The ***B-Path*** consortium combines expertise from academia, NGOs, and industry. It includes experts in the development of diagnostics, partners with extensive expertise in implementation science, including mixed-methods research approaches, cost-effectiveness, and modelling.

The studies will take place in four countries: ***South Africa, Germany, Italy, and Romania.***

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B-PATH

101136380 - B-PATH - HORIZON-HLTH-2023-TOOL-05

EASY BREATH SAMPLES
TO QUICK DIAGNOSIS

INNOVATIVE STRATEGIES

Early and accurate diagnostics are essential for controlling the spread of infectious diseases, improving patient outcomes, and reducing healthcare costs. ***B-Path addresses this need by developing non-invasive breath sampling devices*** for rapid detection of respiratory infections, aiming to transform global health diagnostics.

This process will involve the development of innovative, non-invasive breath aerosol sampling devices for the early and accurate detection of pathogens like SARS-CoV-2, influenza, and tuberculosis. These scalable devices promise to ***enhance disease screening, control transmission, and improve global health outcomes*** with accessible, point-of-care solutions.

PROJECT'S IMPACT

This project will ***significantly impact the detection and management of respiratory pathogens*** with epidemic, pandemic, or significant clinical risk. Highly transmissible pathogens like influenza and coronaviruses pose global threats due to their ability to spread rapidly through respiratory aerosols, crossing borders and infecting large populations. Future pandemics may be triggered by novel viruses or unknown pathogens ("pathogen X"). To address this, we will use ***viral metagenomics*** to rapidly identify new viruses and viral mutations from XBA samples, enabling early detection of emerging threats.

AIM OF B-PATH

For this project, we will evaluate ***two promising non-invasive exhaled breath aerosol (XBA) sampling methods.*** The first is the ***face mask sampling (FMS)***, which is scalable and compatible with various diagnostic assays (DNA/RNA and antigen detection). FMS is particularly beneficial when masks are already worn, such as during epidemics. However, challenges exist with integrated pathogen detection masks, including shelf-life, cost, patient safety, and regulatory issues.
The second approach is with a ***blow-tube style device***, a more straightforward, faster, and cost-effective method. This device can collect samples in about 2 minutes and capture droplets and XBAs. Pathogens are captured on a nanofiber mat and can be easily integrated with diagnostic platforms. This method promises to be more scalable and suitable for widespread use.

The project's key innovation is ***advancing these XBA sampling devices into evidence-based tools*** for diagnosing and screening respiratory infections. By comparing both devices in clinical studies, we aim to identify the best option for different use cases (diagnosis and screening). We will use the ***Respiratory Aerosol Sampling Chamber (RASC)*** as a reference method for standardizing the comparison of different XBA sampling devices.

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