

# **Stroke Preventive Care in Ontario**

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# Evaluation

For **the Provincial Stroke Rounds Planning Committee**: To plan future programs and for quality assurance and improvement.

For **You**: Reflecting on what you've learned and how you plan to apply it can help you enact change as you return to your professional duties

For **Speakers**: The responses help understand participant learning needs, teaching outcomes and opportunities for improvement.



<https://forms.cloud.microsoft/r/b8SUfdKBud>

Please take 2 minutes to fill the evaluation form out. Thank you!

# Disclosure of Affiliations & Financial Support

**Speaker Name: Dr. Manav Vyas**

**Affiliations:** *I have no relationships with for-profit or not-for-profit organizations.*

**Financial Support:** *This session/program has not received financial or in-kind support.*

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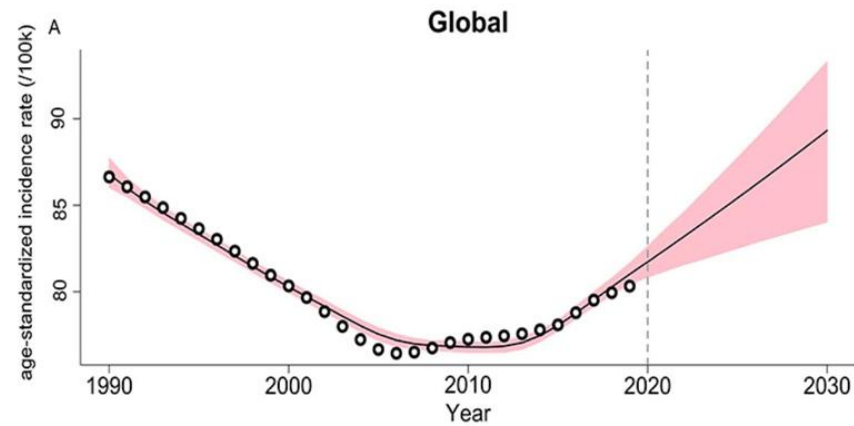
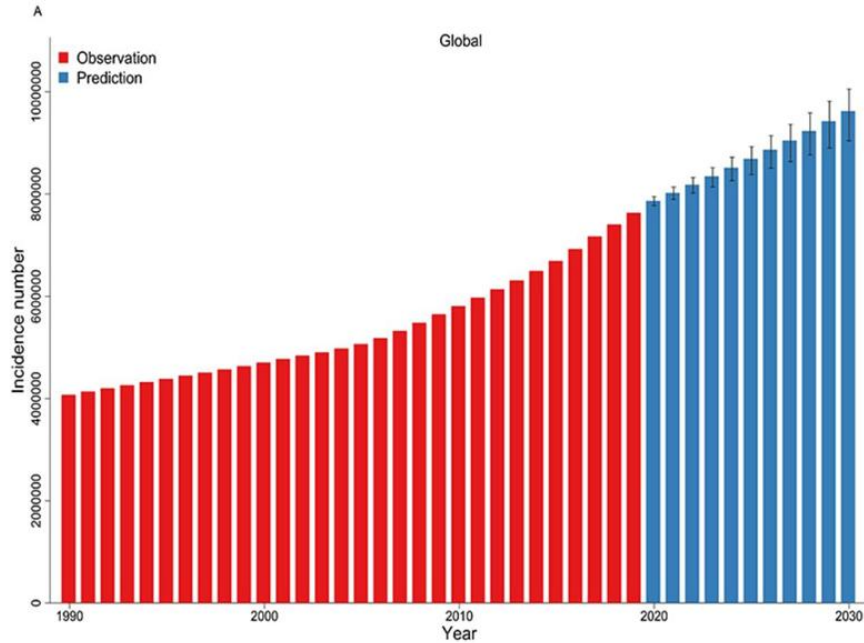
# Objectives

1. Outline the quality of primary and secondary preventive care in Ontario
2. Articulate differences in the quality of secondary preventive care
3. Identify potential actionable targets/strategies where care can be improved

# Burden of Stroke

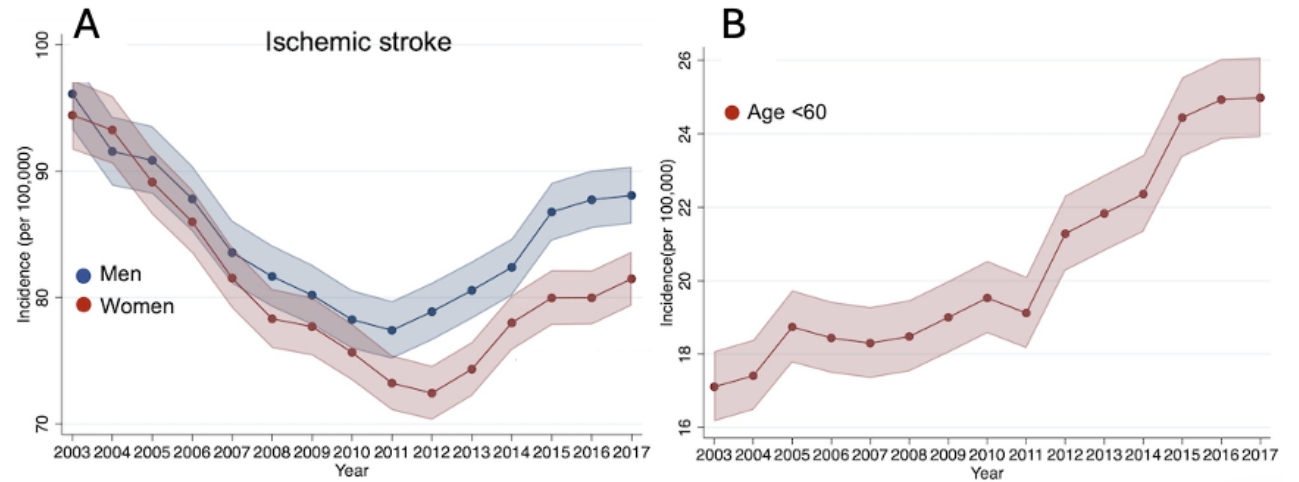
Every 5 minutes, someone in Canada suffers from a stroke

Stroke is the leading cause of disability in Canada and the third most common cause of death



Pu et al. 2023

**Figure 1. Age standardized incidence of stroke per 100,000 population in Ontario with 95% CI stratified by sex (A), and sex-standardized incidence shown for those <60 years of age (B).**



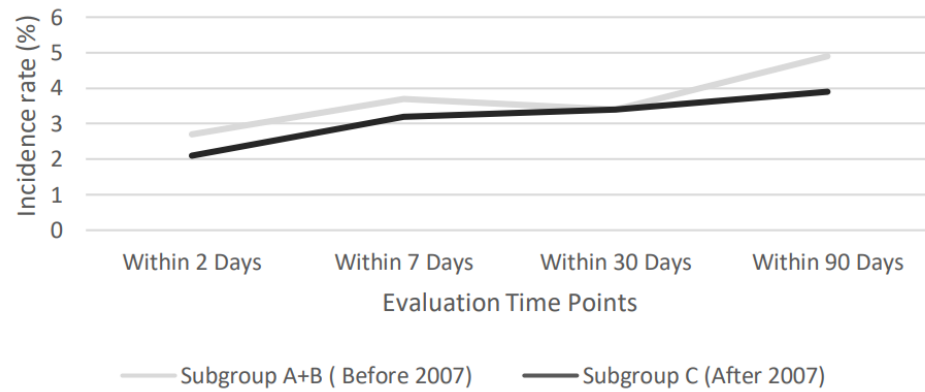
Joundi et al. 2020

# Burden of Recurrent Stroke

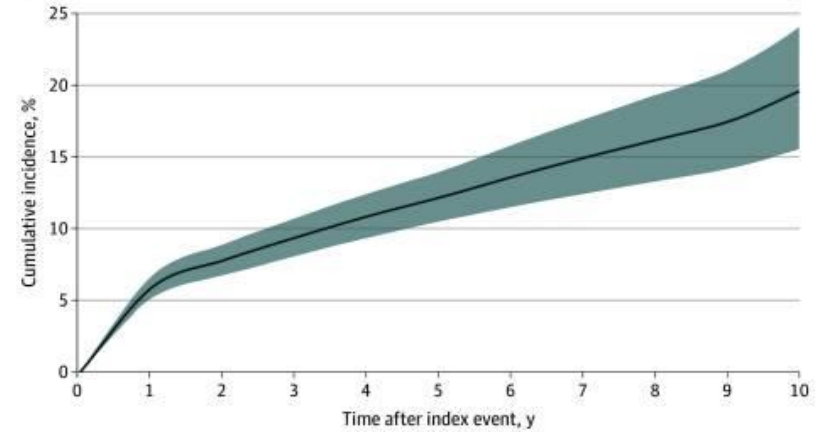
A second stroke carries a higher mortality than the first stroke, and leads to greater disability, but it is considered more preventable than the first stroke

~12% of people will experience a second stroke in 1-2 years, but this varies based on the length of follow-up, and other factors

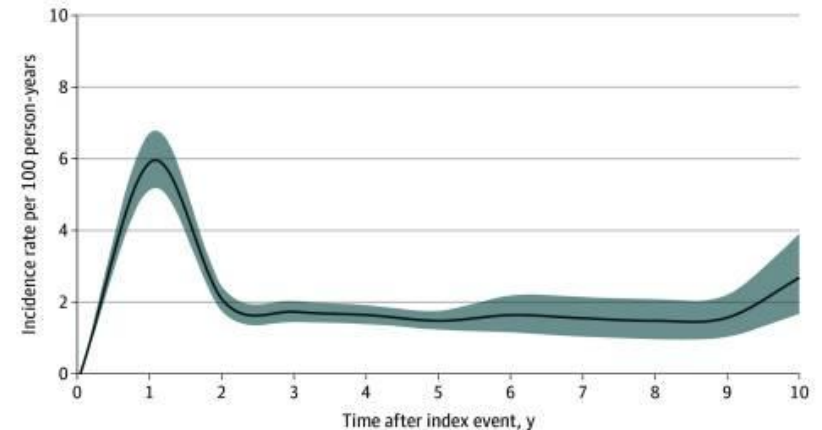
**A** Trend of Ischemic Stroke incidence following Transient Ischemic Attack



**A** Cumulative incidence of stroke



**B** Incidence rate of any stroke







No. of study cohorts	38	25	22	20	17	12	12	12	10	9
No. of person-years	155009	62173	50429	41147	32441	9933	7565	5600	4108	3075
No. of events	9464	1070	745	614	441	149	110	76	61	69

Shahjouie et al. 2020

Khan et al. 2025

# Primary vs. Secondary Stroke Prevention

PRIMARY STROKE PREVENTION	SECONDARY STROKE PREVENTION
 <p data-bbox="733 743 1031 786"><b>Before Any Stroke</b></p>	 <p data-bbox="1462 743 1801 786"><b>After a Stroke or TIA</b></p>
<ul data-bbox="652 839 1031 1001" style="list-style-type: none"><li>• Preventing the first event</li><li>• Lowering stroke risk</li><li>• Targeting risk factors</li></ul>	<ul data-bbox="1411 839 1765 1001" style="list-style-type: none"><li>• Preventing a recurrence</li><li>• Reducing complications</li><li>• Ongoing monitoring</li></ul>
 <b>Goal: Avoid First Stroke</b>	 <b>Goal: Prevent Another Stroke</b>

# Canadian Best Practices – Secondary Stroke Prevention

**Recommendations** Quality Resources Events News

## Secondary Prevention Of Stroke

7th Edition – 2020 UPDATED

[Download Module PDF](#) [Canadian Journal of Neurological Sciences](#)

### Module Sections and Resources

**Definitions**  
Recommendations >

**Core Elements of Delivery of Secondary Stroke Prevention Services**  
Recommendations >

**1. Triage and Initial Diagnostic Evaluation of Transient Ischemic Attack and Non-Disabling Stroke**  
Recommendations >  
1.0 Stroke and TIA >  
1.1 HIGH Risk for Recurrent Stroke (Symptom onset within last 48 Hours) >  
1.2 Brain and Vascular Imaging >  
1.3 Blood Work >  
1.4 Cardiac Studies >  
1.5 Functional Assessment >  
1.6 Virtual Care for Secondary Stroke Prevention (New 2020) >

**2. Lifestyle Behaviours and Risk Factor Management**  
Recommendations >  
2.1 Risk Factor Assessment >  
2.2 Healthy Balanced Diet >  
2.3 Sodium Intake >  
2.4 Physical Activity >  
2.5 Weight Management >  
2.6 Alcohol Consumption >  
2.7 Recreational Drug Use >  
2.8 Smoking Cessation >  
2.9 Pregnancy, Oral Contraceptives and Hormone Replacement Therapy >  
2.10 Adherence to individual prevention plans >  
2.11 Emerging Risk Factors >  
2.12 Air pollution and stroke risk >

11. Cancer Associated Ischemic Stroke

1. Modifiable vascular risk factors
  1. Diabetes – HbA1c < 7%
  2. sBP < 140 mmHg\*
  3. LDL < 1.8 mmol/dL
2. Use of medications for above
3. Use of an anticoagulant in people with atrial fibrillation
4. Use of antithrombotics/antiplatelets
5. Lifestyle factors – smoking, alcohol use, healthy diet, weight management, low salt diet, physical activity, and recreating drug use
6. Management of extracranial carotid disease

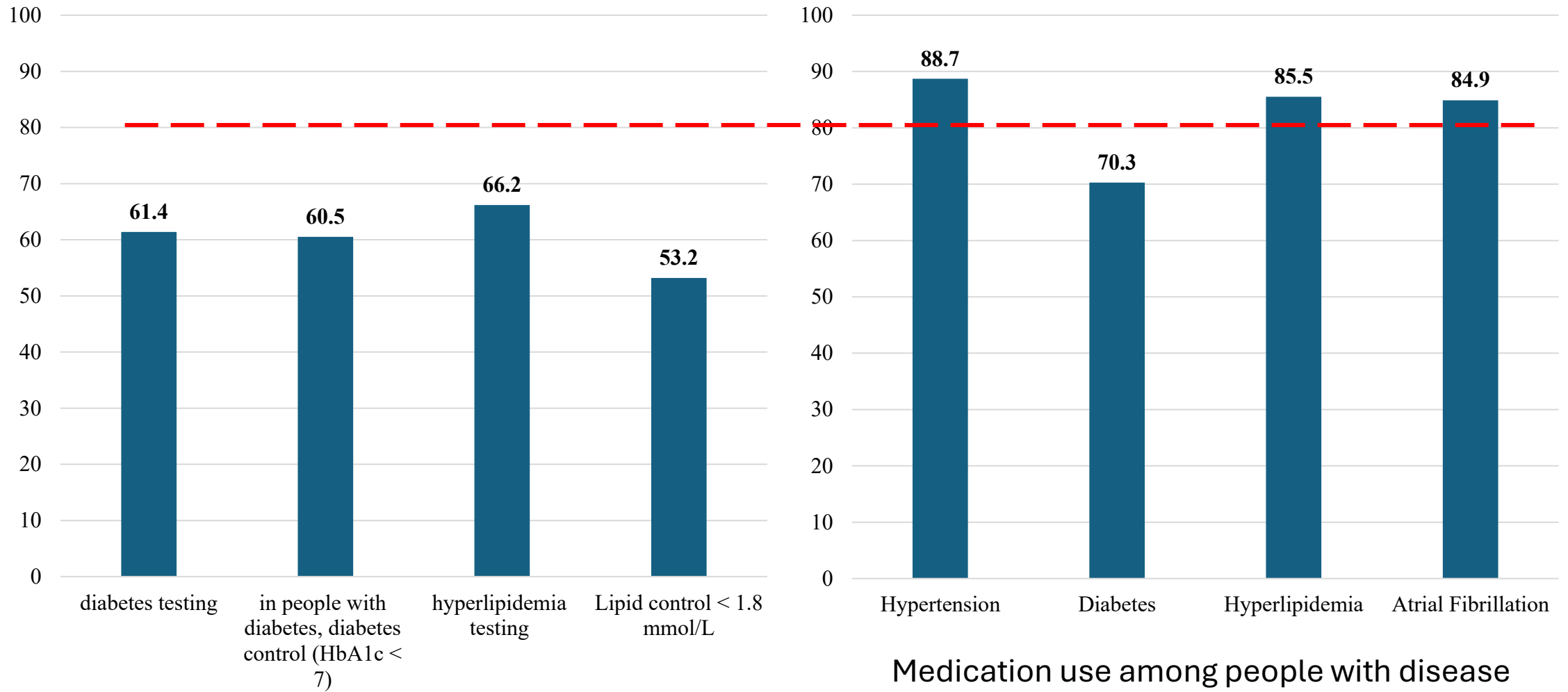
# Secondary Stroke Preventive Care

Community-dwelling patients who survived 1 year after a first-ever ischemic stroke between April 1, 2010 and March 31, 2019

n = 54,712

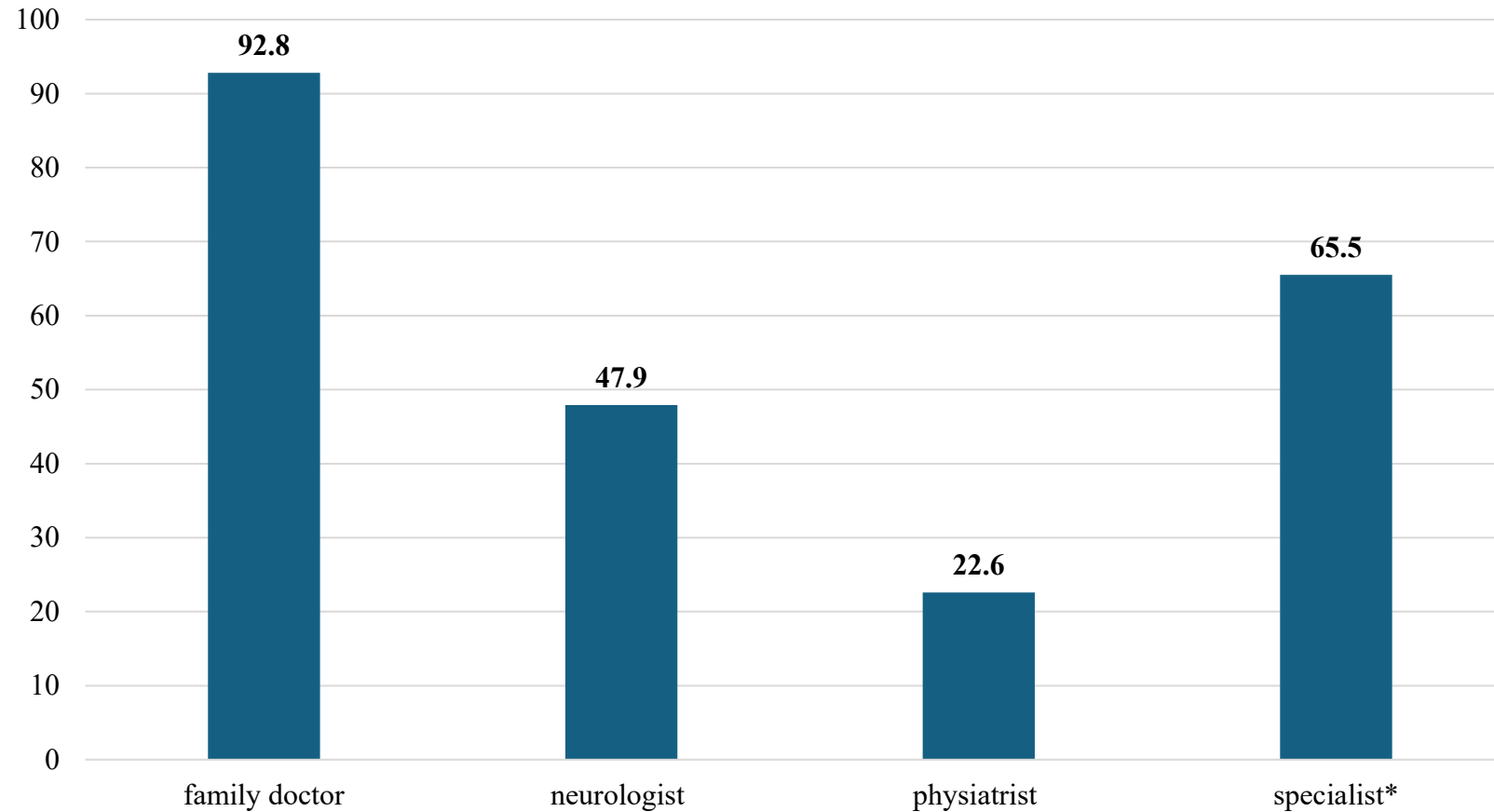
These patients may have been discharged home or to an LTC, and the quality of risk factor was measured in the first year after stroke

# Quality of Secondary Stroke Preventive Care



Medication use among people with disease  
(aged  $\geq 65$  years) Fleet et al. 2025

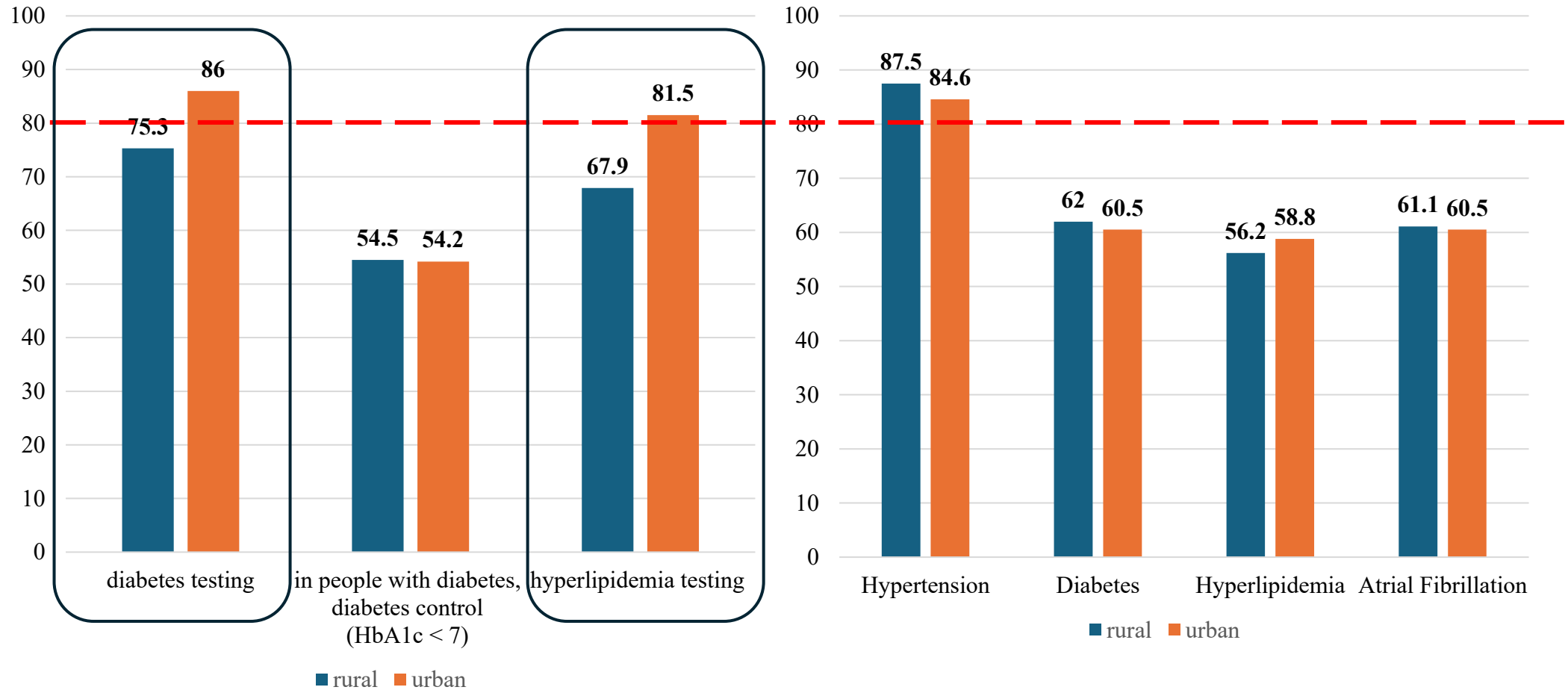
# Visit to a physician in 90 days of discharge



\*within a year of discharge

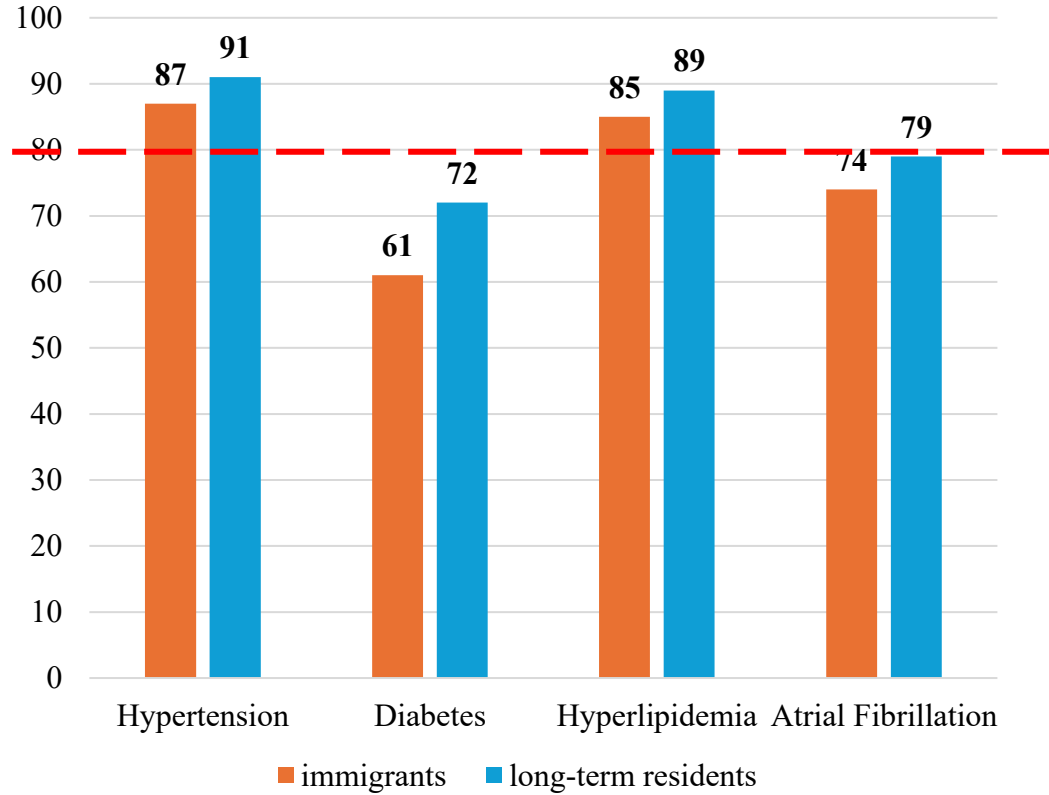
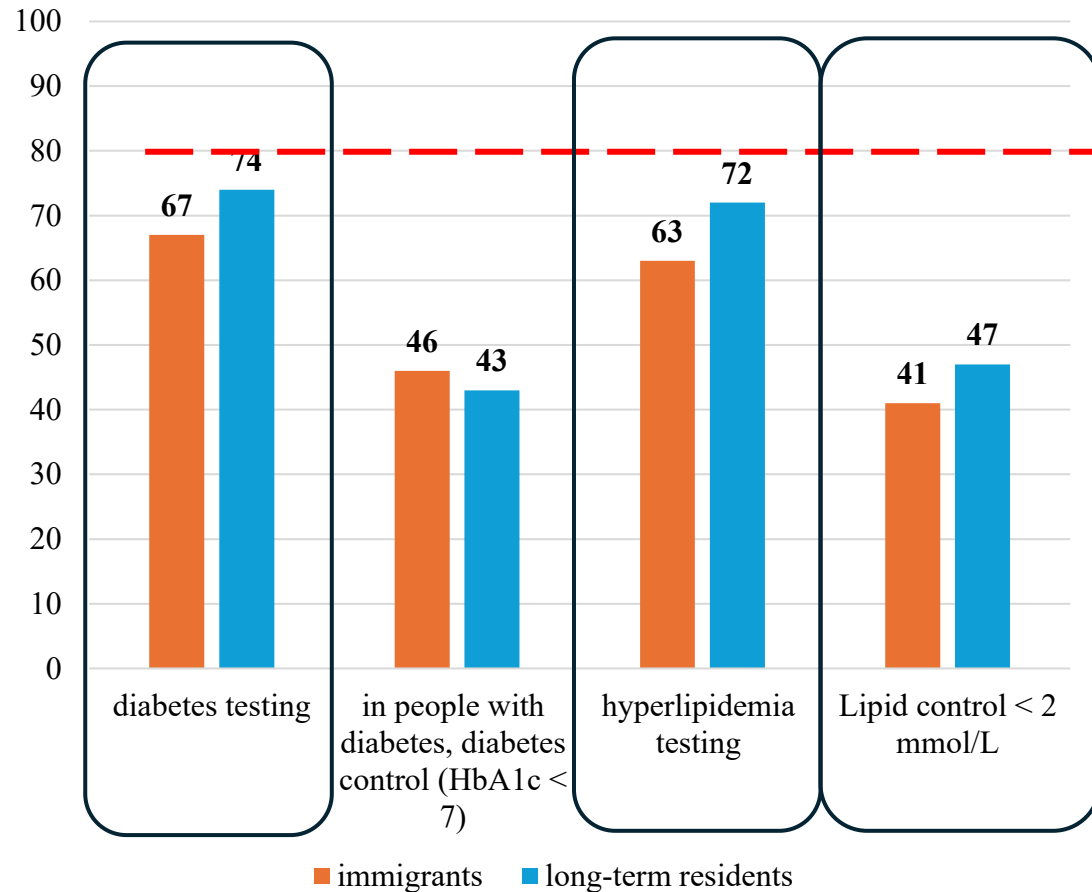
Fleet et al. 2025  
Vyas et al. 2022

# Rural-Urban Differences



Medication use among people with disease (aged  $\geq 65$  years)

# Immigrants vs. Long-term Residents



Medication use among people with disease (aged  $\geq 65$  years)

# Key Take Aways

Secondary preventive care is suboptimal for everyone

Marginally worse care for rural residents and immigrants

All of this despite reasonable access to family doctors and specialists

# How Do We Improve Stroke Prevention?

*“It would be helpful if there was a contact person that was a central person that's not necessarily a doctor, but pick up the phone and I say, look, I'm having some nosebleeds”*

## Guide for Stroke Recovery

Information and resources for persons  
and families recovering from stroke



### Use this Guide to:

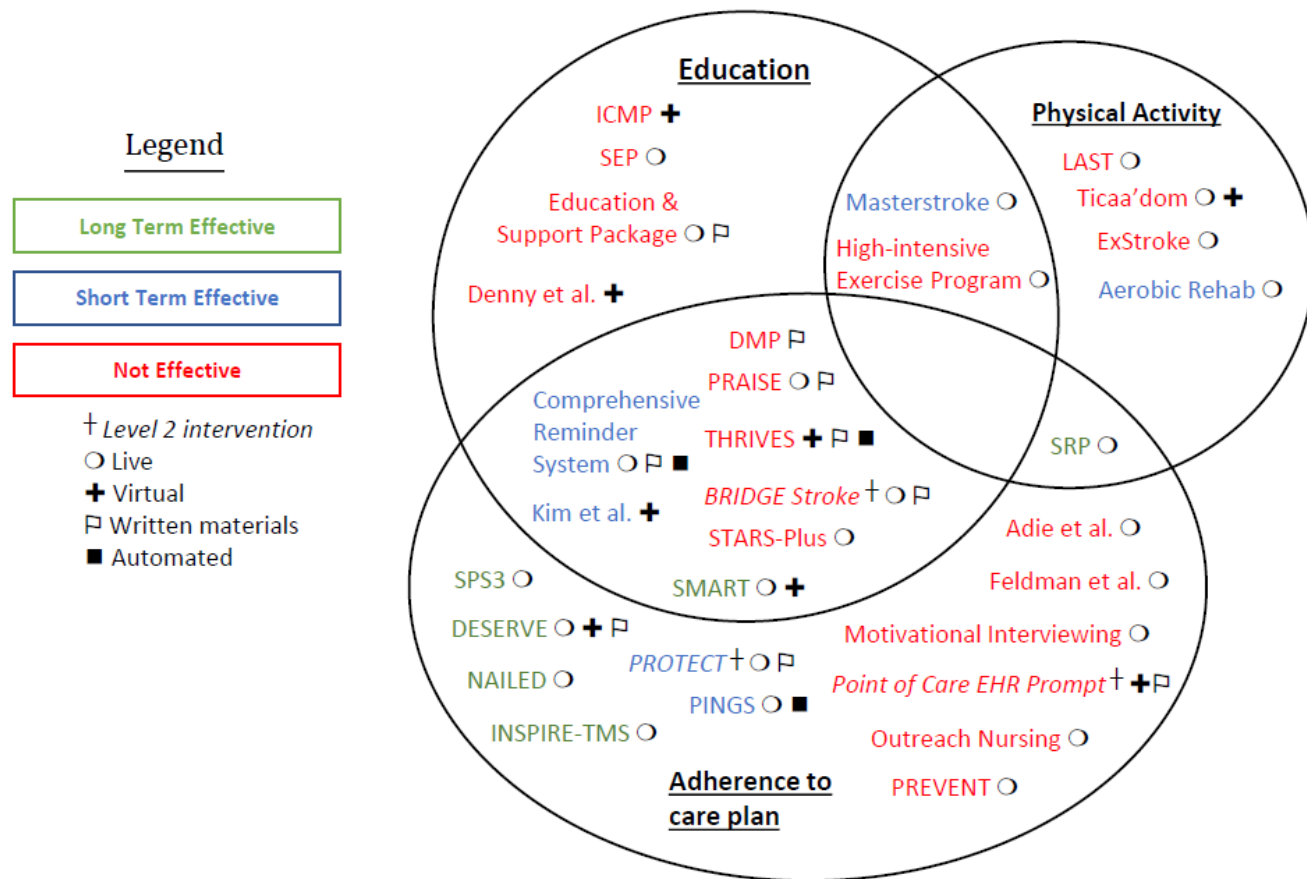
- find information about stroke and your recovery
- set goals to recover, live well and prevent another stroke
- keep track of your progress
- communicate with your health care team
- find resources and support services in your community

# Coordinated Post-Stroke Care

31 interventional studies, many RCTs, to evaluate control of vascular risk factors after stroke

Some had sustained long-term control of risk factors (BP being the most common)

None studied recurrent stroke risk



# Use of Digital Tools to Improve Secondary Stroke Prevention

Interventions that include people, technology and scheduled follow-up

Improving coordination of care across silos – family practice, specialist, and rehabilitation specialists








RCTs (n = 13) showed benefit in adherence and improvement in sBP and HbA1c, but only one study evaluated recurrent stroke risk

## TOPICAL REVIEW

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Section Editors: Dominique A. Cadilhac, PhD, and Janet Prvu Bettger, ScD

A Scoping Review of mHealth Interventions for Secondary Prevention of Stroke: Implications for Policy and Practice

Liam P. Allan , BSc; Lin Beilei, PhD; Jan Cameron , PhD; Muideen T. Olajya , PhD; David Silvera-Tawil, PhD; Amelia K. Adcock , MD; Coralie English , PhD; Seana L. Gall , PhD; Dominique A. Cadilhac , PhD

Allan et al. 2023

# Multimodal Intervention to Reduce Recurrent Stroke

Secondary prevention with a structured semi-interactive stroke prevention package in INDIA (SPRINT INDIA): a multicentre, randomised controlled trial



SPRINT INDIA trial collaborators\*



	Intervention (n=2148)	Control (n=2150)	Unadjusted odds ratio (95% CI)	Adjusted odds ratio (95% CI)*	p value
Composite primary outcome	119 (5.5%)	106 (4.9%)	1.13 (0.86–1.48)	1.12 (0.85–1.47)	0.370
High-risk transient ischaemic attack	5 (0.2%)	7 (0.3%)	0.72 (0.23–2.27)	0.73 (0.23–2.31)	0.694
Ischaemic stroke	39 (1.8%)	40 (1.9%)	0.98 (0.63–1.53)	0.97 (0.62–1.52)	0.694
Intracerebral haemorrhage	5 (0.2%)	2 (0.1%)	2.52 (0.49–4.04)	2.52 (0.49–4.05)	0.694
Acute coronary syndrome	9 (0.4%)	7 (0.3%)	1.30 (0.48–3.48)	1.27 (0.47–3.43)	0.694
Death	61 (2.8%)	50 (2.3%)	1.23 (0.84–1.80)	1.22 (0.83–1.78)	0.694

Data are n/N (%) or odds ratio (95% CI). \*Adjusted using logistic regression for study site, age, region, highest level of education, US National Institute of Health Stroke Scale, stroke characteristics, revascularisation, and medical history.

Table 3: Primary outcomes at 1 year

# Where to next?

Stroke recurrence in Ontario remains high

The impact of lifestyle factors

What is “optimal” stroke preventive care?

How do we support patients/caregivers to take control of risk prevention?

Co-designed, scalable interventions that use technology to reduce existing disparities

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# Primary Cardiovascular Preventive Care

All Ontario residents aged  $> 40$  years or older as of January 1, 2011

Ensured that they have not had any cardiovascular disease before the start date – no stroke, MI, or PCI/CABG

$n = 5,337,318$