CONSORTIUM PROFILE · CAPABILITIES OVERVIEW · ANDALUSIA, SPAIN

Laboratory Capabilities

The Data Science Laboratory (LCD) of the Andalusian Public Health System (SSPA) offers a unique combination of clinical expertise, real-world data infrastructure and applied AI research capacity to support multi-partner European projects.

LCD — LABORATORIO DE CIENCIA DE DATOS

15+	13M+	5+	8M+
AI PROJECTS	PATIENTS	HORIZON EU	EMS CALLS

The LCD acts as a facilitator of **secondary use of SSPA health data for R&D&I**, promoting collaborative analysis and AI application across the public health system. Our work spans three core lines: **knowledge generation** through AI and Big Data in research projects; **AI solution evaluation** through algorithm validation and benchmarking; and **clinical decision support development** — designing and validating tools in multidisciplinary teams of data engineers, clinicians, managers and domain experts.

CORE CAPABILITIES

What we contribute to a consortium

01 — DATA INFRASTRUCTURE

Real-World Population Health Data at Scale

Access to the **Andalusian Population Health Database (BPS)** — 13M+ patients with longitudinal clinical, pharmaceutical, imaging and epidemiological records. Infrastructure for retrospective studies, external validation cohorts and federated research nodes aligned with the **European Health Data Space (EHDS)**.

BPS · SSPA | EHDS-aligned | FAIR | k-anonymisation | Physionet

02 — AI DEVELOPMENT

End-to-End Clinical AI Pipeline Development

Full lifecycle capacity: clinical problem framing, data engineering, model development (**ML, Deep Learning, NLP, Reinforcement Learning**), prospective and retrospective clinical validation, explainability (XAI), and benchmarking against regulatory standards. Proven across oncology, emergency medicine, ICU and public health.

CDSS | XAI | NLP / LLM | Computer Vision | RL

03 — VALIDATION & BENCHMARKING

Independent AI Algorithm Evaluation Service

The LCD operates **EVIAS**, a structured validation and benchmarking service for clinical AI algorithms. We assess safety, efficacy and robustness of AI solutions from public and private organisations, providing independent evaluation reports aligned with **MDR and the EU AI Act**.

MDR | AI Act | Safety | Performance Metrics | Independent audit

04 — OPEN SCIENCE & INTEROPERABILITY

Data Sharing, Governance & Open Repositories

Proven experience designing **anonymised open clinical datasets** (published on Physionet), building multimodal data repositories, and establishing data governance frameworks under **GDPR, FAIR principles and EHDS** requirements. Active participant in European data sharing initiatives.

Open Data | GDPR | Interoperability | FAIR | Federated

TECHNICAL EXPERTISE

AI / ML

- Supervised & Unsupervised ML
- Deep Learning (CNN, LSTM)
- NLP & LLMs
- Reinforcement Learning
- Explainable AI (XAI)
- Survival Analysis

Engineering

- Python · R · SQL
- PostgreSQL · ETL
- Big Data / JupyterHub
- Image Embeddings
- Dashboards & Viz
- ARIMAX · XGBoost

CLINICAL DOMAIN COVERAGE

Oncology | Emergency Medicine / EMS | Infectious Disease | Gastroenterology / IBD | ICU / Critical Care | Rheumatology | Pulmonology | Psychiatry / Mental Health | Perinatal Health | Cardiovascular | Epidemiology & Public Health | Rare Disease | Neurodevelopment

WHY PARTNER WITH LCD

13M+
Patients in the Andalusian Population Health Database — one of the largest regional health datasets in Europe

EHDS
Infrastructure and governance aligned with the European Health Data Space for seamless cross-border data collaboration

360°
Multidisciplinary teams: data engineers, clinical experts, health managers and AI researchers working in concert

RESEARCH PORTFOLIO · DATA SCIENCE LAB · SSPA · ANDALUSIA, SPAIN

LCD — LABORATORIO DE CIENCIA DE DATOS

Selected *European &* National Projects

A curated selection of competitive research projects led or contributed to by the Data Science Laboratory. Showcasing applied AI, machine learning and data engineering in clinical and public health contexts.

5+	1	10+	13M+
HORIZON EU	IHI	NATIONAL	PATIENTS

HORIZON EUROPE & IHI — SELECTED HIGHLIGHTS

+ additional projects available upon request

HORIZON EUROPE

ASSESS-DHT

Assessment of Digital Health Technologies in Europe

Consolidates HTA methods for Digital Health Technologies, producing a generic EU-harmonised framework aligned with the European Health Data Space (EHDS) Regulation across member states.

HTA · EHDS · Digital Health · Policy

↗ assess-dht.eu

HORIZON EUROPE · IHI

BRIDGE

Regulatory Innovation through Sandbox Environments

Framework for designing health regulatory sandboxes. Delivers MOSAIC — a modular model for controlled tech testing — plus evidence packages and checklists for regulators and industry.

Regulatory · Sandbox · MOSAIC · Innovation

↗ bridge-ihi.eu

HORIZON EUROPE

ePerinatal

Digital Intervention for Perinatal Mental Health

Evaluates the "Unete" mHealth ecosystem for preventing perinatal depression and anxiety — combining emotional monitoring, psychoeducational content, CBT tools and digital biomarker validation.

mHealth · Mental Health · Biomarkers · CBT

ACTIVE PARTICIPANT

HORIZON EUROPE

IntelliLung

AI Clinical Decision Support for ICU Ventilation

Validates a reinforcement learning AI-CDSS that optimises mechanical ventilation in ICU patients. Integrates ventilator parameters and clinical data to minimise lung injury across multicentre prospective studies.

Reinforcement Learning · ICU · CDSS · Ventilation

↗ intellilung-project.eu

HORIZON EUROPE

BRIDGE-ID

Early Diagnosis in Neurodevelopmental Rare Disease

Improves early diagnosis for CTNNB1 syndrome and related intellectual disabilities. Develops multilingual AI assistants, digital platforms and clinical guidelines aligned with EU health regulation and GDPR.

Rare Disease · Neurodevelopment · AI · GDPR

REGIONAL & NATIONAL — SELECTED HIGHLIGHTS

+ further projects across oncology, cardiology, gastroenterology & psychiatry

REGIONAL — JUNTA DE ANDALUCÍA

trIAje · CCUE 061

AI Optimisation of Emergency Telephone Triage

Supervised learning, deep learning and NLP applied to 12M+ emergency call records to improve classification of cardiac arrest, stroke, respiratory distress and chest pain — reducing false negatives and improving dispatch accuracy across Andalusia.

NLP · Deep Learning · Emergency · LLM · Triage

LEAD DATA SCIENTIST

REGIONAL — SSPA

ESCULAPIO

Big Data & AI Platform for Population Health Surveillance

Strategic platform integrating SSPA data for 13M+ patients, enabling real-time epidemiological surveillance and emergency response optimisation. Offers k-anonymous FAIR data access via JupyterHub with ARIMAX, XGBoost and LSTM predictive models.

Big Data · Epidemiology · FAIR · LSTM · XGBoost

PLATFORM ARCHITECT