Barriers to eye care among participants of a mobile eye clinic

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Presenter Disclosures

Authors have no relationships to disclose

Acknowledgements

Supported by grant P30 EY010572 from the National Institutes of Health (Bethesda, MD), and by unrestricted departmental funding from Research to Prevent Blindness (New York, NY).

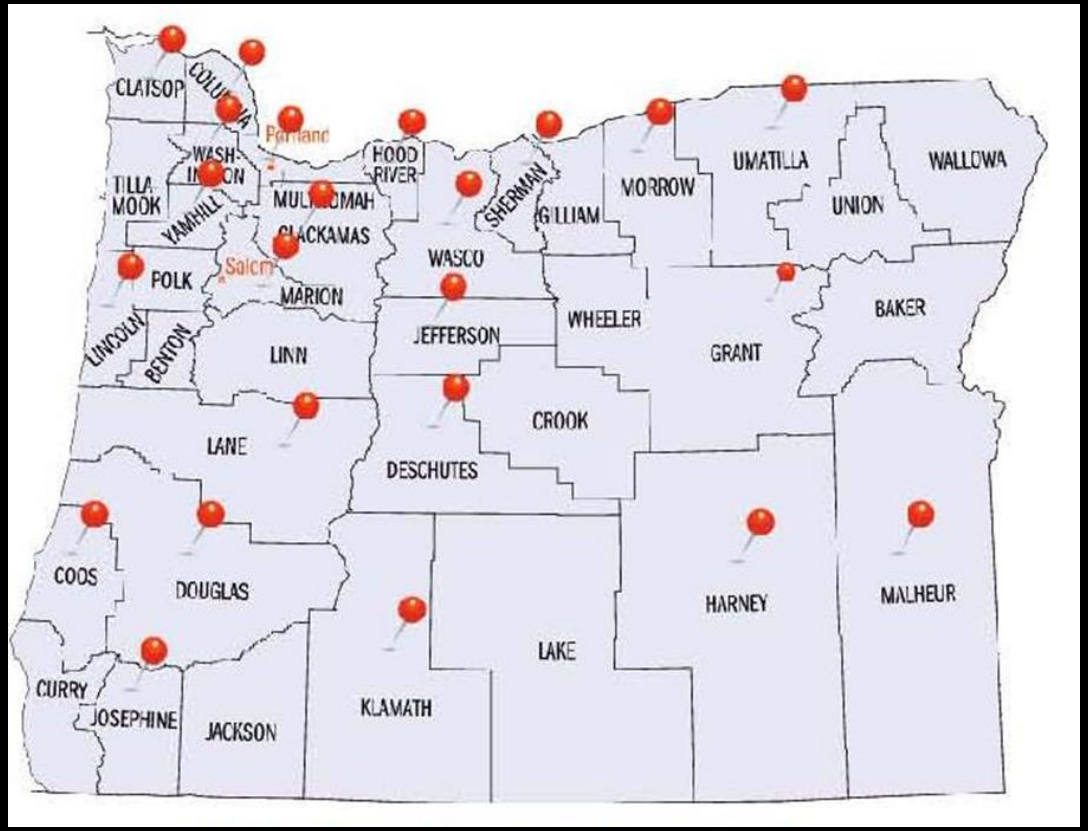
The impact of visual impairment

- Chronic visual conditions accounted for ~$139 billion of national costs in 2013
- Visual impairment can lead to life dissatisfaction, disability, and decreased physical activity
- Between 10.7% to 32.1% of visually impaired individuals are depressed

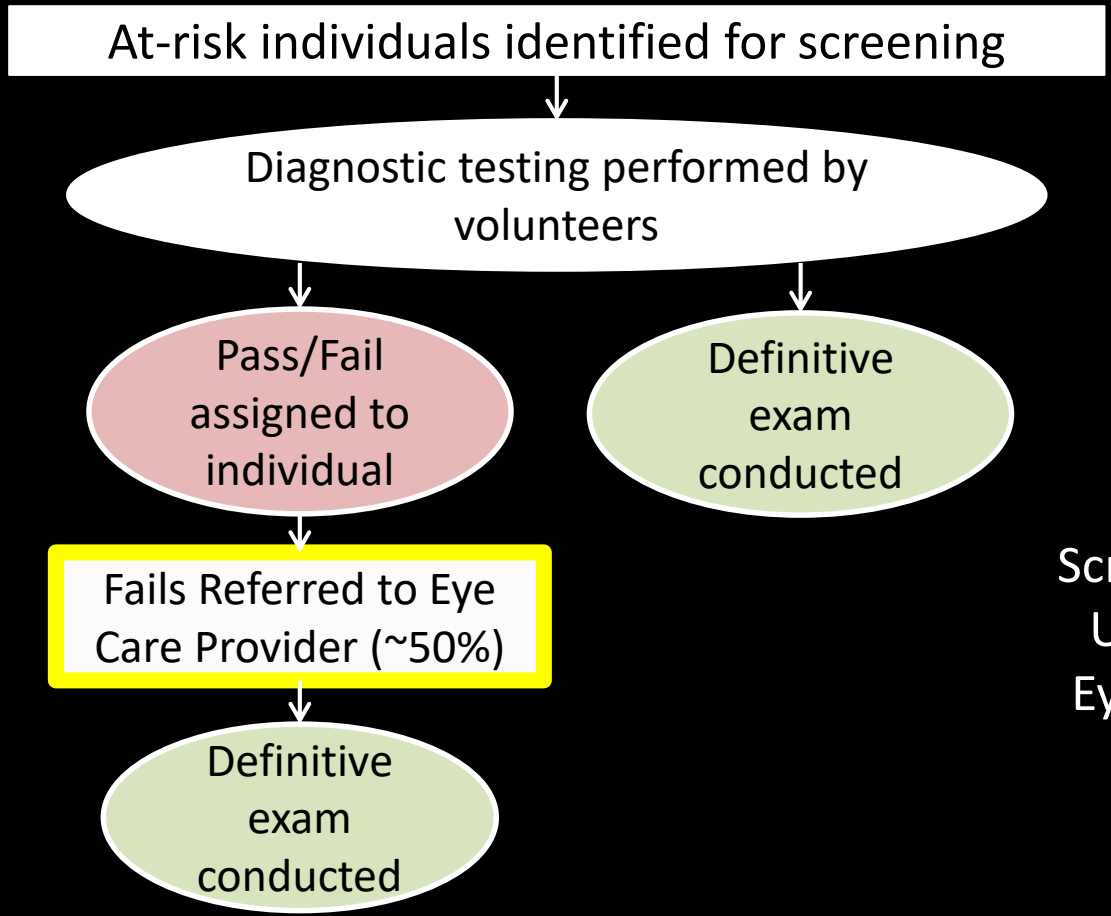
The Casey Eye Institute Outreach (CEIO) Program

- Volunteer-run mobile clinic that provides screening and on-site comprehensive eye exams for adults in Oregon
- *Partner agencies*: FQHC, medical and social service agencies, health and wellness centers

CEIO Program Counties Served



Eye Health Screening Programs



Traditional Eye Health Screening Program

CEI Program Eye Health Screening Program Utilizing On-site Eye Care Provider

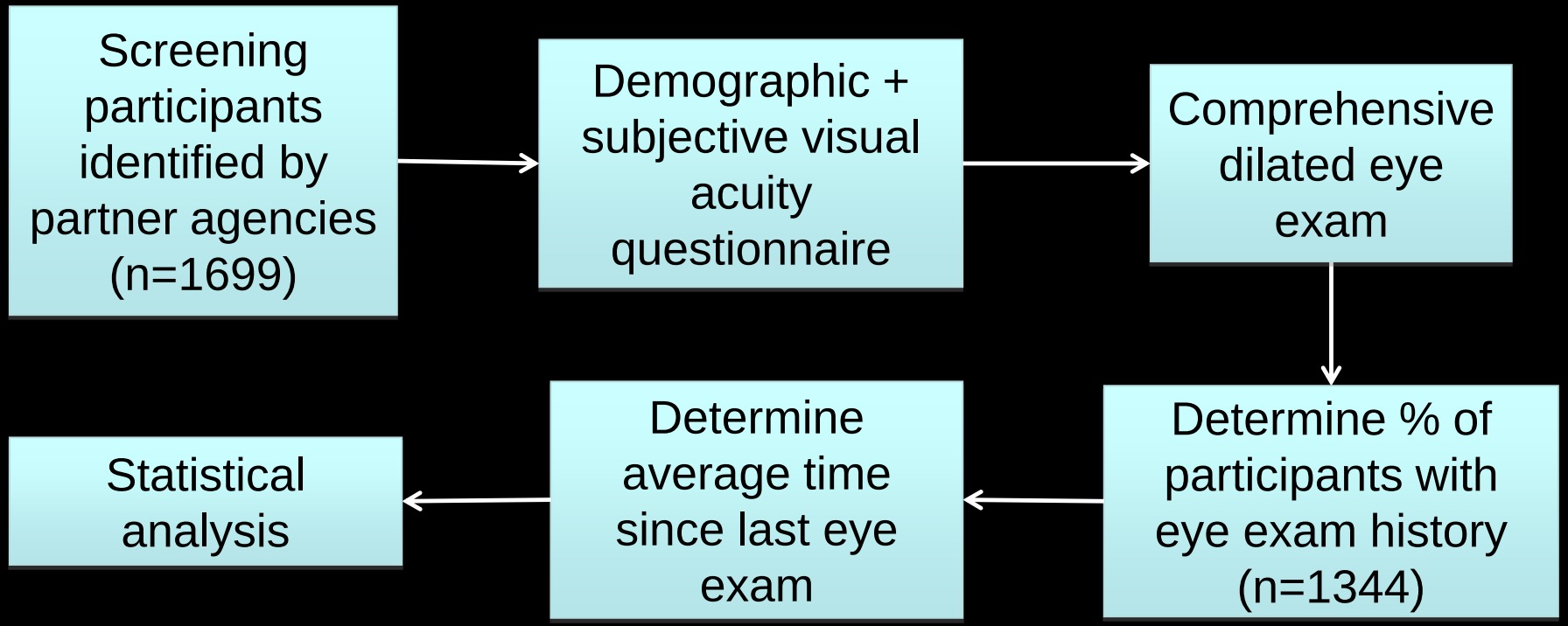
Background

- Rural northeastern US data (2011-2014): TLEE was an average of 7.1 years prior to screening
- Ohio data (2009-2011): 39% last received a dilated eye exam 10+ years prior
- *Possible barriers*: race/ethnicity, gender, health insurance coverage, history of diabetes, subjective/measured visual acuity

Question

What are potential initial barriers to seeking eye care based on quantitative data (time since last eye exam (TLEE)?

Methods



Exclusion criteria: Screenings prior to 10/08/14, under 18 yo, pregnant, repeat participants

Statistical Analysis

- Predictor Variables: Race/ethnicity, Insurance, Location, Diabetic History etc.
  - Categorical Variables
- Outcome Variable (1): Having eye exam history(yes/no)
  - Initial bivariate analysis: Chi-Square Test
  - Further analysis: Logistic Regression Modeling (controlling for age)
- Outcome Variable (2): TLEE
  - Right-Skewed data → Log-transformation
  - Linear Regression Modeling (controlling for age)
- $p < 0.05$ was considered statistically significant

American Academy of Ophthalmology (AAO) Recommendations

Group	Preventive eye exam frequency (y)
40-54 yo	2-4
55-64 yo	1-3
65+ yo	1-2
Diabetics	≤1

Notable Results

Race/ethnicity assoc. with having eye exam history

	History of Eye Exam (N=1344)		No History of Eye Exam (N=261)		p
	n	%	n	%	
Race/Ethnicity					<0.0001
Caucasian	505	96.4	19	3.6	
Hispanic	349	65.1	187	34.9	
AI/AN	231	98.3	4	1.7	
Black	39	86.7	6	13.3	
Asian	70	86.4	11	13.6	
Multiethnic/Other	97	77.0	29	23.0	
Unknown/Unreported	53	N/A	5	N/A	

Compared to Caucasians, the age-controlled OR for Hispanic participants having eye exam history is 0.08 (95% CI [0.05, 0.14]).

Insurance assoc. with having eye exam history

	History of Eye Exam (N=1344)		No History of Eye Exam (N=261)		p
	n	%	n	%	
Health Insurance					<0.0001
None	434	71.4	174	28.6	
Public	593	94.1	37	5.9	
Private	88	91.7	8	8.3	
Unknown/Unreported*	229	N/A	42	N/A	

Compared to the uninsured, the age-controlled OR for participants with:

- *public insurance having eye exam history is* 5.14 *(95% CI* [3.50, 7.53]*)*
- *private insurance having eye exam history is* 4.12 (*95% CI* [1.94, 8.75])

Large percentage of Caucasians had a longer TLEE

	Years since Last Eye Exam						*Ln(Years Since Last Eye Exam)*	
	(0,1] %	(1,2] %	(2,3] %	(3,4] %	(4,10] %	10+ %	Mean ± Std Dev	P Value (Age adjusted)
Race/Ethnicity								**<0.0001**
Caucasian	19.6	19.8	11.9	8.5	26.7	13.5	1.21 ± 1.09	Ref
Hispanic	28.1	20.9	17.5	8.0	19.8	5.7	0.87 ± 1.09	<.0001
AI/AN	45.0	22.5	10.4	5.6	12.6	3.9	0.45 ± 1.16	<.0001
Black	48.7	18.0	7.7	5.1	12.8	7.7	0.57 ± 1.21	0.0056
Asian	45.7	17.1	7.1	7.1	21.4	1.4	0.43 ± 1.29	<.0001
Multiethnic/Other	43.3	17.5	10.3	6.2	13.4	9.3	0.65 ± 1.36	<.0001

Less than 50% of participants with diabetes had eye exams within the past year

	Years since Last Eye Exam						*Ln(Years Since Last Eye Exam)*	
	(0,1] %	(1,2] %	(2,3] %	(3,4] %	(4,10] %	10+ %	Mean ± Std Dev	P Value (Age adjusted)
History of Diabetes (y)								*<0.0001*
None	25.0	20.4	12.4	7.8	24.6	9.9	9.9	1.01 ± 1.18
Yes [1-5]	46.9	19.6	8.4	6.3	14.0	4.9	4.9	0.63 ± 0.99
Yes 5+	43.5	20.8	13.4	7.4	11.1	3.7	3.7	0.47 ± 1.18

Compared to participants w/o diabetes, the age-controlled OR for participants with:

- *1-5y of diabetes diagnosis having eye exam history is* 1.17 *(95% CI* [0.74, 1.86]*)*
- *5+ y of diabetes diagnosis having eye exam history is* 1.99 *(95% CI* [1.20, 3.31]*)*

Other results

- No significant association between subjective or measured visual acuity, having eye exam history, and TLEE
- No significant association between location, having eye exam history, and TLEE

Next steps

- Improving eye care access for Hispanics
- Integrating TLEE as a variable for future eye care disparity research
  - Caucasians
  - Individuals with diabetes

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Questions?