

IHE Report

Bringing about change in COPD care – White paper

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INSTITUTE OF
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Bringing about change in COPD care – White paper

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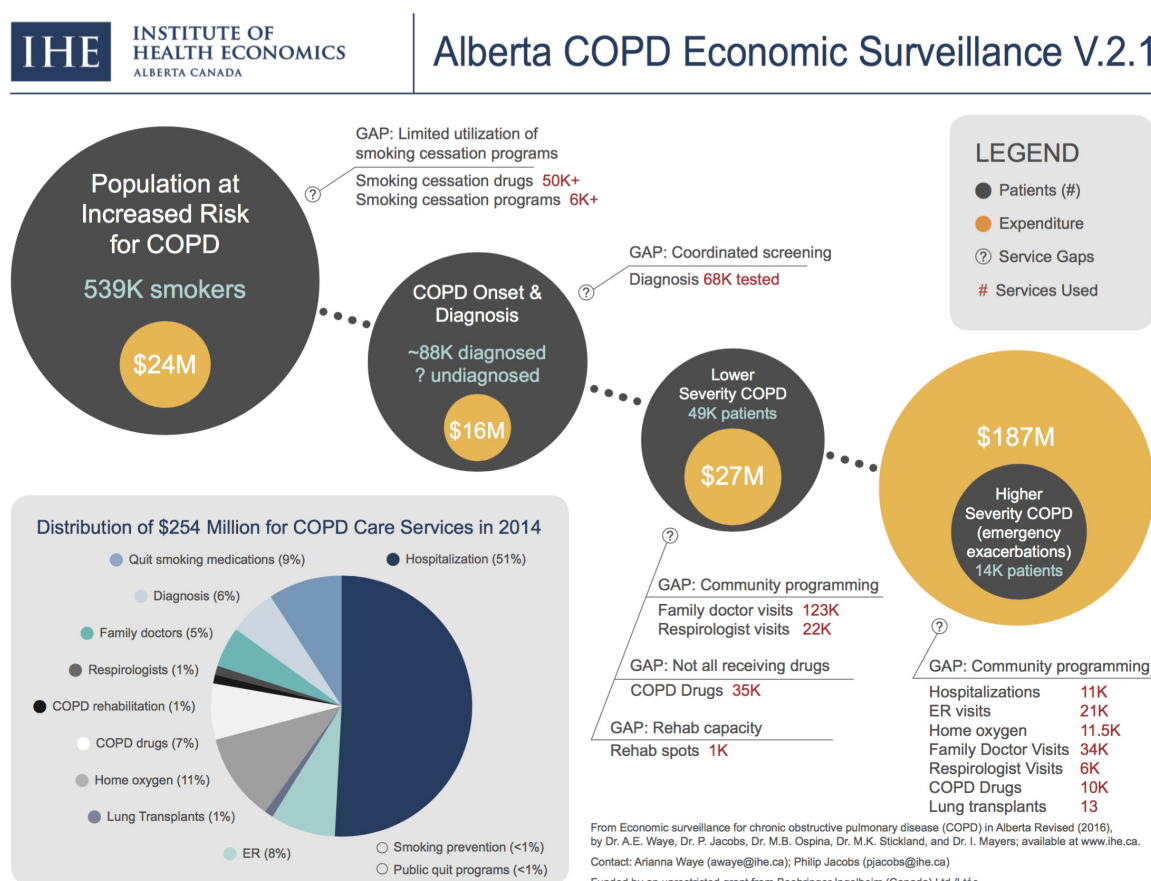
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The IHE Economic Surveillance Report

In 2014, the Institute of Health Economics (IHE) determined there was no documentation of the use and costs of health services provided in Alberta for persons who were at risk of developing chronic obstructive pulmonary disease (COPD), or had either undiagnosed or diagnosed COPD. Although it has been suggested we need more resources in a number of areas, these recommendations have been made without objective knowledge of where along the disease continuum resources are currently being used. Short-range issues including the high cost of COPD hospitalizations, as well as longer-range issues relating to stemming the tide of high costs through prevention, were being addressed without an adequate knowledge of the current pattern of disease-related resource use.

To address this paucity of information, the IHE developed a COPD economic surveillance report for Alberta, *Economic surveillance for chronic obstructive pulmonary disease (COPD) in Alberta* (Waye et al. 2016). In the report, we used real world data obtained from healthcare providers and the provincial health ministry to identify those who were at risk or had COPD at various stages, and to identify the use of health services by this group and any gaps in resources due to low levels of use or unmet demand. Our results are depicted in Figure 1.

FIGURE 1: IHE'S Alberta COPD economic surveillance infographic



In this infographic, we show the cross-section of COPD-related persons (those at risk and those with the disease) along the disease continuum, from being at risk to having severe COPD. We also show the costs of services used by the population at each of the severity stages, based on real world data from Alberta. As we move from group to group, the affected population falls, but costs increase considerably; most of the COPD-related costs are concentrated at the more severe end of the disease spectrum. Furthermore, the relatively low per-person costs at the less severe end of the scale are more preventive in nature. These findings are similarly reflected in other populations across Canada (Khakban et al. 2015; Najafzadeh et al. 2012).

The White Paper

After the completion of the economic surveillance report for Alberta, we undertook a pan-Canadian policy scan with the purpose to obtain information on care gaps across the country, in line with our economic surveillance framework. This white paper is the result; its purpose is to suggest a platform for change to improve COPD care across Canadian jurisdictions, using the shared experiences of teams of health professionals that have found ways to provide innovative care.

This white paper was informed by a national telephone survey of provincial Lung Associations and a national Expert Advisory Group made up of clinicians, health managers, and policy makers (see below). Based on discussions with our Expert Advisory Group and health system informants, we describe five key components that together build a platform for improved COPD care at the provincial and national levels. These are:

1. **Service Gaps in Areas of Need:** We identified gaps in care along the COPD disease continuum resulting from unavailable services, lack of capacity, or insufficient demand.
2. **Shared Experiences:** Our informants identified examples of innovative Canadian programs that help address the gaps in services or resources.
3. **Economic Approach:** We identified resources and costs needed to roll out the COPD services that would address the noted gaps, where the data were available.
4. **Facilitation of Change:** The economic landscape includes those non-profit and networking agencies and organizations who themselves serve to identify needs and promote and facilitate organizational change. These organizations, often ignored when evaluating resource use and needs, include the Canadian Lung Association and its provincial branches, primary care physician organizations, the Canadian Thoracic Society, regional clinical networks, and the Canadian Foundation for Healthcare Improvement.
5. **System Measurement and Performance:** We propose a greater use of information systems and key performance indicators for monitoring program and system success.

A summary of these five components can be found in Table 2, at the end of this paper.

Economic Framework

We take an economic approach in our analysis, focusing on *alternative* ways of using resources to achieve a very broad set of objectives that are related to persons at risk or diagnosed with COPD. Resources, too, are broadly viewed to include those that are provided by households and other private sources, as well as by government.

Alternative Interventions: Alternatives include the current patterns of resource use, as identified in our economic surveillance report, compared with better ways to use resources, which will add benefits to those affected by COPD, and either save resources or contain the cost trajectory. Cost savings, while desirable, should not be the focus of resource assessment. Often a new intervention costs more than its replacement, but still has very significant benefits.

Benefits: Each alternative course of action confers benefits on a variety of groups, including those who are at risk for COPD, those who have COPD, and persons who are associated with them, such as caregivers. We define ‘benefits’ very broadly, and include all of these groups. In the case of COPD, the benefits which we identify are:

- The avoidance of COPD for persons without COPD whose risks are reduced (e.g., due to smoking cessation), or earlier detection for those at risk.
- Improvements in health and well-being for those who already have COPD; this benefit stems from earlier detection. Benefits include reduced symptoms, better exercise tolerance, and improved health status as it relates to the Global Initiative for Chronic Obstructive Lung Disease (GOLD) goals for treatment of stable COPD (see GOLD 2016).
- A more convenient level of services, including facilitated travel, conveniently provided services (including in the home or nearby), and reduced waits for care.
- A reduced burden on caregivers.

Costs: Costs are a monetary measure of resources. As with benefits, costs are also broadly configured to identify *all* resources which are impacted by COPD. These include:

- Resources used in the healthcare system, including family doctor services associated with screening of high-risk persons, diagnosis, and health care, specialist services, hospital services, pharmaceuticals, rehabilitation, care management, vaccinations, smoking cessation devices, and counselling.
- Resources paid for privately, including travel and pharmaceuticals.
- Resources used but not paid for, including lost work and lost leisure opportunities, both for patients and their caregivers.
- Resources needed to reconfigure the system and roll out new modes of service provision. This includes services provided by organizations which plan, promote, and facilitate the implementation of better care, including the Canadian Lung Association, the Canadian Thoracic Society, regional clinical networks, and the Canadian Foundation for Healthcare Improvement.

1. Service Gaps in Areas of Need

We identified a number of areas where service gaps exist at each phase along the disease continuum, based on information obtained in our economic surveillance report and stakeholder survey.

Population at Increased Risk of COPD

Smoking cessation programs

Smoking cessation programs vary across each of the provinces, though most have a telephone hotline to access support, as well as either one-on-one or group counselling sessions. Pharmaceutical treatment is inconsistently provided across the country, especially in terms of nicotine replacement therapy. As well, there is a low demand for smoking cessation programs, which raises the issue of whether there is adequate information being provided about these services.

COPD Onset & Diagnosis

COPD case-finding

Programs that support coordinated screening or case-finding are not known to exist in any province.

Diagnosed COPD Patients

Disease self-management programs

There were noted gaps in this area. We did identify two leading programs for COPD disease self-management, namely: Living Well with COPD (LWWCOPD), based upon a model developed at the Montreal Chest Institute; and the LiveWell Chronic Disease Management COPD program, based on the Stanford model. Both programs are discussed below. INSPIRED also has self-management components, and is presented below.

Primary care funding

Provinces offer pulmonary function testing; however, there are no coordinated efforts or incentives to provide this service. This is an issue, as it is estimated that there are as many as three undiagnosed individuals with COPD for every individual that has been diagnosed.

Pulmonary rehabilitation programs

Pulmonary rehabilitation is provided in each of the provinces assessed; however, a common gap mentioned across all provinces was insufficient access for the number of individuals needing services. Other sources suggest that there are a number of barriers to accessing pulmonary rehabilitation. Some of these barriers include: a lack of program spaces available, cost of parking, and hospital- as opposed to community-based programs. Currently in Canada, access to pulmonary rehabilitation is only available to about 1% of all patients with COPD (Camp 2015).

Connecting patients to services

There is a need for connecting patients to appropriate services at all stages of the COPD disease continuum. Of particular importance is there may be programs or services available but actual or potential patients are not connected, and so there is a gap, but not due to a lack of service availability. In these cases non-profits and coordinated healthcare systems have a large potential role.

Advanced-stage disease management programs

Advanced-stage disease management programs were identified as a major service gap across each of the provinces. No programming currently exists for patients with advanced-stage disease in Canada, with the exception of the INSPIRED pilot program (discussed below), which cannot accommodate the number of patients with advanced-stage COPD.

End-of-life care

End-of-life care is said to be fragmented, without clear protocol or delegation of roles in terms of the timing of end-of-life discussions. There are also few home-based alternatives readily available.

2. Shared Experiences

Based on information from our multidisciplinary Expert Advisory Group, we identified a number of Canadian programs that target persons at various stages of COPD and that have helped to fill the gaps which we identified in our economic surveillance report. The following is a list of these programs. More details can be found in Appendix 1.

BreathWorks

BreathWorks (<http://www.on.lung.ca/breathworks>) is a multi-provincial program operated by the Ontario Lung Association, which people with concerns about their lung health can call to obtain advice from a trained respiratory educator.

Ottawa Model for Smoking Cessation

The Ottawa Model for Smoking Cessation (OMSC; <http://ottawamodel.ottawaheart.ca/>) provides one-on-one counselling to help smokers quit smoking. This program has been duplicated at many sites across the country.

Primary care physician incentives

Primary care physician incentives for chronic care management consist of a series of protocols and associated physician fees that are designed to encourage family doctors to successfully manage patients with a number of chronic conditions, including COPD. British Columbia (via the General Practice Services Committee [GPSC] Incentive Program) and Nova Scotia (via its General Practice Chronic Disease Management Incentive Program) offer different variants of this approach.

LWWCOPD and LiveWell COPD

Living Well with COPD (LWWCOPD; <http://www.livingwellwithcopd.com/>) is a multi-disciplinary program that helps patients and their providers to help manage COPD. The LiveWell Chronic Disease Management (<https://www.saskatoonhealthregion.ca/livewell>) COPD program has also been successfully introduced by the Saskatoon Health Region.

Pulmonary rehabilitation

Pulmonary rehabilitation consists of a series of activities (including exercise training, patient education, and behaviour change therapy) that are designed to prevent people with COPD from regressing and having exacerbations. Pulmonary rehabilitation is offered at a number of sites across the country (Camp 2015), but the capacity is limited.

INSPIRED

INSPIRED (Implementing a Novel and Supportive Program of Individualized care for patients and families living with REspiratory Disease; <http://www.cfbi-fcass.ca/WhatWeDo/inspired-approaches-to-copd>) is a program that offers support to patients with severe COPD and their caregivers, and it has been piloted in a number of sites across the country. There are other similar programs offered in select pockets of the country, including a program at the Vancouver General Hospital's Lung Centre

(<http://lungcentre.vch.ca/>) where all hospitalized COPD patients enter a special intensive follow-up program.

Professional training programs

Across Canada, the Lung Associations have been training health professionals as COPD educators with RESPTREC, the Respiratory Training and Educator Course. Other organizations, such as the pharmaceutical industry and the College of Family Physicians, have also partnered to offer education to family physicians. A tobacco educator program is also offered by the Canadian Respiratory Network for Respiratory Care.

Other program areas

Other program areas not discussed by the survey respondents but that also contribute to COPD patient care include: home care, certain areas of hospital care (e.g., non-invasive therapy), oxygen programs, pharmaceutical therapy, and lung transplants.

3. Economic Approach

Each alternative intervention should be analyzed using the broad economic framework outlined above. For the Canadian examples, benefits and costs have not always been assessed. We have presented these numbers where they have been measured. We recognize that more work needs to be done before the economic framework can be fully applied to guide policy.

Benefits

Benefits of each of these programs include improved quality of life for each patient, as well as additional caregiver supports (e.g., INSPIRED), reduced hospitalizations in terms of emergency room visits, admissions, and length of stay (e.g., LWWCOPD, LiveWell COPD program, pulmonary rehabilitation, GPSC Incentive Program). The Ottawa Model for Smoking Cessation (OMSC) aided 23,300 smokers to quit between 2006 and 2011 (University of Ottawa Heart Institute 2012), and the first nine hospitals to implement the model witnessed an 11.1% increase in the long-term quit rate (29.4%, compared to 18.3% pre-OMSC model) (Reid 2010). Patients in the LWWCOPD program tend to be hospitalized 40% less (Bourbeau et al. 2003; Bourbeau et al. 2006; Gadoury et al. 2005), and annual reports for the LiveWell COPD program indicate a reduction in hospital admissions of 67%, and a 50% reduction in emergency room visits (LiveWell 2015).

Costs

Costs include implementation costs of the programs as well as treatment costs for COPD. The following costs were obtained from the programs where they were available; in some cases we could not obtain costs, and so we lacked an important component of the analysis.

- **BreathWorks:** We were unable to obtain costs for this program.
- **Ottawa Model for Smoking Cessation:** We were unable to obtain costs for this program.
- **Primary care physician incentives – GPSC Incentive Program:** The annual chronic care compensation for physicians in British Columbia is \$315 plus \$15 per telephone/email follow-up (GPSC 2016). The total care cost per patient was \$1,100 less per year for patients cared for under the GPSC Complex Care Initiative (Hollander & Kadlec 2015).

- **LWWCOPD:** The cost per patient for LWWCOPD is an estimated \$808 (given 70 patients per case manager). The treatment cost of patients in LWWCOPD as compared to usual care was upwards of \$2,100 to \$2,500 less per year (Bourbeau et al. 2006).
- **LiveWell COPD:** We were unable to obtain costs for this program.
- **Pulmonary rehabilitation:** The implementation cost in Alberta is \$1,500 per patient for a 6-week outpatient program (personal communication, Alberta Health Services, 2015).
- **INSPIRED:** We were unable to obtain complete costs for this program, as an evaluation was ongoing.

4. Facilitation of Change

Barriers to innovative ideas

A recent report from the government of Canada cites a number of barriers to scaling up innovations in health care, some of which include: system fragmentation, inadequate health data and information management capacity, lack of effective deployment of digital technology, barriers for entrepreneurs, a risk-averse culture, inadequate focus on understanding and optimizing innovation, and a lack of support service capacity (Naylor et al. 2015). These barriers need to be addressed when scaling up innovative programs.

Facilitators of innovative ideas

The adaption of new models of service can be facilitated by economic incentives, partnerships, and change management programs. Resources are needed to innovate and to facilitate the adoption of new delivery models, including agencies and organizations who themselves serve to identify needs and promote and facilitate organizational change. Non-profit organizations in particular have played an important role, and can be encouraged. For example, the Canadian Lung Association, a national body with provincial partners, promotes and funds research that leads to innovation. They also engage in advocacy and education, which is a critical component of prevention and early detection, and provide support for patients in the later stages of disease. Federal and provincial governments have played a key role in funding these non-profits, but the issues surrounding government funding of non-profits has been neglected in recent years.

Networks are also key for facilitating innovation. The Canadian Foundation for Healthcare Improvement (CFHI; formerly the Canadian Health Services Research Foundation), has served as a catalyst for change with regards to the care of more severe COPD cases through its INSPIRED program (discussed above). The Canadian Thoracic Society, a separate professional organization, provides clinical leadership, a key element in the adoption of innovations, and develops/supports research, professional education, and advocacy. In Alberta, the respiratory health Strategic Clinical Network (SCN) has brought together healthcare managers and practitioners to promote the innovation of clinical practice. The SCNs are a division of the province-wide healthcare provider, Alberta Health Services.

Furthermore, more attention to methods of funding may be necessary. Around the world as well as in Canada, new types of contracts such as performance funding have been used to incent improvements in health services. Funding methods such as performance funding could be

considered to reduce the gaps in services that we noted in our economic surveillance report, at all stages of the disease.

5. System Measurement and Performance

High-performing information systems are necessary to monitor system and program success following implementation. There are considerable gaps in information relating to the operations of the COPD “market”, due to two reasons:

- Some services are provided outside the traditional *Canada Health Act* definition of “medically necessary” services. In these cases, data on these services are often not captured.
- Even for those services which do fall into the traditional definition of “medically necessary” (e.g., fee-for-service physician services and inpatient hospital services), data on services are usually not linked, and without linking we cannot obtain a comprehensive picture of disease care.

Specifically, a COPD registry would be needed to track key performance indicators, including confirmation of diagnosis (record of spirometry test and date), record of severity (Medical Research Council [MRC] breathlessness scale and date), and participation in any provincially-provided COPD program. This information would be useful for furthering the understanding of disease progression over time, facilitating resource planning for care services, and monitoring service utilization and performance of the healthcare system. Table 1 describes data that would be needed for such a registry. Only some of the data is currently available from traditional sources, as mentioned above.

TABLE 1: Suggested key health system performance indicators to monitor program success and service gaps

Service	Performance Indicator
Smoking cessation therapy Smoking cessation pharmaceutical therapy	<ul style="list-style-type: none"> Current and past smokers COPD patients currently smoking who receive counselling Pharmaceutical smoking cessation prescriptions filled
Pulmonary function testing (for individuals at risk)	<ul style="list-style-type: none"> Diagnosed COPD patients who receive full pulmonary function tests, spirometry tests Persons with smoking history and respiratory symptoms who receive spirometry tests (targeted case-finding)
General practitioner visits	<ul style="list-style-type: none"> General practitioner visits for persons diagnosed with COPD
Action plan	<ul style="list-style-type: none"> COPD patients with a record of receiving action plan
Case manager	<ul style="list-style-type: none"> COPD patients with a case manager
Self-management education	<ul style="list-style-type: none"> COPD patients with participation in self-management education (e.g., LWWCOPD)
Respirologist visits	<ul style="list-style-type: none"> COPD patients who visited a respirologist
Pulmonary rehabilitation	<ul style="list-style-type: none"> Persons enrolled in pulmonary rehabilitation
COPD drugs	<ul style="list-style-type: none"> COPD patients who receive COPD prescription, by pharmacotherapy type
Immunization	<ul style="list-style-type: none"> COPD patients who receive immunizations (i.e., influenza, pneumococcal)
Emergency room visits	<ul style="list-style-type: none"> Emergency room visits for diagnosed COPD patients

Hospital admissions	<ul style="list-style-type: none"> • COPD-related hospital admissions, length of stay, and unplanned readmission within 30 days • COPD patients discharged with post-discharge follow-up with family physician
Oxygen program	<ul style="list-style-type: none"> • COPD patients who are receiving home oxygen
Lung transplant	<ul style="list-style-type: none"> • Persons with COPD who are referred and who receive a lung transplant

Conclusion

This white paper provides a platform to improve patient care by identifying existing innovative solutions to known gaps in care. The framework of our study was based on the IHE report, *Economic surveillance for chronic obstructive pulmonary disease (COPD) in Alberta* (Waye et al. 2016), and was informed by interviews with policy personnel across Canada from the Lung Association and by our Expert Advisory Group, composed of of policy makers and clinicians. We conclude that the knowledge and technology needed to fill many of the gaps in care that we identified currently exist in Canada. We also note the role that the “engines” of innovation (i.e., the Canadian Thoracic Society, provincial and national Lung Associations, Canadian Foundation for Health Improvement, and other non-profits) and planning organizations within the healthcare system (e.g., Alberta’s respiratory health Strategic Clinical Network) can play to bring about change. This white paper is a beginning initiative; it calls for better data, a focus on key performance indicators that will better identify where the gaps are, and what initiatives need to be taken to fill those gaps.

TABLE 2: Key components to building a platform for improved care through the spread of innovation and shared experience in Canada

Target Group	Service Gaps	Shared Experiences	Economic Approach	
			Demonstrated Effect on Benefits	Cost of Implementation
At-risk of COPD, (smokers) AND COPD patients who smoke	<ul style="list-style-type: none"> Smokers not utilizing cessation programs available (#) Coordinated screening or case-finding are not known to exist in any province No coordinated efforts or incentives for pulmonary function testing Need for connecting patients to appropriate services 	Ottawa Model for Smoking Cessation program provides one-on-one counselling	<ul style="list-style-type: none"> Prevent COPD for those at risk Improves lung function for COPD patients and those at risk Over time reduces the risk of lung cancer Reduces the effects of cardiac co morbidities on COPD prognosis 	<ul style="list-style-type: none"> There is limited information on costs
Diagnosed COPD patients (treatment/services selected as clinically assessed and needed)	<ul style="list-style-type: none"> Lack of COPD disease self-management programs Need for connecting patients to appropriate services 	GPSC BC Incentive program provides action plan, education, end-of-life care planning (where appropriate)	<ul style="list-style-type: none"> Limited study of benefits 	<ul style="list-style-type: none"> Fewer hospital days across time and care Annual Complex Care Management Fee \$315 per patient +\$15 telephone/email follow-up The average cost of care per patient was over \$1,100 less per year
		LWWCOPD and LiveWell COPD program both provide action plan, education, case management	<ul style="list-style-type: none"> Improves quality of life Reduced hospitalizations 	<ul style="list-style-type: none"> \$808 per patient (70 patients:1 case manager) in LWWCOPD <ul style="list-style-type: none"> Treatment cost compared to usual care \$2,100 to \$2,500 less per year No data available for LiveWell COPD
All of moderate, severe, or very severe COPD patients who have had a recent acute exacerbation (i.e., ≤ 4 weeks)	<ul style="list-style-type: none"> Lack of pulmonary rehabilitation capacity (only 1-2.5% of those who need rehabilitation have access to the program) Need for connecting patients to appropriate services 	Pulmonary rehabilitation, including telehealth and home-based rehabilitation (where appropriate)	<ul style="list-style-type: none"> Improved quality of life Reduced hospitalizations Reduced dyspnea as measured by the Medical Research Council scale 	<ul style="list-style-type: none"> \$1,500 per outpatient in Alberta (costs in other provinces are not known)

Specific to severe, or very severe COPD patients who have had a recent acute exacerbation	<ul style="list-style-type: none"> • Lack of advanced-stage COPD disease self-management programs • Need for connecting patients to appropriate services • Fragmented end-of-life care 	INSPIRED provides action plan, education, case management, and end-of-life care planning	<ul style="list-style-type: none"> • Caregiver relief • Improved patient quality of life • Reduced hospitalizations 	<ul style="list-style-type: none"> • Not available at time of writing
Facilitation of Change				
<p>Barriers to the scaling up of innovative ideas</p> <ul style="list-style-type: none"> • Lack of information on part of patients • Inadequate health data and information management capacity • Inadequate focus on understanding and optimizing innovation • Lack of support service capacity <p>Facilitators to the scaling up of innovative ideas</p> <ul style="list-style-type: none"> • Non-profit organizations (e.g., Canadian Lung Association, both national and provincial) • Networks (e.g., Canadian Foundation for Healthcare Improvement, Alberta's respiratory health Strategic Clinical Network, Canadian Thoracic Society) • Care provider payment and incentive systems 				
System Measurement and Performance				
<ul style="list-style-type: none"> • Use of information systems and key performance indicators to monitor system and program success following implementation 				

Appendix 1: Examples of Innovative Canadian COPD Programs

The following are additional details of programs included in the *Shared Experiences* section (section 2) of the white paper.

BreathWorks

BreathWorks (<http://www.on.lung.ca/breathworks>) is a program that can help fill gaps in connecting patients to services. BreathWorks is provided by the Ontario Lung Association (to Ontario, the Maritimes, Western Canada, and Manitoba), as well as by the Saskatchewan Lung Association and the Association Pulmonaire du Quebec. It provides information online, through print material, and via a call line, where patients can speak to a Certified Respiratory Educator who is trained to answer questions related to COPD symptoms, diagnosis, treatment, and management. The Ontario Lung Association received 552 calls in 2015. In addition, 74,390 printed BreathWorks resources were disseminated in Ontario alone this same year. We do not have information on program costs.

Ottawa Model for Smoking Cessation

The Ottawa Model for Smoking Cessation (<http://ottawamodel.ottawaheritage.ca/>) is an outpatient smoking cessation program that provides one-on-one counselling to patients interested in quitting smoking. The program began at the University of Ottawa Heart Institute in 2002, and has since spread to 350 healthcare organizations. Patients may self-refer or be referred by a healthcare practitioner. A quit plan tailored to the patient is developed at the first clinic visit, and patients are then followed-up for one to six months. The purpose of these visits is to prevent relapses, and to provide medication review and titration.

Primary Care Physician Incentives

The General Practice Services Committee (GPSC) is a joint Doctors of BC, Society of General Practitioners of BC, and Ministry of Health committee that works on compensation initiatives for family physicians in British Columbia. These initiatives include the GPSC Complex Care Initiative for COPD, which was developed to align practice with COPD guidelines (<http://www.gpsc.bc.ca/what-we-do/longitudinal-care/billing-guides>). Specifically, family physicians most responsible for a patient's care can annually claim a Complex Care Fee and an office visit. In return, the billing family physician is required to provide a care plan (incorporating patient values and personal health goals), review current therapies, outline linkages with other healthcare professionals involved in care, and describe expected outcomes as a result of the plan (including end-of-life, where appropriate) (Kadlec 2015).

There are incentive programs in other provinces as well, such as Nova Scotia's General Practice Chronic Disease Management Incentive Program, which added COPD as an eligible chronic disease in 2014 (Nova Scotia District Medical Directors of Continuing Care 2014).

Living Well with COPD

Living Well with COPD (LWWCOPD; <http://www.livingwellwithcopd.com/>) has been available since 2000, and is intended to foster a partnership between patients and their healthcare professionals that promotes healthy lifestyle behaviours and skills to self-manage their disease. Patients are provided with a COPD action plan; as part of this patients are shown how to use their medication to prevent and manage symptoms and prevent and manage exacerbations, as well as manage breathing to save

energy (Nault et al. 2012). How to live a healthy lifestyle and manage stress and anxiety are also taught, and there is an exercise program. Patient care is managed by a respirologist, and a case manager coordinates care. Brochures and learning modules can be found on the website, along with other tools for health professionals using the LWWCOPD program.

LiveWell COPD

LiveWell Chronic Disease Management (<https://www.saskatoonhealthregion.ca/livewell>) COPD program is intended to improve the relationship between patients and their physicians, as well as patients' capability of self-managing their disease. The program is provided by the Saskatoon Health Region, working alongside the Lung Association and the Pulmonary Rehabilitation Program. Patients are referred by a health professional after a confirmatory diagnosis of COPD by spirometer. They receive an action plan in every visit, consisting of medical prescription for managing the disease, an exercise plan, and education material on several topics ranging from breathing techniques to nutrition. These services are conducted by an interdisciplinary team and a certified respiratory educator, with the aim to decrease hospital and emergency room admissions, and to improve quality of life of patients and their family. Future work is underway to improve patients' engagement with the program (LiveWell 2015).

Pulmonary Rehabilitation

According to the American Thoracic Society, pulmonary rehabilitation is defined as “a comprehensive intervention based on a thorough patient assessment followed by patient tailored therapies that include, but are not limited to, exercise, training, education, and behavior change, designed to improve the physical and psychological condition of people with chronic respiratory disease and to promote the long term adherence to health enhancing behaviors” (Nici et al. 2006).

There are a number of ways in which pulmonary rehabilitation is implemented. Increasingly, services are being provided in the community or at home. Evidence suggests that provision of service in hospital, at home, or in the community tend to be equally effective (Grosbois et al. 2015). In particular, telehealth has proven to be an especially promising alternative to hospital-based (outpatient) pulmonary rehabilitation (Tousignant et al. 2012; Marquis et al. 2014; Stickland et al. 2011). Stickland et al. (2011) have demonstrated at the G.F. Macdonald Centre for Lung Health in Edmonton, Alberta that pulmonary rehabilitation delivered via telehealth to satellite centres across Alberta (with direct supervision by a therapist) was as effective in terms of improvement in quality of life and exercise capacity as outpatient-based pulmonary rehabilitation. A national pulmonary rehabilitation curriculum is being developed by the G.F. MacDonald Centre for Lung Health, Respiplus, LWWCOPD, and the West Park Healthcare Centre, which will provide resources (including education sessions via podcasts) that will allow for greater access to pulmonary rehabilitation across the country.

INSPIRED

INSPIRED (Implementing a Novel and Supportive Program of Individualized care for patients and families living with REspiratory Disease; <http://www.cfbi-fcass.ca/WhatWeDo/inspired-approaches-to-copd>) was created in Nova Scotia in 2010 to improve care transitions from hospital-to-home for COPD patients with advanced-stage disease. The goal of the program is to support patients and their families to better manage their disease at home, and therefore rely less on the emergency department and inpatient care services. INSPIRED provides individualized, coordinated, and proactive care for

patients with severe COPD (MRC 4 or 5), which includes in home self-management education, personalized written action plan, psychosocial/spiritual support, phone access, and monthly phone follow-up. Care is provided through home visits and calls by a team composed of a coordinator, a respirologist, nurse practitioners, and respiratory therapists. The team also coordinates with existing primary care services and programs.

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Arianna Wye contributed to study conception and design, data analysis and interpretation, and writing, and approved the final version for publication.

Philip Jacobs contributed to study conception and design, data analysis and interpretation, and writing, and approved the final version for publication.

This white paper follows on from the 2016 IHE report, *Economic surveillance for chronic obstructive pulmonary disease (COPD) in Alberta*. It provides a summary of main gaps in COPD care across Canada and, in the context of a broad economic framework, it surveys important examples of programs and policies designed to address these gaps.



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