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

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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

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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?
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?
(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

1994/95
No glaucoma  \(\times\)  \(\times\)  \(\times\)  \(\times\)  \(\times\)  \(\times\)  \(\times\)  \(\times\)  \(\times\)
n=2189

2010/11
Glaucoma
Non-glaucoma

• Cohort 2: those free of cataracts

1994/95
No cataracts  \(\times\)  \(\times\)  \(\times\)  \(\times\)  \(\times\)  \(\times\)  \(\times\)  \(\times\)  \(\times\)
n=1956

2010/11
Cataracts
Non-cataracts

• Cohort 3: those free of vision loss

1994/95
No vision loss  \(\times\)  \(\times\)  \(\times\)  \(\times\)  \(\times\)  \(\times\)  \(\times\)  \(\times\)  \(\times\)
n=2117

2010/11
Vision loss
No 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
Incidence of self-reported glaucoma among white Canadians aged 65+ from 1994/95 to 2010/11 (per 1000 person-year)

Provincial health insurance plan for routine eye exams

Insured (AB, BC, ON, QC, MB, NS) 12.8

Uninsured (SK, NB, PEI, NFLD) 8.1
Incidence of self-reported cataracts among white Canadians aged 65+ from 1994/95 to 2010/11 (per 1000 person-years)

Provincial health insurance plan for routine eye exams

Insured (AB, BC, ON, QC, MB, NS)

75.7

Uninsured (SK, NB, PEI, NFLD)

67.2
Incidence of self-reported vision loss among white Canadians aged 65+ from 1994/95 to 2010/11

Provincial health insurance plan for routine eye exams

- Insured (AB, BC, ON, QC, MB, NS): 22.5%
- Uninsured (SK, NB, PEI, NFLD): 26.6%
Adjusted IRR: Insured vs uninsured

Adjusted for age, sex, education, income, and smoking

- Glaucoma: 1.59
- Cataracts: 1.13
- Nonrefractive vision problems: 0.88
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

    **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))

    **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: