

Mechanisms and causes of death after abdominal surgery in low- and middle-income countries: A secondary analysis of an international randomised controlled trial

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Introduction

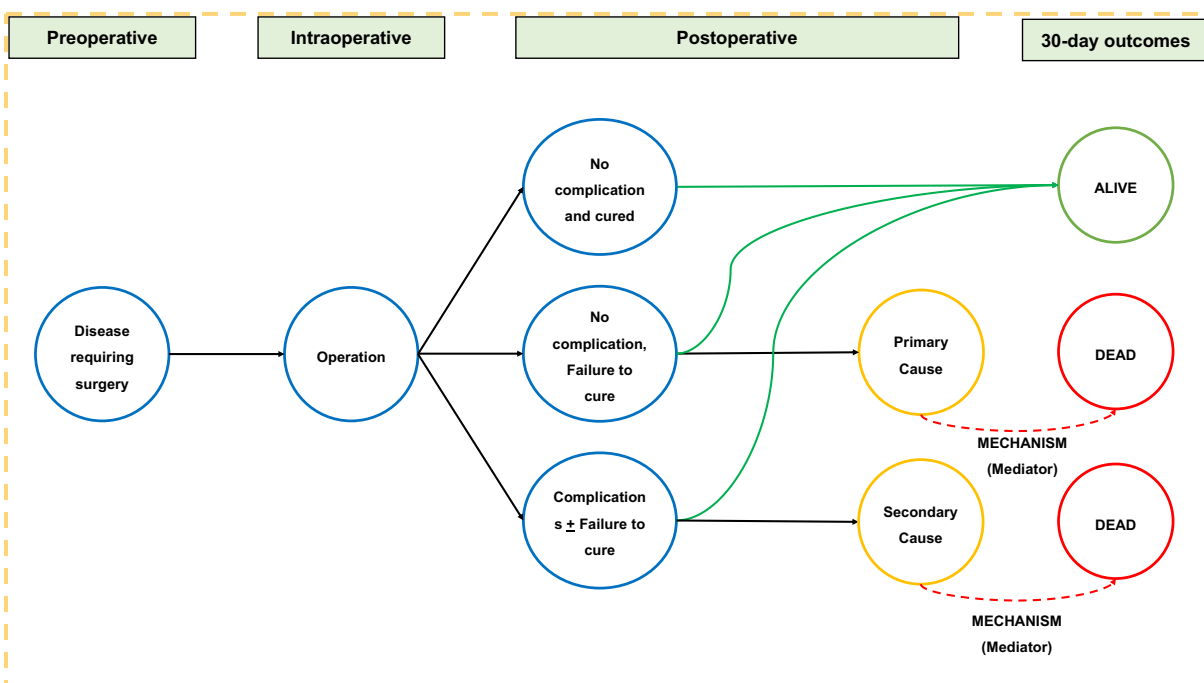
- Death after surgery is devastating for patients, and communities, but remains common in low- and middle-income countries (LMICs).
- This study aimed to develop a new framework to improve conceptual understanding of deaths after surgery and determine mechanisms and causes of postoperative deaths for patients in LMICs.

Methods

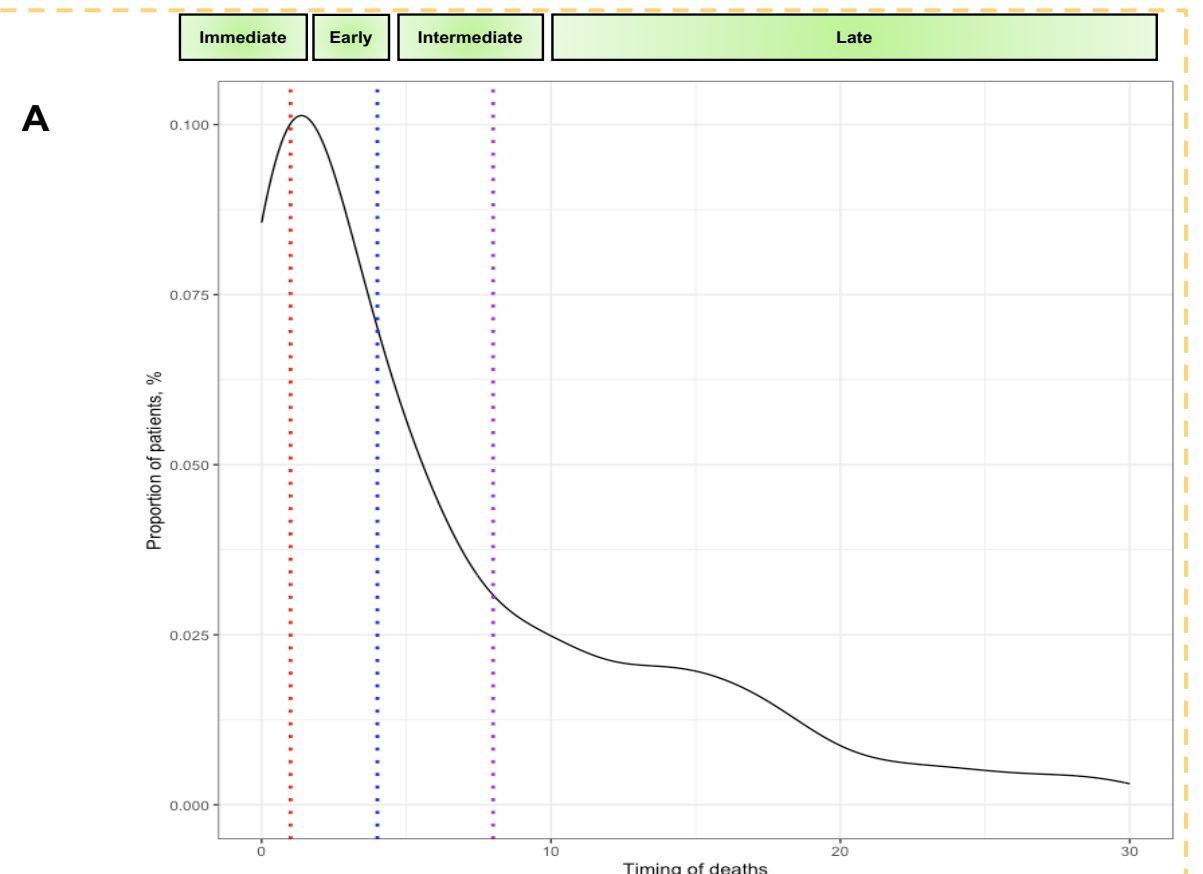
- Secondary analysis of FALCON trial.
- Primary outcome were mechanism and cause of death within 30-days of surgery, determined using a modified verbal autopsy strategy from Serious Adverse Event (SAE) reports.
- Secondary outcomes included the timing and location of postoperative death.

Results

Framework for death

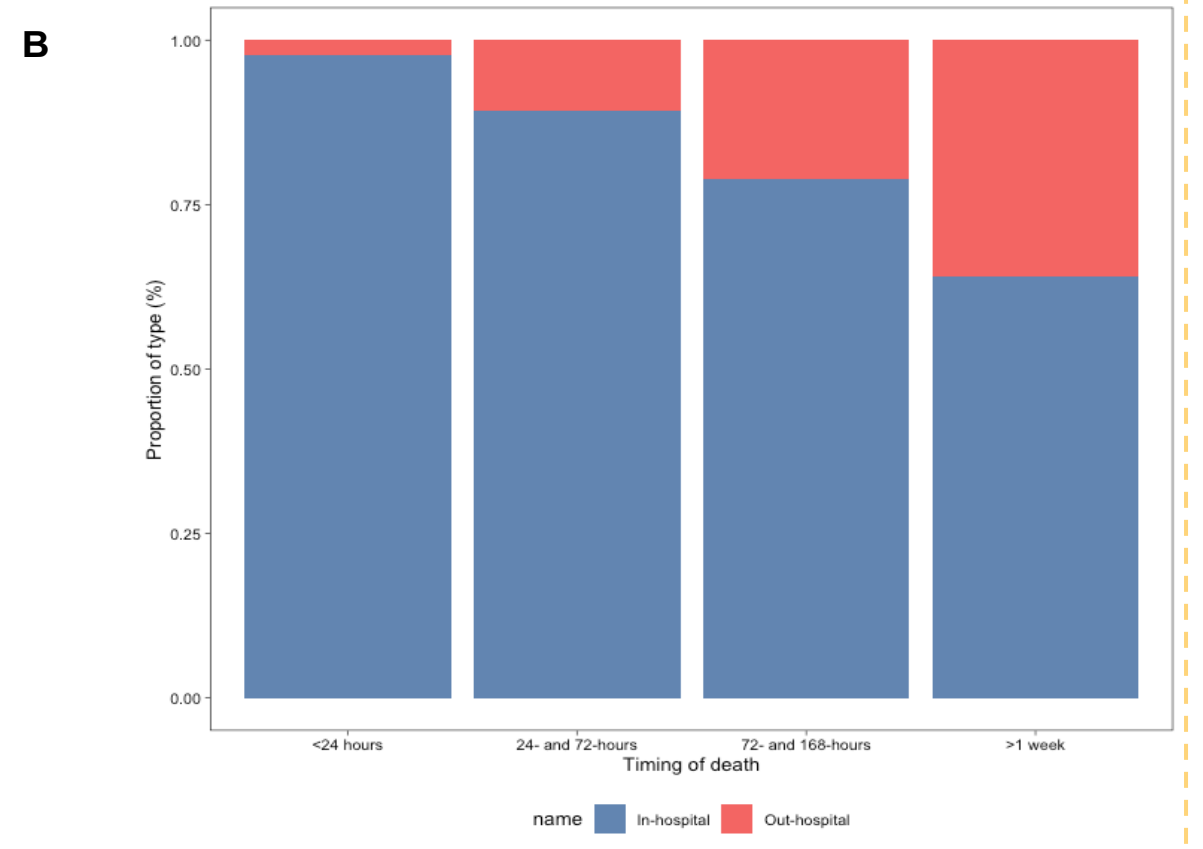


Timing and Location of Death



Causes of death

System	Mechanisms	Causes
Airway, n=1/306 (0.3%)	Primary: Airway obstruction; n=1/306 (0.3%)	Anaphylaxis, n=1
Breathing and ventilation, n=47/306 (15.4%)	Secondary: Respiratory failure; n=47/306 (15.4%)	ARDS, n=21 Pneumonia, n=16 Other respiratory, n=10
Circulation, n=226/306 (73.8%)	Primary: Distributive (i.e., Sepsis); n=113/306 (36.9%)	Abscess, n=2 Cholangitis, n=1 Fistula, n=5 Ischaemic bowel, n=14 Obstruction, n=5 Perforation, n=86 Anastomotic leaks, n=11
	Secondary: Distributive (i.e., Sepsis); n=60/306 (19.6%)	SSI, n=4 Sepsis of unknown origin, n=45
	Hypovolaemic; n=29/306 (9.5%) Obstructive; n=18/306 (5.9%) Cardiogenic; n=6/306 (2.0%)	Bleeding, n=19 Other hypovolaemia, n=10 Pulmonary embolism, n=18 Acute heart failure, n=3 Arrhythmia, n=1 Myocardial infarction, n=1 Other cardiogenic, n=1
Disability / Exposure, 17/306 (5.6%)	Primary: Metabolic; n=7/306 (2.3%)	Cancer progression, n=7 DKA, n=1
	Secondary: Metabolic; n=8/306 (2.6%) Neurological; n=2/306 (0.7%)	Hypoglycaemia, n=3 Hyperkalaemia, n=1 Liver failure, n=3 Stroke, n=1 Seizures, n=1
Unknown mechanism and cause of death, n=15/306 (4.9%)		



Conclusion

- Circulatory failure leads to most deaths after abdominal surgery, with sepsis accounting for almost two thirds.
- Variability in timing of death highlights opportunities to intervene throughout the perioperative pathway.
- Patients without a clear cause of death reflects need to improve capacity to rescue by strengthening perioperative systems.

