

A faint, light blue world map with a white grid overlay serves as the background for the slide. The map shows the continents of North America, South America, Europe, Africa, Asia, and Australia.

How China Can Solve the Problem of Childhood Myopia

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What is the Problem?

- **Myopia is very common, and often not treated:**
 - **Myopia is the cause of 90% of all poor vision among Chinese children**
 - **30-40 million myopic children, half the world's total**
 - **In rural and migrant areas, only 15% of children who need glasses have them**



What is the Problem?

- **In rural areas, refractive services are often not of good quality:**
 - **In Shaanxi/Gansu, two-thirds of refractionists in private optical shops have not graduated from high school**
 - **Half of all children in rural Guangdong who are wearing glasses have a power inaccurate by at least 1.0 Diopter**



Why is it important to solve the problem?

- Recent large studies (Ma X et al, BMJ, 2014) have shown that giving children glasses significantly improves their school performance:
 - Greater impact on math test scores than parental education or family income
 - Bigger educational impact than other health interventions such as iron and de-worming
 - As much benefit as an additional year of schooling



What is needed to solve the problem?

- **Free glasses are necessary for ALL children to benefit**
- **As in the Million Cataract Surgeries Plan, the Chinese government has always shown leadership in investing in healthy vision:**
 - Purchased in bulk, a pair of good glasses can be < 10RMB
 - This is a small cost to improve a child's educational performance substantially



What is needed to solve the problem?

- **Local models show how this might work:**
 - Shanghai currently reimburses 200 RMB/year for glasses
 - In Yunnan, Health Insurance cards can be used to buy glasses



What is needed to solve the problem?

- Training of refractionists at county hospitals nationally is needed: Current project with COS + Orbis
- Closely reflects aims of the 5 year PBL Plan
- County hospitals should be permitted to establish optical shops and sell glasses legally
- Will provide better quality than private shops, which can be regulated more tightly



What is needed to solve the problem?

- The MOE, schools and teachers will play a vital role
- Access to the schools for screening is critical
- Education for children and families on the importance of glasses
- Vision screening and referral by teachers, who have been proven to have high accuracy (> 90% sensitivity and specificity)



Good News from Research: Glasses are SAFE

- Many parents, teachers and even health officials worry that glasses may weaken children's vision
- We recently published a study of 20,000 children at 250 schools (AJO 2015)
- Measured vision without glasses at end of school year
- Children who had been given glasses at the beginning of the year had BETTER vision than those who had not



Good News from Research: Getting kids to wear glasses

- Impact of many glasses programs is reduced, because children don't wear them
- We recently published a study from 100 migrant schools in Shanghai (AJO, 2015)
- When teachers were offered gifts if most children wore their glasses, 70-90% of children wore glasses for the whole school year
- Without teacher incentives: Only 40% wore glasses



Good News from Research: PRICE

- **It is important for County Hospitals to sell glasses to sustain school screening programs**
- **Would free glasses from the government ruin their sales?**
- **Our recent PRICE study in 140 schools in Yunnan and Guangdong showed that giving free glasses to all children does NOT reduce sales:**
 - **20% of families receiving free glasses (40% in Yunnan!) still bought “upgrade” glasses with more stylish frames when offered**



Good News from Research: Preventing myopia

- Many parents and health official are especially interested in preventing myopia
- Unfortunately, the most common method used in China, eye exercises, is not proven to work
- But an important study recently published in JAMA shows that another way, spending more time outdoors, CAN reduce myopia
- Of course exercise is also good to reduce obesity and diabetes risk

Research

Original Investigation

Effect of Time Spent Outdoors at School on the Development of Myopia Among Children in China
A Randomized Clinical Trial

Mingguang He, MD, PhD; Fan Xiang, MD, PhD; Yangfa Zeng, MD; Jincheng Mai, BSc; Qianyun Chen, MSc; Jian Zhang, MSc; Wayne Smith, MD, PhD; Kathryn Rose, PhD; Ian G. Morgan, PhD

IMPORTANCE Myopia has reached epidemic levels in parts of East and Southeast Asia. However, there is no effective intervention to prevent the development of myopia.

OBJECTIVE To assess the efficacy of increasing time spent outdoors at school in preventing incident myopia.

DESIGN, SETTING, AND PARTICIPANTS Cluster randomized trial of children in grade 1 from 12

Editorial page 1137

Supplemental content at jama.com

CME Quiz at jamanetworkcme.com and CME Questions page 1173

Summary: Why is myopia an important problem?

- Chinese children have the highest rates of myopia in the world
- In rural and migrant areas, only 15% of children who need glasses have them
- Better quality refractive services needed in rural areas
- Giving glasses significantly improves children's educational performance



Summary: How to solve the problem?

- **Leadership of MOH and Chinese government:**
 - Providing free glasses (cheap, safe, a good educational investment)
 - National refraction training for county hospital (current program by COS+Orbis)
- **Major role of MOE and schools, support from NGOs**
- **County hospitals organize school screening, supported by glasses sales**
- **Myopia prevention with outdoor activity**



Thank You!

