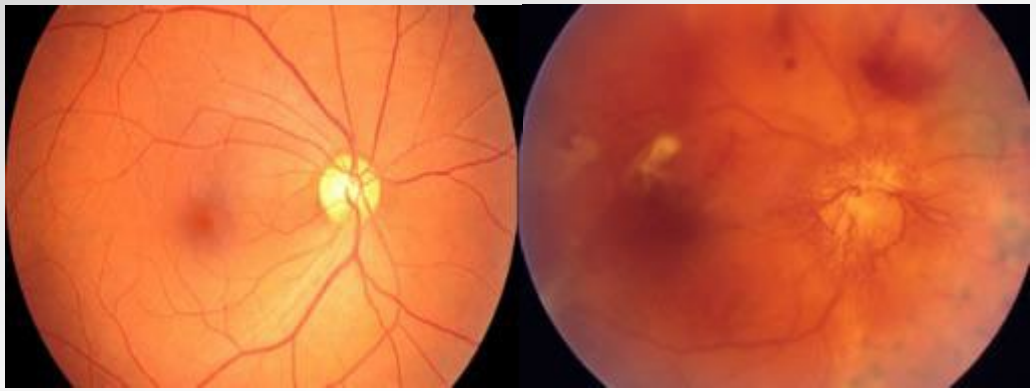
Opportunities to Increase Access to Vision Testing in Underserved Communities



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October 30th, 2024

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- Univ. of WI Baldwin Wisconsin Idea Endowment Grant
- Research to Prevent Blindness

- No relevant conflicts of interest

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Agenda

Background on Leading Causes of Low Vision

Factors Influencing Diabetic Eye Screening in Underserved Communities

Telemedicine-based Diabetic Eye Screening in Primary Care Clinics

Challenges and Opportunities

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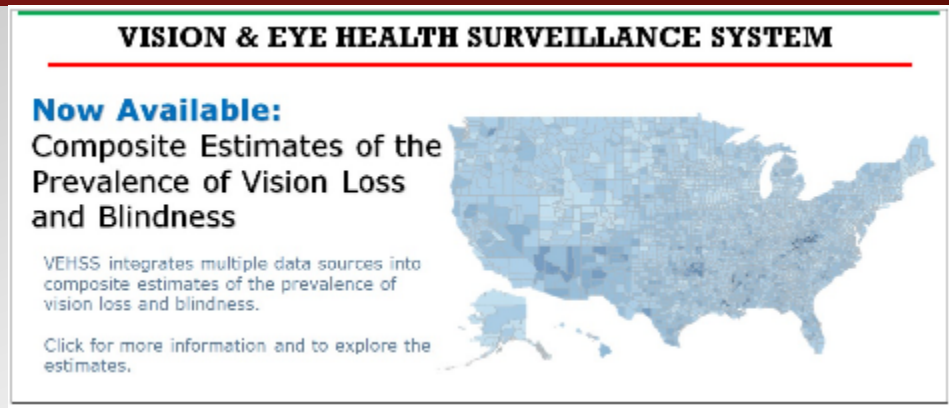
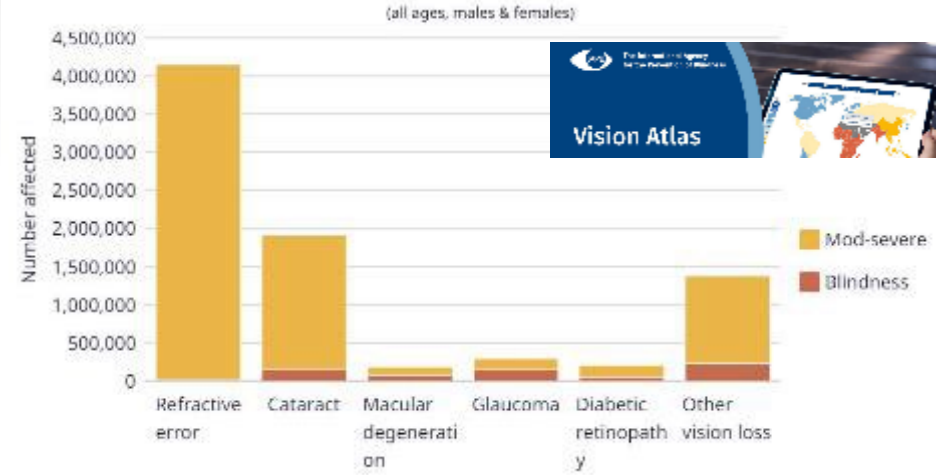
Leading Causes of Blindness and Low Vision

- WHO definitions
  - Blindness (worse than 20/400)
  - Low vision (worse than 20/40)
- Annual cost: $130 billion
- Uncorrected refractive error
- Cataract
- Glaucoma
- Diabetic retinopathy
- Age-related macular degeneration



Causes of Vision Loss in North America (2020)



https://www.cdc.gov/vision-health/php/data-research/index.html#
https://www.cdc.gov/visionhealth/vehss/index.html
https://www.iapb.org/learn/vision-atlas/

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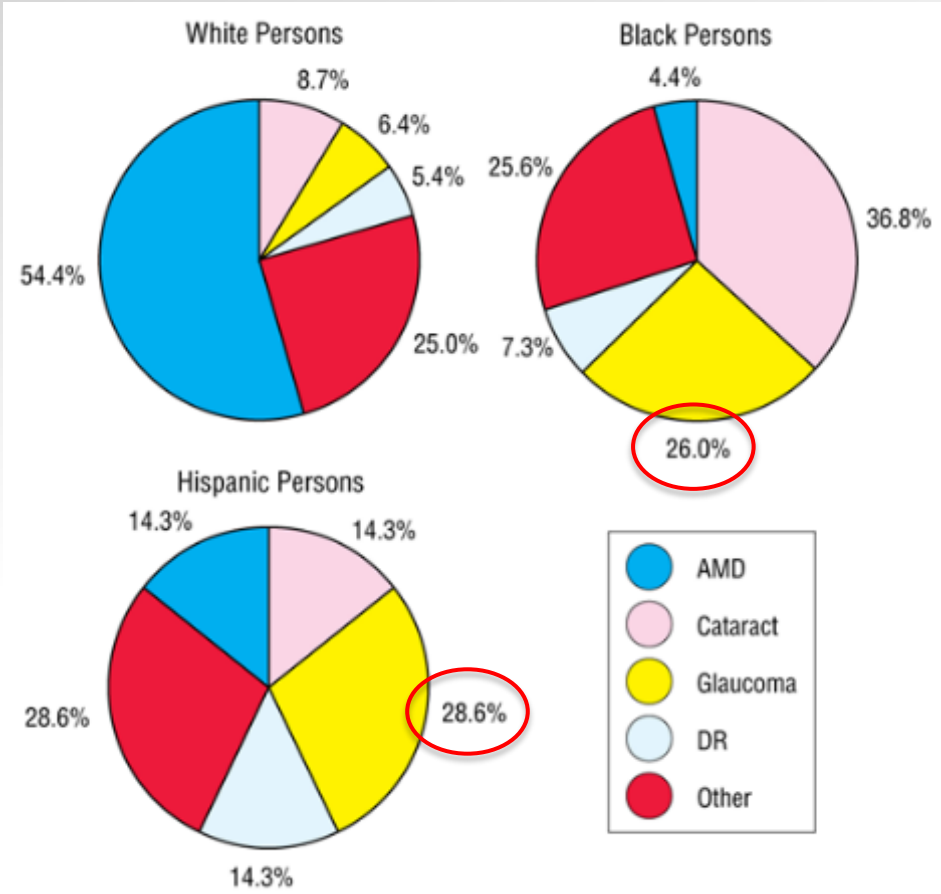
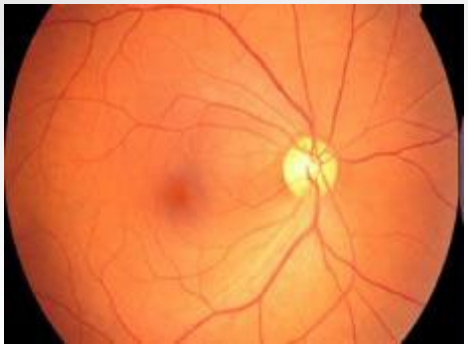
Causes of Blindness by Race and Ethnicity (2004)



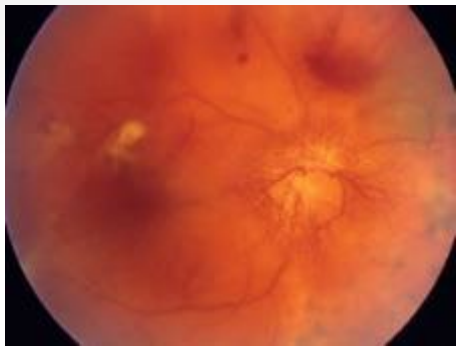
Congdon N, et al. *Arch Ophthalmol.* 2004
https://www.cdc.gov/visionhealth/vehss/index.html
https://www.iapb.org/learn/vision-atlas/

Diabetic Retinopathy

- Diabetes is the leading cause of blindness among working-age U.S. adults
- Early detection and treatment of diabetic eye disease can prevent severe vision loss by 90%
- Only half or fewer of U.S. adults with diabetes receive guideline-concordant yearly eye screening



Normal



Diabetic Eye Disease

Early photocoagulation for diabetic retinopathy: ETDRS report number 9. *Ophthalmology.* 1991;
Maclennan PA, et al. *JAMA Ophthalmol.* 2014;

Diabetic Retinopathy

- Rural communities and urban communities of color have a greater burden of diabetes, more severe retinopathy, less access to eye care
- Black Americans are twice as likely to develop blindness as non-Hispanic whites and 50% more likely to develop diabetic eye disease
- Latinos have the highest rates of visual impairment and blindness of any group in the U.S.

Sommer A, et al. *NEJM.* 1991; Hale NL, et al. *Journal of community health.* 2010; https://www.nei.nih.gov/sites/default/files/2019-06/african-americans-diabetes-can-prevent-vision-loss.pdf
https://www.cdc.gov/diabetes/library/features/hispanic-diabetes.html

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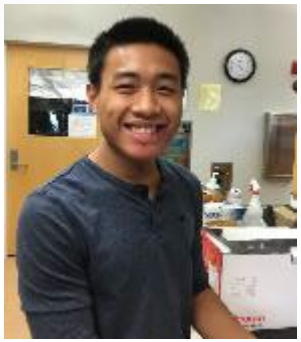
Factors Influencing Diabetic Eye Screening

- Interviewed 60 patients with diabetes (Rural White, Urban Latinx, and Urban Black); 20 clinic staff
- 1 rural health clinic and 2 urban federally qualified health centers
  - What makes it hard? What makes it easier?

Rebecca Swearingen

Christiana Fowlkes



Johnson Hoang

Christian Pelayo

Liu Y, et al. PLoS One. 2018
Pelayo C, et al. Transl Vis Sci Technol. 2023

What Makes It Hard to Get Diabetic Eye Screening?

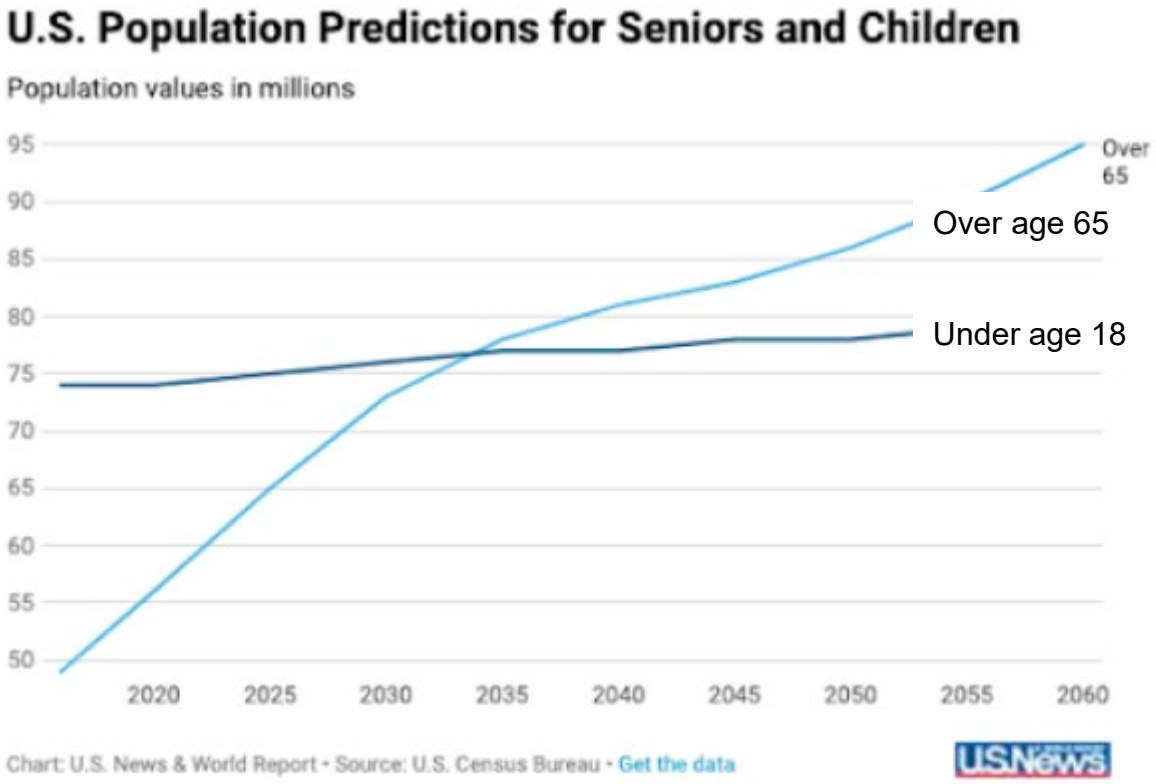
- Lack of knowledge regarding eye screening
- Few eye clinics accept Medicaid insurance & many have appointments booked out several months
- Out-of-pocket costs; Poverty and financial trade-offs
- Discomfort from dilating eye drops
- Avoidance due to anxiety about receiving bad news
- Physical and mental health challenges
- Lack of convenience and time
- Transportation difficulties
- Food and housing instability

What Makes It Easier to Get Diabetic Eye Screening?

- Primary care clinician's recommendation to obtain eye screening
- Knowledge about the benefits of diabetic eye screening
- Reminders about eye screening
- Ability to obtain diabetic eye screening in the primary care clinic
- Financial support and incentives
- Support from family to obtain eye care
- Support from social workers, patient navigators or community health workers
- High self-efficacy and self-advocacy within healthcare
- Trust in healthcare

Urgent need to expand ocular telehealth

- Higher patient volumes, fewer staff and clinicians, ↑ turnover



Hughes H.K., et al. *NEJM* 2022; Mehotra, A. *NEJM* 2022
Sinsky C., et al. *Mayo Clinic Proceedings* 2021; www.morningconsult.com

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Urgent need to expand ocular telehealth

- Higher patient volumes, fewer staff and clinicians, ↑ turnover
- Opportunity to advance health equity by increasing access to patient-centered, high-quality care at lower cost
- Many patients value and have become accustomed to having telehealth options due to COVID-19 impacts

Hughes H.K., et al. *NEJM* 2022; Mehotra, A. *NEJM* 2022
Sinsky C., et al. *Mayo Clinic Proceedings* 2021; www.morningconsult.com

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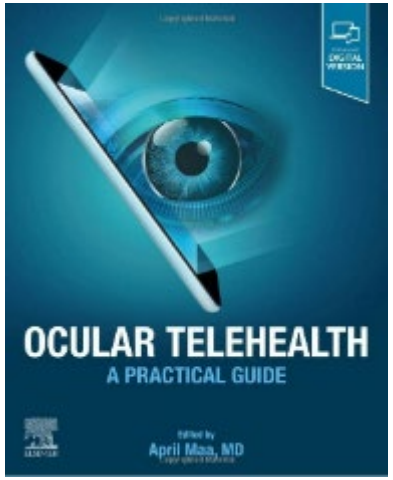
Telehealth types

- Virtual (video or audio)
- Remote patient monitoring
- Mobile (mHealth)
- Hybrid/digitally-integrated visits
- Store-and-forward



Maa AY, Medert CM, Lu X, et al. *Ophthalmology*. 2020; Gan K, Liu Y, Stagg B, et al. *Telemed J E Health*. 2020
https://www.icare-world.com/us/product/icare-home/
https://www.reviewofophthalmology.com/article/the-evolution-of-portable-visual-field-testing
www.peekvision.org

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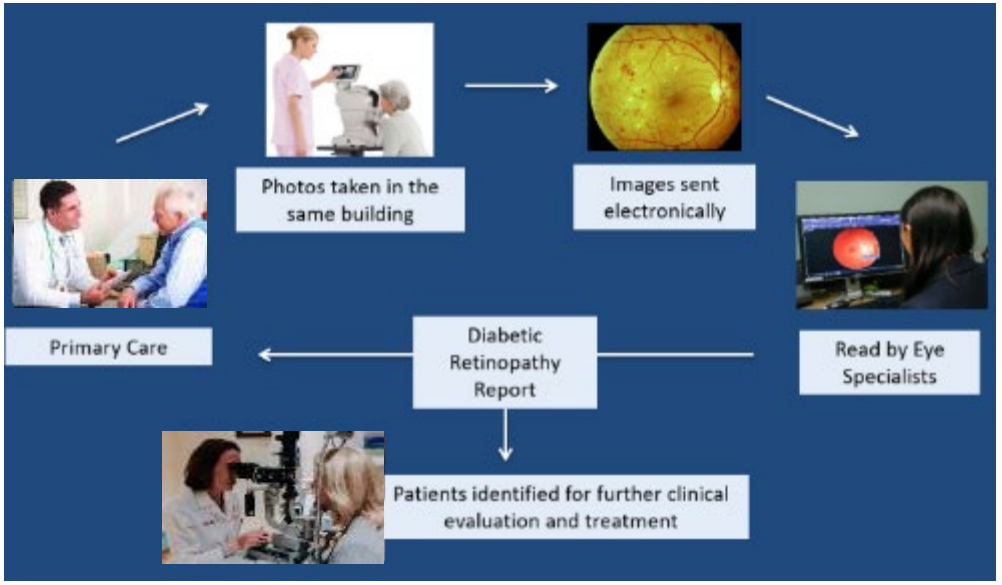

SIGHT | Screening and Intervention for Glaucoma and eye Health through Telemedicine

Horton MB, et al. *Telemed J E Health*. 2020; Scanlon PH. *Acta Diabetol.* 2021; Liu Y, et al. *Curr Diab Rep.* 2019
Yuen J, Xu B, Song BJ, et al. *Ophthalmol Glaucoma.* 2023
https://sightstudies.org/; Newman-Casey PA, Niziol LM, Elam AR, et al. *AJO*. 2023
Hark LA, Horowitz JD, Gorroochurn P, et al. AJO 2023; Owsley C, Swain TA, McGwin G Jr, et al. *AJO* 2024

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Rural eye health disparities

- Diabetic retinopathy
  - Leading cause of blindness in working-age, U.S. adults
  - Prevalence of diabetes projected to increase 2-3X by 2050 (1 in 3 U.S. adults)
  - Rural communities have greater burden of diabetes, more severe retinopathy, less access to eye care

- Primary care as an ideal setting for teleophthalmology
  - 90% of patients with diabetes see their primary care clinician at least once a year, while less than 50% see an eye doctor

Hale NL, et al. *Journal of community health.* 2010; Gibson DM. *JAMA Ophthalmology.* 2019; Boyle JP, et al. *Population Health Metrics*. 2010

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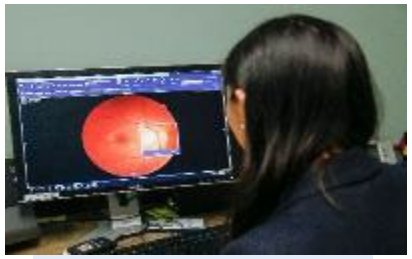
Teleophthalmology provides evidence-based diabetic eye screening

Primary Care

Photos taken in the same building

Images sent electronically



Read by Eye Specialists

Diabetic Retinopathy Report

Patients identified for further clinical evaluation and treatment

Horton MB, et al. *Telemed J E Health*. 2020; Scanlon PH. *Acta Diabetol.* 2021; Liu Y, et al. *Curr Diab Rep.* 2019

Patient Benefits

- **Convenient:** PCP office, no dilating drops, can wear contact lenses
- **Fast:** 10 minutes or less to image both eyes
- **Low cost:** $0-30 out of pocket (versus $50-60 for exam at Walmart/Costco)
    - Covered by many insurers
- Expedited eye clinic appointments for patients with vision-threatening disease

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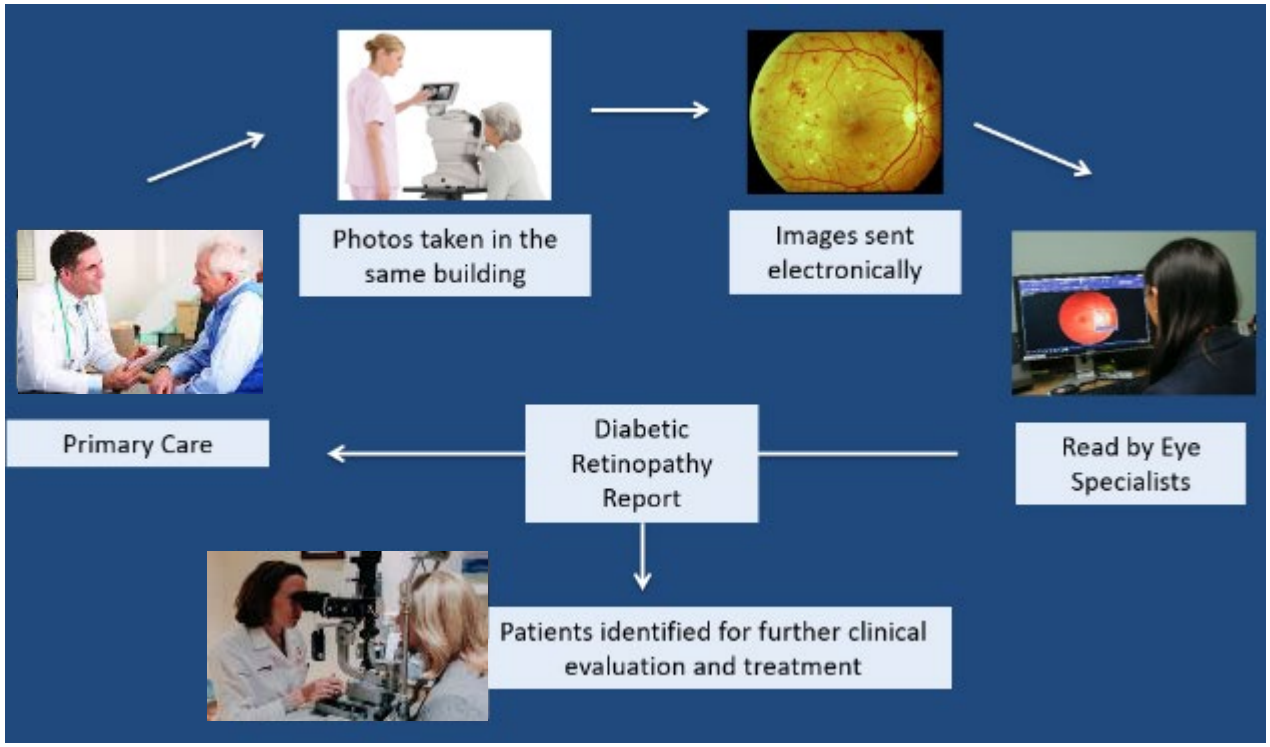
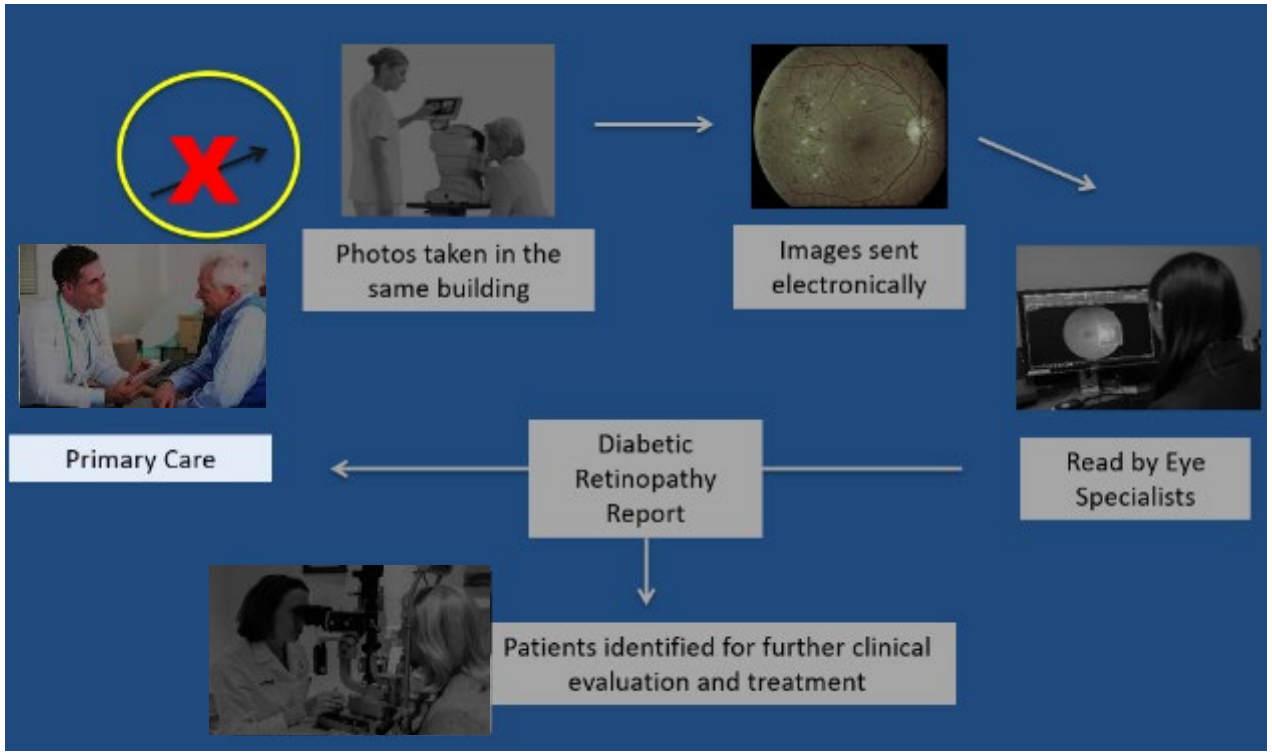
“If you build it, they will come.”

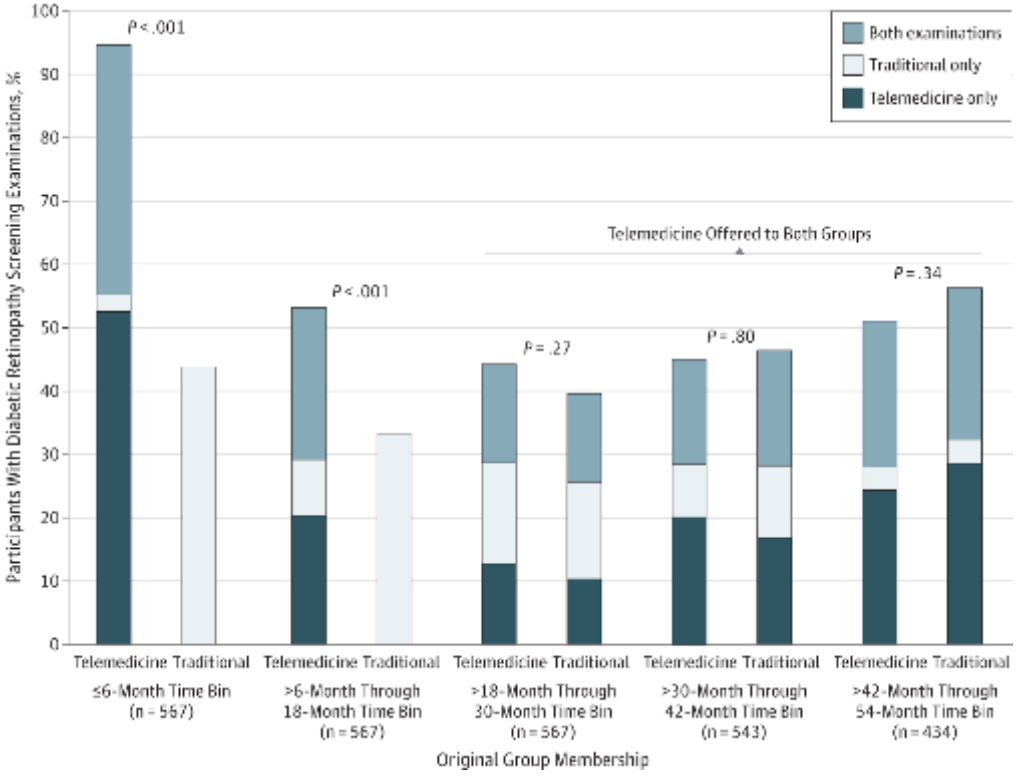


might not

"If you build it, they ~~will~~ come."



Gap in sustained effectiveness



- Randomized controlled trial of Telemedicine vs Traditional diabetic eye screening
- Initial improvement in screening rates in Telemedicine arm was not sustainable after 18 months
- Screening rates never exceeded 55% even after Telemedicine was offered at no cost to all

Mansberger S, et al. *JAMA Ophthalmol.* 2015

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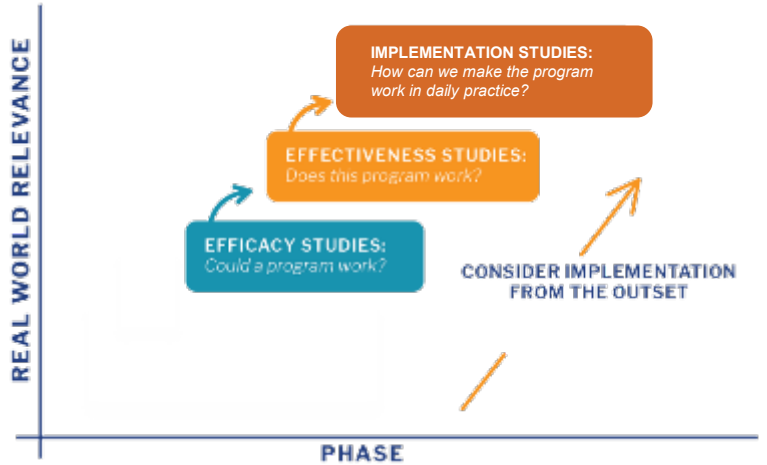
Implementation science

- NIH Definition
  - “Study of methods to promote the adoption and integration of evidence-based practices... into routine health care and public health settings”

- Key Concepts
  - Intervention
  - Context
  - Recipient
  - Facilitation



NIH/NCI Free Online Course (TIDIRC): https://cancercontrol.cancer.gov/is/training-education/training-in-cancer/TIDIRC-open-access

Figure adapted from: https://catalyst.harvard.edu/community-engagement/implementation-science/

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Research Overview

- Goal: Increase diabetic eye screening rates using teleophthalmology in rural primary care clinics

- Mile Bluff Medical Center: rural health clinic located in Juneau County, WI
  - Ranked 68th of 72 counties in the state based on national health/SES metrics

AIM 1:

Conduct interviews with patients, clinicians, and administrators to identify barriers and facilitators to teleophth use

AIM 2:

Develop and test an implementation program to increase teleoph use in federally qualified health centers/rural health clinics

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countyhealthrankings.org; Liu Y, et al. *PLOS ONE* 2018; Liu Y, et al. *BMJ Open.* 2019

Implementation for Sustained Impact in Teleophthalmology (I-SITE)

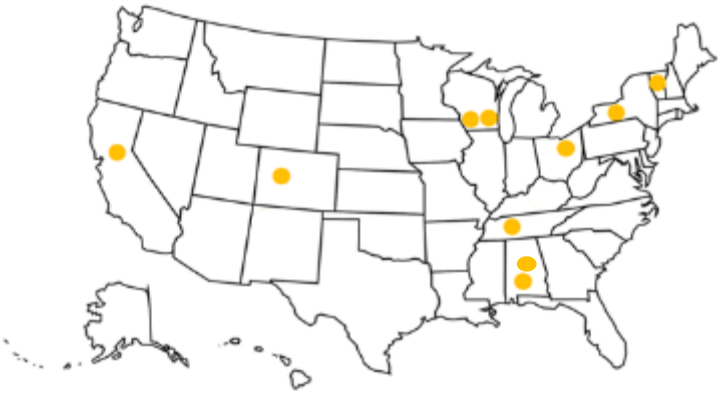
Introductory I-SITE Webinar	I-SITE In-Person Session 1	I-SITE In-Person Session 2	I-SITE Teleconferences
Introduction to I-SITE and Invitation to Participate in Change Team	Identify Top Barriers to Teleoph Use	Identify Top Strategies to Overcome Barriers	Develop and Test Ideas to Increase Screening

Free Online Toolkit: www.hipxchange.org/I-SITE

Torres Diaz A, et al. *Implement Sci Comm.* 2021; Liu Y, et al. *Telemed J E Health.* 2020

Results and Next Steps

- I-SITE (Implementation for Sustained Impact in Teleophthalmology)
  - Sustained 36% increase in diabetic eye screening over 2 years
  - Free online toolkit: https://www.hipxchange.org/I-SITE
  - NIH/NEI UG1 I-TRUST Study to test I-SITE in 10 rural health systems
    - Implementation of Teleophthalmology in Rural Health Systems (I-TRUST)
    - Sites in rural WI, VT, NY, OH, CO, CA, AL, TN



I-TRUST Study
Implementation of Teleophthalmology in RUral Health SySTems

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    - Sites in rural WI, VT, NY, OH, CO, CA, AL, TN

- Expand teleophthalmology use to reduce preventable blindness from diabetes nationally in rural and *urban* communities
  - Adapt and test I-SITE to address unique barriers and facilitators for urban, African American and Latinx Communities

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Communities **A**dvancing
Research **E**quity **for Health**

CARE for Health™

Conduct research addressing **issues important to diverse communities**, particularly those **underrepresented** in biomedical research

Reduce burden on providers using innovative data collection methods

Increase adherence to **evidence-based care**

Improve **efficiency of care delivery**

Integrate research into the clinical care environment

Engender trust in science by addressing community needs

Achieve **longitudinal collection of clinical data** to address health across the lifespan

NIH
National Institutes of Health

WREN
WISCONSIN
Research & Education Network
for our health

Monica Bertagnolli, MD

Challenges and Opportunities

- Payment-related policy issues
  - Increase eye clinics accepting Medicaid, uninsured, and/or undocumented patients
  - Financial support for vision/eye care and transportation
- Vision/eye condition testing in non-eye care clinics
  - Primary care and other medical subspecialties

Dept. of Defense-funded project:

"Improving Lupus Care by Addressing Safe Hydroxychloroquine Use through Virtual Visual Screenings in Rheumatology Clinics"

Christie Bartels, MD MS

Roomasa Channa, MD

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- Vision/eye condition testing in non-eye care clinics
  - Primary care and other medical subspecialties
  - Home-based testing

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Conclusions

- Reviewed leading causes of vision loss

- Factors influencing diabetic eye screening in underserved communities

- Challenges and opportunities to increase access to vision testing, including leveraging telemedicine in primary care clinics

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- Olayinka Shiyanbola PhD
- Maria Mora Pinzón MD MS
- Nora Jacobson PhD

- Christiana Fowlkes BS
- Johnson Hoang BS
- Loren Lock MS
- Christian Pelayo BS
- Rebecca Swearingen PA

- Diabetes Patient Advisory Board
- Latino Health Council of Dane County
- Community Advisory Board (UW CCEHP)

- UW Community Academic Aging Research Network (CAARN)

- UW Wisconsin Network for Research Support (WINRS)

National Eye Institute
NATIONAL INSTITUTES OF HEALTH

Research to Prevent Blindness
Preserving vision and restoring sight through research.

MileBluff MEDICAL CENTER

Outreach COMMUNITY HEALTH CENTERS

Health Innovation Program
Integrating healthcare research and practice

NIATx