

AI4Health

How can AI & data help ensure health in the world



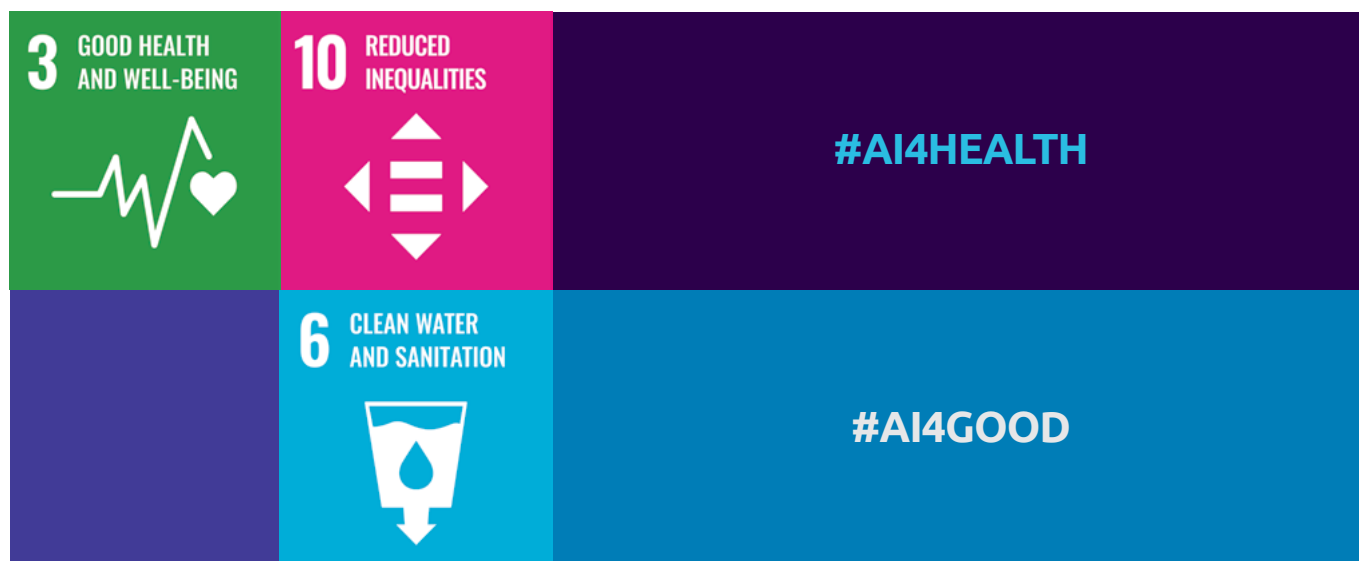
Perform AI

How can AI & data help ensure health in the world

Never like during the pandemic that marked 2020 has the potential of artificial intelligence (AI) for health been greater. **By enhancing intelligent automation and the analytics-driven insights, AI** promises to be a work-changing opportunity for:

- **Practitioners** – AI can augment doctors' capabilities to diagnose and efficiently treat diseases.
- **Patients** – AI can assist patients in their healthcare journey, from real-time advising to the scheduling of appointments.
- **Healthcare providers** – AI can facilitate the allocation of resources and capacities within hospitals and healthcare facilities.

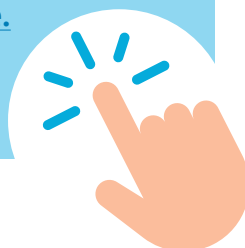
Looking at the United Nations sustainable development goals (SDGs), the technology appears as an enhancer for three of them in particular:



About SDGs

The SDGs constitute an all-encompassing framework, and achieving even one of them will have ripple effects on the rest. But certain SDGs are more focused and targeted towards achieving goals. For health, these three (mentioned above) have a higher focus on it than the rest:

[You can learn more about the SDGs here.](#)



56%

of Millennials are comfortable with using technology to manage their health today.¹

National AI strategies

From the USA, to Korea and Australia, several countries have resorted to AI- and big data-driven tools to predict, manage, and combat the COVID-19 virus. At the same time, governments worldwide have started implementing **health-focused AI strategies**.

Canada - Building a learning health system for Canadians

The CIFAR, the pan-Canadian research organization in charge of the national AI strategy, has convened an AI4Health Taskforce in order to outline recommendations for an integration and coordinated national approach for the use of AI in health.²

South Korea - Building an AI platform for drug development

Aiming at enhancing the development of innovative drugs, the Ministry of Science and ICT is building a platform for the use of AI in predicting the relationship between drugs and their targets.⁴



Israel - tackling COVID-19 with AI

The Israeli Ministry of Health, together with the Maccabi Healthcare Services, launched a nationwide scheme that monitors COVID-19-related symptoms in the population, leveraging diagnostic robotics digital risk assessment and generating heat maps.³

Australia - Specializing its AI strategy on health

In its strategy, the Australian government has identified health as one of the three areas for the country's AI specialization. In this regard, the country aims at focusing on AI's potential for better health, aged care, and disability services.⁵

95%

accuracy was achieved by the Harvard University teaching hospital in diagnosing potentially deadly blood diseases with AI.⁶



"Finding a balance between the potential of AI-driven health, ethical guidelines, and research is key."

- Moez Draief
Chief Scientist, Capgemini Invent

Our approach

Applying the [PublicGoesAI playgrounds](#) of AI in the public sector, Capgemini supports the use of AI to achieve the UN Sustainable Development Goals (SDGs) and accompanies various healthcare professionals in their daily work - be it nurses, emergency helplines or doctors.

When addressing the potential of the technology in health services, we see four primary fields:



AI for research

Improving the analysis of human tissues and optimizing the treatment of diseases.



AI for contextualization

Allowing faster and more effective decision-making in front of injury cases.



AI as an engineering tool

Augmenting the capabilities of healthcare practitioners to make diagnoses.



AI for operations

Predicting and monitoring patterns and dynamics, supporting the organization in its short- and midterm reaction.

Just as in other fields, AI for healthcare comes with challenges that need to be addressed:

1. AI for health tools must be robust and trustful
2. AI for health cases must build on well-collected and shared data, in a manner that avoids biases and respects data privacy

Solutions delivered include:

Classification tools of X-ray images – Applying deep learning and AI, Capgemini has developed a classification system that can, within seconds, distinguish between pneumonia and non-pneumonia cases and between viral and bacterial cases.

Intelligent document processing for healthcare organizations – Capgemini's Knowledge Insights Services (KIS) and Document AI applies a framework using real-time and historical knowledge based on documents coming in various formats, hence automating most trivial processes, such as the extraction of valuable intel and document validation.

Chatbot for emergency helplines – Capgemini developed a voice and text enhancing the provision of faster and easier access to medical information and advice.

The solution helps reduce the number of calls taken by humans while addressing the most critical calls faster.

AI has the potential to cut treatment costs by as much as **50%**⁷

94% accuracy was achieved in the treatment of eye disease by applying machine learning systems in a project for Moorfields Eye Hospital.⁸



River Blindness detection



Accompanying trauma patients



Bed availability & COVID-19 crisis



Read our use cases on the next page

Perform AI

Activate data.
Augment intelligence.
Amplify outcomes.

Use case – AI FOR ACCELERATING THE DETECTION OF RIVER BLINDNESS



AI FOR ACCELERATING THE DETECTION OF RIVER BLINDNESS

The University Hospital of Bonn and Capgemini optimize the evaluation of onchocerciasis drugs. AI is applied to speed up the phase of analysis of histological slides and documentation crucial for determining treatment results.

Challenges

- More than 20 million people – 99% of whom are in Africa – are infected with **onchocerciasis**, which leads to river blindness and chronic disability.
- The process of evaluating the success of treatments for this disease is complex and time-consuming.
- The elimination (interruption of transmission) of onchocerciasis is a target of the WHO's roadmap to 2030.

Solution

- The Bonn-based immunologists and parasitologists are currently using **convolutional neural networks** to automatically analyze histological slides and documentation.
- The AI-system learns to detect and classify **worms** in surgically removed nodules (onchocercomata), creating an empowering precedence for further evaluations.
- Moreover, the application of AI makes it possible to conduct consistent analysis in just a few minutes and, by employing only one reader, saving up to **650 working hours and 2,000 nodules**.



Use case – ACCOMPANYING TRAUMA PATIENTS WITH DECISION-DRIVEN AI



ACCOMPANYING TRAUMA PATIENTS WITH DECISION-DRIVEN AI

Capgemini Invent is part of a partnership of medical scientific and technology experts (Assistance Publique Hôpitaux de Paris, traumabase.eu, CNRS, École Polytechnique, L'École des Hautes Études en Sciences Sociales), applying AI to efficiently address major trauma cases.

Challenges

- **Major trauma** is the most common cause of death for patients aged between 16–45 in France.
- Human decision making when dealing with patients suffering from major trauma is prone to errors during the crucial first 24 hours.
- This could lead to unnecessary fatalities due to complexity, uncertainty, and time pressure.

Solution

- **Traumatrix** enables an innovative response to the health challenge of severe traumas and provides considerable benefits for patient safety and care.
- The **real-time services** includes the prediction of intracranial hypertension and neurosurgery needs, the analysis of the impact of the COVID-19 pandemic on the trauma field, and the prediction of required medical resources after pre-hospital triage.



Use case – ANTICIPATING BED AVAILABILITY AND COVID-19 CRISIS TRENDS



ANTICIPATING BED AVAILABILITY AND COVID-19 CRISIS TRENDS

The partnership between Capgemini Invent and the Agence Régionale de Santé (ARS) Île-de-France aims at applying AI for anticipating and monitoring beds capacities and COVID-19 crisis trends in the region.

Challenges

- The bed capability uncertainty challenges hospitals and health authorities, both on a medical and logistic level.
- Striking the right balance between **scheduled and unscheduled care** during the COVID-19 crisis is key to saving lives.

Solution

STEP applies advanced analytics to:

- Predict the number of beds available in critical care and conventional hospitalization
- Help maintain a minimum of available beds for COVID-19 patients based on epidemiological models.

The insight-driven approach of the project makes it possible to make better decisions and foresee the impact of new confinement strategies.



Thought Leadership Positions



Vaccines are coming
– are we ready?
2020



PublicGoesAI and the
COVID situation
2020



AI for Health
2020

Contact our Experts!

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More Information

Missed the event?
Catch up on all the
individual session
recordings!



Additional links
[Our Perform AI Offer](#)
[AI in the Public Sector](#)
[Capgemini @ AI for Good Summit](#)

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More information





About Capgemini

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