# VALUING HEALTH SERVICES USING BENEFIT TRANSFER: BENEFIT COST ANALYSIS OF CATARACT SURGERIES IN ETHIOPIA

Christopher Azevedo, University of Central Missouri, Warrensburg, MO, U.S.A.
Catherine M. Chambers, University of Central Missouri Warrensburg, MO, U.S.A.
Paul E. Chambers, University of Central Missouri Warrensburg, MO, U.S.A.

dx.doi.org/10.18374/JABE-23-3.2

## ABSTRACT

*According to a survey conducted in 2005-2006, 1.6% of the population in Ethiopia is blind, nearly three times the world average. Nearly 50% of these cases of blindness (more than 900,000 individuals) are due to cataracts. Although the cost of cataract surgery is low, poverty and lack of access mean many people do not receive the surgery. This paper aims to measure the net benefits associated with improved visual acuity in Ethiopia through increased access to manual small incision cataract surgeries. Previously published estimates of the benefits of cataract surgery in low to middle-income countries were used to estimate the benefits of surgery in Ethiopia using the benefit transfer approach. To overcome limitations due to the small number of observations available, Monte Carlo simulations with 100,000 iterations were run. They were used to construct distributions for the marginal costs and marginal benefits of manual small incision cataract surgery in Ethiopia. Based on the current Ethiopian population and the incidence of blindness due to cataracts, we find the estimated total net benefits to be $35.67 million. The positive net benefits of cataract surgery imply that it would be socially optimal to subsidize these surgeries in Ethiopia. Given that we consider a one-time intervention for a country with a growing population, we believe our net benefits estimates are conservative.*

***Keywords:*** *Cataract. MSICS, Ethiopia, Benefit-Cost Analysis, Monte Carlo Simulations*

## 1. INTRODUCTION

The development of cataracts is typically caused by changes in the tissue that makes up the lens. For people living in higher-income countries, cataracts result from the natural breakdown of proteins and fibers as people age. However, in lower-income countries, especially in Sub-Saharan Africa, cataracts occur at considerably earlier ages due to various factors, including poor nutrition and congenital rubella syndrome. With limited ophthalmic care in lower-income countries, cataracts are the leading cause of reversible blindness and visual impairment. For example, Ethiopia, with a population of 120.2 million people, is believed to have one of the highest rates of blindness in the world. Fortunately, improvements in surgical techniques and low material costs have resulted in a cost-effective approach with good visual outcomes. Specifically, manual small-incision cataract surgery (MSICS) is an effective and low-cost treatment for cataracts (Tabin et al., 2008, Venkatesh et al., 2012). Unfortunately, in Ethiopia, access to ophthalmic care, including MSICS, is hampered by the fact that there is a relatively small supply of healthcare workers who disproportionately live and work in the capital, Addis Ababa (Jack et al. 2010). Limited access is not unique to ophthalmic care; according to Kelly et al. (2018), Ethiopia has the lowest surgical rate in the world.

We aim to measure the net benefits of improved visual acuity in Ethiopia through increased access to cataract surgeries. The benefit-cost analysis compares the total benefits and costs of a proposed or ongoing strategy. Specifically, we are interested in measuring the net benefits that would accrue to citizens of Ethiopia due to the provision of cataract surgeries from programs such as the Himalayan Cataract Project (see Himalayan Cataract Project, nd.) According to a survey conducted in 2005-2006, 1.6% of the population in Ethiopia is blind, nearly three times the world average. Almost 50% of blindness (more than 900,000 individuals) is due to cataracts (Berhane et al., 2007). The Ethiopian Ministry of Health offers two health insurance programs – one for individuals in the formal sector of the economy and one for those in