

TITLE

Eye Care for Houston's Underserved Communities

AUTHORS

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BACKGROUND AND SIGNIFICANCE

Houston is a large metropolitan area that harbors diverse communities, yet a substantial population faces challenges in accessing vision care, hindering their ability to fully participate in daily life due to limited eyesight. Among the spectrum of unmet health needs, difficulty in acquiring eyeglasses and eye care ranks as one of the most pervasive in populations experiencing housing instability¹. Uncorrected visual impairment can exacerbate health conditions, as the process of navigating health systems and acquiring health information becomes difficult to impossible². Several efforts exist to promote affordable healthcare and job opportunities for those with housing instability; however, this effort is thwarted if the intended population cannot read their medication bottles, use their phones, or read pamphlets. Furthermore, people experiencing housing instability are more likely to spend significant amounts of time outdoors in direct sunlight, which is a risk factor for developing cataracts^{3,4}. We aim to address these risk factors and communication barriers by providing free reading glasses, sunglasses, and protective cases for eligible patients experiencing housing instability.

Several local volunteer initiatives aim to address the healthcare needs of Houston's underserved communities. The Houston Outreach Medicine Education & Social Services (HOMES) Clinic is the only student-run clinic in Houston and a program of Healthcare for the Homeless-Houston (HHH)^{5,6}. HOMES aims to address medical and social concerns of a general population experiencing unstable housing. Open Gate Homeless Ministries provides dinners, clothing, and health screenings to a predominantly LGBTQ+ youth population⁷. Dia De La Mujer Latina (DML) is a community-engaged organization that serves uninsured Latinos/as at its signature health fiestas, with free vision screening by trained promotores/community health workers. Casa Maria is a local clinic for immigrants lacking health insurance, serving a predominantly Spanish-speaking Latino/Hispanic population. Each of these organizations provides population-specific expertise and a specialized approach to caring for underserved groups in Houston. The collaborative efforts of these organizations in providing critical vision care

services embodies humanism in medicine by emphasizing empathy, compassion, and patient-centered care. By establishing strong provider-patient relationships and leading with dignity and respect, this collaborative project addresses the physical need of comprehensive vision care alongside the psychological, social, and emotional well-being for Houston's underserved community.

The ophthalmology interest groups (OIGs) at Baylor College of Medicine and McGovern Medical School have previously led successful vision screenings at HOMES Clinic, Open Gate, DML, and Casa Maria. This was done in partnership with Prevent Blindness Texas (PBT)⁸, who provide vision screening machines that measure near/distance visual acuity. Yet, there is still a need for continued progress as our resources are limited. Currently, our volunteer vision screenings lack reading glasses and sunglasses, constraining the potential benefit for our clients. By offering reading glasses, sunglasses, and protective cases, we aim to further expand on our progress in addressing the vision needs of Houston's underserved people.

BROADER IMPACTS

Our project aims to serve three major populations: a general population experiencing unstable housing at HOMES Clinic, younger LGBTQ+ individuals at Open Gate, and uninsured Latino/Hispanic populations at DML and Casa Maria. Demographics and visual acuity data from previous vision screenings can be found in **Supplemental Table 1** with the code for data analysis found in the GitHub repository: <https://github.com/toofastdan117/gold-humanism-vision.git>. We begin our vision screening process by having self-identified clients complete the PBT vision screening form (**Supplemental Figure 1**). For those requiring assistance, volunteers are available to read the form aloud to aid in its completion. Next, our clients' visual acuity is evaluated using a vision screening machine operated by a volunteer from PBT. Eligibility is determined if clients report poor near vision or symptoms of presbyopia, an age-related gradual loss of the eye's ability to focus on close objects⁹. If these criteria are met, eligible clients are fitted with reading glasses. The prescription for reading glasses is guided using a vision test chart held 12-14 inches away from the clients' eyes (**Supplemental Figure 2**). After the client expresses satisfaction with their reading glasses, we will donate their best-fitted glasses, a protective case, and sunglasses to aid long-term eye health.

For clients exhibiting poor distance vision or multiple risk factors for developing eye disease, we facilitate referrals to practicing optometrists/ophthalmologists. A client's risk for developing eye diseases, such as glaucoma, is determined by the PBT vision screening form's risk assessment section (**Supplemental Figure 1**). To assist clients requiring referrals, we compiled a printable list of vision clinics, prioritizing programs that accept uninsured/underinsured individuals (**Supplemental Table 2**). Our list includes Dr. Ravi Chundru's ophthalmology clinic at HHH and Spanish-speaking clinics, featuring multiple contact methods, such as website addresses, phone numbers, and QR codes. In addition to addressing our clients' immediate vision challenges, our project promotes enduring solutions by encouraging clients to seek care at affordable optometry/ophthalmology clinics. Comparable studies at different institutions revealed

a large unmet demand for glasses among individuals facing housing instability, with subsequent high levels of satisfaction reported upon the donation of glasses^{11–14}. Obtaining eyeglasses improves access to opportunities such as education and employment, improving housing stability and breaking the cycle of homelessness. Furthermore, conducting vision screenings and providing eyeglasses will significantly enhance our collaborators' health services, leveraging substantial human capital from volunteer groups and alleviating cost burdens for nonprofit organizations.

PROJECT SCHEDULE, MILESTONES, AND BUDGET

Schedule

During the three-month project time period, we plan to perform four vision screening events. The vision screenings are tentatively planned during the spring of 2024 as followed: Open Gate in late March, DML at monthly health fiestas at SW Multiservice Center, Casa Maria in April, and HOMES Clinic on May 19.

Milestones

During our vision screenings, we will measure our clients' visual acuity and demographic factors through the PBT vision screening form. We will also measure our clients' satisfaction with their glasses and/or referrals. We will report milestones in the form of the number of clients screened and the number of glasses donated, along with de-identified demographic information.

Budget

Our budget includes reading glasses bundled with protective cases and sunglasses (**Supplemental Table 3**). This includes the following prescriptions: +1.0, +1.5, +2.0, +2.5, +3.0, +3.5, and +4.0, for a total of 70 glasses accompanied with protective cases. We will order 15 pairs of reading glasses for more common prescriptions, such as +2.5 and +3.0. Our budget also includes 70 sunglasses. Our total budget, including taxes, amounts to approximately \$469.21 using Amazon's current pricing and taxes with free shipping. Any extra equipment will be stored in a secure locked cabinet at HOMES Clinic and utilized in future vision screenings.

SUPPLEMENTAL DATA

Supplemental Table 1: Demographics and Visual Acuity for Houston's Underserved Community.

Numbers represent the number of people screened with percentages in parentheses.

		HOMES (n = 19)	OpenGate (n = 12)	Casa Maria (n = 18)	Dia De La Mujer Latina (n = 126)
Age Groups	18-29	3 (15.8)	6 (50.0)	1 (5.6)	14 (11.1)
	30-49	6 (31.6)	4 (33.3)	10 (55.6)	73 (57.9)
	50-64	8 (42.1)	2 (16.7)	7 (38.9)	32 (25.4)
	65+	2 (10.5)	0 (0.0)	0 (0.0)	7 (5.6)
	(Missing)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Sex	Male	10 (52.6)	11 (91.7)	3 (16.7)	16 (12.7)
	Female	8 (42.1)	1 (8.3)	15 (83.3)	110 (87.3)
	Transgender	1 (5.3)	0 (0.0)	0 (0.0)	0 (0.0)
	(Missing)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Ethnicity	Caucasian	4 (21.1)	1 (8.3)	3 (16.7)	0 (0.0)
	African American	7 (36.8)	6 (50.0)	0 (0.0)	1 (0.8)
	Hispanic/Latino	5 (26.3)	3 (25.0)	13 (72.2)	101 (80.2)
	Native American	0 (0.0)	0 (0.0)	0 (0.0)	11 (8.7)
	Multiple	2 (10.5)	0 (0.0)	0 (0.0)	8 (6.3)
	Other	1 (5.3)	1 (8.3)	2 (11.1)	1 (0.8)
	(Missing)	0 (0.0)	1 (8.3)	0 (0.0)	4 (3.2)
	(Missing)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Insurance	Uninsured	12 (63.2)	12 (100.0)	17 (94.4)	97 (77.0)
	Private	0 (0.0)	0 (0.0)	0 (0.0)	2 (1.6)
	Medicare	1 (5.3)	0 (0.0)	0 (0.0)	0 (0.0)
	Medicaid	3 (15.8)	0 (0.0)	0 (0.0)	0 (0.0)
	County/City Health	0 (0.0)	0 (0.0)	0 (0.0)	1 (0.8)
	Goldcard	2 (10.5)	0 (0.0)	0 (0.0)	0 (0.0)
	Affordable Care Act	0 (0.0)	0 (0.0)	0 (0.0)	1 (0.8)
	Molina	1 (5.3)	0 (0.0)	0 (0.0)	0 (0.0)
	(Missing)	0 (0.0)	0 (0.0)	1 (5.6)	25 (19.8)
	(Missing)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Last Eye Exam	Less than 1 year	1 (5.3)	3 (25.0)	1 (5.6)	8 (6.3)
	1-2 years	5 (26.3)	3 (25.0)	4 (22.2)	34 (27.0)
	3-5 years	5 (26.3)	2 (16.7)	4 (22.2)	32 (25.4)
	More than 5 years	8 (42.1)	3 (25.0)	3 (16.7)	23 (18.3)
	Never	0 (0.0)	1 (8.3)	5 (27.8)	27 (21.4)
	(Missing)	0 (0.0)	0 (0.0)	1 (5.6)	2 (1.6)
	(Missing)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Barriers to Care	Cost	7 (28.0)	5 (38.5)	6 (33.3)	91 (63.6)
	Lack of Transportation	7 (28.0)	3 (23.1)	0 (0.0)	4 (2.8)
	Lack of Knowledge	3 (12.0)	0 (0.0)	0 (0.0)	9 (6.3)
	Clinic Waiting Time	1 (4.0)	0 (0.0)	0 (0.0)	7 (4.9)
	Fear of Doctors	0 (0.0)	0 (0.0)	0 (0.0)	4 (2.8)
	Fear of Treatment	0 (0.0)	0 (0.0)	0 (0.0)	1 (0.7)
	Other	0 (0.0)	1 (7.7)	1 (5.6)	7 (4.9)
	None	3 (12.0)	3 (23.1)	5 (27.8)	9 (6.3)
	(Missing)	4 (16.0)	1 (7.7)	6 (33.3)	11 (7.7)
	(Missing)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Distance Visual Acuity	20/20	4 (10.5)	1 (4.2)	10 (27.8)	24 (9.5)
	20/30	4 (10.5)	4 (16.7)	5 (13.9)	53 (21.0)
	20/40	4 (10.5)	2 (8.3)	9 (25.0)	33 (13.1)
	20/50	3 (7.9)	0 (0.0)	6 (16.7)	37 (14.7)
	20/70	3 (7.9)	0 (0.0)	2 (5.6)	34 (13.5)
	20/100	4 (10.5)	1 (4.2)	1 (2.8)	22 (8.7)
	20/200	14 (36.8)	15 (62.5)	3 (8.3)	40 (15.9)
	unable to screen	2 (5.3)	1 (4.2)	0 (0.0)	9 (3.6)
	(Missing)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Near Visual Acuity	20/20	4 (10.5)	3 (12.5)	9 (25.0)	17 (6.7)
	20/30	8 (21.1)	6 (25.0)	13 (36.1)	36 (14.3)
	20/40	5 (13.2)	2 (8.3)	5 (13.9)	36 (14.3)
	20/50	5 (13.2)	1 (4.2)	3 (8.3)	35 (13.9)
	20/70	2 (5.3)	2 (8.3)	2 (5.6)	41 (16.3)
	20/100	8 (21.1)	2 (8.3)	2 (5.6)	70 (27.8)
	20/200	1 (2.6)	7 (29.2)	2 (5.6)	1 (0.4)
	unable to screen	5 (13.2)	1 (4.2)	0 (0.0)	16 (6.3)

Supplemental Table 2: Low Resource Eye Clinics in Houston.**Healthcare for the Homeless Houston⁶**

- <https://www.homeless-healthcare.org/>
- 713-286-6000
- 1934 Caroline St, Houston, TX 77002
- Weekly Ophthalmology Clinic led by Dr. Ravi Chundru

**UH College of Optometry¹⁵**

- <https://eyecare.opt.uh.edu/>
- 713-743-2020
- 4401 Martin Luther King Boulevard
Houston, TX 77204

**Legacy Community Health¹⁶**

- <https://www.legacycommunityhealth.org/services/vision/>
- Montrose:
 - 832-548-5100
 - 1415 California St. Houston, TX 77006
- Fifth Ward:
 - 832-548-5400
 - 3811 Lyons Ave. Houston, TX 77020

**San Jose Clinic¹⁷**

- <https://www.sanjoseclinic.org/>
- 713-228-9411
- 2615 Fannin St, Houston, TX 77002
- No insurance only



Houston Eye Associates Foundation¹⁸

- <https://foundation.houstoneye.com/>
- 713-668-6828
- 7155 Old Katy Road, Suite S110
Houston, TX 77024
- Uninsured or underinsured only



Supplemental Table 3: Project Budget

Resource	Purchase Link	Price
Reading Glasses, 5-pack with cases included. Strengths: +1.0, +1.5, +2.0, +2.5, +3.0, +3.5, +4.0	https://www.amazon.com/Gaoye-Reading-Blocking-Lightweight-Eyeglasses/dp/B0BCWRQ3QW/ref=sr_1_43?crid=1TUSLDQFGCB4&keywords=reading%2Bglasses%2Band%2Bcases%2Bin%2Bbulk&qid=1704363321&sprefix=reading%2Bglasses%2Band%2Bcases%2Bin%2Bbulk%2Caps%2C106&sr=8-43&th=1	\$18.99 per 5-pack. Multiple orders are indicated for more common prescriptions. +1.0 glasses * 2 = \$37.98 +1.5 glasses * 1 = \$18.99 +2.0 glasses * 2 = \$37.98 +2.5 glasses * 3 = \$56.97 +3.0 glasses * 3 = \$56.97 +3.5 glasses * 2 = \$37.98 +4.0 glasses * 1 = \$18.99 Sum = \$265.86
Sunglasses, 10-pack	https://www.amazon.com/Wholesale-Unisex-80s-Retro-Sunglasses/dp/B01M68J9YO/ref=sr_1_5?crid=OB9UZHDPL4C&keywords=sunglasses%2Buv%2Bprotection%2Bpack%2Badult&qid=1704179471&sprefix=sunglasses%2Buv%2Bprotectionpack%2Badult%2Caps%2C94&sr=8-5&th=1	\$24.00 per 10-pack 5 orders for a total of 50 sunglasses. Sunglasses * 10 = \$120.00 Sum = \$168.00
Estimated Tax		Tax = \$35.35
		Total = \$469.21 (with free shipping)

Supplemental Figure 1: Prevent Blindness Texas Vision Screening Form. This form is available in English and Spanish.



Adult Eye Health Screening Registration Form (PLEASE PRINT)

Screening Site Information (Screener Use Only)					
Date:		Site Location:		Participant ID:	
SECTION 1: Participant Information					
First Name:			Last Name:		
Date of Birth: / /		Age:	Sex: <input type="checkbox"/> M <input type="checkbox"/> F	County:	
Address:		City/State:		Zip Code:	
Phone Number:			Email:		
Ethnicity: <input type="checkbox"/> African American <input type="checkbox"/> Asian <input type="checkbox"/> Caucasian <input type="checkbox"/> Hispanic/Latino <input type="checkbox"/> Native American <input type="checkbox"/> Other:					
Number of People in Household:			Annual Household Income:		
Language Preference: <input type="checkbox"/> English <input type="checkbox"/> Spanish <input type="checkbox"/> Other			Preferred Method of Contact: <input type="checkbox"/> Phone <input type="checkbox"/> Text <input type="checkbox"/> Email		
1. Do you wear prescription glasses/contacts?			<input type="checkbox"/> Yes <input type="checkbox"/> No		
a. If YES, do you have them with you?			<input type="checkbox"/> Yes <input type="checkbox"/> No		
b. Do you wear them for (please check one):			<input type="checkbox"/> Distance <input type="checkbox"/> Near/Reading <input type="checkbox"/> Both		
2. Do you have a vision problem or eye disease?			<input type="checkbox"/> Yes <input type="checkbox"/> No		
a. If YES, please describe:					
SECTION 2: Acknowledgment on Vision Screening (PLEASE SIGN BELOW)					
<p>Today's Adult Vision Screening can help determine if you see as well as you should. Keep in mind, however, that many underlying factors may affect the results of this vision screening. Also, a vision screening does not test for all eye disorders. A vision screening is not a substitute for a professional eye examination by an eye care professional. If you suspect that you are having any vision problems, you should arrange for a professional eye examination, regardless of today's screening results. I hereby authorize the disclosure of health information, related to the results of this screening and subsequent eye exam(s), to be shared with PBA/PBT for purposes related to follow up and statistical analysis. I am a resident of the State of Texas and I consent to a vision screening.</p>					
SIGN HERE: _____					
SECTION 3: Risk Assessment			Yes	No	Recommendations
1. Do you have blood relatives with glaucoma?			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> See doctor regularly
2. Has a doctor treated you for or said you have glaucoma?			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> See doctor regularly
3. Have you had an eye injury or eye surgery?			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> See doctor regularly
4. Have you noticed a change in your vision in the last 12 months?			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> See doctor soon
5. Do you have persistent pain in or around the eye?			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> See doctor now
6. Are you African American or Hispanic/Latino and over age 40?			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> See doctor regularly
7. Are you age 65 or older?			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> See doctor annually
8. Was your last dilated eye exam (with drops) more than two years ago?			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> See doctor regularly
9. Do you have diabetes?			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> See doctor annually
a. If yes, was your dilated eye exam (with drops) more than one year ago?			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> See doctor soon
10. When was your last eye exam? <input type="checkbox"/> Never <input type="checkbox"/> Less than 1 year <input type="checkbox"/> 1-2 years <input type="checkbox"/> 3-5 years <input type="checkbox"/> More than 5 years					
11. Do you have any barriers to receiving eye care (check all that apply)? <input type="checkbox"/> Cost <input type="checkbox"/> Fear of Doctors <input type="checkbox"/> Fear of Treatment <input type="checkbox"/> Lack of Transportation <input type="checkbox"/> Clinic Waiting Time <input type="checkbox"/> Lack of Knowledge <input type="checkbox"/> Other: _____ <input type="checkbox"/> None					
SECTION 4: Visual Acuity Screening (Screener Use Only)					
Distance	Right: 20/	Left: 20/	<input type="checkbox"/> Unable to Screen	<input type="checkbox"/> With <input type="checkbox"/> Without Correction	Screener:
Near	Right: 20/	Left: 20/	<input type="checkbox"/> Unable to Screen	<input type="checkbox"/> With <input type="checkbox"/> Without Correction	Screener:
SECTION 5: Exit Interview (Screener Use Only and Recommendations)					
<input type="checkbox"/> PASS or <input type="checkbox"/> REFER for: <input type="checkbox"/> Risk Factors <input type="checkbox"/> Visual Acuity (If 20/50 or worse in either eye, see doctor soon)					
SECTION 6: Post-Screening Interview (Screener Use Only)					
What type of insurance coverage do you have? <input type="checkbox"/> Uninsured <input type="checkbox"/> Medicaid <input type="checkbox"/> Medicare <input type="checkbox"/> County/City Health <input type="checkbox"/> Private					
Eye Exam Voucher Type:		<input type="checkbox"/> UH <input type="checkbox"/> VSP <input type="checkbox"/> Treatment Fund <input type="checkbox"/> Other: _____ <input type="checkbox"/> None			
Eyeglass Voucher Type:		<input type="checkbox"/> Healthy Eyes <input type="checkbox"/> VSP <input type="checkbox"/> Treatment Fund <input type="checkbox"/> Other: _____ <input type="checkbox"/> None			

Supplemental Figure 2: Vision Test Chart, Adopted from the Peepers Glasses Company¹⁹. This form is available in English and Spanish.

- 1** Hold the chart 12 to 14 inches away from your face. If you're wearing reading glasses, be sure to take them off for the most accurate results.
- 2** Read the chart from the top down. If you can't read the top line, just move down to the next.
- 3** Keep moving down until you can **clearly** read a full line.
- 4** When you can clearly read a line, look at the strength listed for that line. **That's your strength!**

If you can read this, **+1.00** is the right strength for you.

If you can read this, **+1.25** is the right strength for you.

If you can read this, **+1.50** is the right strength for you.

If you can read this, **+1.75** is the right strength for you.

If you can read this, **+2.00** is the right strength for you.

If you can read this, **+2.25** is the right strength for you.

If you can read this, **+2.50** is the right strength for you.

If you can read this, **+2.75** is the right strength for you.

If you can read this, **+3.00** is the right strength for you.

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