

CORONASYS INNOVATION SHEET 35

CURIAL AI SCREENING TEST

Background

Although the good news of an effective vaccine on the horizon largely dominated the news over the last weeks, testing remains a major issue in the fight against SARS-CoV-2 as well. With the new and large surges currently seen in many countries, laboratory capacities remain strained and PCR testing requires some time even without overburdened testing sites and labs. Researchers at the University of Oxford¹ may have found a way to distinguish non- COVID-19 patients from those infected with SARS-CoV-2 with an Artificial Intelligence testing model.

Features

The CURIAL AI screening test was derived in a study involving data of more than 150.000 patients – “the largest dataset of any laboratory artificial intelligence study on COVID-19 to date”². It uses routine hospital data like blood tests, blood gas testing, vital signs, and results of PCR testing for respiratory viruses. The AI model was further trained with different levels of prevalence of Covid-19 in the population to simulate real-life conditions during a pandemic. The AI model derived from the study has a sensitivity of 77.4% and a specificity of 95.7% which means the test can efficiently identify Non-Covid patients. Test results are available after one hour.³

Potentials

The AI- model can help to provide rapid triage for COVID-19 based on routine hospital data. It fits into routine procedures and clinical pathways and can therefore speed up the patient flow. It can be conducted with existing equipment in high- and middle-income countries. This means the test could be implemented quite quickly and inexpensively. The model can also be rapidly adapted to various scenarios⁴ and might be a helpful pretest for PCR testing where availability is limited⁵.

Points to consider

A possible limitation of the study is a quite limited ethnic diversity of the patients included⁶, although ethnic disparities might be influential in the clinical course of patients^{7,8,9}. Also, patients under the age of 18 were excluded, so that the AI model might not perform as well in different subsets of the population and further research is needed in this area¹⁰. The test is primarily designed for infrastructures available in high and middle-income countries. Its applicability for other contexts has to be further assessed.

Conclusion

The AI test might be a helpful to rule- out non-COVID patients in facilities that already have the necessary equipment.

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Publication: 12/11/2020

Country: United Kingdom

Focus area: Testing

Developers: University of Oxford

Beneficiaries:

- Clinicians in high- and- middle- income countries

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- ¹ University of Oxford. “Coronavirus Research,” 2020. <https://www.research.ox.ac.uk/Area/coronavirus-research>.
- ² Soltan, Andrew A S, Samaneh Kouchaki, Tingting Zhu, Dani Kiyasseh, Thomas Taylor, Zaamin B Hussain, Tim Peto, Andrew J Brent, David W Eyre, and David A Clifton. “Rapid Triage for COVID-19 Using Routine Clinical Data for Patients Attending Hospital: Development and Prospective Validation of an Artificial Intelligence Screening Test,” December 11, 2020, 10. [https://www.thelancet.com/journals/landig/article/PIIS2589-7500\(20\)30274-0/fulltext](https://www.thelancet.com/journals/landig/article/PIIS2589-7500(20)30274-0/fulltext)
- ³ Soltan, Andrew A S, Samaneh Kouchaki, Tingting Zhu, Dani Kiyasseh, Thomas Taylor, Zaamin B Hussain, Tim Peto, Andrew J Brent, David W Eyre, and David A Clifton. “Rapid Triage for COVID-19 Using Routine Clinical Data for Patients Attending Hospital: Development and Prospective Validation of an Artificial Intelligence Screening Test,” December 11, 2020, 10. [https://www.thelancet.com/journals/landig/article/PIIS2589-7500\(20\)30274-0/fulltext](https://www.thelancet.com/journals/landig/article/PIIS2589-7500(20)30274-0/fulltext)
- ⁴ Healthcare in Europe. com. “AI Test Rules out Covid-19 Diagnosis within One Hour,” December 11, 2020. <https://healthcare-in-europe.com/en/news/ai-test-rules-out-covid-19-diagnosis-within-one-hour.html>.
- ⁵ Soltan, Andrew A S, Samaneh Kouchaki, Tingting Zhu, Dani Kiyasseh, Thomas Taylor, Zaamin B Hussain, Tim Peto, Andrew J Brent, David W Eyre, and David A Clifton. “Rapid Triage for COVID-19 Using Routine Clinical Data for Patients Attending Hospital: Development and Prospective Validation of an Artificial Intelligence Screening Test,” December 11, 2020, 10. [https://www.thelancet.com/journals/landig/article/PIIS2589-7500\(20\)30274-0/fulltext](https://www.thelancet.com/journals/landig/article/PIIS2589-7500(20)30274-0/fulltext)
- ⁶ Soltan, Andrew A S, Samaneh Kouchaki, Tingting Zhu, Dani Kiyasseh, Thomas Taylor, Zaamin B Hussain, Tim Peto, Andrew J Brent, David W Eyre, and David A Clifton. “Rapid Triage for COVID-19 Using Routine Clinical Data for Patients Attending Hospital: Development and Prospective Validation of an Artificial Intelligence Screening Test,” December 11, 2020, 10. [https://www.thelancet.com/journals/landig/article/PIIS2589-7500\(20\)30274-0/fulltext](https://www.thelancet.com/journals/landig/article/PIIS2589-7500(20)30274-0/fulltext)
- ⁷ Webb Hooper, Monica, Anna María Nápoles, and Eliseo J. Pérez-Stable. “COVID-19 and Racial/Ethnic Disparities.” *JAMA* 323, no. 24 (June 23, 2020): 2466. <https://doi.org/10.1001/jama.2020.8598>.
- ⁸ Laurencin, Cato T., and Aneesah McClinton. “The COVID-19 Pandemic: A Call to Action to Identify and Address Racial and Ethnic Disparities.” *Journal of Racial and Ethnic Health Disparities* 7, no. 3 (2020): 398–402. <https://doi.org/10.1007/s40615-020-00756-0>.
- ⁹ Abuelgasim, Eyad, Li Jing Saw, Manasi Shirke, Mohamed Zeinah, and Amer Harky. “COVID-19: Unique Public Health Issues Facing Black, Asian and Minority Ethnic Communities.” *Current Problems in Cardiology* 45, no. 8 (August 2020): 100621. <https://doi.org/10.1016/j.cpcardiol.2020.100621>.
- ¹⁰ Soltan, Andrew A S, Samaneh Kouchaki, Tingting Zhu, Dani Kiyasseh, Thomas Taylor, Zaamin B Hussain, Tim Peto, Andrew J Brent, David W Eyre, and David A Clifton. “Rapid Triage for COVID-19 Using Routine Clinical Data for Patients Attending Hospital: Development and Prospective Validation of an Artificial Intelligence Screening Test,” December 11, 2020, 10. [https://www.thelancet.com/journals/landig/article/PIIS2589-7500\(20\)30274-0/fulltext](https://www.thelancet.com/journals/landig/article/PIIS2589-7500(20)30274-0/fulltext)

Background on Innovation Sheet Series

As part of a real-time evaluation of the SARS CoV 2 pandemic (with focus on epidemiological, medical, economical, societal, technical, and cultural developments in Germany and Armenia) the CoronaSys research team, under the leadership of Prof. Dr. Martin Voss, is conducting a continuous monitoring of developments and medical, technical, and social innovations concerning Covid-19.

Multiple national and international media outlets, research platforms, and scientific and organizational guidelines, briefs, and updates are screened to feed into this outlet. The rationale behind this is to support the projects' network partners in Armenia and Germany with short summaries of key developments and promising innovations that are shaping the global, German, and Armenian outbreak response and recovery.

The aim of these short briefs is to give condensed and structured information on selected innovations emerging out of the conducted horizon scanning. This could be mainstream big-ticket items or fringe subjects that are easily overlooked in the global flood of information. Some innovations will be followed through their evolution in time while others may only appear once. While subjectively selected, the briefs are descriptive in nature and leave analysis and critical interpretation to the reader. Network partners in both countries are invited to provide feedback on their interest areas and suggest particularly relevant topics for the CoronaSys Workshop series.

The CoronaSys Innovation Sheet Series is published by the [Academy of the Disaster Research Unit](#), which is, as a non-profit limited liability company, a spin-off of the [Disaster Research Unit](#) at the Free University of Berlin. The series is part of the research project "[CoronaSys](#): Addressing the corona pandemic in Armenia through systemic risk management", sponsored by the German Federal Ministry of Education and Research.

If you have any questions, suggestions, or if you wish to be taken on (or off) the project mailing list for CoronaSys updates, innovation sheets, and workshop invitations, please send a message to Janina Schäfer (schaefer@a-kfs.de). For general project inquiries, you may contact the team lead Sara Merkes (merkes@a-kfs.de) or the project lead Martin Voss (voss@a-kfs.de).

Previous CoronaSys Innovation Sheets

- 1 "New" Antiviral Face Masks
- 2 "Dyphox" Surface Coating
- 3 MOVES SLC Portable ICU
- 4 Portable TRI- KLEEN 500UV
- 5 Convalescent Plasma Therapy
- 6 ASIC-App
- 7 BinaxNOW Antigen Test
- 8 Corona Traffic Light
- 9 Aproof at Home Antibody Test
- 10 IVAT Hygiene Tower
- 11 LY-CoV555 Antibody Treatment
- 12 4C Mortality Score
- 13 Regional Corona Prediction Model
- 14 Computer-designed Mini- Proteins
- 15 Covid-19 Simulator
- 16 Trimodulin
- 17 BNT162b2-Vaccine
- 18 SARS-COV-2 Rapidplex
- 19 European Corona- Map
- 20 FELUDA Paper Strip Test
- 21 Humanitarian Action Mapping Tool
- 22 IKKA Score
- 23 WHO Digital Implementation Investment Guide
- 24 RCCE Toolkit
- 25 Cough-Analyzing App
- 26 Follow Up on LY-CoV555 Antibody Treatment
- 27 Follow-up on BNT162b2-Vaccine
- 28 Lucira™ COVID-19 All-In-One Test Kit
- 29 COVID-19 Humanitarian
- 30 AI-Epidemiology-Model
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- 32 Gradian CCV
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- 34 School Reopening Checklist

All previous CoronaSys Innovation Sheets are available online:

<http://coronasys.a-kfs.de/category/innovation-stream/>

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