RWD280

The long-term effects of opioid use before joint replacement surgery:

Trial emulation using routinely-collected administrative data

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Background

Real-world evidence can be used to answer clinically and economically meaningful questions for which randomised trials are infeasible or unethicaly

But the risk of bias inherent in analysis of observational data needs careful consideration

We used a **trial emulation framework** to estimate the *long-term postoperative effects of opioid use before joint replacement surgery*

Trial emulation framework

	Target trial	**Observed data**
Participants:	Patients booked for hip or knee replacement surgery in the public healthcare system	Surgeries recorded in public hospital data between July 2011 and June 2017
Interventions:	Opioid use over 3 months before surgery, stratified into 4 levels based on morphine equivalent dose	Dispensing of opioid medications recorded in pharmaceutical claims data
Comparator:	No opioid use over 3 months before surgery	No dispensing of opioid medications
Outcomes:	Healthcare use, healthcare costs, employment/income, adverse events, over 6-year follow-up	Recorded in health system and tax data

All data were obtained from New Zealand public health system records, via the Integrated Data Infrastructure (www.stats.govt.nz/idi)

Analysis

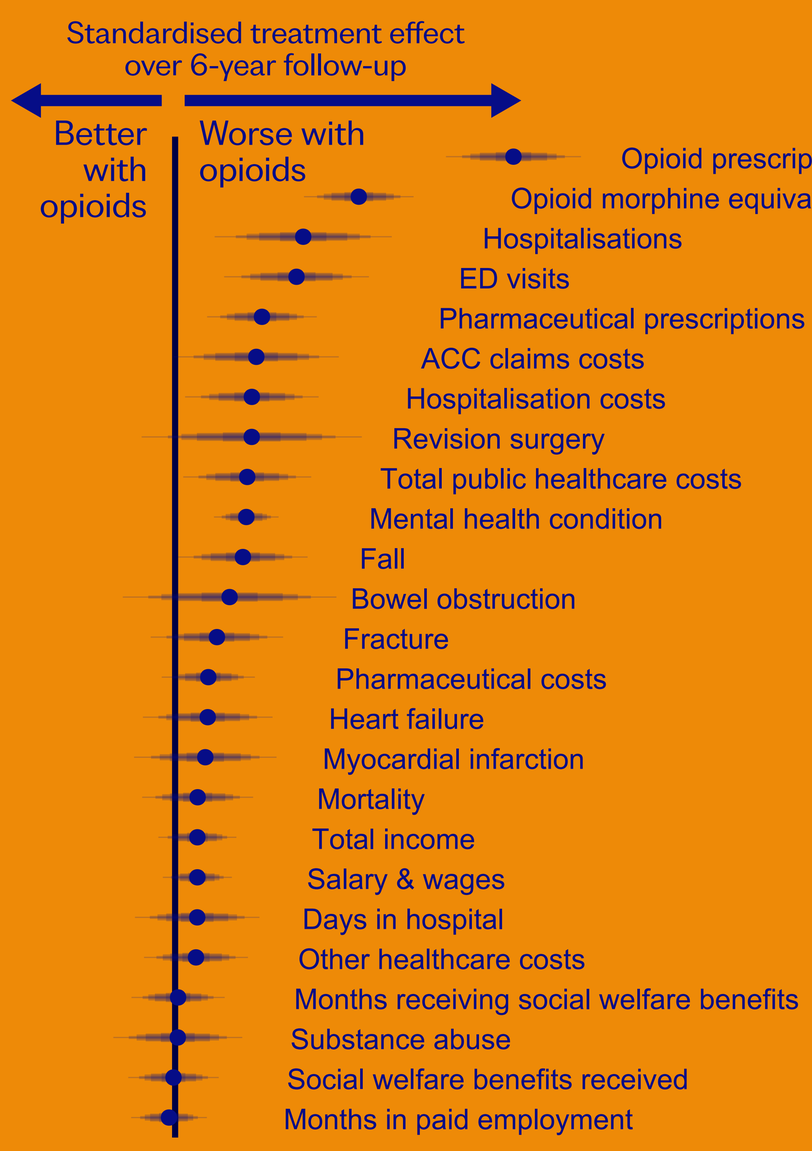
'Randomisation' emulated by inverse probability of treatment weighting

Excellent baseline covariate balancing achieved across a large set of potential confounders

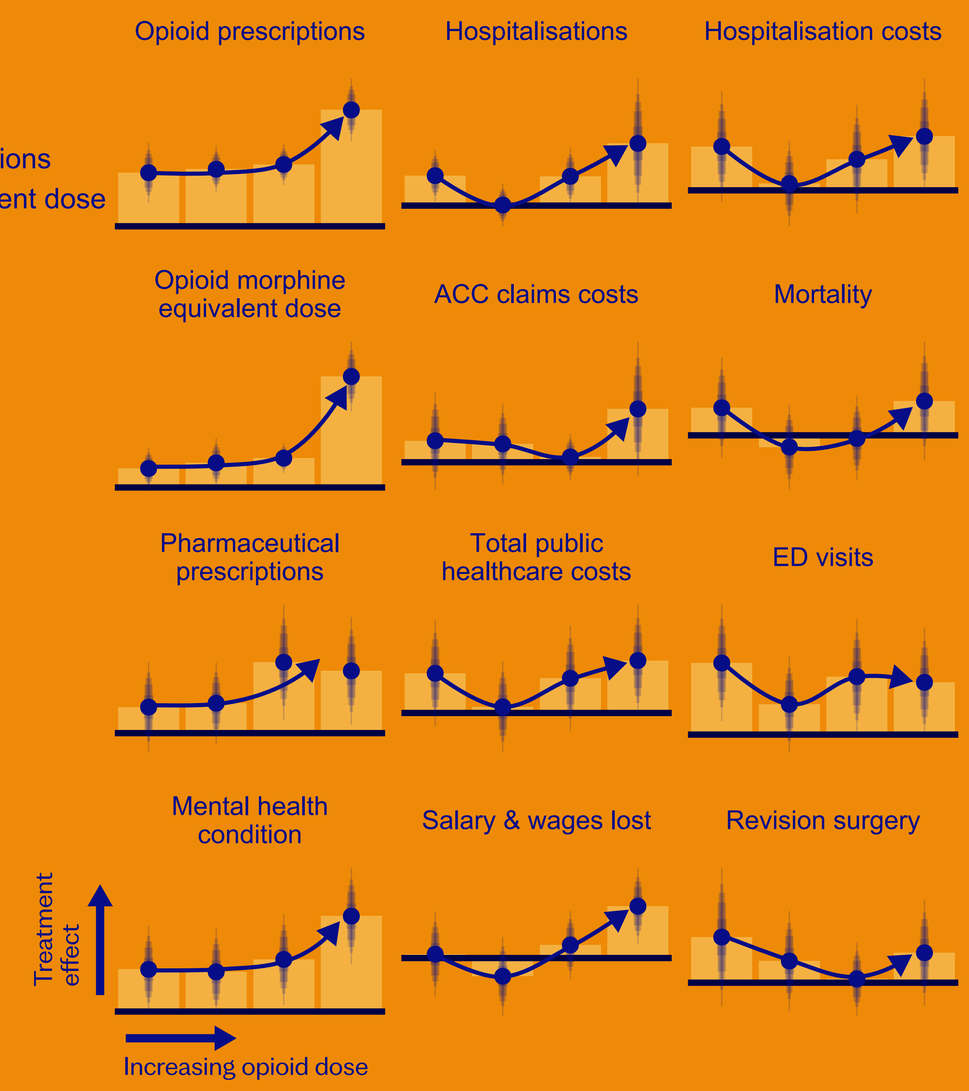
Treatment effects estimated by weighted linear regression and weighted Cox proportional hazards models

Results

Opioid use before joint replacement surgery resulted in worse long-term outcomes...



...but the relationship with opioid dose was mixed



Discussion

Preoperative opioid use was associated with worse long-term outcomes after joint replacement surgery

There was little evidence of a clear relationship between opioid dose and outcomes, at least at low to moderate doses

Limitations

The trial emulation framework helps us identify critical assumptions and limitations:

* Potential for residual confounding (can only control for *observed* covariates)
* Treatment allocation occurs *after* baseline covariate balancing
* Exclusion of patients intending but not actually undergoing surgery
* Patient-reported outcomes not available

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