positions including community paramedics, 20 emergency dispatchers and six nurses to triage less urgent calls. BCEHS is targeting the areas of highest demand and greatest need. We are also making scheduling changes as needed to better meet peak demand. We are committed, through our remaining action plan initiatives and our partnership with our first responder agencies, to achieving our 2020 performance targets

The Auditor's report highlights four key recommendations -- three are directed to BCEHS and one to the Ministry of Health.

RECOMMENDATION 1 – *that BCEHS review its performance management framework to identify additional indicators for timeliness and clinical quality.*

We are pleased the audit confirms we have appropriate performance measures and are taking action to improve our performance against those key targets. At the time of the audit, we were at the very early stages of seeing positive impacts from several significant changes, initiated after the beginning of the audit, and which make up a fundamental part of our Action Plan. We expect these improvements will continue as we move into the third year of our Action Plan this spring.

However, paramedic response times alone do not provide a full picture of the care that the highest acuity patients receive. First responders play a valuable role in responding, and often arrive at scene sooner than paramedics and can administer life-saving interventions for our high acuity calls.

BCEHS is working with first responder agencies to capture this data, and in the future, will be able to

RESPONSE FROM BC EMERGENCY HEALTH SERVICES AND THE MINISTRY OF HEALTH

report more comprehensively on the percentage of time a first responder and/or paramedic is at the patient's side in under 9 minutes.

As the largest provincial ambulance service in the country, BCEHS is a complex organization that handles more than 1400 calls a day – about half a million calls annually. Part of the changes we are making are an evolution to a more patient-centred model, in which a quick response and trip to the hospital may not be best for the patient, or the most appropriate use of resources. For less acute patients, treating them on scene, or recommending alternative care, is in many cases preferable. We are already seeing benefits to patient care by finding alternate pathways for many of our lower acuity calls.

In keeping with our commitment to continually improve our service to patients, BCEHS accepts the Auditor's recommendation and will carefully review our performance management framework and build on our progress to date. Implementation of our new clinical response model has helped improve response times in most communities and major centres including Surrey, Delta and Burnaby. BC also has among North America's best survival rates for patients who have a cardiac arrest outside a hospital.

We will continue to closely track data and conduct clinical reviews to identify ways to best deliver pre-hospital emergency care to patients quickly and efficiently.

RECOMMENDATION 2 – *that BCEHS determine an appropriate level of pre-hospital advanced care coverage that considers patient need and implement strategies to achieve that level.*

BCEHS accepts this recommendation. Our workforce is comprised of paramedics with different levels of training. As the report notes, patients in communities without advanced care paramedics – paramedics who can do more at a scene than a paramedic with more basic training and experience – have fewer medical interventions available to them at the scene of an emergency and on the way to the hospital. In the most urgent cases, however, BCEHS may transport patients by air ambulance, and these patients often have advanced or critical care paramedics treat them while enroute to the nearest trauma facility or higher level of care.

BCEHS is currently conducting a research project, in collaboration with health authorities, to better understand the role advanced care paramedics can have in rural communities as part of the BCEHS Community Paramedicine program. Traditionally, call volume in rural and remote communities has not been considered frequent enough for advanced care paramedics to regularly use and maintain their clinical skills. With the Community Paramedicine Program, opportunities may now exist for this to change. Communities where patients are being seen regularly by a community paramedic have had a 39 per cent decrease in the number of 911 emergency calls. BCEHS will use the results of this research project and other relevant clinical research studies to determine appropriate levels of advanced care coverage, and if needed, work on strategies to achieve that level.

RESPONSE FROM BC EMERGENCY HEALTH SERVICES AND THE MINISTRY OF HEALTH

RECOMMENDATION 3 – *that BCEHS improve transparency and accountability by publicly reporting on its targets and performance.*

BCEHS accepts and supports this recommendation. We do report regularly on our performance to the BCEHS Board and President and CEO, and to the Ministry of Health, and also report publicly on our website on progress being made on the implementation of the BCEHS Action Plan initiatives. We also share response time results quarterly with lower mainland municipalities. However, to ensure greater transparency and accountability, BCEHS will also begin to regularly post on our website progress being made on key initiatives and our progress on meeting our performance measures.

RECOMMENDATION 4 – *that the Ministry of Health work with local governments and BCEHS to ensure that BCEHS can implement a coordinated approach to pre-hospital care that results in:*

- *Medical oversight, to the extent appropriate, across agencies that ensures that patient care meets acceptable medical standards*
- *Data sharing between agencies to better understand whether patients are getting the right medical interventions at the right time*
- *Signed agreements outlining the roles and responsibilities of fire departments, including the level of care provided*
- *Confirmation that first responders are being notified of events where they can best contribute to patient care*

The Ministry of Health accepts and supports this recommendation by the Auditor General. We will work with stakeholders to ensure a coordinated response that maximizes the resources available and delivers best patient care.

Patient safety is the key priority. The Ministry will work with BCEHS to determine an appropriate medical oversight model which will allow for consistent medical standards and practices across all first responder agencies.

The Ministry agrees to work with municipal stakeholders and BCEHS to build collaborative consent agreements that support optimal care and ensure a timely response for high acuity patients. Working together recognizes and leverages the collective contribution of providers. We acknowledge that municipal governments will participate at varying levels depending on what they deem appropriate, and will aim to strike a balance in their level of call responses.

The Ministry acknowledges that data sharing agreements will be a crucial underpinning of the municipal consent and collaboration agreements. The data sharing agreements will allow all parties involved to collectively monitor and improve performance in a collaborative way. We invite the participation and collaboration of our municipal partners.

BCEHS is proud of the improvements and progress we have made. We are the kind of organization that sets aspirational targets and works deliberately to meet them. We are confident that our action plan initiatives, in combination with the increased resources we recently incorporated into our system, will help us

RESPONSE FROM BC EMERGENCY HEALTH SERVICES AND THE MINISTRY OF HEALTH

achieve the targets we've set and will lead to significant improvements for patients.

We are very proud of our professional workforce of emergency call-takers, dispatchers, paramedics and managers who provide patients in challenging situations excellent emergency health care services. We are committed to continuing to transform BCEHS in our patients' best interest and be a leading, world-class emergency medical service.

We thank the Auditor General and her audit team for their hard work and professionalism throughout this process and their focus on our ongoing efforts to improve care in the best interests of our patients.

ABOUT THE AUDIT

BACKGROUND

Emergency health services save lives in B.C.

As defined in the *Emergency Health Services Act*, emergency health services are first aid or other health care provided outside of a health facility without delay in order to preserve an individual's life or prevent or alleviate serious harm or severe pain.

These services are provided in response to a wide array of medical emergencies, such as heart attack, seizure, or physical injuries due to a car accident or a fall. Emergency health services are a critical component of the health care system and often a patient's first point of contact with the health-care system in an emergency situation.

Emergency health services are provided at the scene, en route by ambulance to hospital and during patient transfers between hospitals. The quality and timeliness of the care that patients receive at the scene and on their way to the hospital can shape their subsequent experiences in the health-care system and their longer-term outcomes.

BCEHS is responsible for emergency health services in B.C.

The B.C. government created the provincial ambulance service in 1974, amalgamating the many private and municipal ambulance services in operation at the time. Today, British Columbia Emergency Health Services (BCEHS) is responsible for the delivery, co-ordination and governance of emergency health services and inter-hospital patient transfers, including call intake and dispatch, through the BC Ambulance Service and the BC Patient Transfer Network. The goal of BCEHS is to ensure that patients receive timely and appropriate access to emergency care when required, in every community across the province. Appropriate access to care means patients receive the right services at the right time.

The *Emergency Health Services Act* establishes BCEHS as a corporation responsible for providing emergency health services in B.C. Under the Act, BCEHS is responsible for both delivering emergency health services throughout the province and consenting to the provision of emergency health services by first responders. BCEHS is the only organization in the province authorized by the Act to provide emergency health services. However, BCEHS can and does consent to other organizations, primarily fire departments, providing these services as part of a co-ordinated response. The Act also enables BCEHS to collaborate with other organizations, including

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municipalities, to plan and co-ordinate the provision of emergency health services.

In 2010, government moved BCEHS from the Ministry of Health into the Provincial Health Services Authority (PHSA, one of six health authorities responsible for health service delivery in the province), with the intent of better integrating BCEHS into the health system. The Ministry of Health has overall responsibility for ensuring that all people who live in British Columbia have access to quality, appropriate, cost-effective and timely health services.

BCEHS resources

BCEHS responds to medical emergencies across the province, covering all five regional health authorities. BCEHS uses both ground and air transport for pre-hospital responses and inter-hospital transfers. In 2018, BCEHS responded to over 500,000 pre-hospital events and completed over 90,000 inter-hospital transfers. BCEHS's total expenses in 2017/18 were $478 million, up from $424 million in 2016/17. According to BCEHS, this increase is primarily due to negotiated wage increases, initiatives to improve patient care, and costs related to the opioid crisis. In March 2017, government announced additional funding for BCEHS of $91 million over three years for new staff and equipment as well as new initiatives which are part of BCEHS's plan to make wide-ranging changes to its service by 2020.

BCEHS paramedics respond to the needs of patients with medical services that range from basic emergency care procedures to advanced care for a variety of life-threatening conditions or specialized infant, child and perinatal care.

Province-wide, BCEHS resources include:

- over 4,000 staff, including call-takers and dispatchers, emergency medical responders, and primary, advanced and critical care paramedics (see Exhibit 1)
- approximately 500 ground ambulances, 40 of which are used for advanced, critical and infant care
- seven dedicated airplanes and four helicopters
- 183 ground stations
- three dispatch centres, located in Vancouver, Victoria and Kamloops

Exhibit 1: BCEHS staff categories and numbers, as of March 31, 2018

BCEHS staff categories	Number of staff
Critical and Advanced Care Paramedics	341
Primary Care Paramedics	2,874
Emergency Medical Responders	548
Dispatch staff	287
Drivers	83
Total staff	4,133

Source: BCEHS

ABOUT THE AUDIT

Level of care provided varies by licence level

The *Emergency Health Services Act* requires all individuals providing emergency health services in B.C.—called emergency medical assistants—to be tested and licensed by the provincially appointed Emergency Medical Assistants Licensing Board (EMALB). Exhibit 2 describes the license levels in B.C. Each licence level increases the services a licence holder can provide.

The role of first responders

First responders play an essential role in supporting BCEHS to provide the quickest possible response to patients requiring time-critical care. First responders provide basic life-saving interventions, such as cardiopulmonary resuscitation (CPR), defibrillation and administration of naloxone for drug overdoses. They also provide support to paramedics, including:

- initial scene assessment of accidents and medical incidents
- protection of emergency personnel and the public from incident hazards

First responders work for or volunteer with first responder agencies, such as fire departments, search and rescue organizations and other small, community-based organizations. In B.C., there is no legal requirement for municipalities or other agencies to provide first responder services. Under the *Emergency Health Services Act,* these agencies can only provide emergency health services with the written consent of BCEHS and under terms specified by BCEHS.

Exhibit 2: Licensing levels of emergency health services providers

Licence level	Services provided
First Responder	Provide emergency scene and patient assessment, as well as basic life-saving interventions, such as cardiopulmonary resuscitation (CPR), defibrillation and administration of naloxone for drug overdoses
Emergency Medical Responder (EMR)	Provide care at the first responder level, as well as additional basic emergency care procedures, such as IV line maintenance, pulse oximetry and blood pressure monitoring
Primary Care Paramedic (PCP)	Provide care at the EMR level, as well as additional emergency care procedures, such as the use of airway devices and initiation of IV lines
Advanced Care Paramedic (ACP)	Provide care at the PCP level, as well as advanced medical care for a variety of life-threatening conditions, including cardiac, stroke and trauma, and have access to a range of pain management options
Critical Care Paramedic (CCP)	Provide the highest level of specialized care, with a focus on inter-hospital transport; air medical response; and infant, child and perinatal care

Source: Office of the Auditor General of British Columbia

ABOUT THE AUDIT

Approximately 300 first responder agencies operate in the province. Fire departments make up the majority of those agencies. According to the EMALB, there are over 8,000 licensed first responders in B.C., the majority of whom work for or volunteer with fire departments; approximately 600 other individuals who hold the Emergency Medical Responder licence work for or volunteer with fire departments. Medical emergencies account for the majority of incidents that many fire departments respond to.

Dispatching and providing patient care

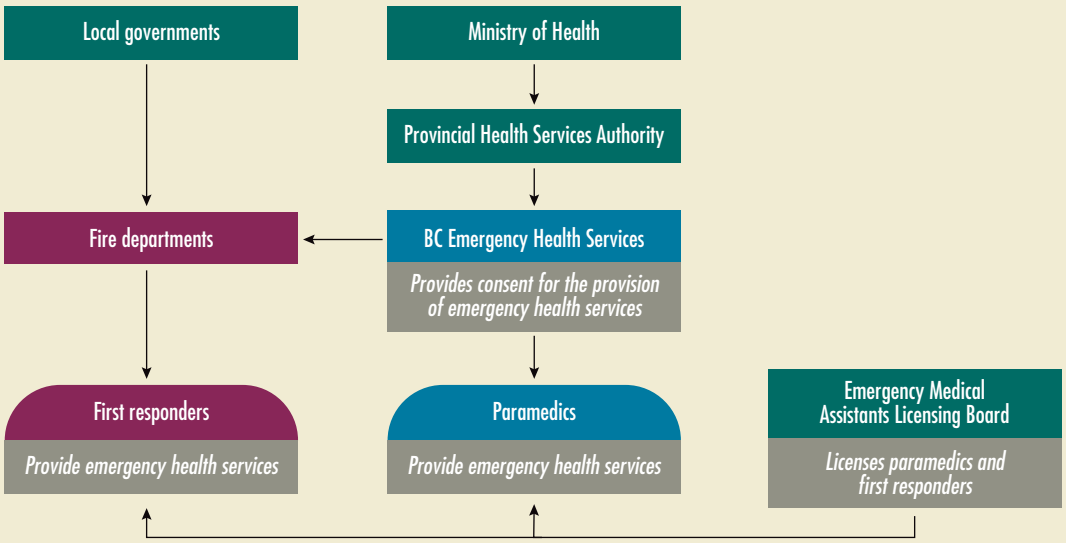
In B.C., response to a patient's medical emergency begins with a call to 9-1-1. A 9-1-1 call-taker determines whether calls should be responded to by police, fire or ambulance. All ambulance calls are sent to BCEHS. A BCEHS call-taker assesses the call, based on the caller's description of the patient's medical condition or injury. BCEHS then dispatches paramedics.

BCEHS call-takers and dispatchers are a first point of contact in medical emergencies. They provide a wide variety of support to callers over the phone, such as CPR instruction for cardiac arrest and critical information on childbirth.

9-1-1 SERVICES IN B.C.

In B.C., 9-1-1 services are a local government responsibility. Local governments either contract with a 9-1-1 call-answer service or provide the service directly themselves. E-Comm is by far the largest 9-1-1 call-answer service provider in B.C., servicing the Metro Vancouver Regional District and 25 other regional districts and communities throughout the province.

Exhibit 3: Licensing and providing emergency health services



Source: Office of the Auditor General of British Columbia

ABOUT THE AUDIT

When assessing calls, BCEHS call-takers notify local fire departments of medical events that they determine are appropriate for fire department first responders to attend. Fire departments choose whether to respond to medical calls; their participation is voluntary. The extent to which fire departments attend medical calls varies depending on the municipality. For example, large urban career-based fire departments typically attend a wider variety of calls than volunteer departments with limited resources.

If fire department first responders attend and arrive at the scene first, they initiate patient care, if appropriate. On the arrival of BCEHS paramedics, fire department first responders hand over patient care to them for further assessment and higher-level care. Paramedics are the lead on patient care when at the scene and, unlike first responders, are authorized to transport patients.

The lone exception to the process described above is in Kitimat. The fire department in Kitimat provides all pre-hospital care and transportation at the Primary Care Paramedic level, under contract between the municipality of Kitimat and BCEHS.

AUDIT SCOPE

Our audit was province-wide and focused on BCEHS performance in the pre-hospital environment. We examined BCEHS performance measures for response times and clinical care, performance against those measures, and changes planned or underway to improve services. The audit also examined BCEHS co-ordination with fire department first responders.

This audit did not include inter-hospital transports, nor did it include search and rescue or other non–fire department first responder agencies. Our audit did not assess the basic organization of pre-hospital service delivery or adequacy of resourcing.

We assessed performance and practices from April 2016 to December 2017. We also assessed response times for high-acuity events in urban areas from January 1, 2018, to December 31, 2018.

AUDIT METHOD

The report is dated February 19, 2019. This is the date on which the audit team finished obtaining the evidence used to determine the findings and conclusions of the report.

Our work involved:

- interviewing BCEHS managers and paramedics from a sample of urban, rural and remote communities
- observing call intake and dispatch in BCEHS's three dispatch centres (Vancouver, Victoria and Kamloops)
- riding with paramedics in Vancouver and Victoria, and with the Surrey Fire Department to medical calls
- reviewing BCEHS data, performance reports and other documentation
- interviewing municipal and fire department representatives from a sample of small and large communities
- consulting with two subject matter experts

AUDIT OBJECTIVE AND CONCLUSION

AUDIT OBJECTIVE

Our objective was to determine whether British Columbia Emergency Health Services (BCEHS) has effectively managed access to ambulance and emergency health services across the province.

Specifically, we undertook the audit to determine whether:

1. BCEHS has appropriate performance measures with targets to manage access to ambulance and emergency health services across the province
2. BCEHS collaborates with fire departments to co-ordinate access to ambulance and emergency health services across the province
3. BCEHS measures and reports on its success in providing access to ambulance and emergency health services across the province
4. BCEHS uses performance results to inform action to improve access to ambulance and emergency health services across the province

AUDIT CONCLUSION

We found that BCEHS had effectively managed access to ambulance and emergency health services in some areas, but performance against key targets for patient care needs improvement, and co-ordination of access to emergency health services with fire departments needs to be strengthened.

Specifically, we concluded that:

- BCEHS had established appropriate performance measures with targets and had regularly assessed whether its expectations for patient care were met. BCEHS met some of its targets, including response times for high-acuity (i.e., time-sensitive) events in rural and remote areas, as well as certain clinical quality measures. However, BCEHS did not meet its response-time target for high-acuity events in urban areas (which account for most 9-1-1 medical events). Several clinical quality measures were also not achieved. In 2016, BCEHS recognized that improvement was needed and at the time of this audit was embarking on significant changes to its service delivery as part of a plan to improve response times and patient care by 2020.

AUDIT OBJECTIVE AND CONCLUSION

- BCEHS and fire department first responders work co-operatively to provide care to patients. However, BCEHS collaboration with fire departments had not resulted in a co-ordinated approach to emergency health services across the province: emergency health services provided by fire departments were not subject to medical oversight by BCEHS, BCEHS and fire departments did not share data, and agreements on roles and responsibilities with some local governments were not in place. Support from the provincial government may be needed to improve co-ordination.

KEY FINDINGS AND RECOMMENDATIONS

PATIENT ACCESS TO AMBULANCE AND EMERGENCY HEALTH SERVICES

PROVIDING THE RIGHT emergency health services at the right time can save lives and improve outcomes for patients in immediate medical need. We assessed whether British Columbia Emergency Health Services (BCEHS) had defined and achieved its expectations for providing patient care or was making changes to improve its service as needed.

BCEHS monitors its performance in providing emergency health services

We looked to see if BCEHS had performance measures for providing timely and appropriate access to care, and whether these measures were consistent with good practice. Measuring and monitoring performance is essential for:

- understanding the quality of patient care delivered
- focusing improvement efforts
- enabling accountability through public reporting

We found that BCEHS had appropriate measures and had monitored them to understand its performance. BCEHS performance measures included response times for high-acuity events, which are the most time-sensitive, as well as measures focused on clinical quality for certain life-threatening conditions. As there are no nationally accepted standards of performance, BCEHS set its own targets for each of these measures. Measures, targets and performance are shown in Exhibits 4, 5 and 7.

Although BCEHS monitored key performance measures, it did not track aspects of its performance regarding:

- how quickly BCEHS dispatches an ambulance, and how this contributes to the overall timeliness of care for high-acuity events
- care for patients experiencing trauma, which, according to BCEHS, accounts for approximately 38% of all 9-1-1 medical events in B.C. (*trauma* refers to a wide range of injuries sustained through events such as falls or high-risk car crashes)
- additional clinical conditions, such as seizure, asthma and pulmonary edema[1]
- first responders' contribution to achieving BCEHS performance targets for certain high-acuity events, notably cardiac arrest

[1] Pulmonary edema is a condition caused by excess fluid in the lungs, making it difficult to breathe.

KEY FINDINGS AND RECOMMENDATIONS

Tracking these additional measures would enhance BCEHS understanding of the timeliness and quality of the services it provides to patients. At the time of our audit, BCEHS was working to develop measures for trauma.

RECOMMENDATION 1: *We recommend that BCEHS review its performance management framework to identify additional indicators for timeliness and clinical quality.*

Targets for timely, quality care are not consistently met

BCEHS response-time targets are not all met

One of BCEHS's performance measures—response times for high-acuity events—reflects its ability to attend to medical events where time matters to the patient's outcome. Many jurisdictions use this as a key measure of success.

We looked to see if BCEHS had achieved its response-time targets for high-acuity events. In 2016, BCEHS announced an action plan identifying a variety of strategies and actions to improve the overall efficiency and effectiveness of emergency health services, including achieving a target of responding in 9 minutes or less, 75% of the time, to the highest-acuity calls in urban areas by 2020. The targets in place at the time of the audit, specific to community type, were 9 minutes for urban communities, 15 minutes for rural communities and 30 minutes for remote areas, achieved 70% of the time, for high-acuity calls.

BCEHS DEFINITIONS FOR URBAN, RURAL AND REMOTE COMMUNITIES

- Urban: served by full-time paramedics with some standby and on-call shifts; encompasses a wide range of communities; includes Vancouver, Kelowna and Terrace
- Rural: served by on-call and standby paramedics, with up to two full-time employees; includes Merritt, Burns Lake and Fort Nelson
- Remote: served by on-call paramedics and includes communities without an ambulance station; includes Masset, New Denver and Gitwangak

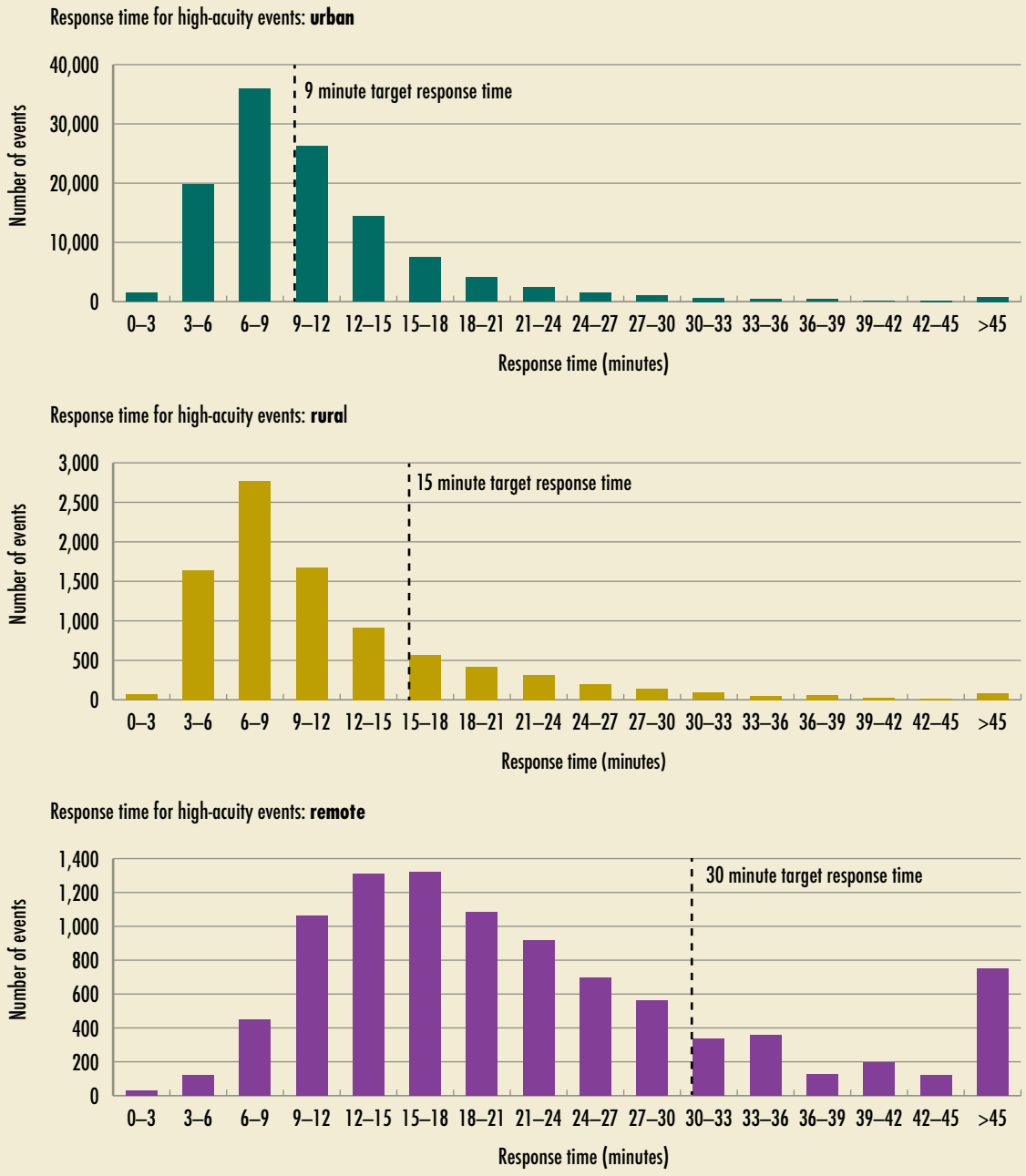
Exhibit 4: Response times of BCEHS paramedics for high-acuity events, April 1, 2016 – December 31, 2017

Community type	Target		Actual
Urban	Arrived within 9 minutes	70% of the time	50% of the time
Rural	Arrived within 15 minutes	70% of the time	79% of the time
Remote	Arrived within 30 minutes	70% of the time	77% of the time

Source: Office of the Auditor General of British Columbia, based on BCEHS data

KEY FINDINGS AND RECOMMENDATIONS

Exhibit 5: Response times of BCEHS paramedics for high-acuity events in urban, rural and remote areas, January – December 2017



Source: Office of the Auditor General of British Columbia, based on BCEHS data

KEY FINDINGS AND RECOMMENDATIONS

We found that BCEHS achieved its response-time targets for high-acuity events in rural and remote areas but was substantially below its response-time target in urban areas (see Exhibit 4). This is significant, because urban areas account for 86% of all high-acuity 9-1-1 medical events. In 2017, there were 125,064 high-acuity events in urban areas. When response-time targets are not met, patients may not be receiving care when they need it.

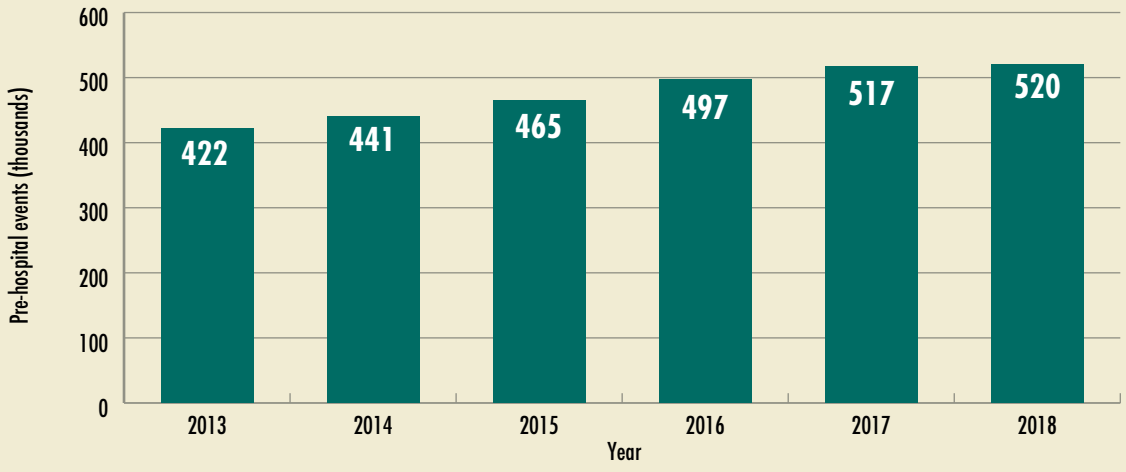
Exhibit 5 shows the range of BCEHS response times for high-acuity events relative to the target.

BCEHS has experienced significant growth in demand for its services, with call volumes increasing by 23% between 2013 and 2018 (see Exhibit 6). In 2015, BCEHS commissioned a study of demand for services, service delivery and resources in the province's most populated urban centres: Metro Vancouver, Fraser Valley and Greater Victoria. The study projected continued annual growth of 6% to 2020 and found that performance would worsen if BCEHS did not make changes to service delivery. In 2016, BCEHS announced an action plan to make wide-ranging changes aimed at improving services across the province, including a change in its response model.

Events subsequent to the audit period

In the first half of 2018 (after the period of the audit), BCEHS added more resources, introduced a new dispatch prioritization process (the clinical response model), and automated the recording of arrival times at the scene. BCEHS advised us that the intent of this

Exhibit 6: 9-1-1 calls for BCEHS services by year, 2013–2018



Source: Office of the Auditor General of British Columbia, based on BCEHS data

automation was to more accurately capture response times and increase confidence in data collected.

We reviewed response times to see if they had improved after the introduction of these initiatives. BCEHS data showed a slight improvement in response times in 2018: 51% of responses to high-acuity events in urban areas were under 9 minutes, compared with 50% for the audit period.

BCEHS clinical quality targets are not all met

Timeliness of response affects patient outcomes, as does the quality of the medical interventions provided at the scene and on the way to hospital. In recent years, many ambulance and emergency health service providers have recognized that measures of clinical quality are needed to balance performance results and to direct improvement.

BCEHS has developed and tracks several clinical quality indicators across three life-threatening conditions: cardiac arrest, stroke and ST-segment elevation myocardial infarction (STEMI). STEMI is a serious type of heart attack during which one of the heart's major arteries is blocked. Timely diagnosis and transport to an appropriate hospital improves the likelihood of patient survival. In B.C., only advanced care and critical care paramedics are licensed to perform early STEMI recognition.

We found that a key target for cardiac arrest—return of spontaneous circulation obtained—was met at the provincial level. A recent study found an improving trend in out-of-hospital cardiac arrest survival in urban areas in B.C. (see sidebar).

CARDIAC ARREST SURVIVAL IN B.C. URBAN AREAS

A recent 10-year study (2006–2016) of out-of-hospital cardiac arrest in large urban centres in B.C. found significant improvement in patient outcomes: patient survival improved from 9% in 2006 to 16% in 2016.[2] In 2017, BCEHS dispatched paramedics and first responders to 7,101 cardiac arrest events, or about 1% of all pre-hospital medical events.

[2] Trends in care processes and survival following pre-hospital resuscitation improvement initiatives for out-of-hospital cardiac arrest in British Columbia, 2006–2016: https://www.ncbi.nlm.nih.gov/pubmed/29408229

However, we also found that BCEHS performance for clinical quality was below its targets for most indicators. A list of clinical quality indicators and performance is included in Exhibit 7. We compiled this information based on BCEHS clinical indicator reports from April 2016 to September 2017.

KEY FINDINGS AND RECOMMENDATIONS

Exhibit 7: Clinical quality indicators

Cardiact arrest		
Indicator	**Target**	**Performance**
Identified by call-taker within 60 seconds	75%	51%
CPR performed by bystanders	10%*	No clear trend
Return of spontaneous circulation obtained	50%	Province-wide: 54% Health region: F: 57%, Int: 44%, Isl: 51%, N: 42% VC : 61%
Paramedic response time within target Urban: 9 minutes Rural: 15 minutes Remote: 30 minutes	75%	Province-wide: 70% Health region: F: 57%, Int: 72%, Isl: 79%, N: 74%, VC: 75%
Stroke		
Indicator	**Target**	**Performance**
Recording of blood sugar check	100%	Province-wide: 86% Health region: F: 88%, Int: 81%, Isl: 85%, N: 79%, VC: 88%
Documentation of onset of symptoms	100%	Province-wide: 55% Health region: F: 56%, Int: 52%, Isl: 57%, N: 38%, VC: 58%
Oxygen given according to protocol for stroke	100%	Province-wide: 69% Health region: F: 69%, Int: 70%, Isl: 72%, N: 52%, VC: 70%
Transported to hospital with on-scene time less than 20 minutes	80%	Province-wide: 69% Health region: F: 71%, Int: 73%, Isl: 67%, N: 71%, VC: 63%
Heart attack (ST-segment elevation myocardial infarction [STEMI])[3]		
Indicator	**Target**	**Performance**
Time from ACP arrival to delivery of patient at appropriate hospital	< 90 minutes	91 minutes
Correctly diagnosed by ACP	80%	72%
False negative diagnosis correctly overridden by ACP	40%	42%

Source: Office of the Auditor General of British Columbia, based on BCEHS data, April 2016 to September 2017
* higher than same quarter last year
Note: F= Fraser, Int=Interior, Isl=Island, N=Northern, VC= Vancouver Coastal

[3] BCEHS STEMI performance indicators results presented in Exhibit 7 reflect the Lower Mainland only.

KEY FINDINGS AND RECOMMENDATIONS

Access to service varies, depending on location in the province

Patient experiences with pre-hospital care will vary, depending on where the patient is relative to where resources are located. Some patients in rural and remote areas can experience a lower level of service than their urban counterparts because of:

- **Longer times to reach patients**—BCEHS sets slower response-time targets for high-acuity events in rural (15 minutes) and remote (30 minutes) areas. These targets reflect the greater distances that have to be covered to reach patients, as well as greater reliance on staff who are on-call in these areas.
- **Longer distances to appropriate hospital care**—For example, all Level 1 trauma centres in B.C. are located in the Lower Mainland. Level 1 trauma centres are recognized as hospitals with a primary role and the required resource capability to provide care for major trauma patients. For some patients, this means long and multi-leg transports from the emergency scene to definitive care.
- **Fewer or no advanced care paramedics**—Advanced care paramedics are not stationed in rural, remote and some urban communities. This is because BCEHS stations them in areas where demand for emergency health services is greatest.

Patients in communities without advanced care paramedics will have fewer medical interventions available to them at the scene of an emergency and on the way to the hospital. This puts some patients at greater risk. BCEHS data indicates that in 2017, advanced or critical care paramedics were dispatched to only 17% of rural and remote pre-hospital patients identified by BCEHS call-takers as requiring the highest level of care available, with a median[4] response time of 27 minutes. In contrast, advanced or critical care paramedics were dispatched to 74% of urban pre-hospital patients requiring the highest level of care available, with a median response time of 11 minutes.

Paramedics in the field have 24/7 access to guidance from advanced care paramedics through the paramedic specialist program, as well as from physicians through

ADVANCED LIFE SUPPORT AND THE AIR AMBULANCE PROGRAM

BCEHS responds to the majority of patient needs with two types of ground ambulances: Basic Life Support and Advanced Life Support. Basic Life Support ambulances are staffed with primary care paramedics and Advanced Life Support ambulances are staffed by advanced care paramedics.

For some emergency calls, BCEHS deploys aircraft staffed by critical care paramedics. The air ambulance program mostly provides transportation between hospitals for patients who need a higher level of care than is available in their community. Dedicated aircraft are based in Vancouver, Prince George, Prince Rupert, Kelowna and Kamloops, as well as Fort St. John on a trial basis.

[4] *Median* refers to the middle value of a data set. Half of the response times fall below the median and half fall above it.

KEY FINDINGS AND RECOMMENDATIONS

the Emergency Physician Online Service through BCEHS' dispatch. However, it has not evaluated its advanced care coverage to determine whether it is sufficient to meet the needs of patients requiring higher-level care across the province.

RECOMMENDATION 2: *We recommend that BCEHS determine an appropriate level of pre-hospital advanced care coverage that considers patient need, and implement strategies to achieve that level.*

BCEHS does not publicly report on its performance against targets

Public performance reporting allows stakeholders and the public to understand how well government organizations are performing in relation to their goals and how well public services are being delivered.

We looked to see if BCEHS had publicly reported on its performance for providing timely and appropriate access to emergency care. While BCEHS responds to requests for information such as its response times in a particular community, we found that BCEHS has not otherwise publicly reported its results against stated goals and targets. This means that patients and other stakeholders do not have the information they need to understand BCEHS targets and performance across the province and therefore to know what to expect in terms of an emergency medical response.

RECOMMENDATION 3: *We recommend that BCEHS improve transparency and accountability by publicly reporting on its targets and performance.*

BCEHS uses performance results to improve access to timely and quality emergency health services

We looked to see if BCEHS had reviewed its performance results and had taken action to improve performance. We found that BCEHS monitored and analyzed its results and that it had several initiatives underway to change service delivery to improve patient care in response to its analysis.

As mentioned on page 21, a study commissioned by BCEHS estimated that future demand for pre-hospital care will grow significantly in the Lower Mainland and Greater Victoria.

In 2016, BCEHS announced an action plan to make wide-ranging changes to its service by 2020. Objectives of the plan are to:

- improve response times for high-acuity patients in all communities
- improve service and provide sustainable employment in rural and remote communities
- provide more appropriate clinical responses for low-acuity patients
- increase the resources available for emergency responses

KEY FINDINGS AND RECOMMENDATIONS

At the time of our audit, the BCEHS action plan was at various stages of implementation, so we did not assess the impact of these initiatives on timeliness or quality of patient care. Initiatives underway include:

- electronic patient care records
- community paramedicine
- new paramedic positions
- clinical response model
- secondary triage
- treat and release

Appendix B provides more information on these initiatives.

CO-ORDINATING WITH FIRE DEPARTMENT FIRST RESPONDERS

Under the *Emergency Health Services Act*, organizations other than BCEHS can provide emergency health services only with written consent from BCEHS and under BCEHS terms. The Act therefore positions BCEHS as the agency responsible for overseeing the provision of emergency health services by fire department first responders and ensuring that patients receive appropriate care.

We looked to see if BCEHS:

- ensured that emergency health services provided by fire departments were subject to medical oversight
- monitored the contribution of fire department first responders to BCEHS performance targets
- notified fire departments according to its dispatch protocols and patient need
- had consent agreements with local governments responsible for fire departments that provide emergency health services
- identified fire departments across the province that are willing and able to provide emergency health services

Co-ordination of access to emergency health services needs improvement

BCEHS works with fire departments through a number of avenues: call-takers notify fire departments of medical events, paramedics and first responders work co-operatively in providing pre-hospital care, and BCEHS staff also meet with municipal and fire department staff. For example, BCEHS staff and municipal representatives in Metro Vancouver periodically meet to discuss issues that affect both BCEHS and fire departments.

However, we found that BCEHS collaboration with fire departments had not resulted in a co-ordinated approach to emergency health services across the province. Emergency health services provided by fire department first responders were not subject to medical oversight by BCEHS, BCEHS and fire departments did not share data with each other, and consent agreements with some local governments were not in place.

KEY FINDINGS AND RECOMMENDATIONS

BCEHS faces challenges in achieving co-ordinated access to emergency health services across the province. BCEHS and some municipalities have different views on how fire department first responders can best support BCEHS in providing effective access to emergency health services. Also, BCEHS is not the employer of first responders and cannot compel fire departments to participate as first responders, enter into agreements or adhere to medical direction. Furthermore, the capacity to provide first responder services varies widely across the province's many fire departments.

The absence of a co-ordinated approach increases the risk of inconsistent application of medical standards, limits understanding of the care provided and the opportunities for improvement, and increases the risk that first responders are not deployed to match patient needs.

Pre-hospital care provided by fire department first responders is not subject to BCEHS medical oversight

Medical oversight helps to ensure that emergency medical services provided to patients meets acceptable medical standards. Medical oversight includes:

- the development of protocols and guidelines for medical interventions
- retrospective review of cases for quality improvement and related education
- real-time medical direction provided by physicians, if appropriate

The testing and licensing of emergency medical assistants is also a component of medical oversight. As stated earlier in this report, this function is assigned to the Emergency Medical Assistants Licensing Board.

The *Emergency Health Services Act* does not explicitly assign responsibility to BCEHS for medical oversight of all paramedics and first responders. However, because the Act positions BCEHS as the agency responsible for emergency health services in B.C., we looked to see whether BCEHS had ensured that fire department first responders were subject to medical oversight, outside of the licensing function.

We found that BCEHS had not ensured that there is medical oversight of fire department first responders. Many fire departments contract with physicians for a range of medical services, and BCEHS will at times engage with these physicians on matters relating to medical standards. For example, BCEHS advised us that they worked with these physicians in the roll out of training to first responders for the administration of naloxone. However, BCEHS does not know:

- which fire departments contract with physicians for medical services
- the range of services that fire departments receive
- the results of any assessments of services provided by fire department first responders

As a result, BCEHS cannot include the entire patient experience in its quality control and continuous improvement initiatives.

Medical oversight of first responders has been the subject of a report to government in the past. A 2007 report to the Emergency Health Services Commission (now BCEHS) titled *First Responders,*

KEY FINDINGS AND RECOMMENDATIONS

Fire Services and Pre-hospital Emergency Care in British Columbia recommended that the commission accept responsibility for ensuring appropriate medical oversight for first responders.

A lack of co-ordinated medical oversight contributes to inconsistent application of medical standards. We were told by both BCEHS and some first responders that some services vary, depending on whether care is provided by BCEHS or a fire department. These areas include spinal immobilization, airway management during overdose, and use of mechanical CPR devices. Without a co-ordinated approach to medical oversight, BCEHS cannot ensure that the patient care provided by fire department first responders is consistent with BCEHS expectations.

BCEHS does not monitor the contribution of fire department first responders to BCEHS targets

We looked to see whether BCEHS incorporated the contribution of fire department first responders in evaluating performance against targets. This would ensure that BCEHS understands the complete scope of care provided to patients in the pre-hospital environment.

We found that first responder response time and patient care data is not shared between BCEHS and fire departments. BCEHS would need this information to incorporate the contribution of fire departments into its performance management activities. BCEHS had focused on managing its own organizational performance.

The resulting gap in the data means that BCEHS does not have a complete picture of the level of service patients receive. This includes response times for cardiac arrest, where first responders can apply CPR and possibly have an immediate impact on patient outcome. It also includes the administration of oxygen for patients experiencing a stroke—a measure that BCEHS tracks for paramedics but not for fire department first responders. BCEHS's ability to take a co-ordinated approach to understanding and managing the overall timeliness and quality of patient care is therefore limited.

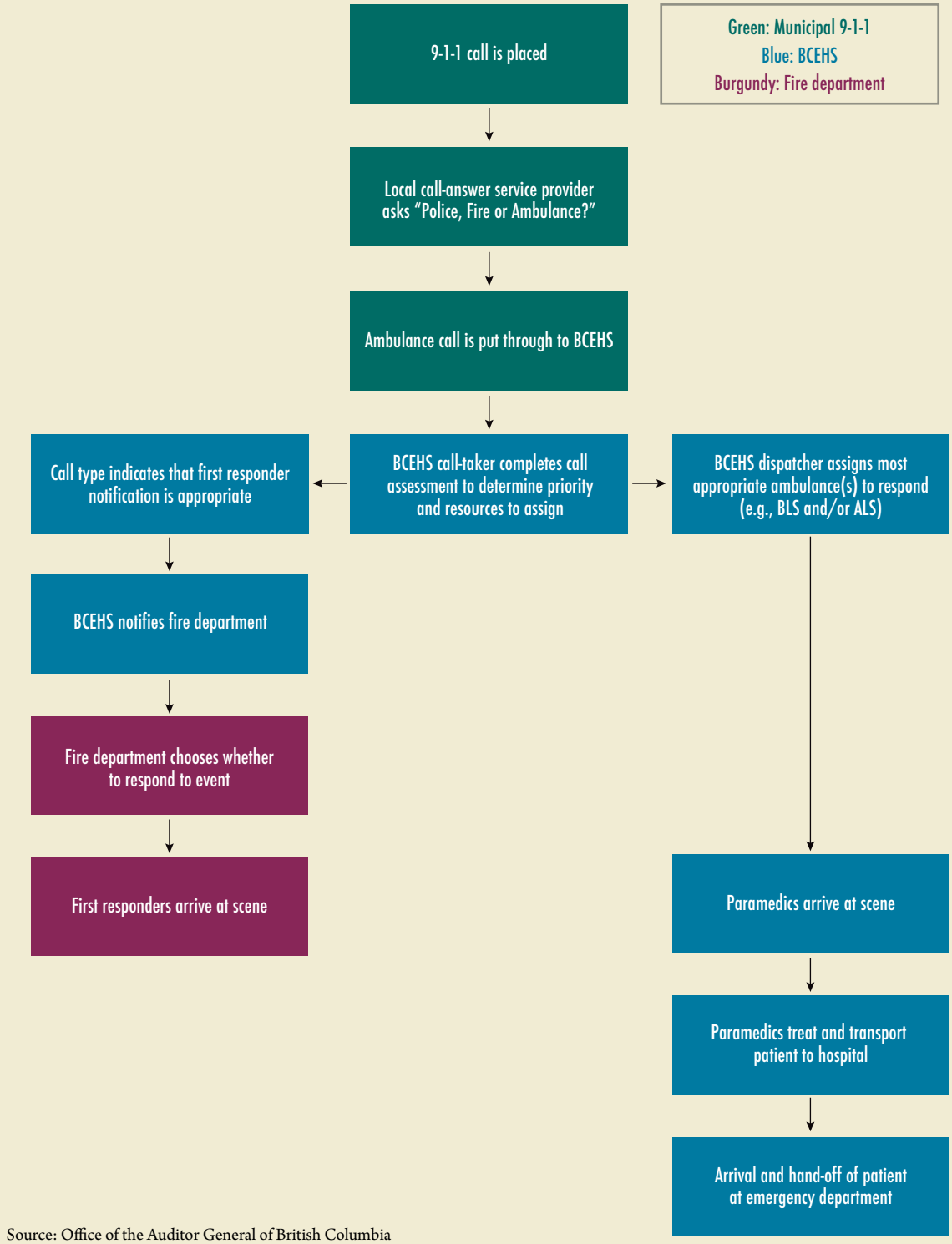
Fire departments are notified according to dispatch protocols

Dispatch protocols help ensure that patients receive care without delay. BCEHS determines the call types that are appropriate for fire departments to attend and is responsible for notifying fire departments accordingly (see Exhibit 8). In most of the province, BCEHS and fire department dispatch systems are linked, allowing notification to occur automatically. For some smaller communities, BCEHS must notify fire departments and other first responder agencies manually by telephone.

We looked to see whether BCEHS notified fire departments according to BCEHS's first responder notification protocols. We found that BCEHS notifies fire departments according to BCEHS protocols in the vast majority of events.

For the period of our audit, BCEHS data indicated that BCEHS notified a first responder agency in 95%

Exhibit 8: 9-1-1 call and dispatch process



Source: Office of the Auditor General of British Columbia

of the events that met BCEHS criteria for sending first responders. Included in the remaining 5% were events where there was no first responder agency available or willing to respond to the call type and where a BCEHS call-taker failed to record a notification (a manual entry is required in the case of telephone notification).

BCEHS has changed notification protocols for first responders

BCEHS notification protocols define which types of events first responders will be notified of. Attendance by first responders is voluntary. We looked to see whether BCEHS based its first responder notification protocols on an assessment of when first responders can best contribute to pre-hospital care. The assessment would consider:

- the interventions first responders are licensed to perform
- patient need
- how quickly paramedics and first responders can arrive at the scene

For the period that we audited (April 2016 to December 2017), BCEHS was notifying fire departments according to its resource allocation plan, a tool that guided BCEHS call-takers and dispatchers on:

- the appropriate call priority (i.e., routine—without lights and sirens—or urgent—with lights and sirens)
- the BCEHS resource(s) to dispatch
- whether first responders should be notified

BCEHS advised us that the resource allocation plan was resulting in more notifications than required based on patient need and that first responders were attending more events than medically necessary.

In May 2018, BCEHS changed the way it notifies first responders of medical events, as part of its introduction of the clinical response model, intended to better prioritize responses to life-threatening events.

According to BCEHS, under the new approach, BCEHS:

- notifies first responders of the most urgent events
- notifies first responders of less urgent calls only if BCEHS estimates that an ambulance will take more than 10 minutes to respond

The intent of the new approach is to notify first responders of events where they can impact patient outcomes and to avoid tying up first responders with lower-acuity calls. BCEHS data indicates that after the changes were introduced in May 2018, first responder notifications across the province dropped by 40% in aggregate.

We did not assess whether this new approach to first responder notification is working as intended, as the system was new and was introduced after the period of our audit. At the time of the audit, there was disagreement between some fire departments and BCEHS about the events where fire department first responders can make a difference to patients. These disagreements stem from differences in views about the appropriate role and value of fire department first responders in providing patient care.

KEY FINDINGS AND RECOMMENDATIONS

Capacity of some communities to provide first responders is not fully understood

We looked to see whether BCEHS, as the agency responsible for emergency health services in B.C., understood and was taking action as needed to improve the level of first responder services across B.C. Specifically, we assessed whether BCEHS had:

- evaluated the level of first responder capacity across rural and remote communities
- identified gaps in capacity
- engaged communities with limited first responder capacity to encourage them to join the first responder program

Some communities may have a fire department but not one that provides first responders in response to 9-1-1 medical events. In other typically remote communities, there is neither a fire department nor a first responder agency in place.

In 2017, BCEHS began an analysis to understand where the gaps are in first responder capacity and where first responder services are most in need, given proximity to ambulance stations in northern B.C. The intent of this work is to help BCEHS focus its efforts on assisting small communities with establishing first responder programs and increasing their ability to provide pre-hospital care.

While BCEHS cannot compel fire departments to participate as first responders, more work is needed in other areas of the province to assess first responder capacity in smaller communities and engage with communities where first responder services are lacking.

Consent agreements were in place with most but not all local governments

Under the *Emergency Health Services Act*, organizations other than BCEHS can legally provide ambulance and emergency health services only in accordance with the written consent of BCEHS and under terms specified by BCEHS. Consent agreements are important because they form the basis of the relationship between BCEHS and fire departments by setting out the roles and responsibilities of each agency. We therefore expected to find that BCEHS had consent agreements with all local governments responsible for fire departments that provide emergency health services in B.C.

At the time of our audit, BCEHS records indicated that there were 294 first responder agencies and that BCEHS had agreements in place with 275 of them. These agreements were with 94% of first responder agencies and represented approximately 84% of the provincial population. We found that the agreements in place provided that:

- BCEHS consents to the local government providing emergency health services by way of its first responders at the First Responder licence level and training such personnel to do so
- first responders will accept direction from paramedics at the scene in accordance with the agreement
- BCEHS will take on any losses of the local government from claims brought against it as a consequence of providing the services in accordance with the agreement

However, most of the agreements were silent on a number of areas that would help ensure a co-ordinated service. For example, they do not:

- specify the types of calls that first responders will attend
- clarify the medical oversight process for first responders
- clarify the extent of first responders' participation in BCEHS quality improvement initiatives
- stipulate data-sharing between agencies

At the time of our audit, BCEHS was working on updating agreements to incorporate the above areas.

At least 19 agencies were actively providing emergency health services without any agreement whatsoever. Local governments that did not have consent agreements with BCEHS include some in rural and remote areas, as well as several in urban areas, including the cities of Burnaby, North Vancouver, Coquitlam, Delta and New Westminster and the District of West Vancouver.

The absence of comprehensive agreements (and in some cases any agreement at all) between BCEHS and fire departments means that the specific role of first responders in pre-hospital care is not spelled out. Even though providing first responder services without an agreement is contrary to the *Emergency Health Services Act*, BCEHS continues to dispatch fire departments without agreements so as not to put patients at risk in those events where timeliness makes a difference.

Some local government representatives told us that agreements have not been signed because of a fundamental disagreement on the role that fire departments should have in providing pre-hospital care. Some fire departments would like to work beyond the First Responder licence level. The BCEHS model of service delivery is one where first responders provide care at the First Responder licence level, with BCEHS staff providing care above that level, and the consent agreements that are in place reflect that model.

Local governments that have trained their fire department staff to the Emergency Medical Responder level and that have fire departments providing care at that level include Prince George, Delta, the Regional District of Kootenay Boundary (Big White) and the Sun Peaks Mountain Resort Municipality. Other communities, including Cranbrook, are considering or are in the process of doing the same. The fire departments in Big White and Sun Peaks have BCEHS consent to practise at the Emergency Medical Responder level on a pilot basis.

BCEHS faces challenges in achieving effective co-ordination

BCEHS faces challenges in achieving co-ordinated access to emergency health services across the province to the benefit of patients. Challenges include the following:

- BCEHS is not the employer of first responders. Fire departments voluntarily provide first responders and are not mandated to participate in pre-hospital care. BCEHS cannot compel fire departments to participate as first responders, enter into agreements or adhere to medical direction.
- There are approximately 300 first responder agencies, from large career-based fire departments in urban areas to volunteer fire

departments and other community agencies in remote areas. Communities will invariably differ in their capacity to participate in pre-hospital care. BCEHS is responsible for reaching agreement with each community on the role that each fire department will have, while pursuing a quality- and patient-focused province-wide service.

- BCEHS and some municipalities have different views on how fire department first responders can best support BCEHS in providing access to emergency health services, in terms of the type of medical events they attend and the level of care they provide to patients.

Because of these challenges, as well as the different levels of government involved, support from the provincial government may be needed to improve co-ordination.

RECOMMENDATION 4: *We recommend that the Ministry of Health work with local governments and BCEHS to ensure that BCEHS can implement a co-ordinated approach to pre-hospital care that results in:*

- *medical oversight, to the extent appropriate, across agencies to ensure that patient care meets acceptable medical standards*
- *data-sharing between agencies to better understand whether patients are getting the right medical interventions at the right time*
- *signed agreements outlining the roles and responsibilities of fire departments, including the level of care provided*
- *confirmation that first responders are being notified of events where they can best contribute to patient care*

AUDIT QUALITY ASSURANCE

We conducted this audit under the authority of section 11(8) of the *Auditor General Act* and in accordance with the standards for assurance engagements set out by the Chartered Professional

Accountants of Canada (CPA) in the *CPA Canada Handbook*—Canadian Standard on Assurance Engagements (CSAE) 3001—and Value-for-money Auditing in the Public Sector PS 5400. These standards require that we comply with ethical requirements and conduct the audit to independently express a conclusion on whether or not the subject matter complies in all significant respects to the applicable criteria.

We apply the CPA Canadian Standard on Quality Control 1 (CSQC) and, accordingly, maintain a comprehensive system of quality control, including documented policies and procedures regarding compliance with ethical requirements, professional standards and applicable legal and regulatory requirements. In this respect, we have complied with the independence and other requirements of the code of ethics applicable to the practice of public accounting issued by the Chartered Professional Accountants of British Columbia, which are founded on the principles of integrity, objectivity and professional competence, as well as due care, confidentiality and professional behaviour.

APPENDIX A: COMPLETE AUDIT CRITERIA

1. British Columbia Emergency Health Services (BCEHS) has appropriate performance measures with targets to manage access to ambulance and emergency health services across the province.
   - BCEHS has established performance measures for timeliness, clinical quality and cost-effectiveness, consistent with good practice for ambulance and emergency health services
   - BCEHS has established targets for access to ambulance and emergency health services across the province
2. BCEHS collaborates with fire departments to co-ordinate access to ambulance and emergency health services across the province.
   - BCEHS identified fire departments across the province that are willing and able to provide emergency health services
   - BCEHS has consent agreements with all fire departments that provide emergency health services in B.C.
   - BCEHS works with fire departments to confirm when fire departments will respond to calls for emergency health services
   - BCEHS consistently notifies fire departments according to its dispatch protocols
   - BCEHS ensures emergency medical services provided by fire departments are subject to medical oversight
3. BCEHS measures and reports on its success in providing access to ambulance and emergency health services across the province.
   - BCEHS monitors performance, including the contribution of fire departments, against targets
   - BCEHS achieves its performance targets for providing access to ambulance and emergency health services
   - BCEHS reports publicly on performance against targets for providing access to ambulance and emergency health services
4. BCEHS uses performance results to inform action to improve access to ambulance and emergency health services across the province.
   - BCEHS analyzes its performance data to understand key drivers for performance results
   - BCEHS takes informed action to improve performance when it does not achieve targets

APPENDIX B: BCEHS INITIATIVES

Initiative	Stage	Description
Electronic patient care records	In progress	British Columbia Emergency Health Services (BCEHS) is transitioning from paper-based to electronic patient care records. The majority of paramedics were using electronic patient care records by 2018.
Community paramedicine	In progress	Community paramedicine has two objectives: ◆ to help stabilize paramedic staffing in rural and remote communities ◆ to bridge health service delivery gaps in the community, identified in collaboration with local primary care teams This program was launched in 2015 and is being implemented over a four-year period with the goal of creating 129 community paramedic positions (80 full-time equivalent positions) across 99 B.C. communities. As part of this initiative and on a pilot basis, BCEHS plans to introduce six rural advanced care community paramedic positions.
New paramedic positions	In progress	Between January 2018 and August 2018, BCEHS created 119 full- and part-time paramedic positions, some as new positions. These positions are in addition to the new community paramedic positions noted above.
Clinical response model	In progress	The first phase of the clinical response model was introduced on May 30, 2018. It is a new process for dispatching resources to medical events, with the aim of getting to the most life-threatening calls faster, while improving the experience for patients who do not require transport to hospital. The new approach uses a more granular approach to call prioritization and paves the way for alternatives to hospital transport for patients, such as advice on the phone (known as secondary triage, described below), transport to a health service instead of a hospital, or treatment by a paramedic at the scene (known as treat and release, also described below). BCEHS estimates that it receives approximately 130,000 calls a year that do not require transport to an emergency department. This is about 25% of all pre-hospital events.
Secondary triage	Trial	BCEHS plans to handle certain low-acuity call types, such as minor infection or nausea, over the phone rather than sending paramedics and ambulance to the patient. In 2018 BCEHS began a trial in which a nurse in dispatch provides advice to low-acuity patients. BCEHS continues to refer the lowest category of calls (referred to as "Omega" calls, for such conditions as a sunburn or a toothache) to HealthLink BC for advice. HealthLink BC is part of the Ministry of Health and is not operated by BCEHS.
Treat and release	Planning	BCEHS is developing policies and a plan to enable paramedics to, where appropriate, treat a patient at the scene and discharge the patient there, rather than transporting the patient to hospital.

Source: Office of the Auditor General of British Columbia, based on information provided by BCEHS

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