WTDTP Projects for September 2022

Project Reference: T1/35

Project Title: **Bayesian multi-parameter evidence synthesis for biomarker driven HTA decision making**

Theme(s): Theme 1: Genomics for drug development & pharmacogenetics

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Project Summary: Precision medicine research identifies subgroups of patients, for example defined by genetic biomarkers in oncology, to which targeted therapies can be delivered successfully. When genetic markers are used to identify groups of patients who can benefit from targeted therapies, they are investigated in clinical trials. Such trials are often of mixed designs, with multiple genetic markers, making it difficult to combine their results in meta-analysis, often required for evaluation of new therapies; for example by the National Institute for Health and Care Excellence (NICE). The project aims to develop statistical methodology for evaluation of therapies, targeted on patient populations defined by genetic biomarkers, allowing for optimal use of diverse data sources (surrogate endpoints and different study designs) for purpose of health technology assessment (HTA) decision-making. The project will explore potential use of methods to incorporate information on the interactions between multiple biomarkers and on polygenic risk scores. The work will be conducted using Bayesian evidence synthesis methods with application to decision modelling. Developed methods will be tested in a simulation study and applied to data on effectiveness of pharmacological cancer therapies. Work will be conducted in collaboration with pharmaceutical industry partner with a potential opportunity for visiting them in Switzerland.