

## **E-Health technology for infectious disease monitoring with a special focus on respiratory infections: Design Conception**

J Heise <sup>1,2</sup>, G Krause <sup>1,2,3</sup>, S Castell <sup>1,2</sup>

<sup>1</sup> Department of Epidemiology, Helmholtz Centre for Infection Research (HZI)

<sup>2</sup>: German Center of Infection Research (DZIF)

<sup>3</sup>: Hannover Medical School (MHH)

The rapidly developing framework of eHealth offers new opportunities for syndromic infection surveillance and clinical/research monitoring. eHealth tools are long-term cost-effective, have an increasing broad reach and acceptance. Other advantages are real-time data collection and processing and the flexibility of eHealth tools compared to paper-based questionnaires. eHealth apps can be used for various contents. Especially in the field of infectious diseases, the collection of real-time data improves data quality (regarding recall-bias) including validity of pathogen detection.

Within the digital framework, we developed an eHealth tool, called “**P**ersonalized assessment of acute **I**nfections - **A**pplication (*PIA*)”, with the aim of facilitating real-time reporting of acute, transient infections focusing on the respiratory tract. One specific feature of *PIA* is that it provides flexible adaption of questions and questionnaires to allow for research on emerging topics and to make the tool usable for various contents. For the first research application of *PIA*, we developed an algorithm for displaying a network of conditional questionnaires at specific times and after specific data entry events. In addition to the real-time reporting of infection symptoms, *PIA* offers the opportunity of biosample collection if a certain case definition applies. In our current project, in case of respiratory infections, the participants take 2 nasal swabs themselves: one swab for virological diagnosis, the second for microbiome analysis. This allows for collection and laboratory analysis at an early stage of disease so that the sensitivity of virus detection increases considerably. Real-time feedback incl. laboratory reports, which can be retrieved in the app, provides an important incentive for participant adherence.

Our focus in the development of *PIA* is the connection of infection research with a user friendly and motivating tool. Therefore, we implement usability and technological acceptance questionnaires to evaluate this specific tool regarding its capability for infectious disease population-based research.

We aim to develop an eHealth tool, which is suitable for clinical and research monitoring in order to achieve long-term usage in future studies.