

Frequency, timing, and causes of 30-day mortality after non-cardiac surgery

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On behalf of VISION investigators

Goals of presentation

- Among patients undergoing non-cardiac surgery inform
 - proportion who die within 30 days
 - by continent and type of non-cardiac surgery
- When do patients die after non-cardiac surgery
- Why do patients die after non-cardiac surgery

VISION design and methods

- Prospective, international, cohort study
- Eligibility criteria
 - ≥ 45 yrs undergoing inpatient noncardiac surgery
- Sampling method
 - representative sample
- 28 centres in 14 countries
 - North and South America, Europe, Asia, Africa, Australia
- Participants actively followed for complications and mortality until 30 days after surgery
 - perioperative Troponin T measurements

Baseline characteristics (N=40,004)

Age in years	
45-64	55%
65-74	25%
≥75	19%
Women	50%
History of	
Hypertension	51%
Active cancer	25%
Diabetes	21%
CAD	13%
PAD	8%
COPD	8%
Stroke	4%
CHF	4%
AF	3%

Type of surgeries

Type of Surgery	
Major General	20%
Major Orthopedic	18%
Major Urology/Gynecology	12%
Major Vascular	7%
Major Neurosurgery	6%
Major Thoracic	3%
Low-risk	36%
Urgent or emergent surgery	11%

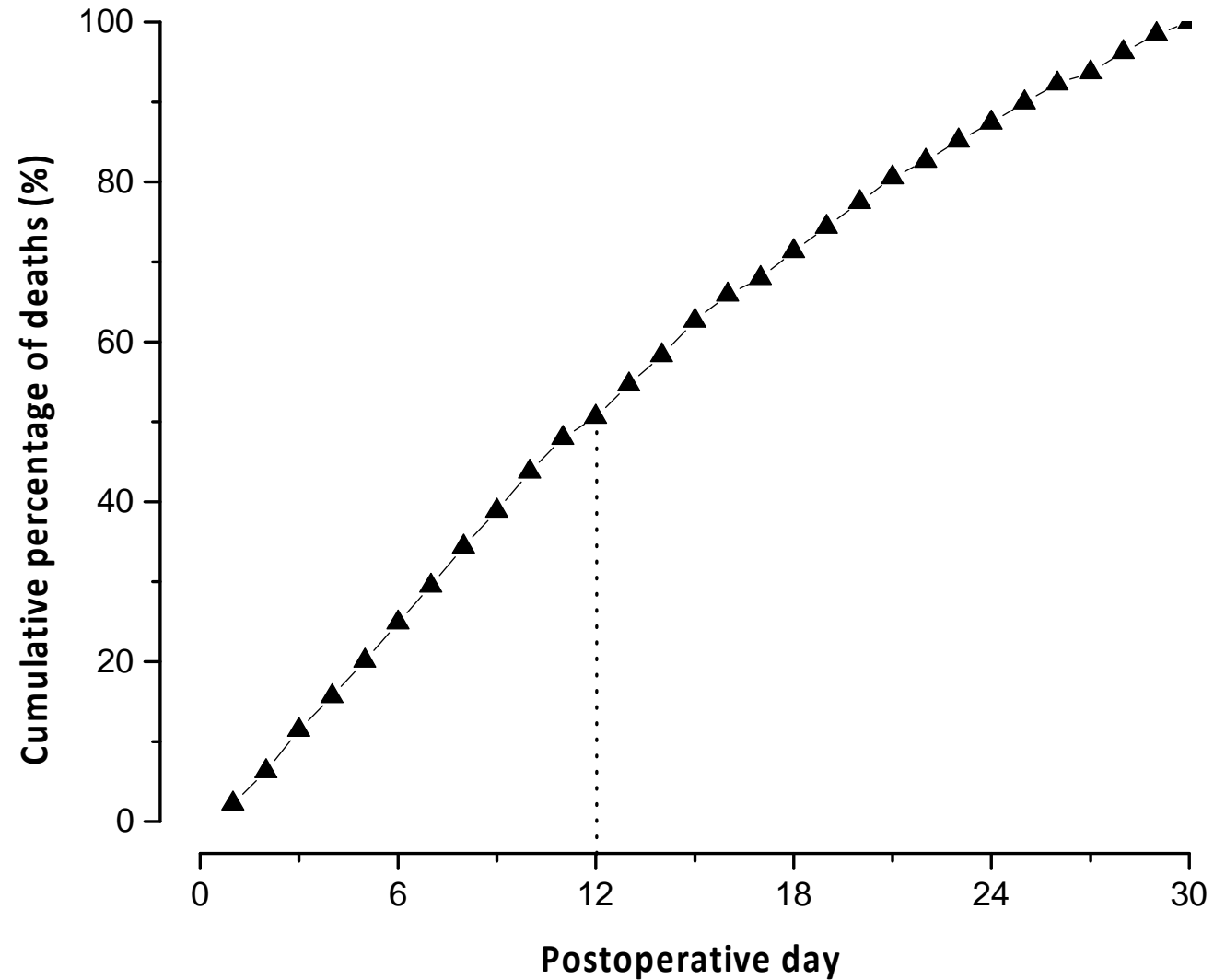
Mortality at 30-days

Regions	# of participants	# of deaths	Mortality (95% CI)
Total	40,004	715	1.8% (1.7-1.9)
North America, Europe, Australia	22,447	253	1.1% (1.0-1.3)
Asia	10,005	197	2.0% (1.7-2.3)
South America	6063	169	2.8% (2.4-3.2)
Africa	1489	96	6.4% (5.3-7.8)

Timing and location of mortality

Timing and location of death	# of deaths	Percentage (95% CI)
Operating room	5	0.7% (0.3–1.6)
Index hospitalization post surgery	500	69.9% (66.5–73.2)
After discharge home	210	29.4% (26.1-32.8)
Mortality after discharge home by region		
North America, Europe, Australia	74/253	29.2% (24.0-35.1)
Asia	73/197	37.1% (30.6-44.0)
South America	45/169	26.6% (20.5-33.8)
Africa	18/96	18.8% (12.2-27.7)

Timing of death during 30 day follow-up



30-day mortality by type of surgery

Surgery	Number of deaths	Percentage (95% CI)
Major General	240	3.0% (2.7-3.4)
Major Vascular	73	2.8% (2.2-3.5)
Major Neurosurgery	62	2.6% (2.1-3.4)
Major Orthopedic	124	1.8% (1.5-2.1)
Major Thoracic	20	1.7% (1.1-2.6)
Low risk surgery	192	1.3% (1.1-1.4)
Major Urology/Gynecology	24	0.5% (0.3-0.7)

Complications with highest attributable fraction

Complication	Incidence (%)	Adjusted HR (95% CI)	Attributable fraction
Major bleeding	6238 (15.6%)	2.6 (2.2-3.1)	17.0%
MINS	5191 (13%)	2.2 (1.9-2.6)	15.9%
Sepsis	1783 (4.5%)	5.6 (4.6-6.8)	12%

Other complications

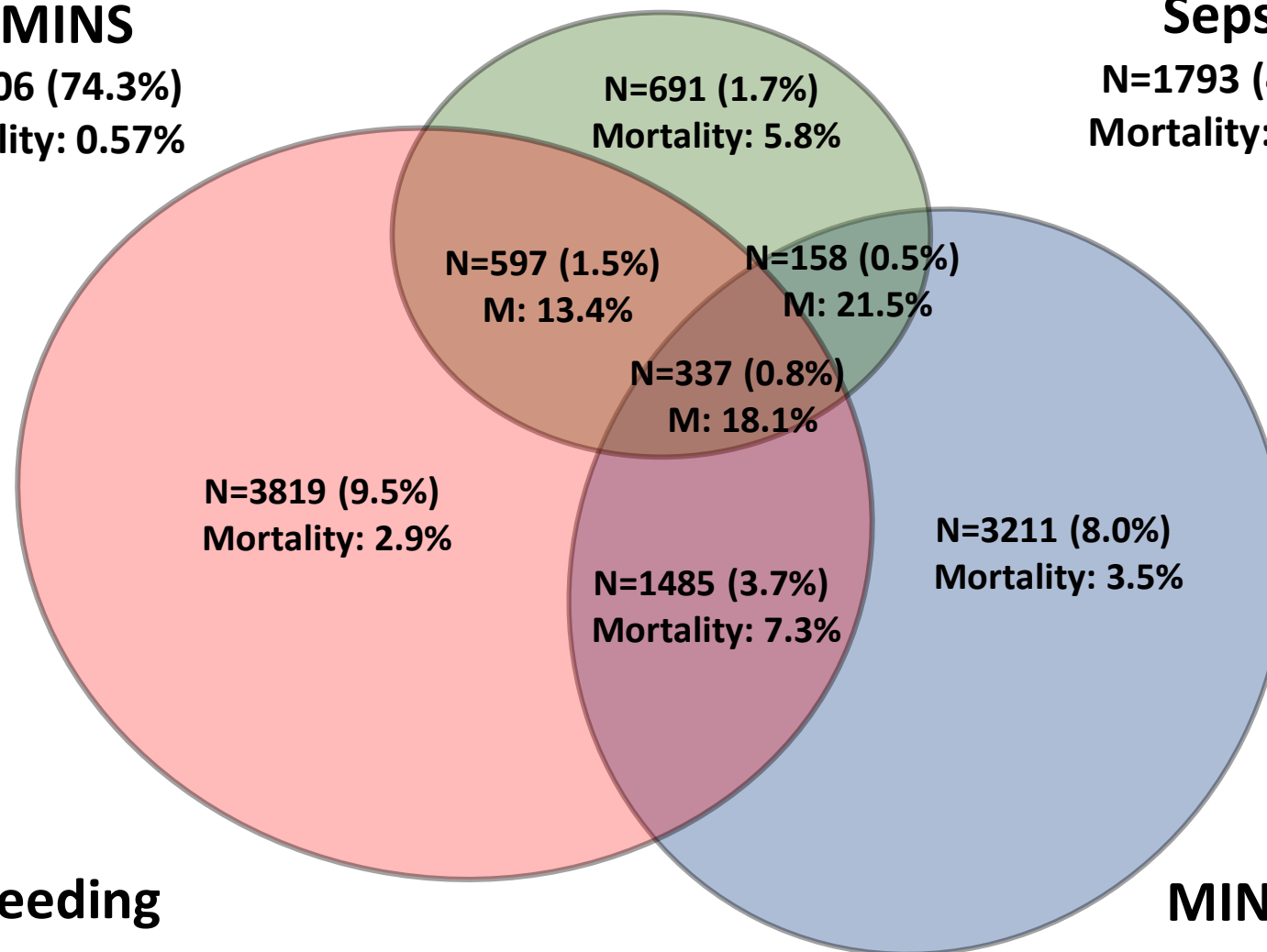
Complication	Incidence (%)	Adjusted HR (95% CI)	Attributable fraction
Non-sepsis infection	2171 (5.4%)	2.3 (1.7-3.0)	2.8%
AKI resulting in dialysis	118 (0.3%)	4.2 (3.1-5.8)	1.1%
VTE	299 (0.75%)	2.2 (1.3-3.7)	<1%
CHF	372 (0.9%)	2.4 (1.7-3.2)	<1%
Stroke	132 (0.33%)	3.7 (2.5-5.7)	<1%

No Bleeding, Sepsis, or MINS

N=29706 (74.3%)
Mortality: 0.57%

Sepsis

N=1793 (4.5%)
Mortality: 12.0%



Bleeding

N=6238 (15.6%)
Mortality: 5.8%

MINS

N=5191 (13.0%)
Mortality: 6.0%

Conclusions

- Perioperative death is major public health issue
 - >1.5 million adults die within 30-days of non-cardiac surgery annually
- Need to re-establish what is low-risk surgery
- Death overwhelmingly occurs outside of operating room
 - focus on early identification and management of postoperative complications
 - extend monitoring into home
- Focus on prevention and management of perioperative MINS, bleeding, and sepsis

Writing Committee

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