# Description

The purpose of the PULSE 2.0 project is to build a modern data platform that collects and manages health-related information across multiple parameters, specifically focusing on wastewater data.

The team will work on gathering requirements, designing the system architecture, and developing the infrastructure software components as well as a user-friendly interface for seamless data input, monitoring and management.

The final product will be a complete Docker-based package that includes the data storage and entry system using PostgreSQL database, and Grafana dashboards for interactive data visualization which will serve mainly for internal purposes, as well as a public health dashboard that will convey information to the public. The platform will also provide necessary APIs to support programmatic access to health-related data.

# Tasks

## Database Implementation

This task involves the docker-based installation of a PostgreSQL database and the implementation of the table structure as specified by the “Public Health Environmental Surveillance Open Data Model (PHES-ODM)” documentation (ODM-documentation-v2.0.1.pdf and ODM\_ERD\_V2.2.3\_Datasets.pdf)

## Data Entry and Management System

Data entry should be possible in three ways:

1. Through a dedicated web-based UI application that enables authorized users to enter both laboratory results as well as other supportive metadata information through dedicated screen views. Such supportive metadata information includes Organisation and Sample Site definitions, List of Values for measurements and units etc. Access to the system should be protected using encrypted user credentials and access to screen views controlled using user Role Based Access.
2. Through APIs which will enable external authorized organizations or automated samplers to securely enter programmatically lab results into the system.
3. By the uploading of lab results from a standardized excel spreadsheet (samples.xlsx). This should have the form of an executable which reads the data from the excel file and uploads them to the database by using the APIs in (b) above.

Therefore, this task consists of the development of APIs which read and write data into the PostgreSQL database, and using these API’s to build a user web application (the Data Entry and Management System) and a console application (the excel uploader).

## Data Monitoring and Early Event Detection

This task involves the development of a system that will enable users to monitor and perform analysis on the collected data as well as provide possible alarms in cases where an irregularity or risk is detected through the analysis of the collected data.

This will involve the Docker-based installation of Grafana and the development of dashboards, some of which will only be available to authorized users (internal use) while others will be available to the public. The public dashboards

**Important links:**

PULSE: <https://github.com/KIOS-Research/covid-pulse-cy/tree/main?tab=readme-ov-file>

PHES-ODM: <https://www.phes-odm.org/>  
PHES-ODM TOOLS: <https://www.phes-odm.org/tools>  
Github – PHES-ODM: <https://github.com/Big-Life-Lab/PHES-ODM/tree/main/templates>  
Dictionaty tables - PHES-ODM: <https://github.com/Big-Life-Lab/PHES-ODM/tree/main/dictionary-tables>

Documentation - PHES-ODM: <https://docs.phes-odm.org/>  
Acknowledgements: <https://github.com/Big-Life-Lab/PHES-ODM/blob/main/README.md#acknowledgements>  
<https://osf.io/ec7jv/>  
<https://osf.io/49z2b/>