Family Medicine

Improving health systems for vulnerable populations from a primary care perspective

Dr. Gina Agarwal, MBBS, PhD, MRCGP, FCFP

Professor
Canada Research Chair in Vulnerable Individuals In Primary Care
McMaster Family Medicine Levitt Scholar

NAPCRG 50th Annual Meeting, Keynote, November 22, 2022

@VIPResearchLab
@CPatClinic
@GinaAgarwall

vipresearchlab.ca
cpatclinic.ca

Land Acknowledgements

The Department of Family Medicine, McMaster University, recognizes and acknowledges that it is located on the traditional territories of the Haudenosaunee and Anishnaabeg nations. This territory, covered by the Upper Canada Treaties, is within the lands protected by the Dish With One Spoon Wampum agreement and is directly adjacent to the Haldimand Treaty territory.

The City of Phoenix is located within the homeland of the O'Odham and Piipaash peoples and their ancestors, who have inhabited this landscape from time immemorial to present day.

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Disclosures

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VIP Research Team Acknowledgements

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Jasdeep Brar, HBSc, MSc(c)

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1. Setting the Scene
2. The Epidemiology
3. The Effects on Healthcare System
4. The Implications
5. Who, Where, How?
6. Health System Impacts
7. Bringing It All Together

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1: Setting the Scene

Physician

Personal reflections about clinical experience in primary care in deprived settings in the UK/Canada

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Council Housing in the United Kingdom

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The World's End Estate

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What does it mean to be 'vulnerable'?

Human/Social

Economic

Physical

Environmental

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Vulnerable Populations

There are many **vulnerable populations:**

- Chronic conditions
- Homeless
- Mental illness
- Low-income
- Ethnic minorities
- Seniors
- …

Vulnerable populations are further impacted by **disparities in social determinants of health and social factors:**

- Poverty
- Housing
- Gender
- Education
- Racism
- Social isolation and lack of care

Vulnerable populations may be found in the **following places:**

- Social housing
- Food banks
- Long term care
- Community Centres
- Homeless shelters

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The VIP Research Lab

The Vulnerable Individuals in Primary Care (VIP) Research Lab develops and evaluates innovative programmes to address **chronic diseases among vulnerable populations**

VISION

To improve health by facilitating equitable access and linkage to primary care for vulnerable populations in Canada and internationally, including Low and Middle Income Countries (LMICs) and High Income Countries (HICs).

MISSION

We are committed to producing robust evidence for novel primary care and community-based interventions that improve primary care access and linkage for vulnerable populations and that reduce inappropriate health care utilization. We will continue to partner collaboratively with patient groups, stakeholders, and primary care providers to develop programs specific to unmet health needs of vulnerable populations. We aim to integrate research into mainstream health practice and the broader health system.

www.VIPResearchLab.ca

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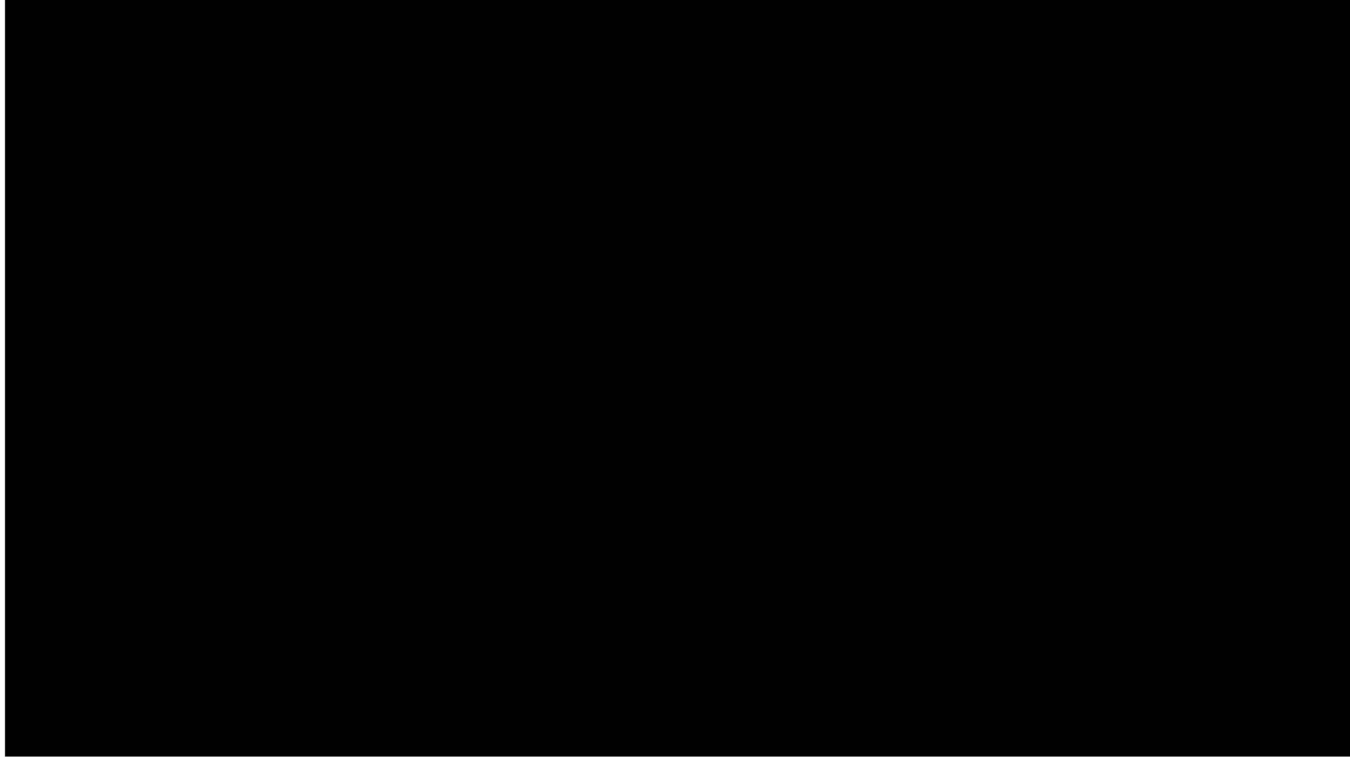
A New Approach



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2: The Epidemiology

Epidemiologist

A Vulnerable Population: Evidence from low-income seniors in social housing in Canada

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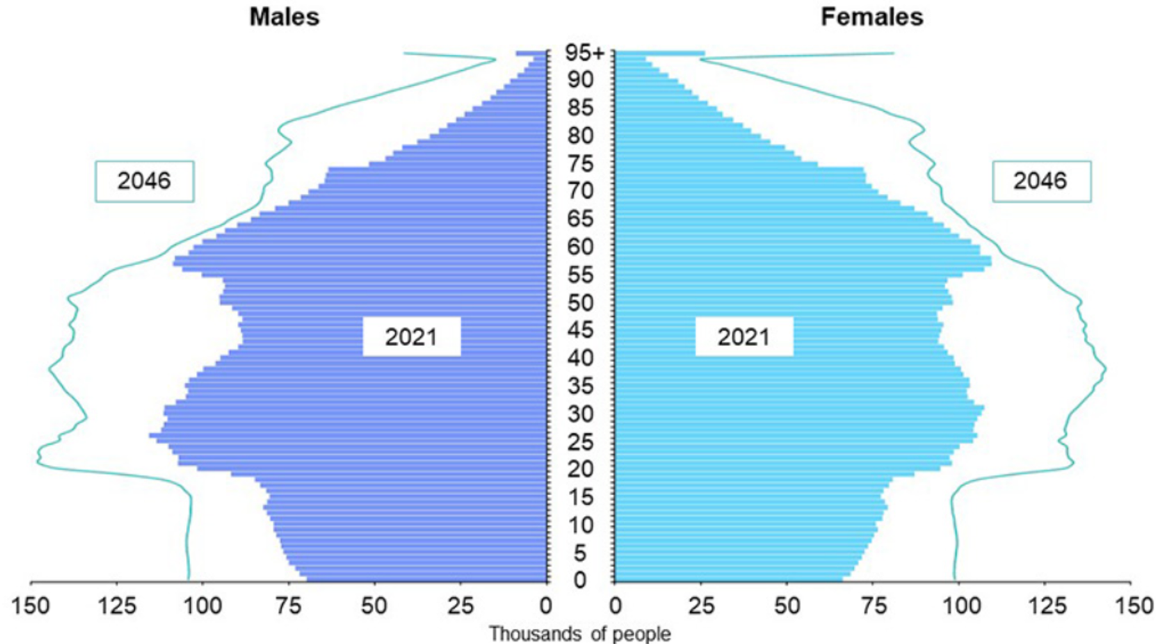
Changing Population Demographics

The Older Population Within Canada Has Grown and is Expected to Grow



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Ontario. 2021. Ontario population projections. Retrieved from https://www.ontario.ca/page/ontario-population-projections

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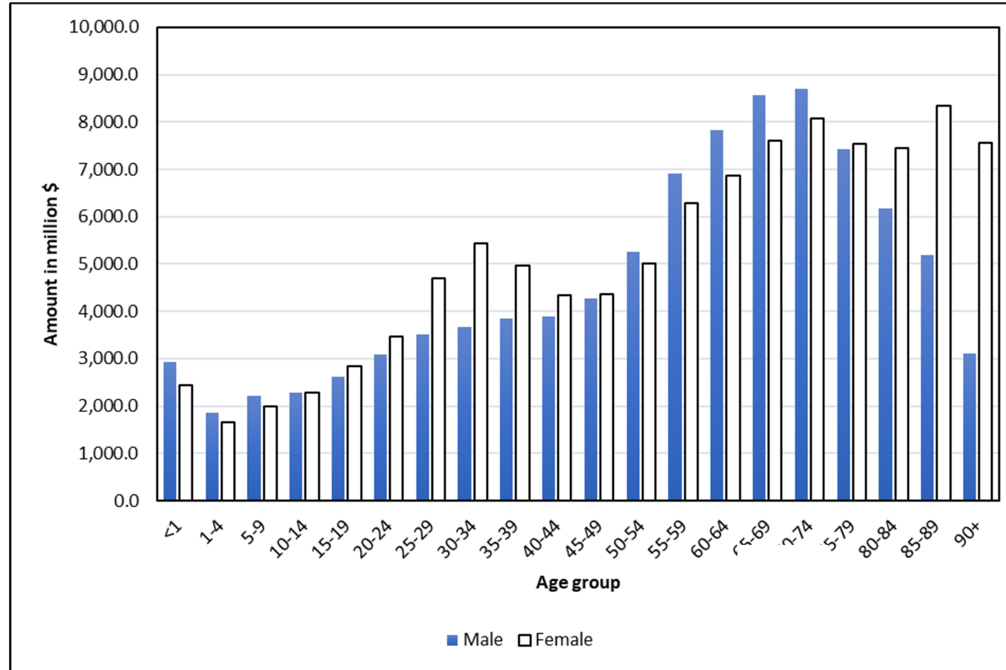
Cost of Healthcare



Canadian Institute for Health Information 2022

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Sources of Data from VIP Research Lab

Multiple data sources from social housing residents and other vulnerable populations:

CP@clinic Program Database

CP@home Program Database

Health Awareness of Behaviour Tool: Survey

Ambulance Call: Records

Health Administrative Data: Two Separate ICES Cohorts

Focus Groups and Interviews: Transcripts

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Type of Data

Domains / questions from existing validated questionnaires:

- Demographics
- Modifiable risk factors
- Non-modifiable risk factors
- Physical measures
- Social determinants of health
- Quality of life
- Health literacy and source of health information

Domains/variables from administrative or ambulance data:

- Diagnosis
- Health status
- Health care utilization

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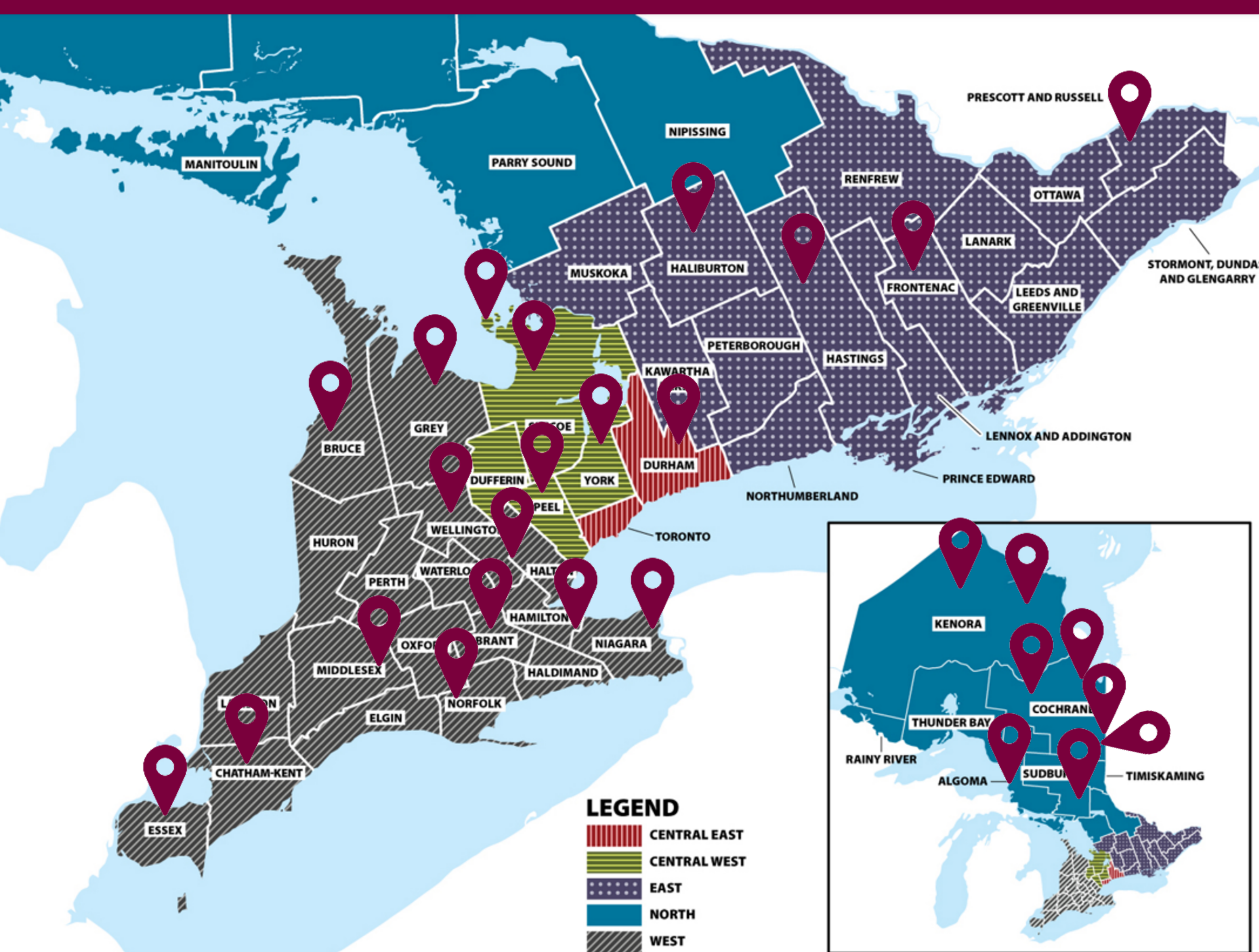

Scope of the Data

3 regions implementing home visits

Residents 50 years and older, between 2014 and 2022

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Older Adults in Social Housing in Ontario:
An example of a vulnerable population

N = 4,433 individuals	
Mean age	74 years
Female	68%
White	81%
Lives alone (widowed/divorced/single)	82%
Education (no high school diploma)	44%

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CP@clinic Program. CP@clinic Database, November 2022.

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Modifiable Risk Factors

	All Residents n=3544
Current Smoker	19%
High Alcohol Consumption	6%
<1 serving of fruits/vegetables daily	40%
<30 minutes of physical activity daily	46%
Adds salt to food	30%
Fatty food consumption at least once per week	50%

CP@clinic Program. CP@clinic Database, November 2022.

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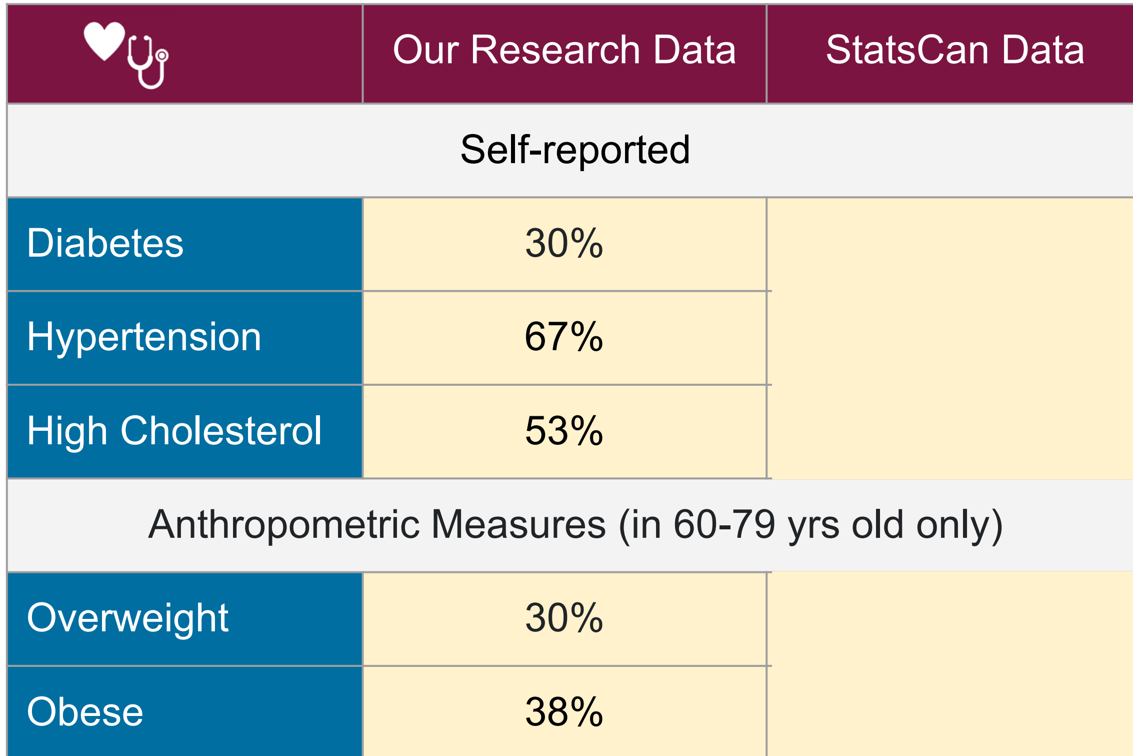
Cardiovascular (CV) Risk Factors



	Our Research Data	StatsCan Data
Self-reported		
Diabetes	30%	
Hypertension	67%	
High Cholesterol	53%	
Anthropometric Measures (in 60-79 yrs old only)		
Overweight	30%	
Obese	38%	

CP@clinic Program. CP@clinic Database, November 2022.

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Hypertension (HTN)

3370 residents had their blood pressure measured

↓

1819 (48%) had high 1st session BP
(>140 systolic or >90 diastolic)

1204 (66%) self-reported being diagnosed with HTN

481 (26%) had not been diagnosed with HTN

48% had moderate/extreme anxiety or depression

20% had poor/fair ability to handle day-to-day stress

CP@clinic Program. CP@clinic Database, November 2022.

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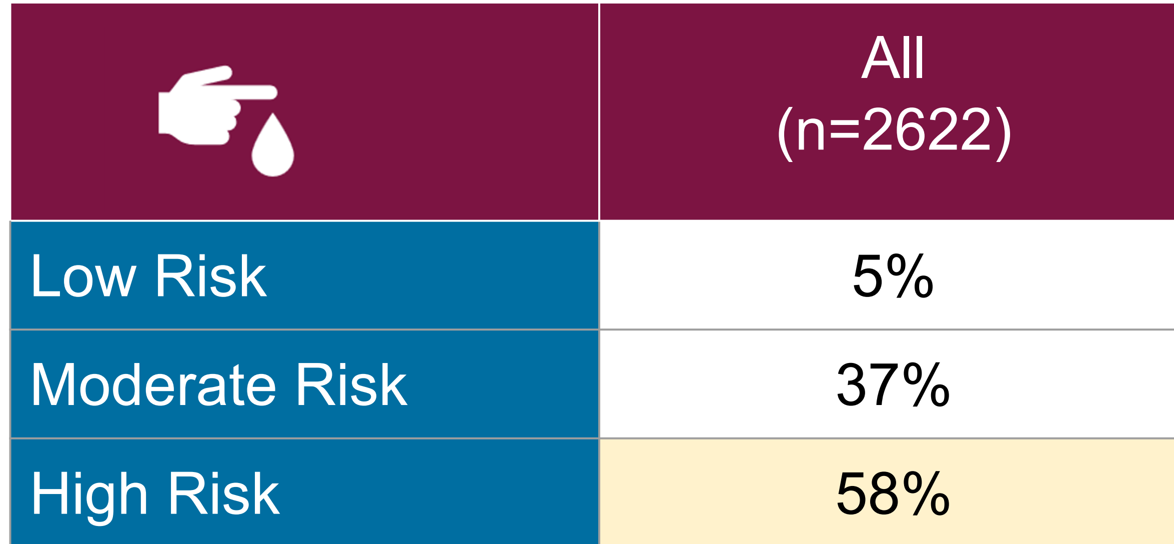
Diabetes Risk Status (not diagnosed)



	All (n=2622)
Low Risk	5%
Moderate Risk	37%
High Risk	58%

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CP@clinic Program. CP@clinic Database, November 2022.

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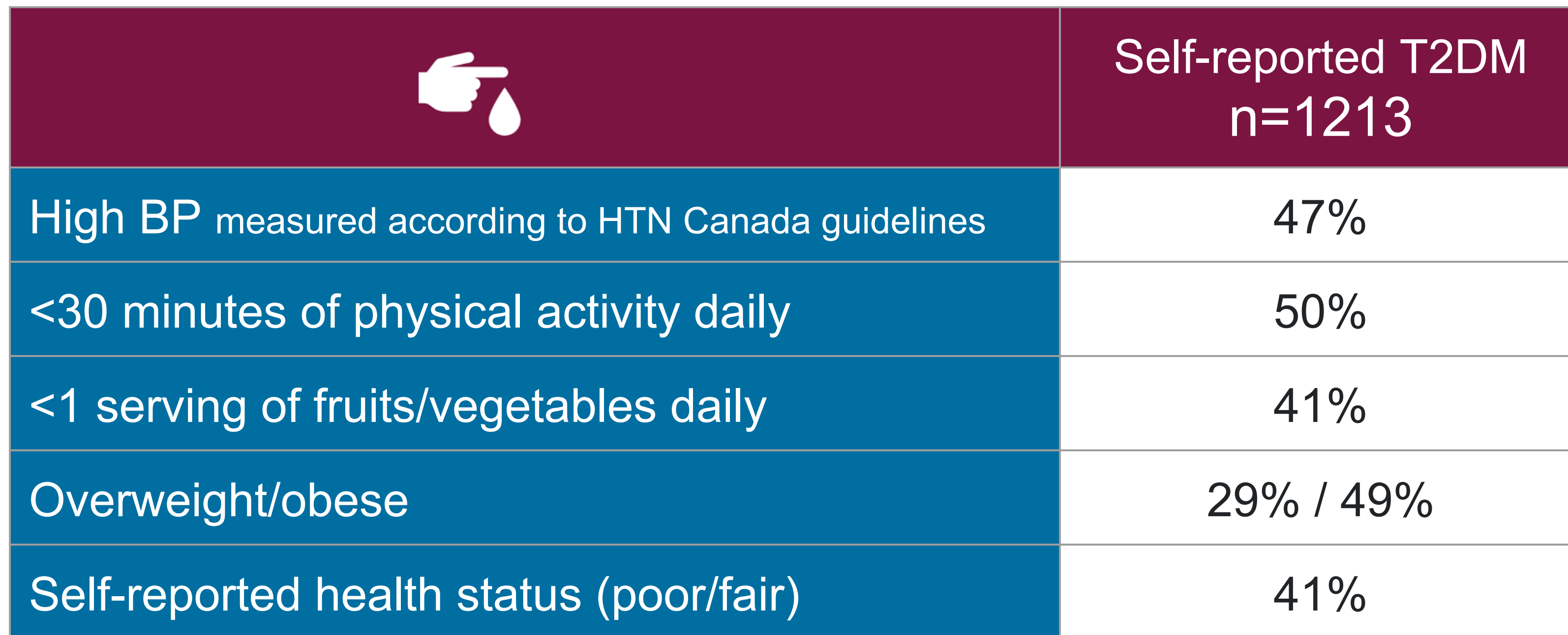
Type 2 Diabetes Mellitus



	Self-reported T2DM n=1213
High BP measured according to HTN Canada guidelines	47%
<30 minutes of physical activity daily	50%
<1 serving of fruits/vegetables daily	41%
Overweight/obese	29% / 49%
Self-reported health status (poor/fair)	41%

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CP@clinic Program. CP@clinic Database, November 2022.

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Conditions Indirectly Impacting CV Health

Quality of Life (QoL) sub-domains	
Problems or unable to perform daily self-care	20%
Limited mobility	53%
Difficulty performing usual activities	36%
Pain/discomfort	74%
Extremely/moderately anxious or depressed	50%
Self-Reported Health Status: Poor / Fair	
All respondents	33%

CP@clinic Program. CP@clinic Database, November 2022.

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Food Insecurity

People living in social housing face

Double

food insecurity rates

compared to older adults in the in the general public

People who did report being food secure were still more likely to report poor dietary habits than the general public.

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Pirrie M, Harrison L, … Agarwal G. BMC Public Health (2020) 20:1320.

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Social Isolation or Loneliness

1 in 5 low-income older adults living in social housing experience social isolation or loneliness

4 to 5x more likely to be hospitalized than those who are not socially isolated, previous research has indicated

Agarwal G. et al. CMAJ Open. 2021; 9(3).

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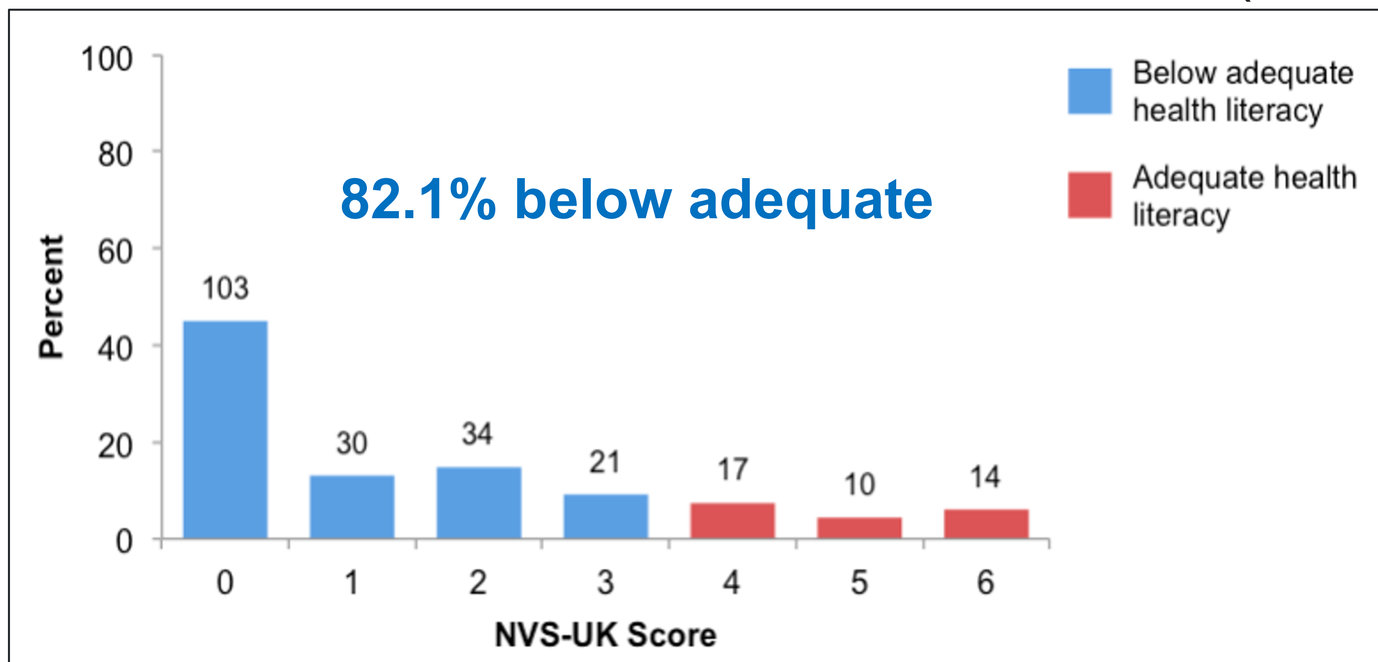
Health Literacy

In a subset in whom NVS-UK was administered (n=229)



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Agarwal G, et al. Canadian Journal of Public Health. 2018;109:401.

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Sources of Health Information

Older adults prefer to get info from health professionals:

Doctor or Nurse	**Educational Brochure/ Pamphlet**	**Pharmacist**	**Family Member**	**Media (print ads, TV, etc)**	**Internet**	**Walk-in Clinic**
79.0%	**28.8%**	**22.8%**	**17.6%**	**11.9%**	**11.7%**	**11.2%**

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Sadri, P…Agarwal, G. Manuscript prepared for submission, 2022.

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3: The Effects on Healthcare System

Seeking Healthcare

Consequences of chronic ill health have health system impacts

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Seeking Emergency Healthcare after a Fall

Pirrie M, Saini G, …Agarwal G. BMC Geriatrics. 2020;20:11.

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People in Social Housing are More Likely to Go to Long-Term-Care Facilities

Up to 5x Rate of transfer to LTC

14% Classified as 'frail'

2019 LTC Waitlist = **34,834** Older Adults

We hypothesize:

- 16,380 social housing older adults could qualify for LTC**
- If 50% are on the LTC Waitlist:

23%

of the LTC Waitlist is social housing older adults

Agarwal G et al. Prehosp Emerg Care. 2019 Jan 9;1-12; Agarwal G et al. CMAJ. 2018 May 28;190(21):E638-47; Agarwal G et al. BMJ Open. 2020 Oct 1; 10(10):e037386.

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Vulnerable Populations are Frequent Callers of 911

In people with ≥5 EMS calls within 12 months:

Loneliness

37 - 49%

More common than regional/Canadian rates

Poverty and food insecurity

43% and 14%

Higher rates than average Ontario citizens

Lower quality of life

Mobility issues	78%
Difficulty with self-care	55%
Difficulty with usual activities	78%
Experience pain/discomfort	87%
Anxiety/depression	67%

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Agarwal G, et al. BMC Public Health. 2019;19:684.

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Rising Levels of 911 Calls

Emergency Medical Services (EMS) calls to 911 **increase 5% annually** in Canada and the US

Older adults = **38 - 48%** of EMS calls

Frequent callers = **13.8%** of ED visits

Demand greater in **older adults** (85%+)

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Strum, R.P, et al. Can J Emerg Med. 2022 24, 742–750.

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Cost of 911 Call for EMS

1 EMS CALL

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*Agarwal, et al. BMC Emergency Medicine. 2017;17:8

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4: The Implications

Novel Interventions

Appropriate for vulnerable populations

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Developing New Interventions

Need to think outside of the box

New and novel partnerships

Setting up for success

Community involvement

Accounting for access

Health system opportunities

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Changing Lifestyle - It's Not Just Education….

Factors that increase confidence to…

…quit smoking

- Intent to quit smoking
- Ability to handle personal crises
- Having less frequent problems with usual activities
- Smoking fewer cigarettes daily

…reduce alcohol intake

- Older age

…eat more fruits & vegetables

- Intent to eat more fruits & vegetables
- Knowledge
- Younger age

…improve physical activity

- Intent to increase physical activity
- Already being active
- Knowledge

…reduce stress

- Ability to handle personal crises

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Dzerounian J, Pirrie M…Agarwal G. BMC Geriatrics. 2022; 22:473.

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Reconnecting To Primary Care

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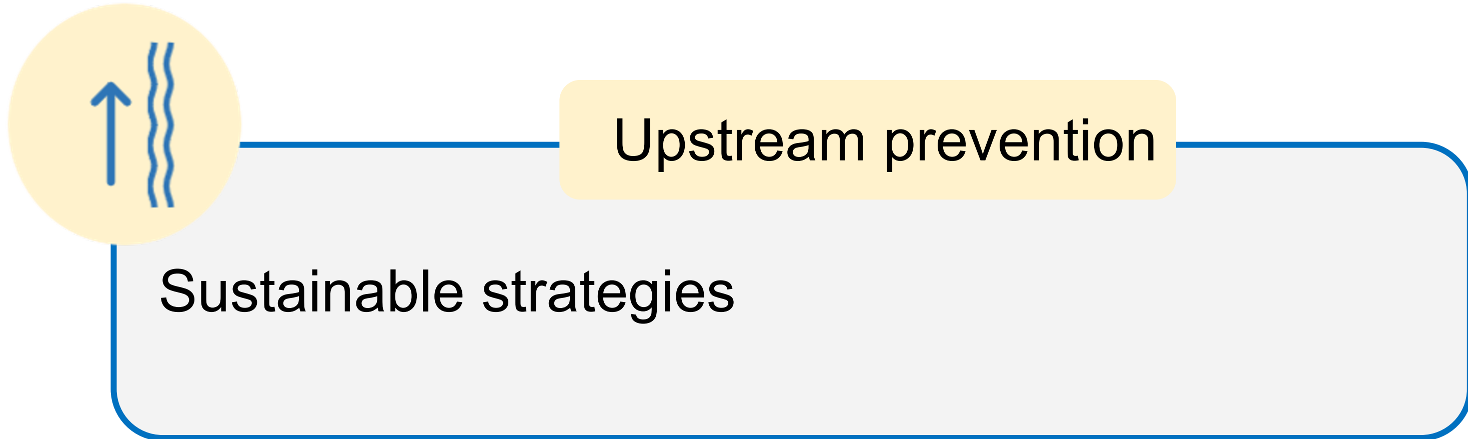
5: Who, Where, How?



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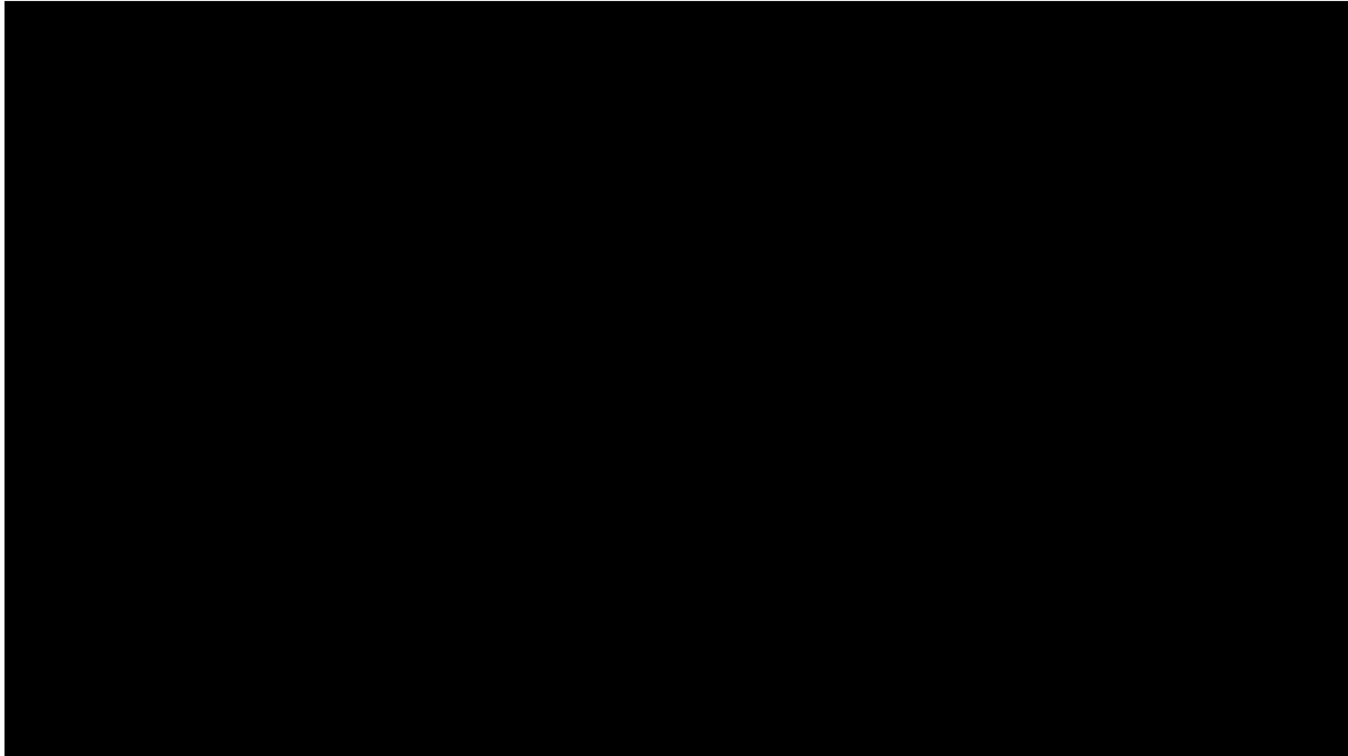
Community Paramedic



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Strategy 1: Who: Task Shifting

Paramedics

Paramedic Students

Lawyers

Lay Health Workers

Health Volunteers

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The CP@clinic© Program

Evidence-based program focused on

Chronic disease prevention

Chronic disease management

Health promotion

We work in partnership with Paramedic Services and provide the following

Accredited CP@clinic paramedic training

Evidence-based health risk assessments

Algorithms and secure database

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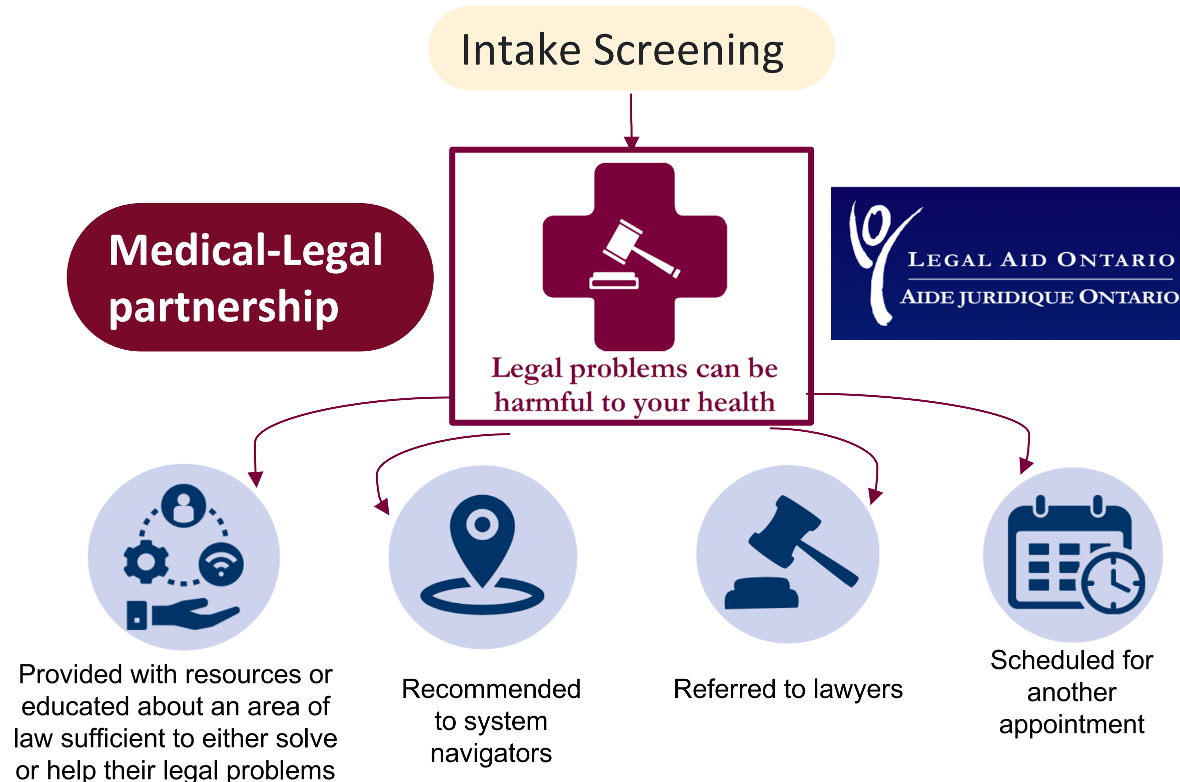
Legal Health Clinic



Agarwal G, et al. BMC Family Practice. 2020;21:267.

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Going to Where People Are

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Strategy 2: Where?

Where do we need to deliver the care / how can people access it?

Where the people are!

In social housing buildings

At home

At community centres

At temples/ places of worship

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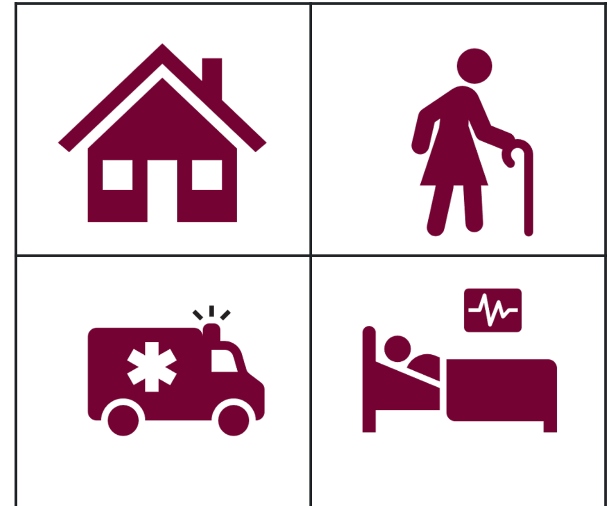
adapted to

In the home: the CP@home Program

- Vulnerable and frail older adults
- Individuals who:
  - Have multiple chronic conditions
  - Have limited mobility
  - Are on the LTC waitlist
  - Are receiving remote patient monitoring
  - Are referred by paramedics (including frequent callers)
  - Are referred by hospital discharge planners (e.g. at risk for readmission)



Agarwal, et al. Trials. 2019; 20:1.

All presented material including the CP@clinic© Program is the sole and exclusive property of the McMaster Community Paramedicine Research Team.

adapted to a Place of Worship

In the community: at a Sikh Gurdwara

- Riverdale neighbourhood, Canada's third largest immigrant settlement
- Predominantly South Asian population
- Individuals who were at risk of chronic health conditions
- Volunteers provided translation in Punjabi, Hindi and Urdu
- Feasible approach for adapting the program for a Sikh South Asian population

Agarwal, et al. BMC Public Health. 2020; 20:1618.

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Strategy 3: Social Determinants of Health

What really influences health?

Housing / eviction

Access to social support and community services

Food

Employment

Benefit coverage

Mental health

Medication

Disability coverage & WSIB

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Legal Health Clinic Results

84% HAD UNMET LEGAL NEEDS

3.44 LEGAL NEEDS PER PATIENT ON AVERAGE

58% REFERRED TO LEGAL AID ONTARIO *or* HAMILTON COMMUNITY LEGAL CLINIC

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Agarwal G, et al. BMC Family Practice. 2020;21:267.

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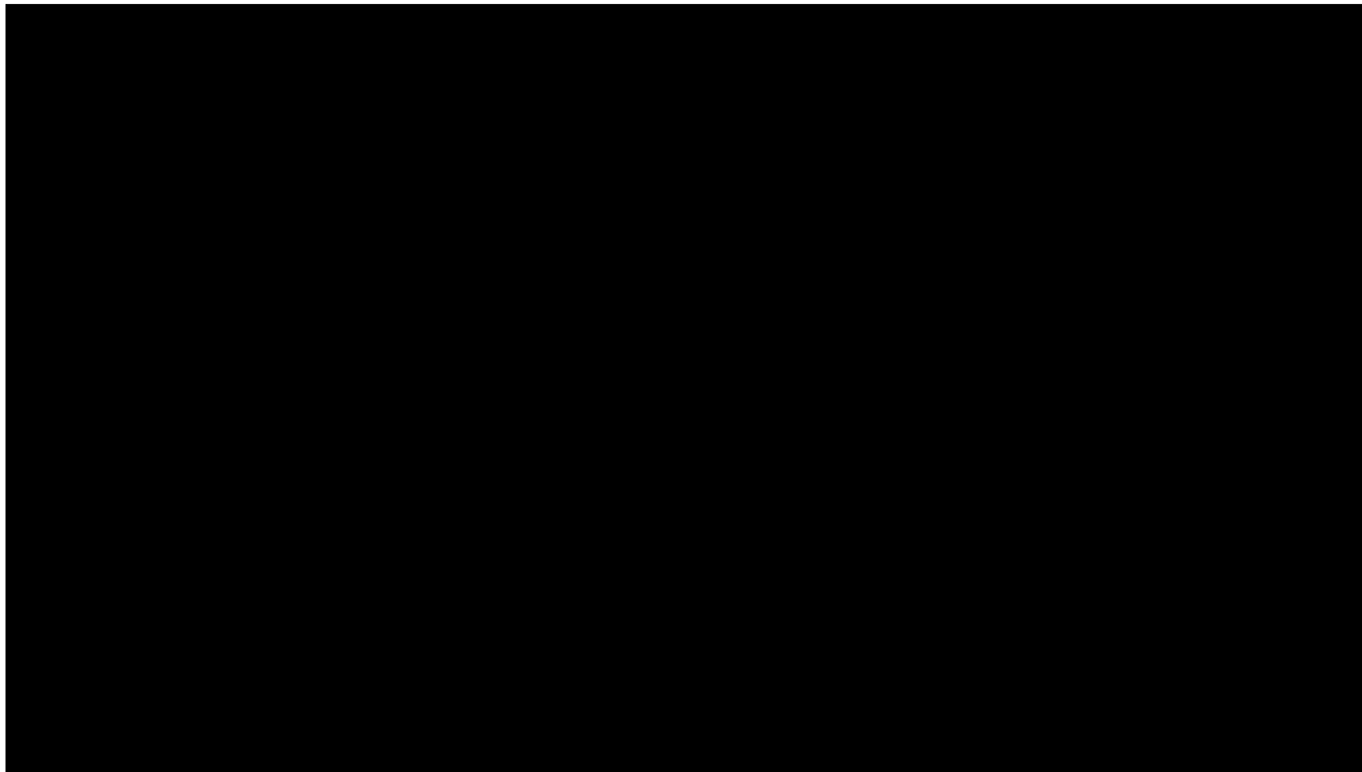
Making a Difference



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6: Health System Impacts

Evidence-based interventions

Research demonstrates robust results: CP@clinic as an example

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Randomized Controlled Trial
Design

Pragmatic cluster-RCT

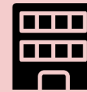
Compare intervention to usual care

In 5 Ontario community sites

For 1 year

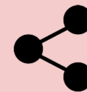
Social housing buildings for low-income older adults

INCLUSION CRITERIA



> 50 residential units

> 60% of residents aged > 55 years



One matched building of similar size and demographics

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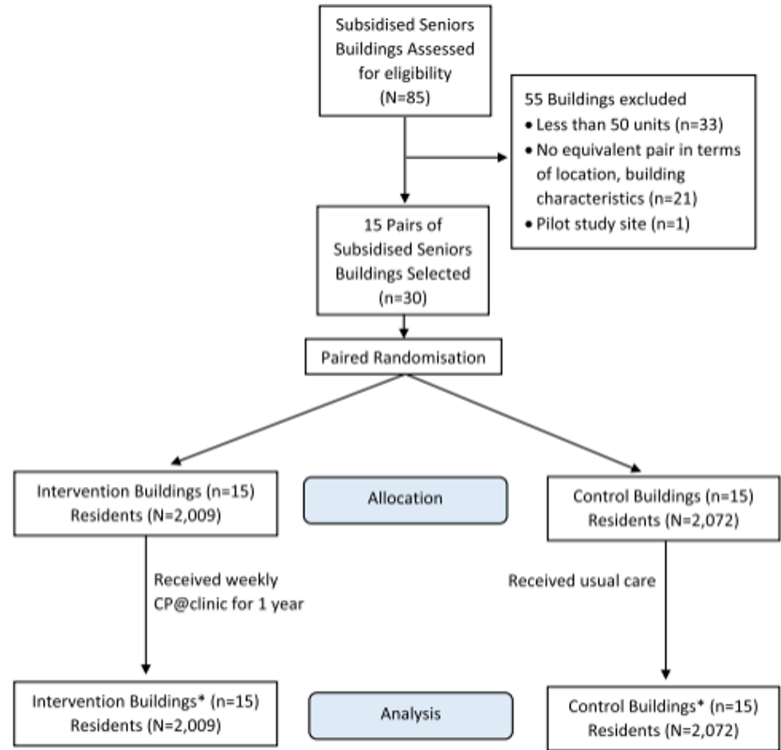
Randomized Controlled Trial

Randomization

794 attendees
715 attended ≥2 times
644 attended ≥3 times

Building participation rates ranged from **10% - 82%**



**Two pairs of buildings had changes in the setting (potential co-intervention, variable demographics) that affected their eligibility for the RCT, sensitivity analysis was done excluding these buildings*

FIGURE 1. CONSORT Flow diagram of the CP@clinic RCT.

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Randomized Controlled Trial

Primary Outcome

Change in mean EMS calls in intervention arm compared to control arm after 1-year intervention

Data extracted from EMRs of 5 regional paramedic services

Building-level analysis: Generalized Estimating Equations (GEE) analysis used to compare mean number of EMS calls per 100 apartment units per month

CP@clinic intervention buildings showed **19 - 25% reduced EMS calls** across all analyses

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Agarwal G et al. Prehosp Emerg Care. 2019;23:718-729; Agarwal G et al. CMAJ. 2018;190:E638-47

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Randomized Controlled Trial

Secondary Outcomes

CP@clinic ©

Change in **health-related quality-of-life (HRQoL) and chronic disease risk factors** among intervention participants

Data extracted from pre/post survey (HABiT) and CP@clinic database

Individual-level analysis: Changes in risk factors between groups, while adjusting for building clusters and pairing using GEE

Lowered **diabetes risk**

Sustained decrease in **blood pressure**

Significant improvement in four **Quality of Life** domains:

- discomfort
- usual activities
- self-care
- pain

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Agarwal G et al. Prehosp Emerg Care. 2019;23:718-729; Agarwal G et al. CMAJ. 2018;190:E638-47

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Randomized Controlled Trial
Secondary Outcomes

CP@clinic©

Change in **health-care utilization** among intervention arm residents compared to control arm, after 1-year of intervention

Data extracted from Ontario administrative health datasets

Individual-level analysis: Changes in health utilization between groups, while adjusting for building clusters and pairing using GEE

Significantly **higher odds** of **antihypertensive medication** initiation amongst those eligible for the Ontario Drug Benefit (≥65 yrs OR <65 with disability)

Sensitivity analysis (attendees only)

Higher incidence rate of **primary care visits**

Lower odds of **long-term care** transfers

Higher odds of **home care** services

Agarwal, G et al. Manuscript prepared for submission, 2022.

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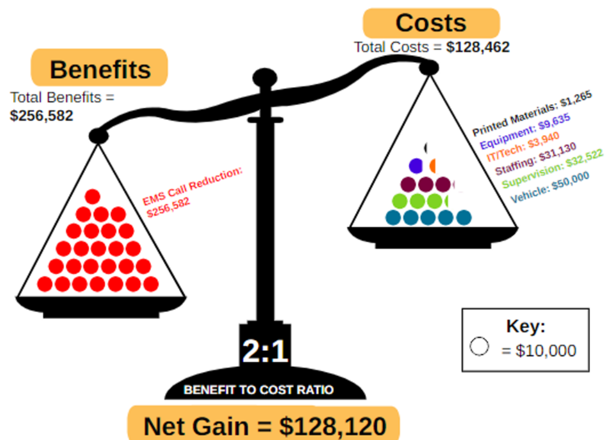
Randomized Controlled Trial

Cost Effectiveness Outcomes

Cost-utility analysis among intervention arm residents compared to control arm, after 1-year of intervention

Actual cost data obtained from paramedic services, health utility scores from pre-post surveys



QALY= Quality-Adjusted Life Year

For every $1 spent on the CP@clinic Program, the Emergency Care System sees $2 in benefits!

Agarwal, et al. BMJ Open. 2020; 10:e037386

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CP@clinic ©

Randomized Controlled Trial

Qualitative Outcomes

Perceptions of the CP@clinic program by participants

Data from **four** focus groups

Thematic analysis: multiple coders analyzed focus group transcripts for common themes

Peace of Mind and Support

Access to Health Resources

Social Participation and Connectedness

Marzanek F…Agarwal G. Manuscript prepared for submission, 2022.

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Peace of Mind, Comfort and Family Physician Support

“... to be able to come down, have your blood pressure checked, talk to them, it just made it so much easier and gave you such peace of mind. That is the most important thing that I got out of it was the peace of mind.”

“I think it made you feel better when you’ve been talking to them...if you had any questions they were answered.”

“I was ready to go to the hospital, but no they made it comfortable enough that I didn’t have use that ambulance.”

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Access to Health Resources Facilitated

“They gave us information. If we needed, if we had questions they would help us. They were very helpful.”

“They found me a doctor I didn’t have one here at all, after 4 years.”

“You were sort of aware of services that were out there but you didn’t know who or where to go.”

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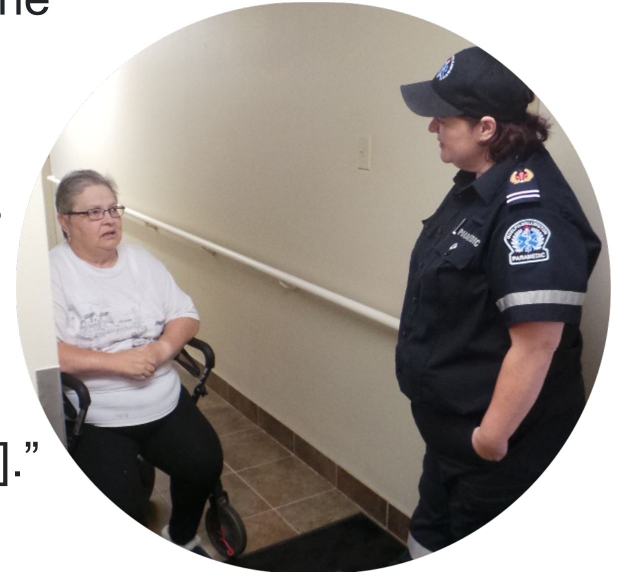
Social Participation and Social Connectedness Increased

"A sense of safety, companionship. Nice to sit out in the hall and wait our turns and talk."

"They (building residents) participated in the sessions and this led them to participate in other things [occurring in the building]."

"We were all out here socializing, waiting [for our turn]."



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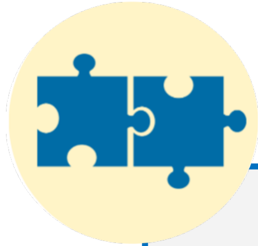
7: Bringing It All Together



Primary Care Perspective

Improving health systems for vulnerable populations

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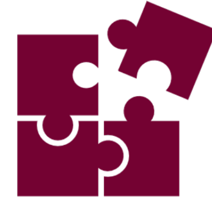
Benefits of the CP@clinic© Program

Reduces Social Isolation

Participants feel more socially connected to each other

Improves Health System Navigation

Participants are provided health information and support



Fills Healthcare Gaps

Providing more time for patients with a healthcare provider

Supports the Primary Care System

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Agarwal G, Brydges M. (2018). Effects of a community health promotion program on social factors in a vulnerable older adult population residing in social housing. BMC Geriatrics. 18(1): 95. https://doi.org/10.1186/s12877-018-0764-9

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The Final Say

Testimonial Video

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McMaster Community Paramedicine Research

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Acknowledgements

Study Participants

Government and Community Organizations

Paramedicine
- International Roundtable on Community Paramedicine
- Paramedic Chiefs of Canada
- Ontario Association of Paramedic Chiefs
- Tema Foundation

Community
- Canadian Red Cross
- St Matthew's House, Hamilton
- Carefirst Seniors & Community Services Association
- City of Hamilton Public Health Services
- Grey Bruce Health Services
- South Bruce Grey Health Centre
- VON Canada, Middlesex-Elgin
- Home and Community Care Support Services Mississauga
- Home and Community Care Support Services Hamilton Niagara Haldimand Brant

International
- Sunraysia Community Health Services, Australia

Technology
- Prehos Inc.
- Interdev Technologies

Paramedic Services
- BC Emergency Health Services
- Brant/Brantford Paramedic Services
- Chatham-Kent EMS
- City of Greater Sudbury Paramedic Services
- Cochrane District EMS
- County of Simcoe Health and Emergency Services
- Essex Windsor EMS
- Frontenac Paramedics
- Grey County Paramedics
- Guelph Wellington Paramedic Service
- Halton Region Paramedic Services
- Hamilton Paramedic Service
- Hastings Quinte Paramedic Services
- Middlesex-London Paramedic Service
- Oxford County Paramedic Services
- Peterborough County-City Paramedics
- Prescott Russell Emergency Services
- Norfolk County Paramedic Services
- Niagara Emergency Medical Services
- Peel Regional Paramedic Services
- York Region Paramedic Services
- Weeneebayko Area Health Authority Paramedic Service
- Beausoleil First Nation Paramedic Service
- Region of Durham Paramedic Services
- Haliburton County Paramedic Services
- Kenora District Services Board – Northwest EMS
- Naotkamegwanning EMS
- County of Renfrew Paramedic Service
- Sault Ste Marie Paramedic Services

Housing
- AdvantAge
- Ontario Non-Profit Housing Association
- City of Greater Sudbury Housing Corporation
- City Housing Hamilton
- Cochrane District Social Services Administration Board Housing Services
- County of Wellington Social Services Department - Housing Services
- County of Simcoe Social Housing Department
- Halton Community Housing Corporation
- London & Middlesex Housing Corporation
- Niagara Regional Housing
- York Housing
- Haldimand Norfolk Housing Corporation

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- McMaster University
- Canadian Frailty Network
- Family Medicine Associates
- Health Canada

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Connect With Us!

Websites
vipresearchlab.ca
cpatclinic.ca

Twitter
@VIPResearchLab
@CPatClinic
@GinaAgarwall

Emails
viplab@mcmaster.ca
mcmastercp@gmail.com

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Thank you!

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@GinaAgarwall

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Social Housing in Ontario

What is it?

Rent-geared-to-income housing based on 30% of a household's gross monthly income

Who Provides It?

Municipalities

Private companies

Non-profit organizations

Charities (Good Shepherd, March of Dimes Canada)

How Many Currently?

237,000 households* (14% of Ontario households that rent their dwelling)

*2021 Census, Statistics Canada

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