



STAFF REPORT ACTION REQUIRED

Pilot Testing the New Air Quality Health Index in Toronto

Date:	April 24, 2007
To:	Board of Health
From:	Medical Officer of Health
Wards:	All wards
Reference Number:	

SUMMARY

The Air Quality Health Index (AQHI) is a new national health based index that will help Canadians understand how to protect their health from air pollution. Toronto has been selected as a pilot site for implementation of the AQHI. Health Canada is providing funding of \$200,000 to Toronto Public Health in 2007-08 to inform the community about the AQHI and evaluate its effectiveness. The Medical Officer of Health recommends that City Council amend the 2007 Toronto Public Health budget to reflect this new funding from Health Canada.

Implementation of the AQHI will also benefit Toronto by stimulating public support for bold action by city government and its agencies, boards and commissions. The AQHI supports the approach and initiatives proposed in the Mayor's *A Change is in the Air* report and the City's resulting *Climate Change and Clean Air Action Plan*.

RECOMMENDATIONS

The Medical Officer of Health recommends that:

1. the 2007 Toronto Public Health Operating Budget be increased by \$160,000 gross and \$0 net to reflect funding from Health Canada for the launch of the Air Quality Health Index Toronto Pilot Program;
2. the Board of Health forward this report to the Budget Committee for consideration; and
3. the Board of Health forward this report to the Toronto Environment Office for information.

Financial Impact

Source of Funds	Gross	Net
One-time funding from Health Canada for AQHI Toronto Pilot Program – 2007	\$160,000	\$0
One-time funding from Health Canada for Completion of Evaluation of the AQHI – 2008	\$40,000	\$0
Total Funding	\$200,000	\$0
Additional position		1

The Deputy City Manager and Chief Financial Officer has reviewed this report and agrees with the financial impact information.

DECISION HISTORY

In November 2001, the Board of Health adopted a staff report called *Condition Critical: Fixing Our Smog Warning System – Summary Report*

<http://www.toronto.ca/legdocs/2001/agendas/committees/hl/hl011126/it007.pdf>.

Recommendation 4 of that report requested that the federal Minister of the Environment ensure that the proposed Air Quality Index (AQI) for Canada include a health effects warning system that accurately conveys the health risk associated with air pollution for both the general population and more sensitive sub-populations.

In July 2004, the Board of Health adopted a staff report entitled *Agenda for Action on Air and Health*

<http://www.toronto.ca/legdocs/2004/agendas/committees/hl/hl040712/it001b.pdf>.

Recommendation 4g of that report requested that the Ontario Minister of the Environment support and work with the federal government to develop an improved AQI smog messaging system that reflects the combined health effects of simultaneous exposure to key air pollutants. This recommendation was adopted by City Council.

ISSUE BACKGROUND

The public needs an accurate warning system to know when air pollution levels are predicted to pose a health risk so that individuals can take action to minimize exposure. The current provincial Air Quality Index (AQI) reflects air quality relative to provincial standards, not health risk. The public's health is harmed at pollution levels below existing air standards. A new national communication tool, known as the Air Quality Health Index (AQHI) is now available to enable people to better protect themselves and people in their care from the harmful effects of air pollution.

COMMENTS

Air pollution in Toronto continues to pose a significant health risk, contributing to about 1,700 premature deaths and 6,000 hospitalizations each year. It also results in increased rates of chronic bronchitis, emergency room visits and asthma symptoms, affecting tens of thousands of people each year. It is of concern that the 20-year trend for key pollutants, such as particulates, nitrogen dioxide and ozone, is not showing a consistent decline in Toronto. In fact, ozone levels have been increasing in recent years.

Toronto is a significant generator of air pollution from the burning of fossil fuels through local activities, such as transportation, heating and cooling buildings, and industrial processes. In addition, Toronto residents are exposed to high levels of regional and transboundary pollutants, particularly from coal-burning power plants in south-western Ontario and the U.S. Midwest.

Major air quality improvements will take time to implement. Maintaining a strong focus on pollution reduction measures is essential. It is also important, however, to provide the public with the best information possible on how air-related health risk changes from day to day, and what they can do to better protect themselves during peak pollution periods.

Development and Pilot Testing of the National AQHI

At Toronto's 2001 Smog Summit, the federal Environment Minister committed to leading an initiative to develop a health risk-based AQI, later known as the AQHI. The AQHI was developed by Environment Canada and Health Canada through a collaborative multi-stakeholder process involving provinces, municipalities and environmental and health non-governmental organizations (NGOs). Toronto Public Health staff participated throughout the process.

The vision for the AQHI initiative is to develop a nationally consistent index that allows residents to respond to air quality conditions no matter where they live or visit. Once fully implemented, it will be possible to compare health risk from the air in communities throughout Canada. Currently, there are differences in AQI reporting systems between provinces.

Development of the AQHI was a major undertaking and has many components. The final formula to generate AQHI values was based on extensive research and peer review. The new formula integrates health risk from three indicator pollutants – ozone, PM_{2.5} and NO₂. As such, the AQHI reflects a health response to local, regional and transboundary sources of pollution.

One of the components of critical importance is the ability to forecast (predict) AQHI values so that the public has sufficient notice to plan their activities. This required the development of additional forecast models and forecaster skills for issuing a multi-pollutant prediction, especially for nitrogen dioxide (NO₂).

Another important component of the AQHI program has been the development of the health messaging, visual display and presentation of information. This was done through stakeholder workshops, extensive focus group testing and public opinion surveys to understand how best to convey information to the public.

In 2005, the AQHI was pilot tested in the interior of British Columbia through an independent website under the branding *AirPlay*. In 2006, the pilot was expanded to other parts of British Columbia, including Vancouver. The Nova Scotia government supported a pilot in Halifax, Dartmouth and Sydney in 2006. The early pilots enabled refinement of the AQHI visual display and identified successful outreach mechanisms.

In all the locations tested, the public and health professionals viewed the AQHI as a helpful tool to reduce exposure to air pollution. However, because the pilot communities tested so far have better and less variable air quality than Toronto, the pilots were not able to assess community response in more polluted air sheds.

How the AQHI Works

The AQHI is a simple, intuitive 10-point scale that shows the level of health risk associated with local air quality. The bigger the AQHI value the greater the risk to health. In addition, the AQHI provides the descriptive terms ‘low’ (0–3), ‘moderate’ (4–6), ‘high’ (7–10) and ‘very high’ (above 10) health risk to accompany the 10-point scale. Pilot testing reveals that people prefer both an AQHI number value and a health risk category when assessing health risk and what actions to take.

AQHI values are posted on the Environmental Canada Weather Office website, where they are updated hourly and forecasts are issued twice daily. When the AQHI pilot starts in Toronto, the Medical Officer of Health will use media events, social marketing techniques and limited advertising to inform the public and community partners of the AQHI, particularly when the AQHI values are 7 or greater, consistent with high health risk.

People differ in their responses to the same level of air pollution, depending on age, underlying medical conditions, and duration or intensity of physical activity. The AQHI allows people to ‘self calibrate’. In other words, people should pay attention to how they feel and whether they have symptoms at specific AQHI values, especially while being very active outdoors. By self calibrating, individuals can reduce their exposure to air pollution at AQHI values that they notice are affecting them.

The AQHI provides separate guidance for the ‘at-risk’ and ‘general population’. The ‘at-risk’ population includes children, seniors and people of all ages with known medical conditions such as breathing or heart problems. The precautionary messages vary with health risk category. At low health risk levels, people are encouraged to be active outside. As the risk level increases, or as symptoms appear with self-calibration, people are advised to reduce physical exertion outdoors or reschedule activities to times when the AQHI is lower.

Physical exertion can be reduced by lowering the intensity or duration of activity and by taking more rest breaks. Strenuous physical activity results in a much higher intake of air pollutants than resting since the rate of inhalation is several times higher. Also, by breathing through the mouth during intense activity, the protective filtering effect of breathing through the nose is by-passed.

The AQHI has many features that make it a more health protective, flexible and effective tool than the current AQI. The AQHI provides a more accurate indication of the combined health risk from multiple air pollutants. It provides health protective advice that is linked with individual sensitivity rather than providing generic advice to everyone. It also promotes physical activity, especially at low pollution levels, and in modified form at higher AQHI levels, as appropriate.

Toronto's AQHI Pilot Program

Toronto Public Health is leading the implementation of an 18-month pilot test scheduled to start in July 2007. This is contingent on the ability of Environment Canada to host the AQHI website by that time. The plan is to implement the AQHI program in Toronto in 2007 and then expand it to the Greater Toronto Area in 2008. Funding from Health Canada will be directed to education and outreach activities, and evaluation of the pilot.

A national "branding" of the AQHI and supporting visuals and graphics will link and provide consistency between cities and towns who are part of the national pilot. A promotion and marketing strategy will provide clear, concise and meaningful messages to the public, based on sound health and atmospheric science. While the public needs to be informed and educated about the AQHI consistently in cities and towns across the country, for Toronto, the message must reflect the ethnic diversity of the city.

The role of Toronto Public Health in the national pilot will be to make Torontonians aware of the AQHI and to help them use it to make informed decisions that will lead to behaviour changes. TPH will develop communications tools including, but are not limited to, web-based information, fact sheets, brochures, and public service announcements for radio.

The Toronto Public Health website will link to the Environment Canada Weather Office. The Public Health website will also link to other city websites on climate change and air quality. The City's telephone services, Toronto Health Connection and Access Toronto/311 will also provide information about the AQHI. Advertisements will inform the community about the new index.

A key component of the Toronto pilot will be the partnership with community organizations to reach target populations, including children, seniors, and people of all ages with known heart and breathing problems, and diverse ethno-racial communities. Local business associations, community groups, health agencies and environmental organizations will be invited to learn about the AQHI and to spread the word to their

client groups. Toronto Public Health will also work with the Clean Air Partnership to coordinate the outreach activities, including community presentations and events.

The Toronto pilot will be evaluated to determine whether further refinement of the national program is warranted. Evaluation components include assessing community groups' involvement in the program and residents' awareness of the new air quality health index.

The Provincial AQI and Calling “Alerts”

During the AQHI pilot testing phase in Toronto, the Ontario Ministry of Environment (OMOE) will continue to run the AQI throughout Ontario. As part of the AQI system, the OMOE will issue smog advisories (also known as smog alerts) as usual when the AQI is expected to be 50 or higher on a regional basis.

The Medical Officer of Health will continue to issue smog alerts in Toronto so that the City's corporate Smog Alert Response Protocol can be activated. Based on historical analysis, it is expected that the number of high health risk days will be (somewhat) higher than the number of smog alert days.

The AQHI, as currently constructed, does not have a threshold value at which a health or smog alert is triggered. It is important during pilot testing to avoid adding an alert trigger to the AQHI so as to minimize public confusion. Upon evaluation of the AQHI pilot, the OMOE will consider whether to replace the current AQI with the AQHI throughout Ontario. At that stage, the Medical Officer of Health will advise on an appropriate AQHI trigger value to alert the public to times of elevated health risk.

Linking the AQHI with Other Clean Air Activities

In addition to using the new tool to promote individual health, the AQHI will encourage people to commit to reducing personal and household emissions of air pollutants and greenhouse gases (GHG). This will be done by engaging the public in the GTA-wide campaign *20/20 The Way to Clean Air*. This umbrella social marketing program provides the public with a menu of options as to how they can reduce vehicle emissions by 20% (the 'on the road' component) and energy use by 20% (the 'at home' component).

The 20/20 program also links the public with the many programs locally available to achieve real reductions in pollution emissions. It is anticipated that awareness of high health risk days will create many opportunities to influence behaviours which generate pollution. The success of the 20/20 program to date has been the awareness by participants that others are also reducing vehicle and home energy use, and that collectively, these small individual changes make a big difference at the community level.

Implementation of the AQHI will benefit Toronto by stimulating public support for bold actions by city government and its agencies, boards and commissions, as are being

proposed in the *Climate Change and Clean Air Action Plan*. Once the Action Plan is developed, its success will depend on local government leadership and community wide support to implement it. Awareness of the urgency of air pollution and climate change threats, coupled with information on what concrete steps individuals can take to reduce their contribution to air pollution, can create a powerful synergy leading to positive change.

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