

Quantifying the Impact of Novel Anti-Cancer Therapies on Health Inequalities in Survival Based on Kaplan-Meier Curves

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BACKGROUND

- There is an interest in understanding how novel anti-cancer therapies impact healthcare inequalities, but such analyses typically rely on individual patient data (IPD).

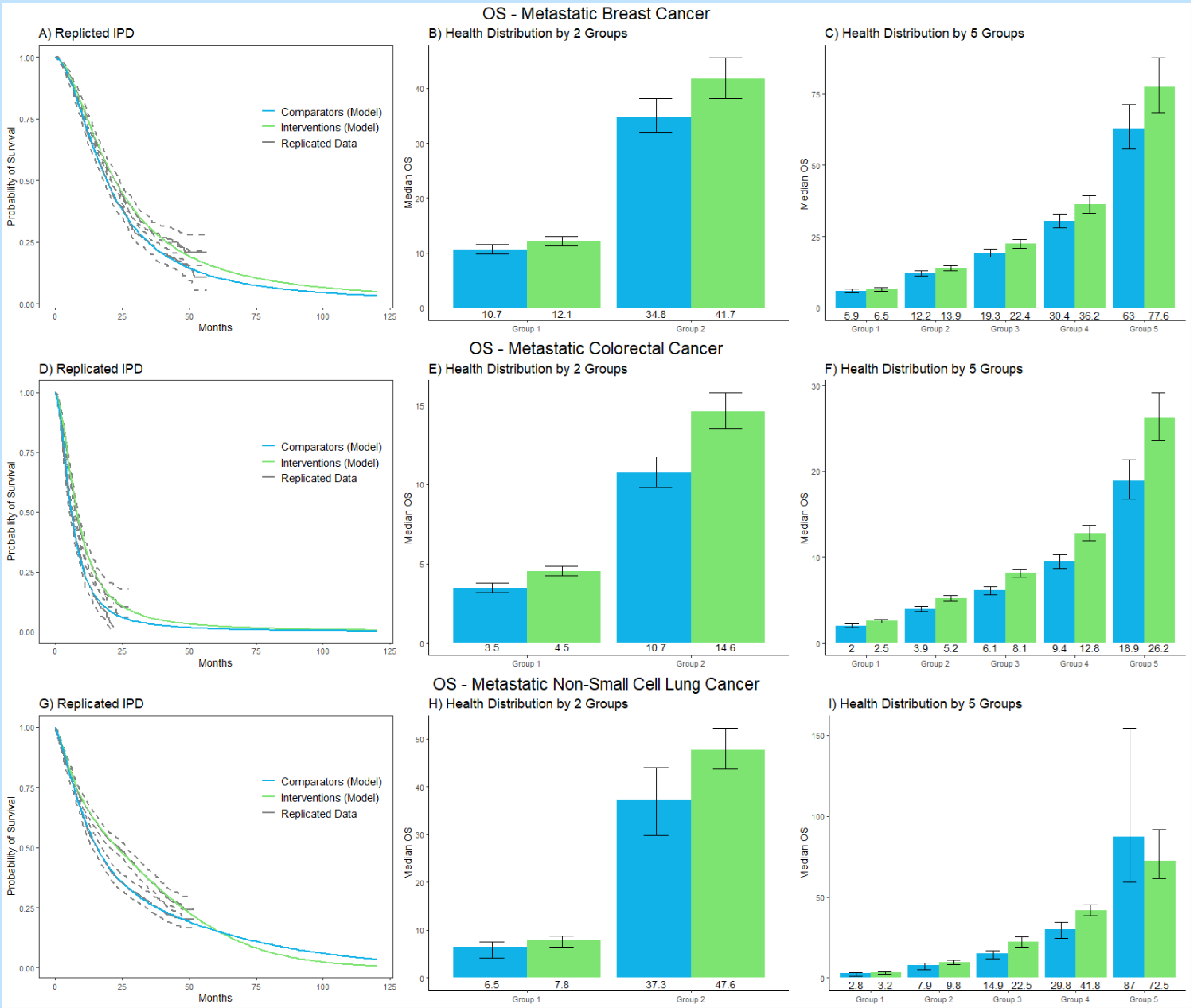
OBJECTIVE

- This study developed and applied a framework for quantifying the impact of novel anti-cancer therapies on health inequalities based on survival data from Kaplan-Meier curves.

METHODS

- For metastatic breast (mBC), metastatic colorectal (mCRC) and metastatic non-small cell lung (mNSCLC) cancer, 9 novel therapies were identified using pre-defined criteria.
- IPD were replicated from Kaplan-Meier curves of overall survival (OS) and progression-free survival (PFS), and pooled for interventions and comparators separately, using sample size-based weights to ensure each therapy contributed equally to the analysis.
- Parametric mixture distributions were considered in modelling OS and PFS data.
- Health inequality was defined as the difference between groups with highest and lowest survival, with 2 group and 5 group stratification.
- For the 5-group stratification, a linear regression model was fitted to use the regression slope as an inequality measure.
- Results were obtained through probabilistic analysis.

RESULTS



	2-Group Stratification		5-Group Stratification		Inequality Gradient	
Cancer Type	Interventions	Comparators	Interventions	Comparators	Interventions	Comparators
mBC	29.6 (26.3; 33.2)	24.2 (21.4; 27.2)	71.1 (61.9; 81.5)	57.1 (49.7; 65.5)	16.4 (14.4; 18.8)	13.2 (11.6; 15.1)
mCRC	10.1 (9.1; 11.1)	7.3 (6.4; 8.2)	23.7 (21.0; 26.7)	17.0 (14.7; 19.5)	5.5 (4.9; 6.2)	3.9 (3.4; 4.5)
mNSCLC	39.9 (35.9; 44.9)	30.8 (23.6; 38.1)	69.3 (58.3; 89.3)	84.2 (56.1; 153.3)	17.1 (14.7; 21.3)	19.0 (13.4; 33.1)

DISCUSSION AND CONCLUSIONS

- Novel metastatic cancer therapies in mBC, mCRC, and mNSCLC generally increased survival inequalities relative to comparators.
- Although further research using (real-world) IPD is warranted, the proposed framework is a useful tool for understanding how treatments may impact survival inequalities in absence of such data, and to inform further research.

REFERENCES

¹Hamers P.A.H., Elferink M.A.G., Stellato R.K., Punt C.J.A., May A.M., Koopman M., et al. (2021). Informing metastatic colorectal cancer patients by quantifying multiple scenarios for survival time based on real-life data. Int. J. Cancer. 148, 296-306.