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Recognizing Eye Health as an Integral Part of Children's School Health Throughout the World

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There is global recognition that delivering eye care is essential to achieving Sustainable Development Goals. The United Nations' (UN) recently ratified resolution on Vision for Everyone[1] reaffirms that improved vision and optimized functional ability are essential to ending poverty (Goal 1); attaining healthy lives (Goal 3); ensuring inclusive and equitable quality education for all (Goal 4); achieving food security and improved nutrition (Goal 2); promoting inclusive and sustainable economic growth and productive employment (Goal 8), and reducing inequality within and among countries (Goal 10). The benefits of access to eye care accrue throughout life, and the earlier in life individuals can take advantage of eye care services, the better. Nowhere is this more apparent than in the pursuit of inclusive and equitable quality education (Goal 4), where trials have shown that providing eyeglasses to school children significantly improves educational outcomes.[2–6] Moreover, programs for the detection and treatment of refractive errors among school children have the potential to be highly cost-effective in all regions of the world.[7–12] Nevertheless, for school eye health programs to be sustainable, it is necessary to integrate them within the broader health care system. Further, in view of their potential impact on education and other areas, such programs must also be closely linked with ministries of education and other relevant government stakeholders.

School Health and Nutrition programs offer an appealing platform through which to deliver eye care services.[13] The last decade has seen unprecedented growth in national school health and nutrition programs. An analysis by the United Nations World Food Program[14] in January 2020 found that more school children benefited from school health and nutrition programs than at any time in history. Around half the world's primary school children, some 400 million, received meals at school every day, and more than 95% of these programs used the school platform to deliver a range of other health services, often including eye health. However, by mid-2020, this decade of growth was brought to a shuddering halt when the COVID-19 pandemic resulted in the closure of schools worldwide and excluded 1.5 billion children from education.[15] This has caused the greatest education crisis in world history, and at the same time, suddenly deprived school children of basic health and nutrition services. Strenuous national efforts to cope and mitigate the effect of the pandemic soon showed that, whether countries were resource-rich or resource-poor, there was no meaningful substitute for the school system to reach young people. Today, a Coalition of nations[16] has emerged, currently including more than 60 countries and 42 international agencies, with the specific resolve to build-back-better school-based programs. Specifically, the goals are to restore school health and nutrition services to 2020 levels by 2023 and reach another 73 million children identified as most in need who were not reached before the pandemic.

To assist this, the Coalition has created a Global Research Consortium for School Health and Nutrition[17] to provide mission-critical evidence to the Coalition to inform the design of better school health and nutrition programs. The Consortium has determined that integrated programs, including eye health and refraction services for school-age children and adolescents, are key to promoting learning, health, and well-being during the critical 7000 days of development to young adulthood and are a major contribution to the creation of human capital. Therefore, the Consortium is seeking the advice of global experts on eye health and refraction to provide credible guidance to share with countries worldwide, rich and poor, as they rebuild and strengthen their national programs.

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Collaborations of this sort are central to the UN's call for integrated health care provision, and opportunities to partner with the highly distributed and integrated school health and nutrition network should be embraced, particularly given the heterogeneity of vision challenges facing the Asia-Pacific region and beyond.

Myopia is already clearly recognized as a major challenge within the Asia-Pacific region,[18] but even within this region it is concentrated in a few locations; primarily mainland China including Hong Kong and Macau, Chinese Taipei, Japan, and South Korea in East Asia, and Singapore in Southeast Asia. A few other countries, such as Vietnam, may be on track to join them, but data on most countries are very limited. This problem is rightly receiving considerable attention. But in other parts of the region, the prevalence of myopia seems to be much lower, such as in rural India,[19] Nepal,[20–22] Cambodia,[23] and Laos,[24] and hyperopic errors are the dominant form of refractive error. They share this characteristic with many other low- and middle-income countries in other parts of the world. Many of these countries also seem to have a need for school-based nutrition programs, given the high prevalence of growth stunting observed. Thus integrated school health, including eye health and nutrition programs, are extremely relevant to the region.

Although hyperopia is quantitatively still the most prevalent refractive error in many countries, it is not yet clear how important correction of hyperopia is. Blurred distance vision is quite easy to detect in myopia. But children with hyperopic errors can often clear their vision by using accommodation, and standard distance visual acuity testing, or even noncycloplegic refraction cannot detect hyperopia reliably. Thus standard school screening is not able to detect most hyperopia.

Yet it should not be assumed that hyperopia is benign. While hyperopic children can sustain high levels of accommodation for the brief period required for visual acuity testing, maintaining accommodation for prolonged periods while reading and writing may be more challenging.

A recent study indicates that approximately one-third of a child's school day is spent engaged in prolonged near work activities,[25] and it appears as though this has a significant impact on the child's visual comfort[26,27] and performance.[28] Indeed, there is a small but growing evidence base suggesting that low and moderate levels of uncorrected hyperopia have a negative impact on educational and developmental outcomes that rely on sustained near work: low and moderate levels of hyperopia have been associated with impaired literacy,[29–31] reading comprehension,[27,32] and reading performance.[28,33]

While caution must be taken when interpreting the results of these studies—many are based on small samples, have inappropriate designs, and lack standardized outcome measures—it is plausible that a young uncorrected hyperope's experience of discomfort during prolonged periods of near work may have negative consequences. Discomfort may well lead to task avoidance in the short term, and the development of a harmful association between visual discomfort and learning activities in the longer term. As such, hyperopia may predispose children and young adults to academic and social pressures that will have a negative impact on their long-term economic prospects. In addition, hyperopia may lead to an earlier requirement for reading glasses as presbyopia develops.

The impact that low and moderate uncorrected hyperopia may have on school children is not restricted to developing countries in Asia: the prevalence of uncorrected hyperopia found in Cambodia, Laos, and Nepal is similar to that found in several African,[34–36] South American,[37] and Scandinavian countries.[27,38,39] There is thus a global need to improve our understanding of hyperopia, the impact it has on educational and developmental outcomes, how we can best implement methods to detect hyperopia, and the threshold at which refractive correction is required.

Maximizing a child's vision is critical to their development, to enable them to reach their full social and educational potential. School-based vision programs are cost-effective and scalable, and the potential for eye care providers to work alongside those providing School Health and Nutrition programs is an opportunity that should be embraced. Recent efforts have been focused on addressing Asia's myopia epidemic but there is a growing body of evidence that suggests low and moderate hyperopia may have an impact on a child's ability to learn. Current methods of screening rely on distance vision assessment, and this approach is not appropriate when it comes to the detection of hyperopia. Hence, there is an urgent need to develop screening tools and methods that can be used to accurately assess the prevalence of hyperopia in children all around the world. Moreover, the paucity of good quality evidence warrants more robust research, such as randomized controlled trials, to fully understand hyperopia's impact on education and learning.

Access to eye care and the provision of eyeglasses to correct all types of refractive errors is vital to improving the educational, economic, and health prospects of future generations. Out of the adversity and challenges of the global pandemic, an opportunity to work alongside School Health and Nutrition networks is emerging. This opportunity should be embraced in our pursuit to achieve Sustainable Development Goals.

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