Oppression framework informed equity cost-effectiveness analysis of diabetic retinopathy screening – protocol paper

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Abstract

Background: Diabetic retinopathy remains primary vision complication of diabetes and leading cause of blindness among adults, with up to 30% prevalence among low-income population. Tele-retina is cost-effective screening alternative to vision loss prevention, yet there is adverse association between screening and income. Intersectionality theory notes barriers to achieving health equity result from intersection of personal social characteristics (i.e., race and income). Experiences at intersections are influenced by interpersonal and structural systems of oppression (i.e., racism). Studies found Tele-retina is dominant strategy to standard of care screening for at risk populations. No study has assessed economic equity impact of DR screening using theoretical foundation. Economic evaluations should consider social inferences of technologies on patient health and health care system.

Objective: To address shortcomings related to the utilization of intersectionality theory in economic evaluations of DR screening, we propose oppression framework informed equity CEA of DR screening program.

Methods: A deductive theoretical drive sequential multimethod approach, consisting of 1) modified delphi ? 2) CASE STUDY OF OPPRESSION FRAMEWORK INFORMED EQUITY CEA. Through Delphi (Panel (N=35-50) - Patient Partners, Field experts, Decision makers) we will select the social constructs to, alongside intersectionality theory, guide modification of equity informed CEA to understand impact of social constructs on economic outcomes. Social constructs will be integrated into validated Tele-retina CEA model.

Results: The Delphi study will provide an understanding on which social factors are deemed important by the stakeholders for guiding the inequity in care access. We may input some/all social factors into the DCEA model or create distinctive context dependent scenarios.

Conclusions: This is first Canadian study to: 1) mainstream how health equity framework and social constructs are utilized in economic assessment, 2) improve Tele-retina screening programs by using health equity lens, and 3) scale and adopt “de-novo” integration of social constructs in economic models for evaluation of other programs. Clinical Trial: Not applcable.

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Keywords: diabetic retinopathy; equity of care; distributional cost effectiveness analysis;

Abstract

Background

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To address shortcomings related to the utilization of intersectionality theory in economic evaluations of DR screening, we propose oppression framework informed equity CEA of DR screening program.

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A deductive theoretical drive sequential multimethod approach, consisting of 1) modified delphi → 2) CASE STUDY OF OPPRESSION FRAMEWORK INFORMED EQUITY CEA. Through Delphi (Panel (N=35-50) - Patient Partners, Field experts, Decision makers) we will select the social constructs to, alongside intersectionality theory, guide modification of equity informed CEA to understand impact of social constructs on economic outcomes. Social constructs will be integrated into validated Tele-retina CEA model.

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The Delphi study will provide an understanding on which social factors are deemed important by the stakeholders for guiding the inequity in care access. We may input some/all social factors into the DCEA model or create distinctive context dependent scenarios.

Conclusion

This is first Canadian study to: 1) mainstream how health equity framework and social constructs are utilized in economic assessment, 2) improve Tele-retina screening programs by using health equity lens, and 3) scale and adopt “de-novo” integration of social constructs in economic models for evaluation of other programs.

Background

Social and Economic Impacts of Diabetes

Every three minutes someone in Canada is diagnosed with diabetes while 11 million are living with diabetes or pre-diabetes (1). About 6.1% of Canadian adults aged 20-79 have prediabetes, putting them at high risk of developing type 2 diabetes (1). The prevalence of diabetes is expected to increase to 5 million (12.1%) by 2025 (1). Ontario has more people living with diabetes than anywhere else in the country. In fact, rates of type 1 and type 2 diabetes have increased by 42 % since 2009 (1). There are now an estimated 4,424,000 million people with diabetes or prediabetes in Ontario (1). Diabetes Canada states that the costs of treating diabetes have surpassed $30 billion (2). Goeree and al. have estimated that the excess attributable cost per incident case/person of diabetes in Ontario is ~ $2930 in the first year after diagnosis and $1240 in following years (3). In Canada, diabetes disproportionately impacts First Nations and Métis people, and people of African, East Asian and South Asian ethnic backgrounds, who experience higher rates of type 2 diabetes compared to the general population (Fig.1) (4). Inequities in the social determinants of health (e.g., income, education, housing), resulting from the impacts of systemic racism, intergenerational trauma and colonization, are associated with higher rates of type 2 and gestational diabetes in priority populations (4).

Equity in health service delivery and Intersectionality framework

Health equity is created when individuals have the fair opportunity to reach their fullest health potential. It is directly correlated with the distribution of resources within any setting (5). Low socioeconomic groups with multiple health conditions and limited access to resources have decreased access to achieving health equity. (5). Intersectionality (Fig. 2) is a theoretical framework in which consideration of heterogeneity across different intersections of social positions is critical to conceptualization of health and social experiences (6). The framework was published Kimberlé Crenshaw and developed within Black feminist theory to better explicate the situation of Black women in the United States (7, 8). It encompasses a wide range of intersections of ethno-racial groups, gender, socioeconomic status, sexual orientation, and other social identities and positions (8). The Framework notes that social positions existing on a hierarchy of social power and are not Independent (8), but rather that they shape human experience jointly. As social positions intersect at the individual level (e.g., income, age, rurality), experiences at those intersections are influenced by larger interpersonal and structural systems of oppression such as racism and sexism (9). The Synergies of oppression are created through intersections of three domains: 1) Socio-economic status (i.e., income); 2) Identity-isms (i.e., race); and 3) Geographies (segregation). Intersectionality in this conceptual framing (Fig. 2) is taken of an intersectional categorical axis where social determinants of health, systems of oppressions, and environmental factors are integrated and three categories/framings within the context of the synergy of oppressions, specifically the outcomes of increased marginalization through oppressions and intersections of social determinants of health. This synergy is further compounded with access to health equity (7-9).

Social and Economic Impacts of Diabetic Retinopathy and Screening

Diabetic retinopathy (DR) is the primary vision complication caused by diabetes (10) and is the leading cause of new cases of blindness in adults aged 20 to 65 years (11), yet it is often asymptomatic in the initial stages (12). The prevalence of DR in Canada ranges from 20% to 30% (12). In 2016, more than a million Ontarians were affected by DR (6). The prevalence of vision loss in Canada is expected to increase nearly 30% in the next decade (13). Lower income and type 2 diabetes have been shown to be associated with increased odds of visual impairment (14). In 2007, the cost of vision loss in Canada was estimated at $15.8 billion and is projected to grow to $30.3 billion by 2032 (12). In addition to these costs, the Canadian National Institute for Blindness estimated the cost of associated complications of vision loss—falls $25.8 million, depression $175.2 million, and hip fractures $101.7 million—and the cost of nursing home admissions $713.6 million (12). Early detection ensures that treatment or intervention can be offered to decrease the incidence of vision impairment or blindness. Evidence notes that one-third of adult diabetic patients did not receive an eye examination for DR within 2 years (6), and more specifically, 25.3% of people with diabetes over the age of 60 years had not seen an eye care provider in the last year (12). Tele-retina is one of the DR screening modalities that can be used to bring the testing to community settings. It is focused on reducing eye care disparities that lead to avoidable vision loss. Tele-retina is a branch of telemedicine that delivers eye care remotely. Retinal images and data are collected and transferred via telecommunication technology to eye specialists (15). Previous research has noted that it is a more cost-effective alternative than the standard screening in detecting DR among lower-income individuals with limited access to eye care (15). Specifically, the cost per case correctly detected was $281.10 with Tele-retina and $982.00 with Standard of care screening (SOC) (To note, standard of care screening for DR entails walking into optometrist or ophthalmologist office to get the eyes checked.), and the cost per case correctly diagnosed was $82.21 and $314.14, respectively. For both pilot and Pan-Ontarian sensitivity analyses, Tele-retina remained the dominant strategy (ICER <0). Unfortunately, screening rates among at risk populations remain below 60% (12, 15).

For DR screening, we know that socioeconomic status is the primary driver of risk for DR screening, and that systemic societal barriers e.g. ageism; racism; sexism (7, 8).to name a few, have a detrimental impact on eye health and vision. Lack of education/information, social role and Identity, competing priorities (getting time off work/study to attend appointments) language barriers, lack of family and clinical support (9, 10) are noted by patients as barriers associated with access to DR screening.

Differential access to retinopathy screening was evident when we evaluated designed Tele-retina model of DR screening. We found that only 50% of low-income individuals living with diabetes with limited access to vision care would get screened through Standard of care screening [walking in optometrist/ophthalmologist office to get their eyes checked, which may be even more challenging in remote and rural areas.] whereas 80% of same population would get screened with Tele-retina program (11). Screening "%" was the major driver associated with Tele-retina's economic dominance. This further suggest the need to elucidate social factors associated with inequity of screening as ignorance of these remains a major factor in perpetuating lack of access to equitable care.

Method

Study design

Building on our current Intersectionality work for DR screening access among those who identify as women of low socioeconomic status (16) meanwhile combining the advantages of multi designs and enabling comprehensive understanding of social complexities related to the implementation context, we propose the deductive theoretical drive sequential multimethod approach. Multimethod design entails the conduct of two or more research methods conducted rigorously and completely, in one project, where the major research question drives the study, but the approach consists of two interrelated studies. The deductive theory driven approach indicates that we begin with a (Intersectionality) theory, develop hypothesis from that theory, and then collect and analyze data to test our hypotheses. Sequential approach indicates quan→QUAN, encompassing two quantitative methods used sequentially, one of which is dominant (in capital letters) (17, 18). Two components are: 1) modified delphi → 2) CASE STUDY OF OPPRESSION FRAMEWORK INFORMED EQUITY CEA. Once the first project (Modified Delphi) is completed, we will use the results to provide details for the oppression framework informed equity CEA (Fig. 3.)

Stage 1. Modified Delphi

In Modified Delphi we are seeking the opinion of Participants as to whether social constructs may dictate one's health (seeking) behaviour. Delphi will guide us in coming up with the set of social construct variables. to be integrated into Tele-retina screening economic model. We anticipate 35-50 participants (Patient representatives N=20-25; Field experts including Health Technology Assessment (HTA) and clinicians N=5-10; Decision and Policy Makers N=10-15) will be purposely selected based on experience, training, and specialized area of knowledge (Table 1). Delphi participants are all members of Diabetes Action Canada Network. Potential participants will be invited via Network email to participate in the study. Diabetes Action Canada (DAC), a pan-Canadian research organization launched in 2016 (19), consists of patient partners, researchers, diabetes specialists, primary care practitioners, nurses, pharmacists, data specialists, and health policy experts committed to improving the lives of persons living with diabetes. The team has successfully partnered and collaborated with DAC to plan, execute, and evaluate research projects to improve patient outcomes and experiences (20). Please find below an abbreviated description of the Modified Delphi as it is a well-established approach to answering a research question through the identification of a consensus view across subject experts.

Table 1: Modified Delphi General categories of Expertise

General categories of expertise	**Number of experts**
Patient representatives	**20-25**
Field experts including Health Technology Assessment (HTA) and clinicians.	**5-10**
Decision and Policy Makers	**10-15**

Approach to Analysis

Social construct selection (income, education, area level deprivation, ethnicity, area-level ethnic diversity, sex, gender) (Table 2) is guided by constructs' baseline distribution and will be presented to the Delphi participants by Patient Partner(s), and Qualitative Researcher. Baseline distribution informs of one's physical, mental and emotional health. It is shaped by one's medical, social, and family history, and continuously influenced by factors affecting everyday life (17, 18, 21) . Relevant population characteristics include dimensions of direct equity concern (e.g., income; area-level deprivation and ethnicity/area-level ethnic diversity) and characteristics that are necessary to estimate expected costs and effects and generate further equity concern (e.g., sex and gender) (17, 18, 20, 21) . We will undertake a two round process to assess importance of each variable (social construct) and on 0-5 Likert scale (not at all important; low importance; neutral; moderately important; very important) (22).

Table 2: Social construct variables to be presented to Delphi participants.

List of Social constructs/variables	Not at all important	Low importance	Neutral	Moderately important	Very important
• Area-level deprivation*					
• Income					
• Education					
• Employment					
• Housing quality					
• Ethnicity					
• Area-level ethnic diversity**					
• Sex					
• Gender					
• Other (suggest)					

***Area-level deprivation**: The construct allows for rankings of neighborhoods by socioeconomic disadvantage in a region of interest (e.g. at the state or national level). It includes factors for the theoretical domains of income, education, employment, and housing quality. ****Area level ethnic diversity**: Based on Statistic Canada census the diversity index is a measure of the racial/ethnic diversity of residents based on seven major racial and ethnic/political groups (Asian American, Black, Latinx, Pacific Islander, Mixed/other race, Native American, and white) identified by the census. The value of Area level ethnic diversity range from 0 to 0.93. A diversity index of 0 means that all people in the area belong to the same ethnic group. The highest possible index of 0.93 (based on current census) corresponds to a perfect mix of ethnic groups, with equal the proportion of each ethnic group in the region.

Round 1: At a workshop, information about variables will be presented to panellists, and subsequently the panel will answer the Delphi questionnaire (Table 2). Questionnaire responses will be entered into excel, frequencies will be calculated, and after Round 1, a summary report prepared. The report will be distributed to panel members. The need for further consideration of each social construct will be reviewed and confirmed through discussion at the meeting.

Round 2: Delphi web-based questionnaire will be submitted 4-weeks following the workshop. Median score and range will be estimated for Likert scale questions in accordance with guidelines (22). Proportion of 70% or higher viewing each domain and topic as 'moderately important'/'highly important' will be considered as indication of stability of participants' consensus with regard to face validity (22). SAS will be used for analyzing data.

Case study of oppression framework informed equity cost-effectiveness analysis

Once Delphi participants have selected the most relevant social constructs/variables to be included in the Distributional cost effectiveness model, we will rank them and select the five social constructs with the highest ranking to be considered for inclusion in the model.
In following the modified Love-Koh et al. (2019) (19) and Asaria, Griffin and Cookson (2016) (23, 24) (Stage A and B as described in detail below) approaches, directed by Senior Health Economist, we will evaluate which DR screening intervention has the best "social value" based on selected social constructs in the Modified Delphi as these are deemed important to the Participants in health-care resource allocation. We will investigate how these fit with the implicit value judgements inherent in the original cost/QALY model formulation of Tele-retina screening Program. To note, Quality adjusted life years (QALYs) is a measure of disease burden, including both the quality and the quantity of life lived (25). The case study is based on the Toronto Tele-retina screening program offered in partnership with 7 primary care organizations with a population focus or located in low-income urban and rural communities with a high prevalence of diabetes and low DR screening rates in more details described in Fig.4 (15). Toronto Tele-retina model is selected because it is a validated economic model but presently does not provide information on equity in the distribution of costs and effects.

Distributional Cost-Effectiveness Analysis

Stage A: Model Social Distributions of Health

Estimating the baseline health distribution

We will describe the baseline distribution of health among the study population (length and health-related quality of life). Baseline distribution will need to include the full general population, and not just the population of receiving the intervention (Tele-retina and SOC). This is important for two reasons. First, the entire general population is typically the relevant population for characterizing policy concerns with health inequality. Second, within the context of a national, budget-constrained system, additional resources used by recipients of the intervention may displace activities that could have been provided to anyone within the full general population. This baseline distribution of health will describe variation in health among multiple different subgroups in the population as defined by relevant population characteristics, allowing for the correlation structure among these various characteristics. The relevant population characteristics include not only dimensions of direct equity concern (e.g., income and ethnicity) but also characteristics that are necessary to estimate expected outcomes and costs and that may generate further equity concern (e.g., sex, gender). There are many health metrics that we could use in this context such as: quality-adjusted life expectancy (QALE) at birth, disability-adjusted life expectancy at birth or age-specific QALE—as long as all are measured on an interpersonally comparable ratio scale suitable for use within a CEA (24). We will likely use QALE, but the final choice of health metrics will be decided in consultation with a Senior Health Economist and pending on data availability. The population characteristics of interest in the case study—those by which a substantial variation in uptake of the Tele-retina screening may be observed will be the top five ranked social variables (age, gender, income etc.) in Delphi study. The first step in estimating our population QALE distribution is to estimate life expectancy (LE), according to each of these characteristics. Typically, in these circumstances we opt to use QALE. To obtain QALE we will consult with data from published literature based on individual studies; systematic review to pool the data; published literature dealing with administrative data; access to diabetic retinopathy screening data from Alliance for Healthier communities which includes data on uninsured patients. For instance, Area-level deprivation is typically measured based on index of multiple deprivation (IMD 2004) quintile groups, and area-level ethnic diversity is based on the percentage of people in the area originating from specific continent, again split into quintile groups (26). National statistics data (Statistics Canada 2021 Canadian Census) may be available by sex and deprivation level/social class, but may not available by our particular measure of ethnic diversity. In that case, we will not include correlations with ethnic diversity in our estimation of the baseline health distribution and instead, for the purposes of the analysis, assume its distribution is independent of deprivation and sex/gender. To note, we may not be able to input all five of the highest ranked constructs pertaining to data quality and data availability.

Estimate the distribution of health changes due to the interventions

To evaluate changes in the baseline health distribution that could be attributed to the use of alternative interventions, it is necessary to know how the outcomes and costs of the intervention differ between the relevant subgroups, and how the opportunity costs of any change in resource use differ by those same subgroups. Having estimated a baseline health distribution, we will model how this health distribution is affected by the Tele-retina screening Program and alternative ways of promoting increased uptake of the Tele-retina screening. We do this by using an existing CEA Toronto Tele-retina screening model (15) of the DR screening (Fig. 4) that simulates the natural history of disease and the impact of screening. The model compares in-person (Standard of care) examination for screening of DR (SOC) versus Tele-retina program (15). The model has been conceptualized for patients residing in neighbourhoods with limited access to ophthalmologist and optometrist at high risk for diagnosis of DR. The SOC is defined as a fundus examination with pupil dilation performed by a primary care eye specialist (optometrist or ophthalmologist). Patients with positive results would be referred to a retina specialist, as coordinated by the primary care provider for comprehensive eye examination with angiography and OCT. Model (Fig.4) illustrates pathways of care, possible consequences, chance of event outcomes, resource costs, and utility of using Tele-retina (TR) versus in-person SOC to measure DR. The published Tele-retina model ends with (severe vision loss) SVL following screening alternatives, however we have conceptualized and presented to the decision-making organization a more complete model containing treatment effects. We will use the model with treatment effect model for the case study.

We note that there are a number of parameters in the model that can vary including: **1.** *Disease prevalence, severity, mortality rate, and natural history*: We assume in our case study that DR–specific parameters may be constant across our population subgroups (may need to confirm with expert); **2.** *Uptake of the intervention*: The impact of DR screening uptake by subgroup is the key difference between the various implementations of the screening program success. We will estimate this parameter for each subgroup. **3.** *Direct costs associated with the intervention*: We assume the direct costs related to treating a given stage of diabetic retinopathy do not vary by subgroup (although the chance of incurring these costs and the screening-related costs by subgroup may vary under the different implementations of the screening program). This seems to be a plausible assumption in the absence of more detailed cost data at the subgroup level. **4.** *Opportunity costs from displaced activities*: We assume that opportunity costs in the base case analysis are shared equally among all population subgroups; this assumption may be explored in sensitivity analyses. **5.** *Other-cause mortality*: The mortality rates may vary by subgroup in the same way as discussed when deriving the baseline health distribution. In calculating these rates, we remove diabetic–specific mortality (assuming this is constant across subgroups) and apply this separately in the model.

Adjusting for social value judgments about fair and unfair sources of inequality

The distributions of health estimated thus far would represent all variation in health in the population. We may perceive that some variation in health seem "fair," or at least "not unfair," perhaps because it is due to individual choice or unavoidable bad luck. Then before measure the level of inequality, we will first adjust the health distributions to only include health variation deemed "unfair". We need to make social value judgments about whether health variation associated with each of the population characteristics is deemed fair. For example, let's assume we have 3 social construct variables to consider: sex, income, ethnicity. We might make the value judgment that differences in health due to sex are fair, whereas differences in health due to income and ethnicity are unfair—this is 1 of 8 possible value judgments that we can make on fairness. We will adjust our modeled health distributions for this value judgment by using the method of direct standardization (27). To do this, we will run a regression on our QALE distribution weighting the subgroups by the proportion of the population they represent to find the association between each variable and QALE. We use reference values for those variables deemed fair (i.e., sex) while leaving the other variables to take the values they have in the relevant subgroups and predict out an adjusted QALE distribution. For example, we use male as the reference value for sex and predict out the QALE distribution. This distribution represents only the variation in health deemed unfair by the social value judgment made. Reference values used in the adjustment process are typically population averages for continuous variables, whereas for categorical variables the most commonly occurring category is typically used with sensitivity analysis performed on the impact of alternative choices of reference category.

Stage B: Evaluating Social Distributions of Health

Once we have estimated the appropriate health distributions, we can characterize the distributions in terms of the twin policy goals of improving total health and reducing health inequality.

Comparing interventions in terms of total health and unfair health inequality: We will compare the interventions in terms of total health and unfair health inequality using a specific index. One useful piece of information for decision makers produced at this step of the analysis is the size of the health opportunity cost of choosing an intervention that reduces health inequality—this is simply the difference in total health between the intervention and a comparator. However, we can go further than that and provide information about the size of the reduction in health inequality, in terms of the difference in 1 or more suitable inequality indices between the intervention and a comparator. The selection of appropriate inequality indices requires further value judgments about the nature of the inequality concern. There are number of commonly used indices (Table 3) to measure inequality that can be broadly grouped into those measuring relative inequality (scale-invariant indices), and those measuring absolute inequality (translation invariant). We can calculate range of relative and absolute inequality measures for the QALE distributions associated with our interventions. A higher value for each measure typically indicates a higher level of inequality between the healthiest and the least healthy. We will select the inequality measure in consultation with a Senior Health Economist.

Table 3: Relative and Absolute Indices

	Tele-retina screening	**Standard of care screening**
Relative Inequality Indices		
Relative gap index (ratio)		
Relative index of inequality		
Gini index		
Atkinson index (ϵ = 1)		
Atkinson index (ϵ = 7)		
Atkinson index (ϵ = 30)		
Absolute Inequality Indices		
Absolute gap index (range)		
Slope index of inequality		
Kolm index (α = 0.025)		
Kolm index (α = 0.1)		

Ranking interventions using dominance rules accounting for the level of inequality

To rank distributions based on mean health and the level of health inequality, we may use economic dominance rules provided by Atkinson and Shorrocks. Dominance rules apply when mean health is higher and inequality is lower for almost any measure of inequality. Both rules are based around the Lorenz curve, which will be used to analyze relative inequality constructed for health distributions. We will do this by ordering the population from least healthy to most healthy and plotting the cumulative proportion of population health against the cumulative proportion of the population. Regarding Atkinson's theorem tests for Lorenz dominance between distributions, this means that the Lorenz curves for the distributions do not cross, and the more equal distribution has at least as much mean health as the less equal distribution. In other words, a distribution is dominated if it has higher inequality and the same or lower amount of mean health. On these criteria, the standard screening strategy is dominated by the targeted reminder.

Shorrocks' theorem tests for generalized Lorenz dominance, wherein the Lorenz curve is multiplied by the mean health. We will consider that distribution is dominated if the generalized Lorenz curve (28) lies wholly below that of an alternative intervention. Under this criterion, both the targeted and universal reminder strategies dominate the no-screening option. This leaves us to compare the universal-reminder and targeted-reminder strategies. However, if the generalized Lorenz curves for 2 distributions cross, we cannot use Shorrocks' theorem to rank the distribution and will use Atkinon's theorem test for Lorenz dominance.

Analyzing trade-offs between total health and health inequality using social welfare indices

We need to rank strategies to specify more fully an underlying social welfare function. We will specify the nature of and level (or value) of inequality aversion. The inequality aversion parameters in these functions describe the trade-off between total health and the level of health inequality (i.e., the amount of total health that a decision maker would be willing to sacrifice to achieve a more equal distribution). Inequality aversion parameters are difficult to interpret on a raw scale. We will use a more intuitive scale by combining a specific value of the parameter with a specific health distribution to derive the *equally distributed equivalent* (EDE) level of health. The difference between the mean level of health in that distribution and the EDE level of health then represents the average amount of health per person that one would be willing to sacrifice to achieve full equality in health, given that specific value of inequality aversion. We will use 2 social welfare indices closely linked to the dominance rules applied above: the Atkinson index (29) to evaluate the distributions in terms of relative inequality, and the Kolm index (30) to evaluate the distributions in terms of absolute inequality to estimate *equally distributed equivalent* (EDE) level of health for all strategies. We will visualize our findings using the equity-efficiency impact plane (Fig. 5) (31). Study timeline is described in Figure 6.

Sensitivity analysis

here are several sensitivity analyses that we may run to explore the impact of making alternative assumptions in our modeling on choice of preferred strategy. We can explore: 1) the impacts of alternative assumptions around the distribution of opportunity costs, and 2) the impacts of alternative social value judgments about which inequalities are considered unfair. We may also perform additional sensitivity analyses, including exploring alternative ways that the reminder strategies might affect the different population subgroups (e.g., having constant proportional effects rather than constant absolute effects) and testing for alternative underlying distributions of DR incidence, and severity.

Results

The Delphi study will offer insights as to which social factors are perceived as important by the stakeholders for guiding the inequity in care access. We may input all social factors into the DCEA Model or create distinctive context dependent scenarios. We are in the process of submitting the Research Ethics Board (REB) application to University Health Network (UHN) REB.

Conclusion

This protocol outlines a study designed to provide information on the (in)equity impact(s) of Tele-retina screening program in at risk patient populations. Understanding the equity impact of Tele-retina program will inform decision makers and program administrators of what may be necessary in creating a contextually, and culturally acceptable Screening Program in line with social context, with the ultimate purpose to improve the screening rate for DR and thus decrease the incidence of severe vision loss for the at-risk populations. This will be the first study in collaboration with Patient Partners to mainstream how we assess the economic impact of screening programs/interventions with respect to (in) equity and access to care on women, people from lower socioeconomic groups or people from certain cultures or racial backgrounds while remaining focused on economic analysis and the best use of care resources. Study caries tremendous external validity as the social construct guided economic model (DCEA) can be applied across disciplines and domains, and a range of care settings when evaluating large-scale public health programmes that have an explicit goal of tackling health inequality. The "de-novo" integration of social constructs into economic models may be transferred to other screening programs (breast, colon etc.) care settings (primary, secondary and tertiary) and models of care. We plan to expand this approach to different stroke initiatives.

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Conflicts of Interest

None declared.

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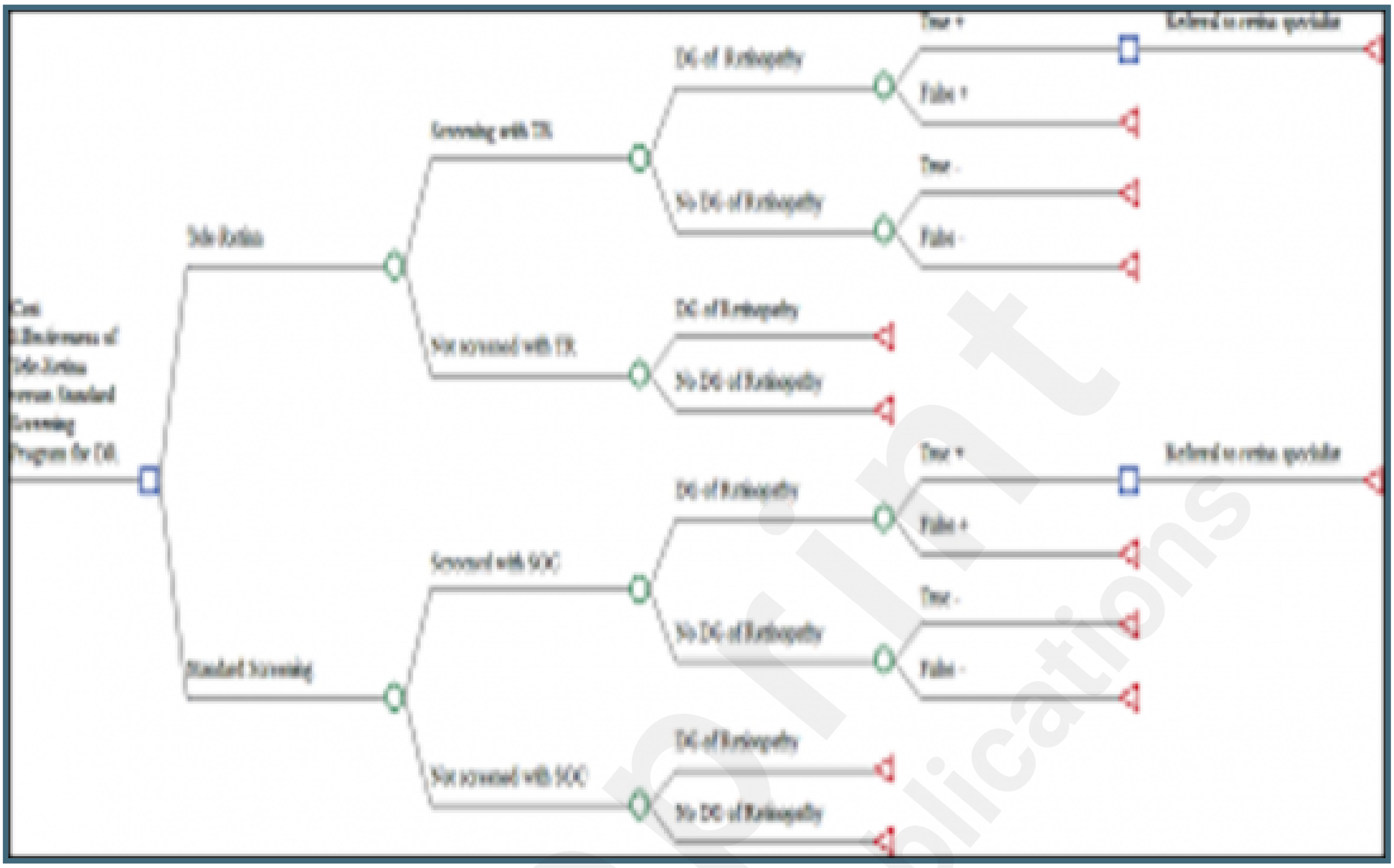
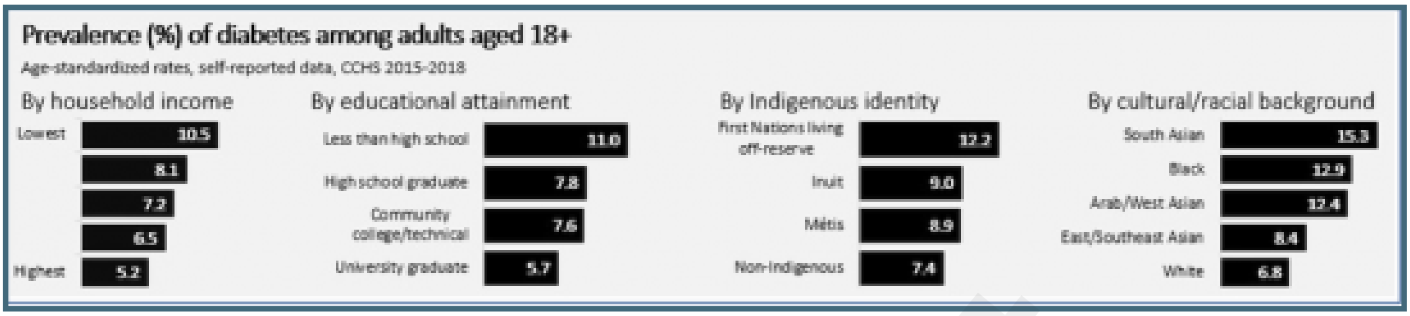
Supplementary Files

Figures

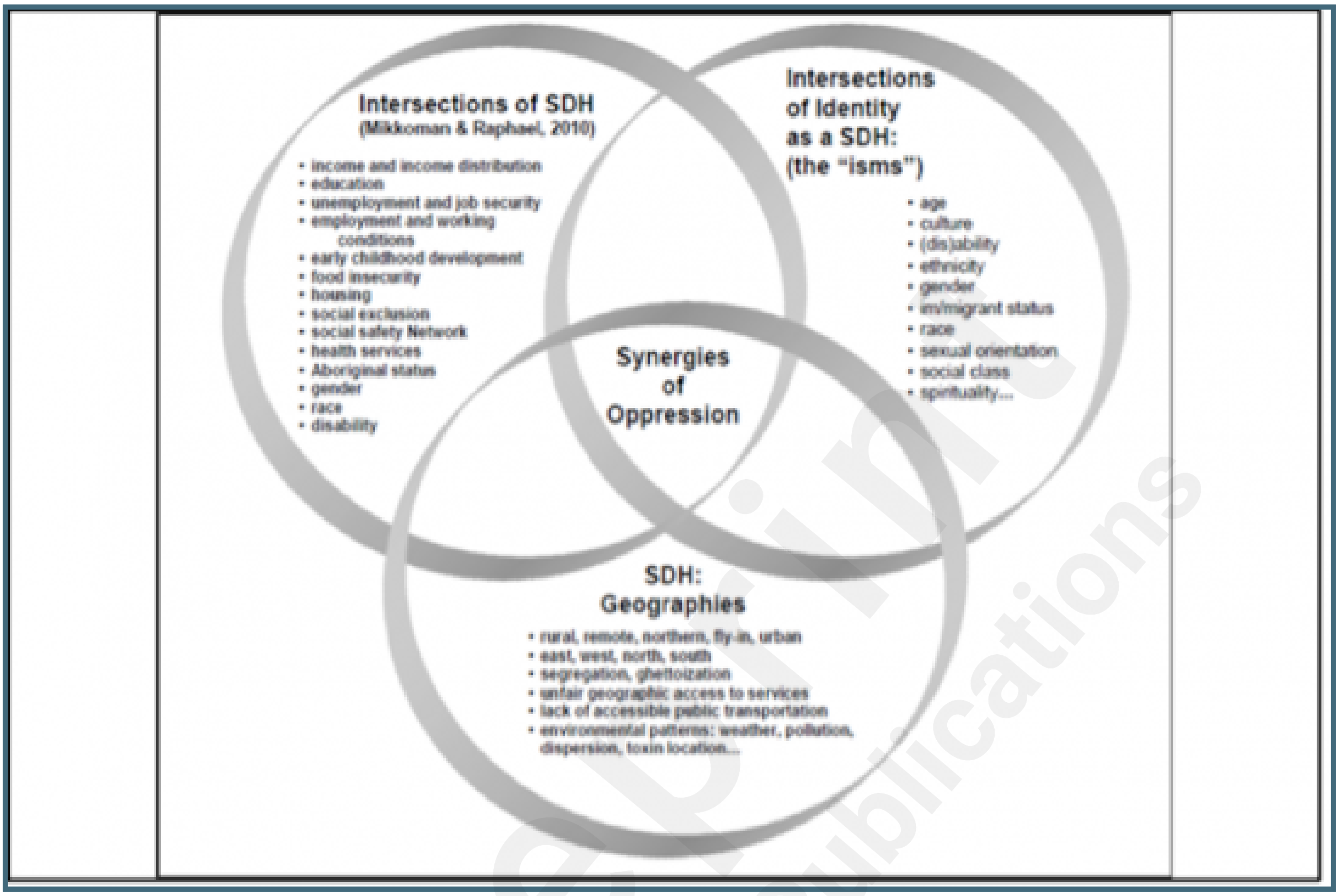
Decision tree of Tele-retina versus standard of care screening (SOC) for diabetic retinopathy (DR) (16).



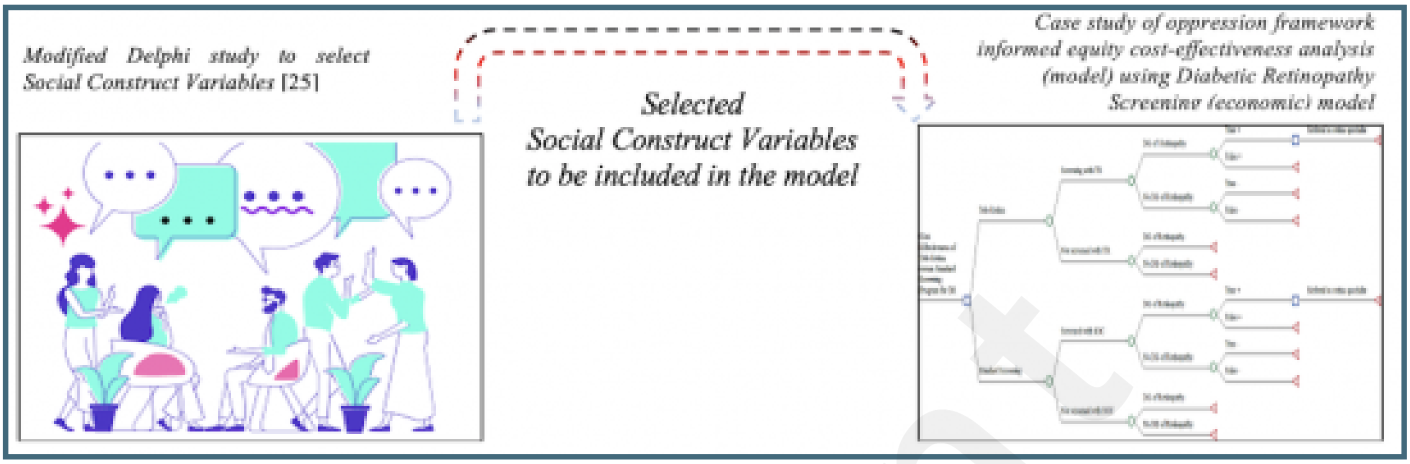
Disproportionate impact of diabetes across groups (10).



Intersectionality Theory - Synergies of Oppression (14).



Multimethod study design.



Health equity impact plane (27).