

"Risk Factors for Moderate and Severe Glaucoma in a Ghanaian Population"

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Background

- I am a third-year undergraduate at Yale University
- Majoring in Molecular, Cellular, and Developmental Biology
- Global Impact Corps Volunteer for Unite For Sight in **Accra, Ghana** in June and July of 2010



What is Glaucoma?

- Eye disease – damage to the optic nerve
- Permanent, irreversible loss of sight
- Correlated with high intraocular pressure (IOP)
- Two main types
 - Primary Open Angle Glaucoma (**POAG**)
 - GRADUAL
 - MAJORITY OF GLAUCOMA CASES
 - Primary Closed Angle Glaucoma (**PCAG**)
 - ACUTE
 - MINORITY OF GLAUCOMA CASES
- Treatment can only prevent further sight loss

EXTREME GLAUCOMA



ADVANCED GLAUCOMA



EARLY GLAUCOMA

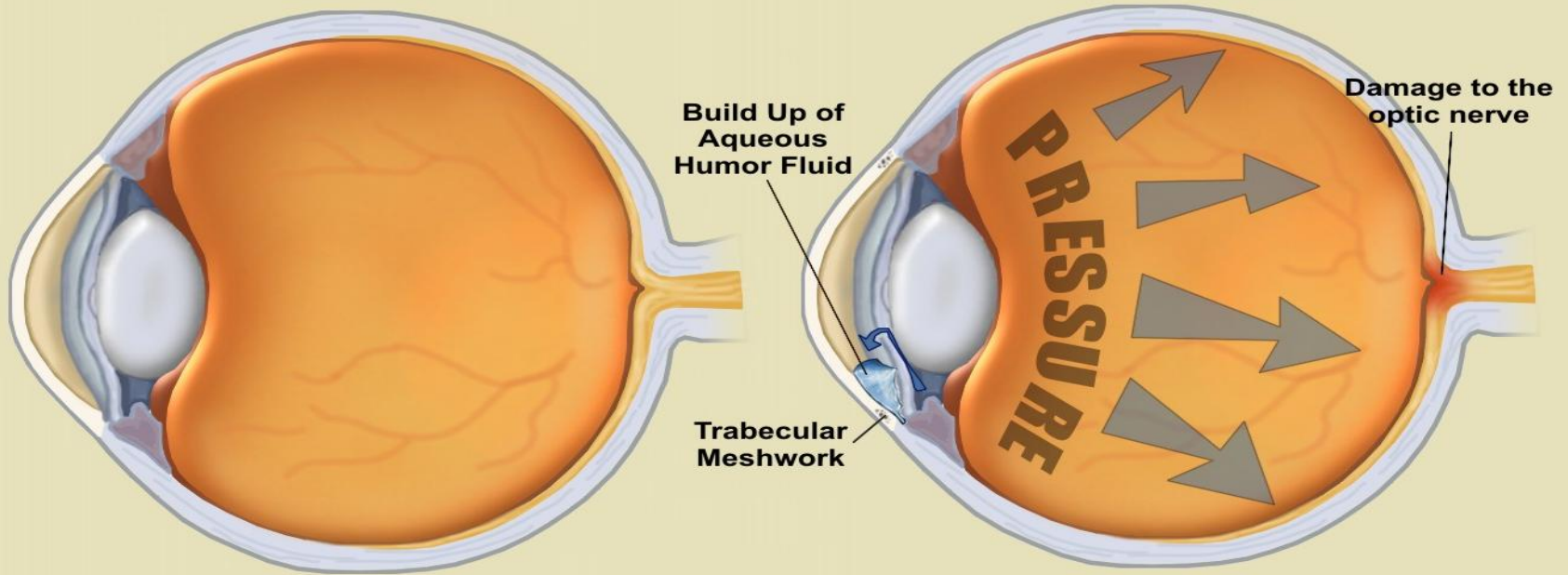


NORMAL VISION



Normal Eye

Eye with Glaucoma



Glaucoma in Ghana

- Developing Democratic Country in West Africa
- Greater impact for poor country + rural areas
- Many barriers to receiving proper eye care
 - Shortage of ophthalmologists and clinical staff
 - Financial and economic insecurity
 - Few hospitals and shortage of medical equipment
 - Low availability of care, especially in poor, rural villages and areas, transportation
 - Education



UFS in Ghana

How to Treat Glaucoma

- Early detection
 - Visual test
 - Measurements
 - Intraocular pressure
 - Cup-to-disc ratio
- Treatment with medicated eye-drops
 - Timolol is a beta-adrenergic receptor blocker that slows aqueous humor production
- Surgery
 - Goniotomy
 - Iridotomy



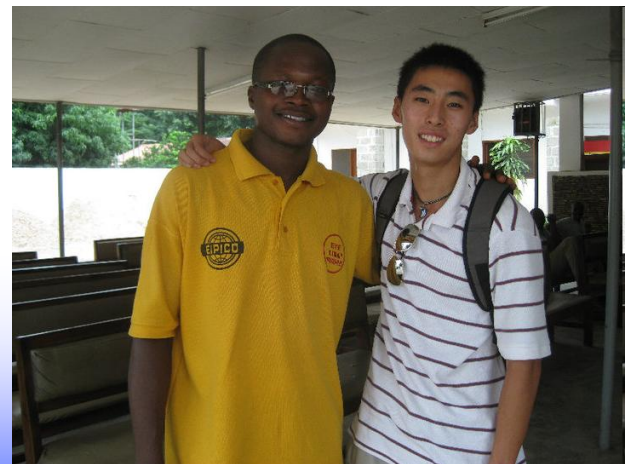
Focus on Juvenile Glaucoma



- Glaucoma symptoms usually emerge in older patients
- Earlier affliction = greater loss of sight over time
- Juvenile: Patient age < 41 years old

Study Logistics

- Month of July at Emmanuel Eye Centre in Accra, Ghana
- Under mentorship of Dr. Michael Gyasi
- Compiled glaucoma patient chart reviews and expanded existing database



Sample Size Statistics

- Sample size: # glaucomatous eyes = **1384**
 - # juvenile glaucomatous eyes = 289
 - % juvenile glaucomatous eyes = $(289/1384) =$ **20.88%**
 - **INTERESTING TREND**
 - In world-wide studies, for any sample population, ~20% glaucoma patients are juveniles



Distribution of Glaucoma Types

Glaucoma Type	# eyes	Percentage
POAG	125/289	43.3%
POAGS	95/289	32.9%
Disc Suspt	42/289	14.5%
NTG	24/289	8.3%
PACG	2/289	0.7%
SACG	1/289	0.3%

Glaucoma and Blindness (based on ISGEO standards)

Eye(s)	# eyes or patients blind	Percentage
Bilateral	3 / 148 patients	2.03%
O.D. only (right eye)	10 / 144 O.D.s	6.94%
O.S. only (left eye)	17 / 145 O.S.s	11.7%

- X²-test for OD/OS following 50:50 distribution, p<0.05... what does this mean?

Age and Sex Distribution

- Basic Stats

- Average age = 28.152

- StDev = 8.233

- Min = 10

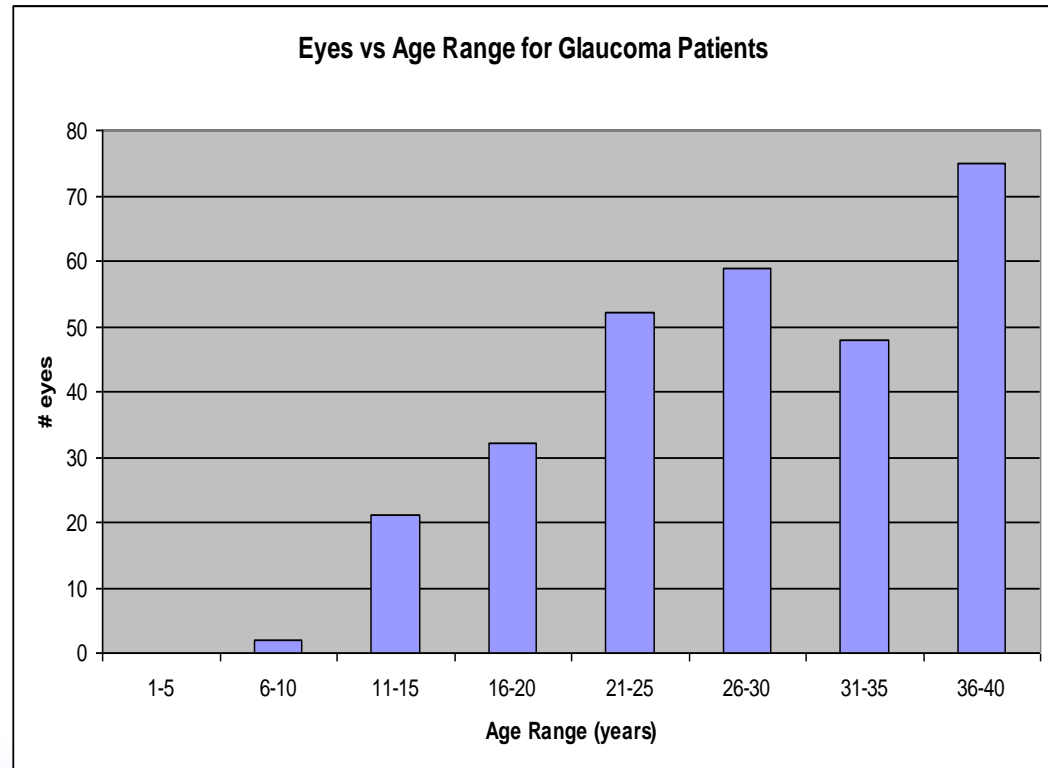
- Med = 29

- Max = 40

- Male/Female ratio

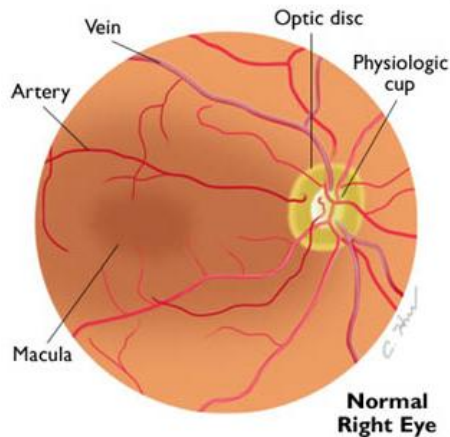
- 144 males; 145 females

- 0.993:1 male:female

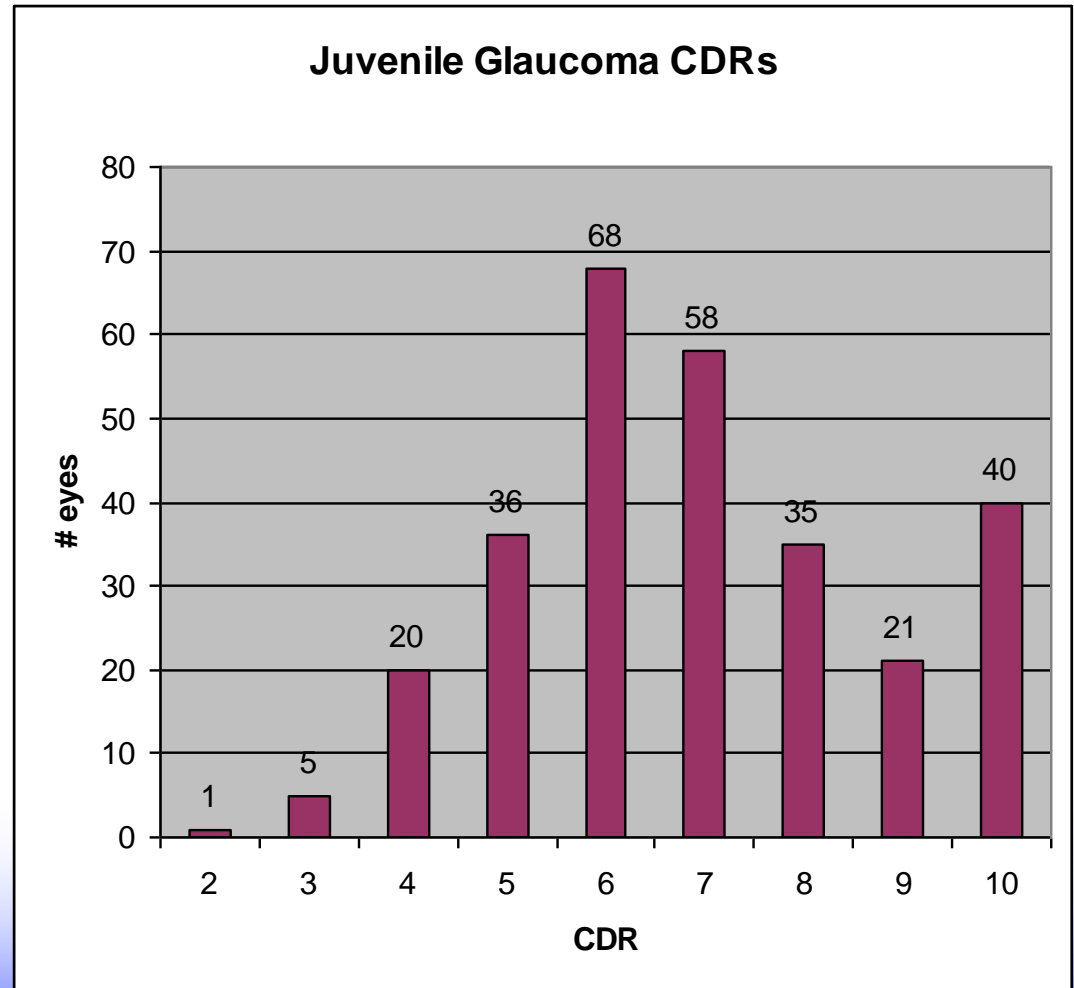


Technical Data

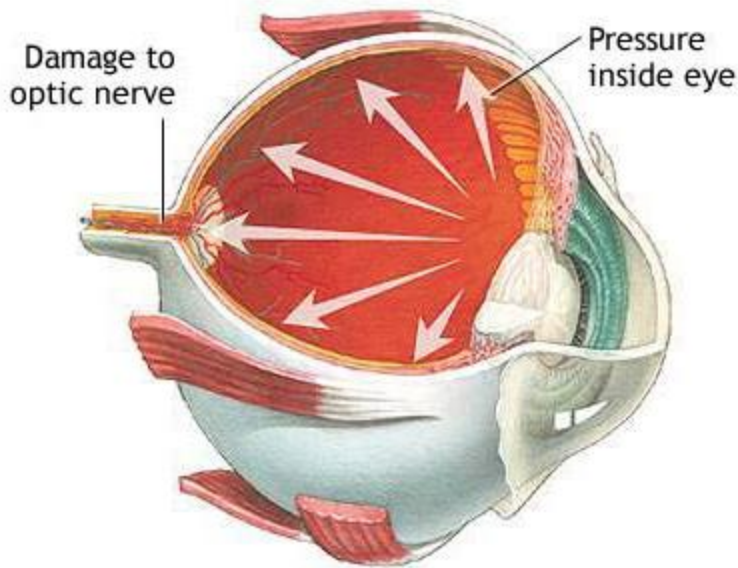
- Cup to Disc Ratio (CDR)



Average CDR = 7.7

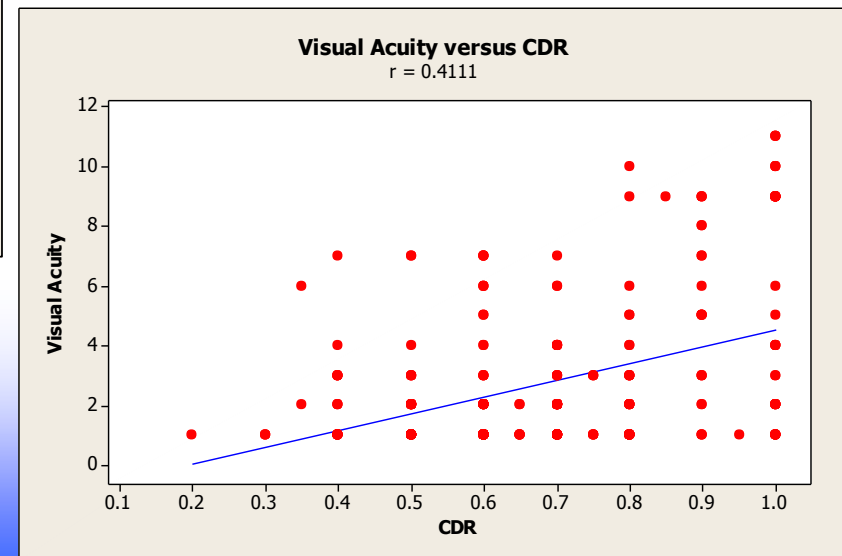
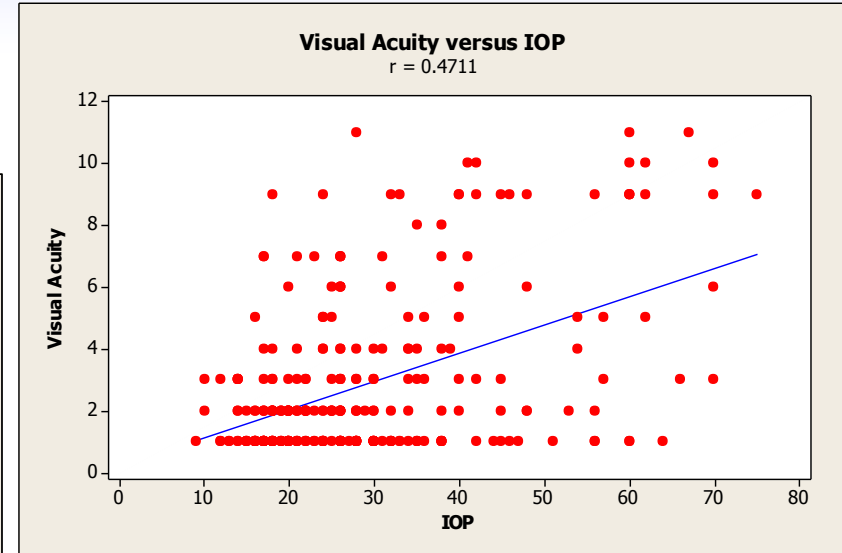
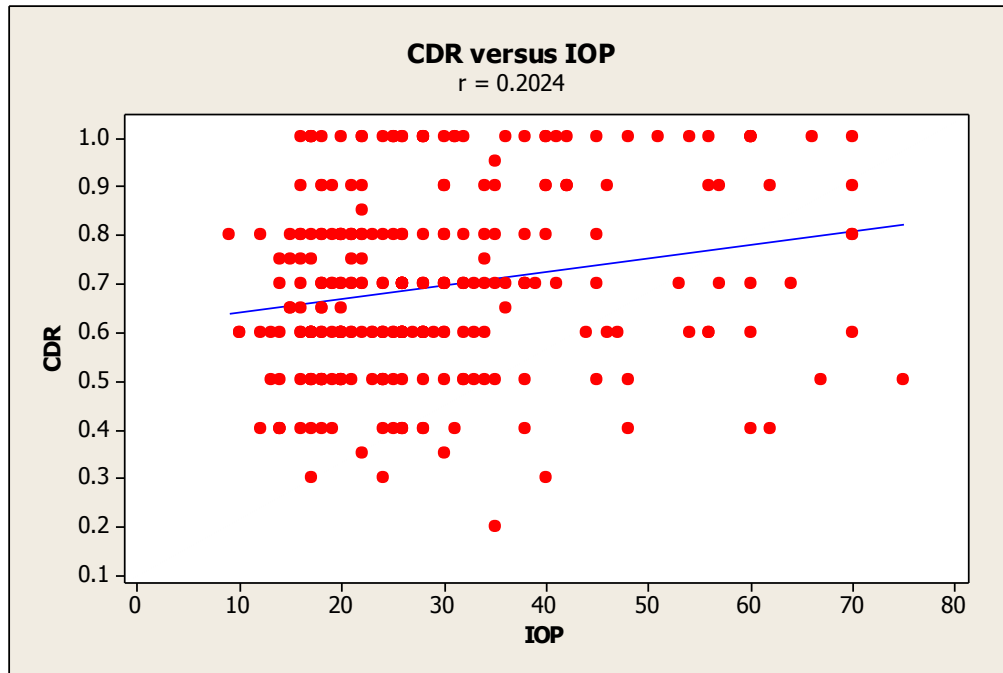


Intraocular Pressure



Eye	O.D. (Right eye)	O.S. (Left eye)
# eyes	144	145
Mean	29.01	29.06
StdDev	13.99	13.53
Min	10	9
Median	26	26
Max	75	70

Regression



So what's the big picture?

- Glaucoma is widespread in Ghana
- Juveniles are affected
- It can be **DIAGNOSED**
 - Simple measurements (Visual acuity, IOP < CDR, etc.)
- It is **TREATABLE**
 - Some components not enough data...
 - Need to reach out more!!



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Dr. Michael Gyasi

Chief Ophthalmologist at Northwestern Eye Clinic and Emmanuel Eye Centre in Accra, Ghana

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