

The World Health Organization notes: “The scale of environmental health problems has expanded from household (indoor air pollution) to neighbourhood (domestic refuse) to community (urban air pollution) to regional (acid rain) to global level (climate change).”

Human activity is a primary source of greenhouse gas emissions, namely through the burning of fossil fuels. While the earth’s forests and oceans can absorb greenhouse gases through photosynthesis and other scientific processes, they can’t sustainably continue with the rising amount of greenhouse gas emissions. And health professionals are increasingly aware that increased greenhouse gas emissions will only put human health at greater risk.

In fact, we now know that there are demonstrable relationships between higher temperatures and morbidity and mortality. We also know that climate change is negatively impacting air quality, resulting in respiratory health issues, not just for individuals with asthma, but also allergy sufferers through increased pollen. And warmer, wetter conditions can help propagate insect-borne diseases, such as Lyme disease.

Throughout this issue of *Horizons*, and within the Queen’s Department of Family Medicine’s Global Health Program, we hope that by giving consideration to the impact of climate change on health, we can raise the profile – and thus research, education, and advocacy – of how the long-term good health of populations depends on the continued stability and functioning of the biosphere’s ecological and physical systems, often referred to as life-support systems.



Photo courtesy of Gaye Jackson, CAPE.

Active Travel, Transportation

Shifting the Way We Move

By Kim Perrotta

Active travel – which includes public transit that usually involves walking or cycling at one end of the trip – and active modes of transportation such as walking and cycling can mitigate climate change while producing significant health benefits.

Active travel has the potential to substantially mitigate climate change, which, in 2016, the World Health Organization (WHO) declared the “greatest threat to global health in the 21st century.” The WHO estimates that climate change will claim 250,000 additional lives each year by 2030 because of heat stress, malnutrition, diarrhea and insect-borne diseases that result directly or indirectly from extreme weather events and the changing climate (WHO, 2016).

The transportation sector in Canada is one of the most significant sources of greenhouse gases (GHGs) that contribute to climate change. In 2005, it was responsible for about 26 per cent of the country's emissions, and about 57 per cent of those emissions were from cars and light-duty trucks used for passenger transport. To meet Canada's commitments under the [Paris Agreement on Climate Change](#), the federal government wants to reduce emissions from this sector by 80 per cent by 2050, from 195 to 38 megatons (Canada, 2016).

It has long been recognized that public transit involves far fewer GHGs than travel alone in one's vehicle. The U.S. Department of Transportation, for example, reported in 2010 that heavy rail transit such as subways produce 76-per-cent fewer GHGs per passenger mile than an average single-occupancy vehicle, while light rail and bus transit produce 62-per-cent and 33-per-cent fewer GHGs respectively (U.S. DOT, 2010). In the Greater Toronto Hamilton Area (GTHA), it was estimated that the new regional transit plan, *The Big Move*, could prevent GHGs from vehicles from increasing by 30 per cent as the population in the region grows by two million people (GTHA Medical Officers of Health [MOHs], 2014).

A number of studies suggest that active modes of transportation can also produce substantial reductions in GHGs. For example, a modelling study conducted in San Francisco estimated that GHGs from vehicles could be reduced by 14 per cent by increasing walking and cycling time among residents from 4.5 to 22 minutes per day (Maizlish et al., 2013). Another modelling study, directed at a region that includes 31.3 million people in 11 metropolitan areas in the U.S., found that the elimination of all short automobile trips (less than or equal to eight km), with cycling being used to replace 50 per cent of those trips, could reduce vehicle miles travelled and GHGs by 20 per cent (Grabow et al., 2011).

Active travel can significantly reduce rates of chronic disease by increasing levels of physical activity. Physical activity has been found to reduce the risk of more than 25 chronic health conditions, including coronary heart disease, stroke, hypertension, breast cancer, colon cancer, Type 2 diabetes and osteoporosis (PHAC, 2011). It also has benefits for mental health (Bingham, 2009). And yet, fewer than one in five Canadian adults and fewer than one in 10 Canadian children are achieving the levels of physical activity needed for healthy growth and development (Colley et al., 2011a; Colley et al., 2011b). This is a serious concern for Canada's health-care system because chronic diseases consume approximately two-thirds of the health-care budget and cost Canadians approximately \$200 billion per year in treatment and lost productivity (PHAC, Elmslie).

Lack of time is one of the leading barriers to increased levels of physical activity (CFLRI, 1996). Active travel can increase physical activity by allowing people to "get the exercise they need" while commuting to work or running errands. Many studies have demonstrated that active modes of transportation can produce significant health

benefits. For example, a recent long-term study conducted in the United Kingdom found that people who walk to work have a 36-per-cent lower risk of dying prematurely from cardiovascular disease, while those who cycle to work have a 40- to 52-per-cent lower risk of dying prematurely from cancer, cardiovascular disease and all causes (Celis-Morales C et al., 2017). The San Francisco study mentioned earlier estimated that premature deaths from chronic diseases could be reduced by 13 per cent or more by increasing walking and cycling among residents from 4.5 to 22 minutes per day. In San Francisco, this would translate into approximately 2,400 avoided premature deaths each year (Maizlish et al., 2013).

Several studies have found that transit use increases the levels of physical activity as well. A Montreal study, for example, found that a round trip on public transit involves, on average, 2,500 steps each day. The researchers estimated that transit users can get approximately 25 per cent of the physical activity recommended for good health by simply walking to and from transit (Morency 2011). The medical officers of health in the GTHA found that the modest increases in active transportation and transit use predicted for the regional transit plan could prevent 184 premature deaths per year and produce health benefits valued at \$1.2 billion per year in the GTHA by increasing levels of physical activity (MOHs, 2014).

Active travel can produce a number of other health benefits. It can:

- reduce acute and chronic health conditions that result from air pollution by reducing emissions of air pollutants from the transportation sector. The transportation sector is a major source of air pollution as well as GHGs. The GTHA MOHs have estimated that the regional transit plan, *The Big Move*, could prevent 154 premature deaths and produce health benefits valued at \$1 billion per year by improving air quality in the GTHA (MOHs, 2014).
- reduce vehicle-related injuries and deaths. In 2014, 1,834 Canadians were killed in vehicle-related collisions while 149,900 were injured. Of those killed, 15.7 per cent were pedestrians and 1.9 per cent were

