



AIOLOS

Artificial Intelligence ToOLS
for Outbreak Detection and responSe

A **sustainable** respiratory pathogens **outbreak detection and response** tool supported by **AI** and **multi-source real-time data** collection platform





A **Franco-German project** developing a sustainable **respiratory pathogens outbreak detection and response tool**



A **multi-source real-time data platform** leveraging on **AI-based models** to support decision making



A **consortium of 6 French and German partners with complementary expertise**: Sanofi, Fraunhofer, CompuGroup Medical, Quinten Health, Umlaut, Impact Healthcare

A project **supported by** the French and German Governments



Supported by:



on the basis of a decision
by the German Bundestag

We see...



A NEED FOR

a resilient multi-stakeholder surveillance & control system to manage pandemics ^(1, 2) even post SARS-CoV-2 ⁽³⁾



A KEY TOOL

to support the mission of the European Health Emergency Response Authority (**HERA**)



A POTENTIAL

for synergies with the Hub for Pandemics & Epidemic Intelligence of the WHO

Related references from the consortium:

- (1) Exploring uncertainty and risk in the accelerated response to a COVID-19 vaccine: Perspective from the pharmaceutical industry. *Vaccines* 2020 - <https://www.sciencedirect.com/science/article/pii/S0264410X20313281?via%3Dihub>
- (2) Potential impact of introducing vaccines against COVID-19 under supply and uptake constraints in France: A modelling study. *PLOS One* 2021 - <https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0250797>
- (3) Uncertain effects of the pandemic on respiratory viruses. *Science* 2021 - <http://science.sciencemag.org/content/372/6546/1043>

- A **pre-industrial solution** based on **multi-sources data** and **AI models** to support decision-making.
- The **federated and integrated data structure** is aligned to the EU data space spirit

WHAT



ALERT

Early detection of new epidemics



MONITOR

Progression and impact



DECIDE

Inform on appropriate response measures

HOW

INTEGRATE

Data from various sources



ANALYSE & PREDICT

Leveraging AI and predictive modeling



VISUALISE & SHARE

Intuitive results via dashboarding



ALERT

Detect **unexpected trends in syndromic manifestation**

- Hospital and ICU admissions related to an acute respiratory infection
- GP consultations
- Lab testing
- Drug consumption in pharmacies
- Social media activity
- ...

MONITOR

Monitor in real time the **spread of an epidemics** and **effectiveness of interventions**. Assess **impact**

- Health activity indicators
- Circulating strains
- Population profile (health, socio-economic)
- Mobility data (dynamics of transmission)
- Social media data (social acceptance of policy response)
- Economic activity data

DECIDE

Test different intervention **scenarios using AI-based modeling** and predictive analysis. Advise on **optimal action measures**

CONSORTIUM PARTNERS



- A consortium of **6 main partners**, bringing **complementary expertise**.



Vaccines and immunological products
Project and Data management

Medical Information Solutions
Data management and dashboarding



Medical and computational science
Data management, AI & modeling

Technological Capabilities Development
Data management and dashboarding



Artificial Intelligence and Precision Medicine
Data prep, AI & predictive modeling

Shared services
Project management
(Subcontracted by Sanofi)



Type of company / institution - [Role within AIOLOS](#)

ASSOCIATED PARTNERS

- Additional **key institutions and companies** involved as **associated partners** to **facilitate data access** and bring **scientific & technical expertise**.

DATA ACCESS



Real time hospital data



Mobility data and hospital data



Centre International de Recherche en Infectiologie

Real time PCR testing and virus sequencing

Universitätsklinikum Erlangen



Real time hospital data

illumina®

Testing rate, sequencing data and analytical solutions



Geo-spatial data

SCIENTIFIC & TECHNICAL EXPERTISE



Virus sequencing data and visualization tools



PredictEST solution and Grand Est region data



Bioinformatics, AI and predictive modeling



Dynamic population modeling



Predictive modeling

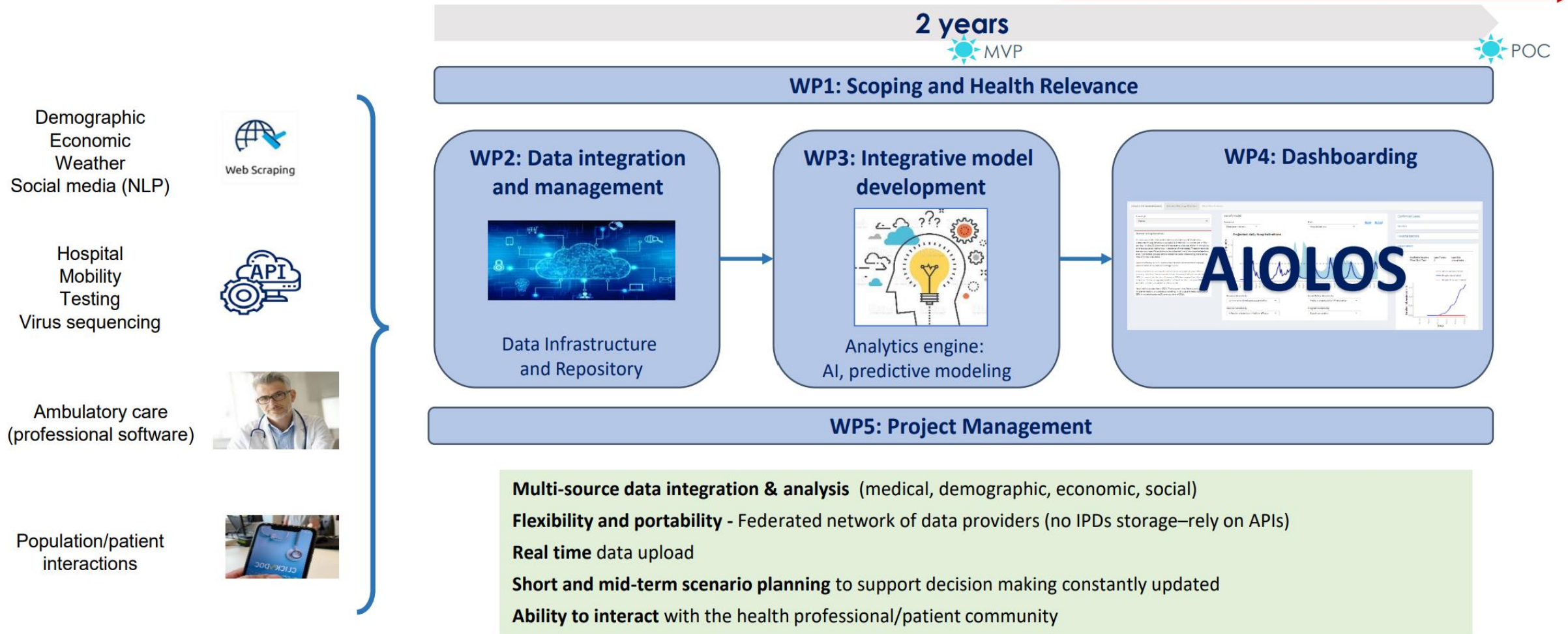
- **Consulted on public health and scientific components** to ensure relevance of the tools for the ends users.

Members of the Scientific Advisory Board

Prof. Antoine Flahaut, MD, PhD	Director of the Institute of Global Health, Faculty of Medicine, University of Geneva
Prof. Sandra Ciesek	Director of the Frankfurt Institute of Medical Virology, Germany
Prof. Jianhong Wu	Laboratory for Industrial and Applied Mathematics, York University, Canada
Prof. Jonas Schmidt-Chanasit	Head Department of Arbovirology and Entomology, Bernhard Nocht Institute for Tropical Medicine, Hamburg, Germany
Dr. Sylvie Briand (<i>observer</i>)	Director, Epidemic and Pandemic Preparedness and Prevention, WHO, Geneva
Dr. Robert Cohen	CHI Créteil, France
Mr Modris Stasul	HERA

WORK PACKAGE CONTENT AND SCHEDULE

Sustainability plan



INTERESTED IN CONTRIBUTION OR CONNECTING?

PROJECT LAUNCH IN BERLIN, 17 JUNE 2022

>50 participants, in person & remotely, with partners and key stakeholders, incl WHO and HERA



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Thank you!

www.aiolos-project.org

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 **Fraunhofer**

quin**ten**
health




umlaut
Part of Accenture

 **IMPACT**
Healthcare