



Application number/Title: 42066 - Development and validation of a risk prediction model for oesophageal squamous cell carcinoma using cohort studies

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Keywords provided by the Applicant PI to describe the research project:

Prediction model, early diagnosis, external validation, oesophageal neoplasm, risk assessment, screening

Application Lay Summary:

Background and aims

Oesophageal squamous cell carcinoma (OSCC) is the main type of oesophageal cancer globally. It is usually diagnosed at advanced stages because the typical symptoms with swallowing problems occur late. Less than 20% of patients survive for 5 years in Western countries. Early detection would lower the mortality. By combining readily identifiable risk factors, we aim to develop a risk prediction model which can help risk assessment and selecting high-risk individuals for screening or surveillance using endoscopies. We would like to use the UK Biobank data to externally validate a prediction model that we will first develop in a large cohort in Norway.

Scientific rationale

The risk prediction model will be developed based on the Nord-Trøndelag Health Study (HUNT) in Norway, and will be validated using UK Biobank data. The very large size of the prospective UK Biobank cohort makes it an ideal dataset to externally validate the prediction model. This study is both health-related and in the public interest. A thoroughly evaluated and validated risk prediction model is fundamental for its future clinical application.

Methodology

We will use the HUNT to develop a model to predict each participant's risk of developing OSCC with next 5, 10 or 15 years, according to their different combinations of risk factors, i.e., age, sex, smoking status, alcohol consumption,

family cancer history and other variables of potential relevance. Then we will assess the performance of the model by testing the ability to separate cases from non-cases and the ability of prediction accuracy which will compare the actual cancer risks with the predicted ones. Finally, we will apply the model to the external cohort (UK Biobank) and evaluate its accuracy and efficacy, and test the feasibility of targeted screening and risk prediction.

Public health impact

We require accessing the whole UK Biobank in order to externally validate a prediction model. Once the model is well-developed and thoroughly externally validated, it could be used by clinicians and patients for tailored screening or surveillance, and policy-makers may distinguish high-risk individuals from the population and thus provide targeted endoscopic screening programs for them. A more tailored prevention strategy for early detection of OSCC would reduce deaths in OSCC.