



Contribution ID: 318

Type: **Poster presentation**

Development of an integrated genomic surveillance (IGS) of public health relevant pathogens in Germany for infectious disease control

Monday, October 13, 2025 7:05 PM (1 minute)

IGS is an effective public health strategy for the surveillance of infectious pathogens. It combines whole-genome sequencing of notifiable pathogens and subsequent bioinformatics analyses with epidemiological case data from the reporting system and further laboratory analysis data.

One of the IGS's primary objectives is to rapidly identify significant pathogen dissemination and to ascertain infection links, even across disparate time periods and locations. Moreover, the IGS enables the continuous detection and monitoring of pathogen variants with evolving characteristics, such as transmissibility and virulence. In doing so, the IGS makes a significant contribution to the decision-making processes.

The RKI has implemented a strategy to build an internationally comparable IGS. Essential processes and infrastructure are being developed in collaboration with National Reference Centers, Consultant Laboratories, state laboratories, the University Medicine Network, and public health authorities.

Core activities include establishing harmonised sequencing workflows and deploying a high-performance bioinformatics and visualisation infrastructure that links sequence and case data in near real time, giving the possibility to also exchange information with other sectors. The knowledge gained from the IGS is passed on to various stakeholders, e.g. to the local health authorities as part of the reporting system, so that it can be used to adapt measures.

Keywords

Public Health Surveillance; Infectious Diseases; Outbreak Detection; Whole Genome Sequencing; Computational Biology

Registration ID

OHS25-0086

Professional Status of the Speaker

PhD Student

Junior Scientist Status

No, I am not a Junior Scientist.

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Session Classification: Snacks & Poster Viewing I

Track Classification: One Health in Public Health