National and Sub-national Burden of Visual Impairment in Iran 1990–2013; Study Protocol

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Abstract
Background: Although Visual Impairment (VI) and its prevention is a public health issue, sub-optimal information about its magnitude in national level and its distribution is one of the impediments for visual health advocacy. In this article, we are detailing the approaches which will be taken to estimate the magnitude (prevalence, incidence, and burden), distribution, and trend (1990 to 2013) of low vision and blindness in Iran. Besides that, an attempt will be made to describe inequalities and their determinants.

Methods: After finalizing the list of diseases, a systematic search will be started using confirmed search terms and all published and unpublished data will be extracted. Other data sources, including data from hospital records will be added to the data extraction sheet. Using distinct statistical models including spatio-temporal model and multilevel autoregressive model, we will estimate rate of burden measures of eye disease and their uncertainty interval by sex, age, year, and province as well as social determinants of visual impairment inequality. The results are to be reported in separated analyses of meta-analysis, trend, risk factors and diseases burden, inequality, Bayesian prediction modeling, and map for visualizing the results.

Conclusion: The results of the current study will address gaps in different regions and have implication for evidence-based policy making in Iran.

Keywords: Blindness, burden, DALY, eye diseases, visual impairment, social determinants of health

Introduction
Visual Impairment (VI) is a global public health concern. The estimation of people suffering from VI all over the world is 259 million from which 42 million are blind and 217 million have low vision.¹ Eye diseases are responsible for 27.7 million Disability-adjusted life year (DALY), which constitutes 1.8% of total DALY of the world population. Eye diseases are placed in rank 14th in the world and 11th among developing countries. This position is estimated to shift up to rank 8th in 2020 (a proportion of about 2.7% DALY).²

It has been shown that the prevalence of blindness in developing countries is higher than that of the developed countries and it is noteworthy that close to three quarters of the world’s blindness is either curable or preventable.¹ The estimation of VI in Eastern Mediterranean Region is 24 million (blind: 5 million; low vision: 19 million).³ The prevalence of blindness and low vision in Iran has been reported variably from 0.39% to 6.9%.⁴–⁸

It should be mentioned that these estimates are conservative; monocular blindness is not included in the definition of blindness but it has physical and psychological morbidities. Refractive error and presbyopia are difficult to be quantified. They are underrepresented in health condition and disease burden estimates despite being the most common health condition in the whole medicine.

Blindness and its accompanying disability could be devastating; in a child, it means a major life-long physical handicap and it ruins early childhood development,⁴ and is a frequent element in the poverty syndrome.¹⁰ Finally, in the aging population, it causes major psychological impacts like depression¹¹ and physically imposes risk of fractures and falls. VI is a prototype non-communicable disease especially in the aging population and a constant feature of ‘epidemiologic transition’. Visual health is gaining an ever-increasing importance in the sight-intensive life of the third millennium overwhelmed with smartphones, digital media, etc. Dry eye is a new pandemy, increasingly being recognized and treated but not reflected in burden studies.² Last but not least, the connection between survival and visual health is now more than established; VI has been shown to be associated with poor survival in older persons and others reported improved survival following cataract surgery.¹²–¹⁵ Modern statistical approaches, e.g., Bayesian