Pilot artificial intelligence-based diabetic retinopathy screening program in Poland

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I have/had an affiliation (financial or otherwise) with a commercial organization that may have a direct or indirect connection to the content of my presentation.

Financial Interest/Affiliation	Name of Company(s)
Grant/Research support	Alcon, Pfizer
Employment/Honoraria/Consulting fees/Travel expenses	Alcon, Santen, Pfizer, Valeant, Polpharma
Major stock shareholder	None
Membership on an advisory panel, standing committee, or board of directors	None
Other financial or material interest	None

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SUMMARY

- The aim of the study was to implement a **DR screening project based on AI** on a local level in Poznan, Poland
- IDx-DR was able to analyze **78% of 450 screening episodes**.
- Among the patients analyzed, according to the single clinician reference standard, IDx-DR had **94% sensitivity and 95% specificity.**
- The percentage of poor quality images **decreased** with staff training and experience with both the fundus camera and the software.
- The final **almost 80% nonmydriatic imaging rate** was deemed satisfactory.

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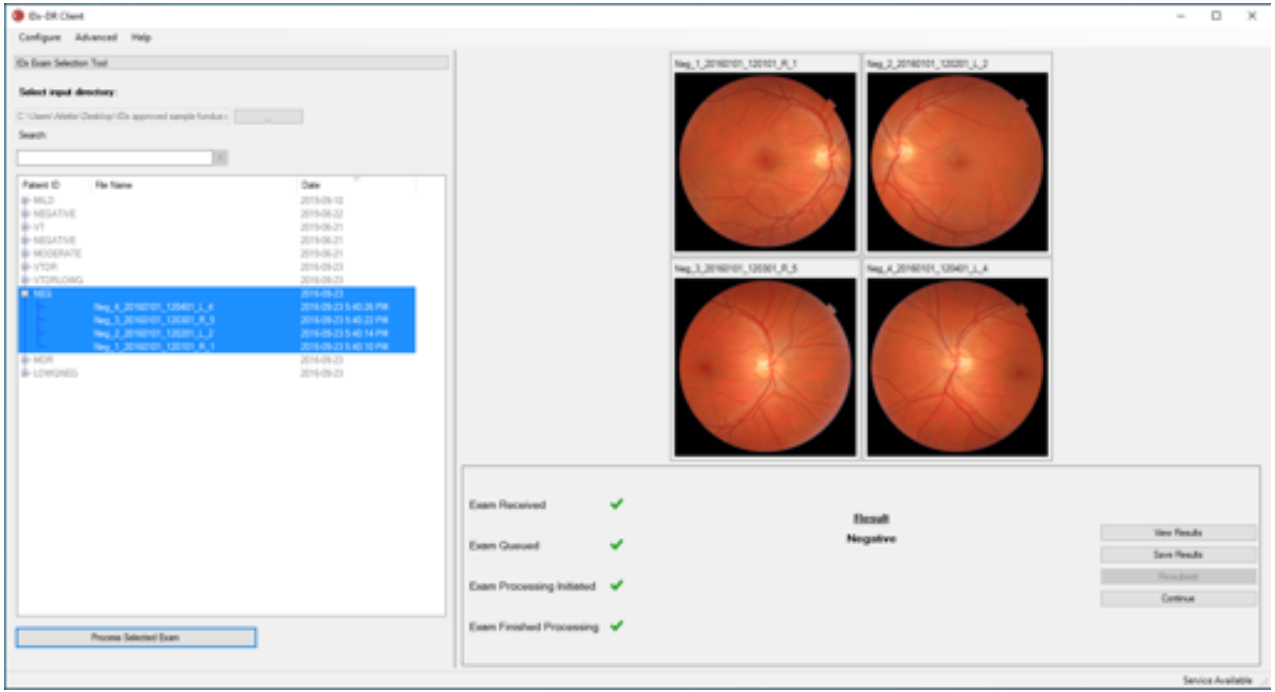
INTRODUCTION

- Prevalence of DR is expected to increase -> put an increasing strain on health care resources.
- Only a few countries were able to develop national DR screening programmes, due to sheer financial cost, personnel and organisational capabilities required.
- Autonomous, deep-learning based systems for DR detection may help alleviate the strain on healthcare resources
- The cost reduction associated with AI DR screening solutions might make it possible to implement screening on a wider, local and later national level

OBJECTIVE

- To implement a DR screening initiative based on AI on a local level in Poznan, Poland



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METHODS

- Population - adult patients who visited a diabetic clinic in Poznan, Poland for their appointments
- Non-mydriatic retinal images captured by diabetic nurses, assisted by an image quality AI, and subsequently diagnosed by the IDx-DR screening system
- Based on the AI system output – **ICDR negative** (no DR or only mild DR and no DME), **moderate retinopathy, vision-threatening retinopathy** (severe NPDR, PDR and/or DME), they are recommended **another screening after 1 year**, routine or urgent ophthalmology referral respectively
- Patients' whose image quality is still deemed insufficient by IDx-DR after re-imaging are advised to visit an ophthalmologist.
- At this stage of the study **all images are later reviewed by a single ophthalmologist**

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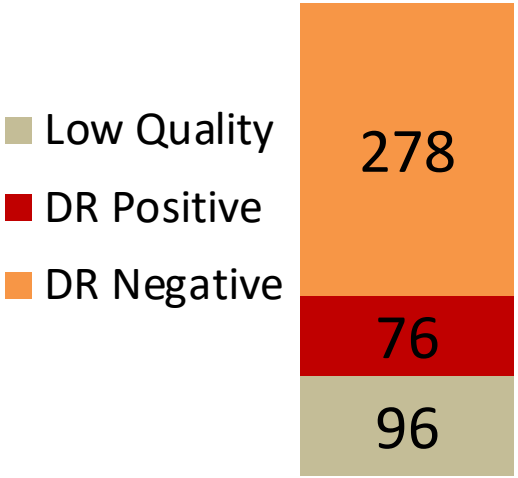
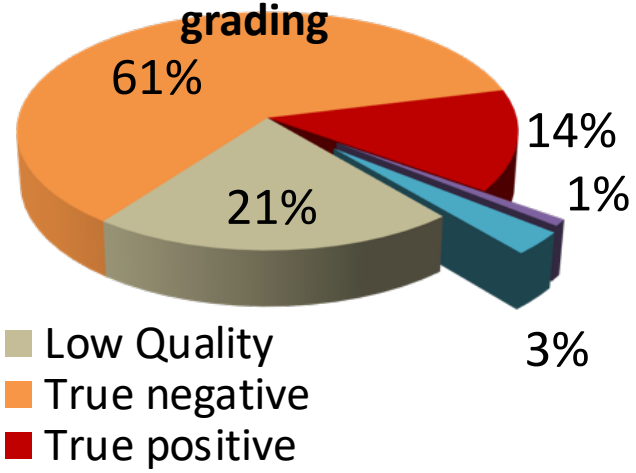
RESULTS

- ✓ initially the program was hindered by numerous obstacles related to locale, hardware, staff training and public perception issues - quickly alleviated
- ✓ IDX-DR was able to analyze 78% of screening episodes vs 82% judged sufficient by a human grader

IDX-DR output – 450 patients



Results after single-clinician grading



CONCLUSIONS

- The DR-screening process with IDx-DR for the image-analysis was easy to implement and use.
- We have reached the level of about 80% of screening episodes being analysable only after additional staff training
- According to the single clinician standard the sensitivity and specificity for the images with acceptable quality were 94% and 95% respectively
- IDX-DR can be used as an autonomous screening device (without clinician oversight)