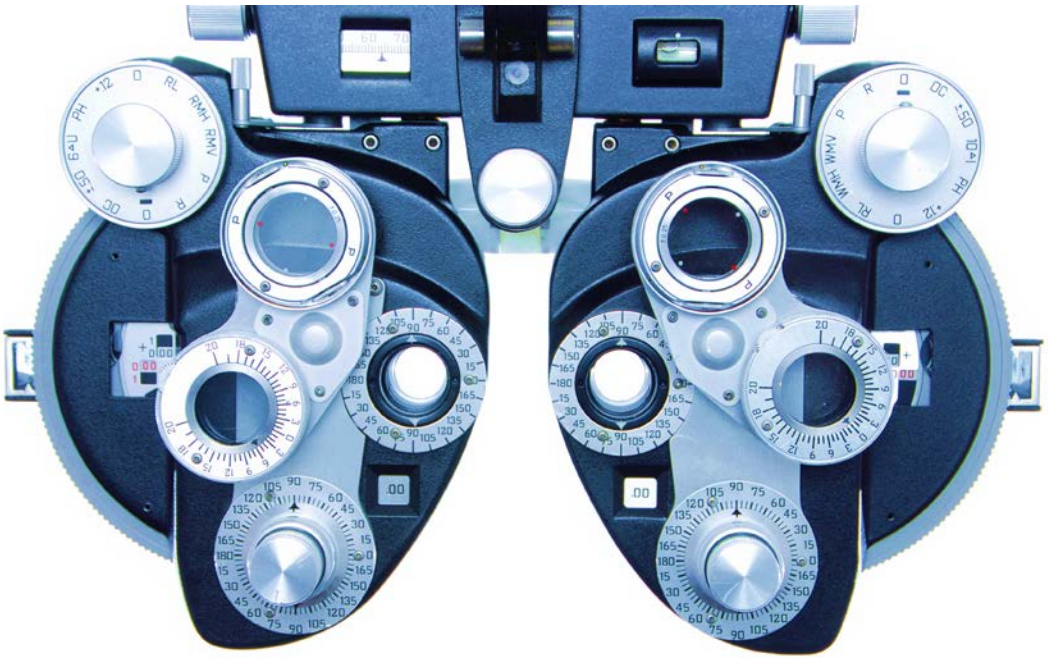

This project provides an actionable data set and recommendations for use by the Canadian Association of Optometrists.

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Executive Summary

From October 2011 to June 2015, the Canadian Association of Optometrists (CAO) collected 2,983 Optometry Incident Report (OIR) forms from participating English and French speaking members. From October 2011 until May 2014, members responded online to the original series of incident-related questions. From May until December 2014, the CAO conducted a campaign to improve the efficacy of the OIR. This campaign entailed two parts:
a) Revising questions based on member feedback; and
b) Updating the link to the OIR on the CAO website.
Upon review by advising Optometrists, the OIR questions received a second series of updates in February 2015.

Since April 2014, data collected in the OIR has been used to support policy development regarding eye care, specifically to emphasize the impact of early diagnosis on long-term healthcare costs. The following report provides an overview of the data disclosed in the Optometry Incident Report (OIR) between December 2011 and June 2015.

Summary of Findings

The following report details the findings of the OIR, including patient age, reason for making an appointment, specific ailments, and more. This data, collected from 2011 until 2015, represents the issues faced in the practices of CAO members.

Over the 4 years of collecting OIR data, 77% of patients visited an Optometrist as asymptomatic patients. On average, 66% of these patients booked an appointment with an Optometrist to update a prescription – not to address a specific ocular condition.

Given that the majority of patients exhibit asymptomatic eye disease, early detection is crucial to treatment. However, 27% of patients wait more than 5 years between comprehensive eye examinations. An additional 39% of patients wait between 2 and 5 years between examinations. Together, these segments represent a significant portion of the population who are not aware of their eye health. Frequent eye examinations can identify issues before they become a significant burden to patients and the public healthcare system. Data relating to the frequency of patient visits should be used to garner support from national and regional healthcare organizations on the matter of eye examinations.

The data collected between February - June 2015 must be considered with caution; after the OIR survey was updated on February 13, 2015, too few responses were collected to reflect the interests of the membership. The data

should be used as a perfunctory glance at issues faced by members until data for all of 2015 has been submitted.

Opportunities for Action

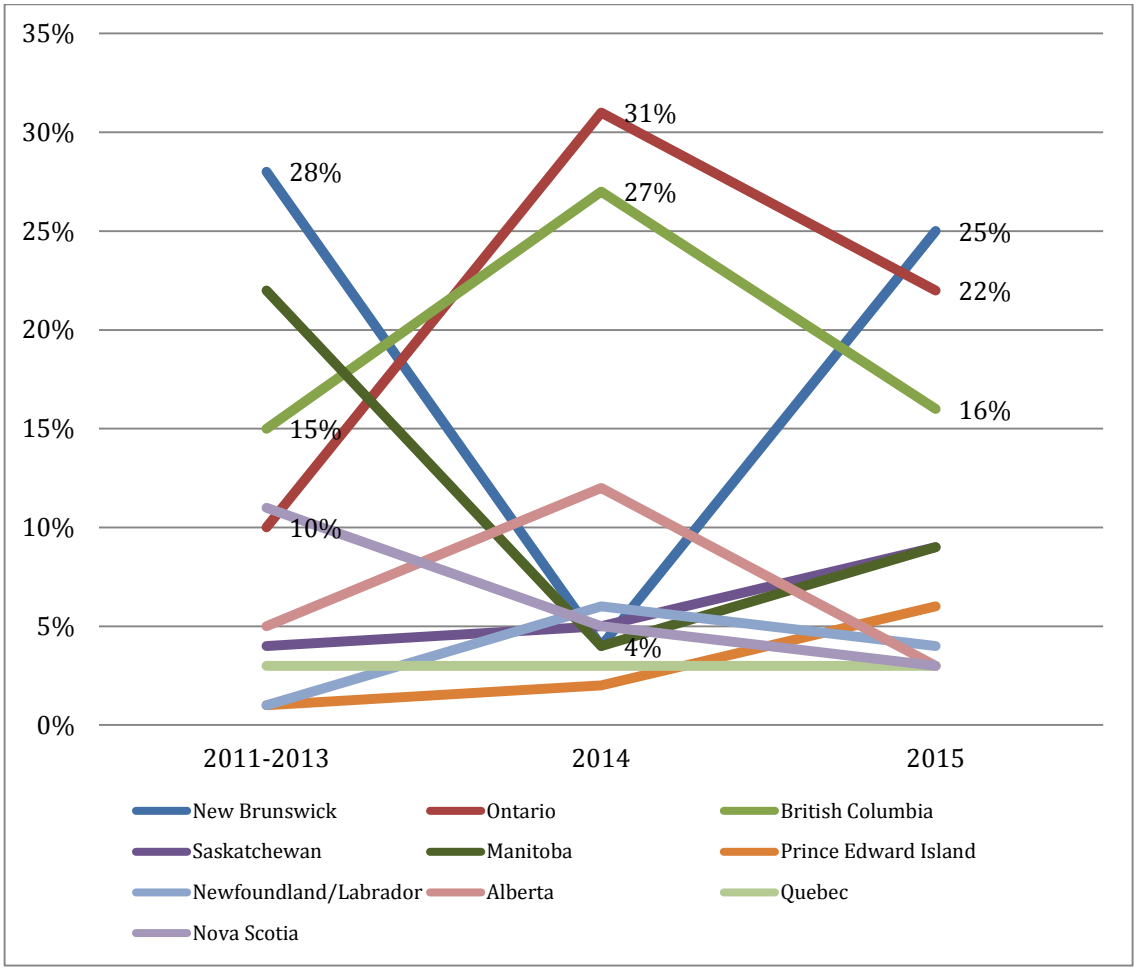
Insights taken from the OIR provide an understanding of the symptoms and eye-health issues members address each day. In particular, opportunities exist to address:

- The long-term health impacts associated with infrequent eye examinations and the discovery of advanced asymptomatic eye disease
- The problems associated with contact lenses and glasses purchased without the advice of an Optometrist
- The public healthcare costs associated with treating eye disease
- The economic value of regular eye exams, in addition to sight tests, in a patient's annual healthcare regime

Optometry Incident Report Form – *Member* Demographic Data

The Optometrists who responded to the OIR provide insight into the regions that contribute the most to their industry association.

FIGURE 1.1 MEMBER LOCATION



n=2,553, English and French responses, Optometry Incident Report 2011 – 2013;
n=326, English and French responses, Optometry Incident Report 2014
n=105, English and French responses, Optometry Incident Report 2015
Question: Please select the province in which you practice
Source: Optometry Incident Report Form

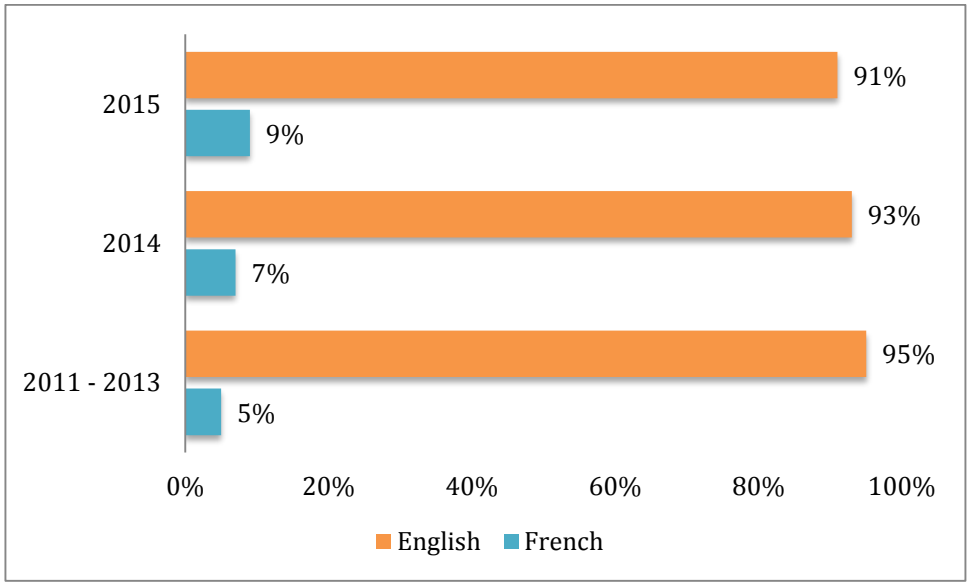
Regional response varied greatly between the 2011-2013 survey and the 2014 and 2015 iterations. Members from Ontario and British Columbia showed the most consistent rates of response; on average, 21% and 19% of responses came from members in these two provinces. Both provinces saw a dramatic increase in response rates in 2014, perhaps the result of regional membership campaigns to increase OIR submissions.

The most prevalent responders from 2011-2013, from New Brunswick and Manitoba, saw a dramatic decrease in response rates in 2014. This decrease suggests members were dis-incentivized to respond in 2014. A low overall response rate from other member provinces indicates a clear disconnect exists between regional members and the value of incident reporting.

Action:

Consider using regional incentives to encourage greater response rates.
This data should be compared to membership numbers.
Identify how this survey response compares to association membership, province by province.
Identify the obstacles that cause significant differences in regional reporting. What factors prevent members in Alberta and Quebec from reporting their findings?

FIGURE 1.2 LANGUAGE OF RESPONSE



n=2,553, English and French responses, Optometry Incident Report 2011 – 2013;
n=326, English and French responses, Optometry Incident Report 2014
n=105, English and French responses, Optometry Incident Report 2015
Question: Language of response
Source: Optometry Incident Report Form

On average, 93% of data collected from the OIR represents feedback from English language Optometrists. On average, 7% of respondents provided feedback in French.

Year-over-year, French language reporting has grown by 2% annually. The CAO should encourage French speaking members to report on their findings more frequently. An easy first step to encourage greater input from French-speaking members is to enable to the CAO website to default to the language of the

member's web browser. At the moment, members must change their preferred language in the CAO website's navigation bar.

Furthermore, the link to the French-language OIR buried in the middle of the left-hand menu in the member's site. In comparison, the English member site features the OIR link prominently as the second menu item. Burying this link may prevent French-speaking members from submitting incidents.

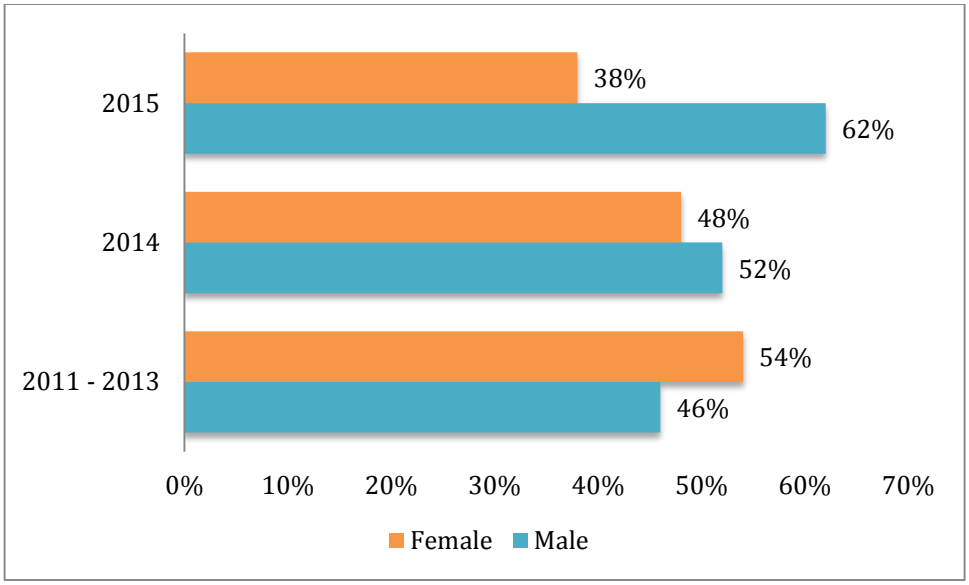
Action:

Present the French-language link in the same way as the English-language link. Change website settings so the default website language matches the website visitor's browser language.

Optometry Incident Report Form – *Patient* Demographic Data

From 2011-2013, 154 members did not respond about patient sex and age. In order to better understand patient demographics, the questions about patient sex and age required response in the 2014 and 2015 OIR.

FIGURE 1.3 PATIENT SEX

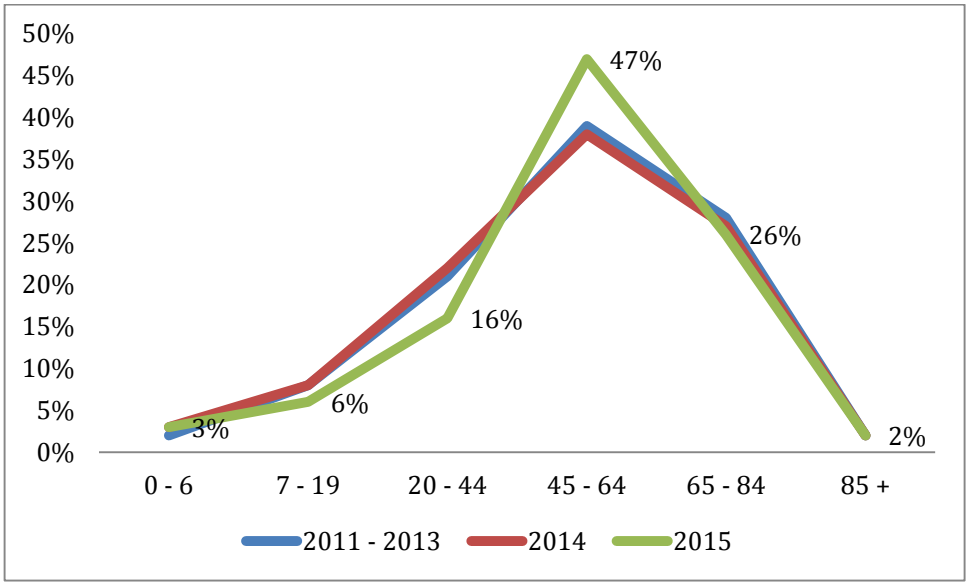


n=2,399, English and French responses, Optometry Incident Report 2011 – 2013;
n=326, English and French responses, Optometry Incident Report 2014
n=105, English and French responses, Optometry Incident Report 2015
Question: Patient sex
Source: Optometry Incident Report Form

Reported incidents demonstrated a relatively even split between women and men from 2011 – 2013 and 2014. While members reported on more male

patients in 2015, this data must be considered with caution given the small sample size and limited time frame in which the data was collected.

FIGURE 1.4 PATIENT AGE



n=2,399 English and French responses, Optometry Incident Report 2011 – 2013;
n=326, English and French responses, Optometry Incident Report 2014
n=105, English and French responses, Optometry Incident Report 2015
Question: Patient age
Source: Optometry Incident Report Form

Year-over-year, 70% of reported incidents occurred in patients over the age of 45. For the most part, Optometrist-reported incidents spike for those patients aged45 – 64.

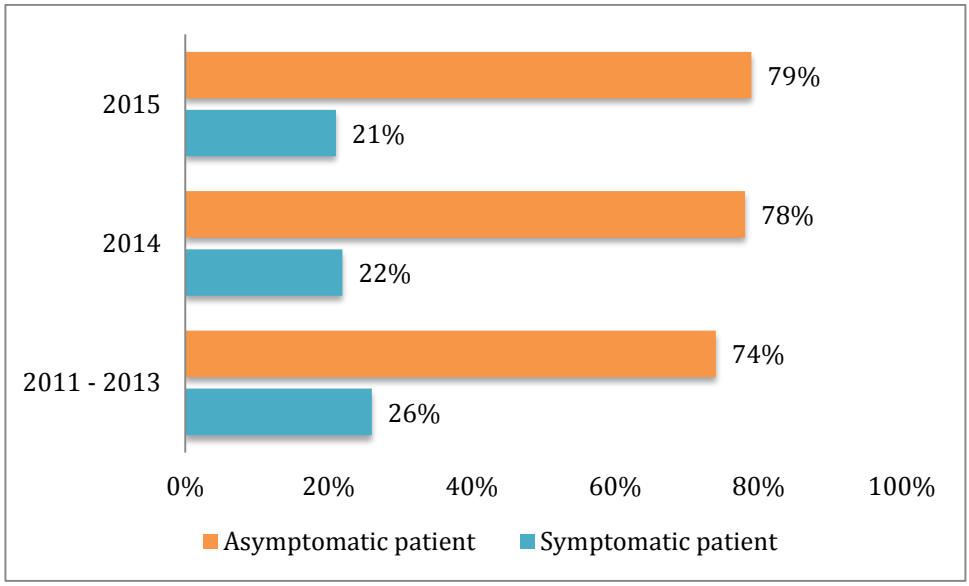
Action:

To learn more about the symptoms and conditions facing specific demographic groups, validate these analyses using Health Canada data.

Optometry Incident Report Form – Incident Data

Data disclosed in the Optometry Incident Report indicates that in 77% of the cases reported, the patient did not present with symptoms related to the underlying condition or diagnosis.

FIGURE 1.5 REPORTED INCIDENTS



n=2,553 English and French responses, Optometry Incident Report 2011 – 2013;
n=326, English and French responses, Optometry Incident Report 2014
n=105, English and French responses, Optometry Incident Report 2015
Question: Select the reason for the patient's visit
Source: Optometry Incident Report Form

Action:

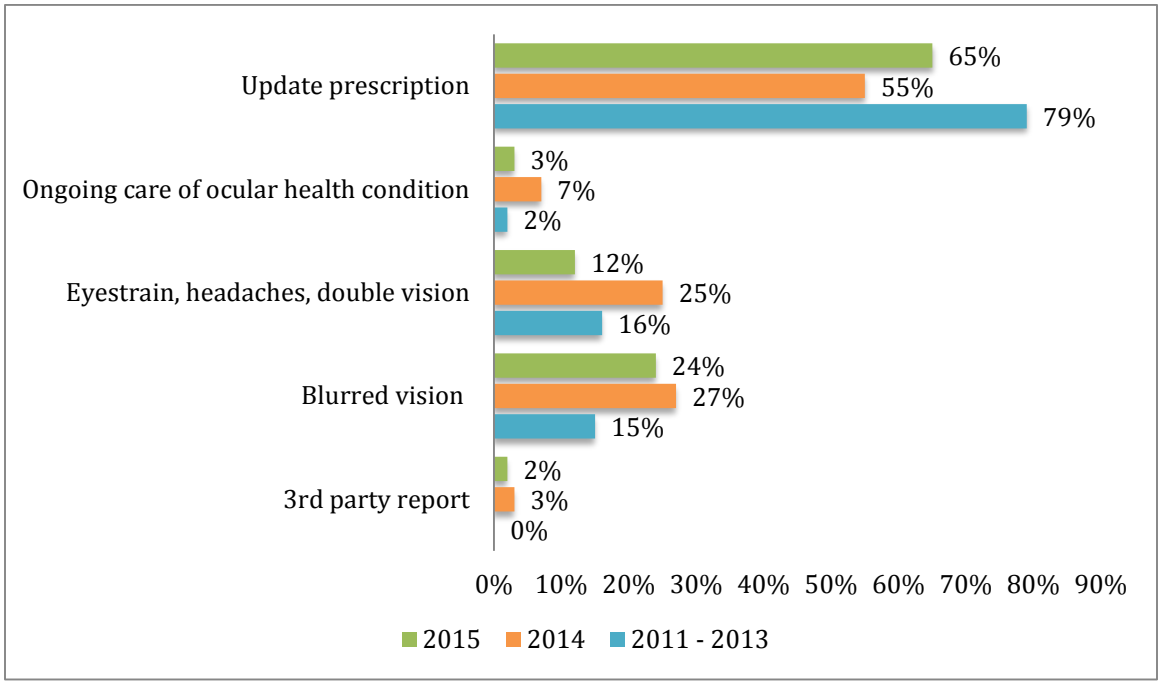
Conduct an analysis to understand the national and provincial economic impacts of asymptomatic eye disease.

Make an effort to understand the value of regular eye exams and sight tests to a patient's overall healthcare costs, and the impact of eye disease on medical caseload and national healthcare costs.

The most frequent reasons for visiting an Optometrist, according to the OIR, include updating a prescription (~66% of patients), blurred vision (~22% of patients) and eyestrain, headaches, double vision (~18% of patients).

This data suggests that the majority of patients wait until their vision is disturbed prior to considering an eye exam. While these patients defer optometric care, their ocular health may be deteriorating as a result of an unknown eye condition.

FIGURE 1.6 REASON FOR PATIENT VISIT



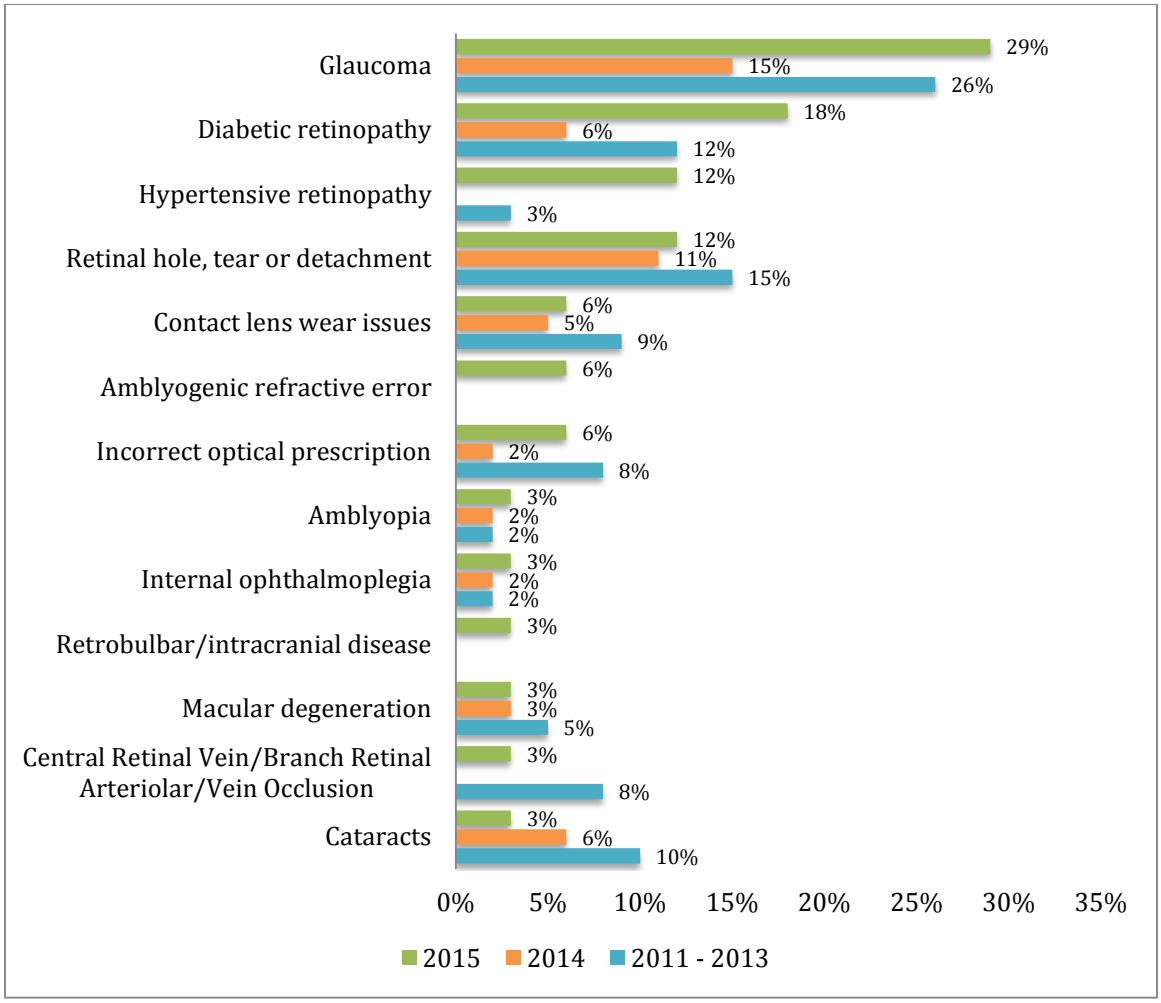
n=2,553 English and French responses, Optometry Incident Report 2011 – 2013;
n=326, English and French responses, Optometry Incident Report 2014
n=105, English and French responses, Optometry Incident Report 2015
Question: Reason for Patient's Visit (Check all that apply)
Source: Optometry Incident Report Form

Action:

Conduct an analysis of the ocular health conditions that lead to overall health care problems or result in the patient seeking medical advice within the public healthcare system.

Throughout Canada, CAO members are consistently reporting glaucoma, retinopathy and retinal holes/tears/detachments as the ocular and systemic issues facing their patients most frequently. On average, from 2011 – 2015, the most frequently reported incidents included 23% of patients presenting with glaucoma-related conditions and 8% of incidents were related to retinal holes, tears of detachment. Two forms of retinopathy were also frequently reported; 12% of incidents were related to diabetic retinopathy while 8% of incidents were related to hypertensive retinopathy.

FIGURE 1.7 OCULAR/SYSTEMIC CONDITIONS DISCOVERED – 2011 TO 2015



n=2,553 English and French responses, Optometry Incident Report 2011 – 2013;
n=326, English and French responses, Optometry Incident Report 2014
n=105, English and French responses, Optometry Incident Report 2015
Question: The reported incident relates to the following conditions
Source: Optometry Incident Report Form

Each year, Optometrists reported additional conditions in smaller quantities, such as:

- Ocular tumours and malignancies;
- Keratitis;
- Uveitis;
- Papilledema;
- Conjunctivitis;
- Neurological conditions; and
- Eye injury or trauma

With limited data for 2014 and 2015, this report presents the most commonly reported optometric issues. Over time, the OIR survey will provide trendable data about specific eye health issues.

Action:
Decide on the level of granularity on which the CAO would like to report on findings from patient examinations. Analysis of conditions selected from a list ensures greater data integrity than analysis of an 'other' field where members manually type an issue. An inclusive and extensive list of conditions allows for a more thorough analysis to be conducted on the most commonly faced ocular/systemic conditions faced by CAO members.

In addition to the incident data submitted for the question "The reported incident relates to the following conditions", some members provided written statements on their findings using the 'other' field. Shown below, these 'other' conditions were grouped by healthcare impacts.

FIGURE 1.8 OCULAR/SYSTEMIC CONDITIONS 2015 REPORTED IN 'OTHER' FIELD

Ocular/systemic conditions	Treatable ocular conditions; could cause permanent, irreversible vision loss	Conditions indicative of underlying systemic issues/disease	Conditions indicative of a potentially life threatening issue
Angioid streaks detected in eye	√	√	
Anterior uveitis; misdiagnosed as ocular infection by an MD	√	√	
Arcus OU		√	
BRVO	√	√	
BRVO and BRAO OD	√	√	√
Choroidal nevus	√	√	
Glaucoma (high-risk angle closure)	√		
Herpes simplex keratitis	√		
Horse shoe tear	√		
Intra retinal heams		√	
Lattice degeneration with holes	√		
Macular edema causing metamorphopsia	√		
Myesthenia Gravis		√	√
Narrow angles that may lead to glaucoma	√		
Narrow anterior chamber angles	√		
Narrow anterior chamber angles that required LPI	√		
Neovascularization of sectoral region of the retina	√	√	
NTG	√		
Occludable anterior chamber angles	√		
Parafoveal hemorrhages and macular edema OS	√	√	
Paediatric cataracts	√		
Poorly treated hypertension/diabetes	√	√	√
Retinal detachment; caused by choroidal melanoma	√	√	√
Retinal hole	√		
Retinal hole - retina required prophylactic laser reinforcement	√		
Retinal hole, lattice	√		
Retinal holes located nasal to the ONH	√		
Retinal tear	√		
Retinal tear; referred for urgent argon laser retinopexy	√		
Retinal vein occlusion (branch)	√	√	
Retinal vein occlusion (central)	√	√	

Right optic atrophy, possible left ischemic optic neuropathy with decrease in vision (finger counting)	√		√
Systemic disease (stroke, MI etc...)		√	√
Toxoplasmosis scar with an associated visual field defect	√	√	
Vitreomacular traction	√		

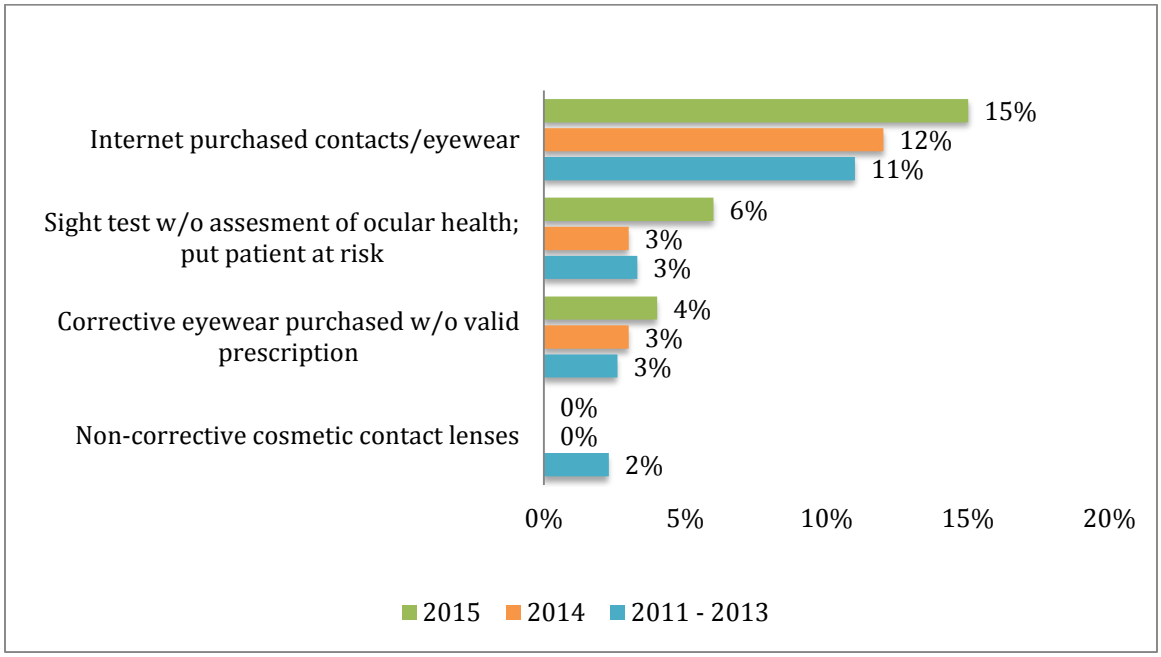
n=105, English and French responses, Optometry Incident Report 2015
Question: The reported incident relates to the following conditions – OTHER response
Source: Optometry Incident Report Form

Action:

Use the healthcare impact categories (the column headings used above) to understand the severity of patient conditions. Append a follow-up question to "The reported incident relates to the following conditions" to include these three fields for all selected conditions. (See proposed questions in Appendix A)
Limit 'other' field to special findings and circumstances. All ocular conditions should be reported in the inclusive list to ensure data can be trended year-over-year.

Many reported incidents are based on glasses or lenses purchased from the Internet, sometimes without a prescription. From 2011 – 2015, an average of 13% of incidents were based on contact lenses and glasses that were purchased from the Internet. Incidents range from prescription contact lenses purchased with the wrong base curve or diameter to poorly fitting glasses. In 3% of incidents, corrective eyewear was purchased without a valid prescription, either online or from a retail eyewear distributor.

FIGURE 1.9 INCIDENT RELATES TO...



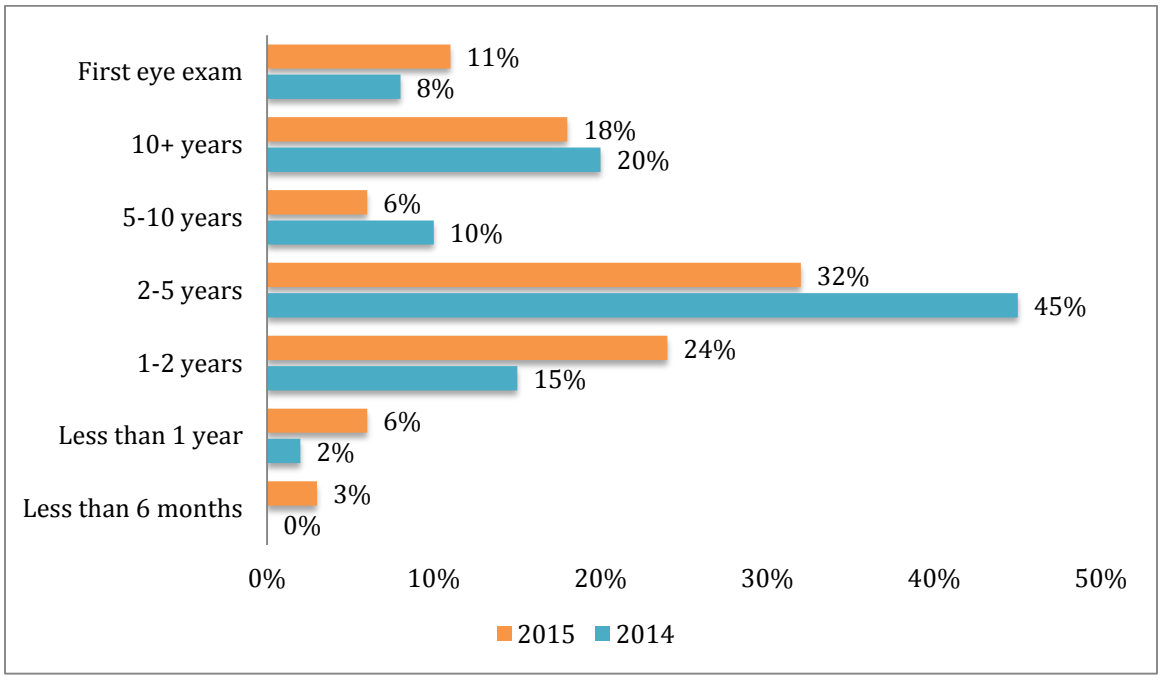
n=2,553 English and French responses, Optometry Incident Report 2011 – 2013;
n=326, English and French responses, Optometry Incident Report 2014
n=105, English and French responses, Optometry Incident Report 2015
Question: The reported incident relates to
Source: Optometry Incident Report Form

Action:

Create and run public awareness campaigns about the 'choose your own adventure' risks of ordering corrective lenses online.
Add a specific survey question about online purchases and the issues encountered. Online issues should not be mixed with eye health issues; while eye health may be compromised by an online purchase, the condition caused should be identified – not the source of the purchase.

Given that the majority of the cases reported patients exhibit asymptomatic eye disease, early detection is crucial to treatment. However, 27% of patients wait more than 5 years between comprehensive eye examinations. An additional 39% of patients wait between 2 and 5 years between examinations. Together, these segments represent a significant portion of the population who are not aware of their eye health. Frequent eye examinations can identify issues before they become a significant burden to patients and the public healthcare system. Data relating to the frequency of patient visits should be used to garner support from national and regional healthcare organizations on the matter of eye examinations.

FIGURE 1.10 LENGTH OF TIME SINCE PATIENT'S LAST EYE EXAMINATION



n=326, English and French responses, Optometry Incident Report 2014
n=105, English and French responses, Optometry Incident Report 2015
Question: Length of time since patient's last eye examination

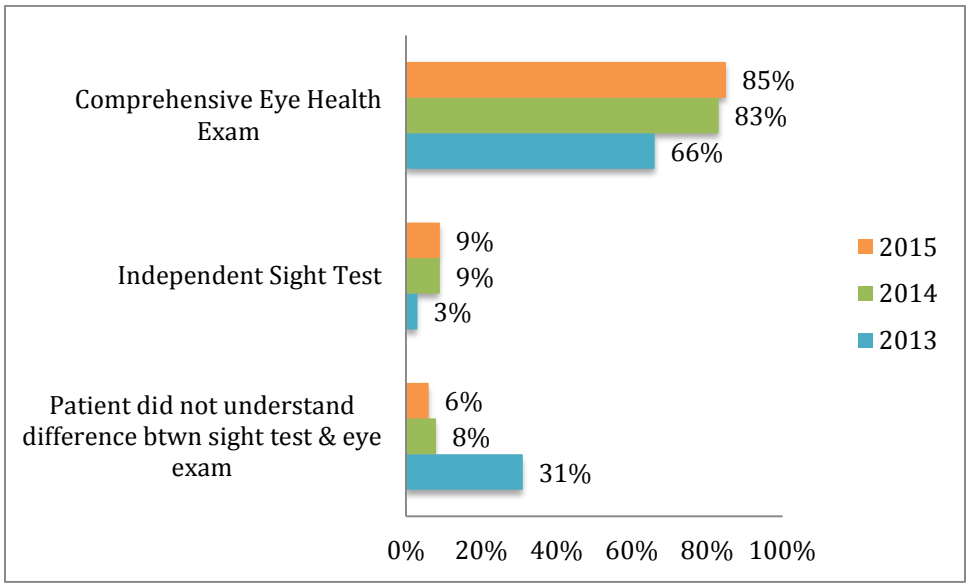
Source: Optometry Incident Report Form

Action:

Run education campaigns based on the Frequency of Eye Examination Guidelines to advise the public on the risks of waiting too long between eye exams.

According to the OIR data, many patients do not know the difference between a sight test and an eye exam. Data from 2011 – 2013 indicates that 31% of patients did not understand the difference between a sight test and a comprehensive eye examination. As such, an average of 4% of incidents were based on patients receiving eye tests without a full assessment of ocular health – putting the patient's eye health at risk.

FIGURE 1.11 TYPE OF ASSESSMENT CONDUCTED



n=326, English and French responses, Optometry Incident Report 2014
n=105, English and French responses, Optometry Incident Report 2015
Question: The Patient's Last Eye Examination was…
Source: Optometry Incident Report Form

Action:

Run awareness campaigns to advise the public on the difference between sight tests and eye examinations. Include information about how an eye examination can help understand overall health.

Help the public to understand the unique services provided by an Optometrist – especially those unavailable through retail optical vendors.

Optometrist Findings

From October 2011 – June 2015, 2,983 Canadian Association of Optometrist members provided detail of their patient findings via the Optometry Incident Report. Details of these incidents included patient age, specific ailments, time since last examination and more.

Over the 4 years of collecting OIR data, 77% of patients reported to the OIR visited an Optometrist as asymptomatic patients. On average, 66% of these patients booked an appointment with an Optometrist to update a prescription – not to address a specific ocular condition.

Given the high number of patients who exhibit asymptomatic eye disease, early detection is crucial to treatment. However, 27% of patients wait more than 5 years between comprehensive eye examinations. An additional 39% of patients wait between 2 and 5 years between examinations. Together, these segments represent a significant portion of the population who are not aware of their eye health. Data relating to the frequency of patient visits should be used to garner support from national and regional healthcare organizations on the matter of eye examinations.

Appendix A

Proposed Changes to Existing OIR Survey

Based on the recommendations made above, a series of proposed changes are recommended for the OIR. Those questions proposed for introduction are numbered 7, *8, 9.a, 9.b.,* and *9.c*. These questions are highlighted in blue.

Detailed instruction is provided within the highlighted section to explain the use of the proposed question.

CAO 2015 Incident Reporting

1. The incident reported relates to:
Answer Options
Asymptomatic findings indicative of ocular or systemic disease
Incorrect or unsafe glasses or contact lenses dispensed via the internet
Glasses or contact lenses dispensed via the internet from an invalid, expired or modified prescription
Incorrect prescription generated by stand alone sight test
Stand alone sight test performed for provision of optical appliance when the omission of an ocular health assessment put the patient at risk

2. Patient Gender
Answer Options
Male
Female

3. Patient Age in years
Answer Options
0-4
5-9
10-19
20-44
45-64

65+

4. Length of Time Since Patient's Last Examination
Answer Options
Less than 6 months
Less than 1 year
1-2 years
2-5 years
5-10 years
10+ years
This was the patient's first eye examination

5. The Patient's Last Examination was a:
Answer Options
Comprehensive Eye Health Examination by Optometrist or Ophthalmologist
Independent Sight Test
Patient did not know as he/she was unable to differentiate between a sight test and comprehensive ocular health examination

6. Select the Reason(s) for the Patient's Visit (check all that apply)
Answer Options
Patient presented for updated prescription prior to purchasing new eyewear
Asymptomatic patient presenting for regular eye health examination
Blurred vision correctable by an updated refractive correction
Ongoing care of a previously diagnosed ocular health condition
Asthenopia/eyestrain, headaches, double vision
Completion of visual report for 3rd party (MOT, RCMP, Military, Aviation etc)
Symptomatic ocular disease with diagnosis delayed due to patient first undergoing a sight test instead of a timely comprehensive eye health examination

Other (please specify)

7. Ocular/systemic conditions or other issues discovered at this visit
Answer Options
Retinal hemorrhage, neovascularization, traction, tumour, hole, tear or detachment
Diabetic retinopathy
Hypertensive retinopathy
Retinopathy associated with other systemic disease such as histoplasmosis, toxoplasmosis, Gardner Syndrome, pseudoxanthoma elasticum etc.
Central or Branch Retinal Arteriolar/Vein Occlusion
Arteriolar embolus
Infection or occlusion of the nasolacrimal system
Dry Eye Syndrome, Sjorgen's Syndrome or other tear film disorders
Any form or combination of blepharitis, conjunctivitis, keratitis or episcleritis
Glaucoma, high suspicion of glaucoma, or presence of significant risk factors including occludable angles, pseudoexfoliation syndrome, pigment dispersion syndrome
Cataract
Macular Degeneration
Optic atrophy or neuropathy
Anterior or Posterior Uveitis
Lesions of the eye and adnexa requiring excision or oncological assessment
Visual field loss suggestive of retrobulbar/intracranial disease
Abnormalities in function/balance of the extraocular muscles
Abnormalities in function of the facial muscles such as Bell's Palsy, myasthenia gravis
Internal ophthalmoplegia

8. Severity of ocular/systemic conditions discovered at this visit	Treatable ocular conditions; could cause permanent, irreversible vision loss	Conditions indicative of underlying systemic issues/disease	Conditions indicative of a potentially life threatening issue
Specific conditions displayed based on response to Question 7 (above); Respondent checks all boxes re severity that apply			
Retinal hole, tear or detachment			
Diabetic retinopathy			
Refractive change induced by elevated blood glucose levels			
Hypertensive retinopathy			
Central Retinal Vein or Branch Retinal Arteriolar/Vein Occlusion			
Arteriolar embolus			
Glaucoma, high suspicion of glaucoma, or presence of significant risk factors including occludable angles, pseudoexfoliation syndrome, pigment dispersion syndrome			
Cataract			
Macular Degeneration			
Lesions of the eye and adnexa requiring excision or oncological assessment			
Visual field loss suggestive of retrobulbar/intracranial disease			
Abnormalities in function/balance of the extraocular or facial muscles			
Internal ophthalmoplegia			
Amblyopia			
Amblyogenic refractive error			
The patient was wearing an inappropriate refractive correction based on the findings of the sight test			
The patient received an improperly filled prescription from an on-line retailer			
The patient received glasses that do not meet Canadian Safety Standards from an on-line retailer			
Other (please specify)			

9.a. Corrective lens(es) used by patient (select all that apply)	Patient experienced complications	No complications
Prescription eyeglasses		
Over-the-counter eyeglasses		
Contact lenses		
Plano/cosmetic contact lenses		

9.b.Indicate what complications patient experienced
If box in question 9.a. 'Patient experienced complications' was checked, respondent is shown this question. If respondent checks 'No complications', they pass to question 9.c.
Incorrect or poor fit
Incorrect wearing regimen
Contact lense wear complications
Improper handling
Lense did not match prescription

9.c. Identify the channel through which patient acquired their corrective lenses(select all that apply)
Online
Non-optical store
Optical store
Other

10. Please select the province in which you practice
Answer Options
British Columbia
Alberta
Saskatchewan
Manitoba
Ontario
Quebec
New Brunswick
Nova Scotia
Prince Edward Island
Newfoundland/Labrador
Yukon
Northwest Territories

Nunavut

11. Optometrist Information
Answer Options
Name:
City/Town:

12. Case Number Enter a reference name or number for this case by which you will be able to retrieve your patient clinical record at a later date. The assigned name should not disclose the name or personal information about the patient.
Answer Options
Case Reference:
Date of the visit: