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A robust and transferable model for the prediction of flood losses on household contents

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Beside the flood hazard analysis, a comprehensive flood risk assessment requires the analysis of the exposure of values at risk, and their vulnerability. Currently, the main focus is on losses on building structures. Nevertheless, the loss on household contents accounts of up to 30% of the total losses on buildings due to floods. Here, we present two functions for estimating flood losses on household contents. The models, predicting the loss on household content in a building based on the loss on it's structure, are developed and validated by insurance claim records. One model is based on a regression between the degree of loss for building structure and the degree of loss for household content. The second model is based on a regression between the absolute losses of both types. Moreover, we tested the models for robustness and predictive power. Both models generate appropriate results with a comparative advantage of the relative over the absolute loss model. The same is true in terms of model transferability. A key factor in the model development was the applied Box-Cox transformation method. By applying tests to the distribution of the residuals, we showed that this transformation method works well for generally right-skewed loss data, and to meet model assumptions of a simple linear regression. We recommend to consider data transformation, as it is providing a statistically correct estimation of the uncertainties.