The Nova Scotia Lung Health Strategy

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The Lung Association of Nova Scotia in collaboration with the Department of Health.

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Message from The Lung Association of Nova Scotia

Motivated by the overwhelming burden of lung disease, the lack of a coordinated plan relating to lung health, and the creation of the National Lung Health Framework, The Lung Association of Nova Scotia formed a historic partnership with the Department of Health in 2008. The initial spirit of this partnership was to bring like-minded people together to create a ‘Made in Nova Scotia’ action plan to guide lung health within the province. Two years and many consultations later we are proud to present to you the inaugural Nova Scotia Lung Health Strategy (NSLHS) – the first provincial lung health strategy in Canada!

This document will provide lung health stakeholders a new opportunity for action and is to be viewed as a starting point rather than an end. It is critical that the dialogue that has led to the development of this Strategy continues. Maintaining such discourse will ultimately help us maximize our resources, which has never been more important for Nova Scotia.

I would like to thank everyone who has contributed to the development of this Strategy. In particular, I thank the members of the NSLHS Steering Committee, Rachelle O’Sullivan, Department of Health, NSLHS Project Manager Marc Mitchell and NSLHS Co-Chair Pat Lee. It has indeed been a pleasure to engage with so many who are passionate about improving the lung health of the people we serve.

Louis Brill
President and CEO, The Lung Association of Nova Scotia
Co-Chair, The Nova Scotia Lung Health Strategy

Message from the Department of Health
A MADE in NOVA SCOTIA ACTION PLAN
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Executive Summary

Respiratory disease in Nova Scotia

One in five Canadians suffer from respiratory disease\(^1\). High provincial smoking\(^2\) and overweight/obesity\(^3\) rates (19.7\% and 60\%, respectively) suggest that the rate of respiratory disease in Nova Scotia may be even higher (greater than 20\% or more than 200,000 Nova Scotians). Lung health stakeholders in the province, including health professionals, non-profit groups, and people with respiratory disease, insist that a new broad based, collaborative approach is needed to reduce the heavy human and economic burden of respiratory disease in Nova Scotia\(^4\).

A collaborative approach

With the development of The National Lung Health Framework, and the presentation of that Framework as a work-in-progress to provincial stakeholders in 2008, it became clear that there was an opportunity in Nova Scotia to lever the Framework as a starting point for development of a provincial lung health strategy. As a result, The Lung Association of Nova Scotia and the Nova Scotia Department of Health worked collaboratively to lead the development of a new lung health strategy for Nova Scotia – the first provincial lung health strategy in Canada.

Identifying gaps in respiratory health service

One of the key foundational steps in the development of such a strategy for Nova Scotia was creating an inventory of lung health assets in the province. The Lung Association of Nova Scotia collected information about existing lung health tools, resources, services, and programs along with key opportunities and gaps that need to be addressed in a provincial strategy. This work culminated in the development of the Inventory of Nova Scotia’s Lung Health Assets (2009).

Also, the first Nova Scotia Lung Disease Profile Project (2009) was conducted by the Population Health Research Unit at Dalhousie University to inform the development of this Strategy. An overview of the respiratory disease burden data described in the Profile Project provides context for recommended actions and is presented here (see pages 16 to 19).

Five strategic action areas

The Nova Scotia Lung Health Strategy will serve as a guideline for future efforts to effectively prevent, treat and manage respiratory disease in Nova Scotia, especially among marginalized groups who are at increased risk of developing respiratory disease. It is organized into five strategic action areas:

1. Tobacco Control
2. Air Quality
3. Chronic Disease
4. Infectious Disease
5. Research, Surveillance and Knowledge Translation

Lung health priorities for 2010

Data from the Inventory of Nova Scotia’s Lung Health Assets (2009) and the Nova Scotia Lung Disease Profile Project (2009), as well as data collected through extensive stakeholder consultation and research into key documents and best practices, were used to identify goals and goal supporting activities for each of the five strategic action areas.

In particular, five priority goals for short term action were identified. The Nova Scotia Lung Health Strategy Steering Committee stressed the importance of initiating immediate action on priority items with the purpose of maintaining the momentum generated by this Strategy and improving lung health in Nova Scotia in the short term. For each priority goal, it is recommended that a multi-stakeholder sub-committee of experts be established to identify appropriate next steps for 2010 and to oversee their implementation. Five priorities for immediate action include:


1. Increase access to CPAP/BiPAP therapy for individuals with sleep apnea to reduce health care utilization.
2. Increase access to education and pulmonary rehabilitation for individuals at-risk of costly COPD hospitalizations.
3. Improve targeted screening for asthma and COPD to reduce emergency room visits.
4. Improve asthma education for individuals and families to enhance self-management.
5. Increase the availability of smoke-free multi-unit dwellings.

The Steering Committee also stressed the importance of meeting the needs of Nova Scotia’s diverse population with culturally specific services and programs. A lack of culturally specific programs and messaging specifically targeting marginalized groups was identified by key informants as a significant gap in the delivery of lung health care in the province.

**Sustained leadership**

It is clear from the breadth of recommended actions in this Strategy that many people and organizations will need to work together to improve respiratory health in Nova Scotia. Ongoing coordination is crucial to support the broad scope of work required. In order to move respiratory health forward in the province, an ongoing mechanism such as a provincially operated program under the direction of the Department of Health is recommended. Such a program would have a mandate to oversee the implementation of this Strategy, as well as coordinate and support the management of respiratory health-related policies, programs, services and surveillance in Nova Scotia.

**Acknowledgements**

Members of the following groups and organizations have invested many hours of volunteer time in the belief that by working collectively on this Strategy, we can make a significant difference in the respiratory health of all Nova Scotians:

- Patient groups;
- Medical professionals and other health care providers;
- Provincial government departments and agencies;
- Private sector/health industry;
- Non-governmental organizations;
- Researchers and clinicians.

*Steering Committee and consultative members are listed in Appendix A.*
Introduction

More than 200,000 Nova Scotians likely suffer from respiratory disease\(^1\). Asthma, chronic obstructive pulmonary disease (COPD), lung cancer, sleep apnea, and infectious respiratory diseases like influenza create a significant burden to Nova Scotia’s health system\(^2\) (see pages 16 to 19 for an overview of Nova Scotia Lung Disease Profile Project data). Perhaps the most significant impact is on the long term quality of life for individuals and families who have a respiratory illness.

In light of recent respiratory disease trends in the province, health professionals, non-profit groups, people with respiratory disease and other lung health stakeholders insist that a new broad based, collaborative approach is needed to reduce the heavy burden of respiratory disease in Nova Scotia\(^4\). With the development of The National Lung Health Framework, it became clear that there was an opportunity in Nova Scotia to lever the Framework as a starting point for development of a provincial lung health strategy. Consequently, The Lung Association of Nova Scotia invited the Nova Scotia Department of Health to work collaboratively to lead the development of a new lung health strategy for Nova Scotia – the first provincial lung health strategy in Canada.

This document contains a recommended approach to comprehensively address respiratory health issues in the province. With the mandate to provide respiratory health leadership to Nova Scotia’s health system, the Strategy will be submitted to the Government of Nova Scotia by The Nova Scotia Lung Health Strategy Steering Committee for review and endorsement.

Data collected through extensive stakeholder consultation (see Appendix B for a list of milestone activities), research into key documents and best practices, and the Nova Scotia Lung Disease Profile Project (2009) were used to identify, develop and prioritize a new set of respiratory health goals and activities for the province. The goals and activities in this Strategy are not intended to address every respiratory health related issue in the province, but rather provide a starting point from which to move respiratory health forward in Nova Scotia.

This Strategy has five strategic action areas (see Figure 1). Within each strategic action area, there are goals and supporting activities. Effective implementation of these activities will require a collaborative effort, including the involvement of provincial and municipal governments, business, community groups, non-government organizations, health professionals, and others.

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I have had obstructive sleep apnea for over 15 years. Although my doctor recommended I use a CPAP machine at night to treat my respiratory condition I simply could not afford one. The Lung Association gave me a pre-owned CPAP machine about 2 months ago now and it has made such a big difference in my life. I can sleep 5 hours straight now (I could only sleep for an hour before I started using the machine), my blood sugar and blood pressure levels have dropped, and I don’t feel so tired all the time. This machine has literally changed my life.

Eula McKay, Timberlea, NS
A major focus of this Strategy is to maximize synergies and minimize duplication of efforts. It aims to align as closely as possible with other provincial strategies (e.g. Nova Scotia’s renewed Tobacco Control Strategy) and initiatives to address common risk factors and co-morbidity. There are clear opportunities for common messaging, initiatives and activities that can meet the needs of multiple strategies.

Many of the activities described in this Strategy are not disease-specific and will result in positive health outcomes for a wide range of conditions. Activities to reduce smoking rates, for instance, will not only reduce the prevalence of COPD in the province, but also the number of heart attacks and strokes\(^1\); the prevalence of diabetes\(^6\) and the prevalence of several types of cancer\(^7\) including lung, bladder, colorectal, pancreas and breast.

To provide context for the strategic action areas, goals and activities, this Strategy provides an overview of the current state of respiratory disease in the province. Data on important risk factors as well as data from the Nova Scotia Lung Disease Profile Project (2009) are presented in the context of national data, data from other similar jurisdictions and other key documents (e.g. Canadian Tobacco Use Monitoring Survey).

...sometimes I worry about certain types of cancers that run in my family, or types of cancer that I could get by doing something that I know is unhealthy, like smoking or eating unhealthy foods... It makes me scared... I have a hard time telling my doctors about my fears.

Anonymous, Cape Breton First Nations
Lung Health Disparities in Nova Scotia

One in five Canadians suffer from respiratory disease\(^1\). High provincial smoking\(^2\) and obesity rates\(^3\) (19.7\% and 60\%, respectively) and the fact that Nova Scotia has the second-oldest population in Canada\(^25\) suggest that the rate of respiratory disease in Nova Scotia maybe even higher (greater than 20\%). The more than 200,000 Nova Scotians likely suffering from chronic or infectious respiratory disease, and their families, need help to better manage their disease.

As well, there are a high proportion of marginalized populations in Nova Scotia who are susceptible to poor respiratory health (see inset). Other groups such as persons with poor educational attainment, work-limiting disabilities, mental health issues, and immigrants may also be at high-risk for adverse respiratory health outcomes, however there is a lack of data to confirm this possibility\(^8\).

It is important to develop and deliver culturally specific policies and programs that meet the needs of Nova Scotia’s diverse population (e.g. different races, ethnicities, languages, and sexual orientations) (see Appendix C for data on the dominant diverse communities in Nova Scotia, by District Health Authority (DHA)).

Several issues impact access to primary health care for Nova Scotians belonging to diverse communities, including\(^9\):

- a lack of race, ethnic, and language specific health data;
- limited outreach to culturally diverse communities;
- too few health services provided in plain language.

Mission, Vision and Guiding Principles

MISSION: To advance the respiratory health of all people living in Nova Scotia through culturally specific, collaborative and equitable patient care, policy, programming, research and leadership.

VISION: Enhanced respiratory health for all Nova Scotians.

GUIDING PRINCIPLES: The Nova Scotia Lung Health Strategy was developed on the foundation of the following guiding principles:

- Efforts at improving respiratory health and overall wellness must occur with meaningful participation from individuals, families, and communities;

- For all people living in Nova Scotia to attain equitable access to the benefits of respiratory health, we must eliminate barriers to prevention, management, and care by addressing the social, economic, environmental and cultural determinants of health;

- A key element of respiratory health is to improve quality of life at all stages throughout the continuum of care – from before birth through to the end of life;

- Respiratory health initiatives and programs must be culturally specific and respectful, building on existing strengths and values;

- Advocacy plays a crucial role in influencing policy and related behaviour change;

- Progress can be maximized by aligning The Nova Scotia Lung Health Strategy with the activities of other strategies, and by fostering collaboration among people from different sectors, and jurisdictions.

Three additional principles will guide the Strategy’s ongoing development and the implementation process:

- The Strategy will be developed and implemented with the cooperation, collaboration, and participation of stakeholders and all levels of government;

- This is a “living process”, flexible and responsive to evolving needs, research, and knowledge, and moving forward in the context of continuous evaluation and quality improvement.

- In the near future, increasing synergies between provincial strategies and programs, and in some cases increasing resources, will be required to maximize progress as well.
Five Priorities for Immediate Action

A primary aim of this Strategy is to be an impetus for immediate action. The Nova Scotia Lung Health Strategy Steering Committee stressed the importance of initiating immediate action on priority items. Such action will ensure that the momentum generated by this Strategy is maintained, that lung health in Nova Scotia improves in the short term and that rising health care costs are mitigated.

General criteria such as disease burden and expected increase in burden, quality of evidence to support short term action, and practicality or ‘do-ability’ for 2010, were used to identify five priorities for immediate action. These are listed in Figure 2. Steps should be taken in 2010 to address these priority goals.

1. Increase access to CPAP/BiPAP* therapy for Nova Scotians suffering from sleep apnea to reduce health care utilization.

2. Increase access to education and pulmonary rehabilitation for individuals at-risk of costly COPD hospitalizations.

3. Improve targeted screening for asthma and COPD to reduce emergency room visits.

4. Improve asthma education for individuals and families to enhance self-management.

5. Increase the availability of smoke-free multi-unit dwellings.

*Continuous Positive Airway Pressure (CPAP) and Bi-level Positive Airway Pressure (BiPAP) therapy are forms of non-invasive ventilatory treatment for individuals diagnosed with sleep apnea.

Figure 2. Five short term priorities for improving lung health in Nova Scotia.
For each priority, it is recommended that a multi-
stakeholder sub-committee of experts be established
to identify appropriate next steps for 2010 and oversee
their implementation. For example, in order to increase
access to CPAP/BiPAP therapy for Nova Scotians living
with sleep apnea, the sub-committee would:

- Conduct a CPAP/BiPAP needs assessment and
  investigate CPAP/BiPAP therapy funding models
  in Ontario, Saskatchewan and Manitoba (where
  CPAP/BiPAP therapy is provincially funded) to
  inform a Nova Scotia funding model. Also, a
  CPAP/BiPAP funding program could be modeled
  after the provincial Home Oxygen Program;

- Oversee the expansion of The Lung Association
  of Nova Scotia’s CPAP/BiPAP Exchange Program,
  in operation since 2007 to meet the increasing
  demand for affordable CPAP/BiPAP machines.
  This could be a viable low-cost alternative while
  a provincial funding program is developed.

Suggested next steps for each priority goal are
described in the Strategy. See the following page(s)
for more information:

- p. 27 for activities supporting priority goal #1;
- p. 22 and 25 for activities supporting priority
  goal #2;
- p. 21 for activities supporting priority goal #3;
- p. 22 for activities supporting priority goal #4;
- p. 13 for activities supporting priority goal #5.

In addition to these five priorities for early action it
is critical to note the overarching priority for lung
health in Nova Scotia, tobacco control. It is essential
that this Strategy acknowledges and continues to call
attention to tobacco control. Smoking is the most
important preventable risk factor for respiratory
disease in Nova Scotia and accounts for 21% of all
deaths in the province10.

If progress is to be made in reducing the massive socio-
economic burden of respiratory disease in Nova Scotia,
it will be by preventing children and youth from starting
to smoke, by encouraging those who do smoke to stop,
and by eliminating tobacco-related disparities among
marginalized groups.
Sustained Leadership

The creation of a permanent respiratory health coordinating mechanism within the health system, such as currently exists for cancer, cardiovascular disease and diabetes, would ensure that real action is taken to reduce the overwhelming burden of lung disease in Nova Scotia. With a mandate to oversee the implementation of this Strategy, such a mechanism, perhaps called Lung Care Nova Scotia, would support and coordinate the management of lung health-related policies, programs, services and surveillance in Nova Scotia.

The need for a consistent mechanism responsible for tracking information about lung programs and services as well as of lung disease burden in the province was highlighted by several respondents in the Inventory of Nova Scotia’s Lung Health Assets (2009) (see Appendix D for an Executive Summary of the Inventory of Nova Scotia’s Lung Health Assets). Knowing what others are doing and the true burden of lung disease in Nova Scotia is seen as essential for identifying future gaps and shedding light on the next steps and new priorities that must be addressed. Keeping the information in this Strategy up to date will not be feasible without the creation of a permanent lung health coordinating mechanism.

It is clear from the breadth of recommended actions in this Strategy that many people and organizations will need to work together to improve respiratory health in Nova Scotia. Ongoing leadership and coordination is crucial to support the broad scope of work required.

RECOMMENDED ACTION:
1 Create a provincially operated program under the direction of the Department of Health, and with input from lung health stakeholders, with a mandate to support and coordinate the management of respiratory health-related policies, programs, services and surveillance in Nova Scotia.

“A lack of ongoing leadership and coordination is a major challenge in addressing respiratory health priorities in Nova Scotia.”
– Inventory of Nova Scotia’s Lung Health Assets (2009)
1.0 Strategic Action Area: Tobacco Control

Background

Overall smoking rates in Nova Scotia are down more than 9% since 1999. Unfortunately, since 2004 rates have been stagnant. This is unlike in New Brunswick, Prince Edward Island and Newfoundland and Labrador, where rates have decreased 4.3%, 2% and 1.6%, respectively, since 2004. In 2008, 19.7% of Nova Scotians (age 15+) smoked; the national smoking rate was 17.9%.

In Nova Scotia, several groups are at high-risk of smoking and of developing smoking-related illnesses, including:

- Teens and young adults;
- Females (especially pregnant and post-partum women);
- Rural residents and low income Nova Scotians;
- Mi’kmaq and African Nova Scotians;
- Lesbian/Gay/Transgendered/Bi-sexual (LGBT) Nova Scotians;
- Nova Scotians with mental health illness;
- Nova Scotians working in certain economic sectors: sales and service, business/finance and administration, and trades/transportation.

Tobacco remains the most important preventable risk factor for respiratory disease in Nova Scotia, as well as a significant contributor to the development of cardiovascular disease and cancer. Also, smoking and exposure to second-hand smoke kills approximately 1,750 Nova Scotians every year, accounting for 21% of all deaths in the province — more than any other preventable cause of death.

In addition to this staggering human toll, smoking is estimated to cost the provincial economy more than $943.8 million a year in direct and indirect health care costs. The total annual federal and provincial tax revenue generated from tobacco sales in Nova Scotia is $163.6 million ($2005/06).

When asked what top five priorities should be addressed by a provincial lung health strategy, tobacco control was consistently identified by Nova Scotia key informants (see inset).

TOP 5 PRIORITIES that should be addressed by a provincial lung health strategy (in order of times referenced):

- Smoking/tobacco use
- Early detection and screening
- Air quality
- Health professional education
- Self-management

The renewed Tobacco Control Strategy (TCS) in Nova Scotia will place special emphasis on addressing health disparities across the population and subpopulations. As well, in planning and allocating resources, the TCS will focus on the broad factors that influence health and overall quality of life.
GOAL 1.1: AGGRESSIVELY REDUCE PROVINCIAL SMOKING RATES.

The renewed Tobacco Control Strategy (TCS) (to be released early in 2010) describes tobacco control in Nova Scotia as a part of a broader, comprehensive effort to build and improve the social, economic and physical environments and resources within communities that enables all residents to develop to their maximum potential.

The renewed TCS is expected to reduce provincial smoking rates by:
1. Preventing those who are not tobacco users from becoming tobacco users.
2. Helping those who are using tobacco to stop.
3. Protecting Nova Scotians from the harms of the tobacco industry, tobacco use and second-hand smoke.

In an effort to maximize synergies and reduce duplication of effort The Nova Scotia Lung Health Strategy aims to align as closely possible with the renewed TCS. Since the renewed TCS is due for release early in 2010, it’s endorsement in The Nova Scotia Lung Health Strategy is not feasible at this time. Instead, The Nova Scotia Lung Health Strategy Steering Committee recommends the following actions to ensure that the renewed TCS will aggressively and effectively reduce provincial smoking rates.

RECOMMENDED ACTIONS:
1 Ensure that a system and resources are in place to establish and address the most important tobacco control issues in the province without delay and on an ongoing basis.

2 Ensure an annual, multi-stakeholder evaluation component is established to critically analyze current and future tobacco control strategies (e.g. Smoke-Free Nova Scotia’s 2003 Tobacco Control Report Card). Groups at-risk of smoking and of smoking-related illnesses must be involved in the evaluation process.
2.0 Strategic Action Area: Air Quality

Background
Both outdoor (ambient) and indoor air quality are important simply because we can not avoid breathing in the air around us. The average Nova Scotian breathes in about 20,000 liters of air a day. In Nova Scotia, air quality is seen as one of the most important opportunities on the respiratory health horizon because of growing public concern about air pollution and climate change.

The main sources of outdoor air pollution from within Nova Scotia come from the burning of fossil fuels for electricity generation and from transportation (see Appendix E for total emissions by province and economic sector). According to a prediction model, electric power generation alone accounted for an estimated $1.6 billion in damage from air pollution in 2002. This number reflects the costs associated with human health effects and other effects such as agricultural damage attributable to air pollution. In 2008, the Canadian Medical Association used national data to estimate that each year in Canada, air pollution is responsible for 21,000 deaths, 620,000 doctor visits, 30,000 emergency department visits, 11,000 hospital admissions, and has an economic impact of over $8 billion.

Indoor air pollutants including radon (a well-known human carcinogen), occupational air contaminants (e.g. dust in mines) and tobacco smoke continue to pose a significant threat to health in the province. They exacerbate the symptoms of a variety of health problems, including chronic respiratory disease.

Second-hand tobacco smoke is especially disconcerting given the high rate of Nova Scotians who report regular exposure to second-hand smoke at home (17.8% in Nova Scotia vs. 15.6% in Canada). Non-smokers who are exposed to second-hand smoke have a 20% to 30% greater risk of developing lung cancer than those not exposed. As well, in 2005, second-hand smoke was estimated to be responsible for the deaths of at least 26 Nova Scotians.

GOAL 2.1: CREATE AWARENESS/EDUCATE THE PUBLIC ON THE IMPACTS OF AIR POLLUTION ON HEALTH AND WHAT THEY CAN DO TO REDUCE AIR POLLUTION.

Clean air is considered to be a basic requirement of human health and well-being. However, air pollution continues to pose a significant threat to health worldwide. According to a World Health Organization assessment of the burden of disease due to air pollution, more than two million premature deaths worldwide each year can be attributed to the effects of urban outdoor air pollution and indoor air pollution (caused by the burning of solid fuels).

The human health effects of poor air quality are far reaching. Ozone has been linked to respiratory illnesses like bronchitis, emphysema, asthma, and pneumonia, as well as cardiovascular illnesses. As well, high ozone levels are associated with increased hospital admissions, emergency room visits, and premature mortality due to cardiovascular and respiratory illness (see Appendix F for annual maximum one-hour ozone concentrations in Nova Scotia, 2000-2007).

Educating Nova Scotians about air quality is a critical aspect of governmental responsibility. Air quality has such a tremendous impact on populations at-risk for respiratory disease (e.g. the elderly) and they need to understand how they are affected, how they can minimize these impacts, and how they can influence policy for the benefit of all Nova Scotians.
RECOMMENDED ACTIONS:
1. Expand the number and nature of public education programs on the link between environment and health.

2. Provide education on ways for individuals to reduce their contribution to air pollution by offering culturally specific programs and initiatives that make it easier for Nova Scotians to incorporate energy efficiency and conservation into their lives (e.g. continued support for Drivewiser Campaign, Green Mobility Capital Grants, Upass).

3. Promote consumer action to reduce air pollution by limiting, where possible, the use of cars for commuting to work and other purposes through sustainable transportation (e.g. Green Mobility Capital Grants for more sustainable transportation options in rural communities, Halifax Regional Municipality Bicycle Blueprint).

4. Expedite certain actions described in the Climate Change Action Plan (2009) that will help reduce air pollutants.

5. Expand the role of relevant non-governmental organizations in advocating for reduced emissions and improved air quality.

GOAL 2.2: ELIMINATE INDIVIDUAL SOURCES OF POLLUTION AND/OR REDUCE THEIR EMISSIONS IN RESIDENCES.

In the last several years, a growing body of scientific evidence has indicated that the air within homes can be more polluted than the outdoor air, even in the largest and most industrialized cities. This is important for Nova Scotians since they spend 93% of their time indoors. Health effects from indoor air pollutants may be experienced soon after exposure or possibly years later.

The first step is to prevent contaminants from entering the home where at all possible. Residential air quality will depend on humidity, the age of the home, the type of heating, the selection of furnishing and insulation materials, and the presence of pets or people who smoke. By taking the necessary steps to reduce the creation of new contaminants in the home, choosing cleaners and building materials carefully, avoiding smoking in the home and keeping windows closed during high pollen days, individuals can reduce their exposure to harmful indoor air contaminants.

RECOMMENDED ACTIONS:
1. Increase consumer awareness of the risks and common causes of indoor air quality problems.

2. Provide consumer incentives to remove indoor air pollution from the home (e.g. provide residential and commercial incentives to improve indoor air quality such as rebates on electronic air filters, radon abatement systems and air-to-air heat exchangers).
GOAL 2.3: INCREASE THE AVAILABILITY OF PRIVATELY AND PUBLICLY OWNED SMOKE-FREE MULTI-UNIT DWELLINGS.

Data suggest that 62% of multi-unit dwellers in Nova Scotia would support a smoking ban in their building19. Multi-unit dwellers in Nova Scotia are most highly concentrated in the Halifax Regional Municipality, which represents more than two-thirds of this population19. Despite the increasing demand for smoke-free housing however, there are few available smoke-free buildings for those who want and need to live smoke-free. The lack of smoke-free options is especially problematic for those with chronic diseases made worse by exposure to second-hand smoke (e.g. asthma and COPD).

RECOMMENDED ACTIONS:

1. Raise awareness among landlords, tenants and provincial government officials from various departments of the health and economic benefits of smoke-free multi-unit dwellings as well as the desire of residents of public housing to have a smoke-free environment.

2. Educate housing providers on the legalities of banning smoking in all or part of a building, including individual units and outdoor patios and balconies; provide resources and support to housing providers interested in adopting smoke-free policies (e.g. smoking cessation resources, staff training).

3. Encourage the Provincial Housing Authority to adopt a smoke-free policy since many Nova Scotians with or at-risk of developing chronic respiratory disease cannot afford to live in privately-owned smoke-free multi-unit buildings.

4. Provide incentives to private multi-unit dwelling owners offering smoke-free multi-unit dwellings (e.g. lower insurance rates for property-casualty insurance).

5. Develop a webpage that lists all privately and publicly owned smoke-free multi-unit dwellings in Nova Scotia (e.g. Smoke-Free Nova Scotia is currently working on such an initiative).
GOAL 2.4: IMPROVE OCCUPATIONAL INDOOR AIR QUALITY BY REDUCING OCCUPATIONAL EXPOSURE TO AIR CONTAMINANTS.

Every office has a variety of contaminants, which can accumulate to high levels and can affect health. Carbon monoxide from vehicle exhaust can be sucked into air intakes and circulated to all parts of a building. Moist plant soils and dehumidifier trays provide ideal breeding ground for bacteria. These can cause diseases or allergic reactions if allowed to accumulate to a high level. Photocopiers and other electrical equipment can produce ozone, a colorless, highly irritating gas. Walls, carpets and furniture can emit chemicals such as formaldehyde. Photocopy toner or cigarette ash particles can become airborne and inhaled.

The National Institute for Occupational Safety and Health (2009) estimates that indoor environmental quality-related health issues cost businesses in the range of $20 to $70 billion annually due to lost productivity, decreased performance, and sick absences.

RECOMMENDED ACTIONS:
1 Identify workplaces/industries at-risk for indoor air quality problems (e.g. auto body shop workers, schools, crab processing plant workers, hair dressers and firefighters).

2 Encourage the Department of Labour and Workforce Development to:
   • Monitor employer compliance with national occupational safety and health standards.
   • Provide education to workplace staff and management about indoor air quality management.

GOAL 2.5: EXPAND AIR QUALITY HEALTH INDEX (AQHI) MONITORING AND DISSEMINATION, AND EDUCATE THE PUBLIC ON THE AQHI.

The Air Quality Health Index (AQHI) was designed by Environment Canada and Health Canada in collaboration with provinces, non-governmental organizations and other stakeholders. It is meant to improve on the existing air quality index by more accurately reflecting actual health risks and providing information to help Nova Scotians manage their own level of risk from air pollution (for more information on the Index please see Appendix G).

RECOMMENDED ACTIONS:
1 Expand AQHI monitoring and dissemination. The AQHI is currently being reported for four locations in Nova Scotia (see map in Appendix H illustrating air quality monitoring stations in Nova Scotia).

2 Inform the general public about the AQHI and familiarize them with the numbers on the scale in terms of their own individual level of risk.

3 Encourage at-risk populations (e.g. individuals living with chronic respiratory disease) to employ the AQHI as a tool to make decisions about when to reduce or reschedule strenuous physical activity and outdoor exposure due to elevated pollution levels.
GOAL 2.6: DEVELOP AND/OR IMPLEMENT POLICY AND LEGISLATION AIMED AT REDUCING EXPOSURES TO ALL HARMFUL OUTDOOR AIR POLLUTANTS.

Despite having a relatively small population, Nova Scotia emits more sulphur dioxide from electric power generation than any other Canadian province\(^{12}\). In 2002, emissions from electric power generated by Nova Scotia Power Inc. accounted for between 39% and 50% of all air pollution damage costs in Nova Scotia\(^{12}\). Transportation and industrial sources (e.g. from the pulp and paper industry) are the next largest contributors to air pollution damages in Nova Scotia\(^{12}\).

RECOMMENDED ACTIONS:

1. Invest in the development of sustainable technology and alternative energy.

2. Enhance other investments that facilitate active transportation and improved air quality, focusing on sidewalks, walking paths, and cycling lanes. Implement Action 22 of Nova Scotia’s Climate Change Action Plan (2009) to develop a program to encourage and support consumers to choose greener cars and trucks that are more fuel efficient and produce less air pollution.


Providing Nova Scotians with improved transportation choices will not only reduce pollution, it will also reduce health care costs.

Stephanie Sodero, Ecology Action Centre
3.0 Strategic Action Area: Chronic Disease

Background
The vast majority of Nova Scotians with respiratory disease suffer from chronic conditions such as asthma, chronic obstructive pulmonary disease (COPD), sleep apnea, lung cancer, and occupational lung disease (see Appendix I through P for disease statistics). These diseases affect people of all ages, cultures and backgrounds. Unfortunately, respiratory disease suffers from comparatively low public awareness that results in adverse consequences such as unnecessary exposure to risk, misdiagnosis and inadequate treatment.

With 15.1% of Nova Scotians in general aged 65 or over, the province has the oldest population in Eastern Canada and the second-oldest in the country. Given that chronic respiratory diseases tend to increase in severity with age, it is not surprising that the number of Nova Scotians with respiratory disease is disproportionately high compared to the rest of Canada. This number is expected to increase as Nova Scotia’s population continues to age (see Appendix J for an illustration of the rising COPD death rate). The corresponding increase in demand for services will pose a significant challenge for the health care system. This reinforces the need for more effective respiratory disease awareness, prevention, management and self-management.

Asthma
Asthma is a chronic inflammatory disease of the airways characterized by persistent symptoms such as cough, shortness of breath, chest tightness and wheeze. An asthma attack can be a frightening event, with feelings of suffocation and breathlessness; it can also be life-threatening. The risk factors for developing asthma are having a family history of asthma and exposure to high levels of antigen, such as mould or second-hand smoke.

The burden of asthma in Nova Scotia is far too great (see inset). Poor asthma control often results in time away from school, work, sports and other activities that affect quality of life. One measure of poor asthma control is hospitalizations. Between 2001 and 2005, approximately 7,843 hospitalizations in Nova Scotia were asthma-related. In 2005, asthma-related hospitalization rates varied significantly between District Health Authorities (DHAs), age groups, urban/rural status and ethnicity (see Appendices K through M). This information will be used to prioritize investments to reduce the burden of asthma in Nova Scotia.

With early and proper diagnosis, effective implementation of management strategies and access to self-management resources, many hospitalizations are avoidable (e.g. up to 75% of hospitalizations among Canadian adults with severe asthma are avoidable). This is important since it is suggested that individuals with uncontrolled asthma use 100% more health services than the non-asthma population.
Chronic Obstructive Pulmonary Disease (COPD)

COPD is a chronic respiratory disorder characterized by progressive, partially reversible airway obstruction.28 Hallmark symptoms experienced by patients with COPD are progressive shortness of breath and physical activity limitations. Increasing severity is associated with immobility, more frequent exacerbations and hospitalizations, and premature death. In 80% to 90% of cases, cigarette smoking is the principal underlying cause of COPD.28

COPD affects a greater proportion of individuals in Nova Scotia than in any other province.26 Current data likely underestimate the true prevalence of COPD in Nova Scotia since it is suggested that more than 50% of individuals with COPD are undiagnosed.29

Hospitalization may be required in the treatment of COPD, particularly when symptoms worsen from infection.30 In Nova Scotia, there are more than 6,000 COPD-related hospitalizations per year.26 The rate of hospitalizations in Nova Scotia is among the highest in Canada.22 As well, COPD-related hospitalizations are more common among senior men, rural residents and lower income adults (see Appendices N and P).36,38 In 2005, COPD-related hospitalization rates varied significantly between DHAs (see Appendix P).26

Severe COPD exacerbations (exacerbations requiring hospitalization) cost the Nova Scotia health care system an estimated $60 million per year.26,33 This estimate does not include costs associated with mild COPD or moderate COPD exacerbations (exacerbations not requiring hospitalization). The projected increase in the number of individuals with COPD will have major implications for the delivery of comprehensive hospital and community services in the future.

Obstructive Sleep Apnea-Hypopnea Syndrome (OSAHS)

OSAHS is the most common of the syndromes described as sleep disordered breathing.1 It is characterized by episodes of pauses in breathing lasting from 10 to 30 seconds during sleep which sometimes recur hundreds of times a night.1 Episodes occur when the loss of upper airway muscle tone during sleep is combined with upper airway narrowing.1 Upper airway size is determined by a variety of factors including obesity and increasing age. OSAHS is more common in patients who smoke.1

There is a lack of OSAHS prevalence data in Canada. Studies suggest however that sleep disordered breathing is at least as prevalent in Canada as in other industrialized nations (4% of men and 2% of women).34,35 Given these estimates and Nova Scotia’s adult population (+15 yrs),36 it is estimated that about 15,000 men and 8,000 women in Nova Scotia have sleep disordered breathing. Since obesity is an important risk factor for OSAHS, high rates of overweight and obesity in Nova Scotia (60% of adults are overweight or obese)3 suggest that the prevalence of sleep disordered breathing may be even higher.

Undiagnosed and untreated OSAHS is associated with reduced quality of life, decreased cardiovascular health and increased health care utilization, transportation accidents and mortality.3 Patients with OSAHS use health care services at approximately twice the rate of control subjects prior to diagnosis (up to 10 years prior to diagnosis) making early diagnosis and treatment (e.g. CPAP therapy) critical for reducing the human and economic burden of the disease.
**Lung Cancer**

Cigarette smoking is the predominant cause of lung cancer accounting for at least 90% of all new cases of lung cancer in men and 80% in women. As well, second-hand smoke is now considered a major risk factor for lung cancer among non-smokers. In fact, non-smokers who are exposed to second-hand smoke have a 20% to 30% greater risk of developing lung cancer than those not exposed.

From 2000 to 2004, lung cancer was the leading cause of cancer death in Nova Scotia (see inset). Researchers are finding that the effects of tobacco seem to be far more damaging to women than men. Women are 1.5 times more likely than men to develop lung cancer.

If progress is to be made in reducing the incidence of lung cancer, it will be by preventing children and teens from starting to smoke and by encouraging those who do smoke to stop. In addition, to reduce lung cancer deaths among non-smokers, it will be necessary to prevent exposure to second-hand smoke. Finally, enhanced early detection is believed to significantly improve lung cancer patient prognoses.

**Lung Cancer in Nova Scotia**
- From 2000 to 2004, lung cancer accounted for a third of all cancer deaths among men (1,914) and a quarter among women (1,296).
- As of 2004, the rate of lung cancer was significantly higher in Cape Breton relative to Nova Scotia as a whole (19% higher).
- Lung cancer rates were also significantly higher in Cumberland, Inverness and Yarmouth counties and significantly lower in Halifax and Lunenburg counties.

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**Occupational Lung Disease (OLD)**

OLD is caused by workplace exposure to irritating or toxic substances that may cause acute or chronic respiratory ailments. Many Nova Scotians suffer unnecessarily from OLD (see inset).

**OLD in Nova Scotia**
- On average, between 2001 and 2005, nearly 600 hospitalizations were attributable to OLD each year.
- Hospitalizations were greatest among older men (>60 yrs) and did not vary in a significant way according to rural/urban status, income or DHA.

Data suggest that there is an occupational contribution in 10% to 15% of asthma cases overall suggesting that up to 4,000 Nova Scotians (15% of adults who visited a physician for their asthma between 2001 and 2005) may suffer from occupational or work-aggravated asthma.

Data from the Workers’ Compensation Board of Nova Scotia (WCB) (2009) suggest that OLD affects a disproportionate number of workers in the manufacturing and the mining/quarries/oil wells industry groups (see Appendix Q for number of WCB claims, by industry group). WCB data also indicate that pneumoconiosis was the most frequently compensated OLD (389 out of 508, or more than 75% of all compensated lung conditions) and that occupational lung cancers (e.g. occupational lung cancer, lung cancer among firefighters and mesothelioma from asbestos exposure) were the most costly (since 2005, the average health care payment per lung cancer patient has been $5300) (see Appendix R for average health care paid per claim, by injury).
Lung Transplants
There are five lung transplant centers in Canada. The centers are located in Vancouver, Edmonton, Winnipeg, Toronto and Montreal. Individuals from Nova Scotia who require lung transplant surgery must relocate to Toronto for the procedure (there are approximately 10 Nova Scotians in Toronto awaiting lung transplant surgery at any one time). Due to the costs associated with relocating and maintaining a second residence in Toronto (approximately $2,500 per month in additional costs, for a minimum of 7 months and as long as 28 months) these individuals and their families face extraordinary uncertainty and financial hardship. The health of these individuals is adversely affected by the stress and anxiety associated with the financial challenges they face.

Being away from home and family is always stressful. In addition, living in a strange province that has a higher cost of living is also very stressful. Each patient deals with stress in their own way. While we do not have a measurement for this at the Toronto General Hospital we all know that stress can impact health. We try to support our out of province patients the best we can.

Ursula Dignard, Multi-Organ Transplant Social Worker, Toronto General Hospital
A. Collective goals and recommended activities for chronic respiratory disease (e.g. for asthma, COPD, OSAHS, lung cancer and OLD):

**GOAL 3.1: INCREASE PUBLIC AWARENESS OF CHRONIC RESPIRATORY DISEASE TO ENCOURAGE PREVENTION, EARLY DETECTION AND BETTER SELF-MANAGEMENT.**

Public awareness of chronic respiratory diseases is low. For example, while 25% of missed school days may be attributed to asthma and 12% of adults with severe asthma miss an average of 34 work days per annum, public awareness of the chronic respiratory condition is low. Lack of knowledge of the disease has led to mismanagement. According to the Asthma Action Study (2005), nine out of ten Canadian adults with severe asthma incorrectly think their asthma is under control and two-thirds of them experience frequent symptoms, compromising their quality of life.

Likewise, COPD is often not diagnosed until late in the progress of the disease. This is due in part to poor public awareness. Lung cancer receives little public or media attention despite the fact that it killed more Nova Scotians than any other cancer between 2000 and 2004.

There are clear opportunities for common messaging in public awareness campaigns that can meet the needs of several chronic respiratory conditions. It is important, however, that intrinsic differences between respiratory diseases, their risk factors, and at-risk populations be considered in the development of respiratory health promoting messages.

**RECOMMENDED ACTION:**

1. Invest in public awareness campaigns that promote primary prevention, symptoms recognition, understanding about risk for marginalized populations and the links between smoking and the various respiratory diseases. Implement awareness initiatives specifically targeted to at-risk populations.

Optimal management of asthma requires adequate evaluation of the patient and his or her environment... Insufficient use of objective measurements of airflow obstruction, may lead to over- or under-diagnosis of asthma...a frequent reason for poor asthma control...and emergency room visits.

*Canadian Asthma Consensus Guidelines, December 2004*

*Of all the chronic conditions, asthma is the #1 reason why kids miss school.*
GOAL 3.2: IMPROVE TARGETED ASTHMA AND COPD SCREENING THROUGH IMPROVED ACCESS TO AND USE OF SPIROMETRY.

Many people with asthma are not referred to pulmonary function test (PFT) labs, even though objective measures are essential to confirm the diagnosis of asthma (see inset on p. 20). A recent Canadian study found that about one-third of individuals with physician-diagnosed asthma did not have asthma when objectively assessed. An earlier study conducted in Halifax found that 62% of participants who did not meet the criteria for asthma were taking medications for asthma. These data suggest that asthma is over-diagnosed in Nova Scotia.

Similarly, for successful early detection of COPD (and thus improved health outcomes), the availability of high-quality spirometry and interpretation are required. Research suggests that 50% of individuals diagnosed with COPD through screening received new treatment as a result of the diagnosis, making them less prone to acute exacerbations and expensive hospital stays. Unfortunately, data suggest that more than 60,000 Nova Scotians have COPD and do not know it. While 70% of physicians in Atlantic Canada report access to spirometry (this is below the national average of 74%), only 10% report using spirometry to diagnose COPD. This is also the lowest rate in Canada.

The consequences associated with a misdiagnosis of asthma and COPD are many and include the lost opportunity to investigate or treat the cause of the patient’s respiratory symptoms appropriately, an increased risk of costly hospitalization and decreased quality of life.

Spirometry tests provide the objective measures needed to confirm an asthma and COPD diagnosis. Several barriers to increased spirometry in Nova Scotia exist, for example:

- Lack of resources, both infrastructure (e.g. PFT labs) and human (e.g. dedicated respiratory technicians trained in spirometry);
- Too few physicians use spirometry to diagnose asthma and COPD;
- Many Nova Scotians cannot travel long distances for diagnostic testing.

RECOMMENDED ACTIONS:

1. Explore and implement solutions to address barriers to increased spirometry. For example:
   - Explore options to increase province-wide testing/screening (e.g. expanded PFT labs/more dedicated respiratory technicians).
   - Emphasize the value of objective screening among physicians (See Goal 3.4, Recommended Action #1).
   - Explore options to make it easier for individuals to travel to available services (e.g. travelling spirometry to underserviced communities).

2. Increase capacity for spirometry. (e.g. Support systematic delivery of SpiroTrec®, a spirometry training course, in Nova Scotia).

3. Create a model to enhance delivery of spirometry in Nova Scotia (e.g. in family physicians’ offices, community health centers).

4. Develop and implement early asthma and COPD detection programs that reflect population-based risk factors (e.g. where smoking rates and exposure to second-hand smoke are high, in areas with high visit rates for respiratory problems such as in emergency rooms, etc.):
   - The Cape Breton DHA where smoking rates are high.
   - The Pictou DHA where asthma-related hospitalization rates are significantly higher than other DHAs (see asthma-related hospitalizations rates, by DHA, in Appendix K).

Next to tobacco control, early detection and screening for lung disease should be the top priority for Nova Scotia’s provincial lung health strategy.

Inventory of Nova Scotia’s Lung Health Assets (2009)
GOAL 3.3: IMPROVE CHRONIC RESPIRATORY DISEASE EDUCATION FOR INDIVIDUALS AND FAMILIES TO ENHANCE SELF-MANAGEMENT.

Many people living with chronic respiratory diseases, and their caregivers, are not aware of available treatments, the benefits of appropriate treatment, or how to prevent poor health outcomes. Given high provincial asthma and COPD-related hospitalization rates (see Appendix S for COPD hospitalization rates by province, territory), it is apparent that Nova Scotians need more help to properly manage their chronic respiratory conditions.

Recent studies confirm that asthma education can improve symptoms and quality of life, and reduce school and work absenteeism, exacerbation rates and the number of emergency room visits\(^{42,48}\). As well, specific educational interventions have been shown to reduce health resource utilization related to management of acute COPD exacerbations\(^{28}\).

RECOMMENDED ACTIONS:

1. Support and enhance chronic respiratory disease education programs to better enable self-management (e.g. invest in clinics akin to the Diabetes Education Clinics in the province). Prioritize access to programs for patients with marked asthma, COPD, and sleep apnea-related morbidity and frequent acute care use.
   - Socioeconomic and cultural factors should influence the design and delivery of asthma and COPD education programs.

2. Implement a mechanism for automatic referral to an education program for all Nova Scotians at-risk of developing COPD (e.g. education programs such as the ones led by the COPD education coordinator in Colchester East Hants and the PRIISME coordinator at the Cobequid Community Health Center).

3. Implement a mechanism for automatic referral to an education program for those living with asthma and COPD seen in the emergency room (e.g. COPD/INSPIRED coordinator in every DHA – at present, there is one at the Queen Elizabeth II Health Sciences Center).

4. Add chronic lung diseases to list of medical conditions covered through the Family Physician Chronic Disease Management incentive Medical Services Insurance program.

5. Promote the internationally recognized, provincially sponsored ‘Your Way to Wellness’ (YW2W) Chronic Disease Self-Management program.
   - Support leader training in each DHA (especially in rural communities).
   - Identify disease-specific information that should be included in the delivery of the program.
   - Integrate the role of physicians and allied health professionals in promoting YW2W (e.g. create mechanism for referral of repeat health care system visitors to the YW2W program).
GOAL 3.4: ENHANCE CHRONIC RESPIRATORY DISEASE EDUCATION AND TRAINING FOR HEALTH CARE PROVIDERS.

Most physicians in Nova Scotia are familiar with COPD guidelines. Familiarity with guidelines, however, does not guarantee that best practice recommendations are applied fully or correctly.

For example, while written asthma action plans have been repeatedly promoted in asthma guidelines, most adults (83% of respondents in the Asthma Action Study (2005)) report that they have not had a conversation about such an asthma action plan with their physician. As well, while it is well established that spirometry is required for the diagnosis of COPD, only 10% of physicians in Atlantic Canada report using it to diagnose COPD. Under-diagnosis of COPD in Nova Scotia has led to poor health outcomes for thousands of people and unnecessary health care system utilization.

This failure to follow best practice guidelines and of communication eventually compromises the chronic respiratory disease patient’s quality of life and leads to increased use of health care resources. Barriers such as time limitations, a lack of a reminder system, or a lack of resources may limit physician adherence to best practice guidelines.

RECOMMENDED ACTIONS:

1. Ensure asthma, COPD, sleep disordered breathing and smoking cessation best-practices are included in the curricula of the medical, nursing and respiratory therapy schools, as well as of allied health care professionals in Nova Scotia with a particular focus on:
   - The value of targeted screening and spirometry.
   - The value of education in preventing acute exacerbations.
   - Optimizing pharmacological and non-pharmacological management strategies.

2. Identify and implement strategies to encourage health care providers to put recommended best practice guidelines into practice (e.g. incentives, training, reminder system).

3. Educate physicians on how to formulate and implement asthma action plans.

GOAL 3.5: INCREASE THE NUMBER OF HEALTH PROFESSIONALS THAT ARE AVAILABLE TO PROVIDE RESPIRATORY SERVICES.

The number of respirologists in Nova Scotia is below the recommended level (1 per 50,000 is recommended). Presently there are 10.7 full time equivalents in Nova Scotia (4 to 5 that will likely retire in the next 5 to 8 years), whereas key stakeholders agree and the literature suggests that at least 19 are needed – especially given the increasing burden of chronic respiratory disease and the need of patients to see a specialist.

The Inventory of Nova Scotia’s Lung Health Assets (2009) suggests that future trends in human resources (e.g. the expected retirement of respiratory therapists in the next 5 to 8 years) and the growth in demand for respiratory health professionals will result in a precarious shortage in human resource. It will be important to initiate a process to decrease the impact of anticipated retirements as soon as possible.

RECOMMENDED ACTIONS:

1. Ensure a commitment by Dalhousie University and the Department of Health to annual funding for the new Respirology Fellowship program (e.g. for a new position every two years). As well, investments to build infrastructure (e.g. equipment for invasive investigations and treatment) are needed in order to attract respirologists to Nova Scotia. Dedicated funding will be important to attract physicians from larger training centers.

2. Re-allocate some existing respiratory therapy resources to support primary health care in the community.

3. Implement Nova Scotia’s New Collaborative Care Model (2008) which is intended to optimize respiratory therapists’ scope of practice.
B. Disease specific goals and recommended activities:

**Chronic Obstructive Pulmonary Disease (COPD)**

**GOAL 3.6: INCREASE ACCESS TO PULMONARY REHABILITATION.**

“An urgent need exists to increase access to pulmonary rehabilitation programs across Canada.”47 Pulmonary rehabilitation is the most effective therapeutic strategy for improving shortness of breath, exercise tolerance and quality of life compared with standard care47. It is also beneficial in terms of reducing health care usage and the associated costs47. Recent pulmonary rehabilitation studies with long term follow up have shown a trend toward decreased hospital days, fewer exacerbations and more efficient primary care use among rehab participants28. Extra expenses associated with pulmonary rehabilitation are completely offset by the reduction in health care utilization costs47.

The Canadian Thoracic Society (CTS) recommends that patients be encouraged to enroll in a supervised pulmonary rehabilitation program to avoid de-conditioning. Seventy percent of physicians in Atlantic Canada recommend pulmonary rehabilitation to their COPD patients22 yet Nova Scotia has just four pulmonary rehabilitation centers in the entire province (see Appendix T for a map of pulmonary rehabilitation programs in Nova Scotia). Stakeholders indicate that potential barriers to increased access include the lack of a widespread, formal referral process for patients who are hospitalized for acute COPD exacerbations, a lack of funding for pulmonary rehabilitation specialists to deliver programs, and a lack of pulmonary maintenance programs in the community.

**RECOMMENDED ACTIONS:**

1. Ensure equitable, timely access to community- or home-based pulmonary rehabilitation programs in each DHA.
   - Program must be accessible (e.g. free parking, close proximity to population being served).
   - Coordinate current resources for optimal efficiency (e.g. collaborate with cardiac rehabilitation programs, such as the ‘Hearts in Motion’ community programs in Capital Health, Pictou County, Annapolis Valley and Guysborough-Antigonish, to provide exercise and self-management to respiratory patients while adding a pulmonary component for disease specific management).

2. Remove barriers for patients with respiratory disease seen in the health care system (e.g. family physician’s office, emergency room, etc.) to participate in a pulmonary rehabilitation program (e.g. improve the referral process).

3. Establish pulmonary rehabilitation programs in each DHA, especially the Cumberland and Guysborough-Antigonish Straight DHAs as they appear to have high rates of COPD-related hospitalizations26 (see Appendix P). Also, one of the South Shore, Southwest, or Annapolis Valley DHAs should set up a pulmonary rehabilitation program immediately as there are none in the region (see Appendix T). While intended for pulmonary rehabilitation, these programs could service other chronic disease groups as well.

I participated in pulmonary rehabilitation for the first time eight years ago. I loved having a place to go where I could exercise safely. For me, like so many others, my limited lung capacity made it difficult to do chores around the house, walk up stairs, or even leave the house! After participating in this program I was able to do things that I hadn’t done in 20 years. Unfortunately though, there is no pulmonary maintenance program in the HRM, which makes it very difficult for those of us who want to keep exercising to stay healthy and out of the hospital.

Deborah McKay, Clayton Park, NS
GOAL 3.7: IMPROVE ACCESS TO MEDICATIONS AND DEVICES TO TREAT COPD.

Bronchodilators form the mainstay of pharmacological therapy for COPD. They decrease airway smooth muscle tone, improve exercise tolerance and health status, and are recommended by the Canadian Thoracic Society (CTS). Some barriers to recommended pharmacotherapy exist and should be addressed in order to better link COPD patient needs and government action in Nova Scotia. For example, the need to complete additional forms to give patients access to medications is a barrier to physicians following CTS guidelines.

RECOMMENDED ACTIONS:
1. Improve access to COPD medications (e.g. make special authorization forms physicians must complete for COPD medications easier to use).
2. Increase access to the Nova Scotia Home Oxygen Program for more people.

GOAL 3.8: ENHANCED PALLIATIVE/END-OF-LIFE CARE.

Appropriate end-of-life care is an important issue for patients/families with chronic diseases such as COPD; so are issues surrounding caregiver burden and lack of home support for patients/families for patients living/dying with advanced respiratory disease in Nova Scotia. Improving end-of-life care may also yield cost-savings through avoidance of costly intensive care.

RECOMMENDED ACTIONS:
1. Create mechanisms to link Nova Scotians living with end-stage respiratory disease, and their family members, with Palliative Care programs in each DHA.
2. Disseminate and incorporate best evidence end-of-life care for those with late-stage COPD. The CTS emphasizes the need to both better understand and deliver quality end-of-life care for patients with COPD in their 2007 Guidelines update. For example:
   • Support the implementation of the INSPIRED project (e.g. funding for INSPIRED coordinators in every DHA). INSPIRED is an acronym for: Implementing a Novel and Supportive Program of Individualized care (for people with) RESpiratory Disease.
   • Ensure palliative care education is promoted and regularly provided in the respiratory health community in Nova Scotia.
   • Ensure respiratory health education is promoted and regularly provided to the palliative care community.
3. Explore options to enhance home support for patients/families living/dying with COPD (e.g. provincial Home Oxygen Program).

“Palliative care takes as its starting point the belief that life is meant to be lived fully, with dignity and comfort, until it’s end.”

Nova Scotia Palliative Care Association
Obstructive Sleep Apnea-Hypopnea Syndrome (OSAHS)

GOAL 3.9: IMPROVE ACCESS TO OSAHS DIAGNOSTIC TESTING/SCREENING.

The majority of Canadians with sleep disordered breathing remain undiagnosed. Individuals living with OSAHS have increased health care expenditure for up to 10 years before diagnosis. For successful early diagnosis and significant cost savings, high public awareness of OSAHS and the availability of high quality polysomnography (sleep test) and interpretation are required.

Potential barriers to early diagnosis and high quality sleep tests and interpretations include:

- Low public awareness;
- Lack of resources/capacity for sleep tests (e.g. DHAs 4, 5 and 6 do not have sleep clinics; there is no pediatric sleep clinic in the province);
- The inability of patients to travel long distances for diagnostic testing/screening;
- Lack of personnel trained to interpret sleep tests.

RECOMMENDED ACTION:

1. Explore value of establishing sleep clinics in DHAs 4, 5 and 6 elsewhere in the province and enhancing capacity in the Halifax Regional Municipality (HRM). Would enhanced capacity in the HRM impact regional wait lists?

2. Collaborate with private vendors who use portable monitoring to improve the quality of care provided and efficacy of subsequent therapy for patients identified with OSAHS.

3. Collaborate with private vendors to increase testing/screening that reflect population-based risk factors (e.g. low income, overweight and obesity).

4. Support initiatives to encourage family doctors to refer suspected OSAHS patients for a sleep test.

5. Ensure sleep tests are interpreted by physicians trained in the diagnosis of OSAHS.

GOALS 3.10: INCREASE ACCESS TO NON-INVASIVE VENTILATORY TREATMENT (CONTINUOUS POSITIVE AIRWAY PRESSURE (CPAP) AND BI-LEVEL POSITIVE AIRWAY PRESSURE (BIPAP)) FOR ADULTS AND CHILDREN APPROPRIATELY DIAGNOSED WITH OSAHS.

Canadian Thoracic Society (CTS) guidelines (2006) state that CPAP/BiPAP is the primary treatment for OSAHS. CPAP has proven to be a very cost-effective treatment. It has an incremental cost-effectiveness ratio of $3,626 per quality-adjusted life year (QALY) over no treatment. A ratio of less than $10,000/QALY is considered extremely cost effective. The clinical and quality of life benefits for individuals using CPAP machines are significant.

Although an estimated 23,000 Nova Scotians have sleep disordered breathing, most of whom have OSAHS, and CPAP/BiPAP therapy is known to yield positive clinical outcomes like decreased blood pressure and blood glucose, Nova Scotia does not yet fund CPAP/BiPAP therapy (the approximate value of a CPAP/BiPAP machine and accessories is about $2,500). CPAP/BiPAP therapy is currently funded in Ontario, Manitoba and Saskatchewan.

RECOMMENDED ACTIONS:

1. Fund CPAP/BiPAP therapy (at least partially) under the provincial health insurance plan for adults and children appropriately diagnosed with OSAHS. Create a funding model for CPAP/BiPAP therapy, based on existing models from other provinces, that establishes criteria for Nova Scotians to qualify for funding. The CPAP/BiPAP funding program could be modeled after the provincial Home Oxygen Program.

2. Ensure there is an active CPAP/BiPAP exchange program in Nova Scotia while therapy is not funded:

   - Support The Lung Association of Nova Scotia’s Equipment Exchange program.
   - Promote the program to physicians, respiratory equipment companies, long-term care facilities and OSAHS patients (e.g. in other provinces where CPAPs are funded).
   - Recruit CPAP/BiPAP donors.
Lung Cancer

**GOAL 3.11: IMPROVE ACCESS TO EARLY LUNG CANCER DETECTION TECHNIQUES.**

In lung cancer the unfortunate reality is that by the time patients develop symptoms, they often have far advanced disease\(^2\). Due in part to the lack of effective screening procedures most lung cancers are diagnosed in late stages. By the time lung cancer reaches stage four, the chances of being cured are less than two per cent\(^2\).

While early detection methods are widely used for cervical cancer (the Pap smear), breast cancer (mammography), colon cancer (occult blood) and prostate cancer (PSA), sensitive lung cancer screening tools remain elusive\(^2\). When lung cancer is detected in its earliest stage, the survival rate is between 80 and 90%\(^2\).

A promising national research project funded by the Terry Fox Research Institute is ongoing to identify a lung cancer screening tool. Dr. Michael Johnston is spearheading the Halifax arm of the study. Dr. Johnston suggests that this screening technique will be ready for widespread use after three to four more years of study.

**RECOMMENDED ACTIONS:**

1. Prioritize early lung cancer detection in health care by supporting detection research.

2. Anticipate new techniques for early lung cancer screening and ensure resources/policies are in place for prompt and full implementation. Forward thinking policies will improve the poor prognoses lung cancer patients are subject to today (85% of individuals diagnosed with lung cancer die within five years of their diagnosis)\(^7\).

**GOAL 3.12: EQUITABLE AND TIMELY ACCESS TO PATIENT NAVIGATION, ONCOLOGY SOCIAL WORKERS AND PALLIATIVE CARE SERVICES.**

The anticipated increase in the incidence of lung cancer among Nova Scotia women is certain to increase demand for health care services (from diagnosis to treatment, to education and support). While promising detection technologies are being studied, the current prognosis for lung cancer remains poor\(^7\). For this reason, supporting, improving and expanding patient navigation, support and palliative care services will be critical to ensure that all those in need receive the services they deserve.

Effective, culturally specific programs will be particularly important. The Path Less Travelled is a promising smoking prevention and cancer outreach program delivered to Cape Breton First Nations communities. Among other things, the program aims to communicate important information in a First Nations context. The Path Less Travelled program is an example outreach program that could be integrated by Aboriginal populations across the province.

Of all the people enrolled in palliative care programs servicing Cape Breton and Halifax counties in 2003, lung cancer patients accounted for about 26% of them, highlighting the value of these types of programs for this population\(^7\).

**RECOMMENDED ACTIONS:**

1. Support the expansion of Cancer Care Nova Scotia’s Patient Navigation programs to all DHAs (currently only in 5 of 9 DHAs).

2. Develop, implement and expand culturally specific educational resources and critical care maps for lung cancer patient across populations disproportionately affected.

3. Create mechanisms to link Nova Scotians with end-stage lung disease and their family members with DHA Palliative Care programs.
Lung Transplant

GOAL 3.13: TO PROVIDE APPROPRIATE LEVELS OF SUPPORT TO THOSE WHO MUST RELOCATE FOR LUNG TRANSPLANT.

RECOMMENDED ACTIONS:

1. Continue support for rent for those who must relocate out-of-province for health care.

2. Establish navigation through the health care system for lung transplant patients:
   • Patient navigator would provide ongoing expert advice throughout the lung transplant process.

3. Explore other opportunities to better serve Nova Scotians who must relocate for health care (e.g. fund furnishing, cable, internet)

Lung transplant patients and their families face many challenges, not the least of which is being torn away from their loved ones and their community support structure to have the life-saving surgery.

Inventory of Nova Scotia’s Lung Health Assets (2009)

The role of a Lung Transplant Patient Navigator would be to ease the burden of relocation and to provide the best available information and resources to the patient and their family members. From diagnosis to recovery, the Lung Transplant Patient Navigator would be the key contact responsible for addressing the complex health care needs of lung transplant patients.

Louis Brill
The Lung Association of Nova Scotia
4.0 Strategic Action Area: Infectious Disease

**Background**

Influenza is an acute viral illness of the respiratory tract characterized by sudden onset of fever, muscle/joint pain, nasal congestion, sore throat and dry cough. Between 10% and 20% of Canadians are infected by the influenza virus each year (type A and type B). Although usually self-limiting, serious complications including death can occur, particularly for the very young, the elderly, those with compromised immune systems and those with chronic respiratory disease. Each year up to 2,500 deaths in Canada are attributable to influenza.

The three main public health aspects of Nova Scotia’s influenza program are prevention through education, surveillance and immunization. Influenza immunization is widely known as the most effective means for reducing the morbidity and mortality associated with influenza. Each year, nearly 300,000 Nova Scotians receive an influenza vaccine the preventive benefits of which can last up to 4 to 6 months.

Comprehensive influenza and influenza immunization surveillance is essential to the planning, implementation, and evaluation of public health practice. In Canada, surveillance of communicable diseases is supported by provincial legislation that mandates the reporting or notifying of communicable diseases by laboratories, physicians and others. Nova Scotia’s weekly surveillance publication, Respiratory Watch, outlines regional influenza activity levels in the province, including variations in the peak and spread of influenza A and influenza B.

Infectious disease experts recommend that gaps in influenza education, immunization and surveillance be a primary focus of this Strategy. A move toward more effective influenza education and enhanced influenza surveillance may benefit other infectious respiratory diseases as well.

Inventory of Nova Scotia’s Lung Health Assets (2009)
GOAL 4.1: INCREASE THE NUMBER OF HEALTH CARE PROVIDERS THAT PROVIDE AND SUPPORT INFLUENZA AND PNEUMOCOCCAL IMMUNIZATION.

Despite straightforward and widely available guidelines on hand washing, covering coughs and sneezes, and influenza vaccines, there are still at least between 10% and 20% of Nova Scotians who acquire influenza every year\textsuperscript{53}. While education and awareness of necessary precautions appear to be rising, evidence suggests that there is a long way to go, even among health care workers. For example, in a 2006 study conducted at McMaster University, investigators determined that health care workers only wash their hands appropriately 30% of the time\textsuperscript{55}.

The literature shows that a clear recommendation from a health care provider is a significant factor in determining whether individuals receive vaccines\textsuperscript{56}. There are many opportunities for health care workers to promote and support annual influenza and pneumococcal immunization.

RECOMMENDED ACTIONS:

1. Implement strategies that encourage health care providers to promote and support annual influenza immunization such as:
   - Ensuring that high-risk individuals are advised about and/or offered influenza vaccine at every clinical encounter during the Fall and early Winter.
   - Encouraging and supporting initiatives to provide influenza vaccine within health care facilities such as at outpatient specialty clinics (e.g. asthma clinics), as part of discharge planning for admitted patients and in emergency rooms.
   - Being a positive role model for other health care workers by being immunized themselves, encouraging co-workers to be immunized, providing factual information on influenza vaccine and ensuring health care worker patients are offered vaccine.
   - Promoting and supporting the allocation of resources to implement comprehensive influenza immunization programs for both the public and health care workers.
   - Working with other partners, such as pharmacists and the Victoria Order of Nurses, to increase opportunities for the public to access influenza and pneumococcal immunization.

Immunization of individuals at high-risk for severe influenza and its complications, their close contacts, and health care workers remain the cornerstones of influenza prevention and control.
GOAL 4.2: INCREASE RATES OF INFLUENZA AND PNEUMOCOCCAL IMMUNIZATION AMONG HEALTH CARE WORKERS AND INDIVIDUALS AT HIGH RISK FOR SEVERE INFLUENZA.

Despite the central role of immunization in influenza prevention, immunization rates remain sub-optimal in Nova Scotia. Three high-risk groups that consistently fail to meet national immunization rate standards are health care workers, seniors (>65 years) and adults with underlying medical conditions (e.g. chronic respiratory disease)\textsuperscript{53}. As Nova Scotia’s population ages, the prevalence of chronic cardiopulmonary disease and other chronic conditions (e.g. diabetes) is expected to increase. This increase will mean a greater susceptibility for more Nova Scotians to infectious respiratory illnesses such as influenza and pneumococcus\textsuperscript{57,58}.

RECOMMENDED ACTIONS:

1. Monitor immunization rates and analyze trends (with particular attention given to rates among health care workers, seniors and individuals with chronic respiratory disease) to inform public health policy decisions.

2. Investigate why health care workers in Nova Scotia choose not to be immunized for influenza and implement strategies to promote immunization uptake among more health professionals:
   - Play a DVD at staff meetings or grand rounds at the start of the flu season that tells a story.
   - Have governing bodies (e.g. Doctors Nova Scotia) communicate with their members about the value of influenza vaccination.
   - Provide incentives for immunization (e.g. draw for all those who are immunized).

3. Have health care staff sign a declination (formal refusal) indicating that they do not wish to be immunized in an effort to increase vaccine uptake.

4. Identify and address barriers to influenza vaccine uptake among Nova Scotia seniors and individuals with chronic respiratory disease.

5. Use novel approaches to increase seniors’ access to influenza immunization such as offering transportation to community flu clinics.

6. Support the DHAs in meeting the immunization needs of their communities.
GOAL 4.3: ENHANCE NOVA SCOTIA’S CAPACITY TO RESPOND TO INFLUENZA PANDEMICS.

Increasing Nova Scotia’s capacity to distribute and administer influenza vaccine each Fall produces greater capacity to respond to the inevitable influenza pandemic. This is especially important given the continued H1N1 pandemic.

Despite the uncertainty about the magnitude of the H1N1 pandemic, estimates of the health and economic impact remain important to aid public health policy decisions and guide pandemic planning. The estimated health impact for Nova Scotia is outlined in Appendix U59.

The Nova Scotia Health System Pandemic Influenza Plan outlines roles, responsibilities, and key activities of the health sector response before, during, and following an influenza pandemic. This plan continues to evolve as new information and evidence come forward, and as decisions are finalized or modified in the Canadian plan. It complements similar health services plans that are in development in each of the DHAs.

RECOMMENDED ACTIONS:

1. Ensure continued implementation and regular updating of the Nova Scotia Health System Pandemic Influenza Plan (including an evaluation component) as well as similar health services plans in each DHA.

2. Encourage the timely dissemination of updated information about pandemics (e.g. availability of vaccine, priority groups, required doses and public health messages) to all Nova Scotians, especially lung health stakeholders.

3. Enhance capacity for mass immunization clinics.
   - Since human resources may be limited, explore possibility of, for example, hiring students, retired nurses or physicians to fill voids during peak immunization periods.

GOAL 4.4: MAINTAIN AND EXPAND THE PROVINCIAL INFLUENZA AND IMMUNIZATION SURVEILLANCE SYSTEM.

Data collection methods for influenza immunizations in Nova Scotia are less than optimal53. A number of limitations exist, including the completeness of reporting, the potential for duplicate reporting, and misclassification. Stakeholders agree that Nova Scotia would benefit from an electronic immunization registry.

RECOMMENDED ACTIONS:

1. Enhance the Nova Scotia influenza and immunization surveillance system.

2. Explore the feasibility of expanding influenza and immunization surveillance to include immunization status of diverse populations such as individuals with chronic respiratory disease or Mi’kmaq Nova Scotians.
5.0 Strategic Action Area: Research, Surveillance and Knowledge Translation

Background

While high quality respiratory research is conducted in Nova Scotia\(^5\), available funding does not reflect the increasing burden of respiratory illness in the province. At least 200,000 Nova Scotsians likely suffer from respiratory disease\(^6\,\,58\) and Nova Scotia has the highest rate of death from respiratory disease in the country\(^6\,\,51\). As well, national data suggest that respiratory disease accounts for at least 6.5% of total health care costs in the province (not including health care costs attributable to lung cancer\(^58\)).

Innovative research is key to finding cures for respiratory illnesses and developing more effective disease prevention and management approaches. Every significant advance made in respiratory disease research increases the potential for major cost-savings to our health care system and economy. As well, every dollar distributed by the Nova Scotia Health Research Foundation through its funding programs attracts $7.40 in external funding\(^60\). To drive effective prevention and management of respiratory disease and its risk factors, enhanced, coordinated research efforts that are then translated into both improved health outcomes and economic benefits are required\(^58\).

GOAL 5.1: INCREASE FUNDING FOR RESPIRATORY HEALTH-RELATED RESEARCH IN NOVA SCOTIA TO REFLECT EVIDENCE OF NEED.

Since 2000, the Nova Scotia Health Research Foundation (NSHRF) has awarded 6.6% of its research budget to lung health-related research projects (see Appendix V for lung health-related research funding in Nova Scotia). Unfortunately, NSHRF’s budget ($4.9 million) has not increased since 2000. Taking inflation into account, NSHRF’s budget has actually decreased by more than 20% in the past 9 years\(^60\). In the same time, the prevalence of chronic respiratory disease is believed to have increased\(^1\). Under-funding has delayed progress in exploring such areas as the health effects of short term exposure to air contaminants, and the determinants of health that prevent some populations from accessing respiratory health services.

In order to attract and retain a new generation of talented young researchers and develop highly innovative scientists, we need to create a supportive setting that includes sustained funding, a stable infrastructure, and mid-career support. Funded research chairs are considered critical to the development of senior scientific support and as recruitment tools for international experts.

Stakeholders agree that increased and sustained respiratory health-related research funding is needed to curb the increasing burden of respiratory disease in Nova Scotia. Increased investment will translate into more effective treatment and prevention of respiratory disease in Nova Scotia, while realizing a significant cost savings to both our health care system, and the overall productivity of the provincial economy.

RECOMMENDED ACTIONS:

1 Increase the NSHRF budget annually to at least keep pace with inflation. This will play a vital role in supporting long-term, ‘up-stream’ fundamental research (e.g. basic sciences), and research that will impact on the greatest number of people (e.g. research on common risk factors/ co-morbidity such as addiction or the environment).

2 Promote NSHRF funding programs among respiratory health researchers (e.g. hold an annual meeting where respiratory health researchers can learn more about NSHRF grants).

3 Create a Nova Scotia Lung Health Research Fund by identifying new and existing funding resources/partners (e.g. private industry, other provinces).

4 Increase the number of studentships and post-doctoral awards to nurture young, talented respiratory scientists in Nova Scotia.
GOAL 5.2: MORE TARGETED RESPIRATORY HEALTH-RELATED RESEARCH IN NOVA SCOTIA.

In order to improve the value of respiratory health-related research in Nova Scotia it will be important to address respiratory-health related issues in a strategic and coordinated manner. Stakeholders agree that the research conducted by basic scientists in Nova Scotia is invaluable and that these researchers are consistently doing more with less60. As well, stakeholders insist that more research reflecting the priorities of target populations be conducted. Although it is known that certain risk factors and diseases are more common in some subpopulations, not nearly enough is known about the state of disease and the needs of at-risk groups.

Potential lung health-related research priorities could include:

- **Socioeconomic, cultural determinants of respiratory health.** Expand research that examines relationships between respiratory health and the needs of at-risk populations;
- **Nicotine replacement therapy.** It is seen as an area offering significant potential as a cessation approach, although more research is said to be needed regarding its effectiveness;
- **Impact of environment change on lung health;**
- **Impact of occupational air quality on lung health;**
- **Evaluative research of specific policies, interventions, campaigns, strategies (e.g. cost-effectiveness, health outcomes) and more broad evaluative research (e.g. how to institutionalize ideas and interventions);**
- **Survey to assess the impact of disease and the quality of life of those with chronic respiratory disease would add another dimension to data on disease surveillance and health outcomes;**
- **Examine barriers to enhanced knowledge transfer/exchange.** Explore how to best translate knowledge into meaningful action and results in Nova Scotia.

RECOMMENDED ACTION:

1 Create mechanisms whereby respiratory health research priorities are identified, using surveillance data and paying particular attention to the skills of Nova Scotia’s respiratory health-related researchers.

GOAL 5.3: REGULAR TOBACCO USE SURVEILLANCE IN AT-RISK SUBPOPULATIONS.

Surveillance is an iterative process that creates a continuous improvement loop by identifying future gaps and shedding light on the next steps and new priorities that must be addressed58. There are growing concerns about the prevalence of tobacco use among several subpopulations in Nova Scotia10. Given the high health and economic costs of tobacco use10, stakeholders point to the need for better surveillance to fully understand the links between smoking and high-risk subpopulations. This will enable policy makers to make informed decisions based on current trends (e.g. strategies and resources can be put into place for an optimal response).

RECOMMENDED ACTIONS:

1 Advocate for continued funding for the Canadian Tobacco Use Monitoring Survey, the Canadian Community Health Survey, and maintain ongoing funding for the Health of Mi’kmaq Survey. These surveys report on tobacco use rates in Nova Scotia, including regional disparities and rates among Nova Scotia’s Mi’kmaq population.

2 Regularly monitor, publish and make accessible tobacco use prevalence statistics in high-risk/priority populations, such as:

- Immigrants
- African and Mi’kmaq Nova Scotians
- Low income Nova Scotians
- Nova Scotians with mental illness
- Lesbian/Gay/Bisexual/Transgendered Nova Scotians
- Blue collar workers
- Pregnant and post-partum mothers
- Nova Scotians with chronic respiratory disease
GOAL 5.4: IMPROVE SURVEILLANCE OF CHRONIC RESPIRATORY DISEASES AS WELL AS HEALTH OUTCOMES.

The Lung Association of Nova Scotia commissioned the Nova Scotia Lung Disease Profile Project in February 2009. This was the first attempt to examine the burden of stakeholder-defined, priority respiratory diseases in the province. The Profile Project is not a surveillance report on prevalence of respiratory disease. Rather, it examines patterns of health care utilization for respiratory illnesses.

It is unclear how hospital management practices may affect hospitalization rates for COPD and asthma. The Public Health Agency of Canada is expected to recommend a common case definition for these two diseases in the near future. A recommended case definition will have a positive impact on future prevalence studies in this area.

Understanding and tracking respiratory disease, its trends, issues, risk factors, impacts and outcomes in the population over time, provides valuable information for policy and program development and for research on an ongoing basis. Stakeholders indicate that it is particularly important to develop a better understanding of trends in respiratory disease, and risk factors, among at-risk populations.

RECOMMENDED ACTIONS:

1. Coordinate annual compilation, analysis and timely dissemination of respiratory disease data for Nova Scotia, available through the Population Health Research Unit at Dalhousie University, in order to examine regional disparities in mortality and morbidity, access and quality of care and health care costs.

2. Create a mechanism to find and report on marginalized groups (e.g. ethnicity) at the time of health care collection, renewal and application. Currently there is no way of monitoring these in existing databases.

3. Add a link between provincial programs and existing registries to determine multiple risk factors and priorities for action. This would be in keeping with the province’s goal of increased integration.

4. Conduct a population survey that includes assessing lung function with spirometry. This would provide a more complete picture of the prevalence of asthma and COPD in the province.

5. Invest in better coordination and sharing of respiratory health, environmental and health economic data and analysis.
   - Populate the Public Health Agency of Canada’s Chronic Disease Infobase with data from Nova Scotia Lung Disease Profile Project (2009).
   - Share data from the Inventory of Nova Scotia’s Lung Health Assets (2009) and the Nova Scotia Lung Disease Profile Project (2009) with chronic disease stakeholders in Nova Scotia (e.g. with the Heart and Stroke Foundation for their online Health Directory).
GOAL 5.5: ENHANCE KNOWLEDGE TRANSLATION/EXCHANGE BETWEEN RESEARCHERS AND RESEARCH USERS.

Knowledge translation/exchange (KT/E) is the bridge between discovery and impact. The Nova Scotia Health Research Foundation (NSHRF) is a leader in coordinating and facilitating KT/E opportunities. They have a KT/E funding program and are encouraging KT/E methods application. For example, the NSHRF offers Cochrane Systematic Review Grants to Nova Scotia researchers and health care workers. Unfortunately, insufficient synthesis research, such as systematic reviews, is being done in Nova Scotia. This is especially disconcerting since policy makers can best utilize synthesis research in decision making. The ultimate goal of KT/E is to improve research value by disseminating research to a wide range of audiences, including the public, private industry, health care providers, policy makers and funders.

RECOMMENDED ACTIONS:

1. Invest in and promote the NSHRF KT/E Program among Nova Scotia researchers and health care workers (e.g. annual workshops). The purpose of the KT/E Program is to increase the sharing, utilization and further dissemination of health research knowledge that supports informed decision making. Measure the effectiveness of the KT/E Program.

2. Organize opportunities for stakeholders to gather and exchange knowledge of best practices, policies and programs.

3. Share data collected in the development of this Strategy.
Measuring Our Progress

The establishment of a provincially operated program, perhaps called Lung Care Nova Scotia, with a mandate to oversee the delivery of this Strategy is recommended. Such an agency could evaluate progress annually, with a multi-stakeholder advisory board, to ensure that resources are appropriately allocated to meet the evolving lung health needs of Nova Scotians.

It will be important to measure progress both in terms of Strategy activities that have been implemented and the results that have been achieved. It is recommended that this Strategy is evaluated by keeping track of the number of activities that have been put into practice to help achieve, or partially achieve, the goals identified within each strategic action area.

As well, the ability to profile and understand the occurrence and patterns associated with the many diseases collectively referred to as ‘respiratory diseases’ will be critical if this Strategy is to succeed. Having clearly defined measures will help ensure that this Strategy is achieving results. Initial measures in each of the five strategic action areas for improving respiratory health in Nova Scotia are outlined. It is recommended that a provincially operated program identify targets for each measure.

**Tobacco control**
**INITIAL MEASURE**
- Smoking rates (by gender, age group, income level, urban/rural status, DHA, race/ethnicity and marginalized groups)

**Air quality**
**INITIAL MEASURES**
- Nova Scotia Power Inc. green house gas, sulphur dioxide and nitrogen oxides emissions
- Proportion of Nova Scotians regularly exposed to second-hand smoke

**Chronic disease**
**INITIAL MEASURES**
- Spirometry use
- Number of established asthma/COPD educators/coordinators producing programs per DHA
- Number of pulmonary rehabilitation programs in Nova Scotia
- Initiation of a CPAP/BiPAP funding program in Nova Scotia
- Respiratory disease-related physician contacts, hospitalization-rates and deaths, by age group, gender, urban/rural status, income quartile, DHA, race/ethnicity and marginalized groups. At this point, data limitations preclude us from being able to report on the prevalence of respiratory disease.

**Infectious disease**
**INITIAL MEASURES**
- Influenza immunization rates (especially among health care workers, seniors and those with underlying medical conditions e.g. chronic respiratory disease)
- Number of hospitals vaccinating patients

**Research, surveillance and knowledge translation**
**INITIAL MEASURES**
- Nova Scotia Health Research Foundation funding
- Respiratory-health related research funding
- Enhanced respiratory disease and risk factor surveillance (especially among marginalized groups)
- Respiratory health-related knowledge translation grants/activities in Nova Scotia
Conclusion

This document is the creation of hundreds of stakeholders representing many communities, perspectives and areas of expertise. The Strategy’s vision, mission and principles embody Nova Scotia’s respiratory stakeholders’ collective direction for a coordinated response to addressing respiratory disease in Nova Scotia. The goals and recommended actions identify their collective priorities for implementing this response.

This unprecedented collaborative effort among lung health stakeholders will facilitate the creation of and support of new partnerships, networks and knowledge sharing among respiratory health stakeholders across the province. As a living process, this Strategy will continue to be responsive to the evolving needs, research, and knowledge of stakeholders in Nova Scotia, moving forward in the context of continuous evaluation and quality improvement. This Strategy should be reviewed annually to reflect on the scope of lung disease in the province as well as on the evolving needs of Nova Scotians at risk of or living with lung disease.

Among other things, this document highlights respiratory health disparities among Nova Scotia’s population and subpopulations as well as significant gaps in the availability of culturally relevant programs and messages specifically targeting marginalized populations. It will be important that this Strategy elicits immediate change in order to begin to bridge the health gap between the general Nova Scotia population and marginalized groups.

It was our intent to create an evidence-based, ‘Made in Nova Scotia’ action plan to guide lung health within our province. With the delivery of this document this project is now complete. For this extraordinary effort to serve our province it is essential that lung health stakeholders across Nova Scotia now turn the focus towards implementation. The direction is now clear. Leadership and accountability must now be established to ensure this effort has a positive and lasting impact on the health of Nova Scotians.
Leading.
Acting.
Together.

When you can’t breathe, nothing else matters.
Appendix

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### Appendix A: Stakeholders in the development of The Nova Scotia Lung Health Strategy.

#### Steering Committee Members

<table>
<thead>
<tr>
<th>Name</th>
<th>Selected Affiliation</th>
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<tbody>
<tr>
<td>Angela Birch</td>
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<td>Lung Association of Nova Scotia</td>
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<td>Dr. Michael Johnston</td>
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<td>Shona Kinley</td>
<td>Novartis Pharmaceuticals Canada Inc.</td>
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<td>Nova Scotia Department of Community Services</td>
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<td>Capital District Health Authority</td>
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<td>Dr. Wade Watson</td>
<td>IWK Health Center</td>
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#### Consultative Stakeholders

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<th>Name</th>
<th>Selected Affiliation</th>
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<tbody>
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<td>Barb Bryden</td>
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<td>Michael Derosenroll</td>
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<td>Peggy Dunbar</td>
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<td>Dr. David Elliot</td>
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<td>Scott Gillis</td>
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<td>Donna Haverstock</td>
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<tr>
<td>Aimee Lester</td>
<td>Colchester East Hants District Health Authority</td>
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<td>Allen McAvoy</td>
<td>Heart and Stroke Foundation, Nova Scotia</td>
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<tr>
<td>Sharon MacIntosh</td>
<td>Smoke-Free Nova Scotia</td>
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<tr>
<td>Ryan McCarthy</td>
<td>Nova Scotia Health Research Foundation</td>
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<tr>
<td>Dee Mombourquette</td>
<td>Nova Scotia Department of Health Promotion and Protection</td>
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<td>Catherine Shepherd</td>
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<tr>
<td>Doug Steeves</td>
<td>Environment Canada</td>
</tr>
<tr>
<td>Dawn Stegen</td>
<td>Physical Activity, Sport and Recreation, Nova Scotia Department of Health Promotion and Protection</td>
</tr>
</tbody>
</table>

#### Asset Map Informants

Informants include VPs of Acute/Clinical Care, VPs of Community Health, Directors of Public Health, Directors of Rehabilitation Services, Medical Officers of Health and Tobacco/Chronic Disease Prevention Coordinators in each DHA.
**Appendix B: Timeline of The Nova Scotia Lung Health Strategy milestone activities.**

<table>
<thead>
<tr>
<th>Date</th>
<th>Milestone</th>
</tr>
</thead>
<tbody>
<tr>
<td>November 2007</td>
<td>The Lung Association of Nova Scotia (LANS) approached the Department of Health (DOH) regarding the need for a provincial lung health strategy. LANS invited the Minister of Health to partner in this effort.</td>
</tr>
<tr>
<td>December 2007</td>
<td>LANS presented a plan to develop a Nova Scotia Lung Health Strategy to senior leaders within the DOH.</td>
</tr>
<tr>
<td>February 2008</td>
<td>Partnership formed between LANS and the DOH.</td>
</tr>
<tr>
<td>February 2008</td>
<td>Provincial Lung Health Stakeholder Engagement Meeting and Patient Forum were staged in Halifax. Forty key stakeholders were brought together to review the status of the National Lung Health Framework and to consider the need to develop a “Made in Nova Scotia” action plan to guide lung health activity within the province. This need was recognized and unanimously supported.</td>
</tr>
<tr>
<td>February 2008</td>
<td>Pat Lee, CEO, Pictou County Health Authority and Louis Brill, President and CEO, LANS, were named The Nova Scotia Lung Health Strategy co-chairs.</td>
</tr>
<tr>
<td>March 2008</td>
<td>Steering Committee members were identified and recruited.</td>
</tr>
<tr>
<td>March 2008</td>
<td>Project plan approved by LANS, DOH.</td>
</tr>
<tr>
<td>June 2008</td>
<td>First Steering Committee meeting.</td>
</tr>
<tr>
<td>September 2008</td>
<td>Second Steering Committee meeting.</td>
</tr>
<tr>
<td>November 2008</td>
<td>Asset Mapping process begins.</td>
</tr>
<tr>
<td>November 2008</td>
<td>Working Group meetings, stakeholder engagement.</td>
</tr>
<tr>
<td>February 2009</td>
<td>Nova Scotia Lung Disease Profile Project commissioned by LANS.</td>
</tr>
<tr>
<td>May 2009</td>
<td>Third Steering Committee meeting.</td>
</tr>
<tr>
<td>May 2009</td>
<td>Inventory of Nova Scotia’s Lung Health Assets completed by LANS.</td>
</tr>
<tr>
<td>June 2009</td>
<td>Nova Scotia Lung Disease Profile Project completed by Population Health Research Unit (PHRU) Dalhousie University.</td>
</tr>
<tr>
<td>August–October 2009</td>
<td>Strategy document development and subject matter expert review.</td>
</tr>
<tr>
<td>November 2009</td>
<td>Fourth Steering Committee meeting. Consensus reached on four of five strategic action areas.</td>
</tr>
<tr>
<td>December 2009</td>
<td>Draft three of strategy distributed to Steering Committee for review and approval.</td>
</tr>
<tr>
<td>February 2010</td>
<td>Strategy presentation to DOH Senior Leadership Team and District Health Authority CEO council.</td>
</tr>
<tr>
<td>TBA</td>
<td>Strategy launch and release.</td>
</tr>
</tbody>
</table>
### Appendix C: Diverse Communities in Nova Scotia by District Health Authority

The largest population outside Halifax is shaded.

#### Diverse Communities in Nova Scotia by District Health Authority

<table>
<thead>
<tr>
<th>DHA</th>
<th>First Nations</th>
<th>Francophone Canadians*</th>
<th>Black*</th>
<th>Chinese</th>
<th>South Asian</th>
<th>Arabic</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 SSDHA</td>
<td>980</td>
<td>585</td>
<td>420</td>
<td>95</td>
<td>40</td>
<td>75</td>
</tr>
<tr>
<td>2 SWNDHA</td>
<td>2,095</td>
<td>13,085*</td>
<td>1,755*</td>
<td>80</td>
<td>105</td>
<td>85</td>
</tr>
<tr>
<td>3 AVDHA</td>
<td>985</td>
<td>1635</td>
<td>1,125</td>
<td>160</td>
<td>25</td>
<td>105</td>
</tr>
<tr>
<td>4 CEHHA</td>
<td>1,390</td>
<td>835</td>
<td>700</td>
<td>78</td>
<td>192*</td>
<td>116</td>
</tr>
<tr>
<td>5 CHA</td>
<td>165</td>
<td>400</td>
<td>345</td>
<td>25</td>
<td>35</td>
<td>-</td>
</tr>
<tr>
<td>6 PCHA</td>
<td>665</td>
<td>475</td>
<td>520</td>
<td>95</td>
<td>25</td>
<td>35</td>
</tr>
<tr>
<td>7 GASHA</td>
<td>1,070</td>
<td>3960</td>
<td>640</td>
<td>75</td>
<td>40</td>
<td>25</td>
</tr>
<tr>
<td>8 CBDHA</td>
<td>5,310*</td>
<td>4235</td>
<td>970</td>
<td>185*</td>
<td>90</td>
<td>125*</td>
</tr>
<tr>
<td>9 CDHA</td>
<td>3,570</td>
<td>11,290</td>
<td>13,365</td>
<td>2,485</td>
<td>2,345</td>
<td>3,030</td>
</tr>
</tbody>
</table>

* This table includes the 5 most populous groups in Nova Scotia.

*~ The largest population outside of Halifax is shaded.

~ Francophone Canadians includes anyone who identifies any combination of French and English as first language still understood or current language.

© Statistics Canada Census uses the terminology Black, in this document we use African Canadian.
Contact The Lung Association of Nova Scotia for the full report.

EXECUTIVE SUMMARY
This inventory report attempts to answer the question of “who is doing what and where” with respect to respiratory health in Nova Scotia. During the winter and spring of 2009 The Lung Association of Nova Scotia staff collected information about respiratory health services across Nova Scotia. This report presents the results of that data collection process.

The Asset Map as it currently exists represents a snapshot in time. Given the appropriate support to keep it updated, the Asset Map has the potential to become a significant knowledge portal that will help stakeholders, especially policy makers, answer key questions about respiratory health in Nova Scotia.

The Asset Map development process has itself been highly informative, leading to a number of important observations and conclusions.

1 The top 5 priorities that key informants who provided information for this data collection process think should be addressed by a provincial lung health strategy are (in order of number of times referenced): tobacco use (20), indoor and outdoor air quality (9), early detection and screening (9), health provider education (8), and chronic disease self-management (6).

2 Key informants recommend that funding for nicotine replacement therapy (NRT) be expanded beyond those who choose to partake in group counseling and that pharmacotherapy be funded as NRTs are not always tolerated. Respondents stress the importance of increasing investment in the provincial Tobacco Control Strategy and implementation of strengthened legislation to curb tobacco use. Also noted is a lack of consistency among school-based tobacco prevention and cessation programs in Nova Scotia.

3 Key informants indicate that there is a significant gap in the availability of culturally competent programs and messaging and a lack of programs and messages specifically targeting vulnerable populations.

4 Air quality is seen as one of the most important opportunities on the respiratory health horizon because of growing public concern about pollution and climate change. Respondents see continued air quality monitoring as important (there are 5 Air Quality Health Index monitoring stations in Nova Scotia) and suggest that it is important to implement new legislation to improve air quality in Nova Scotia.

5 When key informants identified gaps, wait times for screening and disease management were cited most often. Other gaps that were identified include: lack of coordination of services, self management programs, spirometry testing, access to services in rural areas and lack of detection tools for general practitioners.

continued on next page
There does not appear to be a coordinated approach to ongoing professional development related to respiratory health promotion and care. As well, public awareness of respiratory disease and proper management is seen as quite low.

The greatest challenges that need to be overcome in order to address the priority respiratory health issues are (in order of number of times referenced): resources/funding (20), leadership and coordination (7), and political will (5). Rural access to care and the current focus on an acute care versus a chronic disease model were also identified as challenges that need to be overcome.

A key issue for stakeholders is whether resources are being used optimally or whether efforts are being duplicated. Knowing what others are doing or what is being done elsewhere is seen as essential for effective and efficient management. In this regard, The Nova Scotia Lung Health Strategy and the Asset Map initiatives are seen to be important drivers for shared information, knowledge and collaboration.

In Nova Scotia there is no central agency to help coordinate and support the management of lung health services, and therefore, there is no consistent mechanism for tracking information about programs and services across the province. Collecting the information presented in this report represents a significant amount of effort expended on the part of the Lung Association of Nova Scotia, and keeping the inventory up to date will not be feasible without the creation of a permanent lung health coordinating mechanism within the health system, such as currently exists for cancer, cardiovascular disease and diabetes. The need for such a mechanism was highlighted by several respondents who indicated that lack of leadership and coordination is a major challenge in addressing lung health priorities.

While there are some gaps in the Asset Map (38 out of 54, or 70% of the questionnaires were completed), this report represents the first attempt to comprehensively collect data about lung health assets in the province, and it should be a useful tool for identifying priorities for the evolving provincial lung health strategy.
Appendix E: Total Emissions by Province and Economic Sector. Emissions from electricity generation in Nova Scotia represent the greatest contribution to total emissions of any province or territory (kt = kilotonnes).

Figure 3-2 Annual maximum one-hour average O$_3$ concentration, 2000-2007

Appendix G: The Air Quality Health Index (AQHI). The AQHI relates outdoor air quality to health risk and is measured on a scale ranging from 1 to 10+. As shown, the higher the number, the greater the risk21. You can find the AQHI at www.airhealth.ca.

<table>
<thead>
<tr>
<th>Health Risk</th>
<th>Air Quality Health Index</th>
<th>Health Messages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>1 – 3</td>
<td>At-risk Population *</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Enjoy your usual outdoor activities.</td>
</tr>
<tr>
<td>Moderate</td>
<td>4 – 6</td>
<td>Consider reducing or rescheduling strenuous activities outdoors if you are experiencing symptoms.</td>
</tr>
<tr>
<td>High</td>
<td>7 – 10</td>
<td>Reduce or reschedule strenuous activities outdoors. Children and the elderly should also take it easy.</td>
</tr>
<tr>
<td>Very High</td>
<td>Above 10</td>
<td>Avoid strenuous activities outdoors. Children and the elderly should also avoid outdoor physical exertion.</td>
</tr>
</tbody>
</table>

* For example, people with existing respiratory or cardiovascular conditions, young children, the elderly, and those physically active outdoors.
Appendix H: Ambient Air Quality Monitoring Stations in Nova Scotia.
Appendix I: Number of Respiratory Disease-Related Physician Visits in Nova Scotia. This table identifies the average number of Nova Scotians who were in contact with a physician for a respiratory condition one or more times during fiscal years 2001–2005. COPD, asthma and lung cancer were the three most common respiratory diseases for which individuals were in contact with physicians during years 2001–2005.

<table>
<thead>
<tr>
<th>Disease Category</th>
<th>Underlying Cause</th>
<th>Contributing Cause</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>COPD*</td>
<td>61,762</td>
<td>458</td>
<td>62,220</td>
</tr>
<tr>
<td>Asthma</td>
<td>44,934</td>
<td>627</td>
<td>45,561</td>
</tr>
<tr>
<td>Lung Cancer</td>
<td>2,617</td>
<td>11</td>
<td>2,628</td>
</tr>
<tr>
<td>OLD**</td>
<td>807</td>
<td>8</td>
<td>815</td>
</tr>
<tr>
<td>Sleep Apnea***</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>110,120</strong></td>
<td><strong>1,104</strong></td>
<td><strong>111,224</strong></td>
</tr>
</tbody>
</table>

*Chronic Obstructive Pulmonary Disease  
**Occupational Lung Disease  
***Data not available

It was possible for a physician to code visits for respiratory disease as a contributing diagnosis with reference to the underlying cause of diagnosis. However, generally visits with a physician for a respiratory illness were coded in the underlying cause of visitation.
Appendix J: Leading Causes of Death in the United States. Of the six leading causes, only COPD has been increasing steadily since 1970\textsuperscript{63}. The trends illustrated here are similar to those in Canada and Nova Scotia.
Appendix K: Age Adjusted Rate of Asthma-Related Hospitalization by District Health Authority (DHA) (2005) (95% confidence intervals)²⁶.
Appendix L: Annual Rate of Asthma-Related Hospitalization by Age Group and Urban/Rural Status (2001–2005) (95% confidence interval)\textsuperscript{26}.
Appendix M: Rate of Asthma for On-Reserve Mi’kmaq versus Non-Aboriginal Canadian Children (0–12 years) (adapted from The Health of the Nova Scotia Mi’kmaq Population, 2007)\textsuperscript{64}.
Appendix N: Age Adjusted Rate of COPD-Related Hospitalization by Urban/Rural Status (2005) (95% confidence interval)²⁶.
Appendix O: Age Adjusted Rate of COPD-Related Hospitalization by Median Income Quartile (2005) (95% confidence interval)\cite{note1}. Income quartile 1 = 0 to ~$30,000; 2 = ~$30,001 to ~$37,000; 3 = ~$37,001 to ~$46,000; 4 = $46,001+. According to the 2001 Canadian Consensus, the lowest median household incomes were in the Cape Breton and Guysborough-Antigonish Straight Health Authorities.
Appendix P: Age Adjusted Rate of COPD-Related Hospitalization by DHA (2005) (95% confidence interval).
**Appendix Q:** Workers’ Compensation Board of Nova Scotia (WCB), Occupational Lung Disease Compensation Data 2005–08 (2009), by Industry Group.

<table>
<thead>
<tr>
<th>Industry Group</th>
<th>Total Paid (to June 30/09)</th>
<th># of Claims</th>
<th>Average Health Care Paid</th>
</tr>
</thead>
<tbody>
<tr>
<td>MANUFACTURING</td>
<td>$144,997.24</td>
<td>119</td>
<td>$1,218.46</td>
</tr>
<tr>
<td>MINING/QUARRIES/OIL WELLS</td>
<td>$138,354.59</td>
<td>232</td>
<td>$596.36</td>
</tr>
<tr>
<td>GOVERNMENT SERVICES</td>
<td>$138,160.69</td>
<td>50</td>
<td>$2,763.21</td>
</tr>
<tr>
<td>CONSTRUCTION</td>
<td>$73,612.94</td>
<td>51</td>
<td>$1,443.39</td>
</tr>
<tr>
<td>LOGGING/FORESTRY</td>
<td>$51,718.74</td>
<td>4</td>
<td>$12,929.69</td>
</tr>
<tr>
<td>HEALTH/SOCIAL SERVICES</td>
<td>$23,887.36</td>
<td>7</td>
<td>$3,412.48</td>
</tr>
<tr>
<td>OTHER SERVICES</td>
<td>$10,864.59</td>
<td>7</td>
<td>$1,552.08</td>
</tr>
<tr>
<td>COMMUNICATION/UTILITIES</td>
<td>$9,705.25</td>
<td>12</td>
<td>$808.77</td>
</tr>
<tr>
<td>RETAIL TRADE</td>
<td>$8,846.06</td>
<td>7</td>
<td>$1,263.72</td>
</tr>
<tr>
<td>WHOLESALE TRADE</td>
<td>$7,763.99</td>
<td>7</td>
<td>$1,109.14</td>
</tr>
<tr>
<td>TRANSPORTATION/STORAGE</td>
<td>$1,336.07</td>
<td>6</td>
<td>$222.68</td>
</tr>
<tr>
<td>UNKNOWN</td>
<td>$1,300.00</td>
<td>2</td>
<td>$650.00</td>
</tr>
<tr>
<td>REAL ESTATE/INSURANCE AGENTS</td>
<td>$102.42</td>
<td>2</td>
<td>$51.21</td>
</tr>
<tr>
<td>BUSINESS SERVICES</td>
<td>$50.00</td>
<td>1</td>
<td>$50.00</td>
</tr>
<tr>
<td>FISHING/TRAPPING</td>
<td>$50.00</td>
<td>1</td>
<td>$50.00</td>
</tr>
<tr>
<td><strong>GRAND TOTAL</strong></td>
<td><strong>$610,749.94</strong></td>
<td><strong>508</strong></td>
<td><strong>$1,202.26</strong></td>
</tr>
</tbody>
</table>
**Appendix R:** Workers’ Compensation Board of Nova Scotia (WCB), Occupational Lung Disease Compensation Data 2005–08 (2009), by Injury.

<table>
<thead>
<tr>
<th>Industry Group</th>
<th>Total Health Care Paid (to June 30/09)</th>
<th># of Claims</th>
<th>Average Health Care Paid</th>
</tr>
</thead>
<tbody>
<tr>
<td>OCC DIS*-ASBESTOS EXPOSURE</td>
<td>$173,356.03</td>
<td>167</td>
<td>$1,038.06</td>
</tr>
<tr>
<td>PNEUMOCONIOSIS (ALL pneumo categories combined)</td>
<td>$114,659.80</td>
<td>216</td>
<td>$1,225.61</td>
</tr>
<tr>
<td>OCC DIS- OCCUPATIONAL CANCER</td>
<td>$87,383.07</td>
<td>16</td>
<td>$5,461.44</td>
</tr>
<tr>
<td>OCC DIS-MESOTHELIO-MA (ASBESTOS)</td>
<td>$68,861.20</td>
<td>9</td>
<td>$7,651.24</td>
</tr>
<tr>
<td>OCC DIS-FIRE FIGHTER - CANCER</td>
<td>$53,662.43</td>
<td>15</td>
<td>$3,577.50</td>
</tr>
<tr>
<td>OCC DIS-INDUSTRIAL BRONCHITIS</td>
<td>$42,424.74</td>
<td>44</td>
<td>$964.20</td>
</tr>
<tr>
<td>OCC DIS-ASTHMA OCCUPATIONAL</td>
<td>$33,504.36</td>
<td>15</td>
<td>$2,233.62</td>
</tr>
<tr>
<td>OCC DIS-LUNG/EXPOSURE CHM/TXNS</td>
<td>$22,209.92</td>
<td>20</td>
<td>$1,110.50</td>
</tr>
<tr>
<td>OCC DIS-SILICOSIS</td>
<td>$14,688.39</td>
<td>6</td>
<td>$2,448.07</td>
</tr>
<tr>
<td>GRAND TOTAL</td>
<td>$610,749.94</td>
<td>508</td>
<td>$1,202.26</td>
</tr>
</tbody>
</table>

*Occ Dis = Occupational Disease*
Appendix S: COPD Hospitalization Rates, by Province. Despite declining smoking rates in Canada, COPD hospitalization rates are on the rise. Flare-ups are the most frequent cause of medical visits, hospital admissions and death among patients with COPD. Up to 50% are caused by respiratory viruses, mainly the common cold; the remainder are thought to be due to bacterial infection\textsuperscript{22}. 

![COPD Hospitalization Rates per 100,000 by Province (Adults 55+)](chart.png)

Source: Canadian Institute for Health Information, 2001
Appendix T: Pulmonary Rehabilitation Programs in Nova Scotia.
Appendix U: Estimated Number of Cases by Outcome for an Influenza Pandemic of Mild to Moderate Severity.

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Attack Rate 15% (mean number)</th>
<th>Attack Rate 35% (mean number)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Death</td>
<td>563</td>
<td>1,313</td>
</tr>
<tr>
<td>Hospitalization with recovery</td>
<td>1,407</td>
<td>3,283</td>
</tr>
<tr>
<td>Outpatient care</td>
<td>70,341</td>
<td>164,130</td>
</tr>
<tr>
<td>Ill, no formal care</td>
<td>68,372</td>
<td>159,535</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>140,683</strong></td>
<td><strong>328,261</strong></td>
</tr>
</tbody>
</table>
### Appendix V: Annual Rate of Asthma-Related Hospitalization by Age Group and Urban/Rural Status (2001–2005)

(95% confidence interval)

<table>
<thead>
<tr>
<th>Funding Agency</th>
<th>2000 – 2009</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Funds for health-related research ($)</td>
</tr>
<tr>
<td><strong>NSHRF</strong></td>
<td></td>
</tr>
<tr>
<td><strong>1. Lung</strong></td>
<td></td>
</tr>
<tr>
<td>2. Cancer</td>
<td>1) 1,139,817</td>
</tr>
<tr>
<td>3. Cardiovascular</td>
<td>3,998,943</td>
</tr>
<tr>
<td>4. Diabetes</td>
<td>3) 765,339</td>
</tr>
<tr>
<td></td>
<td>4) 101,8477</td>
</tr>
<tr>
<td><strong>CIHR</strong></td>
<td></td>
</tr>
<tr>
<td>(‘99 – present)</td>
<td></td>
</tr>
<tr>
<td><strong>1. Lung</strong></td>
<td></td>
</tr>
<tr>
<td>2. Cancer</td>
<td>1) 7,231,724</td>
</tr>
<tr>
<td>3. Cardiovascular</td>
<td>18,821,584</td>
</tr>
<tr>
<td>4. Diabetes</td>
<td>3) 13,319,057</td>
</tr>
<tr>
<td></td>
<td>4) 4,467,948</td>
</tr>
</tbody>
</table>

**Word search terms:**
Lung, COPD, Respiratory, Pulmonary, Breath, Ventilation, Cystic Fibrosis, Inflammation
(just ‘lung’ for CIHR)
Cancer
Cardiovascular
Diabetes
References


