

# Validation and development of models using clinical, biochemical and ultrasound markers for predicting pre-eclampsia: an individual participant data meta-analysis

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## Plain English summary

IPD meta-analysis of pre-eclampsia markers

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# Plain English summary

## What is the problem?

Pre-eclampsia, a condition in pregnancy that results in raised blood pressure and protein in the urine, is a major cause of complications for the mother and baby.

## What is needed?

A way of accurately identifying women at high risk of pre-eclampsia to allow clinicians to start preventative interventions such as administering aspirin or frequently monitoring women during pregnancy.

## Where are the research gaps?

Although over 100 tools (models) have been reported worldwide to predict pre-eclampsia, to date their performance in women managed in the UK NHS is unknown.

## What did we plan to do?

We planned to comprehensively identify all published models that predict the risk of pre-eclampsia occurring at any time during pregnancy and to assess if this prediction is accurate in the UK population. If the existing models did not perform satisfactorily, we aimed to develop new prediction models.

## What did we find?

We formed the International Prediction of Pregnancy Complications network, which provided data from a large number of studies (78 studies, 25 countries, 125 researchers, 3,570,993 singleton pregnancies). We were able to assess the performance of 24 out of the 131 models published to predict pre-eclampsia in 11 UK data sets. The models did not accurately predict the risk of pre-eclampsia across all UK data sets, and their performance varied within individual data sets. We developed new prediction models that showed promising performance on average across all data sets, but their ability to correctly identify women who develop pre-eclampsia varied between populations. The models were more clinically useful when used in the care of first-time mothers pregnant with one child, compared to a strategy of treating them all as if they were at high-risk of pre-eclampsia.

## What does this mean?

Before using the International Prediction of Pregnancy Complications models in various populations, they need to be adjusted for characteristics of the particular population and the setting of application.

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## This report

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