

# Applying AI for the good of humanity, a tool for early detection of preventable blindness in diabetes patients is here

written by InvestorNews | July 20, 2023

Is Artificial Intelligence (AI) going to save the world? Likely not if you are a fan of the Terminator series made famous by Arnold Schwarzenegger or the Dune novels written by Frank Herbert, amongst other potential humanity ending scenarios. But until AI becomes self-aware, there is certainly a lot of good the data processing and analysis tools provided through machine learning can do to help humanity achieve significant improvements to our health and well-being until we all become slaves to our computer overlords.

One publicly traded company using AI that doesn't already have a Trillion dollar market cap is [DIAGNOS Inc.](#) (TSXV: ADK | OTCQB: DGNOF). DIAGNOS is a Canadian corporation dedicated to the early detection of critical health problems based on its FLAIRE Artificial Intelligence (AI) platform. FLAIRE allows for quick modifying and developing of applications such as CARA (Computer Assisted Retina Analysis). CARA's image enhancement algorithms provide sharper, clearer and easier-to-analyze retinal images. CARA is a cost-effective tool for real-time screening of large volumes of patients. CARA has been cleared for commercialization by the following regulators: Health Canada, the FDA (USA), CE (Europe), COFEPRIS (Mexico) and Saudi FDA (Saudi Arabia).

DIAGNOS primarily markets CARA as a software platform which

assists health specialists in the detection of diabetic retinopathy. [Diabetic retinopathy](#) (also referred to as macular edema) is a diabetes complication that affects the eyes. It's caused by damage to the blood vessels of the light-sensitive tissue at the back of the eye (retina). At first, diabetic retinopathy might cause no symptoms or only mild vision problems, but it can lead to blindness. The condition can develop in anyone who has type 1 or type 2 diabetes.

A patient may experience no symptoms of diabetic retinopathy until the condition becomes severe. Early detection and treatment can prevent 85% to 95% of blindness cases. Thus it makes a lot of sense that everyone with diabetes gets screened for diabetic retinopathy at least once a year due to the fact that it is estimated that up to 347,000 people every year could go blind from a curable disease if they aren't screened early enough. This seems like a very good use of AI for the betterment (and not enslavement) of humanity.

In February, DIAGNOS and École de Technologie Supérieure (ÉTS), a world-renowned technical university [announced](#) that they would be presenting the results of their ground-breaking research on mass screening for macular edema using Optical Coherence Tomography (OCT) at ARVO 2023, the Annual Conference of the Association for Research in Vision and Ophthalmology (ARVO). The screening process for macular edema has been revolutionized by the research carried out by DIAGNOS and ÉTS, resulting in impressive efficiency of algorithms, fidelity of the "heat map" type decision-making tool, and an extremely low rate of "false positives." It is anticipated that DIAGNOS' AI-enabled screening process could become the go-to method adopted by healthcare professionals in the future.

I'm not worried about the AI being deployed by DIAGNOS taking over the world anytime soon. However, I am excited to see where

this Company goes next. I can't help but think it's a good thing to become the de facto tool for early detection of preventable blindness in diabetes patients. That's got to be worth something. But there's also the springboard of having a successful platform in place to build off of. Time will tell if this AI story starts making headlines with all the rest of them out there.

DIAGNOS Inc. trades at a market cap of C\$35 million.

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# The EYES have it, Early Stage Detection of Diabetes and Cardiovascular Disease

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Using Artificial Intelligence (AI) to better image and analyze the retina of the eye to detect early stage disease is a potential game changer in the prevention of blindness and cardiovascular diseases such as stroke, heart attack, and diabetic related disease.

Today's company is pioneering its work in this field with [USA clinical trials](#) commencing soon and a global commercialization rollout already underway. The company is [Diagnos Inc.](#) (TSXV: ADK | OTCQB: DGNOF) ("DIAGNOS").

DIAGNOS has developed an Artificial Intelligence (AI) tele-ophthalmology platform, which uses Computer Assisted Retina Analysis (CARA) to examine a patient's retina (back of the eye) for the early detection of diseases, such as diabetes, and

conditions such as cardiovascular disease, hypertension and stroke. CARA's image enhancement algorithms provide sharper, clearer and, thus, easier-to-analyze retinal images.

CARA has been cleared for commercialization by the following regulators: Health Canada, the FDA (USA), CE (Europe), COFEPRIS (Mexico) and Saudi FDA (Saudi Arabia). DIAGNOS already operates in [16 countries](#), with 131 screening sites, has 222,034 patients under their care, and has performed more than [400,000](#) retinographies around the world. DIAGNOS' CARA achieves great precision in diabetic retinopathy pre-diagnoses, reaching a sensitivity of 98.4%, specificity of 97.6% and [a certainty of 97.9%](#).

**DIAGNOS uses an AI technology know as CARA to better analyze the retina of the eye, a key way to detect early cardiovascular disease**



Source: [DIAGNOS website](#)

**DIAGNOS achieves two firsts and an eight at the GAMMA (Glaucoma grAding from Multi-Modality imAges) contest**

At the recent GAMMA competition, DIAGNOS achieved some stunning results including [two firsts and an eighth place out of a total of 566 teams](#). Now that's super impressive!

The October 28, 2021 announcement [stated](#): "DIAGNOS was the only one, of the top 8 teams, that competed with a marketed, commercialized system. DIAGNOS used the same platform that it currently uses for diabetic retinopathy screening, which is marketed worldwide, while the others were principally from academic institutions."

Key results included:

- Localization of macula fovea in fundus images. (**DIAGNOS placed 1<sup>st</sup> overall**)
- Segmentation of optic disc and cup in fundus images. (**DIAGNOS placed 1<sup>st</sup> overall**)
- Grading glaucoma using multi-modality data. (**DIAGNOS placed 8<sup>th</sup> overall**)

## **USA clinical trial for the early detection and prevention of stroke using CARA-STROKE**

On November 23 DIAGNOS [announced](#): “DIAGNOS will start a clinical trial study in the USA commencing December 6th, 2021 for early detection and prevention of stroke using CARA-STROKE.” The trial aims to confirm early Proof-of-Concept results that showed a strong potential in the early detection of stroke through the inspection and micro circulation analysis of the retina.

The upcoming USA clinic trial at the CommonSpirit Health Research Institute, Chattanooga Center for Neurologic Research LLC, is intended to further prove the effectiveness of DIAGNOS’s CARA technology.

Note: CommonSpirit Health is a non-profit national Catholic healthcare system that operates 137 hospitals and more than 1,000 care sites across 21 states of the USA.

## **Some facts about cardiovascular disease including stroke**

- Stroke causes 1 out of every 20 deaths.
- The management of stroke represents a cost of around US\$34 billion per year in the United States.
- According to the WHO, 15 million people suffer a stroke worldwide each year. Of these, 5 million die and another 5 million are permanently disabled.
- Europe averages approximately 650,000 stroke related

deaths each year.

- Worldwide Research Institutes says that the worldwide market size for stroke management will hit over \$66 billion by 2023.

Source: [DIAGNOS announcement](#)

Clearly, the above facts speak volumes as to the need to diagnose cardiovascular disease early. And that is exactly what DIAGNOS does.

### **Not just an idea, commercialization has begun**

As previously discussed in some detail [here](#), DIAGNOS commercialization is gaining momentum. Some examples include:

- [July 22, 2021](#) – DIAGNOS announced the official opening of the AI Assisted screening clinic at Magrabi Hospital in Saudi Arabia. Magrabi Hospitals and Centers has **thirty-four branches in the Middle East**.
- [July 28, 2021](#) – DIAGNOS announced a pilot in Spain with three franchisees from Opticalia Group.
- [August 16, 2021](#) – DIAGNOS announced signing a Memorandum of Understanding (MoU) for a distribution agreement with Essilor International. **Essilor International is the world's leading ophthalmic optics company.**
- [September 2, 2021](#) – DIAGNOS announced a three-year contract renewal with Optina Diagnostics providing a Telemedicine Platform to support their early detection of Alzheimer's Disease.
- [September 14, 2021](#) – DIAGNOS announced a 3-year contract with Cielo Vista Eye Clinic in Mexico.
- [September 16, 2021](#) – DIAGNOS announced a multi-year contract with Juarez Health & Medical Tourism Cluster in Mexico, who focuses on medical tourism and **serves between 10-12,000 patients a day.**

## Closing remarks

DIAGNOS's CARA technology is clearly a winner. It has already won numerous global contracts and the recent GAMMA competition. Any potentially positive results from the upcoming CommonSpirit Health Research Institute clinical trial would just be icing on the cake.

With 15 million people suffering a stroke worldwide each year the time has come for better early diagnosis to allow earlier treatment and prevention, potentially reducing this terrible statistic.

Diagnos Inc. trades on a market cap of just [C\\$30 million](#) which seems very small when compared to the massive market for cardiovascular disease diagnosis. One to follow closely in the years ahead.

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# Eyes on DIAGNOS as commercialization gains momentum

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The best time to buy an emerging company is when it begins commercialization. At this stage all the hard years of product development and certification are done and, if successful, the revenues are about to flow. Today's company looks to be in just that stage.

[Diagnos Inc.](#) (TSXV: ADK | OTCQB: DGNOF) ("DIAGNOS") has

developed its FLAIRE Artificial Intelligence (AI) tele-ophthalmology platform, which uses Computer Assisted Retina Analysis (CARA) to examine a patient's retinas in their eyes for the early detection of diseases, such as diabetes, and of conditions such as cardiac hypertension and stroke. CARA's image enhancement algorithms provide sharper, clearer and easier-to-analyze retinal images.

CARA has been cleared for commercialization by the following regulators: Health Canada, the FDA (USA), CE (Europe), COFEPRIS (Mexico) and Saudi FDA (Saudi Arabia). DIAGNOS already operates in [16 countries](#), 131 screening sites, has 222,034 patients under their care, and has performed more than [400,000](#) retinographies around the world. DIAGNOS' CARA achieves great precision of diabetic retinopathy pre-diagnoses, reaching a sensitivity of 98.4%, specificity of 97.6% and [a certainty of 97.9%](#).

### **DIAGNOS has a significant and growing global business**



Source: [DIAGNOS website](#)

### **DIAGNOS commercialization is gaining momentum**

The following recent news items give a feel for how fast DIAGNOS is moving in their global rollout:

- [July 22, 2021](#) – DIAGNOS announced the official opening of the AI Assisted screening clinic at Magrabi Hospital in Saudi Arabia. In the country the incidence of diabetes is about 27% of the population, hence the clinic hopes to play a key role in the diagnosis of diabetic retinopathy which can lead to gradual complete loss of vision. Magrabi Hospitals and Centers has thirty-four branches in the Middle East. DIAGNOS President, André Larente, [stated](#): “We



extend our best wishes to Magrabi hospitals. We would also like to thank everyone in attendance for their time and efforts in making this project a reality. The main beneficiaries will be many thousands of diabetic patients whose vision can now be protected through this collaboration.”

- [July 28, 2021](#) – DIAGNOS announced a pilot in Spain with three franchisees from Opticalia Group.
- [August 16, 2021](#) – DIAGNOS announced signing a Memorandum of Understanding (MoU) with Essilor International. The MoU is non-binding and **forms the basis of a potential distribution agreement with Essilor International for DIAGNOS’ CARA platform. Essilor International is the world’s leading ophthalmic optics company.** Essilor designs, manufactures and markets a wide range of lenses and diagnostic ophthalmic instruments. DIAGNOS President Larente [commented](#): “DIAGNOS is focused on its commercialization strategy and pursuing opportunities with potential partners. **We are very pleased that our AI-based technology has attracted the attention of global eyecare sector leaders such as Essilor International** and we are looking forward to our discussions with respect to a mutually beneficial potential worldwide distribution agreement.”
- [September 2, 2021](#) – DIAGNOS announced a three-year contract renewal with Optina Diagnostics providing a Telemedicine Platform to support their early detection of Alzheimer’s Disease.
- [September 14, 2021](#) – DIAGNOS announced a 3-year contract with Cielo Vista Eye Clinic in Mexico. DIAGNOS will supply its CARA platform and enable Cielo to screen its patients for Diabetic Macular Edema and Diabetic Retinopathy.
- [September 16, 2021](#) – DIAGNOS announced a multi-year contract with Juarez Health & Medical Tourism Cluster in

Mexico. The Cluster is the only certified health network in the country of Mexico, focuses on medical tourism, and serves between 10-12,000 patients a day.

### **Magrabi Hospitals launches initiative for early screening for diabetic retinopathy using DIAGNOS's CARA platform in Saudi Arabia**



Source: [Diagnos Inc.](#)

Other earlier commercialization deals have been done with [Óptica Central](#) (third largest optical retailer in Costa Rica), a distribution agreement in Europe with [Diagnos Europe GmbH](#), and [IRIS The Visual Group Inc.](#) (Canada) including the New Look Vision network (North America).

### **Revenues forecast to soar from now to 2023**

As you can see just from the recent news above, DIAGNOS is having significant success in commercializing its products globally. As a result of this, revenue is forecast to increase dramatically from C\$270,000 in 2021 to C\$800,000 in 2022, and [C\\$7,920,000 in 2023](#). If achieved the Company is forecast to be profitable and trade on a [forecast 2023 PE of 16.0](#).

### **Closing remarks**

DIAGNOS Inc. trades on a current market cap of [C\\$33 million](#). Global commercialization of their FLAIRE/CARA ophthalmology platform is clearly gaining momentum which should lead to rapidly growing revenues. The medical technology space can exhibit rapid growth once a new technology gains market share or becomes a leader. Stay tuned.

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# Expanding globally in the AI image based diagnosis sector, Diagnos is actively commercializing their CARA technology

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CARA's Artificial Intelligence image enhancement algorithms make standard retinal images sharper, clearer and easier to read. CARA is accessible securely over the internet, and is compatible with all recognized image formats and brands of fundus cameras, and is EMR compatible. Targeting the early detection of these diseases by using AI to better examine and diagnose patients as early as possible is the focus for [Diagnos Inc.](#) (TSXV: ADK | OTCQB: DGNOF) ('Diagnos').

Diagnos uses an Artificial Intelligence (AI) tool known as CARA (Computer Assisted Retina Analysis) to examine patient's retinas in the eye for the early detection of diseases such as diabetics, hypertension and other cardiovascular disease. CARA is a tele-ophthalmology platform that integrates with existing equipment (hardware and software). CARA's AI image enhancement algorithms make standard retinal images sharper, clearer and easier to read.

Key winning features of CARA:

- CARA is accessible securely over the internet and is

compatible with all recognized image formats and brands of fundus cameras.

- CARA is a cost-effective tool for screening large numbers of patients in real-time.
- CARA complies with local regulations, is FDA cleared for commercialization in the United States of America, is Health Canada licensed for commercialization in Canada, licensed by the Saudi FDA, COFEPRIS in Mexico and is CE marking compliant in Europe.

### **Diagnos' AI software enhances the ability to detect early-stage cardiovascular disease by viewing the retina of the eye**



Source: [www.diagnos.ca/](http://www.diagnos.ca/)

Diagnos has already had their CARA platform in production since mid-February 2020 and will be following with further applications and enhancements for the technology. Diagnos already operates in [16 countries](#), 131 screening sites, and has 222,034 patients under their care. The Company is fully funded until about [mid 2022](#) and should continue to grow revenues as their CARA platform commercializes further.

### **Diagnos operates in 16 countries and has 222,034 patients under care**



Source: [www.diagnos.ca/](http://www.diagnos.ca/)

The latest news just the past month shows how quickly Diagnos is commercializing. For example:

- [24 February, 2021](#) – Exclusive Strategic Partnership Agreement with Labtician Ophthalmics, a leader in Canadian

and International eyecare markets. Labtician Ophthalmics has customers across Canada and will introduce and commercialize Diagnos' AI platform to monitor ocular health and improve patient care in diabetic patients.

- [2 February, 2021](#) – Further deployment of Diagnos' AI based CARA Technology in Saudi Arabia. Dr. Salman Abdullah Al-Mutairi, Executive Director of Enayah Charitable Association [stated](#):

“For almost three years, Enayah has been using DIAGNOS' AI based CARA platform successfully to screen thousands of diabetic patients for diabetic retinopathy with an early detection test. By using DIAGNOS' telemedicine solution we have been able to identify patients needing care early so their vision can be saved. As part of our “Combating Blindness” program, we are extremely pleased to extend this service and add it to other tests in our fleet of vans of Mobile Smart Eye Clinics.”

### **Closing remarks**

Diagnos Inc. is in the early days of commercializing their CARA technology having only begun in mid-February 2020, approximately a year ago. This is good news for investors as the company is trading on a market cap of just C\$39 million.

I see (no pun intended) exciting times ahead for this company in a potentially huge market.

- [Diagnos' Andre Larente on the benefits of using AI for the early detection of critical health issues \(video\)](#)
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# Thompson on DIAGNOS and the ‘exploding’ AI healthtech industry

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## ***AI Healthcare Provider Diagnos Continues to Sign Deals and Partnerships Amid COVID-19 Crisis***

[Diagnos Inc.](#) (TSXV: ADK | OTCQB: DGNOF | FSE:4D4A), a software platform provider for the early detection of critical health issues through the use of Artificial Intelligence (“AI”) and Machine Learning (“ML”), continues to sign deals and partnerships amid the current COVID-19 health crisis.

Diagnos’ CARA (“Computer Assisted Retina Analysis”) telemedicine platform, delivers eye care and disease diagnosis through standard fundus photography, which involves photographing the rear of an eye, and Diagnos’ patented image processing and AI analysis.

### **New 3-Year Agreement with University of Montreal Hospital Centre**

On January 19, Diagnos [announced](#) a three-year partnership agreement with the Center Hospitalier de l’Université de Montréal (“CHUM”) on AI projects related to the early detection of various retinal diseases.

Since 2018, Diagnos has been working with CHUM and using AI to screen for diabetic retinopathy and added a second screening site in the ophthalmology department in 2019 to help improve the screening process for patients with more serious conditions.

The new 3-year clinical trial aims to validate if the AI algorithm (“NeoRetina”) developed by Diagnos to detect the presence of diabetic retinopathy, can detect this disease and grade its severity by the analysis of fundus photographs when compared with traditional methods.

According to the clinical trial information, more than 10% of the population of Quebec (approximately 900,000 people), suffer from diabetes and around 40% of people with diabetes suffer from diabetic retinopathy.

Retinopathy is any damage to the retina of the eyes, which may cause vision impairment, and early detection and regular check-ups are important in preventing the progression of the disease.

Dr. Fabrice Brunet, President and CEO of CHUM, commented, “We are pleased to be working with Diagnos to bring innovation and excellence in care to patients. The evaluation and refinement of Diagnos technology using artificial intelligence in the early detection of certain diseases by our ophthalmology, endocrinology, and now cardiology teams contribute to improving the quality and safety of the care provided to the population.”

### **New Clinics in Saudi Arabia and New Rollouts Planned in Second Half of 2021**

On January 14, Diagnos [announced](#) the opening of five new screening clinics at different locations of [Magrabi Hospitals & Centers](#) located in Riyadh, Saudi Arabia, with the help of its Saudi business partner, Kanhoor Medical Co.

Magrabi is a provider of Ears-Nose-and-Throat (“ENT”), Dentistry, and Ophthalmology services with more than 35 locations in the Middle East and North Africa and delivers eye care to more than 1 million patients annually.

After 2 field trials using Diagnos' AI-assisted screening platform, Magrabi is launching the new locations to increase the availability of the CARA service to its diabetic patients and also to reduce wait times.

The plan between Diagnos, Magrabi, and Kanhoor is to rollout the CARA platform to the remaining 22 Magrabi hospitals in Saudi Arabia in the second half of 2021 and then extend the service to the other Magrabi hospitals in the Middle East and Africa.

### **Healthcare Diagnosis Market Exploding**

According to a 2020 industry report on the Healthcare Diagnosis market, AI in the healthcare diagnosis market was valued at US\$3.6 billion in 2019 and is forecasted to reach US\$66.8 billion by 2027, growing by a staggering 44% annually.

One of the largest growth segments is AI-assisted diagnostic solutions in areas such as cancer detection, cardiovascular disease, eye care, and radiology.

### **Worldwide Commercialization**

Diagnos currently operates screening sites in 15 countries with certifications from regulatory bodies in various countries including the U.S., Canada, the European Union, and Mexico. In 2020, Diagnos signed partnerships and commercial agreements with companies that serve patients in Canada, Colombia, Guatemala, Mexico, and southern California.

### **Final Comments**

In a [recent interview](#), Andre Larente, CEO of Diagnos, commented that the company is fully funded for the next 18 months and he expects that more existing clients are going to restart their operations soon, which should increase revenue for Diagnos.



In addition, he said the company has a “strong pipeline” that could results in new deal announcements during the year.

Finally, screening for diabetic retinopathy is just one application of Diagnos’ AI technology and the company expects to make announcements with new partners to use the technology to detect other health issues, such as cardiovascular problems, including hypertension.

Meanwhile, even after Diagnos’ recent stock increase, the company’s market capitalization is less than C\$43 million. With its recent announcements and rollout trajectory, the low valuation makes it a prime takeover target for any consolidator executing a roll-up strategy in the AI healthtech industry.

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## Diagnos’ AI Platform to Fight Vision Loss Continues to Expand Globally

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[Diagnos Inc.](#) (TSXV: ADK | OTCQB: DGNOF) is a software platform provider for the early detection of critical health issues through the use of Artificial Intelligence (“AI”) and Machine Learning (“ML”), and it **continues to expand globally with recent deals and government financing support.**

Utilizing AI and ML, Diagnos developed a Computer Assisted Retina Analysis (“CARA”) software platform to process image data, making standard retinal images sharper, clearer, and easier to read. This technology assists healthcare specialists

in the detection of vision loss, including diabetic retinopathy.

CARA is a teleophthalmology platform, a branch of telemedicine, which delivers eye care through digital medical equipment and telecommunications technology. The CARA platform integrates with various types of existing retinal cameras at the point of care, is compatible with all recognized image formats, and is Electronic Medical Records (“EMR”) compatible.

## **Digital Health Surging**

AI technology is spreading rapidly into various verticals including automotive, healthcare, and pharmaceuticals. According to [ABI Research](#), global AI venture capital investments in the healthcare and pharmaceutical sectors reached \$2.4 billion in 2019, up 140%, compared with \$1 billion in the prior year.

In the healthcare industry, companies are leveraging AI to overcome human’s lack of ability to detect pertinent details in data from various sources, including photos, microscopic images, X-rays, CT scans, and MRI scans.

During the current COVID-19 health crisis, with shelter-at-home orders, telemedicine and remote monitoring tools have seen a growth in demand as hospitals focus on keeping patients safe while delivering care.

## **Diagnos Client Signings Continue**

Recent client successes have included:

- Last month, Diagnos [announced](#) a contract with Devlyn Grupo, an optical retailer with over 900 stores in Mexico and Guatemala. Devlyn will test the CARA platform for diabetic retinopathy screening at select locations with a planned larger roll out to more stores in early 2021.
- In September, Diagnos [reported](#) that it re-signed a U.S.-

based client, Chaparral Medical Group, to another three-year agreement. Chaparral is a 60 physician multi-specialty group serving 23 clinics in Southern California.

- In July, Diagnos [signed](#) a service agreement with the Colombian Telemedicine Centre Ltd (“CTMC”) in Colombia, South America. The CTMC selected the CARA platform to start screening Colombia’s population in conjunction with largest vision specialist center in the country.
- In June, Diagnos [executed](#) an agreement with Labtician Ophthalmics, a Toronto-based surgical eye care products and equipment company with customers across Canada, and Labtician will use Diagnos’ AI solution to monitor ocular health in its diabetic patients.

## **Well Funded for Growth**

Diagnos is well funded after raising \$2.1M in capital earlier this year and then receiving a \$2M, 10-year, interest-free loan from the government of Quebec via the Economic Development Fund to support the commercialization of the CARA platform globally.

The CARA platform is securely accessible over the Internet and Diagnos currently operates screening sites in 15 countries with certifications from regulatory bodies in various countries including the U.S., Canada, the European Union, and Mexico.

Meanwhile, even after Diagnos’ recent stock jump, the Company’s market capitalization is only \$32.5M and makes it a prime takeover target for any consolidator executing a roll-up strategy in the healthtech industry.