Exceptionally Low Prevalence of Refractive Error and Visual Impairment in Schoolchildren from Lao People's Democratic Republic

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Objective: Vientiane Province is an urbanizing region in Southeast Asia. We aimed to determine the prevalence of refractive error and visual impairment in primary school–aged children in this region.

Design: Prospective, cross-sectional survey.

Participants: A total of 2899 schoolchildren from Vientiane Province, Lao People's Democratic Republic (Lao PDR).

Methods: Ten districts from Vientiane were randomly selected and 2 primary schools were randomly selected from each district. All children aged 6 to 11 years at selected schools were eligible to participate. The examination included visual acuity (VA) testing, cycloplegic retinoscopy with subjective refinement if indicated, ocular motility testing, and anterior segment and fundus examinations in visually impaired children.

Main Outcome Measures: Cycloplegic refraction and VA.

Results: There was an estimated total of 3330 children who were eligible to participate, and data were recorded from 2899 (87%) of these children. Complete refractive data were available on 2842 children (85% of eligible population). The mean spherical equivalent (SE) in the right eyes was +0.60 diopter (D) (95% confidence interval [CI], 0.49–0.72), and the mean SE in the left eyes was +0.59 (95% CI, 0.50–0.68). The prevalence of hyperopia was 2.8% (95% CI, 1.9–3.7; 88 subjects), and the prevalence of myopia was 0.8% (95% CI, 0.3–1.4; 24 subjects). The majority of children (98%; 95% CI, 97.0–99.0) had normal unaided binocular VA (at least 20/32 in their better eye). The overall prevalence of any visual impairment (presenting VA <20/32 in the better eye) was 1.9% (95% CI, 1.0–2.9; 55 subjects). In multivariate logistic regression analysis, age ($P = 0.001$) was a significant predictor, and female gender ($P = 0.08$) and Yao ethnicity ($P = 0.09$) were borderline significant predictors of the presence of any visual impairment.

Conclusions: Visual impairment is not a public health concern in this primary school–aged population; however, visually impaired children in the community were not studied. From this baseline, future surveys could determine the effect of increasing urbanization on myopia prevalence in this population.

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Uncorrected refractive error is the leading cause of visual impairment worldwide[1] and in school-aged children in both industrialized and developing regions.[2–12] Cross-sectional studies report wide variations in the prevalence of myopia among different populations.[3–8,12,13] The prevalence of myopia in certain regions, particularly urban East Asian regions, is high.[14] Existing evidence, albeit limited, indicates that the prevalence of myopia has dramatically increased in certain urbanized Asian regions, particularly Singapore[14] and Taiwan,[16] but not in Australia,[17] and only weakly in the United States.[18]

Various hypotheses currently compete to explain the wide variation in school-age myopia prevalence, including near work during childhood,[19–21] outdoor activity,[22–24] urban versus rural living,[2,4,5,7,25] and population density.[26] A predisposition to myopia seems to be particularly strong in those of Han Chinese descent, but to date, there is no convergence of evidence toward a unifying explanation, and the gene/environment interactions that underpin the development of school-age myopia remain poorly understood.[27,28] Myopia has been reported to affect approximately 37% of 13-year-old children living in rural southern China.[5] Whether the trend to increasing rates of myopia is occurring in other less-developed parts of neighboring East Asia remains largely unknown.

Lao People's Democratic Republic (Lao PDR) is a landlocked country in Southeast Asia. The Tai people are the major ethnic group. Historical, genetic, and linguistic evi-

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