

SC1-PHE-CORONAVIRUS-2B

# ENVISION

**Intelligent plug-and-play digital tool for real-time surveillance of COVID-19 patients  
and smart decision-making in Intensive Care Units**

Project No. 101015930

<b>Deliverable Number</b>	D6.7
<b>Deliverable Title</b>	Final event
<b>Work Package Number</b>	6
<b>Work Package Title</b>	Outreach and rollout
<b>Lead Participant</b>	ESAIC
<b>Contributors</b>	Cathy Weynants, Julia Dowell (ESAIC), Kai Zacharowski, Elina Nürensberg-Goloub, Jesco Panther, Markus Ketomäki, Jan Kloka, Lea Grebe, Johanna Keim, Benjamin Friedrichson, Oliver Old, Patrick Booms (GUF), Geraldine Hartmeier (accelCH), Anastasiia Aksonova (accelCH)
<b>Delivery date</b>	21-03-2023
<b>Dissemination level</b>	Public
<b>Type</b>	Report
<b>Version</b>	1



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101015930.

### **Disclaimer**

The text, figures and tables in this deliverable can be reused under a provision of the Creative Commons Attribution 4.0 International License ([CC BY 4.0](https://creativecommons.org/licenses/by/4.0/)). Logos and other trademarks are not covered by this license.

The content of the publication herein is the sole responsibility of the publishers and it does not necessarily represent the views expressed by the European Commission or its services.

While the information contained in the documents is believed to be accurate, the authors(s) or any other participant in the ENVISION consortium make no warranty of any kind with regard to this material including, but not limited to the implied warranties of merchantability and fitness for a particular purpose. Neither the ENVISION Consortium nor any of its members, their officers, employees or agents shall be responsible or liable in negligence or otherwise howsoever in respect of any inaccuracy or omission herein.

Without derogating from the generality of the foregoing neither the ENVISION Consortium nor any of its members, their officers, employees or agents shall be liable for any direct or indirect or consequential loss or damage caused by or arising from any information advice or inaccuracy or omission herein.

### **Project Abstract**

Within only six months, over 7.4 million people have been diagnosed with SARS-CoV-2. In the most severely hit countries, over 10% of infected patients have received treatment in Intensive Care Units (ICUs). Insufficient data and limited knowledge of the disease as well as the lack of tools to support the intensivist in making accurate, timely and informed decisions, have led to high mortality rates.

Continuous surveillance, the collection and intelligent analysis of data from many sources, including ventilators and electrical impedance tomography, would allow intensivists to decide on the best suitable treatment to accelerate the recovery of the often comorbid COVID-19 patients while reducing the burden on clinical staff and healthcare costs. This information would also increase our understanding of the yet unknown course of the disease, supporting other stakeholders in the quest for new therapies.

In ENVISION, our multidisciplinary public-private consortium will advance an innovative digital tool, Sandman.MD, a real-time and plug-and-play monitoring app, to an intelligent decision-support system for monitoring, prediction and treatment of COVID-19 patients in ICUs – the Sandman.ICU – reaching Technology Readiness Level 9 and ready for CE marking by the end of the project. The app has been developed by our SME partner app@work and successfully introduced by several hospitals in Germany for use during the perioperative period. Sandman.ICU will be integrated into an AI-driven data analytics suite with predictive modelling tools and enhanced with smart alert functionality. The digital tool will be validated and demonstrated in 13 hospitals across Europe. Our Health Technology Assessment expert partner will demonstrate the economic and societal value of Sandman.ICU, while an experienced SME, will manage the innovation process in view of immediate market uptake. The rollout will be supported by the European Society of Anaesthesiology and Intensive Care (ESAIC).

## Revision history

Date	Authors	Revision
24.02.2023	Geraldine Hartmeier (accelCH)	Template
14.03.2023	Julia Dowell (ESAIC) Cathy Weynants (ESAIC)	Draft version
14.03.2023	Jesco Panther (GUF)	Revision 1
20.03.2023	Julia Dowell (ESAIC) Anastasiia Aksonova (accelCH)	Final version

## Table of Contents

<b>Partner short names</b> .....	<b>6</b>
<b>Abbreviations</b> .....	<b>6</b>
<b>Executive Summary</b> .....	<b>7</b>
<b>1 Organisation and planning</b> .....	<b>7</b>
<b>2 Agenda</b> .....	<b>8</b>
<b>3 Inviting Key Stakeholders and communication before the event</b> .....	<b>8</b>
<b>4 Delivering the Event</b> .....	<b>9</b>
<b>5 Communication after the Event</b> .....	<b>10</b>
<b>6 Conclusion</b> .....	<b>11</b>
<b>7 Appendices</b> .....	<b>12</b>
7.1 ENVISION Final Event: Agenda.....	12
7.2 ENVISION Final Event: Presentations .....	13

## Partner short names

AAW	app@work GmbH
accelCH	accelopment Schweiz AG
accelDE	accelopment Deutschland GmbH
CCHT	Spitalul Clinic Judetan De Urgenta Pius Brinzeu Timisoara
CHUC	Centro Hospitalar e Universitario de Coimbra E.P.E.
DPT	Central Hospital of Southern Pest National Institute of Hematology and Infectious Disease
ESAIC	European Society of Anaesthesiology and Intensive Care
GUF	Johann Wolfgang Goethe Universität Frankfurt am Main
ICS-HUB	Institut Catala de la Salut – Bellvitge University Hospital
iDA	Intelligent Data Analytics GmbH & Co. KG
KC	Lietuvos Sveikatos Mokslu Universiteto Ligonine Kauno Klinikos
LMI	Löwenstein Medical Innovation GmbH & Co. KG
SE	Semmelweis Egyetem
TAU	Tampereen Korkeakouluosaatio SR
UCL	University College London
UMCG	Universitair Medisch Centrum Groningen
UMCL	Univerzitetni Klinicni Center Ljubljana
UMCM	Univerzitetni Klinicni Center Maribor
UMFCD	Universitatea de Medicina si Farmacie Carol Davila din Bucuresti
UNIPG	Università degli Studi di Perugia
UNITO	Università degli Studi di Torino

## Abbreviations

AI	Artificial Intelligence
D	Deliverable
EC	European Commission
H2020	Horizon 2020
ICU	Intensive care unit
M	Month
MS	Milestone
WP	Work Package

## Executive Summary

Deliverable **D6.7 Final Event** is part of **Work Package 6 (WP6), Task 6.1: Disseminate scientific and technological results**. Several other activities took place as part of **Task 6.1: Disseminate scientific and technological results**, but the Final Event was the official end to the project and an opportunity to present the results.

The aim of **D6.7 Final Event** was to disseminate the scientific and technological results to the scientific community and healthcare stakeholders at a specific meeting near the end of the ENVISION project timelines. This was successfully completed on 24 January 2023 in Brussels, Belgium and was attended both in-person and also remotely.

The event was not only an opportunity to share the results and experiences from the ENVISION project, but it was an important occasion to bring stakeholders and partners to discuss what work still needs to be done with regard to AI and Digital Healthcare and how future projects could achieve this.

## 1 Organisation and planning

The Final event was organised by accelCH, GUF and ESAIC. It was agreed from the beginning that the focus of the event was AI and Digital Healthcare and the agenda needed to reflect this. As the ENVISION project was due to end on 31 January 2023, it was agreed to have the Final Event close to this date and combine it with the final Steering Committee meeting the following day. This meant that anyone travelling to the event could attend both events and minimise their travel costs. Brussels was chosen as the location for the event due to its excellent transport links and because Prof. Zacharowski was able to secure the use of the meeting facilities at the Representation of the State of Hessen to the EU for both the final event and the Steering Committee meeting that took place the next day. The Event could be attended in person or remotely.

The Final Event was named 'Highway to Health', and a logo was designed by GUF, which was used on all promotional material.



Figure 1: The Final Event was named 'Highway to Health'.

As part of the planning the following topics were considered and agreed between the organising partners:

- Risk management: identifying risk and associated risk mitigation
- Agenda and Keynote speakers
- Task organisation and group responsible

## 2 Agenda

The agenda was drafted by accelCH and sent to ESAIC for review and input. The focus of the Event needed to be closely linked to the project's main aim and also be engaging and varied enough so that non-partner stakeholders would also prioritise attending.

In parallel, the organising partners approached potential keynote speakers in collaboration with other partners as well as contacts in their personal networks.

The final agenda included the following items (please see Appendix 1 for the detailed agenda):

- Welcome Session
- Panel Session 1: *Artificial Intelligence to Improve Patient Safety and Combat Future Health Threats*, with two speakers and a Discussion session
- Panel Session 2: *Data standardisation and digital Healthcare* with three speakers and a Discussion session
- Closing Session

## 3 Inviting Key Stakeholders and communication before the event

The organising partners had several video calls and email communication to discuss which specific groups to approach in terms of stakeholders. The matrix from the **D6.2 Outreach plan** was used as a basis and added to with additional contacts. One of the groups that was suggested is Projects funded under the same call as ENVISION (SC1-PHE-CORONAVIRUS-2B). A contact list was created, and coordinators from related projects and other relevant stakeholders were invited.

A webpage was set up as part of the ENVISION website, which was used for event promotion and registration for internal and external participants ([Highway to Health - Registration](#))

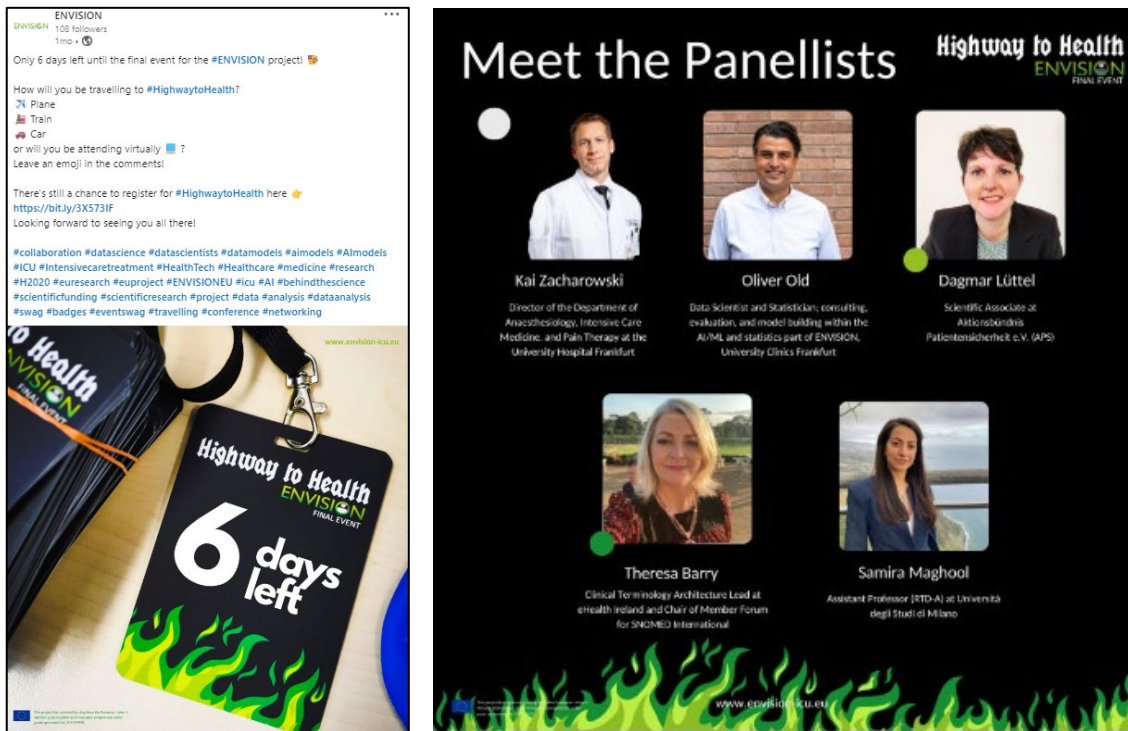


Figure 2: The Highway to Health webpage was created within the ENVISION website.

The event was promoted not only via the ENVISION project website but also via social media outreach. There was an event countdown campaign and an introduction to the panellists posted on LinkedIn



(Figures 3 and 4), and some of these posts were shared by ESAIC with their Anaesthesiology and Intensive Care community.



Figures 3 and 4: LinkedIn posts to promote the ENVISION Final Event

## 4 Delivering the Event

The event was attended by 31 people in-person and approximately 100 people remotely. In-person attendees travelled from Germany, Portugal, the Netherlands, Italy, Switzerland, Lithuania and the UK.

During the event, Project Coordinator Prof. Dr. Dr. med. Kai Zacharowski reflected on the progress of the project's main objectives – the development of an intelligent plug-and-play digital tool for real-time surveillance of COVID-19 patients and smart decision-making in intensive care units. One of the event's key topics was how to improve patient safety and combat future health threats using Artificial Intelligence. A special guest Dagmar Lüttel, the Scientific Associate at Aktionsbündnis Patientensicherheit e.V. (APS), gave an overview of how the Active Alliance for Patient Safety offers guidance for healthcare staff on digital health and patient information on COVID-19. Another important topic raised during the event was data standardisation and digital healthcare. During this session, Dr. Oliver Old, Data Scientist and Statistician at University Clinics, Frankfurt presented on digital healthcare in light of the FAIR principle. A Clinical Terminology Architecture Lead at eHealth Ireland and Chair of Member Forum for SNOMED International, Theresa Barry was sharing insights on SNOMED CT and how it supports the development of comprehensive, high-quality clinical content in electronic health records. Finally, Dr. Samira Maghool, Assistant Professor (RTD-A) at Università degli Studi di Milano, hosted a presentation on another EU-funded project SMART BEAR – a big data platform that offers evidence-based personalised support for healthy and independent living at home.

After the presentations, there was a networking dinner which was an excellent opportunity for people to meet and continue discussing some of the ideas raised during the afternoon.

The consensus from the presentations and the discussion sessions was that patient safety is extremely important, and AI can play a crucial role and should be a main priority. However, more funding is needed to continue making progress, and it needs to be acknowledged that the speed of progress is different in the given countries.

The experience of the ENVISION project is very important, and despite logistical problems, including unforeseen delays because of the COVID-19 pandemic and clinicians having to reprioritise workloads, it has been a success, and important data has been collected. There was also a discussion about how the results can be used for future research.



Figure 5: The in-person attendees at the Final Event



Figure 6: One of the panel discussions at the Final Event

## 5 Communication after the Event

Following the event, there were several posts on Social Media to share the success of the event, including a short video: [LinkedIn Highway to Health Video summary](#). The video summary accumulated 1,172 views from all our followers, with a CTR of 4.98% and a 13.07% engagement rate. There is also a summary of the event on the COVEND website [and LinkedIn social media channel](#) (another EU-funded project, funding programme HORIZON-HLTH-2021-CORONA-01-0) as many of the Consortium partners are involved in both projects: [HIGHWAY TO HEALTH – COVend at the ENVISION project final event](#).

## 6 Conclusion

The ENVISION Final Event aimed to mark the end of the project by sharing its results and further discussing the impact on digital healthcare while fighting COVID-19. It was a well-attended hybrid event which brought together consortium members as well as a wider audience and gave the opportunity to have a discussion about the results within the wider setting of AI. Despite the logistical challenges faced by the project due to the COVID-19 pandemic, the consensus was that it had been a success, and the event enabled conversation between many of the consortium members about future collaboration and research.

## 7 Appendices

### 7.1 ENVISION Final Event: Agenda

#### **AI and Digital Healthcare**

**24 January 2023 | 17:00 – 20:00 CET**

**In-person and virtual event**

**16:30 – 17:00 Event Registration**

*In-person:* Registration at the desk on the 1st floor of the Representation of the State of Hessen to the EU, Rue Montoyer 21, 1000 Bruxelles, Belgium

*Virtual:* Registration link (event link sent via email upon registration)  
<https://us02web.zoom.us/j/83515017802?pwd=eVNna1dCMTVMWWE5ZmtNaWpDeU5JUT09>

**17:00 – 17:15 Welcome Session**

**Joël Girard, Prof. Dr. Dr. med. Kai Zacharowski**

**17:15 – 17:35 Panel Session Part 1: Artificial Intelligence to Improve Patient Safety and Combat Future Health Threats**

**Prof. Dr. Dr. med. Kai Zacharowski**

*Director of the Department of Anaesthesiology, Intensive Care Medicine, and Pain Therapy at the University Hospital Frankfurt*

EU funded project: ENVISION - Intelligent plug-and-play digital tool for real-time surveillance of COVID-19 patients and smart decision-making in intensive care units.  
<https://www.envision-icu.eu>

**Dagmar Lüttel**

*Scientific Associate at Aktionsbündnis Patientensicherheit e.V. (APS)*

The Active Alliance for Patient Safety offers guidance for healthcare staff on digital health and patient information on COVID-19 among other activities related to patient safety.

<https://www.aps-ev.de/>

**17:35 – 18:00 Discussion (moderated by Kai Zacharowski)**

Artificial intelligence has the potential to revolutionise healthcare, but realising its full potential requires collaboration and engagement from a wide range of stakeholders. With clinicians, scientists, representatives of patient safety organisations and policymakers, we will discuss the promising opportunities and challenges of developing and implementing AI tools in the EU.

**BREAK**

18:30 – 19:00 **Panel Session Part 2: Data standardisation and digital healthcare**

**Dr. Oliver Old**

*Data Scientist and Statistician; consulting, evaluation, and model building within the AI/ML and statistics part of ENVISION, University Clinics Frankfurt*

Digital Healthcare in the light of the FAIR principle

**Theresa Barry**

*Clinical Terminology Architecture Lead at eHealth Ireland and Chair of Member Forum for SNOMED International*

SNOMED CT supports the development of comprehensive high-quality clinical content in electronic health records. It provides a standardized way to represent clinical phrases captured by the clinician and enables automatic interpretation of these.

<https://www.snomed.org/>

**Dr. Samira Maghool**

*Assistant Professor (RTD-A) at Università degli Studi di Milano*

EU funded project: SMART BEAR - Smart big data platform to offer evidence-based personalised support for healthy and independent living at home.

<https://www.smart-bear.eu/>

19:00-19:45 **Discussion** *(moderated by Markus Ketomäki, University Clinics Frankfurt)*

Data is a critical component of future progress in AI technologies. Large amounts of high-quality data are needed to train and validate AI models. Data collection, sharing and standardisation are critical to harnessing the full benefits of AI in healthcare. With our experts, we will discuss the requirements and challenges of data collection and processing in the EU and the patient's perspective on the use of personal data for research and development.

19:45 – 20:00 **Closing Session**

**Prof. Dr. Dr. med. Kai Zacharowski**

20:00 – 22:00 **Joint Networking Dinner**

## 7.2 ENVISION Final Event: Presentations




# ENVISION

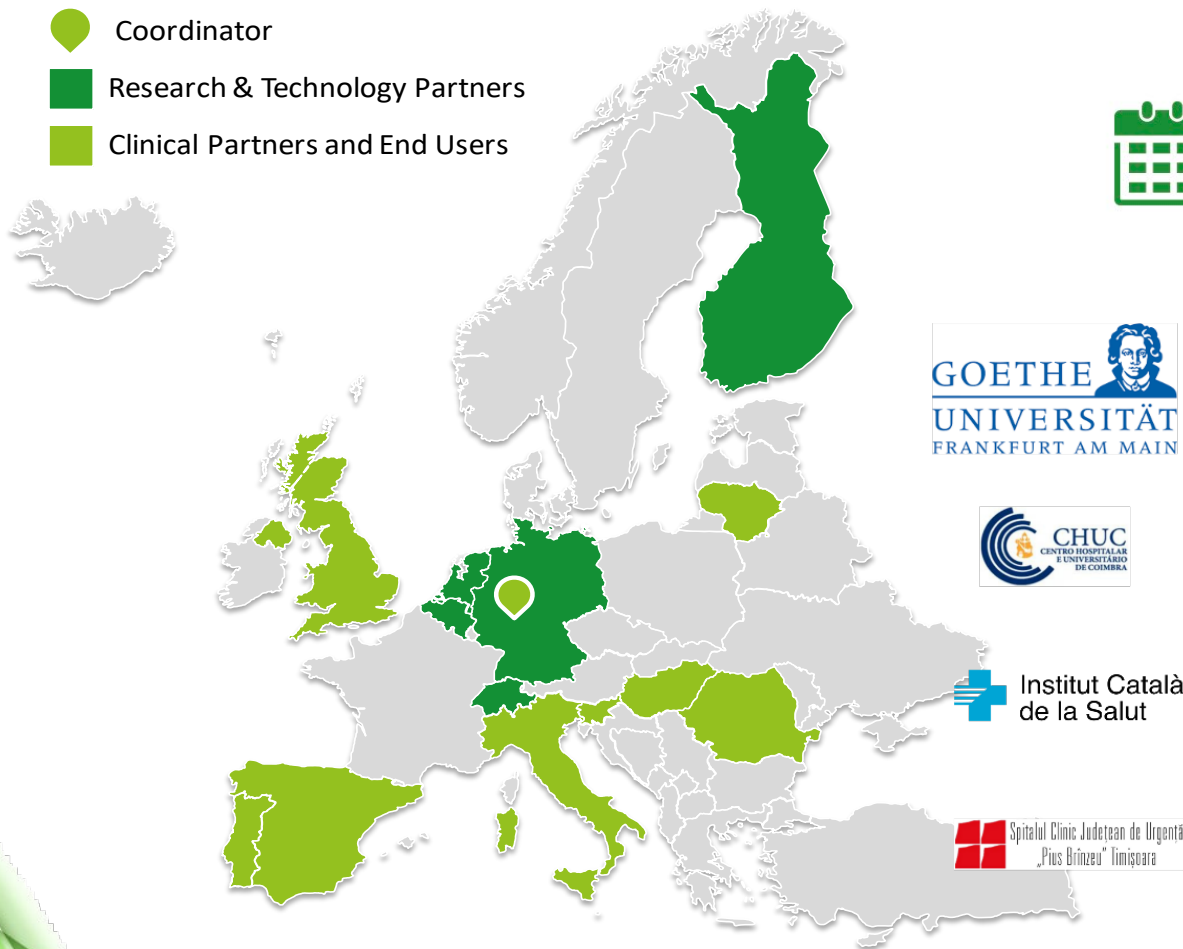
Intelligent plug-and-play digital tool  
for real-time surveillance of COVID-19 patients  
and smart decision-making in intensive care

Prof. Dr. Dr. Kai Zacharowski



## 21 partners from 13 countries

-  Coordinator
-  Research & Technology Partners
-  Clinical Partners and End Users



DURATION  
01.12.2020 – 31.01.2023



BUDGET  
5.6 million euro



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101015930.

# AI can improve patient outcomes and reduce costs

## KEY REQUIREMENTS TO DEVELOP AND IMPLEMENT AI-BASED CLINICAL TOOLS

- Population-representative data must be accessible, sufficient, **standardized**, and of high quality
- Data collection tools must be intuitive to be actually used by clinicians
- Data must be standardized and processed in a GDPR-compliant manner
- Storage and access infrastructure must be efficient and allow sharing the data



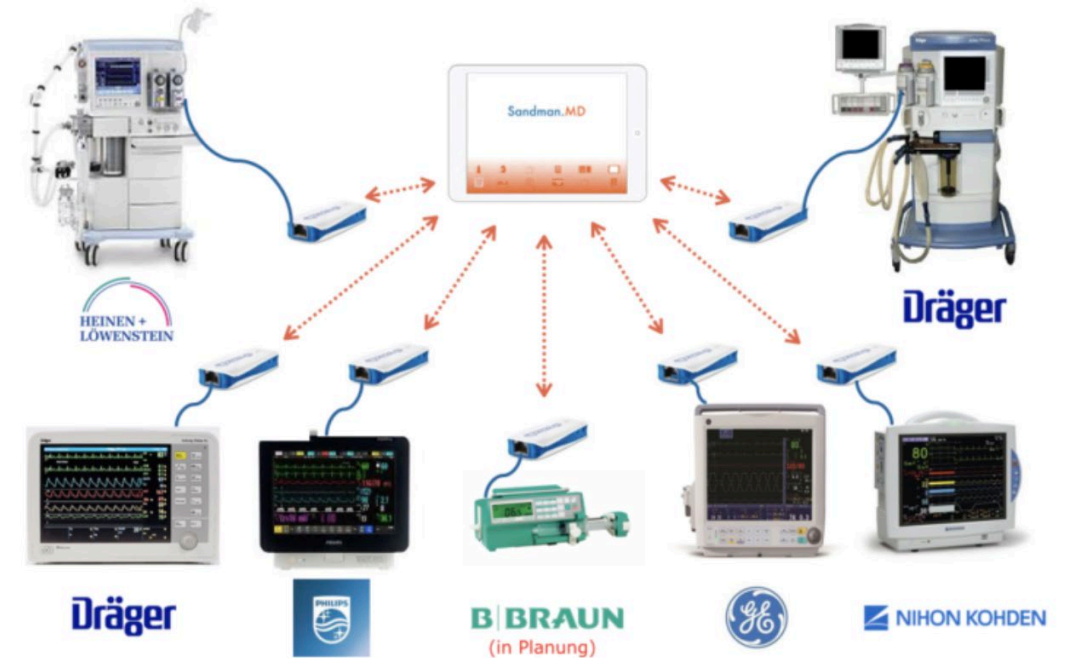
An intuitive user interface on a COTS device to facilitate implementation into clinical practice.



# Digital tool for monitoring and decision-making

## SANDMAN.IC – CONNECT AND ASSIST

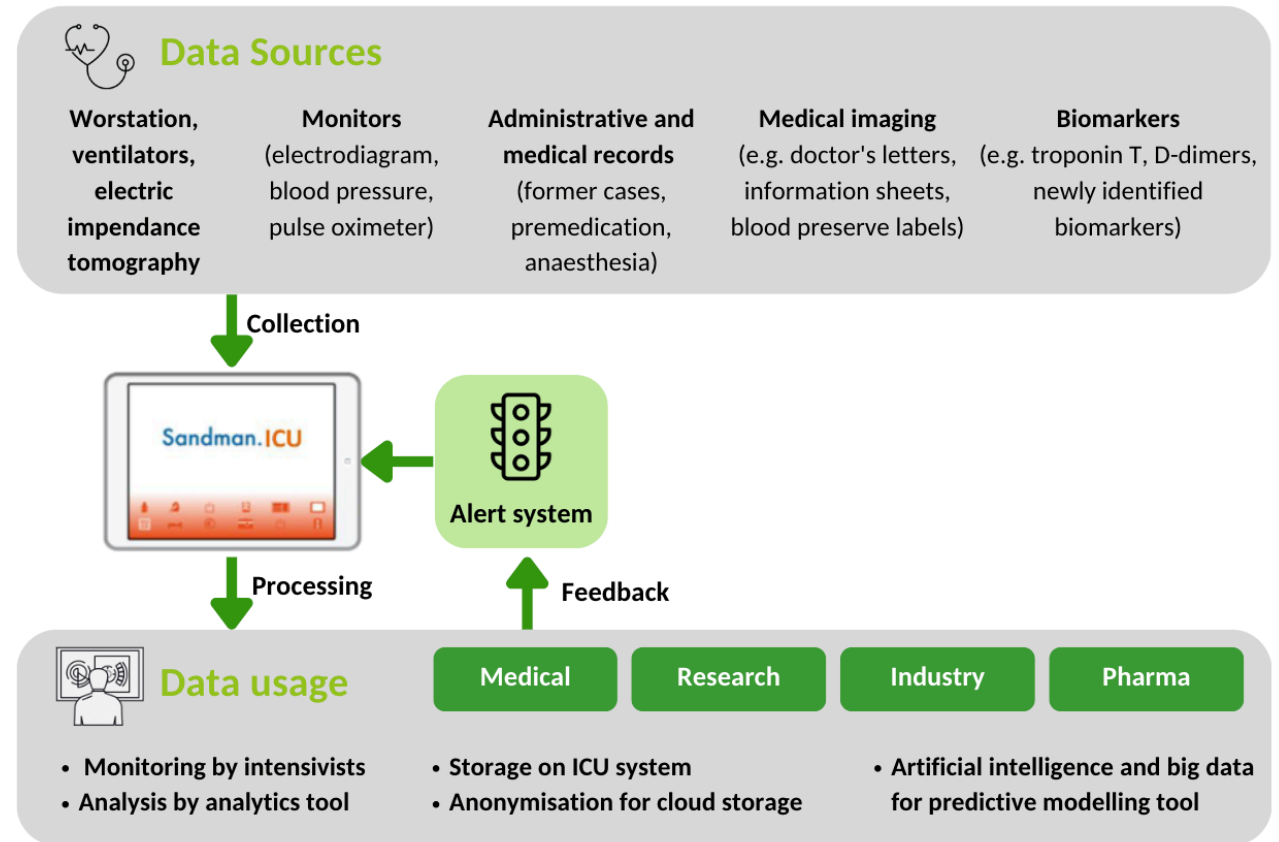
- Digital tool to assist in the management of COVID-19 patients in ICUs
- Real-time monitoring of patients
- Alert system based on big data analysis
- Improve the care of critically ill patients
- Ease the burden on the medical staff.



# Diverse applications in treatment and research

## EVIDENCE & TRANSPARENCY

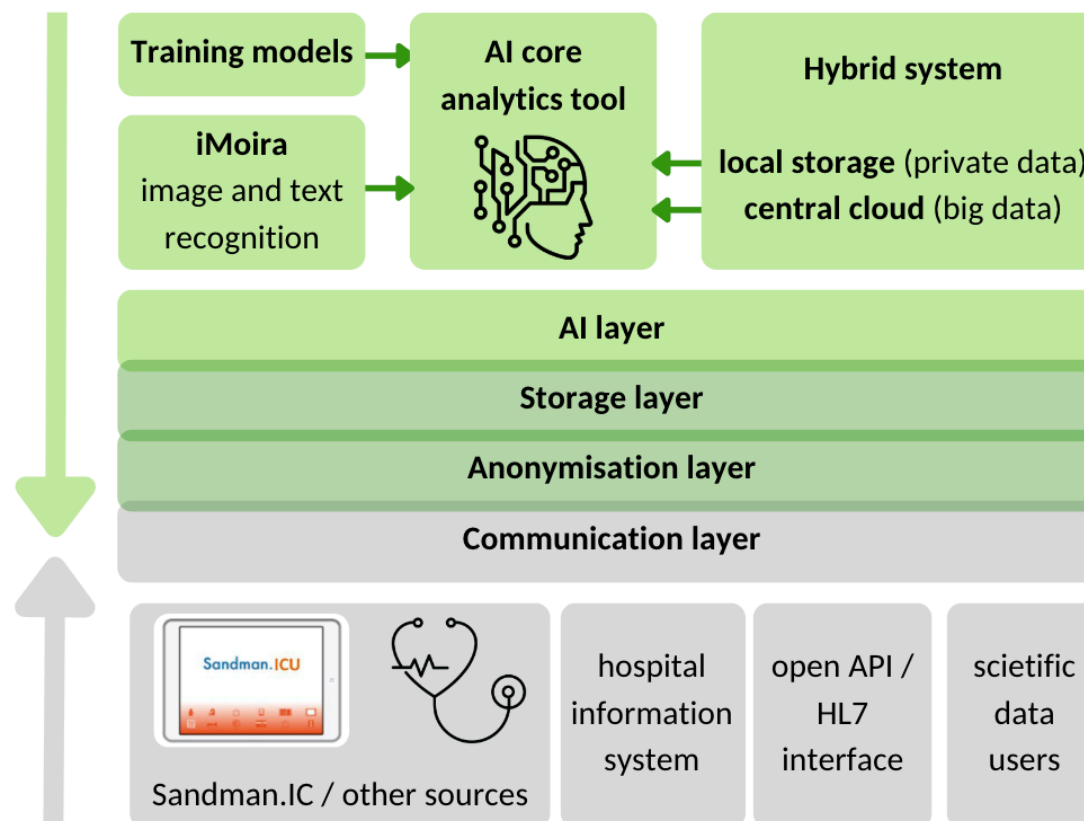
- Risks
- Problem constellations
- Optimisation strategies
- New procedures
- Medical technologies and medications
- Research tools



# Multi-layer platform with integrated analytics

## VERSATILE & FLEXIBLE

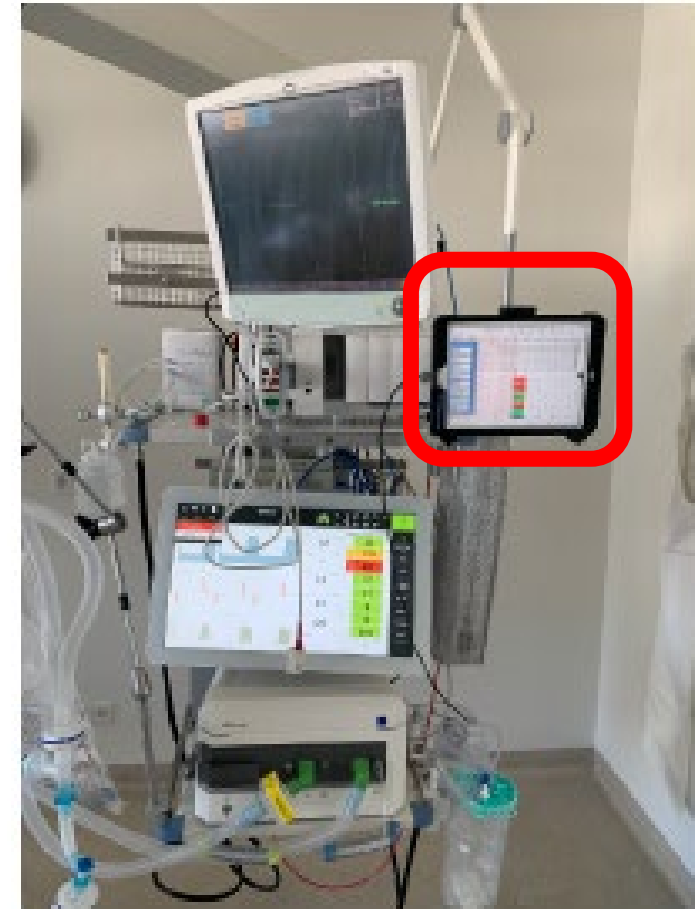
- Multi-layer ICT architecture
- Integrated data analytics technology
- Customisable to meet specific needs
- Predictive models can be trained and applied to other diseases and indications



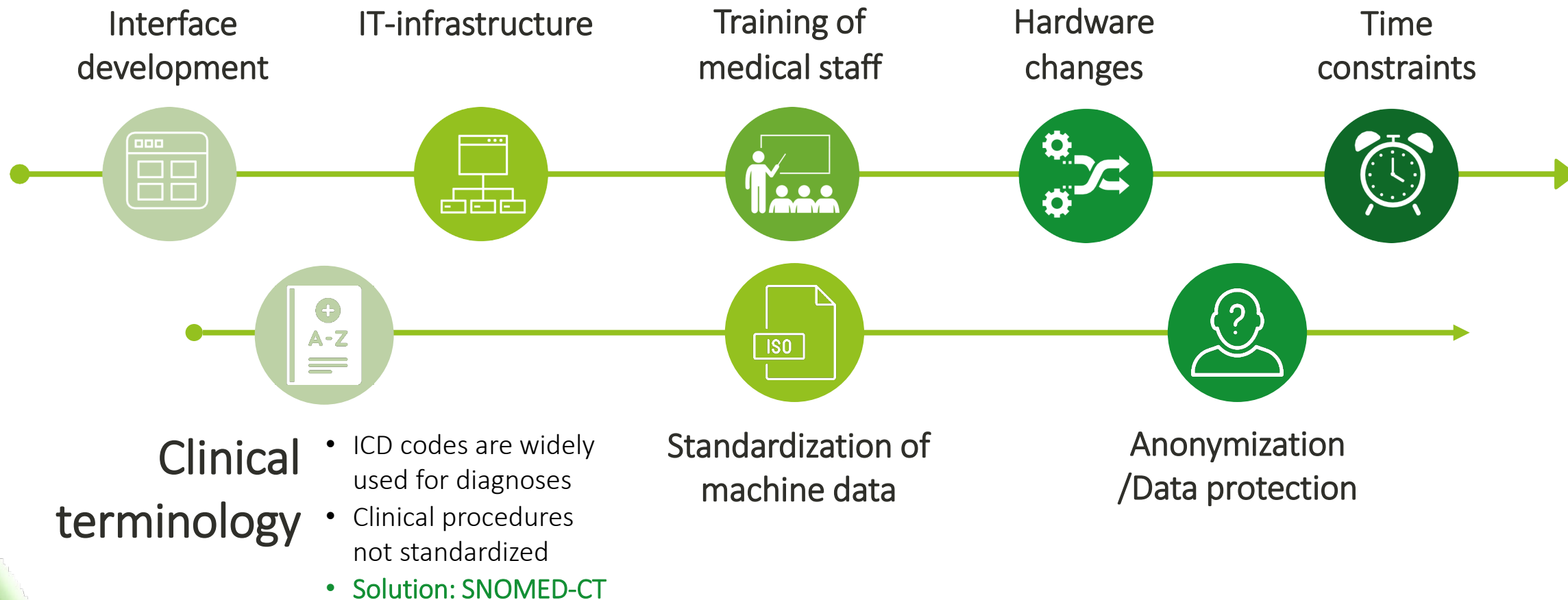
# Pilot project at the University Clinics Frankfurt

## KEY POINTS TO ADAPT THE PROTOTYPE FOR CLINICAL NEEDS

- Connect the Sandman.IC to the Elisa 600 and GE Carescape monitor
- Ensure that it is possible to change ventilators as well as monitors with the Sandman.IC
- Test long-term documentation
- Collect initial/simulated measurement data
- Collect user feedback on



# ENVISION tackles numerous challenges





# Integration of the SNOMED CT system

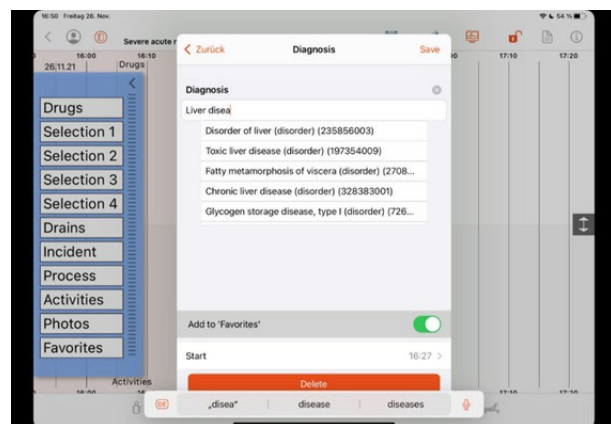
## CHALLENGE: CLINICAL TERMINOLOGY

- ICD terminology is established in all countries but regional differences exist
- OPS for medical procedures in Germany but different systems in other European countries;

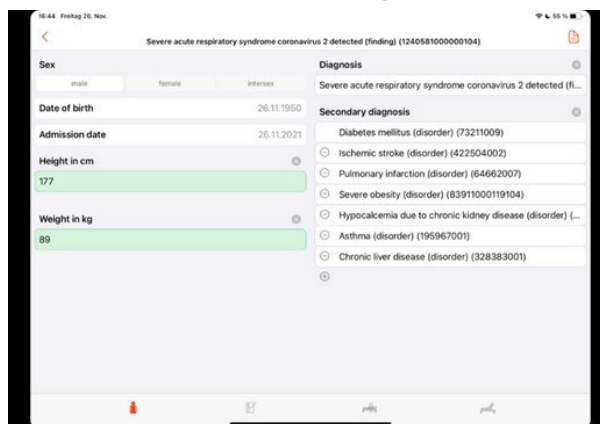


Integration of SNOMED CT into Sandman.IC  
to standardize clinical terminology for all partners

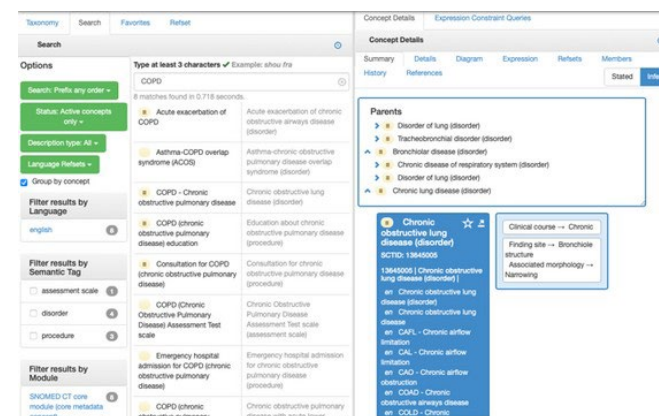
Follow-up diagnoses



Admission diagnoses



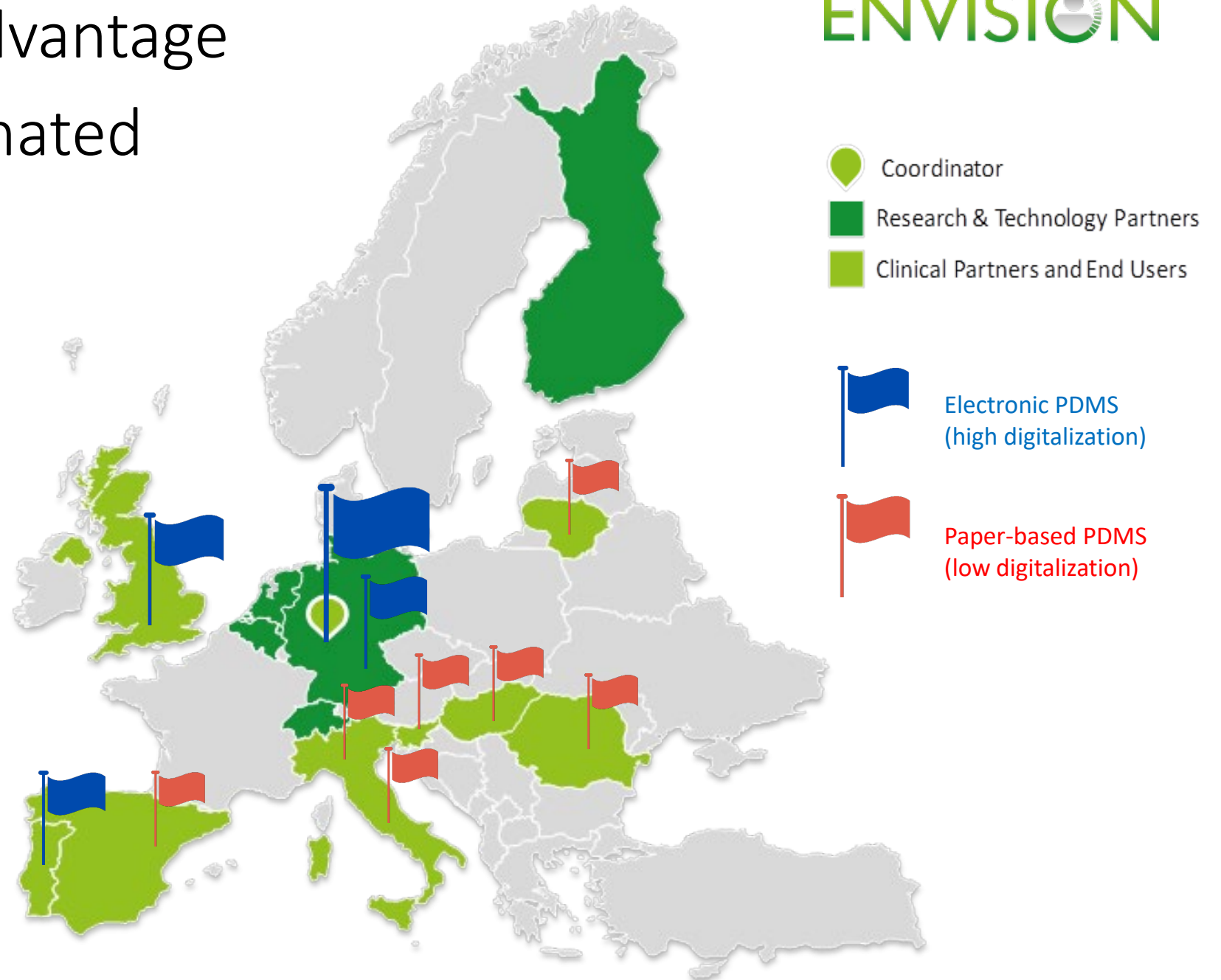
SNOMED CT –Browser (online)



# Follow-up: Take advantage of the well-coordinated consortium

- Apply the lessons learned
- Collect retrospective ePDMS data from partner clinics
- Analyse data and develop AI models relevant to future global health threats

ENVISION



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101015930.

## Contact us and stay in touch

### Project Coordinator

Prof. Dr. Dr. Kai Zacharowski

### Clinical Data Scientists

Dr. Jan Kloka  
Dr. Benjamin Friedrichson

### Management

Geraldine Hartmeier  
Markus Ketomäki  
Lea Grebe



Connect with us on



[envision-icu.eu](https://www.envision-icu.eu)



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101015930.