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# P89 Forecasting models for healthcare planning suffers from inadequate performance evaluation

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# Most of these models are not properly validated!

**Introduction:** The prediction of future health care capacity needs continuous to be of high demand. Many such models have been developed for disease incidence and prevalence, covering viral diseases such as COVID-19 as well as circulatory and neurological diseases. However, the usefulness and successful implementation of such models in health care planning remains unclear. Thus, following a systematic review and evidence mapping of health care planning, we aimed to describe to which extent such models are validated.

**Methods:** All publications retrieved from PubMed and Embase, matching our predefined search strings, were screened for relevance by two independent reviewers using the Rayyan online tool. All publications that could not be excluded by title and abstract were retrieved for full text synthesis.

**Results:** Of 5415 articles screened 263 were read in full text, of those 105 were deemed eligible for the review. Of the 105 forecasting models 45 was not at all validated, 3 claimed to be validated, but there was no indication of validation in the article. 11 models were only validated by some form of model fit assessment (apparent validation). Temporal validation was performed for 39 models, 4 models were geographically validated, and 3 models were validated with random splits. The most common disease groups are cancer (22 models) and infectious disease (27 models).

**Discussion:** Most forecasting models for health care capacity needs are not properly validated. Temporal validation is an appropriate method for evaluating performance of a time trend extrapolation, it is also the most commonly used approach. Implementing a model that is not properly validated, can lead to capacity planning decisions that wrongfully allocates resources such that waiting lists in some fields grow, while other fields waste resources on overcapacity.

**Conclusion:** The research on prediction models in health care planning is of limited scope. Meantime, the use of performance evaluation for these models is inadequate. Thus, more research on performance and implementation of forecasting models for health care capacity needs are warranted.

