V. Ocheretenko[1], K. Goncharuk[1], Prof. N.V. Pasyechnikova[2], Dr. A.R. Korol[2], M.D., Dr. A.A. Nevskaya[2].

Using of AI for Mass Screening of Diabetic Retinopathy
as a Disruptive Technology Implementation

1. Ukrainian diabetic federation
2. The Filatov institute of Eye Diseases and Tissue Therapy of the NAMS of Ukraine

Background

DM is the fastest growing chronic disease in the world. More than 1.5 million Ukrainians have DM (2017). The most common is DM2 - about 92%. NCDs in Ukraine, including DM, are the cause of more than 80% of lost years of potential life because of premature death and disability. DR is leading preventable vision impairment. It occurs in about a third of PWD with damaging effects that can be prevented with timely screening and treatment.

Aim

Our goal is to create a patient-centric environment for eye care where early detection with AI-driven solutions will be accessible; to increase the % accuracy during such screening of an eye fundus to over 90% which would exceed the accuracy rate of DR detection by human experts.

METHOD

MedTech startup CheckEye has partnered with the Filatov institute of Eye Diseases and Tissue Therapy of the NAMS of Ukraine to conduct training of our proprietary neural network. To train it to determine the stages and severity of DR we used 12,000 images.

Ukrainian Diabetic Federation with CheckEye conduct screening in the Chernivtsi region on a cloud-based AI and machine learning-based DR diagnostic platform. The platform analyzes photographs of the patient's eye fundus, making diagnosis available to thousands of people especially in rural areas, where there is little access to modern diagnostics.

RESULTS

We achieved 84% accuracy in detecting DR with AI-driven solution during the screening of an eye fundus. We would aim to increase the % of accuracy in detecting DR to over 90%.

Patient-centric approach environment for eye care where early detection is accessible across a multitude of locations will be created. Wider effects of this approach will include reducing an economic burden of vision impairment and it will help millions of people to prevent vision loss.

CONCLUSIONS

We have achieved a high level of DR detection which is comparable to known similar systems. However, our system has the potential for improvement to increase detection accuracy by 90% or more.

The Filatov Institute

CHECK EYE

References.
1. «Atlas: Diabetes in Ukraine», 2021
2. «Register of people with diabetes who require insulin therapy», 2021
3. «Using AI for diabetic retinopathy screening» R. Raman, 2021
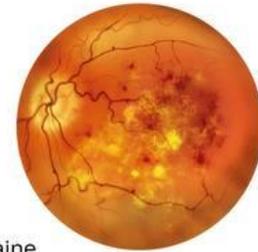
V. Ocheretenko1, K. Goncharuk1, Prof. N.V. Pasyechnikova2, Dr. A.R. Korol2, M.D., Dr. A.A. Nevskaya2.

Using of AI for Mass Screening of Diabetic Retinopathy

as a Disruptive Technology Implementation

1. Ukrainian diabetic federation

2. The Filatov institute of Eye Diseases and Tissue Therapy of the NAMS of Ukraine

Background

DM is the fastest growing chronic disease in the world. More than 1.5 million Ukrainians have DM (2017). The most common is DM2 - about 92%. NCDs in Ukraine, including DM, are the cause of more than 80% of lost years of potential life because of premature death and disability. DR is leading preventable vision impairment. It occurs in about a third of PWD with damaging effects that can be prevented with timely screening and treatment.

METHOD

MedTech startup CheckEye has partnered with the Filatov institute of Eye Diseases and Tissue Therapy of the NAMS of Ukraine to conduct training of our proprietary neural network. To train it to determine the stages and severity of DR we used 12,000 images.

Ukrainian Diabetic Federation with CheckEye conduct screening in the Chernivtsi region on a cloud-based AI and machine learning-based DR diagnostic platform. The platform analyzes photographs of the patient's eye fundus, making diagnosis available to thousands of people especially in rural areas, where there is little access to modern diagnostics.

CONCLUSIONS

We have achieved a high level of DR detection which is comparable to known similar systems. However, our system has the potential for improvement to increase detection accuracy by 90% or more.

References.

1. << Atlas: Diabetes in Ukraine»>, 2021

2. <<Register of people with diabetes who require insulin therapy», 2021

3. «Using AI for diabetic retinopathy screening» R. Raman, 2021

Aim

Our goal is to create a patient-centric environment for eye care where early detection with AI-driven solutions will be accessible; to increase the % accuracy during such screening of an eye fundus to over 90% which would exceed the accuracy rate of DR detection by human experts.

RESULTS

We achieved 84% accuracy in detecting DR with AI-driven solution during the screening of an eye fundus. We would aim to increase the % of accuracy in detecting DR to over 90%.

Patient-centric approach environment for eye care where early detection is accessible across a multitude of locations will be created. Wider effects of this approach will include reducing an economic burden of vision impairment and it will help millions of people to prevent vision loss.

K

The Filatov Institute

CHECK EYE