

Optimal tournament design: two case studies in handball

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Abstract

The choice of an appropriate format for sports tournaments poses an important research question of operations research. We present two case studies in handball.

In the first part, our aim is to analyse different designs for the World Men's Handball Championships. This event, organised in every two years, has adopted four hybrid formats consisting of knockout and round-robin stages in recent decades, including a change of design between the two recent championships in 2017 and 2019. They are evaluated under two seeding policies with respect to various outcome measures through Monte-Carlo simulations. We find that the ability to select the strongest competitors as the winner is not necessarily a monotonic function of the number of matches played, the most frugal format is the second best with respect to efficacy, making it a good compromise in this unavoidable trade-off.

The second study compares the current competition format of the EHF (European Handball Federation) Champions League, the most prestigious men's handball club competition in Europe, to the extensively used alternative with equally strong groups. We show that it is possible to increase the quality of all matches played together with raising the uncertainty of outcome, essentially without sacrificing fairness.

Our results have useful implications for the governing bodies of major sports.

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The talk is based on the following papers:

- Csató, L. (2019): A simulation comparison of tournament designs for the World Men's Handball Championships. <https://arxiv.org/abs/1803.10975>
- Csató, L. (2019): How to design a tournament: lessons from the men's handball Champions League. <https://arxiv.org/abs/1811.11850>

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