

Government-insured Routine Eye Examinations and Incidence of Self-reported Glaucoma, Cataracts and Vision Loss

Jin YP, Badley E, Trope GE, Buys YM, Chan C

2014 National Conference
Canadian Research Data Centre Network (CRDCN)

Winnipeg, Oct 30, 2014

Background

- Government-insured healthcare coverage exists for eye disease such as diabetic retinopathy, glaucoma and cataracts
- General/routine eye exams are not uniformly covered by government and may require individual payment

Government Coverage for General/Routine Eye Exams in Canada

	AB	BC	ON	QC	MB	NS	SASK	NB*	PEI*	NFLD*
<20	√ (0-18)	√ (0-15)	√ (0-19)	√ (0-17)	√ (0-17)	√ (0-9)	√ (0-17)	X	X	X
	1/yr	1/yr	1/yr	1/yr	1 ev'y 2 yrs	1 ev'y 2 yrs	1/yr	–	–	–
20-64	X	X	X	X	X	X	X	X	X	X
65+	√	√	√	√	√	√	X	X	X	X
	1/yr	1/yr	1/yr	1/yr	1 ev'y 2 yrs	1 ev'y 2 yrs	–	–	–	–

*: NB: de-insured in 1992;

PEI: never insured;

NFLD: de-insured in 1991.

Government Coverage for General/Routine Eye Exams in Canada

	AB	BC	ON	QC						
<20	√ (0-18)	√ (0-15)	√ (0-19)	√ (0-17)						
	1/yr	1/yr	1/yr	1/yr						
20-64	X	X	X	X						
65+	√	√	√	√						
	1/yr	1/yr	1/yr	1/yr						

Government Coverage for General/Routine Eye Exams in Canada

					MB	NS				
<20					√ (0-17)	√ (0-9)				
					1 ev'y 2 yrs	1 ev'y 2 yrs				
20-64					X	X				
65+					√	√				
					1 ev'y 2 yrs	1 ev'y 2 yrs				

Government Coverage for General/Routine Eye Exams in Canada

							SASK			
<20							√ (0-17)			
							1/yr			
20-64							X			
65+							X			
							—			

Government Coverage for General/Routine Eye Exams in Canada

								NB*	PEI*	NFLD*
<20								X	X	X
								—	—	—
20-64								X	X	X
65+								X	X	X
								—	—	—

*: NB: de-insured in 1992;
 PEI: never insured;
 NFLD: de-insured in 1991.

Government Coverage for General/Routine Eye Exams in Canada

	AB	BC	ON	QC	MB	NS	SASK	NB	PEI	NFLD
<20										
20-64	X	X	X	X	X	X	X	X	X	X
65+										

Hypothesis

Different government coverage policies for general eye exams



Different access to eye care providers



Different detection of eye diseases
Different eye disease rates

Aim

- To determine if there is an association between the policy of government-insured general/routine eye examinations and incidence of self-reported glaucoma, cataracts and vision loss

Methods - 1

- Canadian longitudinal National Population Health Survey (NPHS)
- A survey run by Statistics Canada
- Includes 17, 276 people from all ages in 1994/1995
- Same persons were interviewed every two years until 2010/2011 (cycle 9), representing a 16-year follow-up
- Cycle 1 (1994/95): 83.6%
- Cycle 2 (1996/97): 92.8%
- Cycle 3 (1998/99): 88.3%
- Cycle 4 (2000/01): 84.9%
- Cycle 5 (2002/03): 80.8%
- Cycle 6 (2004/05): 77.6%
- Cycle 7 (2006/07): 77.0%
- Cycle 8 (2008/09): 70.7%
- Cycle 9 (2010/11): 69.7%

Methods - 2

- White respondents aged 65+ at baseline 1994/95 were included (n=2618)
- Information on two vision conditions was obtained from the survey questions asked in each cycle:

Now I'd like to ask about certain chronic health conditions which you may have. We are interested in 'long-term conditions' that have lasted or are expected to last 6 months or more and that have been diagnosed by a health professional.

Do you have glaucoma?

Do you have cataracts?

Methods - 3

- I. Are you usually able to see well enough to read ordinary newsprint **without** glasses or contact lenses?
- II. Are you usually able to see well enough to read ordinary newsprint **with** glasses or contact lenses?
- III. Are you able to see at all?
- IV. Are you able to see well enough to recognize a friend on the other side of the street **without** glasses or contact lenses?
- V. Are you able to see well enough to recognize a friend on the other side of the street **with** glasses or contact lenses?

Methods - 4

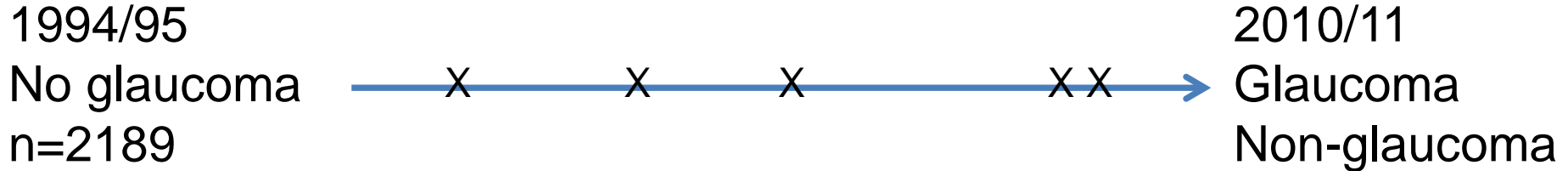
- (a) No vision problems
 - (b) Problems corrected by lenses (distance, close, or both)
 - (c) Problems seeing distance (not corrected)
 - (d) Problems seeing close (not corrected)
 - (e) Problems seeing close and distance (not corrected) or no sight at all (blindness)
- Self-reported vision loss: (c) + (d) + (e)

Methods - 5

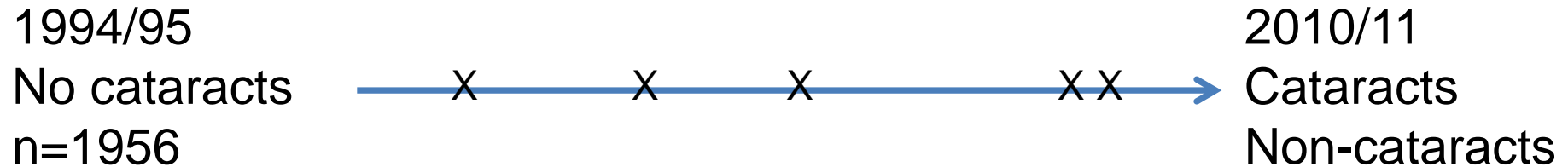
- Cohort 1: those free of glaucoma
- Cohort 2: those free of cataracts
- Cohort 3: those free of vision loss

Methods - 5

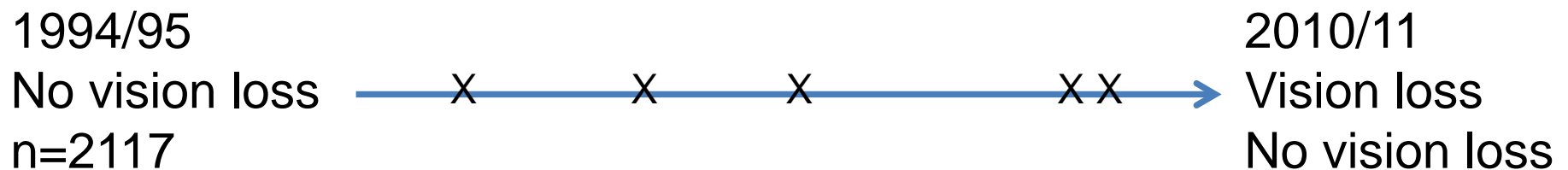
- Cohort 1: those free of glaucoma



- Cohort 2: those free of cataracts



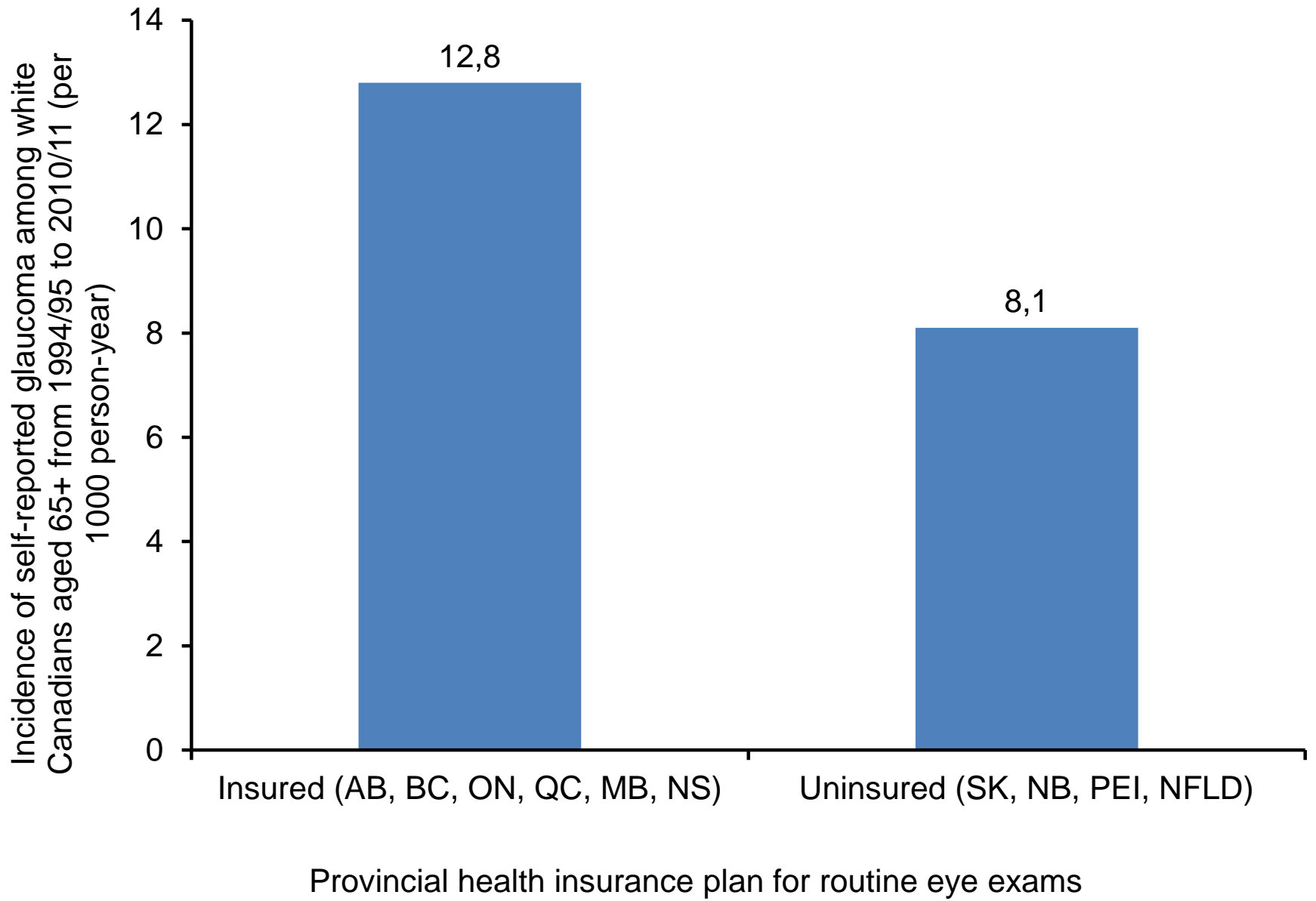
- Cohort 3: those free of vision loss

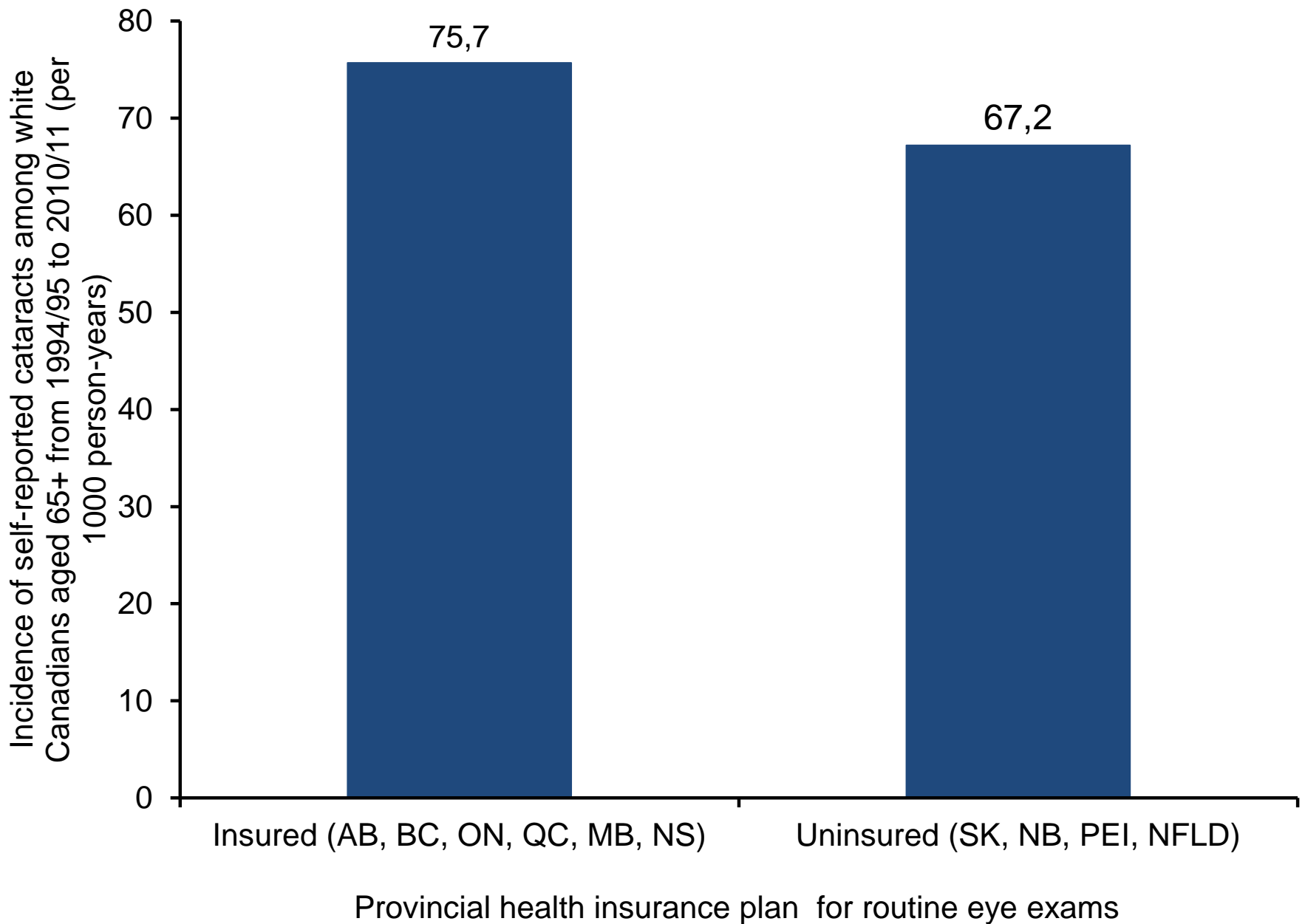


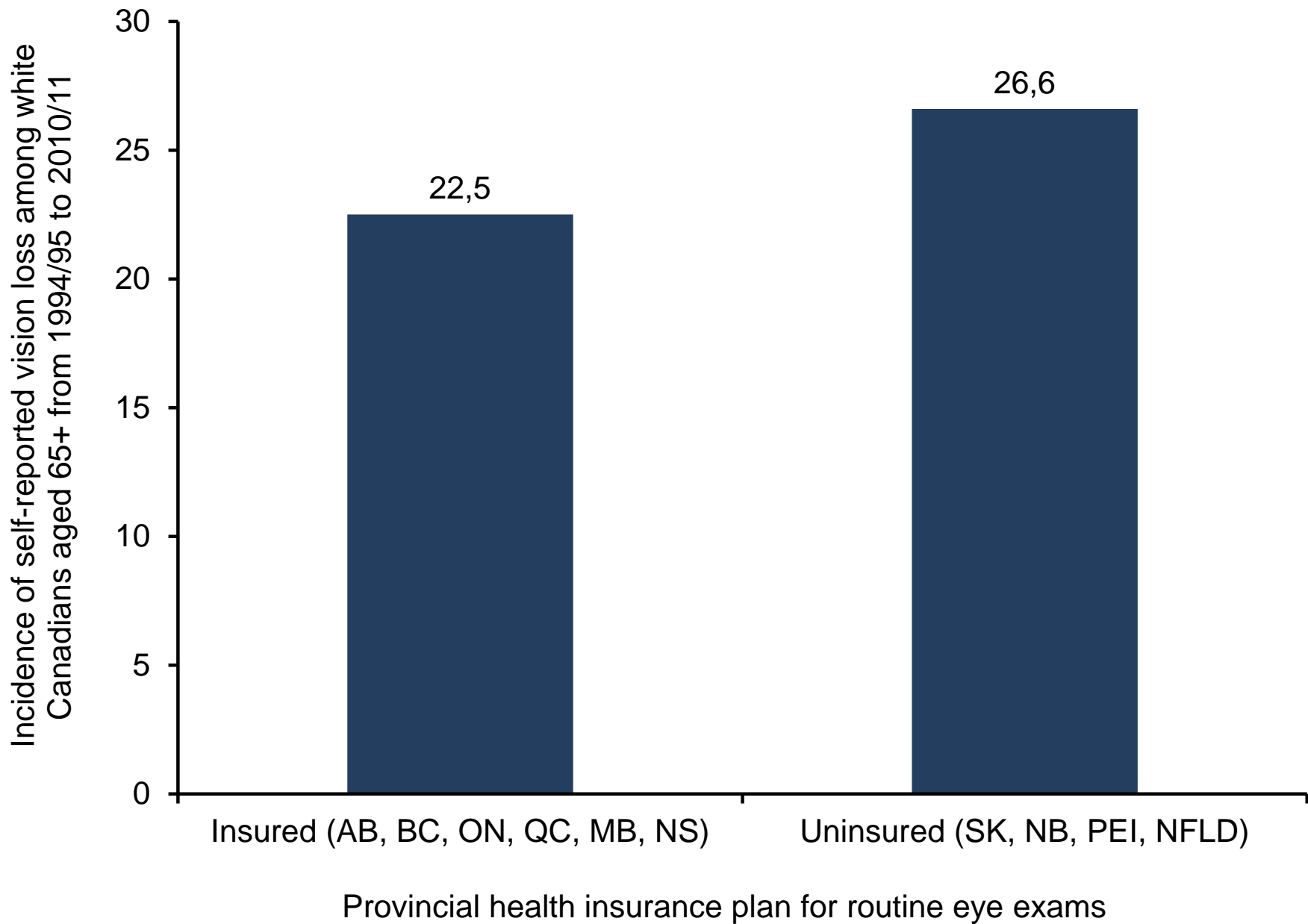
Methods - 6

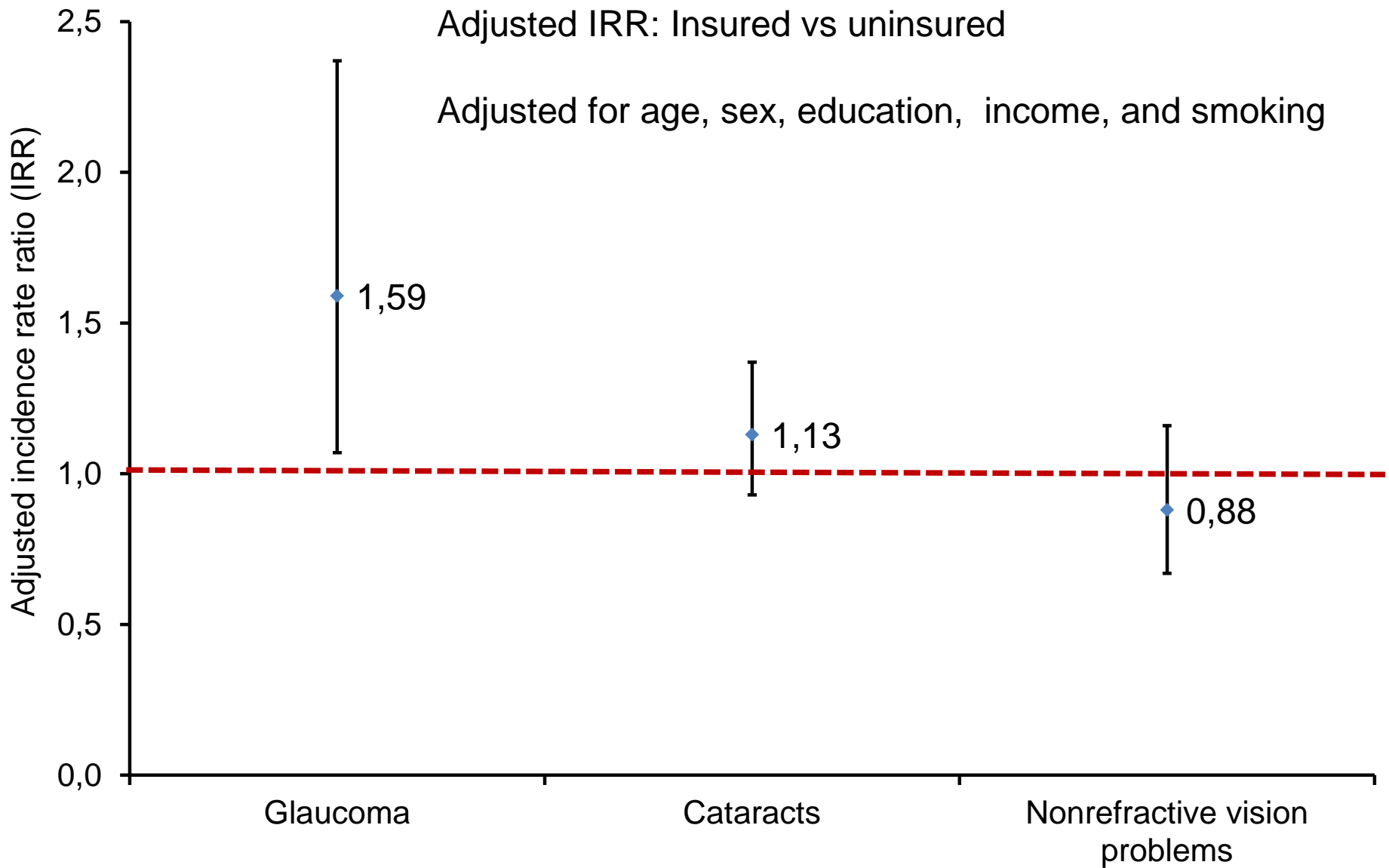
- Incident cases: The time of first self-reporting of the relevant vision questions in the follow-up cycles and were compared by government-insured general/routine eye examinations
- Government insurance status for general/routine eye examinations was assigned based on reported respondent's province of residence in 1994/1995 and their corresponding provincial health insurance policy
- Weighted Incidence Rate Ratios (IRRs) were calculated to compare incidence rates in government insured versus uninsured populations, controlling for age, sex, education, income and smoking

Results









Earlier hypothesis

Different government coverage policies for general eye exams



Different access to eye care providers



Different detection of eye diseases
Different eye disease rates

Conclusions

- Government-funded general/routine eye examinations are associated with a higher incidence of self-reported glaucoma and cataracts, likely due to better detection
- Government-funded general/routine eye examinations are also associated with a lower incidence of self-reported vision loss, likely due to better access to eye care and early treatment for preventable/avoidable vision loss

Limitations

- Recall and reporting error associated with self-report
 - Raina P et al. Agreement between self-reported and routinely collected health-care utilization data among seniors. *Health Serv Res.* 2002; 37(3):751-74.
Canada: “Substantial to almost perfect agreement was found for the contact utilization measures” (defined as any stay in hospital (yes or no) and any contact with a health professional (yes or no))
 - MacLennan PA et al. Medical record validation of self-reported eye diseases and eye care utilization among older adults. *Curr Eye Res.* 2013;38:1-8.
US: “Agreement between self-report and medical records was substantial for eye care utilization ($\kappa = 0.64$) and glaucoma ($\kappa = 0.73$).”
- Vision loss: medically correctable or not?

Strengths

- Longitudinal follow-up
- First Canadian data on incidence of glaucoma, cataracts and vision loss
- Nationwide, largest, random sample

Thank you!

Funding:



CIHR **IRSC**
Canadian Institutes of Health Research Instituts de recherche en santé du Canada