



## **Modelling Probabilities of Weather-Related Road Accidents**

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Weather has a strong impact on road accidents. Several studies have addressed the impact of weather road accident counts in different regions on a monthly or daily time scale. However, little research is available regarding hourly accident probabilities, in particular for Germany.

Here, we use logistic regression models to predict hourly probabilities of road accidents caused by slippery road conditions for administrative districts in Germany. The response variables are derived from a dataset comprising five years of severe road accidents in Germany. Meteorological predictor variables are derived from the high-resolution COSMO reanalysis data set. Regression models of different complexity are evaluated with respect to their predictive skill by using a cross validation approach.

We find that precipitation and temperature are among the most important factors contributing to the accident probabilities. On average, in case of precipitation the accident probability increases by a factor of 5 if the surface temperature is above 0°C and it increases by a factor of 20 if it is below 0°C. Impact models as shown in this work can be useful for issuing warnings in the framework of decision-support tools.