

# **MASK - A mobile Application to monitor symptoms and medication of patients with allergic rhinitis**

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## **Background**

Allergic rhinitis (AR) is among the most common diseases globally, impairing social life and performance. Several unmet needs have been identified in allergic rhinitis and asthma, including exposure, optimal control and comorbidities. Patient-integrated applications to report symptoms exist, but this valuable information cannot be utilized nor stratified to be beneficial for the patient in an Integrated Care Pathway (ICP). This is the first attempt on a European scale to provide allergic rhinitis patients with an app-based tool to report symptoms and actual medication, and to include this in their personalized treatment.

## **Methods**

MASK (MACVIA-ARIA Sentinel Network for allergic rhinitis) is a simple system, centered around the patient which was devised to fill many of these gaps using smartphone based apps, supported and linked to expert validated guidelines (ARIA) in allergic rhinitis and its asthma comorbidity. It is integrated as EU twinning project using the scaling-up strategy recommendations in the European Innovation Partnership on Active and Healthy Ageing (EIP on AHA) and available in many languages. The MASK app utilize a visual analogue scale (VAS) assessment of disease control, symptoms and medication; All available relevant prescription and Over-the-counter medication are available within the app and it collects data for overall allergic symptoms, as well as nasal, ocular, asthma symptoms as well as work related impact. A tablet based platform for physicians and other health care professionals allow integration of care pathways for allergic rhinitis from patients to health care providers using a common language and a clinical decision support system. The MASK apply to the EU legislation concerning GDPR.

## **Results**

The MASK App is available in 21 countries and 15 languages and has been downloaded 23294 times by 13177 single-users, 102 of these located in Denmark. VAS are well validated for the measurement of AR symptoms and correlate well with the ARIA severity classification. Scientifically, the MASK app has enabled the identification of phenotypic differences between a priori defined rhinitis groups. The results suggest novel concepts and research questions in allergic rhinitis that may not be identified using classical methods. A pilot study on 1136 users combining 5818 work days provided not only proof-of-concept data on the work impairment collected with the app but also data on the app itself, especially the distribution of responses for the VAS, which supports the interpretation that persons with rhinitis report both the presence and the absence of symptoms. The Allergy Center in Odense plans for relevant patients referred to AllergyCenter, Odense, to implement use of MASK app prior first consultation.

## **Conclusion**

Overall the MASK app is reported user friendly, flexible and has shown scientific potential. This will be emphasized with increasing numbers of users in relation to increased knowledge and experience. Having access to detailed patient history such as real-time symptoms and severity as well as medication prior first visit are valuable information to optimize diagnosis and treatment. Integration with real-time pollen counts will further improve usability. MASK appears to be an advanced, global and integrated solution, answering some of the unmet needs in allergic diseases, which will improve policies and standards.