



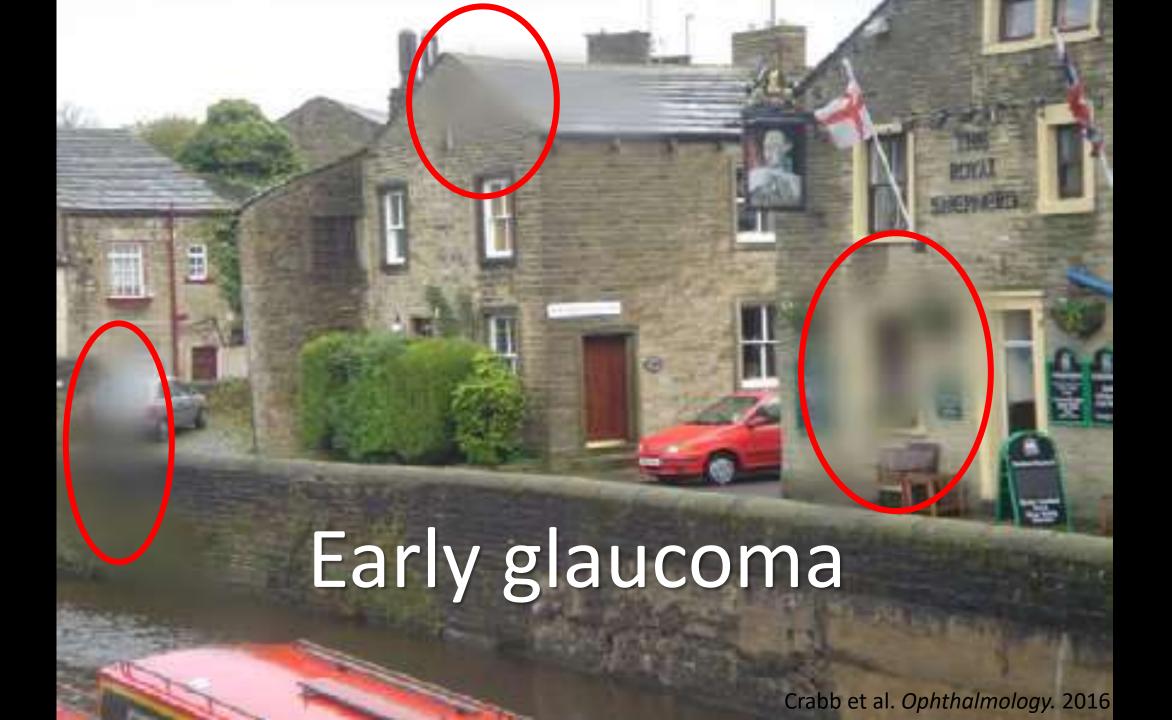
Genomics to Transform Glaucoma Care

Anthony Khawaja

Honorary Consultant Ophthalmologist & Professor of Ophthalmology

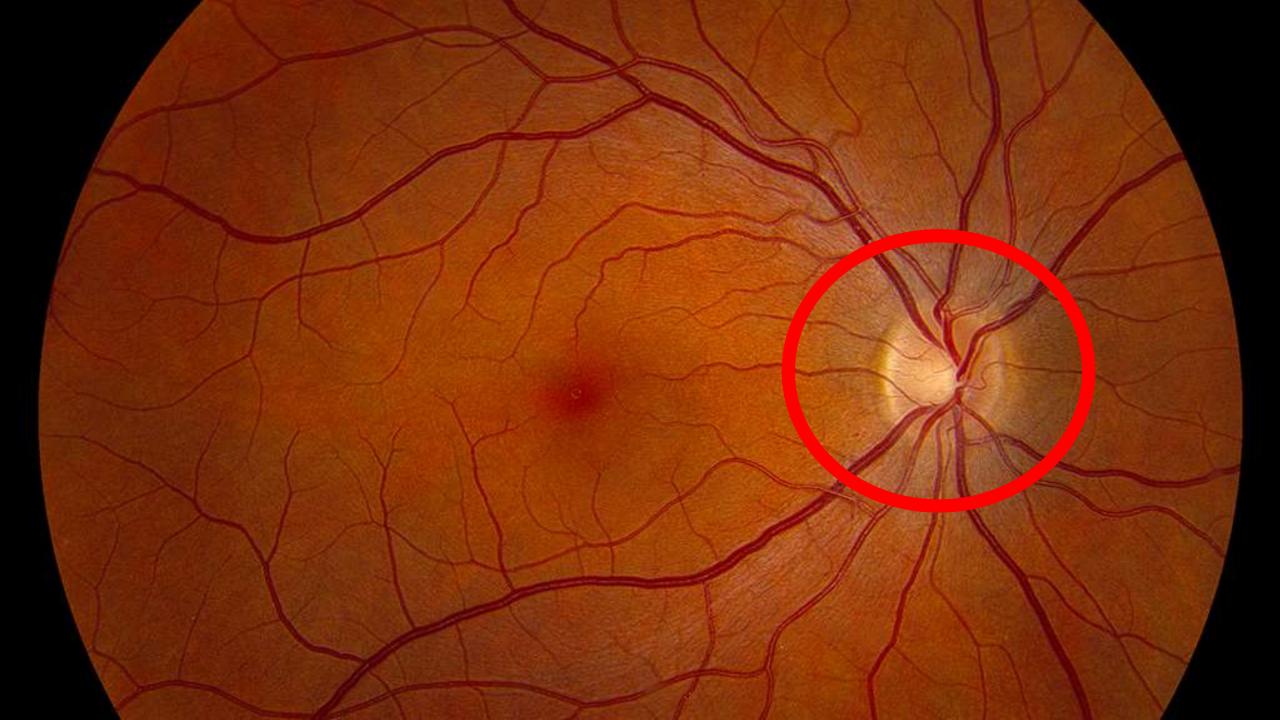
Moorfields Eye Hospital AGM

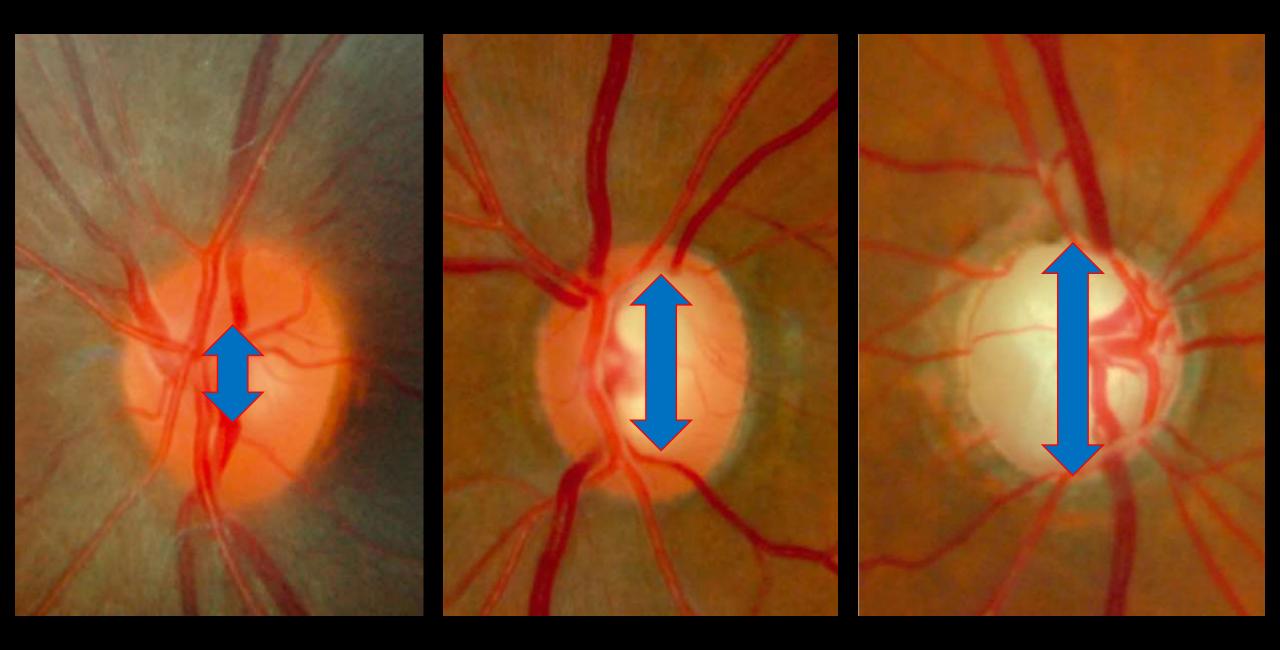
2nd October 2024



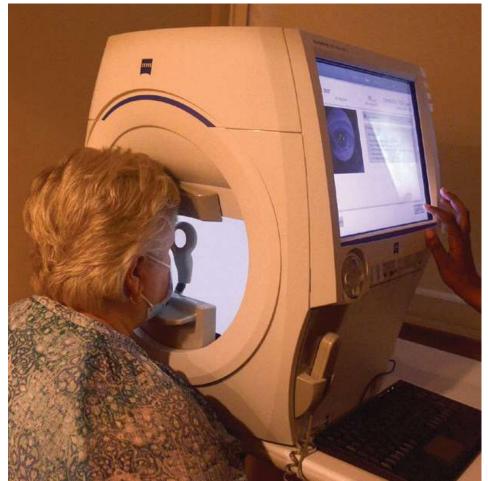




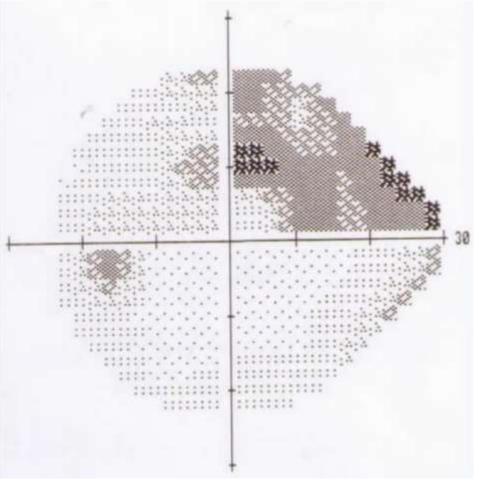


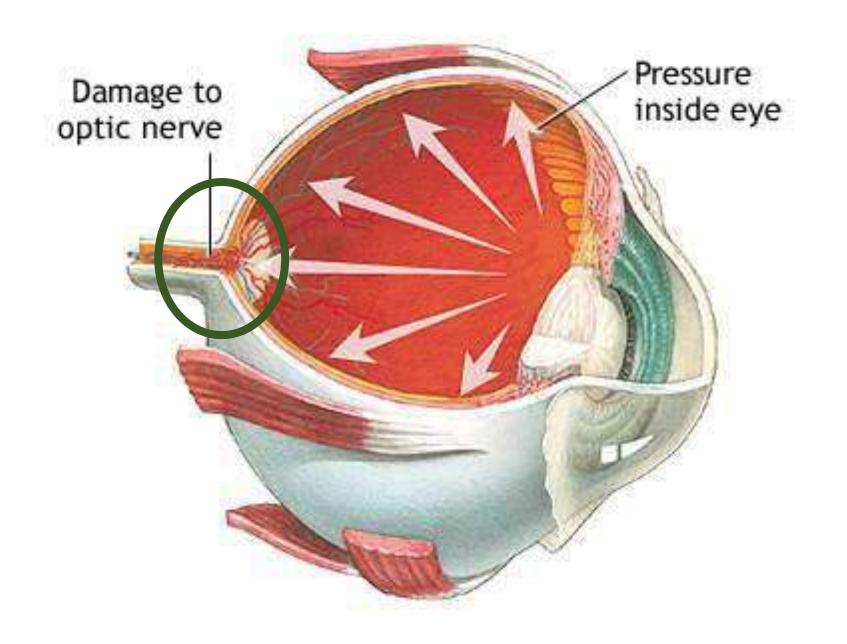












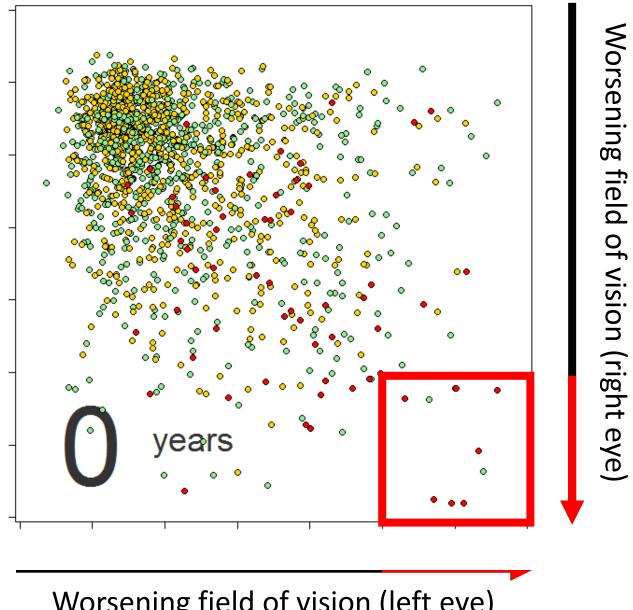
#1: Screening is not recommended





#1: Screening is not recommended

#2: Risk of blindness varies



Worsening field of vision (left eye)

#1: Screening is not recommended

#2: Risk of blindness varies

#3: Treatment outcomes vary





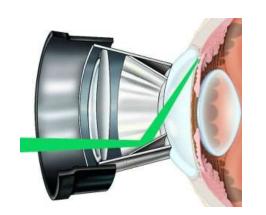




Many treatments!









Selective laser trabeculoplasty versus eye drops for first-line treatment of ocular hypertension and glaucoma (LiGHT): a multicentre randomised controlled trial



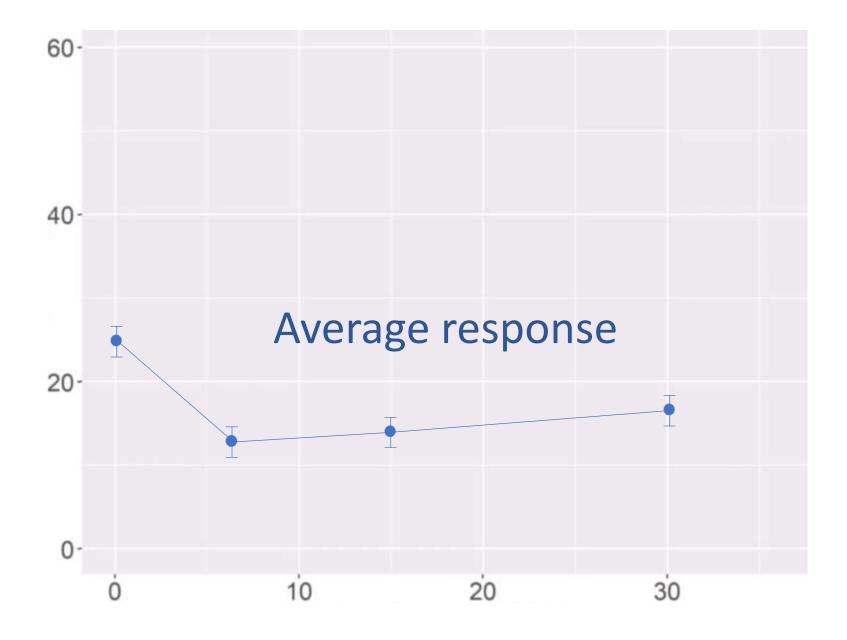
Gus Gazzard, Evgenia Konstantakopoulou, David Garway-Heath, Anurag Garg, Victoria Vickerstaff, Rachael Hunter, Gareth Ambler, Catey Bunce, Richard Wormald, Neil Nathwani, Keith Barton, Gary Rubin, Marta Buszewicz; on behalf of the LiGHT Trial Study Group*











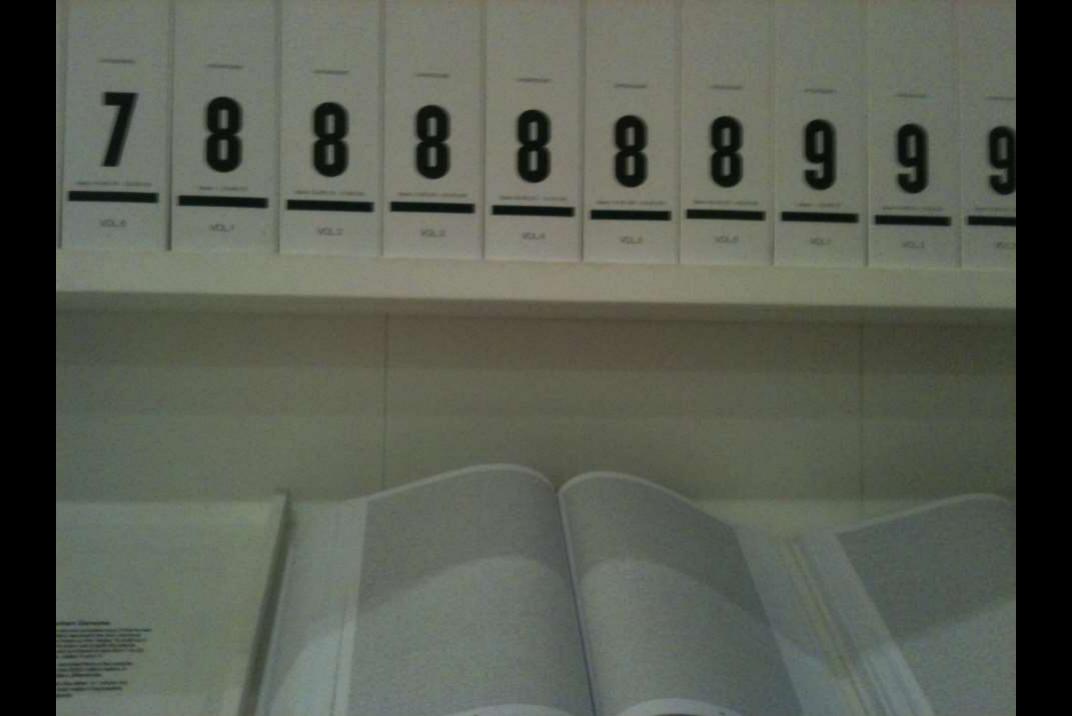
Khawaja *et al. Ophthalmology* **127**, 748–757 (2020)



wellcome collection



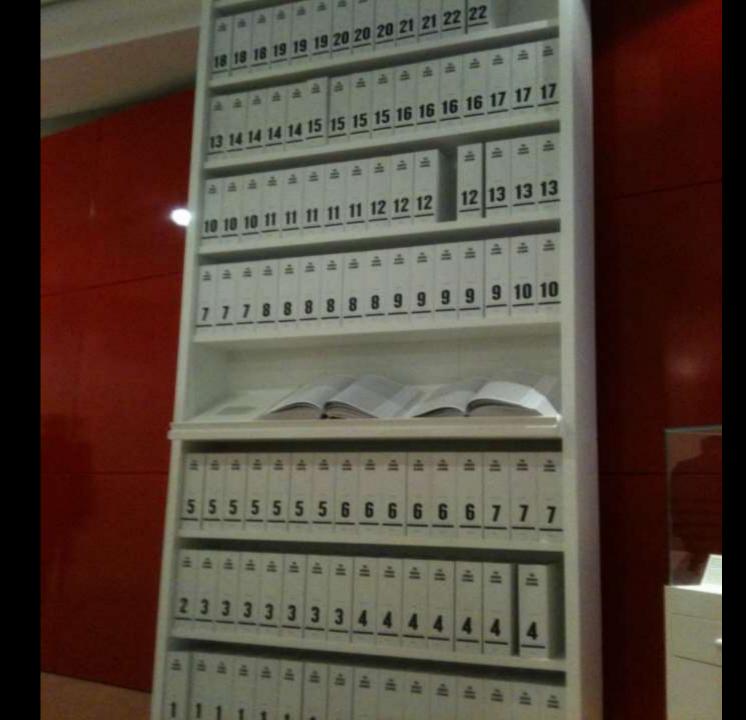




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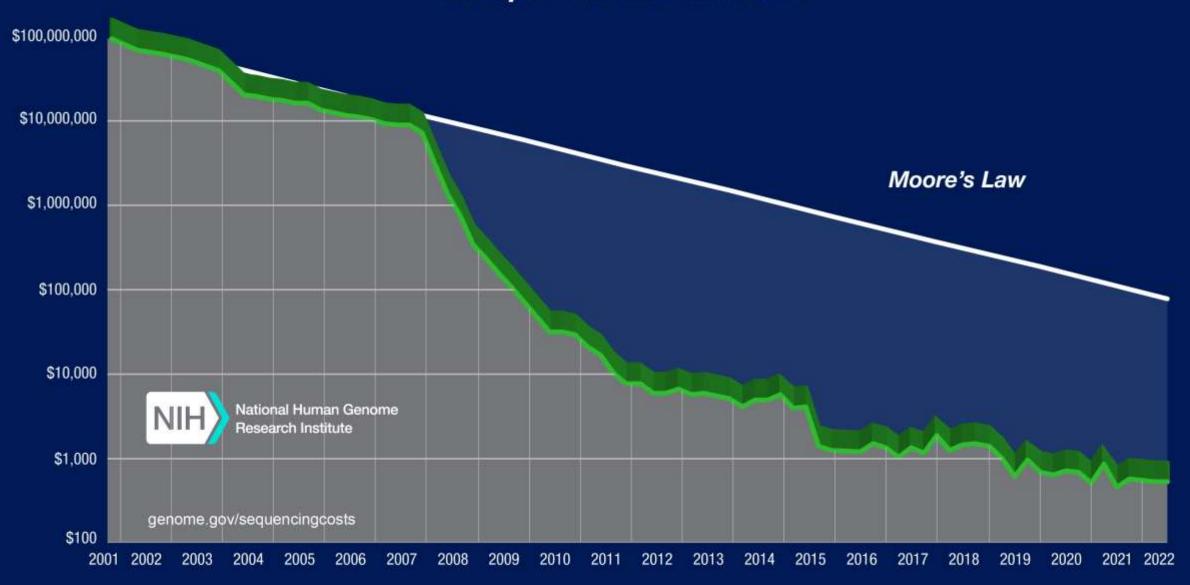
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3 billion letters a/c/g/t

Cost per Human Genome



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The best DNA gift with the most to give.

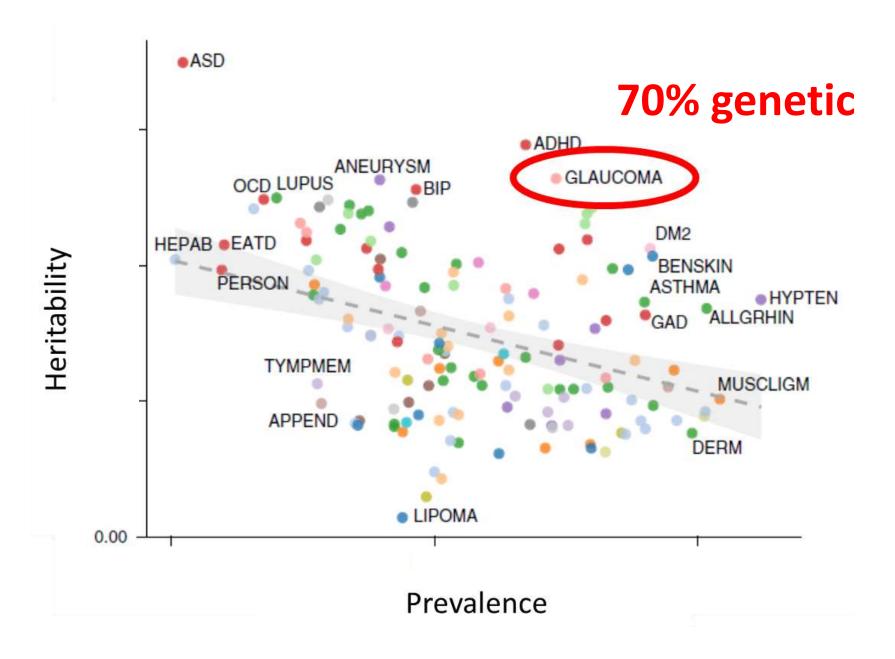


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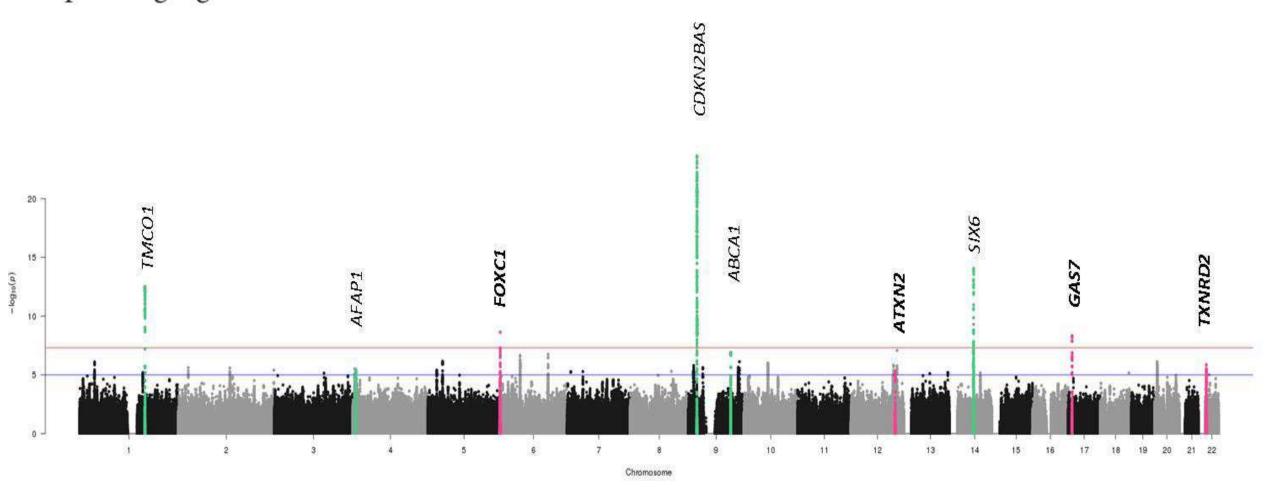
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shlist



Wang et al. Nature Genetics. 49, 1319–1325 (2017)

Genome-wide association analysis identifies *TXNRD2*, *ATXN2* and *FOXC1* as susceptibility loci for primary open-angle glaucoma





500,000 participants

22 centres

Eye measures supplement















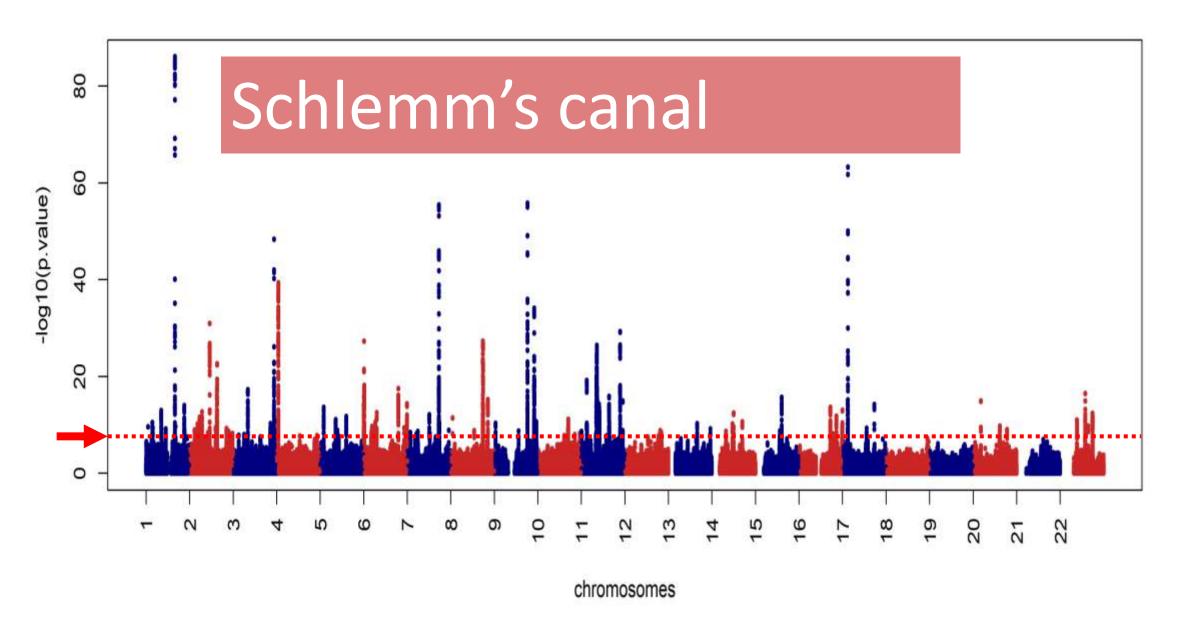




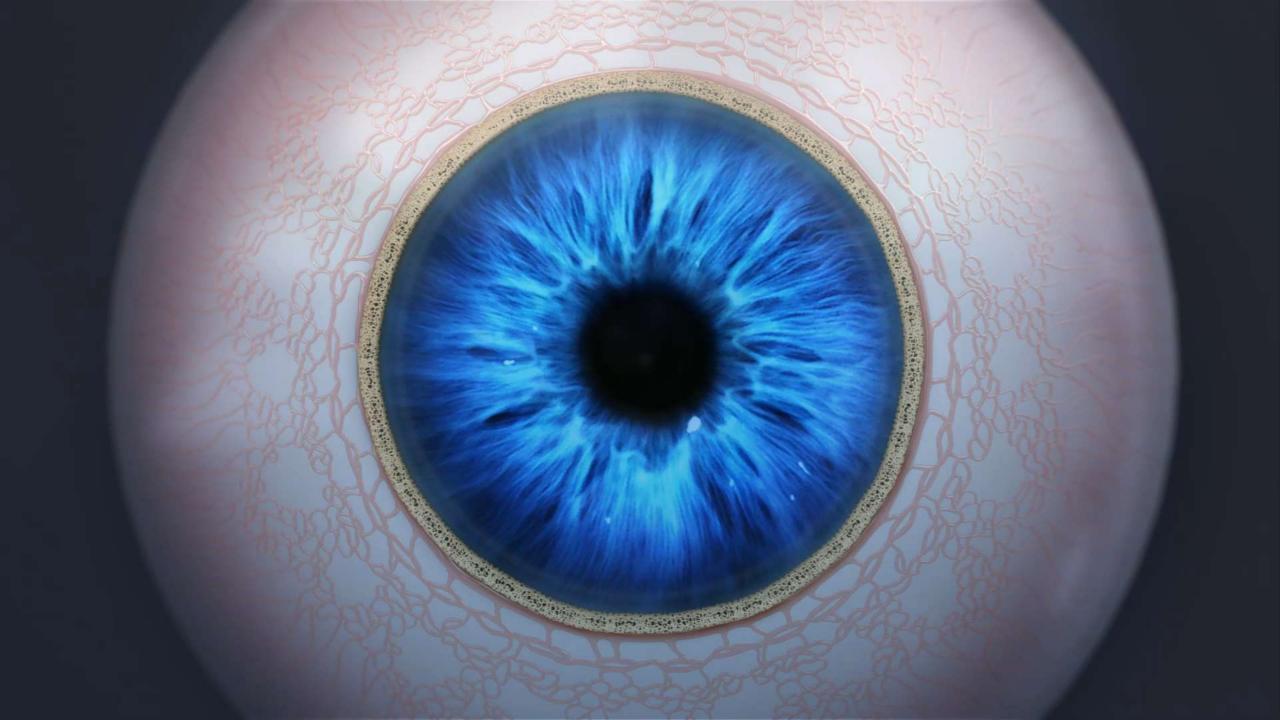








Khawaja et al, Nature Genetics, 2018





Moorfields Glaucoma BioResource

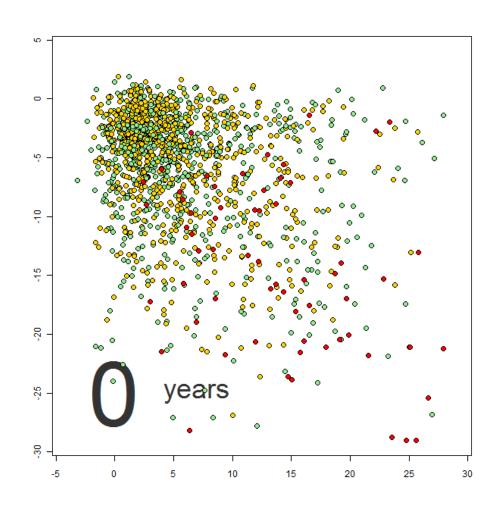


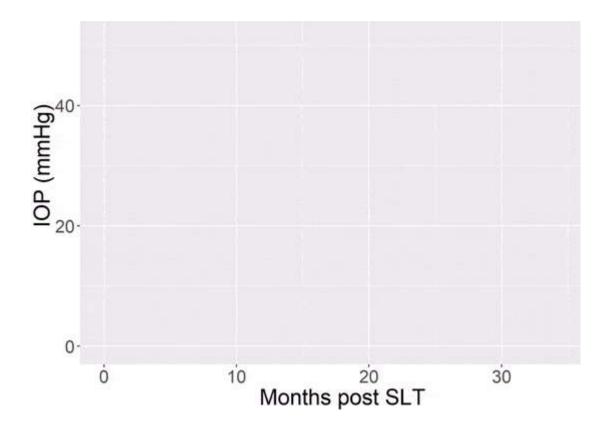


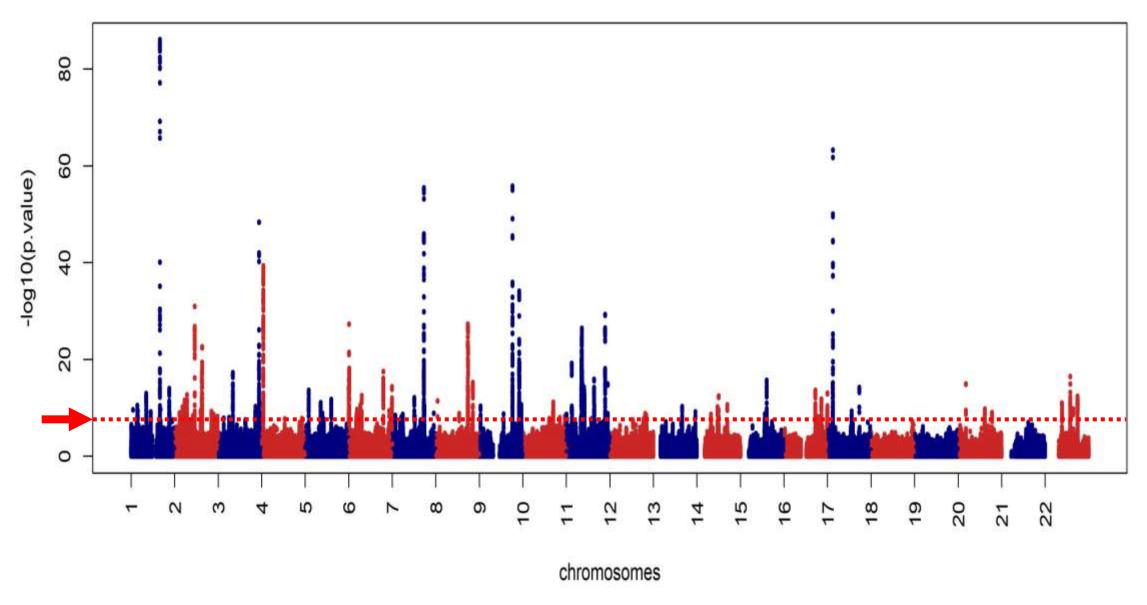
Moorfields Glaucoma BioResource







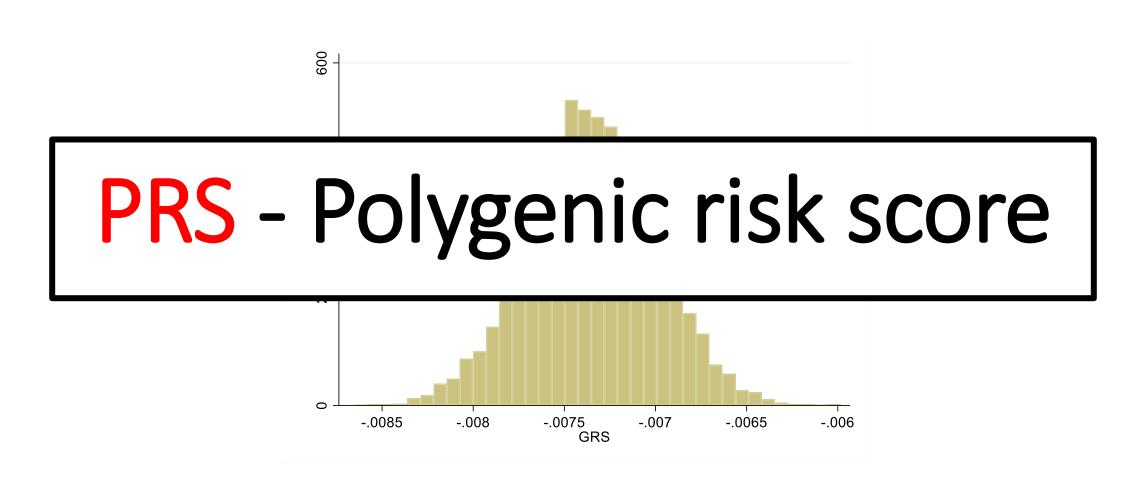




Khawaja et al, Nature Genetics, 2018

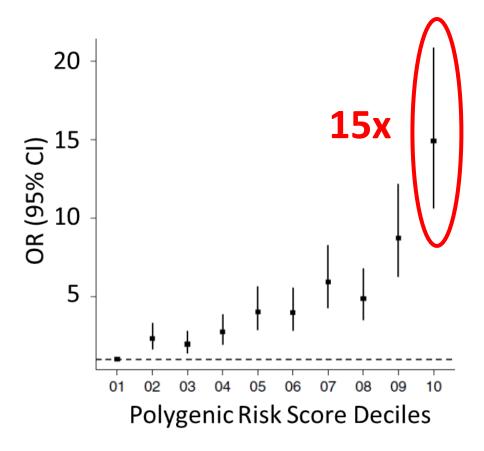
One number!

One number!



Multitrait analysis of glaucoma identifies new risk loci and enables polygenic prediction of disease susceptibility and progression

Jamie E. Craig^{1,40}, Xikun Han^{0,2,3,40*}, Ayub Qassim^{0,1,40}, Mark Hassall^{0,1}, Jessica N. Cooke Bailey^{0,4}, Tyler G. Kinzy⁴, Anthony P. Khawaja^{0,5}, Jiyuan An², Henry Marshall^{0,1}, Puya Gharahkhani^{0,2},



What can I do to help with my glaucoma?

vegetables activity food outdoors vegetarian tea
coffee sunlight fibre
coffee drugs
fruit smoking
Mediterranean drink fat diet nutrition sedentary exercise alcohol medications

activity food outdoors

Modifiable Risk Factors for Glaucoma Collaboration

Mediterrane and the Mount Sinai







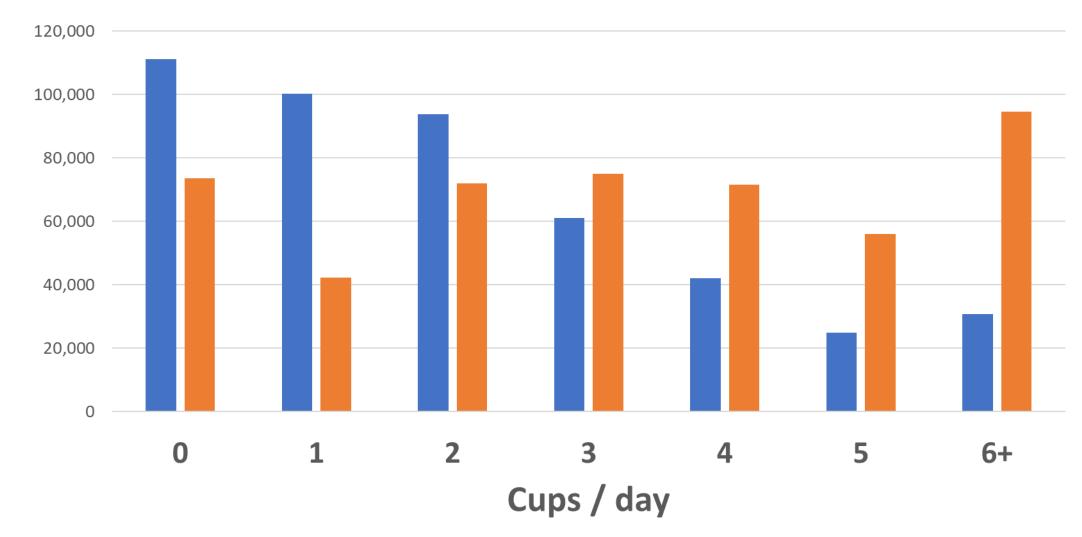
modify

neat









Oxford WebQ



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	☐ White									
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Bread	☐ Wholemeal ☐ Other- please describe: Extras:	top)		71	11			4 ()		6+

Caffeine derivation



Oxford WebQ instrument covering **24-hour recall**



Instrument repeated up to **5 times** between 2009-2012

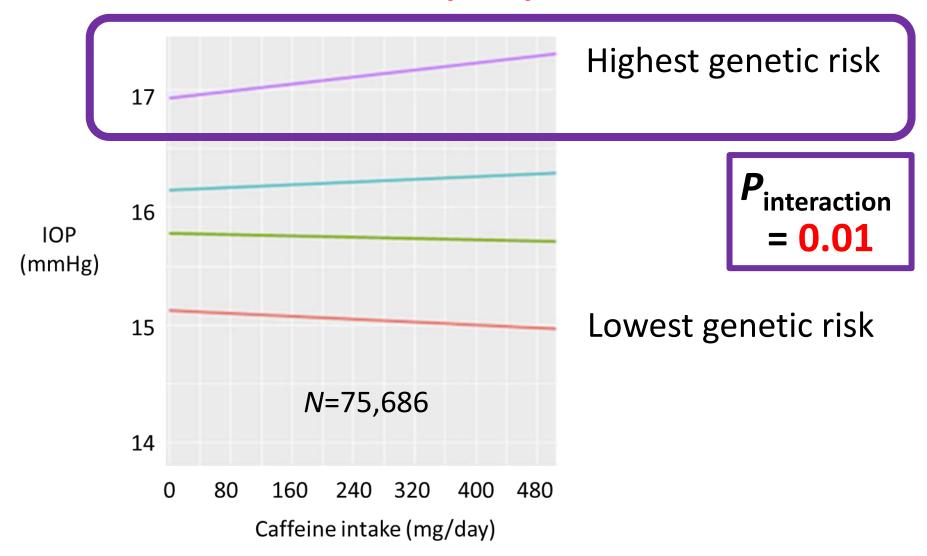


19 questions on caffeine containing foods and beverages

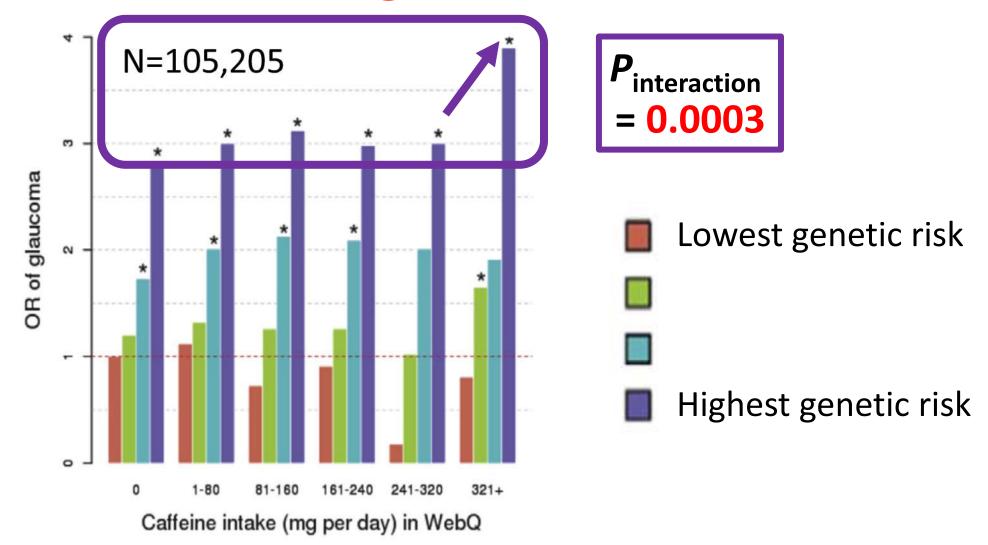


Total caffeine consumption calculated using published reports on caffeine content.

Caffeine and eye pressure

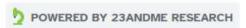


Caffeine and glaucoma





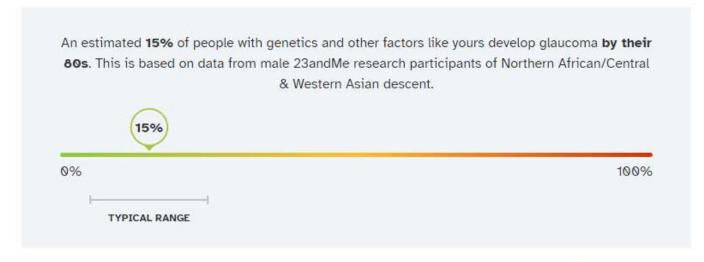
Glaucoma



Glaucoma is a group of eye conditions that occurs when the nerve in the back of the eye (called the optic nerve) is damaged, most commonly due to high eye pressure. Optic nerve damage can cause gradual vision loss that may start as blind spots or loss of side (peripheral) vision and worsen over time.



Anthony, your genetic result is associated with a **typical likelihood** of developing glaucoma.



This estimate is based on currently available data and may be updated over time.



Ways to take action

Experts agree that for people who have glaucoma caused by high eye pressure, it is important to reduce eye pressure to slow vision loss. Evidence suggests that healthy lifestyle habits may help manage eye pressure.

- Get regular, moderate exercise. Some exercises may increase eye pressure, like inverted yoga positions or headstands. Talk to your doctor about an appropriate exercise program.
- Wear eye protection to avoid injuries, such as when using power tools or playing racket sports.
- · Limit caffeine consumption.

Talk to your doctor if you notice any changes to your vision, such as reduced side (peripheral) vision or blind spots. If you have concerns about glaucoma, talk to a healthcare professional about whether getting regular dilated eye exams is right for you. You may be referred to an eye specialist, such as an ophthalmologist.



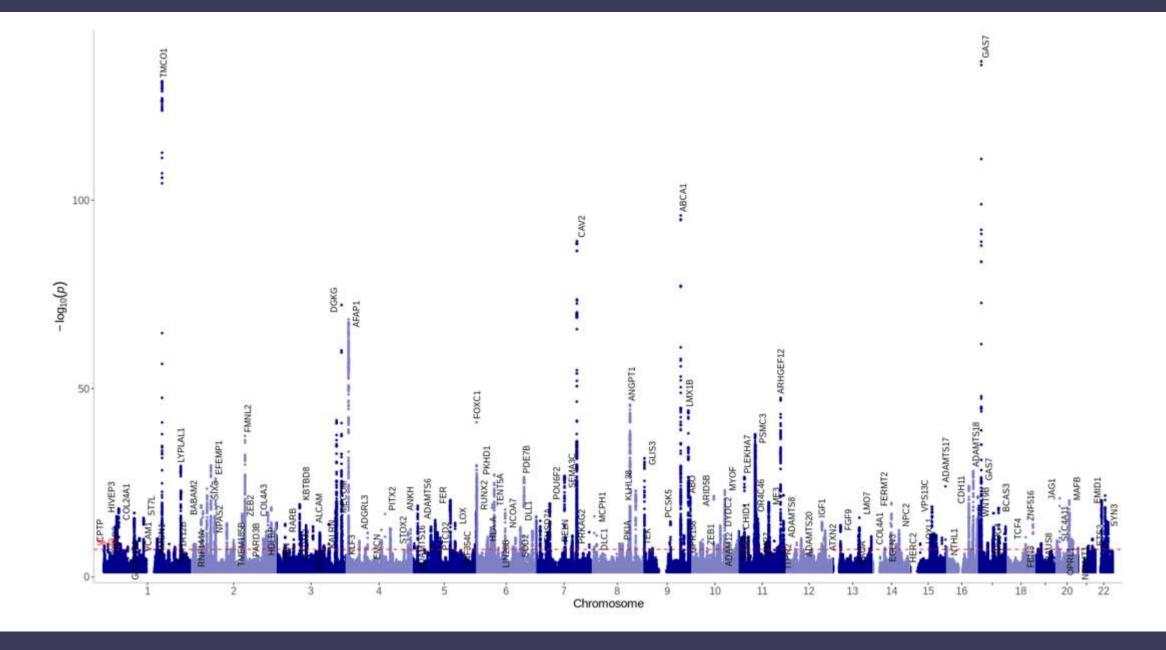
+ Our Future Health



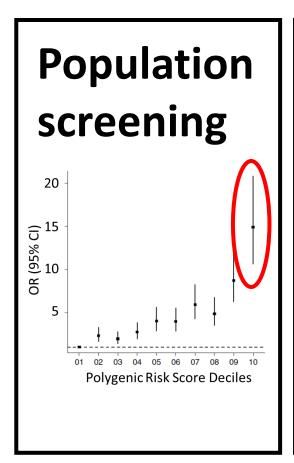
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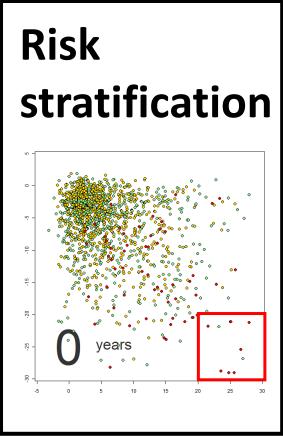
5 million adults

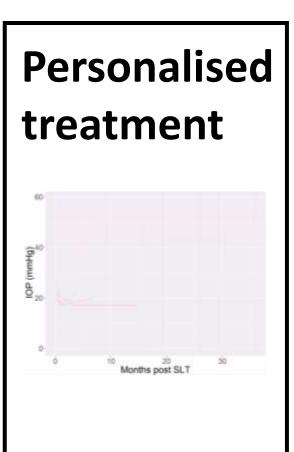


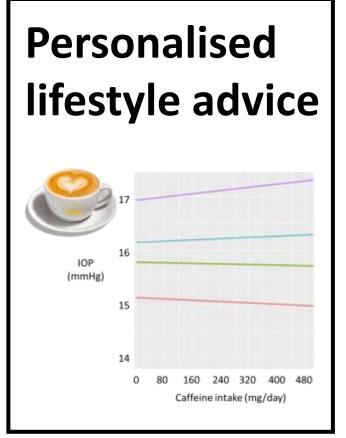


Genomics for personalised glaucoma care













Thank you













Any questions?







Thank you for attending Moorfields Annual General Meeting

The presentation and a recording of the meeting will be posted on www.moorfields.nhs.uk



