



The Community Health Assessment Program through Emergency Medical Services (CHAP-EMS): A Community Paramedicine Initiative for older adults in subsidized housing

Dr Gina Agarwal MBBS PHD MRCGP FCFP

Presentation Outline

- Introduction
- Current Problem and Our Community Data
- The Solution: CHAP-EMS
- CHAP-EMS Findings
- Next Steps.....
- Questions

Dr. Gina Agarwal

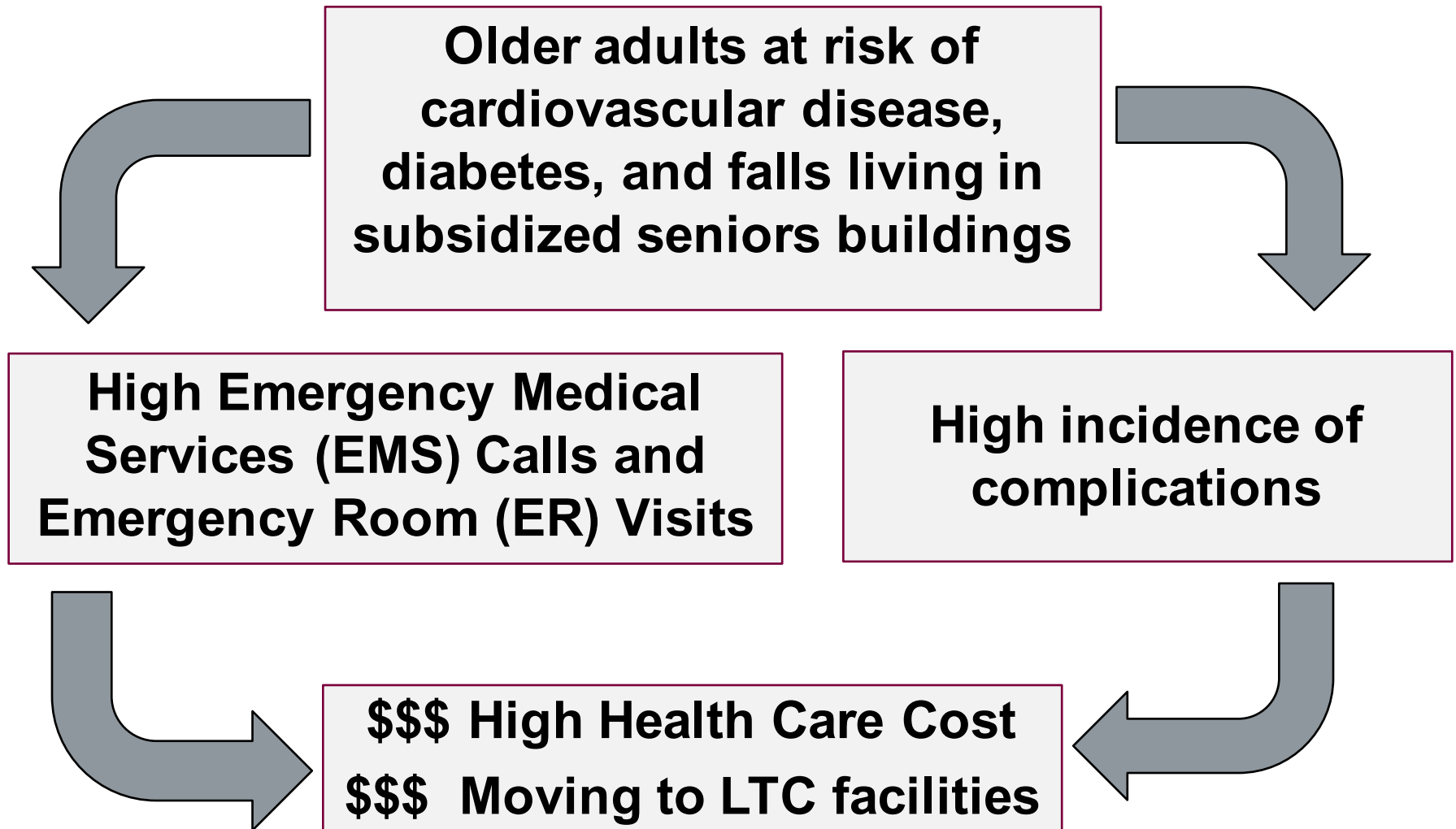
- Qualifications
 - MBBS PHD MRCP CCFP FCFP
- Background
 - Nearly 25 years clinical medicine experience since qualification, predominantly family medicine
 - Family physician for 20 years (in UK and Canada both)
- Affiliations:
 - Family Medicine Colleges (UK and Canada)
 - McMaster University: Family Medicine, Clinical Epidemiology and Biostatistics
 - McMaster Family Health Team: Clinician/Quality Lead
 - Canadian Diabetes Association: Guideline committee 2018
 - Public Health Agency of Canada: Expert consultant on CANRISK

Dr. Gina Agarwal

- Research expertise in chronic disease screening and management, pragmatic trials in a primary care/family practice setting
- Community programming development and evaluation expertise (since 2001)
- CHAP-EMS Program lead (past 5+ years)

Current Problem and Our Community Data from Subsidized Housing

Our Current Problem



Community Data: EMS Calls



- Seniors do call EMS
 - Account for 1/3 of EMS calls (\$1044 per call with ambulance transport)
 - High co-morbidity ↑ health care utilization
 - High priority: Seniors in subsidized buildings
- 2014/15 Data from subsidized buildings (500 of 2722 Residents):
 - Hamilton, Guelph, York and Sudbury



Community Data: Population

- 73% were female
- 71% high-school educated or less
- 91% lived alone



- 55% HTN
- 27% known DM
- 39% high chol
- 66% obese

- 42% poor/fair health
- 42% problems ADLs
- 18% problems self-care

Recipe for disaster!

- HRQoL poor/fair overall
- 70% pain/discomfort
- 61% mobility issues
- 44% anxiety/depn.

Community Data: Cost of Healthcare

Population of Ontario by age group and sex, 1971, 2013, 2036^{5,6}

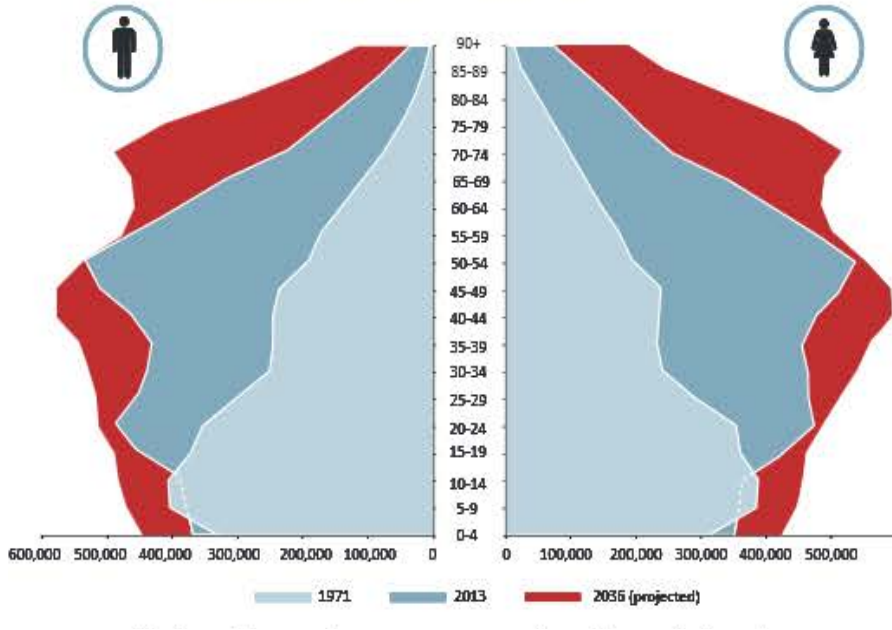
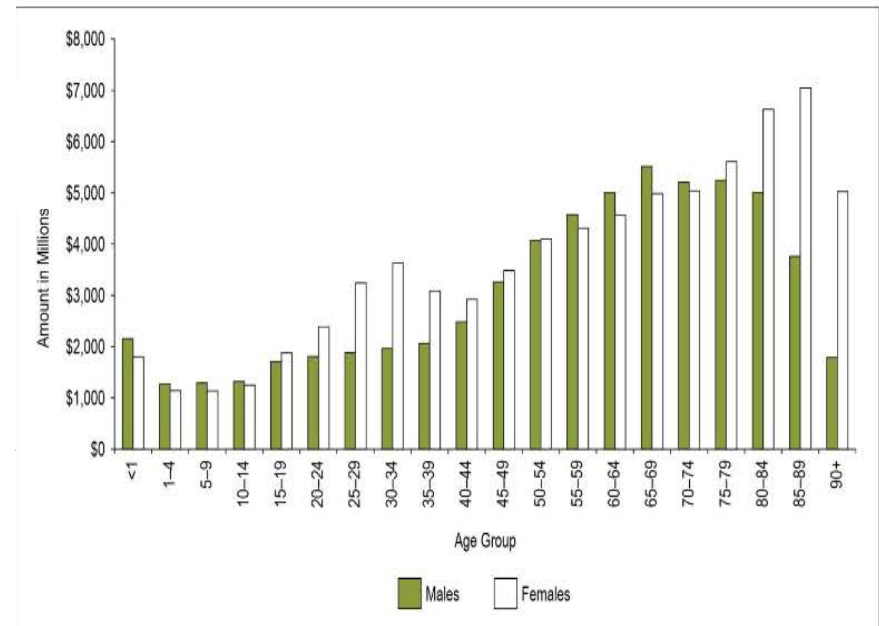


Figure 33: Total Provincial/Territorial Government Health Expenditure, by Age and Sex, Canada, 2012

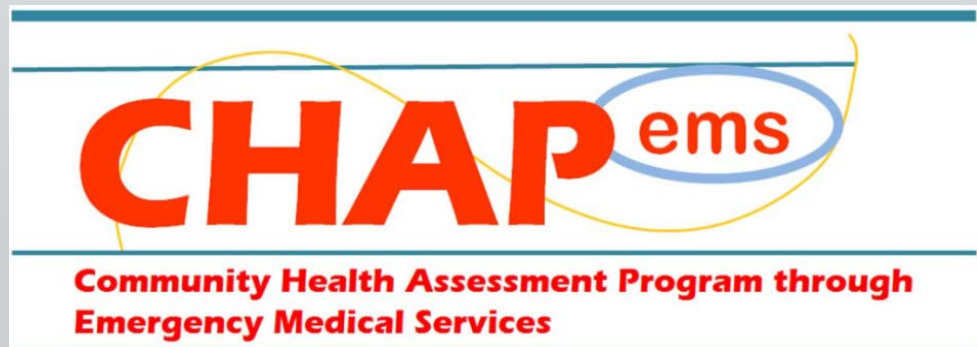


The older population within Canada is expected to grow & health expenditures rise as people age

Graph 1: Public Health Ontario. (2016) Ontario's Population: Determinants of Health. Retrieved from <https://www.publichealthontario.ca/en/DataAndAnalytics/OntarioHealthProfile/Pages/default.aspx>

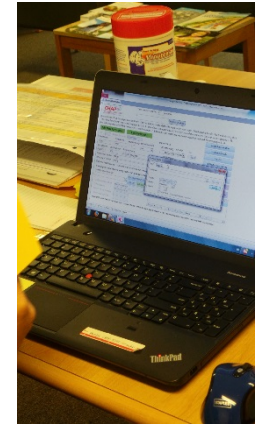
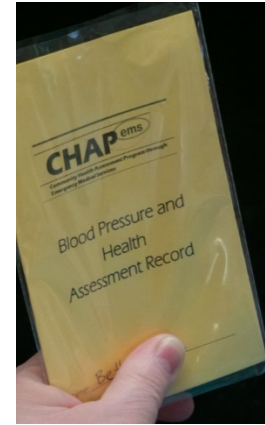
Graph 2: Canadian Institute for Health Information. (2014) National Health Expenditure Trends, 1975 to 2014. Retrieved from: https://www.cihi.ca/en/nhex_2014_report_en.pdf

The Solution:

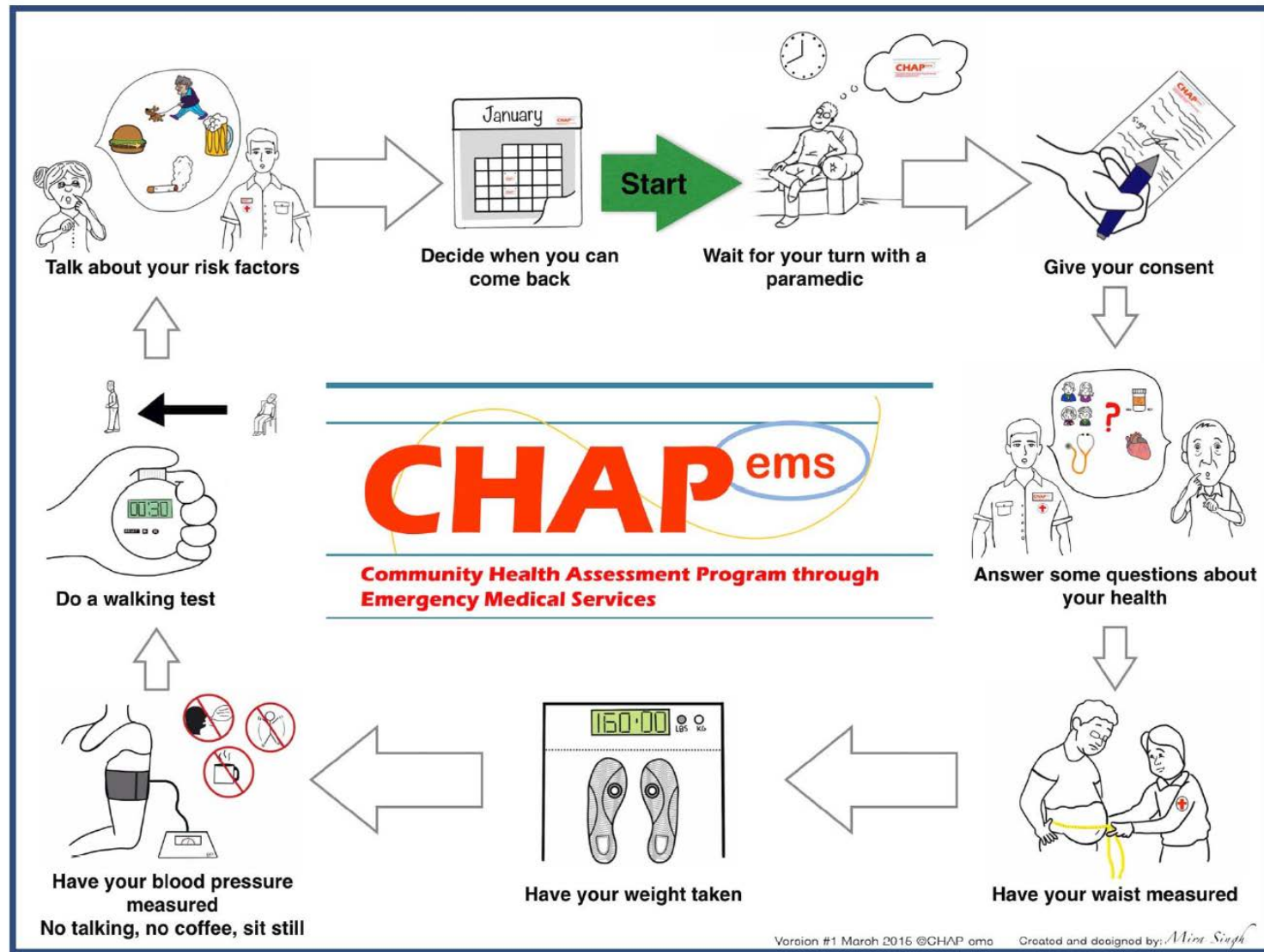


CHAP-EMS: About the Program

- Weekly drop-in health risk assessments with community paramedics
 - Using validated tools
 - Cardiovascular (e.g. BP, weight, smoking)
 - Diabetes (Fasting CBG if moderate/high risk)
 - Falls
- Tailored health education and promotion
- Referrals
 - Local wellness programs
 - EatRight Ontario
 - Health Care Connect
 - CCAC
- Reports back to family physician (“closes loop”)
- Using common area of subsidized seniors’ apartment buildings



CHAP-EMS: Session Structure



CHAP-EMS Facts



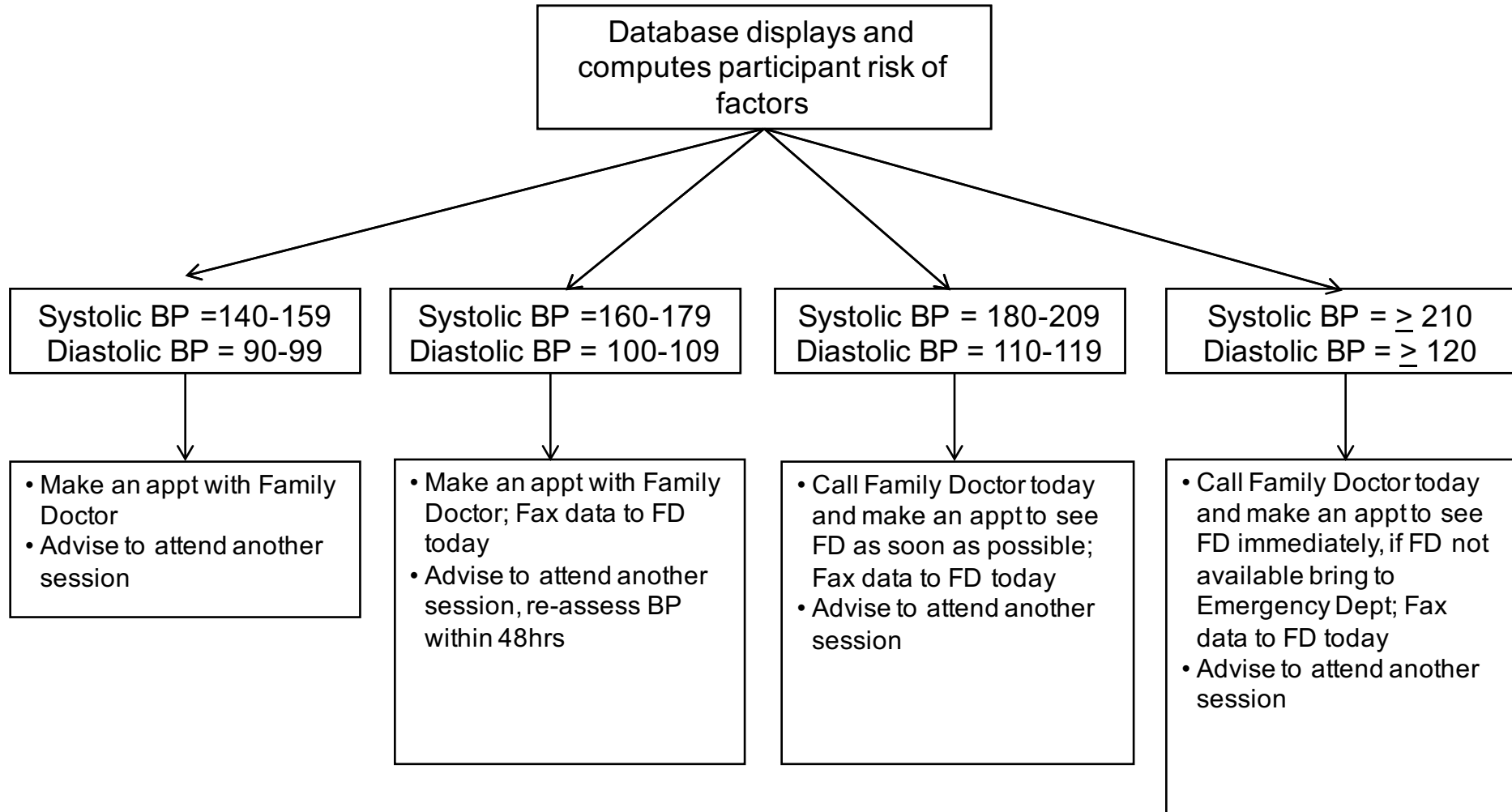
- Targeting > Frequent EMS callers (building level)
- Implemented as part of a research program (Department of Family Medicine, McMaster University)
- Based on evidence (CHAP / BMJ 2011;342:d442)
- Program development: Agarwal, G., et al. (2015) BMC Research Notes. 8: 113.
- Protocol: Agarwal, G., et al. (2015). BMJ Open, 5(6), e008110.



Algorithms

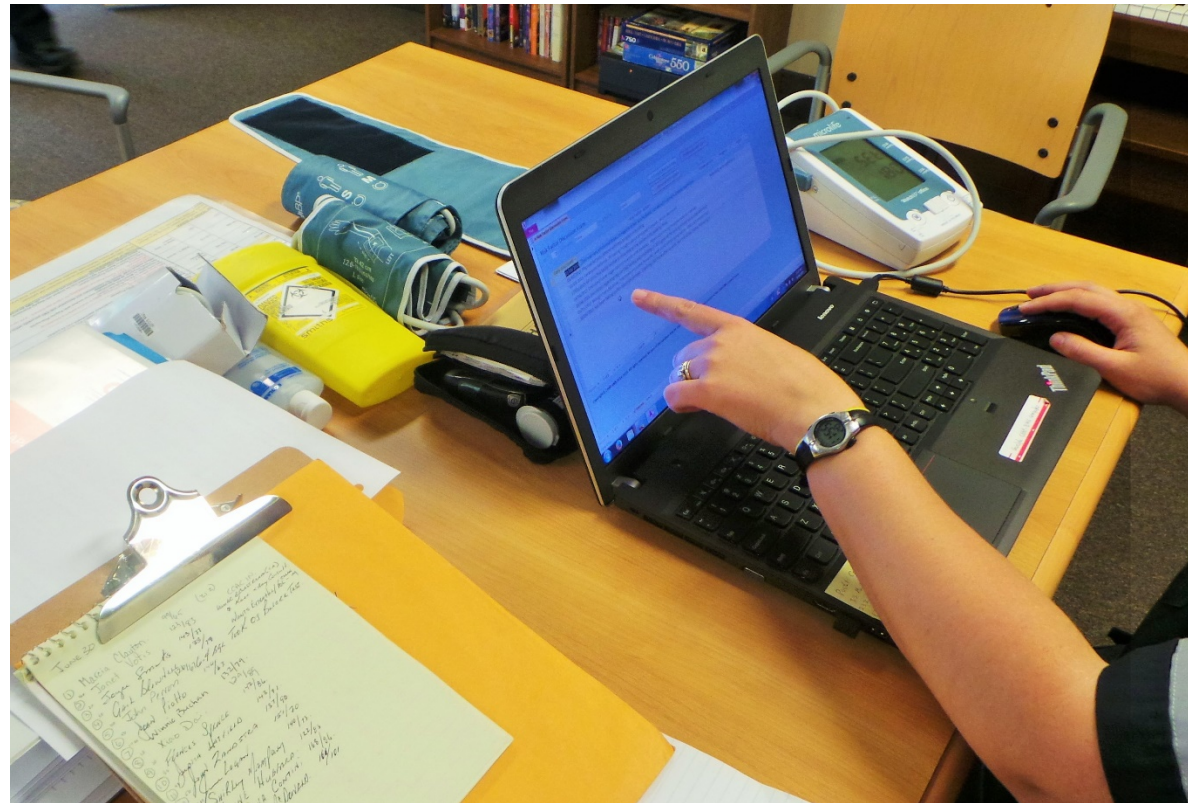
- Allow paramedics to triage CHAP-EMS participants based on risk assessment outcomes
- Medical decision/coverage built in to CHAP-EMS
- Paramedics sign off on their understanding of their ability to adhere to the algorithm as part of training/policy

Blood Pressure



CHAP-EMS Database

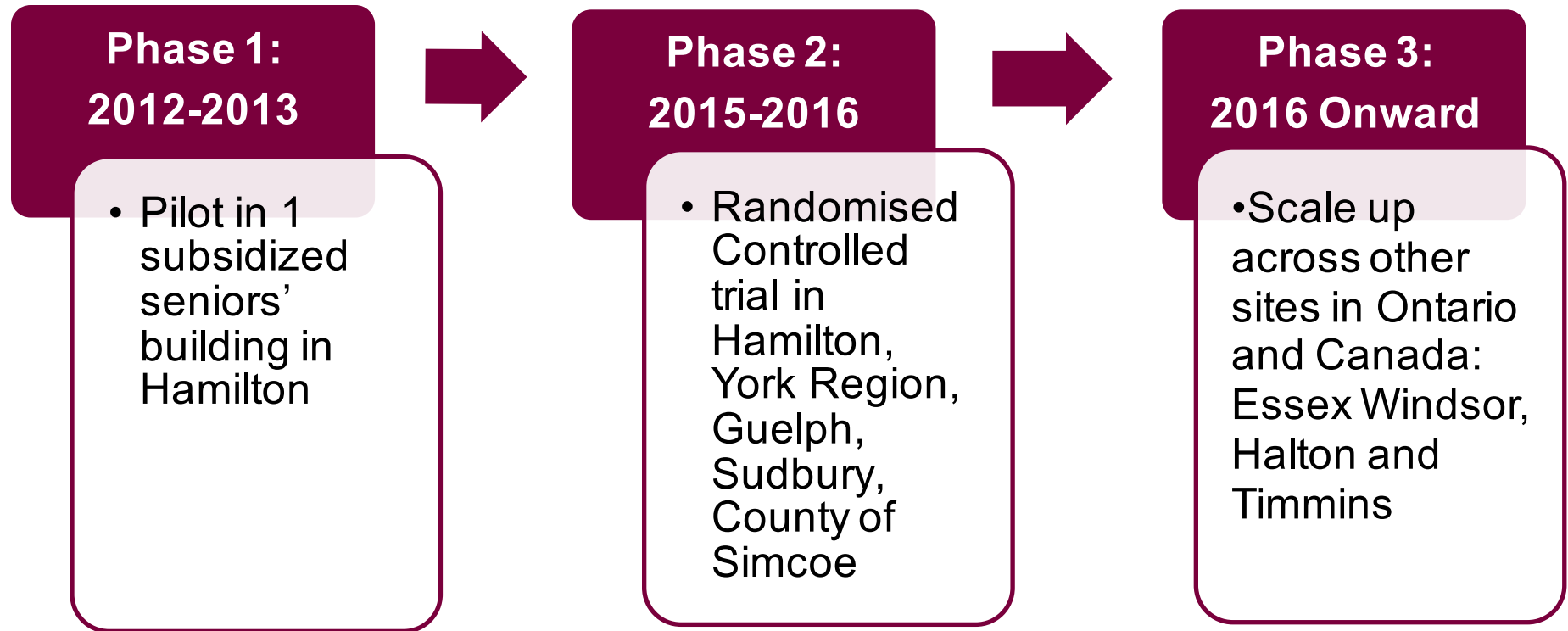
The screenshot shows the CHAP-EMS database web application. The form is titled '1-Personal Information' and includes the CHAP-EMS logo. Instructions at the top state: 'Instructions: Fill-up the pages consecutively, click the buttons on "Add New Participant" and complete pages 1, 2, 3, 4, then discuss for follow-up visit, click "Find Participant", complete pages 7, 8, 9'. The form has two main buttons: 'Add New Participant' and 'Find Participant'. Below these are fields for ID (2), Date of first visit (03/02/2015), Last Name (Voris), First Name (Janet), Middle Initial (L), Signed Consent (Yes), Postal Code (N1E3X5), Unit Number (206), Building Name (33 Marlborough St.), Ethnicity of Mother (White), and Ethnicity of Father (White). There is a checkbox for 'Have a Family Doctor' which is checked. Below this is a section for 'If participant doesn't have a family doctor, call Health Care Coordinator' with a dropdown for 'Find Physician from list'. At the bottom, there are fields for 'Family Doctor's Name' (Martin, Andrew), 'Clinic's Name' (Rockwood Clinic), and 'Clinic's Phone Number'. There are also buttons for 'Add to physician list', 'Edit List', and 'Refresh'.



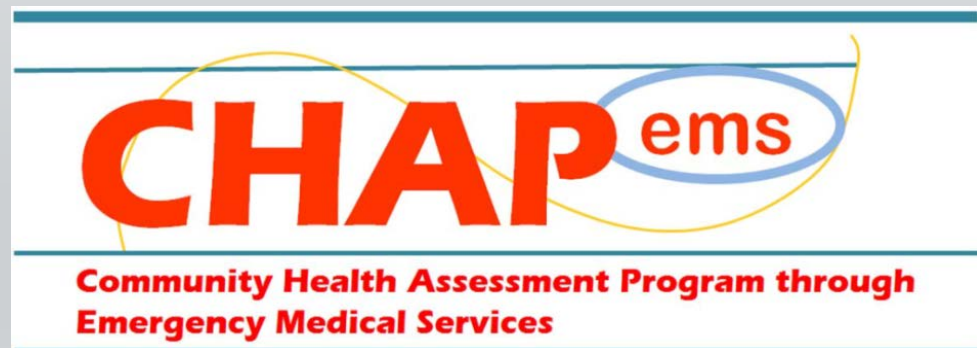
CHAP-EMS Goals

- **Empower** older adults to be **proactive** in **prevention** and **management** of hypertension, diabetes and other cardiovascular risk factors
- Increase awareness of cardiovascular health, diabetes risk, falls risk and **community resources** available
- Encourage and support **healthy lifestyle behaviours**
- Provide accurate blood pressure readings, diabetes risk score and cardiovascular risk information to family physicians (FPs) and **encourage dialogue** with FPs
- Develop the role of paramedics in **community health promotion** initiatives

CHAP-EMS Milestones



CHAP-EMS Results



CHAP-EMS Phase 1 Results: The Strathcona Pilot Impact

- Reduced EMS calls by 25%
- Reduced diastolic and systolic BP after 5 visits
 - 70% had BP under 'control' (vs. 40% at baseline; mean BP fell 5mmHg)
- Reduced diabetes risk category
 - From high to moderate or moderate to low, for 15% of residents
- Reduced social isolation
- Provided an opportunity for paramedics to use skills while on modified duty

CHAP-EMS Phase 1: Results

Basic Cost Benefit Analysis

Cost of the Program

- 8 hrs **modified** paramedic time /week **\$0**
- One time equipment cost **\$2,500**

Savings due to the program

- EMS call decrease of 25% (104 calls in 2012, to 84 calls in 2013 – approx. 20 calls less or **\$20,680**)

NET SAVING OF \$18,180 per year per building

CHAP-EMS Phase 2 Preliminary Results: Randomized Control Trial

- 16 subsidized apartment buildings in 5 sites: Hamilton, Guelph, York Region, Sudbury, Simcoe
- RCT Timeframe: 2015 – 2017
- Blood pressure, CANRISK, EQ5D QoL assessments measured at the first and 6th month visit
- Will measure EMS calls & Health Utilization data (ICES) after 1 year implementation

CHAP-EMS Phase 2: Randomized Control Trial

- 6 months pre/post
- Significant reductions ($p < 0.05$):
 - Overweight/obese BMI/ elevated waist circumference categories
 - At risk of developing diabetes (CANRISK)
 - 15% from high to moderate and 7% from moderate low risk of diabetes
 - Systolic/diastolic BP after 1/12, sustained until 6/12
 - QoL categories for pain/discomfort and anxiety/depression significantly improved

CHAP-EMS Phase 2: Preliminary Basic Cost Benefit Analysis

Cost of the Program in 4 buildings for 1 year

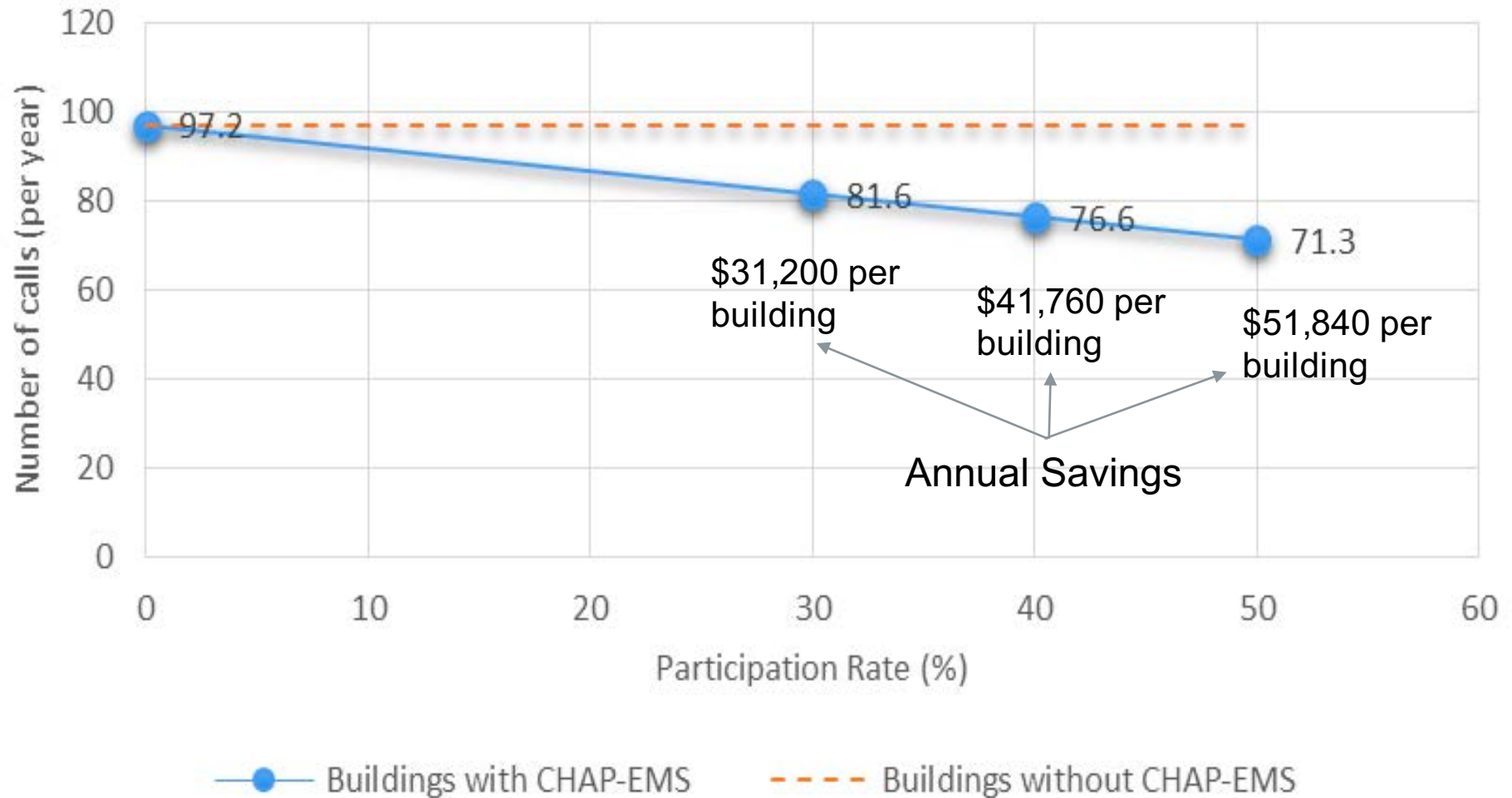
- 16 hrs paramedic time/week/annum **\$44,920**
- One time equipment cost **\$2,500**

Savings due to the program assuming 30% participation rate

- EMS call decrease of 30% **\$124,800**

NET SAVING OF \$77,372

Annual projected ambulance calls in a 200 unit building by CHAP-EMS participation rate



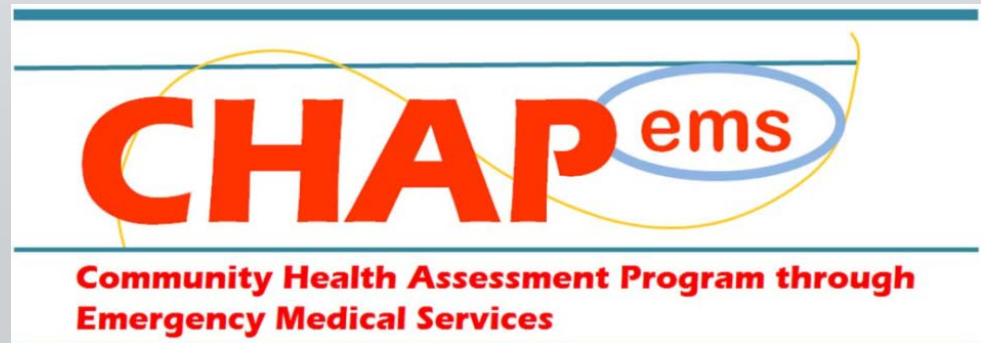
CHAP-EMS:

Implications of Phases 1 and 2

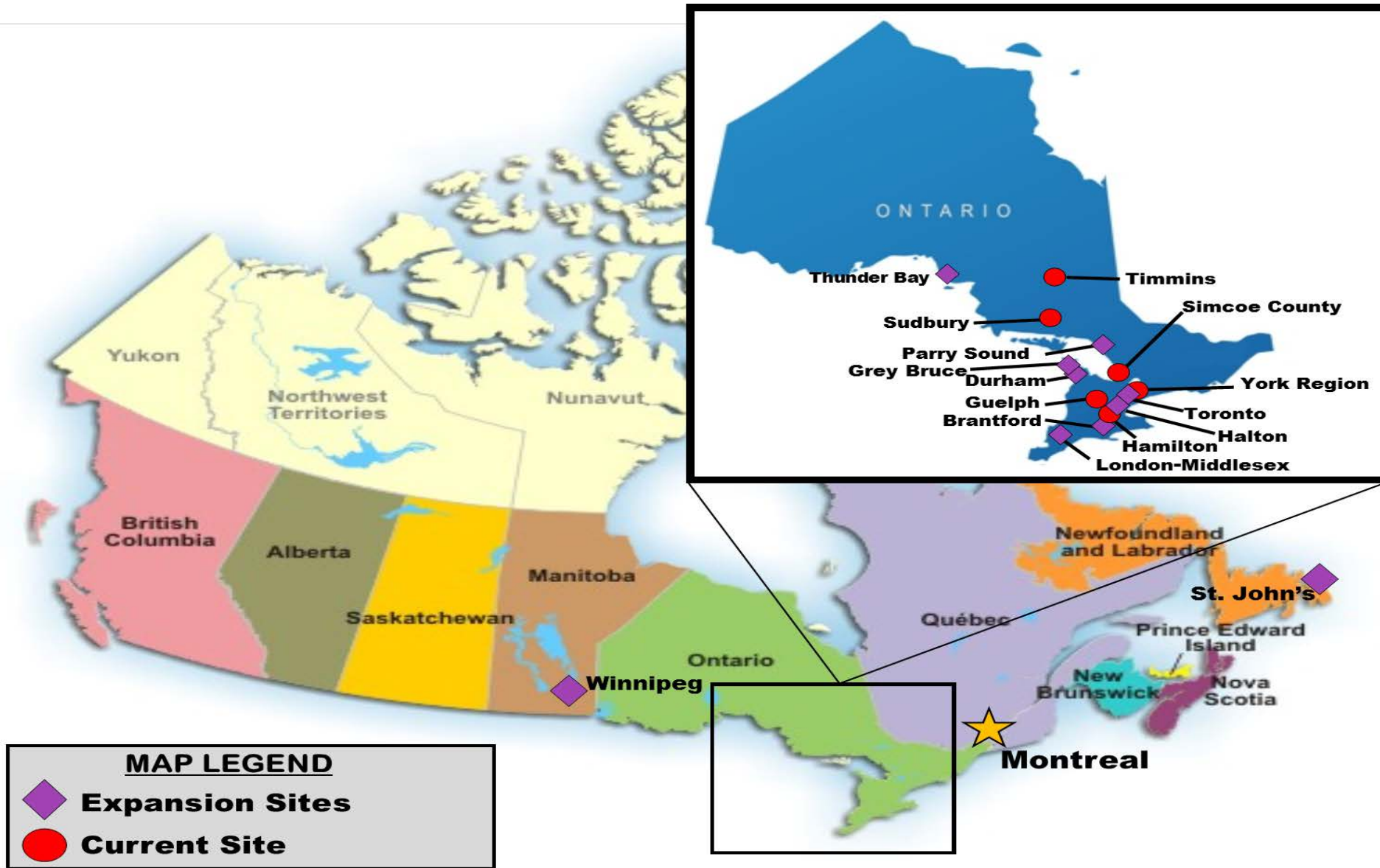
- After implementation over 1 year in an urban seniors' building, CHAP-EMS is likely to be effective in:
 - Decreasing mean BP
 - Changing lifestyle factors, diabetes risk
 - Decreasing EMS calls
- Potential cost savings
 - 911 calls **\$15,000 - \$35,000**
 - Health changes long term will also result in long term cost savings which are currently analysing (ICES data)



Phase 3: The Future of CHAP- EMS



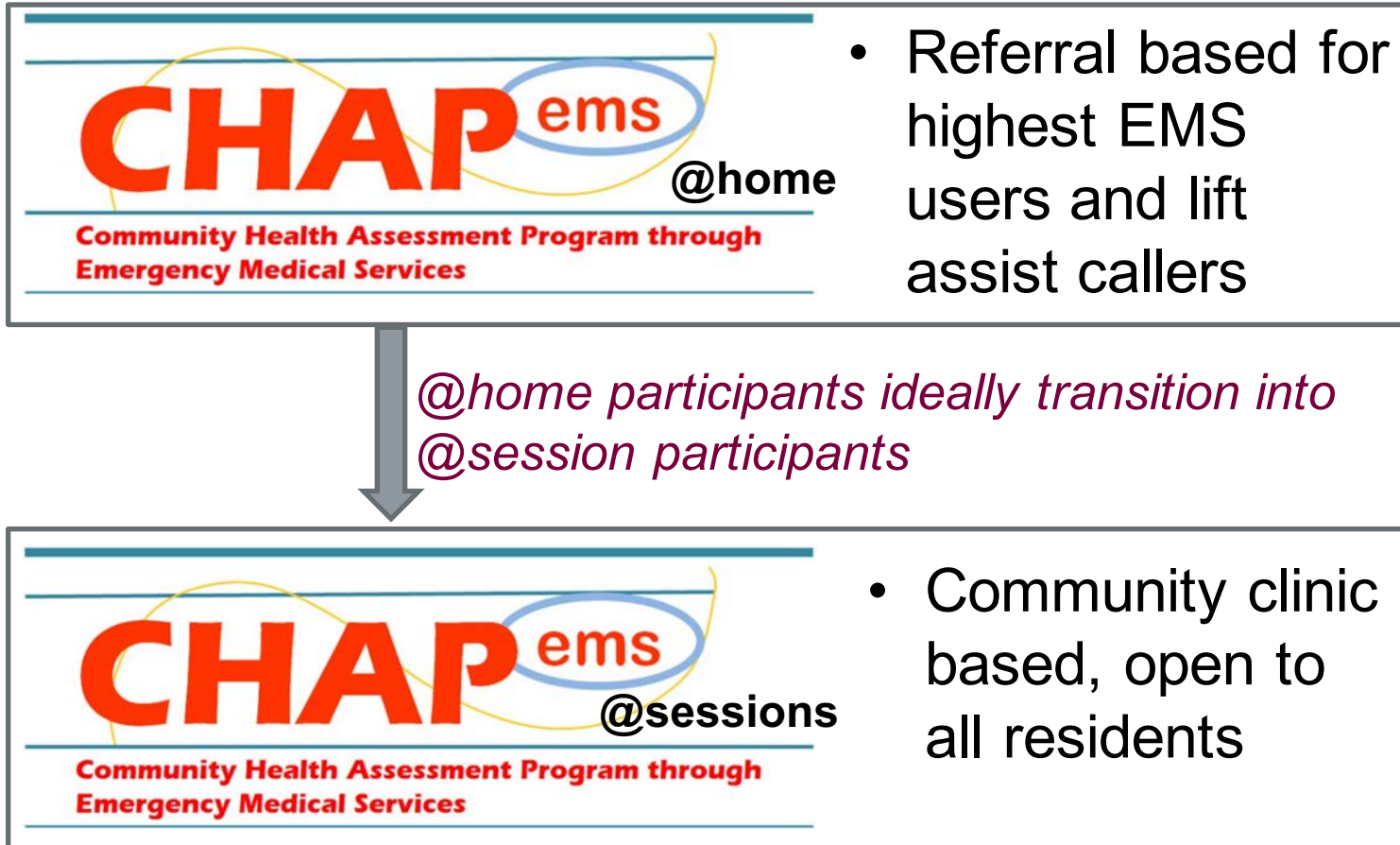
CHAP-EMS Phase 3: Current and Future Sites



Further research required

- Long term outcomes (1yr, 2yrs, 3+yrs)
- Best practices for program length/ time in buildings
- Addition of program components (mental health, social isolation, poverty, elder abuse, CHF, AF)
- Modified versus regular staff
- Program adaptation to different settings (language, immigrants)

A Complete Community Paramedic Solution



Based on robust evidence and tried and tested!

Future Directions

CHAP **ems**

**Community Health Assessment Program through
Emergency Medical Services**

Moving to
other high
need
populations

Curriculum
development
for CP with
colleges

Expanding
the CHAP-
EMS staffing
model

Implementation
/ Evaluation of
complementary
CP approaches


The Solution



CHAPems

The logo for CHAPems features the word "CHAP" in large, bold, orange capital letters, followed by "ems" in a smaller, blue, lowercase font. A yellow swoosh underline is positioned beneath "CHAP", and a blue oval encircles the "ems" portion.

**Community Health Assessment Program through
Emergency Medical Services**



**High Emergency Medical
Services (EMS) Calls and
Emergency Room (ER) Visits**

A light green rectangular box with a yellow border containing the text. A green arrow points down from the top left corner of the box.

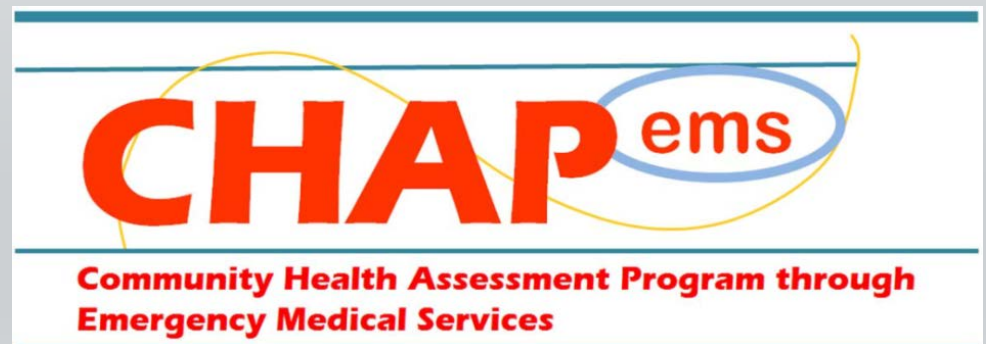
**High incidence of
complications**

A light gray rectangular box with a yellow border containing the text. A green arrow points down from the top right corner of the box.

Health Care Savings \$\$\$

A light green rectangular box with a dark green border containing the text. A large gray arrow points up from the bottom left towards the box.

Our Network





Some of Our Partners and Collaborators



The CHAP-EMS Research Team

Rest of the CHAP-EMS Team:

Francine Marzanek

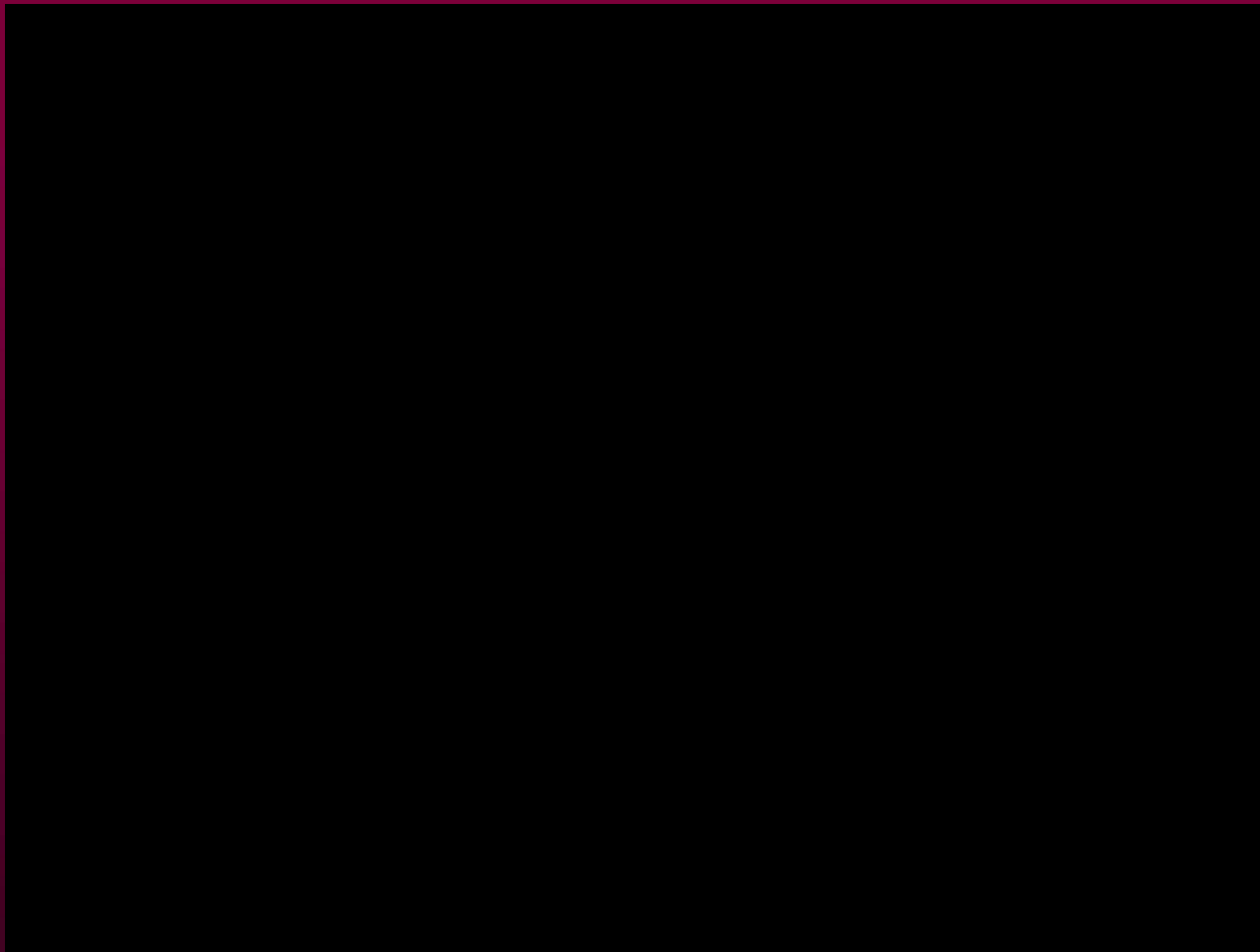
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