

Patient-level simulation models in cancer care: a systematic review

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BACKGROUND

Patient-level simulation (PLS) models:

- Broad applicability & advantages compared with conventional cohort models.
- Limited knowledge about potential & application of PLS models in cancer care.

OBJECTIVES

Analyse literature to determine:

- Main application areas & model types.
- Reasons for using PLS models.
- Reporting quality.

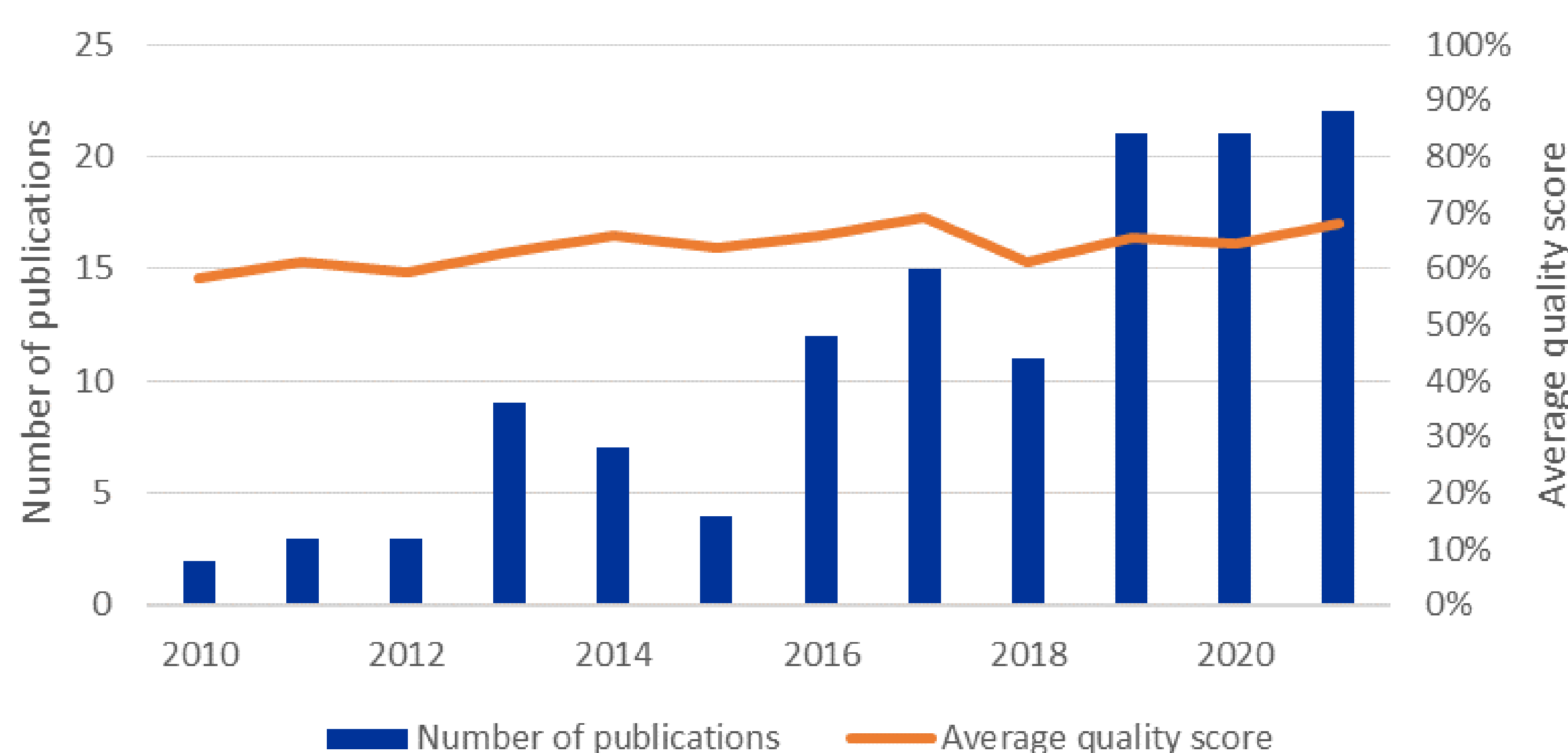
METHODS

Systematic review:

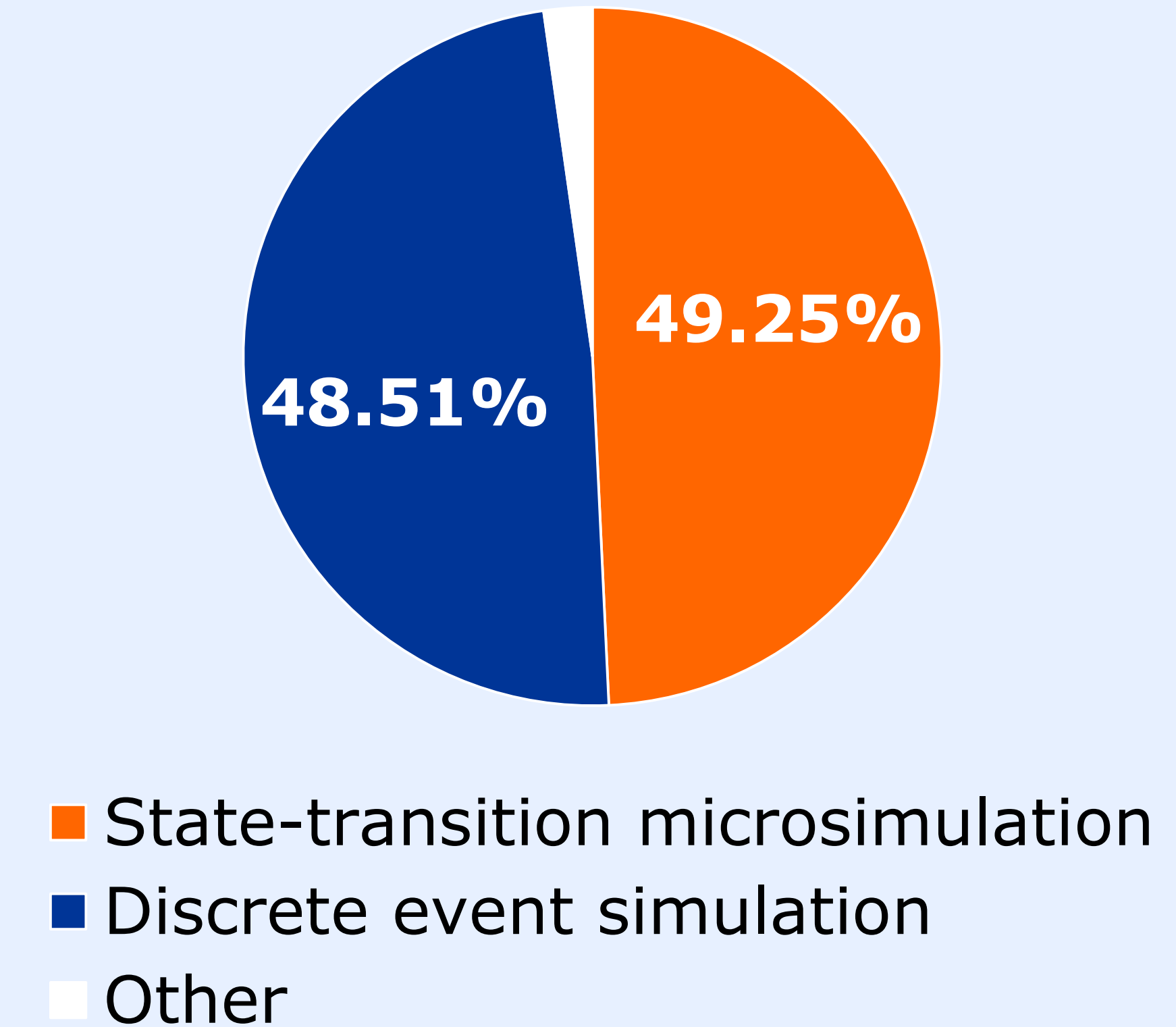
- Reasons for use: conventional inductive content analysis.
- Reporting quality: checklist based on ISPOR-SMDM guidelines.

RESULTS

Number of publications & reporting quality over time



Model structures



Application areas

Disease progression modelling (DPM)

- Aim: simulate progression cancer & impact of treatments on clinical outcomes & costs.
- Reasons for use: representation patient heterogeneity & history (e.g., personalised oncology, treatment sequences).
- Direct comparisons with cohort models are rare → limited knowledge exists about relative benefits of PLS models.

Health & care systems operation (HCSO)

- Aim: simulate cancer care systems & the impact of changes in care delivery on operational outcomes.
- Reasons for use: understanding & improving cancer care delivery.
- Papers rarely describe application of model results → suggests limited influence on clinical practice.

CONCLUSION

- PLS models are used to simulate the progression of cancer & to model cancer care delivery.
- In the DPM domain more direct comparisons with cohort models are required to establish the relative advantages of PLS models
- In the HSCO domain the impact on clinical practice needs to be systematically assessed.
- Adherence to the ISPOR-SMDM guidelines should be improved. .



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