March 23, 2000

To: Board of Health

From: Dr. Sheela V. Basrur, Medical Officer of Health

Subject: Health Effects of Noise

Purpose:

This report responds to a request from the Board of Health for a literature review on the health effects of noise and implementation of a public awareness program.

Financial Implications and Impact Statement:

There are no financial implications for Public Health on this issue.

Recommendations:

It is recommended that:

(1) the Medical Officer of Health, the Commissioner of Urban Development Services, and the Commissioner of Works & Emergency Services collaborate on their respective public outreach activities regarding the health effects of noise and measures to prevent or minimize noise in the community; and

(2) the Board of Health forward this report for information to the Commissioner of Urban Development Services, the Commissioner of Corporate Services, the Commissioner of Works & Emergency Services, the Sustainability Round Table, the Works Committee, and the Planning and Transportation Committee.

Background:

On March 24, 1998, the Board of Health considered a communication (March 10, 1998) from Eric Greenspoon, President, NoiseWatch, requesting the Board of Health to make it a policy and program priority to continue research on the relationship between noise and stress-induced illnesses, and to implement a program to raise public awareness of environmental noise. The
Board of Health referred this communication to the Medical Officer of Health for appropriate action.

NoiseWatch sent two communications (April 1997, July, 1997) to the Board of Health, requesting the Medical Officer of Health to provide the Board with a comprehensive summary of recent studies and literature concerning the human health effects of noise, specifically focusing on stress-induced health outcomes. In September 1997, the Medical Officer of Health reported on the findings of an initial review of scientific literature regarding the potential stress-induced health concerns and an overview of options to address environmental noise.

NoiseWatch approached the Environmental Task Force in January 2000. As indicated in the Proposed Environmental Plan report (January 2000), the Environmental Task Force recommended that noise be added to the list of issues to monitor in relation to sustainability and the natural environment.

**Comments:**

Noise, which is often referred to as unwanted sound, is typically characterized by the intensity, frequency, periodicity (continuous or intermittent) and duration of sound. Sound is the result of pressure changes in the air caused by vibration. Unwanted sound to some may be considered wanted sound by others, as in the case of loud music.

Noise affects millions of people worldwide on a daily basis. Highway noise alone affects more than 18 million people in the United States and 100 million people worldwide. It is estimated that community noise levels in the United States have increased eleven percent during the last decade, with aviation noise projected to rise at an even more rapid rate. Internationally, the issue of noise is gaining more attention as countries set their own national standards in accordance with the noise hazards they are prepared to accept.

In the Greater Toronto Area, it has been estimated that the population will increase by forty percent in the next twenty years and that automobile ownership projections are estimated to increase by sixty percent (from 1996). The expansion of the Pearson Airport is currently being projected to increase air traffic from approximately twenty seven million passengers to fifty million passengers over the next decade. Further, the former City of Toronto area is becoming known as a center for music festivals on city streets, parks and public areas. This increase in public leisure activities will likely add to the noise levels in the city.

Traditionally, the scientific research regarding noise has been based on occupational exposures with an emphasis on hearing loss. More recently, research has focused on noise as an auditory stressor. Evidence indicates indirect health effects including an increased risk for cardiovascular disease, negative effects on mood, sleep, performance, reading and memory acquisition. The Health Council of the Netherlands has summarized the weight of scientific evidence for the possible long-term effects of exposure to noise in Table 3 in the attached technical report entitled “Health Effects of Noise” (Attachment No.1).
There is strong evidence to show that individuals have negative subjective responses to noise. However, there is no clear noise level threshold for measuring community reaction. This is likely due to the considerable variation in people’s tolerance to noise levels and the different types of noise making it difficult to quantify direct health effects.

One way of measuring excessive noise is the point at which 10 percent of the population is seriously affected or highly annoyed by the noise. This reliance on dose-response data that relates physical exposure to reported annoyance does not accurately reflect the issue of excessive noise. Firstly, it relies on annoyance as the index of public response without an understanding of the social and psychological variables that determine when a given noise generates annoyance in a particular person or community. Secondly, this one dimensional approach limits consideration of other key health outcomes that also appear to be moderated by psychosocial variables (e.g., increase in blood pressure). Thirdly, complaints may not be reflective of the problem as subjects who deny adverse effects (e.g., use an avoidance coping style) were seen to have more negative health effects.

The dose-response relationship has not been accurate in predicting community annoyance because communities, as do individuals, differ in the criteria they set for acceptable noise levels. For example, there may be an expectation of a certain amount of quiet in a given area, or there may have been public discourse on the issue of economic versus environmental considerations in expanding a local airport. Therefore, it is not appropriate to attempt to predict a given community’s response to new noise in an area based on reactions of people who have lived in high noise exposure areas.

It is evident that reducing noise levels in homes and the community at large requires a multiplicity of actions by all levels of government, the private sector and the general public. Within the City of Toronto, the issue of noise is being addressed in a variety of ways.

(1) Urban Development Services

The Noise Section currently administers the Noise Control Programme which is based on two key principles: 1) when noise is eliminated, it must be eliminated at its source and 2) general ambient noise standards should not be adopted or used for the purpose of policing the City’s sound environment. The handling of complaints regarding noise and the harmonization of the Noise By-law are presently under review by an internal by-law review working group. In the interim, the Noise Section and Toronto Police Services are responsible for enforcing the Noise By-law. The By-law regulates or prohibits certain noises within the City of Toronto which disturb, or may disturb, the quiet, peace, rest, enjoyment, comfort or convenience of Toronto residents and currently only applies to the former City of Toronto. The noise by-laws in the former municipalities are still in place and enforced by municipal standards officers. All of these by-laws attempt to address the localized nature of particular problems in the community. For example, in the former Toronto, there are more stringent rules in place to govern HVAC systems and other equipment noises due to the close proximity of residences with each other and with other conflicting landuses.
(2) Works & Emergency Services

Works & Emergency Services and Urban Development Services are currently discussing noise policy and technical functions that are located within the Noise Section. Responsibilities such as Noise Impact Statement reviews, noise barriers, noise studies etc., which currently reside within the Noise Section could be transferred to Works & Emergency Services.

(3) Corporate Services

Occupational health and safety consultants within the Human Resources Division are responsible for assisting the City, as an employer, in identifying and controlling workplace hazards to protect employees from noise-induced hearing loss. Program activities include: conducting noise surveys, providing technical services and advice regarding noise control measures, assisting in the development of specifications for equipment and vehicles, assisting in the selection of hearing protection, providing noise training and education, and providing employee exposure data, upon request, to the Workplace Safety and Insurance Board.

(4) Public Health Division

Toronto Public Health currently provides speech and language services for children up to five years of age in the Toronto area. A child who is experiencing difficulty with speech and language can be referred for an assessment to a speech pathologist. A referral is made to an audiologist to test for hearing difficulties as part of the initial assessment. A speech and language treatment plan can be developed following the assessment. Toronto Public Health has the lead role for this provincially funded program, and contracts out to community-based agencies so as to provide for better accessibility of services.

Animal Services is responsible for responding to calls from the public regarding noise from animals (e.g., barking dogs). Animal Services enforces the Noise By-law in only three of the former municipalities: North York, East York and Toronto. This service is addressed by other by-laws in the other former municipalities.

Toronto Public Health has a unique role to play in reviewing the latest research on noise so that this information might assist city officials and the public in preventing and reducing excess noise levels where reasonable and possible. Toronto Public Health is also currently planning a variety of health promotion activities to promote noise awareness, in consultation with Urban Development Services, Corporate Services and NoiseWatch.

Conclusions:

Noise is an important health issue that affects more than hearing. The scientific research demonstrates that health effects occur at noise levels below those that impair hearing. Some of these health effects include increased risk for cardiovascular disease, negative effects on sleep, communication, performance and behaviour, reading and memory acquisition, and mental health.
Controlling noise in Toronto is a very difficult and complex undertaking that involves all levels of government as well as the private sector and the general public. Toronto Public Health is interested in increasing public awareness of the health effects of noise and encouraging concerted action to prevent or reduce noise at its source. This report has been prepared in consultation with staff in Urban Development Services, Works & Emergency Services and Corporate Services. Public Health staff will continue to collaborate with others in the corporation and community during implementation of outreach activities.

Contact:

Monica Campbell  
Manager, Health Promotion & Environmental Protection  
Toronto Public Health  
Telephone: (416) 392-1560 ext 8-7017  
Fax: (416) 392-7418  
Email: mcampbe2@city.toronto.on.ca

Dr. Sheela V. Basrur  
Medical Officer of Health

List of Attachments:

“Health Effects of Noise” report
References:


