

FINAL PROGRAM



20th Annual John K. Friesen Conference

GROWING OLD IN A CHANGING CLIMATE

EXPLORING THE INTERFACE BETWEEN POPULATION AGING
AND GLOBAL WARMING

May 25-26, 2011
Vancouver, Canada
Simon Fraser University
Segal Graduate School of Business



GROWING OLD IN A CHANGING CLIMATE:

EXPLORING THE INTERFACE BETWEEN POPULATION AGING AND GLOBAL WARMING

MAY 25-26, 2011

SFU SEGAL GRADUATE SCHOOL OF BUSINESS, 500 GRANVILLE STREET, VANCOUVER, CANADA



May 25th, 2011

It is our pleasure and privilege to welcome you to Vancouver to participate in the 20th John K. Friesen Conference, which this year will be on "*Growing Old in a Changing Climate: Exploring the Interface Between Population Aging and Global Warming*". The intersection between population aging and global warming is a new and emerging area for both research and policy, but one that will be vitally important in years to come. The challenge for participants at this conference, and then moving forward, will be to transcend traditional disciplinary boundaries and forge new links that will foster international and interdisciplinary collaboration.

Over the next two days, participants from all corners of the globe will share their knowledge and experience. The conference program features invited keynote presentations by world experts in their fields, panel sessions, symposia, as well as paper and poster presentations. We believe that the conference will be a milestone event that will be the foundation for new and exciting research in years to come

Vancouver is the "Jewel of the Pacific" and the perfect venue for any conference. We trust that you will enjoy your visit and have time to get to know this beautiful city and the province of British Columbia.



Andrew Sixsmith PhD
Professor and Director, SFU GRC
Vice President, International Society of Gerontechnology
2011 Friesen Conference Chair



Gloria Gutman PhD
President of the International Network for Prevention of Elder Abuse
Past President, International Association of Gerontology and Geriatrics
Research Associate, SFU GRC
2011 Friesen Conference Operations Chair



Heather Stewart PhD
Regional Project Manager, Canadian Longitudinal Study on Aging
Research Associate, SFU GRC and UBC Brain Research Centre
2011 Friesen Conference Program Chair

John K. Friesen Conference Secretariat

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Simon Fraser University | Gerontology Research Centre | 2800-515 W. Hastings Street | Vancouver | British Columbia | V6B 5K3 | Canada



On behalf of the Province of British Columbia, I would like to welcome delegates to the 20th John K. Friesen Conference. This conference is an important opportunity for stakeholders from around the world to share knowledge, establish alliances and collaborate with regard to the challenges that arise from an aging population and climate change.

British Columbia is committed to building the best system of support for the aging population, and advancements resulting from collaborative approaches among experts in gerontology and climate science will serve to further the Province's objective to support older people to age in place.

I congratulate the many researchers, service providers and policy makers who are dedicated to the health and safety of older persons in our province and around the world, and whose work has already had an enormous, positive impact. Events such as this provide a great catalyst toward continued cooperative endeavours, and serve to encourage and promote solutions that address older peoples' ambitions and needs.

I would like to thank the Simon Fraser University Gerontology Research Centre for hosting this conference and for its ongoing efforts to better the lives of older adults.

To everyone attending, I wish you a productive and informative conference.

Yours truly,



Dr. Margaret MacDiarmid
Parliamentary Secretary for Seniors to the Minister of Health



SFU

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Welcome from President Andrew Petter, Simon Fraser University

I am delighted to extend a warm welcome to attendees of the 20th Annual John K. Friesen Conference *Growing Old in a Changing Climate: Exploring the Interface between Population Aging and Global Warming*. Hosted by Simon Fraser University's acclaimed Gerontology Research Centre, this conference brings together internationally renowned researchers and experts to share their knowledge and explore new ideas about how global warming and climate change impact a growing older adult population, and how best to respond to those challenges.

This is a timely topic that has implications for a broad range of stakeholders from around the world. The program features some outstanding keynote speakers and offers a wealth of opportunity to hear about the latest research, policies, practice guidelines, risk assessment and adaptation strategies.




My best wishes for a rewarding conference and an enjoyable stay in beautiful Vancouver.

Andrew Petter
President and Vice-Chancellor



Exhibitors & Sponsors

	<p><u>British Columbia Network for Aging Research (BCNAR)</u> BCNAR brings together researchers from different disciplines, research streams, academic institutions, community-based organizations, health regions. Goals are to provide opportunities for researchers to collaborate in generating innovative aging research and to leverage funding. BCNAR provides access to shared resources, hosts workshops and conferences, supports team building, capacity development and KT. http://www.bcnar.ca/</p>
	<p><u>Canadian Institutes of Health Research Institute of Aging (IA)</u> supports research, to promote healthy aging and to address causes, prevention, screening, diagnosis, treatment, support systems, and palliation for a wide range of conditions associated with aging. IA's mandate is the aging person in an aging society, and the effects of different diseases and conditions on aging. Its goal is to improve the quality of life and health of older Canadians. www.cihr-irsc.gc.ca</p>
	<p><u>Health Canada and the Public Health Agency of Canada</u> are taking actions to prepare Canadians for the health risks associated with climate change and public health emergencies by:</p> <ul style="list-style-type: none"> • Increasing understanding of the health effects of climate change • Assessing vulnerability of specific populations and regions • Identifying needed adaptations and facilitating action <p>For more information visit www.healthcanada.gc.ca/cc or www.publichealth.gc.ca/seniors</p>
	<p><u>The International Association of Gerontology and Geriatrics (IAGG)</u> is comprised of 73 national organizations in 65 countries with a combined membership 45,100. Objectives are to promote research on individual and population aging, training of highly qualified personnel, and members' interests in international affairs. IAGG organizes a World Congress every four years, auspices workshops, expert meetings and regional Congresses, and collaborates regularly with the UN's Programme in Ageing, WHO, UNDP and other international organizations. http://www.iagg.info/</p>

	<p><u>International Network for Prevention of Elder Abuse (INPEA)</u> INPEA's mission is to increase capacity through international collaboration to recognize and respond to the mistreatment of older people, so that the later years of life are free from abuse, neglect and exploitation. It engages in research, education, and advocacy and originated World Elder Abuse Awareness Day, held annually on June 15. INPEA has Special Consultative Status with ECOSOC at the UN, is active in the UN NGO Committee on Aging in New York, Geneva and Vienna and is one of two international special interest organizations formally affiliated with IAGG. www.inpea.net</p>
	<p><u>International Society for Gerontechnology (ISG)</u> The International Society for Gerontechnology (ISG) promotes design of technology and environments for independent living and social participation of older persons in good health, comfort and safety. It holds biennial international conferences, publishes the quarterly journal <i>Gerontechnology</i> and, like INPEA, enjoys a collaborative relationship with IAGG as a Standing Committee. www.gerontechnology.info</p>
	<p><u>Pacific Institute for Climate Solutions (PICS)</u> The Pacific Institute for Climate Solutions (PICS), hosted and led by the University of Victoria and in collaboration with Simon Fraser University, the University of BC and the University of Northern BC, represents a dynamic knowledge network that integrates multi-disciplinary approaches to climate change. PICS mission is to partner with governments, the private sector, other researchers and civil society, in order to undertake research on, monitor, and assess the potential impacts of climate change and to assess, develop and promote viable mitigation and adaptation options to better inform climate change policies and actions. www.pics.uvic.ca</p>
 <p>GERONTOLOGY RESEARCH CENTRE</p>	<p><u>Simon Fraser University Gerontology Research Centre</u> Founded in 1982 the Simon Fraser University GRC specializes in research in six areas: Aging and the Built Environment, Health and Aging, Prevention of Elder Abuse and Neglect, Changing Demography and Lifestyles, Culture and Aging, and Aging and Technology (www.sfu.ca/grc). The associated Department of Gerontology, established in 1983, offers a post-baccalaureate Diploma in Gerontology, an undergraduate minor, as well as Master's and PhD Degrees (www.sfu.ca/gerontology)</p>

Wednesday, May 25th, 2011

Registration

Foyer 07:30 – 21:00

Opening Ceremonies

Plenary Main Hall A & B 08:30 – 09:00

Welcome and Opening Remarks

Andrew Sixsmith, Chair of the 20th John K. Friesen Conference

Greetings and Welcome from Simon Fraser University

Andrew Petter, President and Vice-Chancellor

Message from the British Columbia Ministry of Health

Margaret MacDiarmid, Parliamentary Secretary for Seniors to the Minister of Health

Keynote Address 1

Plenary Main Hall A & B 09:00 – 10:00

A global perspective on the interface between climate change and population aging

Dr. Carlos Corvalán, Senior Advisor in Risk Assessment and Global Environmental Change

Pan American Health Organization/WHO

Coffee Break

Foyer 10:00 – 10:30

Panel Session 1- Defining the Issues: Climate Science, Health and Gerontological Perspectives

Plenary Main Hall A & B 10:30 – 12:00

Climate change and the threat to an aging population, *J.M.R. Stone*

Global aging: Key elements of the "demographic transition", *G. Gutman*

The impact of climate change on the most vulnerable of older populations, *G. Tokesky*

Lunch

Foyer 12:00 – 13:00

Wednesday, May 25th, 2011

Panel Session 2 - Mitigation and Prevention Strategies: Lessons Learned on the Front Lines

Plenary, Main Hall A & B

13:00 – 14:30

Challenges encountered by older adults when seeking safe shelter pre-disaster and receiving intervention post-disaster, *L. Brown*

Research to support public health action on heat and health, *T. Kosatsky*

Taking command of the obvious, *M. Weston*

Mitigating climate change and the short and long term benefits of acting now, *K. Sykes*

Coffee Break

Foyer

14:30 – 15:00

Keynote Address 2

Plenary, Main Hall A & B

15:00 – 16:00

Climate change and health of an aging Canadian population: Adaptation frameworks and strategies for risk reduction

Dr. Peter Berry, Senior Policy Advisor, Climate Change and Health Office (CCHO) in the Safe Environments Programme at Health Canada

Symposium 1 - Climate Change Means More Weather-related Disasters: Will Older Adults be Safe?

Concurrent Symposium, Main Hall A & B

16:00 – 17:30

Convened and Chaired by Maggie Gibson

A peer-to-peer community development response to the need for increased awareness about emergency preparedness among older adults

G. Gutman, M. Kloseck, M. Gibson & L. Cox

A provider-targeted e-learning response to the triple threat of frailty, dementia and disasters

M. Gibson, D. Maltais, L. Hardy & S. Ruthe

An inter-generational bridging response to the need for more resilient communities

Sharon Mackenzie

Aging, climate change, health and well-being: The possibilities of narrative inquiry

C. Phoenix

Symposium 2- Challenges of Global Warming for the Elderly: Heat Stroke, Hyperthermia and Health

Concurrent Symposium, Main Hall C

16:00 – 17:30

Convened and Chaired by Matthew White

Global warming and heat-related pathologies in the elderly

W.L. Kenney

Heat stress and the aging workforce: what are the health implications?

G. Kenny

Elderly responses to heat stress and strategies for adaptation to warm climates

M.D. White

Wednesday, May 25th, 2011

Symposium 3 - Seniors' and the Push for Age-friendly Transportation in our Community: Making it Green

Concurrent Symposium, Room 2800

16:00 – 17:30

Convened and Chaired by Beverley Pitman

Seniors-led community development in B.C.'s lower mainland

B.A. Pitman

The North Shore seniors Go Bus

E. A. Loverin

The road ahead: Is there quality of life after the car?

D. Dunne

Planning a sustainable transportation system for an aging population

P. Hill

STAR - Seniors Transportation and Resources Strategy

M. Mahan

Day 1 Closing Remarks

Plenary, Main Hall A & B

17:30

Reception

Foyer

18:00 – 19:15

Pacific Institute for Climate Solutions (PICS) Special Public Lecture

Plenary, Main Hall A & B

19:30 – 21:00

Chaired by Nastenka Calle, PICS and Heather Stewart, SFU Gerontology Research Centre

Climate change and health: Acting to reduce risks and vulnerabilities

*Dr. Carlos Corvalán, Senior Advisor in Risk Assessment and Global Environmental Change
Pan American Health Organization/WHO*



Pacific Institute
for Climate Solutions
Knowledge. Insight. Action.

Thursday, May 26th, 2011

Registration

Foyer 07:30 – 16:00

Panel Session 3 – Climate Change Adaptation Strategies for Aging Populations

Plenary, Main Hall A & B 08:30 – 10:00

B. Menne

G. Kierzek

L. Frank

S. Sheppard

Coffee Break

Foyer 10:00 – 10:30

Paper Session 1- Policy, Law and Public Service

Concurrent Papers, Main Hall A & B 10:30 – 12:00

Enforcing the rights to life and healthy environment under international climate regime

S. Alabi

UK policy and practice for sustainable public services in the context of an ageing population

S. Evans, S. Hills & J. Orme

Age-friendly cities and climate-change resistant cities: A research on synergies

J. Hu

Low carbon: high energy! Towards active ageing in sustainable neighbourhoods

R. Bond

Designing the eco-town: conflicts and convergence between ageing population and climate change at the Kobe workshop

J. Myerson, J. Bichard, & R. Gheerawo

Paper Session 2- Regional and National Examples of Climate Change Impacting Older Adults

Concurrent Papers, Main Hall C 10:30 – 12:00

Climate change adaptations in British Columbia's small cities and rural communities: An exploratory study

J. Drolet

Climate change effects on human mortality in Tehran, Iran

M. Farajzaden

Why do elders of ethnic communities avoid social activities?

V.K. Mago, V. Dabbaghian & P. Borwein

Ageing in Greece in an evolving environment of climate change

K. Nikoli

Assessing the vulnerability of older adults to climate change: Review of the science

J.L. Gamble, P.A. Schultz & B.J. Hurley

Assessing the vulnerability of older adults to climate change: Highlights of a listening session

J.L. Gamble, P.A. Schultz & W.S. Jaglom

Thursday, May 26th, 2011

Paper Session 3- Heat Related Morbidity and Mortality

Concurrent Papers, Room 2800

10:30 – 12:00

Shifts in mortality during a hot weather event in Vancouver: Rapid assessment with case-only analysis.

S.B. Henderson, T. Kosatsky, & S.L. Pollock

Elderly population mortality associated with apparent temperature in Metro Vancouver

G. Krstic

Housing, homelessness and hot weather: The impact of heat waves on the most vulnerable elderly

P. Stephenson

Heat awareness and response in senior populations in British Columbia

K.L. Bassil, T. Kosatsky & H. Moffatt

Lunch

Foyer

12:00 – 13:00

Symposium 4- Supporting Local Governments to Create Age-Friendly, Inclusive, Accessible and Sustainable Communities – Federal, Provincial and Local Perspectives

Concurrent Symposium, Main Hall A & B

13:00 – 14:30

Convened by The Seniors Healthy Living Secretariat, BC Ministry of Health Services

Chaired by Patti Gorr

Supporting communities to respond to extreme heat - Health Canada

A. Rogaeva

Supporting local governments to create age-friendly, inclusive, accessible and sustainable communities – Seniors Healthy Living Secretariat, BC Ministry of Health

L. Syverson

What can local governments do to create age-friendly cities and address the impacts of climate change?

N. Carley

Symposium 5- Technology, Climate Change and Aging

Concurrent Symposium, Main Hall C

13:00 – 14:30

Convened and Chaired by Andrew Sixsmith

Technology solutions for seniors in a time of climate change, *A. Sixsmith*

Using wireless sensor networks for simultaneous monitoring of environmental and bio-medical data, *M. Marzencki & B. Kaminska*

Information and communication technologies for seniors - a modeling approach, *U. Glässer*

Towards developing companion robots for seniors, *K. Gupta*

The effect of climate on injuries due to falls, *F. Feldman*

The role of telecare in supporting formal carers, *R. Woolrych*

Assistive technology and climate change, *W.B. Mortenson*

Thursday, May 26th, 2011

Symposium 6- Suzuki Elders and the Environment: A Model for Education and Action

Concurrent Symposium, Room 2800

13:00 – 14:30

Convened by The Association of Suzuki Elders

Chaired by Diana Ellis

D. Ellis

M. McAvity

N. Adams

K. Perrin

Coffee Break

Foyer

14:30 – 15:00

Keynote Address 3

Plenary, Room 2800

15:00 – 16:00

Age of climate change: Opportunities and risks of climate change for an ageing population

Dr. Gary Haq, Senior Research Associate

Stockholm Environment Institute at the University of York (UK)

Panel Session 4- Preparing Aging Populations for Climate Change in British Columbia and Beyond

Plenary, Room 2800

16:00 – 17:30

Special challenges for public health with climate change and aging populations

T. Takaro

Climate change, air quality and chronic disease: prospects for adaptation through urban design

M. Brauer

Potential impact of climate change on the health of BC's seniors

A. Ostry

Preparing for climate change: British Columbia's adaptation strategy

J. Pouliotte

Closing Remarks

Plenary, Room 2800

17:30

Gala Dinner

Restaurant TBA

19:00 – 21:00

Abstracts

KEYNOTE ADDRESSES

May 25, 2011 | 09:00 – 10:00

KEYNOTE ADDRESS 1

A global perspective on the interface between climate change and population aging

Carlos Corvalán

Current vulnerabilities in the population affect the capacity to respond to the impact of climate change. Identifying population groups that cannot cope with the effects of climate variability and extremes is essential for designing and implementing effective strategies for climate change and health. Population ageing is a sign of public health success, and current trends indicate the process will continue in many developing countries, but so will climate change. The vulnerability of older people can be exacerbated by structural stress factors which exist in many communities, such as poverty, food insecurity, social conflict, and disease. This challenge calls for a well coordinated health sector response which includes strengthening core public health interventions to encompass greater attention to environmental and social determinants of health.

May 25, 2011 | 15:00 – 16:00

KEYNOTE ADDRESS 2

Climate change and health of an aging Canadian population: Adaptation frameworks and strategies for risk reduction

Peter Berry

Climate change is expected to increase risks to the health and well-being of people living in Canada and around the world through impacts on physical, economic and social environments. Seniors can be particularly vulnerable to the impacts of climate change because of physiological sensitivities to a range of hazards, existing perceptions of health threats, and capacity challenges at the individual or community level which make adaptation difficult. Important strides have been made in efforts to prepare seniors for more frequent disasters and in efforts to make communities healthier and more resilient in the face of a changing climate. Addressing growing health risks from climate change will mean building on these initiatives through a proactive approach that includes broad collaboration among multiple partners and sectors. This session will provide information on Health Canada initiatives aimed at protecting the most vulnerable citizens from climate change impacts.

May 26, 2011 | 15:00 – 16:00

KEYNOTE ADDRESS 3

Age of climate change: Opportunities and risks of climate change for an ageing population

Gary Haq

Climate change and an ageing population bring together key policy challenges which need to be addressed to ensure a safe, secure, equitable and sustainable future. This Keynote presentation will examine older people as Contributor, Casualty and Champion of climate change. It will discuss the social, environmental and economic dynamics that determine vulnerability and resilience of older demographic groups. It will outline the need for a coherent policy response that addresses the interface between climate change and older people. One that harnesses the contribution older people can make to addressing climate threats, while reducing the vulnerability of older people ensuring they reach later life with greater resilience.

May 25, 2011 | 10:30 – 12:00

PANEL SESSION 1 - DEFINING THE ISSUES: CLIMATE SCIENCE, HEALTH AND GERONTOLOGICAL PERSPECTIVES

Climate change and the threat to an aging population

J.M.R. Stone

This talk will explore the science of climate change and its implications for an aging population. It will explain why climate change is a broad threat to society, the economy and the environment; and how the climate is likely to change focussing on the increase in the frequency and severity of extreme weather and climate events which are a particular threat to older people.

Global aging: Key elements of the "demographic transition"

G. Gutman

Population aging is happening worldwide, and at unprecedented speed in the developing world. It occurs when there are two simultaneous trends: increasing life expectancy and declining fertility. But older people are not a homogeneous group. Gerontologists distinguish between the young-old (age 65-74), middle-old (75-84), older-old (85-99) and very-old (100+). While age is only a rough predictor of health, functional status and life-style, there are between age group differences that have implications for physiological and psychological reaction to climate change and ability to cope with it. This presentation will include a description of the sex distribution, housing and living arrangements, education, socio-economic status, social support, mobility, functional status and "techno-savvy" of today's and tomorrow's 65+ population – key variables to consider when discussing mitigation and adaptation to climate change. Also key to consider are other global trends occurring simultaneously with population ageing such as migration, urbanization and the recent economic downturn.

The Impact of climate change on the most vulnerable of older populations

G. Tokesky

As the population ages, changes in the world's climate and an increase in weather-related events will affect more and more older persons. Within the aging population, the most vulnerable group is the frail elderly that require some level of care and support to remain in the community. This presentation will focus on what happens when a disaster impacts the frail elderly and the health care system designed to care for them. This presentation looks at various health care models and the challenges associated with providing care to the frailest of older persons before, during and after a major disaster. Finally, this presentation will discuss the lessons learned from nine major disasters that led to changes to the way health care is provided to frail elders during a catastrophic event.

May 25, 2011 | 13:00 – 14:30

PANEL SESSION 2-MITIGATION AND PREVENTION STRATEGIES: LESSONS LEARNED ON THE FRONTLINES

Challenges encountered by older adults when seeking safe shelter pre-disaster and receiving intervention post-disaster

L. Brown

Although most healthy older adults recover without assistance after extreme weather events, there are vulnerable subgroups that are at increased risk for negative health consequences. These include elders who are socially isolated, frail, physically ill, cognitively impaired, or with previous exposure to an extreme and prolonged traumatic stressor. Findings from two research projects – 1) Use of Psychological First Aid (PFA) with older adults, and 2) disaster literacy of older adults will be discussed.

1. The need for appropriate interventions for elders who have experienced traumatic events is paramount. PFA, like medical first aid, does not have to be delivered by a licensed clinician. Study results highlight methods to assess elders, strategies to enhance coping, and approaches to implement PFA at the personal, community, and healthcare system level.
2. The consequences of low health literacy on physical health have been well documented with older adults, people from diverse cultural backgrounds, and those with low incomes more likely to have health literacy problems. Because people who were either unable or unwilling to adequately prepare for and respond to the 2004 or 2005 hurricanes experienced dire consequences, the number of publications describing steps that should be taken to ensure personal safety has grown considerably. This study evaluated if the target audience possessed sufficient disaster literacy to use the information as intended.

Research to support public health action on heat and health

T. Kosatsky

Research from various disciplines can promote, support and contextualize public health action to prevent illness and death related to hot weather. Examples are sociological assessments of who died during the 1995 Chicago heat wave, experimental evidence of age-related differentials in the physiology of the heat response, occupational medicine research into the time course of heat acclimatization, models of the cooling capacity of room fanning versus water misting of occupants, and spatial overlays of attributes of heat vulnerability over a city or region. During this presentation I will review projects to which I have contributed since 2003: the PHEWE study of mortality attributable to heat in 15 European cities; surveys of city and country preparedness for heat in Europe; the influence of local greenery on where hot day deaths occur in Montreal; knowledge, attitudes and practices of Montreal residents with chronic heart and lung disease around hot weather preparedness and response; changes in heat susceptibility from 1985-2010 in Vancouver; and, observed shifts in patterns of mortality during the 2009 Vancouver heat event.

Taking command of the obvious

M. Weston

As the title of this session conveys, if we are content on learning lessons but fail to apply lessons learned, then we are destined to have to learn them again. With the far reaching and lasting effects of Climate Change upon us, that would be a waste of precious time and resources. The basis of this presentation is the authors' experience having worked or supervised well in excess of ten thousand critical emergencies involving seniors and their caregivers, and having directed the nations Aging Network's response on 18 Presidential Declared Disasters in the United States. Lessons learned from, AND applied, at the frontlines and deep in the trenches include Safe Centers, Mega Shelters, specialized disaster products, cruise ships, and storage units, Capacity Building Staff Surveys and Matrix's are but a few examples of tools that have been used and will be examined to mitigate the potentially overwhelming set of circumstances caused by climate change and associated disasters.

May 25, 2011 | 13:00 – 14:30

**PANEL SESSION 2-MITIGATION AND PREVENTION STRATEGIES: LESSONS
LEARNED ON THE FRONTLINES**

Mitigating climate change and the short and long term benefits of acting now

K. Sykes

Studies suggest that acting now to mitigate the consequences of climate change has not only immediate benefits but also long term benefits. For example, by reducing green house gas emissions today benefits persons of all ages, especially those most susceptible to ozone and particulate matter. Smart growth strategies, where and how we develop, address both environmental concerns such as the human health effects from air pollution and drinking water contaminants. For example, as we build we replace natural cover with impervious surfaces such as concrete or asphalt. Impervious surfaces affect ground water due to its volume and rate of surface water runoff. An EPA report found that urban runoff is responsible for the majority of environmentally impaired ocean shorelines, impaired estuary miles and impaired lake miles. Heat islands that contribute to extreme heat events in urban centers can be mitigated through landscaping, green roofs and preserving and protecting green space.

May 25, 2011 | 16:00 – 17:30

SYMPOSIUM 1 -CLIMATE CHANGE MEANS MORE WEATHER-RELATED DISASTERS: WILL OLDER ADULTS BE SAFE?

M. Gibson (Convenor)

PARTICIPANTS: G. Gutman – *A community development response to increase awareness about emergency preparedness among older adults*; M. Gibson – *A provider-targeted e-learning response to the triple threat of frailty, dementia and disasters*; S. MacKenzie - *An inter-generational bridging response to the need for more resilient communities*; C. Phoenix – *Ageing, climate change, health and well-being: the possibilities of narrative inquiry*.

ISSUE: Emergencies and disasters are increasing worldwide, secondary to factors including climate change, human pressures on the environment and infrastructure failure. Mounting evidence internationally suggests that older people suffer disproportionately in disasters as a consequence of largely remediable factors that cross the four pillars of emergency management: preparedness, response, recovery, and mitigation/prevention. Speakers will describe capacity building projects and theoretical models that have the potential to contribute to local, national and international efforts to reduce the disproportionate vulnerability of older adults in emergencies and disasters. **CONTENT:** Models for moving evidence into practice emphasize the importance of engaging end-users in the knowledge creation and application process. This symposium will highlight approaches to this task that employ different methodologies, target audiences, evaluative processes and dissemination activities. Each approach provides a unique response to the challenge of making the changing world a safer place for the aging population. **STRUCTURE:** Gloria Gutman will describe a demonstration project that used a community development approach to increase awareness of emergency preparation issues among residents of a high-density naturally occurring retirement community (NORC). In peer-led focus groups, older adults were provided with a realistic emergency scenario and guided to consider needs and resources with respect to both sheltering in place and evacuation. Emergency preparedness recommendations were reviewed for relevance, comprehensiveness and accessibility, leading to recommendations for emergency management organizations. Maggie Gibson will describe the development, evaluation and dissemination of a four module e-learning tool entitled "*Frailty, Dementia and Disasters: What Health Care Providers Need to Know*" that was developed through the collaborative efforts of a pan-Canadian team of health care and social service providers, policy makers and researchers. The e-learning modules utilize an extreme weather scenario and can be used by any health care organization as part of its emergency management learning strategy. Sharon MacKenzie will describe the work of the izi Intergenerational Society of Canada. This voluntary organization builds capacity for inter-generational empathy, support and partnerships. This presentation will emphasize "thinking outside the box" in terms of responding to the challenges posed by the combined forces of population aging and global warming. Cassandra Phoenix will close the session with a presentation that invites researchers to expand their repertoire of investigative approaches to include narrative inquiry as a method for understanding the interplay between climate change, health and well-being for older adults. **CONCLUSION:** One response to the challenges posed by population aging in a changing climate must be increased opportunity for individuals, communities, service providers, organizations and policy makers to build their capacity to address the unique needs that older adults face in emergencies and disasters. Knowledge translation efforts to meet this need should employ the full range of available methodologies, including community capacity building strategies, technological approaches, innovative advocacy efforts and storytelling.

Keywords: disasters, peer-to-peer training, e-learning, inter-generational, narrative inquiry

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May 25, 2011 | 16:00 – 17:30

SYMPOSIUM 1 -CLIMATE CHANGE MEANS MORE WEATHER-RELATED DISASTERS: WILL OLDER ADULTS BE SAFE?

A peer-to-peer community development response to the need for increased awareness about emergency preparedness among older adults

G. Gutman, M. Klooseck, M. Gibson and L. Cox

Increasing seniors' participation in emergency planning has been identified as a priority internationally¹. While it is well recognized that seniors have disproportionate vulnerability in emergencies and disasters, it is also agreed that seniors are an untapped resource². There is general acceptance that more can be done to increase participation of seniors in individual and communal emergency preparedness (EP) efforts. However, while governmental and non-governmental organizations are encouraging seniors to adopt EP attitudes and habits, little is known about how seniors actually define their own risks and resources. This demonstration project used a community development approach to increase awareness of EP issues among residents of a high-density naturally occurring retirement community (NORC). **Methods:** This study was conducted in a NORC in a mid-sized Canadian city that houses a full spectrum of seniors (healthy, frail, disabled) with high health service utilization³. Seniors in this community range in age from 65 to over 90 years of age, with an average age of approximately 79 years. Community capacity building and participatory action research approaches were used to recruit a peer-based leadership team of 10 seniors from within the NORC who received training on EP and subsequently helped to recruit participants and facilitate focus groups attended by other residents. In the first round of focus groups, participants were provided with a realistic emergency scenario (power lost following an ice storm) and guided by a series of open-ended questions to consider their own needs and resources, as well as those of their neighbours, with respect to both sheltering in place and evacuation. In the second round, the same participants reviewed senior- and high rise- specific sections of Ontario's Emergency Preparedness Guide for People with Disabilities/Special Needs⁴ for relevance, comprehensiveness and accessibility. The sessions were audio-taped, transcribed and thematically analyzed. **Results and Discussion:** 33 seniors attended 7 focus groups (number of attendees per session ranged from 2 to 6). Round One revealed a belief that seniors in this community will survive because they have survived emergencies and disasters in the past (i.e., wars, etc.), a belief in external assistance without knowing whether that external assistance will actually materialize, and a general lack of concrete and consistent information concerning what to do in an emergency situation. Round Two revealed both strengths and gaps in current materials and specific feedback for policy developers and emergency management organizations. The findings demonstrate an adaptable model for increasing emergency preparedness for this sector of the community.

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Keywords: community development, NORC, emergency preparedness

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SYMPOSIUM 1 -CLIMATE CHANGE MEANS MORE WEATHER-RELATED DISASTERS: WILL OLDER ADULTS BE SAFE?

A provider-targeted e-learning response to the triple threat of frailty, dementia and disasters

M. Gibson, D. Maltais, L. Hardy and S. Ruthe

Frailty and dementia are specific risk factors for heightened vulnerability, leading to increased risk for isolation, suffering and death in emergencies and disasters¹. Vulnerable groups are often neglected in emergency preparedness initiatives and sidelined in community recovery and rehabilitation activities post-disaster². An emerging consensus suggests that health care providers can contribute to disaster resilience for vulnerable groups at each phase of the emergency management cycle, but only if they have the requisite knowledge, tools and resources³. Evidence suggests that for the most part, they do not. The overall goal of this knowledge translation initiative was to develop, evaluate, and disseminate an e-learning tool to meet this need. **Methods:** Key literature on geriatric emergency preparedness and response issues, including the roles and responsibilities of health care providers, was identified and synthesized in consultation with the Seniors and Emergencies: International Working Group on Health Care Providers and Continuity of Health Services convened by the Division of Aging and Seniors, Public Health Agency of Canada (PHAC). Content was piloted in a facilitated workshop in London, Ontario. A Canada-wide health provider reference group provided feedback on the transition from a traditional powerpoint presentation to an e-learning format. The evaluation process included facilitated review of the English version of the program by health care providers in two in-person workshops in Whitehorse, Yukon Territory and of the French version of the program in two in-person workshops in Chicoutimi, Quebec. An on-line review was conducted by health care providers in South Vancouver Island, British Columbia. A technical advisory group consisting of representatives from PHAC and the Canadian Dementia Research and Knowledge Exchange (CDRAKE) network provided expert guidance for web based dissemination. **Results and Discussion:** The e-learning program “Frailty, Dementia and Disasters: What Health Care Providers Need to Know” is designed to help health care providers, administrators and policy makers understand the disproportionate vulnerability of older adults who are frail and those who have dementia in emergencies and disasters; the components of the emergency management cycle and how they apply to this target population; best practice resources that can be used to improve emergency preparedness, response, recovery and mitigation; and the role of health care organizations and providers in emergency management for older adults who are frail and those who have dementia. The program is hosted by CDRAKE at www.dementiaknowledgebroker.ca, and can be used (free) by any health care organization as part of its emergency management learning strategy.

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Keywords: e-learning, emergency management, dementia, frailty, disasters

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SYMPOSIUM 1 -CLIMATE CHANGE MEANS MORE WEATHER-RELATED DISASTERS: WILL OLDER ADULTS BE SAFE?

An inter-generational bridging response to the need for more resilient communities

S. Mackenzie

As a society we have allowed generations to become increasingly isolated: workers in the workplace, children in the schools, and seniors in retirement communities and care facilities. izi Intergenerational Society of Canada is committed to assisting communities in building new networks of purpose between generations. These inter-generational partnerships are the groundwork of community resiliency and make us a safer and more stable society¹. Every community's most precious resource is its people. Yet often we neglect to invest in this most important resource, in particular, the two ends of the demographic spectrum, the young and seniors. One of the characteristics of mono-generational situations is that many young people and many older adults are suffering issues related to isolation. In a disaster, be it smaller and personal in nature, or catastrophic and generalized, these people are disadvantaged². At present only 7% of Canadian seniors are in care facilities³ so a large percentage of our older adults may in fact be alone in their apartments or homes when an emergency or disaster strikes. **Methods:** The izi Society implements projects that are intended to purposefully connect older adults and children and youth within the context of their community. These connections may be educational in nature, service related or celebrations of life together. Workers in the workplace, children in and out of the schools, and older adults in and out of care are coached and encouraged to come together to create sustainable partnerships in simple and cost effective ways. This presentation will explore the potential to include issues of emergency preparedness and disaster resilience within this framework. **Results and Discussion:** This presentation will build on the two previous papers by creating an opportunity to "think outside the box" in terms of responding to the challenges posed by the combined forces of population aging and global warming. The paper will include discussion as to how projects such as the proposed izi Intergenerational Community Demonstration project and other completed projects (e.g., the Meadows School Project⁴) demonstrate the potential to connect youth and the aged in order to provide assistance, safety and camaraderie. The potential for nurturing empathy between age groups through inter-generational, as opposed to mono-generational, events is far-reaching. This paper will explore the application of this approach to the challenge of making the world a safer place for older adults and other vulnerable populations in the face of increasing risk of natural and human-made disasters. Generations are empowered when they cross-over in their educating for safety and companionship. Bridges established between generations are crucial to support in times of trouble. Audience feedback and suggestions will be encouraged.

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SYMPOSIUM 1 -CLIMATE CHANGE MEANS MORE WEATHER-RELATED DISASTERS: WILL OLDER ADULTS BE SAFE?

Aging, climate change, health and well-being: The possibilities of narrative inquiry

C. Phoenix

Purpose: The purpose of this conceptual paper is to examine the possibilities of narrative inquiry for understanding how climate change, health and well-being might intersect in the everyday lives of older adults. Narrative begins with the assumption that experience is constituted and lived through storytelling. Telling stories about our environment, our relationships, and ourselves is fundamental to how we make meaning (Phoenix, Smith & Sparkes, 2010). Everything from our history to our future, from our physical health to our emotional well-being is linked to the tales we tell ourselves and others (Kenyon, Bohlmeijer & Randall, 2011). Stories are central to who we were and who we can become. **Method:** In order to begin to better understand what narrative inquiry as a methodology can be (Smith, 2007), and gain some theoretical purchase on this field, I first define narrative. Next, a distillation of guiding assumptions and characteristics are offered. Finally, some reasons as to why narratives may be of benefit for understanding the health implications of growing old in a changing climate are highlighted. **Results /Discussion:** Narrative inquiry is a useful and important way of theorising and doing research examining the interplay between climate change, health and well-being in the everyday lives of older adults. It can reveal how personal and political realities are constructed, and the ways in which older adults might enact truth claims about climate related health impacts. **Conclusion:** Informed, principled, and responsible choices must be made by researchers and applied professionals about why and when they might engage with narrative inquiry should they wish to do so.

Keywords: Narrative inquiry; Ageing; Health and Well-being; Climate change.

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May 25, 2011 | 16:00 – 17:30

SYMPOSIUM 2 - CHALLENGES OF GLOBAL WARMING FOR THE ELDERLY: HEAT STROKE, HYPERTHERMIA AND HEALTH

M. White (Convenor)

PARTICIPANTS: GP Kenny- *Climate change and rising heat: Health implications for the aging Canadian population and workforce*; WL Kenney- *Global warming and heat-related morbidity and mortality in the elderly*; MD White- *Elderly responses to heat stress and strategies for adaptation to warm climates*

ISSUE: With global warming new important challenges are apparent for elderly Canadians. There is a relative risk of 1.7 for hospital admission during heat waves for the elderly (1). During heat waves 12-100% additional deaths (2) are due in part to cardiovascular causes rather than hyperthermia (i.e. increased core temperature). It is also striking that high ambient temperatures increase breathing-related hospital admissions, particularly in the elderly population (3). The underlying physiological causes of ailing health in the elderly under heat stress remains to be defined, as do what preventative strategies and measures can be taken. **CONTENT AND STRUCTURE:** Dr. Glen P. Kenny will present on the current understanding of human adaptive physiological responses to heat and how vulnerable older workers can be protected in these conditions. His presentation will document the additional risks of aging workers and those with chronic conditions including diabetes. Outcomes from his presentation will include knowledge on the development of heat stress prevention and control measures to manage heat stress in these vulnerable older workers. Dr. Larry L. Kenney will present on his extensive research on cardiovascular responses of the elderly during heat stress. His presentation is targeted at elucidating the physiological link between the aging cardiovascular system and heat-related cardiovascular morbidity and mortality. Outcomes from his presentation will include a detailed description of changes in the cardiovascular responses in elderly individuals (64-81 years of age) relative to younger control group (19-28 yoa). The results from Dr. Kenney's research show that mortality in the elderly appears to follow from diminished cardiovascular responses rather than from heat stroke. Dr. Matthew D. White will present on how pulmonary ventilation responses in the elderly change during acute heat stress. His studies employ traditional modulators of breathing, such as hypoxia, to assess how human pulmonary ventilation responds in the heat. His research on elderly Canadians follows from his research on pulmonary ventilation responses to chronic heat stress in humans (4). Outcomes from his presentation will include a description of the diminished pulmonary ventilation responses of the elderly to traditional modulators of breathing and how this contributes to their increased health risk during heat stress. **CONCLUSIONS:** Overall the symposium will give a synopsis of what new challenges are evident for the elderly as a consequence of global warming and what gaps remain in our understanding of elderly human physiological responses to heat stress. Strategies will also be identified to help elderly individual prepare for and manage their health during heat waves.

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Keywords: adaptation, aging, heat acclimation, heat stress, physiology

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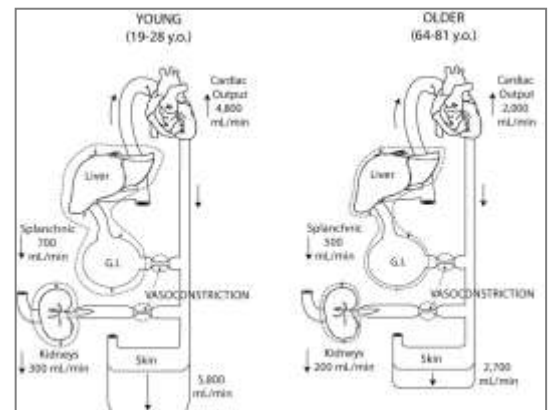
SYMPOSIUM 2 - CHALLENGES OF GLOBAL WARMING FOR THE ELDERLY: HEAT STROKE, HYPERTHERMIA AND HEALTH

Global warming and heat-related morbidity and mortality in the elderly

W.L. Kenney

There is a clear association between global warming and the frequency and severity of environmental heat waves (HW), as well as a strong relation between heat waves and morbidity and mortality among men and women over the age of 65. In many reports, the number of excess deaths during HW due to *direct* heat-related causes, i.e., heat stroke, is markedly smaller than the overall excess mortality¹. A recent meta-analysis covering the years 1966-2006 documented that 12-100% of additional deaths during HW were attributable to psychiatric illness or cardiovascular causes --without fulfilling common criteria for "heat-related death" (e.g., core temperature $\geq 40.6^{\circ}\text{C}$)². Resting heat stress necessitates an integrated response of the cardiovascular system that determines the available blood flow supply characteristics of the system. During maximal passive hyperthermia, when skin blood flow (SkBF) can approach 8 L/min, pumping function of the left ventricle is severely stressed. The aging heart, even in healthy primary aging, lacks the b-adrenergic responsiveness to minimize that strain. **Methods:** To elucidate the physiological link between the aging cardiovascular system and heat-related cardiovascular morbidity and mortality, results of a study previously done in our laboratory are reexamined³.

Results and Discussion: To understand the large number and proportion of HW deaths among the elderly due to cardiovascular problems, one must examine the responses of the healthy aged heart to passive heat stress. We examined the responses of older (64-81 yr) and young (19-28 yr) men by measuring cardiac output as well as its distribution to the major vascular beds (see figure) during prolonged passive heating. During supine rest, subjects were heated to the limit of their individual thermal tolerance using hot water perfused suits. The young men increased SkBF by an average of 5.8 L/min, compared to an average increase of only 2.7 L/min by the older men. However, a key major finding of this investigation was that the orchestrated cardiovascular response to direct passive heating was altered as a function of age of the subject. Specifically, the increase in cardiac output was significantly less in the older men despite similar increases in skin and core temperatures. A lower stroke volume, most likely due to an attenuated b-adrenergic responsiveness, was the primary factor for the lower cardiac output observed in the older men. This age-difference in the stroke volume response occurred despite a similar fall in central venous pressure in all subjects. While the young men were able to maintain or increase stroke volume despite the falling central venous pressure, stroke volume fell progressively in the older men. Both age groups had similar increases in heart rate during the heating protocol. However, when expressed as a percent of maximal heart rate, the older men responded with a higher $\%HR_{\text{max}}$ response, i.e., they relied on a greater proportion of their chronotropic reserve. **Summary:** With global warming, the increased mortality among the elderly is likely due to cardiovascular sequel rather than heat stroke per se and laboratory data provides a logical physiological rationale.



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SYMPOSIUM 2 - CHALLENGES OF GLOBAL WARMING FOR THE ELDERLY: HEAT STROKE, HYPERTHERMIA AND HEALTH

Climate change and rising heat: Health implications for the aging Canadian population and workforce G. Kenny

Aging has been associated with a progressive deterioration of aerobic capacity, muscular strength, and muscular endurance, as well as a progressive increase in body-fat mass. As a result, physical work capacity and tolerance to heat stress decrease¹. Performing physical work in the heat leads to greater physiological strain, as manifested by higher core and skin temperatures, increased heart rate, and a lower sweat rate for middle-aged individuals compared to younger adults^{2,3}. This decrease in thermoregulatory ability, which is compounded by chronic disease, can be attributed to a combination of factors including changes in sweating³, skin blood flow³, and cardiovascular function⁴ all of which can decrease the body's ability to maintain core temperature at safe levels, especially during extended heat exposure and/or work in the heat⁵. This can lead to increased dehydration, premature fatigue, and decreases in motor function and performance, resulting in an increased risk of thermal and/or physical injury⁶. Current workplace heat safety guidelines are primarily based on research performed on young, healthy individuals, placing ageing workers and those with chronic conditions (e.g. diabetes) at risk. Considering that recent years have seen: 1) an aging Canadian population and workforce⁷; and 2) a higher incidence and prevalence of obesity and diabetes⁸, employers can no longer rely on heat stress prevention and control measures that were developed for a younger healthy workforce. The purpose of this presentation is to examine our current understanding of the adaptive responses to extreme ambient conditions and its adverse effects on vulnerable workers and to review current research directed at adapting heat stress prevention and control measures to protect vulnerable individuals such as older workers. This will include the examination of on-going studies examining the effects of aging on whole-body heat loss and body heat storage during work in the heat as evaluated by whole-body calorimetry. This knowledge will be used to provide 1) the best and most up-to-date information for heat vulnerable populations of the effect of heat and work on their health and safety, and 2) effective heat stress prevention and control measures to manage heat stress vulnerable workers, a population group for which no guidelines currently exist.

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SYMPOSIUM 2 - CHALLENGES OF GLOBAL WARMING FOR THE ELDERLY: HEAT STROKE, HYPERTHERMIA AND HEALTH

Elderly responses to heat stress and strategies for adaptation to warm climates

M.D. White

It is unclear what physiological changes predispose the elderly to a decreased ability to sustain their health in during heat exposure. High ambient temperatures increase respiratory-related hospital admissions, particularly in the elderly population. In humans a hyperthermic-induced hyperventilation or thermal hyperpnoea is evident with increases in core temperature. This hyperventilation influences both cranial temperature and whole body acid-base status. The purpose of this presentation will be to review our preliminary studies of human pulmonary ventilation responses to hyperthermia to help establish if this is impairing the health of the elderly in the heat. **Methods:** Elderly individuals (50-60 years of age) and controls (20-30 years of age) were rendered hyperthermic in a climatic chamber held at 50°C/20%RH. Pulmonary ventilation responses to elevated core temperatures as well as eucapnic hypoxic ventilatory response tests (eHVR) were compared between in normo- (NT) and hyperthermic (HT) conditions. **Results- Study 1:** Pulmonary ventilation (V_E) was not significantly different between the control and elder group in either the NT ($p=0.75$) or HT ($p=0.45$) conditions. Pooled values during body warming gave a significant increase ($p=0.03$) of V_E from ~14 to 22 L/min. There was a corresponding trend for an increase ($p=0.09$) in tidal volume (V_T) from ~0.95 L in the NT condition to 1.34 L in the HT condition. Neither the younger nor the elder group's frequency of breathing (F_B) was influenced by the elevation of esophageal temperature (T_{ES}). For both groups the $P_{ET}CO_2$ significantly decreased ($p=0.006$) from ~38 mm Hg to ~29 mm Hg and $P_{ET}O_2$ significantly increased ($p=0.006$) from ~105 mm Hg to ~115 mm Hg (Fig. 2b). **Results- Study 2:** For the ventilatory responses to eucapnic hypoxia, all younger and elder volunteers completed the NT- but only 3/5 of the elder group completed the HT- eHVR test. Of the two volunteers who could not complete the eHVR, one completed the first 6 min and the other volunteer was unable to complete any of the eHVR test; both volunteers experienced presyncopal symptoms. Irrespective of Temperature, between groups peakHVR was significantly reduced ($P=0.007$) for the elder vs. the younger group. There was a significant main effect of Age for eHVR in NT ($P=0.001$) but not in HT ($P=0.147$) with means comparisons given in Table 1.

Table 1. eHVR responses (mean \pm SD) in control and elder groups in normothermic (NT) and hyperthermic (HT) environments. (* $p < 0.05$ between NT groups).

Time (min)	Eucapnic Hypoxic Ventilatory Response ($L \cdot \text{min}^{-1} \cdot \%^{-1}$)			
	Control NT (n=5)	Control HT (n=5)	Elder NT (n=5)	Elder HT (n=3)
+5	0.95 \pm 0.29	1.64 \pm 1.13	0.23 \pm 0.12*	0.19 \pm 0.26
+10	0.64 \pm 0.22	1.39 \pm 1.35	0.13 \pm 0.28*	0.07 \pm 0.21
+15	0.52 \pm 0.25	0.86 \pm 0.72	0.08 \pm 0.13*	0.23 \pm 0.42
+20	0.43 \pm 0.21	0.79 \pm 0.80	0.04 \pm 0.12*	0.43 \pm 0.70

Discussion and Conclusions: These preliminary results support that elderly humans have a normal hyperventilation response to elevated core temperature, but a significantly reduced chemo-sensitivity that renders them incapable to respond to normal modulators of breathing when they are heat stressed.

Keywords: aging, breathing, hyperthermia, hypoxia

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May 25, 2011 | 16:00 – 17:30

SYMPOSIUM 3 - SENIORS AND THE PUSH FOR AGE-FRIENDLY TRANSPORTATION IN OUR COMMUNITIES: MAKING IT GREEN

B. A. Pitman (Convenor)

PARTICIPANTS: B.A. Pitman – *Seniors-Led Community Development in BC's Lower Mainland*; E.A. Loverin – *The North Shore Seniors Go Bus: An Alternative Seniors Transportation Model*; D. Dunne – *The Road Ahead: Is there Quality of Life after the Car?*; P.M. Hill – *Planning a Sustainable Transportation System for an Aging Population*; M. Mahan – *STAR, the Seniors Transportation and Resources Strategy*.

ISSUE: Affordable and accessible transportation is the number one issue for older adults in BC's Lower Mainland. Without a driver's license, many seniors are cut off from the services, social life and amenities in their communities, i.e. the very network of relationships that research links to good health among older adults. While recent changes to public transit mean accessibility has improved for people with disabilities, including many seniors, many more are too frail or fearful to ride the bus. A growing number of seniors are advocating for age-friendly community development, including affordable and accessible transportation services. They make two demands: one is for a senior-friendly approach to the design and operation of public transit; the other is for the expansion of alternative forms of seniors' transportation. **CONTENT:** Findings will be presented from five vantage points in the increasingly coordinated, community-based response to seniors' transportation issues in the region. First, from the United-Way funded seniors' community planning tables addressing the issue, the results of surveys, community dialogues and pilots carried out since 2008; second, from a seniors' organization, its experience with a community shuttle-bus designed and operated for older adults; third, from the road-safety perspective of BCAA, the results of research on older drivers and the case for alternative seniors transportation; fourth, from Translink, strategies for making public transit more accessible for seniors and people with disabilities; and fifth, the social-enterprise response to these issues as conceived by a non-profit organization active in the field of environmentally sound transportation. **STRUCTURE:** Beverley Pitman will summarize the activities of the seniors' community planning tables and those of a partnership drawn from the public transit, non-profit, charitable and government sectors, and outline their joint accomplishments. Annwen Loverin will describe the North Shore Seniors Go Bus, a successful model of senior-specific transportation launched in 2006. David Dunne will describe older driver behaviours, the need for driver cessation strategies and alternative transportation for seniors. Peter Hill will describe Translinks' activities and future plans to increase the accessibility of its public transit fleet for older adults. Margaret Mahan will outline the STAR Strategy, a transportation resource hub designed to match seniors with rides, coordinate research and support the development of alternative seniors' transportation in BC. Following these presentations, there will be an open discussion about the possibilities for 'greening' age-friendly transportation. **CONCLUSION:** Seniors and their advocates are introducing age-friendly forms of transportation to the Lower Mainland which show signs of being environmentally sound.

Keywords: seniors transportation; age-friendly communities; older drivers; sustainable development

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SYMPOSIUM 3 - SENIORS AND THE PUSH FOR AGE-FRIENDLY TRANSPORTATION IN OUR COMMUNITIES: MAKING IT GREEN

Seniors-led community development in B.C.'s lower mainland

B.A. Pitman

Since 2008, United Way of the Lower Mainland has funded several seniors-led community planning tables in the Greater Vancouver area. Comprised of older adults, representatives of seniors' organizations, the seniors' service sector and government agencies, as well as politicians from (sometimes) all levels of government, the planning tables have a double mandate – to coordinate local seniors' services and address issues of concern to local seniors. Across the region, affordable and accessible transportation has emerged as the number one issue at these tables. In this paper, I describe the kind of community development process that is taking shape as seniors engage in the research, experimentation, advocacy, and policy work required to bring about age-friendly transportation in their communities. **Methods:** The transportation-related activities of the seniors' community planning tables are summarized and key elements of their achievements are set out. These include effective research and issue identification, community mobilization, involvement and action on practical, political and policy fronts on the part of some key partners (local and regional transportation providers, non-profit and charitable organizations, local politicians, and municipal and provincial agencies). **Results and Discussion:** Seven planning tables conducted survey questionnaires, community dialogues and pilot projects related to seniors' transportation issues. Their findings, together with input from key partners, helped prompt action on the part of the provincial government. Current activities of this community-based partnership include: research on alternative seniors transportation providers and barriers to innovation in the field, the development of the STAR (Seniors Transportation and Resources) Strategy, and the CASI (Community Action for Seniors Independence) Project. Lastly, potential roles for the partnership are described, including a greater emphasis on planning for socially and environmentally sustainable transportation.

Keywords: community development, age-friendly communities, alternative transportation, partnerships

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SYMPOSIUM 3 - SENIORS AND THE PUSH FOR AGE-FRIENDLY TRANSPORTATION IN OUR COMMUNITIES: MAKING IT GREEN

The North Shore Seniors Go Bus: An alternative transportation model

E. A. Loverin

Numerous community programs and services exist to support the physical, mental, and emotional well-being of older adults. Health policy research demonstrates a positive linkage between seniors' community relationship networks and health: seniors involved in one or more organizations are more likely to report good health than those not as involved.¹ When lack of transportation presents a barrier to community organizations and services, seniors may experience greater dependence on acute over preventative services, find that their ability to live independently is compromised, and focus more on meeting basic needs over quality of life. While a variety of transportation options exist for seniors, including driving, public transit, and other alternatives, such options are ideal, according to the US Beverly Foundation, if they satisfy the 5 A's of Seniors Friendly Transportation: availability, acceptability, accessibility, adaptability and affordability. Here, I describe the North Shore Seniors Go Bus in these terms and in relation to global climate change. **Methods:** The history of this community shuttle bus is described, focusing on its origins in a community-based partnership, its seniors-centred design and operation, and the benefits it affords older adults, their families and the community. **Results and Discussion:** The Seniors Go Bus was launched in 2006 and today operates three days a week in North Vancouver and the eastern edge of West Vancouver. Each day focuses on different neighbourhoods and the route and schedule are built from regular bookings, with one-time and last-minute bookings added in. The service works well because:

- partnership in development, promotion, and operation has increased responsiveness of and commitment to the service;
- the service easily coincides with existing activities;
- a created route combines with the flexibility of stops available on request and the accessibility of door-through-door service to create efficiencies in moving larger numbers of riders;
- the technical expertise, professionalism, and caring demeanour of the driver is an excellent match for the clientele's needs;
- the slower pace of the service means that frailer and more isolated seniors are self-selecting into the service while more active seniors who can use other modes of transportation are self-selecting out.

Experience with the Seniors Go Bus indicates that seniors transportation options should be communicated to individuals and families before they are needed, should not be stigmatized, should enable seniors to make both basic needs and quality of life trips, and should create a complementary menu of options for individuals. We have just begun to study the climate change impacts of alternative seniors transportation models, centring on the overall reduction of a community's vehicle emissions. Early discussions indicate that the routing and scheduling effectiveness of the Seniors Go Bus offer considerable vehicle emission reductions over private automobile use and that the daily neighbourhood focus offers further reduction opportunities.

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Keywords: seniors, transportation, climate change

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May 25, 2011 | 16:00 – 17:30

SYMPOSIUM 3 - SENIORS AND THE PUSH FOR AGE-FRIENDLY TRANSPORTATION IN OUR COMMUNITIES: MAKING IT GREEN

The road ahead: Is there quality of life after the car?

D. Dunne

One of the realities of today's society is our over-dependence on the private automobile as a means of staying connected to the community. Because car-dependence is particularly pronounced among older people, population aging suggests that the future – the road ahead – will have even more cars. Unfortunately, the view down the road is not a pretty one for other reasons – older drivers are more likely to be involved in traffic accidents and more likely to be injured or killed as a result, than younger drivers. In this paper, I describe the heightened risks to seniors and others on the road associated with an aging population whose members continue to drive, largely because alternative forms of transportation suitable for seniors are not available. **Methods:** The work of BCAA's Road Safety Foundation is focusing increasingly on the implications of population aging for safety on the road, seniors' reluctance to stop driving, and the need for alternatives to the private automobile so that driving cessation is common, not only because it is the safe thing to do but because it is also practical. The paper summarizes research in this area. **Results and Discussion:** We can look at our aging population in terms of those who can and wish to continue driving, those that choose not to drive (or limit their driving) and those who should not drive (usually as a result of a medical condition and or medications). We can better understand the individual, social and environmental effects of these different choices when we factor in the costs (human and financial) associated with motor vehicle crashes. Statistics show that as we live longer we are outliving our safe driving abilities by an average of 6 to 10 years (males / females). Although chronic medical conditions can affect people of any age, today's seniors are typically dealing with multiple medical conditions and medications, many of which can affect their functional abilities. While most healthy older people remain competent drivers, those with medical conditions can often present a safety risk to themselves and other road users. Clearly, we need to support the timely transition to driving cessation for all three segments of the aging population. We need strategies for each segment that encourage appropriate and responsible decision making and use of transportation options. And we need to implement these strategies as individuals, families, communities and governments. But opportunities as well as challenges are associated with the growing numbers of elderly in our society. If we are able to truly address seniors' transportation and mobility needs, we can help ensure they maintain a good quality of life, improve their safety and the safety of others on the road and, in the process, positively impact climate change. We can do that by developing 'senior-friendly' transportation alternatives that are also environmentally sound. Our failure to do so will almost certainly result in greater dependence on the automobile, more traffic fatalities, and an increasingly degraded planet.

Keywords: seniors, traffic safety, transportation alternatives

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May 25, 2011 | 16:00 – 17:30

SYMPOSIUM 3 - SENIORS AND THE PUSH FOR AGE-FRIENDLY TRANSPORTATION IN OUR COMMUNITIES: MAKING IT GREEN

Planning a sustainable transportation system for an aging population

P. Hill

2005 marked the year that accessibility became a prominent issue for TransLink. Since then, much advancement has been made, including the creation of an Access Transit Users Advisory Committee on accessibility issues, the achievement of a 100% wheelchair, scooter and stroller accessible transportation fleet, improvements to the custom transit (HandyDART) model and improved outreach and information programs for all customers. The purpose of this presentation is (1) to briefly outline TransLink's response to the operational and policy issues surrounding the mobility demands and accessibility concerns of seniors and persons with disabilities in the Metro Vancouver region over the past decade, and (2) provide an overview of the role a public transportation system can play in protecting the environment and supporting the economic and social objectives of the region. **Methods:** Translink's response to an aging population is described and analyzed.

Results and Discussion: As the public transit system in the Metro Vancouver area becomes increasingly accessible, more individuals choose it as a viable transportation option. However, the projected demand for more accessible transportation is expected to be influenced by a significant population increase (an increase of approximately 1 million by 2020), combined with a rapidly aging population demographic and the social phenomenon of 'aging in place'. TransLink now faces the challenge to ensure it provides sustainable, accessible transportation choices that meet the needs of all current and future users. Some barriers that will need to be overcome while planning for our future population include:

- Building capacity and more flexible options that do not significantly increase the financial commitments from already stretched budgets;
- Ensuring all future transit vehicle designs account for increased capacity for wheelchairs, scooters, and strollers;
- Providing sustainable and healthy choices in addition to the conventional transit fleet, such as walking and cycling;
- Encouraging seniors to learn about alternative transportation choices to ensure a safer transition from driving cars to more appropriate public transportation options;
- Collaborating with municipalities on regional and municipal land use decisions on where to locate seniors-specific housing and/or light industrial parks.

Now more than ever, TransLink must work with external partners, stakeholders and corporate subsidiaries to plan and manage the region's transportation system as a strategic whole, meeting the demands of the aging population in a manner that protects the environment and supports the economic and social objectives of the region.

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Key words: accessibility; transportation; seniors; mobility; disability

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May 25, 2011 | 16:00 – 17:30

SYMPOSIUM 3 - SENIORS AND THE PUSH FOR AGE-FRIENDLY TRANSPORTATION IN OUR COMMUNITIES: MAKING IT GREEN

STAR - Seniors Transportation and Resources Strategy

M. Mahan

STAR takes the momentum of population aging, the need to remain mobile if healthy aging is to occur, and provides mobility solutions that are less carbon intensive than classic individual driving behaviours. STAR also creates the space and organization for agencies serving the aging population to share best practices, lever resources and generally optimize use of all forms of energy. STAR represents a way of working that will be more important than ever as climate change impacts the economy in a broad way. Finally, STAR is also working to develop the programs and projects that will increase the viability and utilization of active transportation by seniors (with a view to zero carbon footprint) and working with electric mobility industries to bring electric fleets to the senior serving agencies and companies. **Methods:** The history and principles of the STAR Strategy as developed by BEST (Better Environmentally Sound Transportation), a Vancouver-based non-profit organization are described, together with the strategy's relationship to global climate change. **Results and Discussion:** STAR is a response not only to seniors-specific transportation needs, but also to the highly fragmented and fragile nature (in terms of funding) of the emergent alternative seniors' transportation sector. In the hands of BEST, a non-profit associated with the development of bicycle lanes and other forms of active transportation in the Greater Vancouver area, STAR is also a response attuned to global climate change.

Keywords: seniors, transportation, active transportation, social enterprise, climate change

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May 26, 2011 | 8:30 – 10:00

PANEL SESSION 3- CLIMATE CHANGE ADAPTATION STRATEGIES FOR AGING POPULATIONS

B. Menne

G. Kierzek

L. Frank

New tools for aging visionaries: Elders as agents of change in the community

S. Sheppard

Elderly people occupy a unique position in history, as the only generation that has seen both 'baseline' conditions before climate change, and its emerging impacts. They thus carry a responsibility to tell their stories and reframe community perspectives on resiliency. Many communities are not "age-friendly": people cannot walk to buy a newspaper, drop into a clinic, or age in place in smaller homes. Often seen as resistant to change, older residents of such neighbourhoods have actually become the catalyst to radical changes needed to make communities more complete, compact, healthy, resilient and low-carbon. Baby-boomers are also concerned with their future legacy, and can help communities take a long-term view. Using stories from action research in BC communities, we illustrate how aging populations can enhance their role in re-envisioning and retrofitting communities, by engaging with new visual media and visioning processes to influence community design, local policy, and social norms, and by collaborating with youth in shared community visions.

May 26, 2011 | 10:30 – 12:00

PAPER SESSION 1: POLICY, LAW AND PUBLIC SERVICE LINKED TO CLIMATE CHANGE

Enforcing the rights to life and healthy environment under international climate regime

S. Alabi

Purpose: Most notably from the period of the industrial revolution, many challenges have faced humankind regarding the environment and sustainable development. The most sustained environmental issue facing humankind this century remains climate change; this is evident because of its calamitous effects on global issues of importance. And sadly, climate change has threatened many areas of global issues such as public health, human rights, international trade, marine environments, biodiversity, topography of small island states, political stability and economies of the developing states, to mention but a few. Whilst climate change has been regarded as a global problem with global responses in terms of climate laws and policies which promote global reduction of GHGs, no policies or laws are implemented specifically to public health under the climate regime at the international level. Of course various reports of the Intergovernmental Panel on Climate Change (IPCC) have established the projected climate change-related exposures which are likely to affect the health status of millions of people, particularly those with low adaptive capacity in the developing countries. It is thus clear that both younger and older populations are vulnerable to adverse effects of climate change. The question is if no international policies are implemented specifically to the public health of the ageing population under the climate regime, are there international regimes which address this issue? **Method:** The aim of this paper is to establish linkages between climate change and other international regimes so as to determine if climate obligations can be enforced through the regimes. In so doing, the paper aims to propose that climate litigation may reshape global responses to climate change from the perspective of human rights enforcement. **Discussion:** Whilst it is a fundamental human right to have right to life which most countries have enshrined in their domestic constitutions, it is therefore inevitable that a healthy environment must be secured. Nevertheless, this paper makes a case purview for international climate policies which address the ageing population of the older population in the absence of health policies under the climate regime. **Conclusion:** Apart from identifying that climate litigation through human rights may reshape global responses to adverse effects of climate change on ageing populations, it aims to provide the fora to achieve such feats.

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May 26, 2011 | 10:30 – 12:00

PAPER SESSION 1: POLICY, LAW AND PUBLIC SERVICE LINKED TO CLIMATE CHANGE

UK policy and practice for sustainable public services in the context of an ageing population

S. Evans, S. Hills and J. Orme

Purpose: Older people account for a large proportion of public services accessed in the UK and these services are significant contributors to the UK carbon footprint. Demographic trends therefore present a major challenge for making services sustainable in the context of global warming. We report on a research project commissioned by the UK Government to explore the impact of climate change on public services (Evans et al. 2010). We present an analysis of the array of government policies and strategies that have emerged in response to the challenges that climate change pose for society. We assess the implications of these for health and social care services that are already struggling to respond to the increasing demands of an ageing population and explore some examples of environmentally friendly models of service delivery. We conclude by making recommendations for commissioners and policy makers in terms of making public services more sustainable. **Methods:** A mapping exercise identified twenty five recent UK government strategies and policies focusing on mitigating against and adapting to climate change. Detailed case studies identified a range of good practice in terms of services that have adopted a sustainable approach. Finally, a series of recommendations were developed for policy makers and commissioners with a view to promoting services that are sustainable. **Results and Discussion:** Government policies fall into four broad categories in terms of their overall aims: reducing carbon emissions, embedding sustainable procurement, promoting sustainable communities and encouraging sustainable development. Key policies under the previous Labour administration include The Climate Change Act (DEFRA 2008), Procuring Our Future (DEFRA 2005) and Securing the Future (HM Government 2005). The tangible aims of policies under the new coalition government are less clear, despite their stated objective to be 'the greenest government ever'. Many initiatives have been targeted at promoting sustainable development within the NHS, but there has been no similar strategic approach to social care services. Case study work identified a range of good practice for promoting sustainable development in health and social care, including combining top down and bottom up approaches, mainstreaming telecare and web based initiatives, and promoting systems based on co-creation, localism and mutualism. A range of potential challenges to sustainable commissioning were identified, including a lack of long term thinking, resistance to innovation and the trend towards personalisation of services. **Conclusion:** We conclude that there are many opportunities for making public services sustainable in the face of climate change, fiscal crisis and a rapidly ageing population. However, these challenges can only be met by taking a holistic approach to services that integrate environmental, social and economic aspects of sustainability. Crucially, the government must ensure that the resources and conditions to support such 'triple win' approaches are rapidly put in place.

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Keywords: UK public services, climate change

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May 26, 2011 | 10:30 – 12:00

PAPER SESSION 1: POLICY, LAW AND PUBLIC SERVICE LINKED TO CLIMATE CHANGE

Age-friendly cities and climate-change resistant cities: A research on synergies

J. Hu

The World Health Organization has initiated a movement for age-friendly built environments, while UNESCO has long discussed sustainable cities with a focus on climate change mitigation and adaptation. Without direct collaboration between the two efforts, the recommendations for an age-friendly city appear to have distinctive similarities and synergies with climate-change resistant cities. **Purpose:** This paper seeks to explore these synergies which can be further capitalized upon to advance both movements, for the purposes of promoting wellbeing of seniors in midst of climate change. **Methods:** Literature reviews were performed on both the issue of age-friendly built environments and the issue of sustainable cities (specific to climate change mitigation and adaptation). Comparative analyses of the data were then performed to explore commonalities, differences, and potential for collaboration. **Results and Discussion:** Synergies between sustainable cities and age-friendly cities exist largely for climate-change mitigation, though there certainly is overlap with climate-change adaptation designs as well. Regarding mitigation, mixed-use and high-density designs¹ which drastically reduce the distances between points-of-travels can aid in climate change mitigation² through cutting (or possibly eliminating, in the case of car-free cities) the greenhouse gases produced by vehicular miles travelled. At the same time, reducing distances between points-of-travel helps to reduce 1) travel cost, 2) travel time, and 3) general travel risk (ie. car accidents) for seniors³, which ultimately improve senior's access to health care, employment, and community governance. This is especially important in light of the increased rates of disability and chronic illness among seniors. Secondly, regarding adaptation, simplifying the travel environment provides distinct benefits in terms of protecting seniors from risks of extreme climate. A prototype design for sustainable cities⁴, which shifts travelling to a primarily indoor setting, is a specific example of how sustainable cities can defend and even enhance the mobility of seniors in midst of climate change. Overall, the literature reviews shows promising synergies in terms of transport-oriented development and senior mobility.

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Keywords: age-friendly cities, sustainable cities, transport-oriented development

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May 26, 2011 | 10:30 – 12:00

PAPER SESSION 1: POLICY, LAW AND PUBLIC SERVICE LINKED TO CLIMATE CHANGE

Designing the eco-town: Conflicts and convergence between ageing population and climate change at the Kobe workshop

J. Myerson, J. Bichard, and R. Gheerawo

Purpose: The design of homes, neighbourhoods, even towns and cities will have an impact on how we respond to the challenge of climate change. Rising temperatures and unpredictable weather will have most impact on the most vulnerable in society, making the design connections between the elderly and climate change a significant factor. However research into sustainable environmental design strategies that can contribute to reducing the energy demand of homes and workplaces has largely ignored the needs of ageing populations – and the body of knowledge around inclusive design and lifetime homes for older people has similarly been developed in complete isolation from climate change. Thus two of the most pressing global issues for the design profession – demographic and climate change – have each been considered without recourse to the other. **Methods:** It was to create an interface between these two design issues that Professor Sarah Harper, Director of the Oxford Institute of Ageing at the University of Oxford, and Professor Jeremy Myerson, Director of the Helen Hamlyn Centre for Design at the Royal College of Art, London, jointly convened a four-day international expert workshop at St Catherine's College, Kobe, Japan, on 15-18 January 2010. The aim of the Kobe workshop was to bring together a panel of leading design academics and practitioners from the UK and Japan to share ideas, build knowledge and explore scenarios at the interface of demographic and climate change. UK participants came from the Architecture Department at the University of Cambridge and the University of Surrey as well as Oxford and the RCA. The Japanese delegation was led by professors from the Faculty of Design at Kyushu University and Shizuoka University of Art and Culture, and included the designer of the new age-friendly mass transit system in Fukuoka City. There were 18 participants in the workshop. **Results:** This presentation describes the process and outcomes of the Kobe workshop, focusing on points of conflicts and convergence between ageing population and climate change. A live 'brief' to develop a new age-friendly eco-town at Bicester, Oxfordshire, provided the dynamic real-world platform for four teams to work on different design aspects – work, health, mobility and energy – and create scenarios for the future. The picture that emerged from Kobe was complex. On the one hand, there are conflicts between social enterprise and mobility and the need to curb energy use, threats to outdoor green business from wilder weather, and problems with low-output lighting for those with visual impairments. On the other hand, there are convergences between high-density energy infrastructures and the needs of older people, and positives to be taken from inter-generational mixing in terms of community wellbeing and productivity. The Kobe international workshop was a unique gathering and its insights set an integrated new agenda for design research. This paper tells the inside story and sets out that agenda.

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Keywords: Eco Towns, Climate Change, Ageing

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May 26, 2011 | 10:30 – 12:00

PAPER SESSION 1: POLICY, LAW AND PUBLIC SERVICE LINKED TO CLIMATE CHANGE

Low carbon: high energy! Towards active ageing in sustainable neighbourhoods

R. Bond

Purpose: Globalisation, urbanisation, climate change and demographic ageing are converging, though sometimes competing, trends that are directing the shape of our collective global future. At a national level in Ireland, these are addressed by a range of agendas in the areas of economic policy, spatial strategy, sustainable energy strategy and an emerging strategy on positive and active ageing. However, much current change is driven by leadership at the local level, in a practice to policy innovation paradigm, building local evidence to shape national policy evolution. This paper will provide an overview of how urbanisation, climate change and ageing are being addressed in an integrated development plan for County Louth in Ireland, working within the WHO's Age-friendly Cities framework. **Methods:** The presentation will:

- highlight the governance and management mechanisms that have been re-cast within existing structures to ensure a joined up delivery approach;
- identify and discuss several cross thematic action areas at a range of implementation levels from urban design to sensor-activated behavioural monitoring in the home, that illustrate the opportunities for such an approach;
- highlight the role that 3rd level educational bodies can play in forging and sustaining continuous innovation to support local and regional leadership and entrepreneurship, and;
- outline some of the challenges that are emerging and some of the strategies that are being considered to energise change over a long haul.

Results and Discussion: The paper will conclude with some reflections on a possible integrated theoretical framework based on a Teilhardian perspective of energy and action.

Keywords: Age-friendly cities; urban design; active aging

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May 26, 2011 | 10:30 – 12:00

PAPER SESSION 2: REGIONAL/NATIONAL EXAMPLES OF CLIMATE CHANGE
IMPACTING ON OLDER ADULTS

Climate change adaptations in British Columbia's small cities and rural communities: An exploratory study
J. Drolet

From wildfires, severe wind and rain storms, and flooding, British Columbians are seeing increasing evidence of how weather change can adversely affect our lives. Although warmer temperatures may be appealing, seemingly small changes in climate can have significant ecological, social, and economic consequences. For example, slightly warmer temperatures have contributed to the devastating mountain pine beetle infestation in the BC Interior and Northern regions. There are growing concerns about summer water shortages in the agriculturally-significant Okanagan region. Hotter, drier summers increase evaporation, drying the soil and ground-fuel materials. These conditions could pave the way for more forest fires. Besides destroying forests, fires can be financially costly. Nationally and internationally, the frequency of natural disasters is increasing. The cumulative effect of these disasters produces a significant personal, material and economic strain on individuals, communities and the fiscal capacity of all levels of governments. Prevention/mitigation strategies can reduce or prevent disasters, losses and emergency response and recovery costs that would otherwise be incurred. In 2008 the Government of Canada adopted a National Disaster Mitigation Strategy, outlining how disaster risk reductions can be achieved, to the benefit of individuals, communities and infrastructure. The goal of the Strategy is to protect lives and maintain resilient, sustainable communities by fostering disaster risk reduction as a way of life. This presentation will share original research findings from a SSHRC-funded study that examines the ability of small cities and rural communities to respond and adapt to climate change and disasters. **Methods:** The study utilized focus groups, interviews and a survey to learn about community-based approaches to responding and adapting to climate change and resultant disasters in numerous small cities and rural communities. Policy-makers, community leaders, government officials, activists, disaster workers, program officers, among others, shared their experiences on how communities are responding and/or adapting to climate change at the local level. **Results and Discussion:** Results demonstrate that many of BC's small cities and rural community are already experiencing the impacts of climate change at the local level. The findings demonstrate that the impacts are felt differently in each community, which requires further investigation to better meet the emergent and future needs. Information, education and communication on climate change adaptation is urgently needed to meet the needs of vulnerable populations including women, older people, and others.

Keywords: climate change, vulnerable populations, social work

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May 26, 2011 | 10:30 – 12:00

PAPER SESSION 2: REGIONAL/NATIONAL EXAMPLES OF CLIMATE CHANGE IMPACTING ON OLDER ADULTS

Climate change effects on human mortality in Tehran, Iran

M. Farajzadeh

The relationship between climate and human health has been examined by researchers from various disciplines (Mather, 1974; Oliver, 1981). However, the short-term association of weather parameters with mortality over the whole range of variation has been addressed by only a few studies and these have mainly focused on temperature. The aim of this study quantifies the effects of stressful weather on cause-specific mortality (cardiovascular, respiratory and stroke) in Tehran in during 2002-2005. **Methods:** Weather variables data were obtained from the Iranian Meteorological Organization for the period of 2002-2005. Also daily mortality data from 2002 to 2005 were obtained from the Behesht Zahra organization. We just selected the disease mortality that had strong correlation with climate factors including Cardiovascular, Respiratory and Stroke diseases based on previous studies (Yan, 2000; Kan et al., 2007). ANOVA model were used to compare daily mortality in different seasons of year with regard to climate factors. To reduction climate factors, factor analysis was applied. The climate factors are divided to two components including temperature and precipitation and then were analyzed. **Results and Discussion:** Results show a total of 166069 deaths in the study area and these rates were attributed to cardiovascular and respiratory systems failure, stroke and some other diseases such as neoplasm and digestive disease which in this research have not been discussed. The causes of death by cardiovascular, respiratory systems failure and stroke comprised 38.5, 4.5 and 4.9 percent respectively. The number of total and cause specific mortality in winter is more than that occurs in the other seasons. In the other words, the highest mortality occurs in winter season while the lowest total and cause specific mortality occurs in the summer season. The results of ANOVA showed that there is a distinct difference between daily mortality in the seasons of year. There is no significant difference in daily mortality in winter and autumn seasons for cardiovascular and respiratory disease mortality while there isn't a difference in summer and autumn daily mortality. But for stroke disease mortality there isn't a difference in daily mortality between seasons. There is a significant difference for total daily mortality only in winter seasons. Of course, daily mortality in winter is higher than autumn and for spring higher than summer. Therefore the seasons of year are divided to three seasons (winter, spring and summer).

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May 26, 2011 | 10:30 – 12:00

PAPER SESSION 2: REGIONAL/NATIONAL EXAMPLES OF CLIMATE CHANGE IMPACTING ON OLDER ADULTS

Why do elders of ethnic communities avoid social activities?

V.K. Mago, V. Dabbaghian & P. Borwein

Purpose: A high agriculture yield witnessed in India during the 1960's and beyond made farmers prosperous, particularly in the Punjab region¹ in India. The well-off farmers sent their children to developed countries like the USA, Canada, UK, and Australia. Therefore a significant increase in Indian immigration has been observed in Canada. The recent changing climatic conditions are adversely impacting agriculture² in India and hence income. The Canadian Family Class integration channel of immigration made it possible for elders to come here and join their families who moved during the Green Revolution. This resulted into high influx of elders from Punjab³. The elders of this ethnic community find it challenging to integrate with the surroundings due to various social, cultural and environmental factors, apart from communication problems that they face. The most effective way, suggested in the literature^{4,7}, is to promote their interactions through social networking. **Method:** We plan to apply Quality Function Deployment (QFD), a total quality management⁸ tool, to understand the relationship between the prohibiting causes and the ways that can be employed to promote their participation. The overall design of the study is divided into three phases. Phase 1: Conducting survey, based on vignette and open-ended questions, to identify the causes that prohibit elders of ethnic group from social interactions. Phase 2: Applying QFD tool to understand the relationship between the causes and the ways that can be employed to bridge the gap. Phase 3: Designing fuzzy logic based mathematical model(s) for simulation. This research work is unique and innovative as it: 1) applies fuzzy QFD to the field of gerontology and then 2) designing mathematical model for optimal resource utilization. **Results and Discussion:** Climate change has resulted in either stagnation or reduction in agriculture produce in India. This has led to the immigration of elders who have their families in Canada. But after moving, they find it difficult to integrate with Canadian culture. A study is required to understand the problems they face from their social environment. We plan to design a generic mathematical model to enhance their participation in social activities while keeping the cost at a minimal level. This is a novel idea as it incorporates expertise of gerontology, management and mathematics.

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Keywords: Climate change, Agriculture yield, Migration, Social activities, Quality function deployment, Mathematical modelling.

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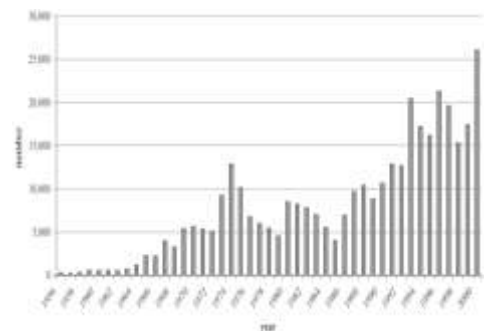


Figure 1: Indian immigration to Canada trend (1956-2000)

May 26, 2011 | 10:30 – 12:00

**PAPER SESSION 2: REGIONAL/NATIONAL EXAMPLES OF CLIMATE CHANGE
IMPACTING ON OLDER ADULTS**

Ageing in Greece in an evolving environment of climate change

K. Nikoli

Over the past three decades the climate of Greece has been transformed from moderate-dry into extremely hot and humid. The forest fires that have taken place every year since 1981 and the associated air pollution have caused dangerous alterations to the physical environment of our country. At the same time the population of older persons had increased, with 24% of the 11 million aged 60 and over. Greek old people suffer from a complex of respiratory diseases during the summer months when temperatures reach 40-43 degrees C. Traditionally older persons in Greece have been regarded as the cornerstone of the family. Their role has a particular emphasis on the socio-psychological components of Greek cultural life. In this presentation we will address the following critical questions: Is the physical environment of Greece as it has been transformed, able and ready to provide a "Home" for its older people? What measures need to be taken in order that older persons have positive well-being? In answering these questions we will identify some key-pathways that support our global environment, including transforming elders from being viewed as weak and vulnerable, to enabling them to be partners for a shared support of our physical and social environment.

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May 26, 2011 | 10:30 – 12:00

PAPER SESSION 2: REGIONAL/NATIONAL EXAMPLES OF CLIMATE CHANGE IMPACTING ON OLDER ADULTS

Assessing the vulnerability of older adults to climate change: Review of the science

J.L. Gamble, P.A. Schultz & B.J. Hurley

Purpose: Older adults are frequently identified as a population that is likely to be especially vulnerable to the impacts of climate change. A number of physiological, emotional, and social factors contribute to this vulnerability, including the generally higher prevalence of certain diseases, medical conditions, and functional limitations among older adults; their higher sensitivity to extreme heat and other extremes of weather; their increased social isolation; and financial constraints. This paper summarizes the state of the science regarding the impacts of climate change on older adults, including key climate and non-climate factors influencing their sensitivity and vulnerability to climate change, determinants of older adults' adaptive capacity, and measures that could be undertaken to reduce their vulnerability. **Methods:** We performed targeted literature searches for peer-reviewed studies, gray literature, and government publications covering demographic statistics on older adults, factors contributing to vulnerability, determinants of adaptive capacity, and possible response strategies. We synthesized and summarized the key findings of these studies to prepare a general state-of-the-science report on the vulnerability of older adults to climate change. **Results and Discussion:** Key findings include:

Demographic characteristics:

Older adults are a diverse and rapidly growing population.

Location matters: Many older Americans live in regions that are expected to be relatively hard-hit by climate change.

Primary climate stressors:

Climate change is likely to affect older adults disproportionately. Projected impacts of climate change to which older adults are particularly sensitive include extreme heat and weather events (heat waves, hurricanes, floods, and droughts), reductions in air quality, and increases in the risk of infectious diseases.

Factors affecting exposure:

Exposure is determined by local and individual factors. The quality and adequacy of buildings and infrastructure, as well as the availability of social services and community support networks, affect the degree to which older adults are likely to be exposed.

Determinants of adaptive capacity:

Socioeconomic status and community resources strongly influence adaptive capacity. Financial resources allow communities to invest in effective technologies and infrastructure, provide social services, build strong institutions, and provide vibrant and safe neighborhoods for older Americans. Many factors affect vulnerability and adaptive capacity, may interact with each other, and rarely act in isolation.

Measures to reduce vulnerability:

Building capacity at both the community and individual levels is key. Developing early warning and response systems, coupled with planning and development to enhance community resilience, will go a long way toward reducing the vulnerability of older adults to impacts of climate change. At the same time, vulnerable individuals could be provided with information, tools, and services to help them avoid or mitigate risk.

Keywords: climate change, vulnerability, older adults, aging, adaptation

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May 26, 2011 | 10:30 – 12:00

PAPER SESSION 2: REGIONAL/NATIONAL EXAMPLES OF CLIMATE CHANGE IMPACTING ON OLDER ADULTS

Assessing the vulnerability of older adults to climate change: Highlights of a listening session

J.L. Gamble, P.A. Schultz & W.S. Jaglom

Purpose: In the United States, climate change is expected to exact a range of impacts on the health and well-being of vulnerable populations, including older adults. To address these issues, we look to the discussion at a December, 2010 Listening Session hosted by the U.S. Environmental Protection Agency (EPA) and attended by representatives from eight non-governmental organizations (NGOs) who serve older adults in the United States. The Listening Session sought to identify how NGOs perceive the impacts of climate change on older adults in the United States and their involvement in addressing their special needs. **Method:** The participants were selected by first identifying NGOs working with older populations on a national level and then selecting those which have a focus on issues specifically related to health. The listening session was organized as a round-table discussion structured around a series of questions designed to elicit information about how and in what ways aging-related NGOs have begun to address the issue of climate change as it impacts older adults in the United States. The session was conducted in the format of a focus group where initial questions were posed and members of the group responded to one another. The session was divided into three sections, including (1) characterizing the vulnerability of older adults to climate change, (2) examining existing or planned programs for older adults related to climate change, and (3) identifying research needs. The session was recorded and transcribed.

Results and Discussion: Findings from the session suggest that aging NGOs:

- i. Are interested in understanding the potential impacts of climate change for their constituents,
- ii. Recognize a series of non-climate risk factors that create greater vulnerability to climate change among older adults,
- iii. Find that older adults are less concerned about the long-term consequences of climate change and more so about near-term extreme events, such as extreme heat, tropical storms, flooding, and wildfires,
- iv. Also note that most policy responses have focused on near-term threats from extreme weather rather than on the longer-range impacts of climate change,
- v. In some cases, have developed communication resources designed to educate older adults, caregivers, and advocates about the risks posed by climate change,
- vi. Desire input from federal agencies about the state of the science, about measures or indices which characterize or quantify the vulnerability of older adults, and about best practices or decision tools for addressing adaptation needs or developing response strategies.

This listening session provided a foundation for: assessing the particular vulnerabilities of the older adult population; understanding the interplay of important climate and non-climate risk factors; examining the efficacy of existing programs and best practices; addressing opportunities for communication and cooperation between the scientific and the advocacy communities; developing adaptation strategies; and identifying research needs and gaps.

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May 26, 2011 | 10:30 – 12:00

PAPER SESSION 3: HEAT-RELATED MORBIDITY AND MORTALITY

Shifts in mortality during a hot weather event in Vancouver: Rapid assessment with case-only analysis

S.B. Henderson, T. Kosatsky, and S.L. Pollock

Purpose: At the end of July 2009 Vancouver, British Columbia experienced three consecutive days with maximum temperatures exceeding 30°C at the airport. Such conditions are extreme for the region, and vital statistics data showed that high temperatures coincided with elevated mortality. The objective of this work is to assess whether people who died during the hot weather event were different from people who died on typical summer days in 2009.

Methods: Running 7-day averages of the daily maximum temperatures recorded at the Vancouver airport were calculated to identify that July 27th – August 2nd was the hottest calendar week in the summer of 2009. People who died during this period were compared to people who died during the eight previous weeks of the summer. Characteristics that predicted shifts in mortality during the hot weather event were assessed using case-only analyses.^{1,2} In brief, the characteristic of interest was set as the response variable and the heat event was treated as predictive covariate, with a value of 1 for death during the event and 0 for death during the comparison period. The characteristics considered were: (1) age category (< 65, 65-74 and 75-84 compared with 85+); (2) sex (male compared with female); (3) death at home (compared with death at another location); (4) administrative health area (AHA) having population density >1000 persons/km² (compared with ≤1000 persons/km²); (5) AHA having >40% of people over 65 living alone (compared with ≤40%); and (6) AHA having >20% of residents below a low-income cut off (compared with ≤20%). **Results and Discussion:** There were 413 deaths during the hot weather event, compared with an average of 291 deaths for previous summer weeks. Risk of mortality during the hot weather event was highest in the 65-74 age category compared with the 85+ category (OR = 1.50; 95%CI = 1.09–2.06). During the Chicago³ and Paris⁴ heat waves risk was highest for those in the 85+ category, and we cannot speculate as to why persons of 65-74 were relatively more impacted in Vancouver. Deaths at home were increased over deaths in hospital or other locations (OR = 1.39; 95%CI = 1.06–1.80), which may reflect the rapid demise associated with exposure to extreme heat.^{5,6} A similar increase occurred during the 2003 Paris heat wave, where risk factors for at-home death included: living alone; chronic diseases; lack of mobility; sleeping on the top floor; limited thermal insulation; and higher temperatures around the decedent's residence. These factors may partially explain increased mortality for AHAs with population density >1000 persons/km² (OR = 1.23; 95%CI = 1.00 – 1.53).

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Keywords: heat wave; mortality; risk factors; case-only design

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May 26, 2011 | 10:30 – 12:00

PAPER SESSION 3: HEAT-RELATED MORBIDITY AND MORTALITY

Elderly population mortality associated with apparent temperature in Metro Vancouver

G. Krstic

Ambient air temperature is a recognized seasonal factor associated with mortality in the general population and particularly in the vulnerable subpopulation of elderly¹⁻⁵. However, due to a variation in environmental/meteorological parameters and population characteristics, it is difficult to predict and quantify accurately short or long-term health effects from outdoor temperature extremes. Studies suggest the presence of a lag time between the exposure and an effect, where lag times of 0 to 3 days during heat waves have been observed to produce the strongest effect on mortality rates^{4,6,7}. Ambient temperature and mortality show a skewed V-shaped relationship⁴ where, depending on the geographical area, temperature extremes outside a thermal comfort zone of approximately 15° to 26°C may lead to an elevated stress and increased population mortality^{3,4,8}. This study is designed to evaluate the association between seasonal variation in apparent temperature (AT) vs. circulatory and respiratory (C&R) mortality rates in Metro Vancouver elderly population. Methods: The analyses presented in this paper are based on daily meteorological data (i.e., air temperature (°C), relative humidity (%), and wind speed (m/s)) obtained from 13 monitoring stations of Metro Vancouver, and daily mortality rates for circulatory and respiratory causes, excluding influenza and viral pneumonia, in the population age 65 years and over obtained from the British Columbia Vital Statistics Agency for the period from January 2004 to December 2006. The values for AT, as a measure of perceived outdoor temperature, are calculated using the method as described by Steadman (1994)⁹. Descriptive statistics and scatter plot analyses revealed no evidence of non-normality in the distribution of daily mortality and AT data allowing the use of linear regression. The strength, direction, and statistical significance of Pearson's correlation coefficients (r) are observed and the AT evaluated in terms of its ability to explain the variation in the response variable (i.e., mortality from circulatory and respiratory causes) by calculating the coefficients of determination (r²) for all seasons, warm temperatures above 15°C, and cold temperatures below 10°C. Results and Discussion: Linear regression analyses of daily mortality from circulatory and respiratory causes vs. moving average AT using 1, 2, 3, 5, and 7-day models show r²-values of 0.024 (p=0.07), 0.044 (p=0.01), 0.053 (p<0.01), 0.039 (p=0.025), and 0.021 (p=0.11) for warm temperatures above 15°C; and r²-values of 0.058 (p<0.001), 0.112 (p<0.001), 0.138 (p<0.001), 0.191 (p<0.001), and 0.236 (p<0.001) for cold temperatures below 10°C, respectively. The results from warm temperature models indicate that a 3-day moving average AT is the best predictor of heat-related mortality in the elderly population, which is in agreement with the published epidemiological evidence⁷. Cold temperatures appear to be better than warm temperatures in predicting mortality, showing an increasing strength for longer time intervals. Approximately 24% of the variation in mortality from circulatory and respiratory causes in cold season could be accounted for by the variation in a 7-day moving average AT. Comparative prediction abilities of 3-day moving average models for warm vs. cold AT will be shown during the presentation. In a changing climate, a 1°C increase of a 3-day moving average AT could be associated with 0.29 additional deaths per 100,000 elderly population (i.e., up to 27 additional deaths during a 92-day warm season (June – August) in a 300,000 elderly population of Metro Vancouver).

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Keywords: elderly, mortality, apparent temperature

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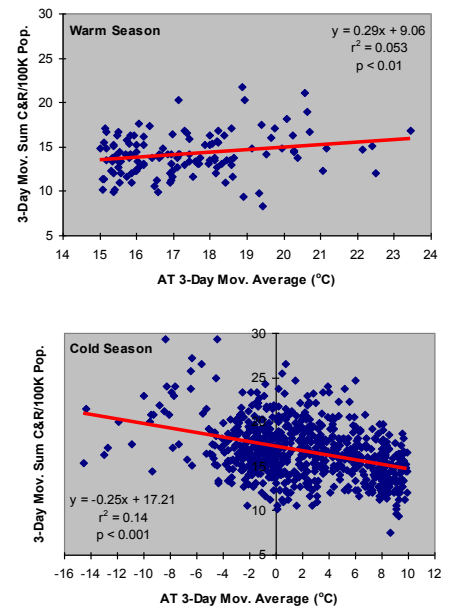


Figure 1: Mortality vs. Moving Average AT

May 26, 2011 | 10:30 – 12:00

PAPER SESSION 3: HEAT-RELATED MORBIDITY AND MORTALITY

Housing, homelessness and hot weather: The impact of heat waves on the most vulnerable *P. Stephenson*

This paper reflects on the already known disastrous impacts of heat waves on mortality rates of elderly individuals to suggest intermediate and longer-term responses that are required to limit dramatic increases in deaths due to heat exposure. For example, The Earth Policy Institute estimates that a minimum of 35,000 people died in Europe in August 2003 in eight countries where data was available (Larson, 2003; Bhattacharaya, 2003). In France alone, the numbers reached nearly 15,000—most of them elderly and isolated people. Although very high death rates, particularly among isolated and insecurely housed elderly in Europe and North America have been well documented, strategies to avoid even more serious outcomes in the near future have not been well developed (Keatinge, 2003). This paper suggests some inexpensive strategies individuals may be able to take in view of the current lack of planning, as well as policy steps needed to insure that action actually will be taken.

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Keywords: heat-waves, housing, mortality, mitigation, strategies

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May 26, 2011 | 10:30 – 12:00

PAPER SESSION 3: HEAT-RELATED MORBIDITY AND MORTALITY

Heat awareness and response in senior populations in British Columbia

K.L. Bassil, T. Kosatsky and H. Moffatt

Purpose: Senior populations are more vulnerable to health effects from heat exposure and may have less adaptive capacity to deal with the increased duration and severity of such events.¹ Public perception studies provide the opportunity to improve understanding of the way the public perceives the impact of heat on health.²⁻⁴ The objective of this study is to describe heat awareness and response in elderly populations in the southern interior regions of British Columbia. **Methods:** Participants included individuals over the age of 65 years, residing in Chilliwack, Hope, and Abbotsford, BC. Through a combination of focus groups and survey questionnaires conducted over the summer of 2009, information was collected across three key areas: i) knowledge of heat as a health hazard, ii) key sources used to obtain information about impending hot weather, iii) protective behaviours adopted during periods of extreme heat. **Results:** A total of 108 participants were included in this study. The majority of participants with access to air-conditioning live in long-term care or assisted living facilities (nearly 75%). Of the community dwellers, only 30% have air conditioning in their homes. Only half of participants expressed feeling that hot weather is a serious problem, yet most people reported using at least one protective measure during periods of extreme heat. Despite the majority of participants identifying a social network of people they are in regular contact with, only 7% ask for help with their daily activities during periods of hot weather. **Discussion:** This pilot study has helped to contextualize this situation in the BC context; heat is not perceived as a major health hazard. However, seniors represent a group vulnerable to hot weather and most respondents reported using at least one protective measure during periods of extreme heat. There is work to be done to increase perception of heat as a health hazard in areas of BC, and encourage the use of protective behaviours.

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Keywords: hot weather, health, elderly, heat perception

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May 26, 2011 | 13:00 – 14:30

SYMPOSIUM 4- SUPPORTING COMMUNITIES IN RESPONDING TO AGING POPULATIONS AND CLIMATE CHANGE- FEDERAL, PROVINCIAL AND LOCAL PERSPECTIVES

L. Syverson (Convenor)

PARTICIPANTS: P. Gorr, Division on Aging and Seniors, Public Health Agency of Canada (Moderator); A. Rogaeva, Climate Change and Health Office, Health Canada- Supporting Communities to respond to Extreme Heat; L. Syverson, Seniors Healthy Living Secretariat, BC Ministry of Health - Supporting Local Governments to create Age-friendly, Inclusive, Accessible and Sustainable Communities; N. Carley, City of Vancouver - What Can Local Governments do to create Age-friendly Cities and Address the Impacts of Climate Change?

ISSUE: Local governments are facing two growing challenges of the aging population and climate change. In an urban environment, extreme heat can have a major impact, and the frequency and severity of extreme heat events in Canada are expected to increase dramatically as the climate continues to change. The response to these challenges can result in more inclusive, accessible, age-friendly and sustainable communities for all ages. **STRUCTURE:** The Symposium will be chaired by Patti Gorr, Department of Aging and Seniors, Public Health Agency of Canada. Anastasia Rogaeva will provide an overview of Health Canada's Developing Heat Resilient Individuals and Communities Initiative and the information and tools for Canadian communities to help protect vulnerable populations, including seniors, from the health risks of extreme heat events. She will discuss preventative approaches based upon smart urban design that can reduce the urban heat island effect. Lauren Syverson will discuss the BC Ministry of Health's Age-friendly BC initiative, which has been underway since the initial World Health Organization Age-friendly Cities project in 2007. She will provide an overview of the supports available to BC local governments and how communities can leverage opportunities to integrate the creation of age-friendly communities into other community sustainability and green initiatives. Neal Carly will discuss the City of Vancouver's approach to adapting a wide range of social programs and the built environment to create an age-friendly City and address the impacts of climate change on all populations. He will discuss how social, education and emergency response programs have been adapted to manage the impacts of extreme weather on vulnerable populations throughout the City, and how they are transforming the built environment by adding more trees for shade, encouraging green walls and adding sidewalks, benches, curb ramps, bike lanes, way finding and other facilities to encourage walking and cycling for both an aging population and citizens of all ages. **CONCLUSION:** With a better understanding of what actions local governments can take, and of the various supports and resources available for local governments, participants can generate ideas to move forward and better integrate supports and resources.

Keywords: Age-friendly communities, accessible communities, green cities

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May 26, 2011 | 13:00 – 14:30

SYMPOSIUM 4- SUPPORTING COMMUNITIES IN RESPONDING TO AGING POPULATIONS AND CLIMATE CHANGE- FEDERAL, PROVINCIAL AND LOCAL PERSPECTIVES

Supporting communities to respond to extreme heat

A. Rogaeva, P. Berry

Purpose: The frequency and severity of extreme heat events in Canada are expected to increase dramatically as the climate continues to change. As part of Health Canada's Developing Heat Resilient Individuals and Communities Initiative the department is producing information and tools for Canadian communities to help them protect vulnerable populations, including seniors from the health risks of extreme heat events. **Results and Discussion:** Health Canada has developed a toolkit for communicating heat health risks to the public and a best practices guidebook for developing heat alert and response systems. Through the provision of advice to public health and emergency management officials in Canada, these documents support the development of healthy sustainable communities by providing information on risks to health from extreme heat, highlighting the most effective way to integrate heat-health messages with other health promotion campaigns and discussing preventative approaches based upon smart urban design that can be effective in reducing the urban heat island effect, thereby protecting the health of seniors.

Keywords: best practices, heat, communication, communities, vulnerable, urban design.

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Supporting local governments to create age-friendly, inclusive, accessible and sustainable communities

L. Syverson, R. Lawrence, D. Jmieff

Purpose: To provide an overview of how local governments can respond to the need to create age-friendly communities and address climate change. **Results and Discussion:** The Age-friendly BC initiative has been underway since the initial World Health Organization Age-friendly Cities project in 2007. An overview of the supports available to BC local governments, opportunities for recognition for local governments from the federal, provincial and international levels, and how this can be integrated into other community sustainability and green initiatives will be provided. There will also be examples provided of actions that have been accomplished in communities in B.C. that address both age-friendly and climate change responsive objectives.

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May 26, 2011 | 13:00 – 14:30

SYMPOSIUM 4- SUPPORTING COMMUNITIES IN RESPONDING TO AGING POPULATIONS AND CLIMATE CHANGE- FEDERAL, PROVINCIAL AND LOCAL PERSPECTIVES

What can local governments do to create age-friendly cities and address the impacts of climate change?
N. Carley

Purpose: To highlight actions underway within the City of Vancouver in adapting the built environment and social programs to create an age-friendly City and to address the impacts of climate change on all populations within the City. **Results and Discussion:** In this presentation, we will discuss the actions of the City of Vancouver has taken or planned to adapt to these factors within the community. For climate change, social, education and emergency response programs have been adapted to manage the impacts of extreme weather (cold/snow, heat/drought) on vulnerable populations throughout the City. The City is adapting the "built environment", such as adding more trees for shade and encouraging green walls to address climate change, while enhancing the public realm. For an age-friendly City, the City is adding sidewalks, benches, curb ramps, water fountains, bike lanes, way finding and other facilities to encourage walking and cycling for both an aging population and citizens of all ages.

Keywords: Age-friendly communities, accessible communities, green cities.

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May 26, 2011 | 13:00 – 14:30

SYMPOSIUM 5- TECHNOLOGY, CLIMATE CHANGE AND AGING

A. Sixsmith (Convenor)

PARTICIPANTS: Andrew Sixsmith (GRC, SFU) How can technology help seniors in the face of climate change?; Marcin Marzencki (CIBER, SFU) Using wireless sensor networks for simultaneous monitoring of environmental and bio-medical data; Uwe Glaesser (Computing Science, SFU) Information and Communication Technologies for seniors- a modelling approach; Kamal Gupta (Engineering, SFU) Towards Developing Companion Robots for Seniors; Fabio Feldman (Fraser Health) Research on Falls and Prevention of Falls; Ryan Woolrych (Health sciences, SFU) Use of telehealth in the management of chronic disease; Ben Mortenson (Gerontology, SFU) Assistive technologies to aid independent living.

ISSUE: Climate change will present several challenges to seniors in coming years, for example in relation to environmental conditions and health and the situation of seniors during natural disasters, such as floods. In addition the increasing numbers of seniors within world populations will place added strain on services, especially during periods of emergency and times of excessive heat and cold. The symposium aims to explore the potential of new technology to provide help and support to seniors in the face of a changing climate. **CONTENT:** The symposium draws on the expertise of researchers based at SFU and British Columbia in areas such as gerontology, robotics, computing science and engineering. Andrew Sixsmith will highlight some of the major challenges emerging as the world populations age in the context of global climate change. Marcin Marzencki will look at the simultaneous monitoring of environmental data and cardiopulmonary signals using wireless sensor networks. Uwe Glaesser will talk about modelling approaches to determine user requirements for information systems. Kamal Gupta will talk about recent developments in robotics and how these can be used to create companion robots that are able to provide help and support to seniors. Fabio Feldman will address the important issue of falls, particularly in respect to falls during cold weather and falls prevention approaches. Ryan Woolrych will talk about management of diseases such as COPD using telecare systems to connect seniors to community health professionals. Ben Mortenson will review how assistive technologies can be used to help older people in relation to mobility and independent living. **STRUCTURE:** The symposium will be introduced and moderated by Andrew Sixsmith, with each speaker outlining some of the recent developments in their field and suggesting possible avenues for future developments in light of some of the issues around climate change. Each presentation will be approximately 10 minutes providing ample time for general discussion at the end. The final discussion will focus specifically on mapping out an agenda for future research and development. **CONCLUSION:** The symposium is aimed at presenting state-of-the-art research in information and communications technologies for seniors and exploring the potential of these for solutions to the growing problem of climate change.

Keywords: Climate change, seniors, new technology, chronic disease management, robotics, sensor networks, information systems, falls

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May 26, 2011 | 13:00 – 14:30

SYMPOSIUM 5- TECHNOLOGY, CLIMATE CHANGE AND AGING

Technology solutions for seniors in a time of climate change

A. Sixsmith

By 2031, more than nine million Canadians (23%) will be aged over 65 and around 45% of them will report some form of disability through physical or cognitive impairment, chronic disease or frailty. At the same time, climate change may have a significant effect on seniors, for example due to their increased vulnerability during natural disasters or at times of excessive heat or cold. Developments in areas such as information and communication technologies and robotics have considerable potential for ameliorating some of these problems, by providing additional safety and security, supporting mobility, independent living and improving health and quality of life. **Methods:** The paper emphasises the heterogeneity of the older population and how their needs are highly variable in relation to products and services to support healthy and active living. The paper also reviews some of the recent advances within information and communication technologies that may represent key avenues for research and development to support seniors in a time of climate change. **Results and Discussion:** The paper highlights some of the major challenges emerging as the world's population ages in the context of global climate change and summarises recent developments in ambient technologies, robotics, telehealth and assistive technologies.

Keywords: information and communications technology, gerontechnology

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May 26, 2011 | 13:00 – 14:30

SYMPOSIUM 5- TECHNOLOGY, CLIMATE CHANGE AND AGING

Using wireless sensor networks for simultaneous monitoring of environmental and bio-medical data

M. Marzencki and B. Kaminska

Purpose: Recent accelerated climate change, more frequent extreme weather conditions, and natural disasters have affected our health and lifestyles^{1,2}. This is especially true for seniors, who are more sensitive to extreme temperatures, humidity, and pollution. Current methods of evaluation and treatment of the resulting diseases is not oriented at correlating the cause with effect, but rather concentrates on managing the consequences. Furthermore, during abnormal environmental events, health services are overwhelmed with patients and may reduce their standard of care making the entire system inefficient. We propose to use wireless technologies to enable real time remote monitoring of cardiopulmonary signals and subject activity in correlation with local environmental conditions. **Methods:** A wireless sensor network composed of wearable sensor nodes and environmental sensing nodes is used³. The nodes are organized into a mesh network allowing for direct interactions between devices and thus distributed operation of the system. Each wearable sensor node acquires cardiopulmonary signals and activity data with a miniature accelerometer attached to the suprasternal notch of the subject. The miniature accelerometer is a more convenient acquisition method than the standard ECG electrodes, especially for the senior population due to the skin sensitivity and cracking issues during prolonged use of wet electrodes. Environmental sensing nodes provide temperature, humidity, and air quality information. The data acquired by the environmental sensing nodes is used to trigger a more accurate bio-medical data acquisition on the wearable nodes. The wireless network is connected to the Internet allowing remote reporting and data interpretation for rapid response. **Results and Discussion:** Simultaneous acquisition of the subject's health data and the environmental data enables direct evaluation of influence of the environment on the subject's health. Furthermore, dangerous environmental conditions can be easily detected and appropriate monitoring can be activated. Due to selective activation of high fidelity bio-medical measurements triggered by the environmental data, wearable devices can be further miniaturized and their lifetime can be significantly extended without loss in precision or data reliability. **Conclusion:** Evaluation of the impact of climate change on health and lifestyle of senior populations can be significantly improved by using wireless sensor networks. Simultaneous monitoring of environmental data and cardiopulmonary signals enables identification of correlations between climate and health of individuals.

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Keywords: Climate change, telehealth, wireless sensor networks, wearable sensors

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May 26, 2011 | 13:00 – 14:30

SYMPOSIUM 5- TECHNOLOGY, CLIMATE CHANGE AND AGING

Information and communication technologies for seniors - a modeling approach

U. Glässer

Information and communication technology (ICT) has an enormous, yet widely unexploited, potential to promote active aging and create supportive environments that enable mobility and independent healthy aging. **Purpose:** Smart systems can help older people control their everyday environment by monitoring movement, activity patterns or vital signs for changes in health status, or potential emergencies. The aim of our work as presented here is to develop a methodological framework for exploring and modeling needs and expectations of seniors for active aging in terms of abstract computational services operating in a distributed network environment. Specifically, we intend to develop a computational modeling framework consisting of computational methods and tools needed to design and experimentally validate advanced AAL software services that support mobility, independence and social participation of older people within and outside of their home. Serving as a reference model in developing and testing service components, the framework will ensure a consistent integration of AAL services into a network environment based on existing standards. Equal emphasis will be put on technical function and performance, and on user-friendly concepts and interfaces. In exploring the problem space, we focus on four key design aspects: a comprehensive reference model for AAL services, a platform-independent AAL service architecture, executable service models for rapid prototyping, and prototypical implementations on generic devices. In order to obtain critical feedback of end-users already at the conceptual level, this is, in early stages of requirements analysis and validation of design specifications, we combine top-down and bottom-up system design approaches. **Method:** Technically, the reference model defines the functionality of services and their interoperability patterns in abstract computational terms, serving as a precise documentation for the design, development and testing of software components that implement the desired services. **Discussion:** A challenge in the definition of the reference model is that it naturally deals with a moving target; that is, the conceptual service model itself will evolve over time. This calls for a flexible specification/modeling approach, as was used for SDL^{1,2}. The approach taken here builds on the Abstract State Machine (ASM) method, known for its versatility in modeling complex distributed and mobile systems³. Rapid prototyping of high-level AAL service component models will enable experiments in early design stages, providing feedback on key technical requirements (interoperability and performance) to ensure the integration of solutions in a coherent and consistent framework as well as feedback on user-friendliness and suitability of solutions. Our approach builds on extensive experience with ASM modeling of complex distributed and mobile systems that are executable using the CoreASM open source tool environment⁴.

References:

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May 26, 2011 | 13:00 – 14:30

SYMPOSIUM 5- TECHNOLOGY, CLIMATE CHANGE AND AGING

Towards developing companion robots for seniors

K. Gupta

The population of older citizens in Canada and other major economies has been sharply increasing in recent decades due to improved standards of living, excellent health care, and development in state of the art preventive and diagnostic medical technology. While most seniors prefer to live in the comfort of their homes and independently as much as possible, it is clear that beyond some point, they may not be able to take care of themselves and need a helping hand in order to manage their day-to-day activities. Among current solutions include admission to assistive living facilities, nursing homes, in-home nursing, and living with close family members. These solutions, however, are often costly and demanding for the state, the individual and the family. Meanwhile, robotics technology has advanced at a tremendous pace, particularly in the last five years. With novel sensors, fast computing and advances in robotics - in particular ability of robotic systems to autonomously perform physical (involving both manipulation and mobility), as well as cognitive tasks - it is a logical step to adapt and extend this technology toward helping seniors live independently in their own home. We will explore this avenue in this talk.

Keywords: Companion robots

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The effect of climate on injuries due to falls

F. Feldman

Falls and fall related injuries in the aged 65 and older population is a major health concern accounting for 60 % of all injury related deaths and 86 % of all injury related hospitalizations. Although falls are generally believed to occur more often during the winter months, research findings on the effect of climate or seasonal patterns on incident of falls and related injuries have been inconsistent. The first part of the presentation will provide some additional evidence on the association between climates and the risk of falls and fractures and attempt to explain the mechanisms underlying these associations. The second part of the presentation will emphasize the use of technology to the prevention of falls and fractures, including the latest research related to hip protectors and compliant flooring.

Keywords: Falls, Fractures, Climate, or seasonal patterns, Seniors, Technology

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May 26, 2011 | 13:00 – 14:30

SYMPOSIUM 5- TECHNOLOGY, CLIMATE CHANGE AND AGING

The role of telecare in supporting formal carers

R. Woolrych

In an increasingly ageing population, solutions are being sought to enable older people to live independently in their own homes. Here, assistive technology has the potential to develop supportive environments for older people through monitoring their health and well-being in and around the home. This may provide a useful tool for those responsible for delivering care to the older person, such as formal carers and community nurses. Such intervention has the ability to provide information which allows the formal carer to be responsive to the changing condition of the older person, particularly relevant to those living with conditions, such as COPD, where symptoms are exacerbated by seasonal fluctuations in weather and temperature. However, little research to date has examined the impact of technology on the role of the formal carer. This is perhaps surprising given that the formal carer is in a valued position, being the person that often has sole responsibility for clinical decision-making, visiting the client on a regular basis and developing a level of trust and reciprocity with the older person. This paper is based on results from the implementation of an assistive technology project designed to provide formal carer's with patient information to support them in making care-related decisions. The study followed the trial use of a telecare system, capturing the experiences of formal carers and documenting the impact of assistive technology on older people. **Methods:** The research applied a multi-methods approach incorporating live forum theatre (n=2), trial and case conferences (n=6), exit interviews (n=6); and a dissemination session (n=1) involving formal carers at all stages of the research. **Results and Discussion:** The findings identify that assisted living devices have the potential, once trust is established, to support formal carers to undertake their role more effectively. It can provide them with a valuable clinical decision-making tool, particularly amongst older people living with COPD who are more vulnerable to changes in temperature, alerting the formal carer who can then make the necessary intervention. However, in accepting assistive technology as part of an integrated care solution, there are implications on the role and responsibilities of the formal carer, existing mechanisms for delivering community care and the quality of the relationship between the carer and the cared for. The paper concludes by considering the challenges for assistive technology if it is to be directly supportive of formal care-givers.

Keywords: telecare, carers, assistive technology

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Assistive technology and climate change

W.B. Mortenson

For seniors in the future, climate change will likely affect assistive technology use and device development, as average global temperatures increase and extreme weather events become more common. This presentation will explore how climate change, especially in terms of the increased prevalence of extreme weather conditions, may precipitate or exacerbate disability and affect the use of existing assistive technologies including tele-alert systems, mobility devices, and wheelchair seating, and ambient assisted living systems. New devices that are may be required to address issues associated with climate change will also be identified. **Methods:** Based on a review of climate change predictions, the potential impact on assistive technology use and development was envisioned. **Results and Discussion:** Climate change will likely affect assistive technology use. Some of the individual-related effects of climate change may be ameliorated through the use of existing devices and new technologies that could be developed.

Keywords: Climate change, seniors, assistive technology, disability

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May 26, 2011 | 13:00 – 14:30

SYMPOSIUM 6- SUZUKI ELDERS AND THE ENVIRONMENT: A MODEL FOR EDUCATION AND ACTION

D. M. Ellis (Convenor)

PARTICIPANTS: Members of the Association of Suzuki Elders- Marks McAvity, Neale Adams, Karl Perrin, Diana Ellis

ISSUE: Elders concerned about the environment can bring their own lifetime of knowledge, experience, and a specific elder perspective, to education and action on environmental issues. **CONTENT:** The Purpose Statement of the Association of Suzuki Elders reads: *"The Suzuki Elders are a voluntary association of self-identified elders working with and through the David Suzuki Foundation. We bring our voices, experiences and memories to mentor, motivate and support other elders and younger generations in dialogue and action on environmental issues. Suzuki Elders listen, learn, share and act through educating, communicating, connecting and advocacy."* In the symposium the history, vision and strategic plan of the Suzuki Elders, and its placement within the David Suzuki Foundation will be described. Recent initiatives will be shared. The challenges and opportunities of developing an elder perspective on environmental issues, including climate change, will be discussed. **STRUCTURE:** A moderator plus three members of the Association of Suzuki Elders will present for approximately 60 minutes. Questions and dialogue with participants will be encouraged in the final half hour. **CONCLUSION:** Elders are more than a vulnerable population to be considered in planning adaptation to, and mitigation of, climate change. Many elders wish to, and can, act vigorously on environmental issues, while bringing a valuable elder perspective to the work. We have much to learn from our elders

Key Words: Elder perspective, education, action.

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May 26, 2011 | 16:00 – 17:30

PANEL SESSION 4-PREPARING AGING POPULATIONS FOR CLIMATE CHANGE IN BRITISH COLUMBIA AND BEYOND

Special challenges for public health with climate change and aging populations

T. Takaro

Climate change is causing public health to pay special attention to the adaptive capacity of vulnerable populations. Seniors are at increased risk for health effects from climate change for several reasons such as reduced physiologic capacity to respond to heat and low income. They may also be at increased risk of waterborne infectious disease due to the diminished immune function in aging populations. This presentation will explore several potential public health responses to these vulnerabilities for seniors.

Climate change, air quality and chronic disease: prospects for adaptation through urban design

M. Brauer

Climate change and air pollution are linked through common emission sources and health impacts. Warming is linked to increased forest fires, smoke emissions and resultant respiratory disease impacts. Warmer climates have already led to longer pollen seasons, worsening symptoms for those with pre-existing allergic diseases. Increases in the frequency and intensity of extreme heat events are also expected to coincide with increased summer smog episodes and their resulting cardiovascular and respiratory health impacts, including premature mortality. Health impacts of climate change via air pollution will require increased application of traditional health protection measures, while common emissions sources require that climate mitigation approaches do not compromise air quality. However, these interactions also suggest opportunities for co-benefits through which greenhouse gas emissions are reduced in combination with reductions in emissions of health-damaging air pollutants. Healthy urban design, in which active transportation is facilitated, can lead to emission reductions while providing further potential health benefits through

Potential impact of climate change on the health of BC's seniors

A. Ostry

The purpose of this paper is to outline how climate change will likely affect seniors in BC. I first outline the changes in climate that are likely to occur in BC over the next several decades. This is followed by an elucidation of the main pathways between these likely changes in the environment and adverse impacts on the health of seniors. While the limited current research on this topic tends to focus on impacts of heat waves and air pollutants, concomitant to climate change, it is possible in BC, that community and economic de-stabilization and decreased food security attendant to climate change may be important determinants in the future for seniors' health outcomes.

Preparing for Climate Change: British Columbia's Adaptation Strategy

J. Pouliotte

In addition to working to reduce greenhouse gases through the implementation of the Climate Action Plan, the Climate Action Secretariat in the Ministry of Environment is helping British Columbia prepare for and adapt to the unavoidable impacts of climate change. The presentation will outline the BC Government's approach to climate change adaptation, with particular focus on those strategies and actions that intersect with the health and other sectors relating to climate change, health and an aging population.

Keynote Speaker and Panelist Biographies

Peter Berry, PhD (Canada)



Dr. Peter Berry is Senior Policy Advisor at Health Canada's Climate Change and Health Office in Ottawa where he has conducted research on health risks of climate change to Canadians, adaptive capacity, health vulnerability assessment and communicating climate change risks to the public. He is co-author of a number of Health Canada documents related to climate change and health including chapters of the report "*Human Health in a Changing Climate: A Canadian Assessment of Vulnerabilities and Adaptive Capacity*", released in 2008. Currently he is co-authoring publications to help Canadians prepare for more extreme heat events, including "*Communicating the Health Risks of Extreme Heat Events: Toolkit for Public Health and Emergency Management Officials*" and "*Assessment of Vulnerability to the Health Impacts of Extreme Heat in Winnipeg*". Peter actively participates in a number of collaborations related to preparing for the health impacts of climate change: he is co-chair of the Expert Advisory Group for development of Health Canada guidelines for assessing human health vulnerabilities to extreme heat events and is a member of an international Advisory Group for development of Pan American Health Organization/World Health Organization guidelines for assessing human health vulnerabilities to climate change. He is a past member of the Advisory Committee for the Climate Change Impacts and Adaptation Initiative under the Climate Prosperity Program of the National Roundtable on Environment and the Economy (NRTEE).

Michael Brauer, PhD (Canada)



Dr. Michael Brauer is a Professor in the School of Population and Public Health at The University of British Columbia. Michael also directs the Bridge Program – a strategic training program linking public health, engineering and policy. He is recognized internationally for his research on air pollution exposure and health impacts. Michael has participated in studies throughout the world and served on advisory committees to the World Health Organization, the US National Academy of Sciences, the Royal Society of Canada, the International Joint Commission and governments in North America and Asia.

Lisa Brown, PhD (USA)



Dr. Lisa Brown is an Associate Professor in the Department of Aging and Mental Health Disparities, College of Behavioral and Community Sciences, at the University of South Florida, Tampa, Florida. Lisa's clinical and research focus is on aging, disasters, health, vulnerable populations, and long-term care. Since 2004, Lisa has studied the acute and long-term psychosocial reactions and consequences of natural and human-caused disasters. Her research efforts focus on disaster mental health literacy, psychological first aid, access and use of disaster mental health services, and the effects of disasters on vulnerable populations. In addition to her scholarly activities that include co-editing a textbook on the psychology of terrorism and writing book chapters and journal articles on disasters and older adults, she also served as a volunteer mental health clinician after the 2004 and 2005 hurricanes in the United States. In 2007, Lisa was appointed to serve as the Assistant Clinical Director of Disaster Behavioral Health Services by the Florida Crisis Consortium, Florida Department of Health. In June 2008, she was appointed to the Disaster Mental Health Subcommittee of the National Biodefense Science Board Federal Advisory Committee, U.S. Department of Health and Human Services.

Carlos Corvalán, MPH, PhD (Brazil/USA)



Dr. Carlos Corvalán is a Senior Advisor on Risk Assessment and Global Environmental Change at PAHO/WHO, based in Washington DC. Carlos joined the World Health Organization (WHO) in 1993 and the Pan American Health Organization (PAHO/WHO) in 2008. He is editor and author of the WHO book "*Decision-Making in Environmental Health – From Evidence to Action*", the WHO report "*Climate change and human health – risks and responses*", and of the WHO report "*Ecosystems and human well-being – health synthesis*", which was WHO's contribution to the Millennium Ecosystem Assessment. He also co-authored WHO's report on "*Preventing diseases through healthy environments*", which provides a detailed assessment of the environmental burden of disease globally, by region and by country. For many years Carlos has been giving workshops to representatives from ministries of health and other government officials and experts to promote awareness and action related to protecting health from climate and other environmental changes. Carlos has a Masters degree in Public Health from Sydney University, Australia, and a PhD in Environmental Health from Nijmegen University in the Netherlands.

Larry Frank, PhD (Canada)



Dr. Larry Frank is the Bombardier Chairholder in Sustainable Transportation at the University of British Columbia and Senior Non-resident Fellow of the Brookings Institution. He specializes in the interaction between land use, travel behaviour, air quality, and health. Larry has been studying the effects of neighbourhood walkability on travel patterns and sustainability for over 20 years. He has lead or co-authored over 100 papers and two books; "*Health and Community Design: The Impacts of The Built Environment on Physical Activity*", and "*Urban Sprawl and Public Health*". Larry and his colleagues have also been conducting detailed assessments of fuel consumption and climate change impacts of urban form policies. Over the past decade, Larry has been working directly with local governments to help translate results from this research into practice based tools that can provide direct feedback on the health and environmental impacts of alternative transportation and land development proposals.

Gloria Gutman, PhD (Canada)



Dr. Gloria Gutman developed and directed the Gerontology Department and Gerontology Research Centre at Simon Fraser University from 1982-2005. Gloria served two terms as President of the Canadian Association on Gerontology, was President of the International Association of Gerontology and Geriatrics from 2001-2005, and currently is President of the International Network for Prevention of Elder Abuse. In addition, Gloria is a Director of the International Institute of Aging UN Malta, and a member of the World Health Organization's Expert Advisory Panel on Health and Ageing. She is author/editor of 22 books and monographs and over 150 scholarly articles, reports, and chapters on senior's housing, dementia design, long-term care, health promotion, aging and technology and seniors and emergency preparedness. In 2007, Gloria was awarded the Order of British Columbia for her pioneering work in Gerontology. In 2010 she was awarded an LLD honoris causa by the University of Western Ontario and named one of Canada's best 45 over 45 by *Zoomer* magazine.

Gary Haq, PhD (England)



Dr. Gary Haq is a Human Ecologist and Senior Research Associate at the Stockholm Environment Institute at the University of York (UK). Gary has worked on a wide range of interdisciplinary environmental projects (e.g. transport, climate change and air pollution) at the local and international level. He has a particular interest in human behaviour and the environment. Gary has led a number of climate change communication and social marketing initiatives to achieve community behavioural change. He was one of the first academics in the UK to examine the issue of an aging population and climate change and has produced a number of reports on this subject. He regularly writes for the UK press and has appeared on BBC radio and TV news and discussion programmes. His new book "*Environmentalism Since 1945*" will be published in September 2011 by Routledge.

Tom Kosatsky, MD, MPH (Canada)

Dr. Tom Kosatsky is Medical Director, Environmental Health Services, at the British Columbia Centre for Disease Control (BCCDC). Tom is also Scientific Director at the National Collaborating Centre for Environmental Health (NCCEH), and Clinical Associate Professor at the University of BC. His work at BCCDC involves support for regional public health providers, and the BC Health Ministry, in both service and research. The focus of his work with the NCCEH involves identifying quality evidence to support environmental public health activities across Canada, assessing program effectiveness, and supporting education and training. Current research highlights the assessment of population vulnerability to temperature extremes throughout BC. Prior to his March 2008 arrival in BC, Tom was consultant in environmental health to the Montreal Public Health program, and Associate Professor of Epidemiology at McGill University. Recent Montreal research included studies of knowledge, attitudes and practices of vulnerable Montrealers faced with high outdoor temperatures. Tom is a trained occupational physician, and has also worked for the US Centers for Disease Control and for the World Health Organization.

Aleck Ostry, PhD (Canada)



Dr. Aleck Ostry is Professor in the Faculty of Social Sciences at the University of Victoria. Aleck holds a Canada Research Chair in the Social Determinants of Community Health, and is a Senior Scholar with the Michael Smith Foundation for Health Research in British Columbia. He has a Master of Science in Health Service Planning, a Masters degree in history specializing in the history of public health, and a PhD in epidemiology. Aleck conducts an extensive research program on the social determinants of health, with focus on rural health, food security and nutrition policy.

Jennifer Pouliotte, MA (Canada)



Jennifer Pouliotte is a Climate Change Adaptation Advisor with the Climate Action Secretariat in the BC Government's Ministry of Environment. The Climate Action Secretariat provides cross-government leadership to achieve BC's greenhouse gas emission reduction targets and to prepare for climate change impacts. Prior to joining the Climate Action Secretariat, Jennifer worked on the socio-economic components of environmental impact assessments with Golder Associates, and on climate change adaptation and international development with the United Nations Institute of Training and Research in Geneva. She has a Masters degree in Geography from the University of

Guelph.

Stephen Sheppard, PhD (Canada)



Dr. Stephen Sheppard teaches sustainable landscape planning, climate change communications and visualization at the University of British Columbia. Stephen directs the Collaborative for Advanced Landscape Planning (CALP), a research group using future scenarios and 3D visualization tools to support community engagement and planning on climate change. Stephen has over 30 years' experience as a consultant in environmental assessment, energy planning, and public participation. He was a reviewer of the IPCC 4th Assessment, and heads the Social Mobilization research theme for the Pacific Institute for

Climate Solutions (PICS). Stephen's recent research projects focus on new visioning methods for communicating local climate change futures and informing public perceptions of clean energy. His latest book, entitled "*Visualizing Climate Change: A Guide to Visual Communication of Climate Change and Developing Local Solutions*", will be published later in 2011. For more information, see the CALP website: www.calp.forestry.ubc.ca.

John M.R. Stone, PhD (Canada)



Dr. John Stone received his education in the UK with degrees in Chemistry, Mathematics and Physics. John came to Canada as a post-doctoral fellow at the National Research Council (NRC). His career was with the Federal government where he worked at the NRC, External Affairs and Environment Canada. John ran the federal climate research program for several years and advised Ministers on the issue of climate change. He served on the Bureau of the Intergovernmental Panel on Climate Change (IPCC) for the 3rd and 4th Assessment Reports, and also worked for the International Development Research Centre (IDRC). John retired in 2005, and is currently an adjunct Research Professor at Carleton University in Ottawa.

Kathy Sykes, MA (USA)



Kathy Sykes has been serving as the Senior Advisor for the United States Environmental Protection Agency Aging Initiative since 2002. She strives to raise awareness among older adults, and public health and aging professionals about environmental health hazards. She is committed to protecting both environment health and human health through smart growth practices. During her 25 year career, Ms. Sykes has held various health and aging policy positions at the state and federal level. She served as Associate Director for Planning & Legislation for the CDC's National Institute for Occupational Safety and Health, as professional staff for the U.S. Special Committee on Aging, and as Associate

Staff for Congressman David Obey of Wisconsin. She also worked as a special assistant for the Administrator of the Wisconsin State Division of Health. Kathy received a master's degree from the University of Wisconsin-Madison in Public Policy and Administration and Health Services Administration. In 2010, she became a Fellow in the Gerontological Society of America. She has served as guest editor for publications dedicated to aging and the environment for the American Society on Aging (2010) and for the International Federation on Ageing (2011).

Tim Takaro, MD (Canada)



Dr. Tim Takaro is a physician-scientist, and is Associate Professor and Associate Dean for Research in the Faculty of Health Sciences at Simon Fraser University. Tim's training is based in occupational and environmental medicine, public health and toxicology from Yale, and also the University's of North Carolina and Washington. Tim's research is primarily directed toward linkages between human exposures and disease, and determining public health-based preventive solutions to such risks. His work includes use of biological and other markers for medical surveillance, exposure assessment, and disease susceptibility with a focus on immunologic lung disease, human health and war, clinical occupational and environmental health and population resiliency to the human health effects of climate change. Tim's current research on climate change and health focuses on water quality in British Columbia communities, and some of his research collaborations include projects in Bangladesh, Iraq, Mongolia, Cuba, the United States as well as other regions within Canada.

George Tokesky (USA)



Mr. George Tokesky is Senior Director of Community Relations at Hospice by the Sea, Inc., a not-for-profit, community-based provider of hospice and palliative care, caregiver support, bereavement counselling and home health agency services in South Florida. In his position, George oversees the Fund Development and Communications departments. He has over 15 years experience working in the healthcare industry, and was previously Vice President of Community Care Services at Alzheimer's Community Care, Inc. From 1998-2005, George served at the Florida Department of Elder Affairs as a Government Operations Consultant and as one of the agency's Emergency Coordinating Officers. In this capacity, George worked directly with Florida's healthcare policies and regulations, specifically in the fields of housing, long term care and disaster recovery. In 2004 and 2005, when seven hurricanes made landfall in the United States, George was recruited and deployed as a member of the United States' Administration on Aging Disaster Response Team. In 2005, he transferred to the Florida Department of Health and was responsible for overseeing the state's Special Needs Shelter Program. To date, George has been deployed for nine federally-declared disasters, and is recognized as an accomplished speaker, educator and materials author, for which he has received several meritorious awards and recognitions.

Michael Weston, MSc (USA)



Mr. Michael Weston is typically described as the "spirit and conscience" of any organization that he has been a part of, and has created and directed programs across the expanse of Human Services for the past thirty years. Mike's accomplishments have been varied and diverse. He has been responsible for piloting a state-wide initiative to enhance the quality of care in Florida nursing homes by expanding community involvement. Mike creates and directs numerous community-based initiatives, and is a former and founding Director of Disaster Planning and Operations for Florida's Department of Elder Affairs. He has recently served as a Disaster Consultant to the United State's Administration on Aging, and in that capacity was tasked by the Department of Homeland Security as the Federal Coordinating Officer over many recent presidential declared disaster events. Mike is recognized as one of the nation's foremost experts on Special Needs populations. He has chaired the Disaster Services Committee for the American National Red Cross, has served on the Statewide Human Research Subject Review Board, and has made numerous presentations at the national and international level. Mike holds a Master of Science degree in Human Services, and is constantly utilized as a consultant and educator.

Notes

2011 Friesen Conference Organizing Committee

Andrew Sixsmith, Director, Gerontology Research Centre, Simon Fraser University & Vice President, International Society of Gerontechnology (**Conference Chair**)

Gloria Gutman, President, International Network for Prevention of Elder Abuse & Past-president, International Association of Gerontology and Geriatrics (**Operations Chair**)

Heather Stewart, Regional Project Manager, Canadian Longitudinal Study on Aging, Research Associate, Gerontology Research Centre, Simon Fraser University & Brain Research Centre, University of BC (**Program Chair**)

Raymond Adams, Information Officer, Gerontology Research Centre, Simon Fraser University

Nastenka Callé, Simon Fraser University Site Coordinator for the Pacific Institute for Climate Solutions (PICS)

Vahid Dabbaghian, Director, Modelling of Complex Social Systems (MoCCSy) Program, Mathematics Department, Simon Fraser University

Patrick Simpson, SAFERhome Society

Owen Hertzman, Department of Geography, Simon Fraser University

Matthew White, Laboratory for Environmental and Exercise Physiology, Department of Biomedical Physiology and Kinesiology, Simon Fraser University

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Patti Gorr, Senior Policy Analyst, Division of Aging and Seniors, Public Health Agency of Canada

Peter Berry, Senior Policy Analyst, Climate Change and Health Office, Health Canada