

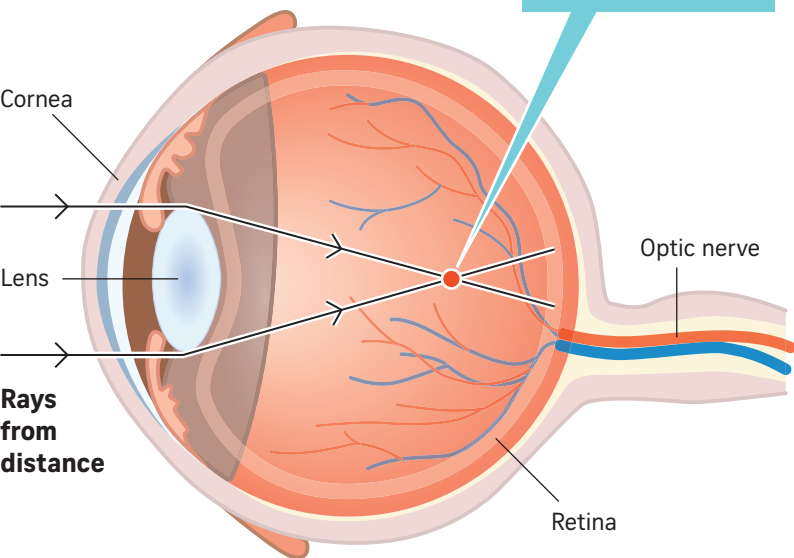
The long and short of myopia in children

Determined to identify risk factors behind this widespread and chronic condition, Professor Saw Seang Mei and her team from the Singapore Eye Research Institute began a study in 1999 of close to 2,000 children aged seven to nine years, and followed them through their youth to adulthood.

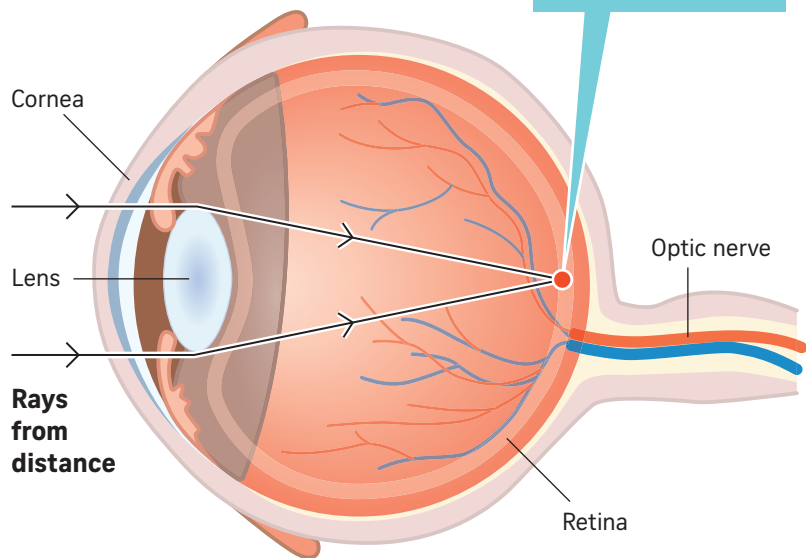
The Singapore Cohort of Risk Factors for Myopia study, the first of its kind in Asia, has not only uncovered the main causes of myopia in children but also tracked their myopia progression over the years. It also identified those who are at risk of developing severe myopia later on in life. **Cheryl Tan** takes a look at some of the findings.

Childhood myopia is caused by excessive growth and elongation of the eyeball, resulting in light rays from distant objects focusing in front of the retina instead of on the retina. This causes distant objects to appear blurry, while close objects remain clear.

MYOPIC EYE AT REST



NORMAL EYE AT REST



Average age for onset of myopia is **8.5 YEARS** in children here, compared with 12 to 16 years in Europe and the United States

Myopia rates progress at an average of **0.75 DIOPTRIS** (75 degrees) a year in local children, before stabilising at the age of around 25 years

Having myopia at a young age is dangerous as there is a longer runway for myopia progression, increasing the likelihood of high myopia in future

High myopia could lead to other complications:

Cataract

Where one's lens becomes cloudy, leading to blurry vision.

Macular degeneration

Loss of one's central vision due to damage to central part of retina (known as macular). This causes difficulty in reading, watching TV and recognising people's faces.

Glaucoma

Increased fluid pressure in the eyeball which damages the optic nerve. The condition is often symptom-less but could cause blindness if left untreated.

RISK FACTORS INCREASING LIKELIHOOD OF MYOPIA

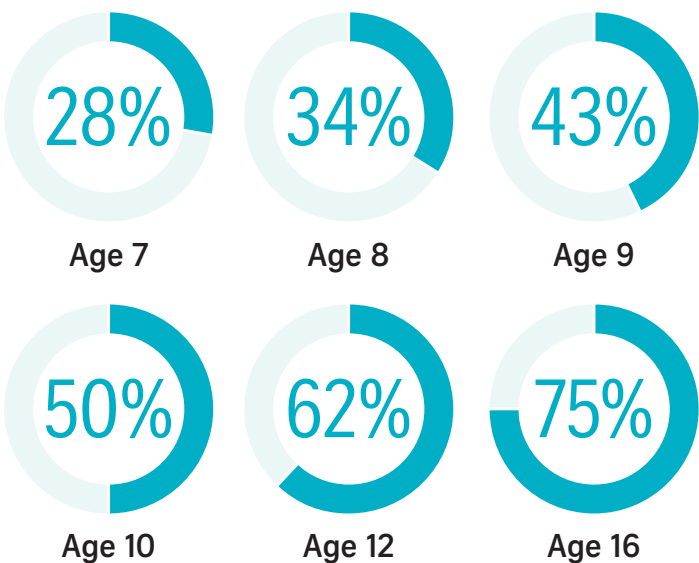
ENVIRONMENTAL FACTORS

- **Near work, such as reading or playing games on electronic devices**
- **Lack of outdoor play**
 - When high light levels from the sun reach the retina, a chemical known as dopamine, which helps to prevent myopia, is produced.
 - The study found Singaporean schoolchildren on average spent only one to 1.5 hours outdoors each weekday, and one to two hours each day on weekends.

GENETICS

- **Myopia genes**
 - Genetic studies found around 300,000 small genes for myopia.
 - Children with more myopia genes have higher genetic tendency to develop myopia.
- **Family history**
 - If both parents are myopic, risk of myopia in the child is at least three times higher.
 - If both parents have high myopia, risk of myopia in the child is four to five times higher.

TRACKING MYOPIA RATES AMONG CHILDREN



Ages 26-30: currently screening



MYOPIA PREVENTION AND TREATMENT STRATEGIES



• **Spend more time outdoors**, provide facilities in schools and community.



• **Test children with family history of myopia** and enforce lifestyle changes for those with genetic tendency to develop myopia.



• **Spectacles and atropine eye drops** can slow progression of myopia.



• **Precision medicine** is being used to identify children more likely to develop high myopia as an adult.



• Main predictors include severity of myopia in childhood, how quickly myopia progresses, and whether lesions (injuries) are found in the retina.



• Children with higher risk can be given more aggressive treatment to prevent myopia from worsening.