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The Cost-Effectiveness of a School-Based Vision Screening Program to Detect Amblyopia and Refractive Errors in Young Children Compared to Usual Care Screening in Ontario, Canada: An Economic Analysis

Afua Oteng Asare. OD, MPH, MSc[1,2], Daphne Maurer. Ph.D. FRSC[1,4], Natasha Saunders MD, MSc, FRCPC[1,2,3,5], Agnes M.F. Wong. MD Ph.D. FRCSC[1,2,6], Wendy J. Ungar. MSc, Ph.D.[1,2,3]

Institute of Health Policy, Management and Evaluation, University of Toronto, Toronto[1]; The Hospital for Sick Children, Toronto[2]; ICES, Toronto[3]; McMaster University, Hamilton[4]; Department of Pediatrics, University of Toronto, Toronto[5], Department of Ophthalmology and Vision Sciences, University of Toronto, Toronto[6].

Purpose: In 2018, the Ontario Ministry of Health and Long-Term Care mandated universal vision screening in senior kindergartens to be organised by public health units. Evidence for the cost-effectiveness of such a program is important for resource-allocation decisions but lacking. Universal vision-screening in senior kindergarten may be more cost-effective than usual care vision screening alone. The purpose of this study was to determine the cost-effectiveness of a universal vision screening program organized by a local public health unit in addition to usual care screening as part of well-child checks to detect amblyopia, amblyopia risk factors and uncorrected refractive errors. This program was compared to usual care screening as part of well-child checks alone for children. The target population was children living in the Toronto Central Local Health Integration Network (LHIN).

Methods: A cost-utility analysis was conducted to test the cost-effectiveness of i) usual care screening as part of well-child checks, in addition to public health screening conducted by the Toronto Public Health Unit in senior kindergartens of all public elementary schools (comparator), compared to ii) usual care vision screening in clinics as part of well-child checks alone in the Toronto Central LHIN (reference). The benefits of each program were measured as quality-adjusted life years (QALYs). Costs and benefits were quantified for a child participating in either program from the age of 2 to 18 years from the cost perspective of the society. The outcome of the analysis was the additional cost required to achieve an additional unit of a benefit. This was quantified as the *Incremental Cost Effectiveness Ratio (ICER)* = $\Delta Costs/\Delta Benefit$.

Results: The average cost of screening a child in the public health + well-child program was $2,825; $23 more than screening a child in the well-child only program ($2,802). However, the public health + well-child program was more effective, with a child gaining 42.59 QALYs on average, compared to 42.57 QALYs in the well-child only program. The ICER (cost of an additional QALY) was $1,153/QALY, indicating a positive trade off.

Conclusion: On average, the public health screening + well-child checks program was the more cost-effective program compared to well-child screening only to detect amblyopia, amblyopia risk factors and uncorrected refractive errors in the Toronto Central LHIN of Ontario. There was significant variability surrounding the results of the analysis, therefore further research to reduce over-all uncertainty is recommended.