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

sanofi

Fraunhofer

quinten health

CGM CompuGroup Medical

umlaut
Part of Accenture

IMPACT Healthcare

PROJECT OVERVIEW

AIOLOS

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:

FRANCE 2030

Federal Ministry for Economic Affairs and Climate Action

on the basis of a decision by the German Bundestag

REASON & VISION OF AIOLOS IN THE EU CONTEXT

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

AIOLOS SOLUTION

- 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

DATA APPROACH

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**.

sanofi Vaccines and immunological products Project and Data management	CGM CompuGroup Medical Medical Information Solutions Data management and dashboarding
Fraunhofer Medical and computational science Data management, AI & modeling	umlaut Part of Accenture Technological Capabilities Development Data management and dashboarding
quinten health Artificial Intelligence and Precision Medicine Data prep, AI & predictive modeling	IMPACT Healthcare 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

HCL Hospices Civils de Lyon — Real time hospital data

orange — Mobility data and hospital data

CIRI 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

infas 360 — Geo-spatial data

SCIENTIFIC & TECHNICAL EXPERTISE

GISAID — Virus sequencing data and visualization tools

PRIeSM — PredictEST solution and Grand Est region data

INSTITUT PASTEUR — Bioinformatics, AI and predictive modeling

TSPED School of Public Health / Université de Bordeaux — Dynamic population modeling

York U — Predictive modeling

SCIENTIFIC ADVISORY BOARD

- **Consulted on public health and scientifc 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 (*observer*)	Director, Epidemic and Pandemic Preparedness and Prevention, WHO, Geneva
Dr. Robert Cohen	CHI Créteil, France
Mr Modris Stasul	HERA

WORK PACKAGE CONTENT AND SCHEDULE

Demographic
Economic
Weather
Social media (NLP)

Hospital
Mobility
Testing
Virus sequencing

Ambulatory care
(professional software)

Population/patient
interactions

Sustainability plan

2 years

MVP

POC

WP1: Scoping and Health Relevance

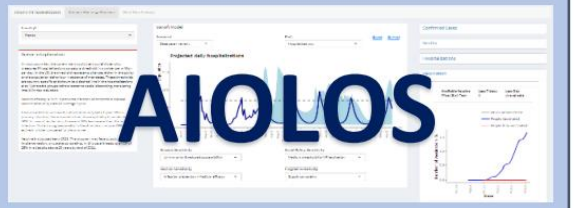
WP2: Data integration and management

Data Infrastructure
and Repository

WP3: Integrative model development

Analytics engine:
AI, predictive modeling

WP4: Dashboarding



WP5: Project Management

Multi-source data integration & analysis (medical, demographic, economic, social)

Flexibility and portability - Federated network of data providers (no IPDs storage–rely on APIs)

Real time data upload

Short and mid-term scenario planning to support decision making constantly updated

Ability to interact with the health professional/patient community

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

contact@aiolos-project.org

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Thank you!

www.aiolos-project.org

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