



UKHVR WEB APP

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Background

- UK Heart Valve Registry initiated in 1986
- Funding withdrawn in 2004
- National Adult Cardiac Surgery Adult Cardiac Audit registry has been collecting clinical data including implant data

Initial idea

(PI: Mr Joel Dunning*, Middlesbrough)

- What are the short-term failure rates of prosthetic valves?
- Are any rates significant after adjustment for other variables?

***Email:** joeldunning@doctors.org.uk

Lessons learned



Going one step further

- How does mid-term survival differ between valves?
- Are patient characteristics similar?
- What are the market share trends?... by bovine?... by porcine?

“

I think a focus on transparency isn't just a philosophical or ideological gimmick; it is a necessary progression. I see it this way. The future of healthcare is going to be driven by three forces: the first is economics; the second is public expectations; and the third is technology. [...]

It is about putting more data and raw data out into the public domain for others to process and present.

”

Sir Professor Bruce Keogh
NHS Medical Director
7 July 2011

Data wrangling

- All AVR's between April 1998 - March 2012
- Mapped >8000 entries to ~100 valves
- 160 other variables preprocessed
- Exclude: missing implant data (11.2%); non-valve implants (0.6%); unmatched or overmatched data (4.2%)
- Total of 87,423 AVR's

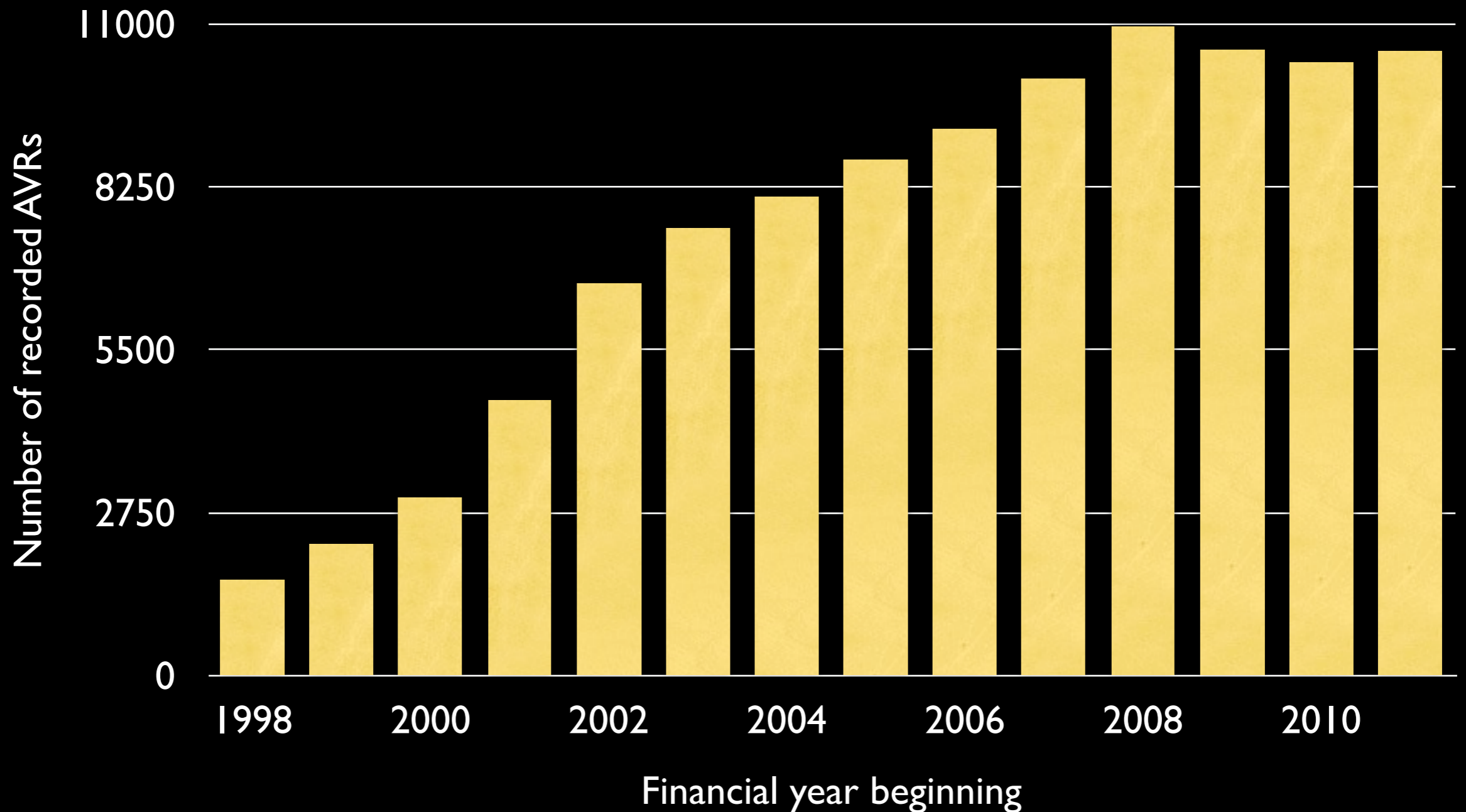
The UKHVR Web App

Built with:



Compliant with Chrome, Safari, Internet Explorer 10, iOS (iPad)

Registry growth



Summary

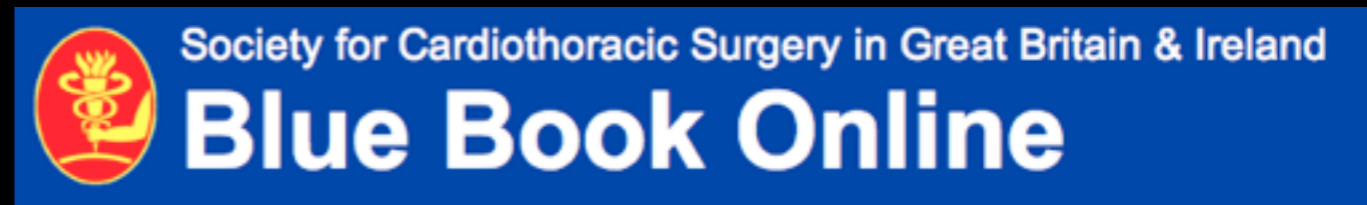
- The data exists and is useable (and growing!)
- Powerful front-ends can inform all stakeholders
- Transparency drives improvements in quality

Availability

- Still in development
- Requires work: MVRs, rings, failure module, pathology + haemodynamic data
- Requires data validation
- Requires joint SCTS and NICOR approval

Questions?

Some other apps
you might also be
interested in...



Available now: bluebook.scts.org



Coming soon to iOS & web

In case app fails...

Logistic EuroSCORE (%)



The data

Clinical registries are quite messy; however, when it came to the SCTS registry implant data, there were over 8000 different entries for about 100 aortic valve implants! This is because the data is collected inconsistently by two free-text fields per valve. We developed an algorithm that maps all available implant data to a known valve brand (i.e. manufacturer) and model. Sometimes we could only match a brand, but not a (complete) model; these are listed as unknown or partially known valves.

We included all records where there was evidence of AVR occurring between 1st April 1998 and 31st March 2012. It was also necessary to exclude a small number of records. Our exclusion criteria were:

- Fully missing implant data
- Missing discharge status
- Missing NHS number
- Within admission reoperations
- Completely unmatchable data
- Records that matched to multiple brands and/or models
- Mitral valves (sometimes surgeons do actually use MVs in the AV position, but it is rare and there is no definitive way of knowing if a transcriptional error or not)
- Homografts or autografts
- Rings, TAVIs or conduits without valves

In total this app holds data on 87,423 AVR implants, with an expected further ~10,000 per year. About 1% of records had a recorded implant type that contradicted the valve model. After careful consideration, we gave priority to the derived implant type from the recorded model.

Feedback



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Advisor
Ben Bridgewater
Cardiac surgeon
[Homepage](#)
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SCTS UK Heart Valve Registry Tool v0.6.5

Implant variables

Implant type

- All
- Biological
- Mechanical

Implantation date range (financial years beginning)



Brand

ALL

Clinical variables

Age at operation (years)

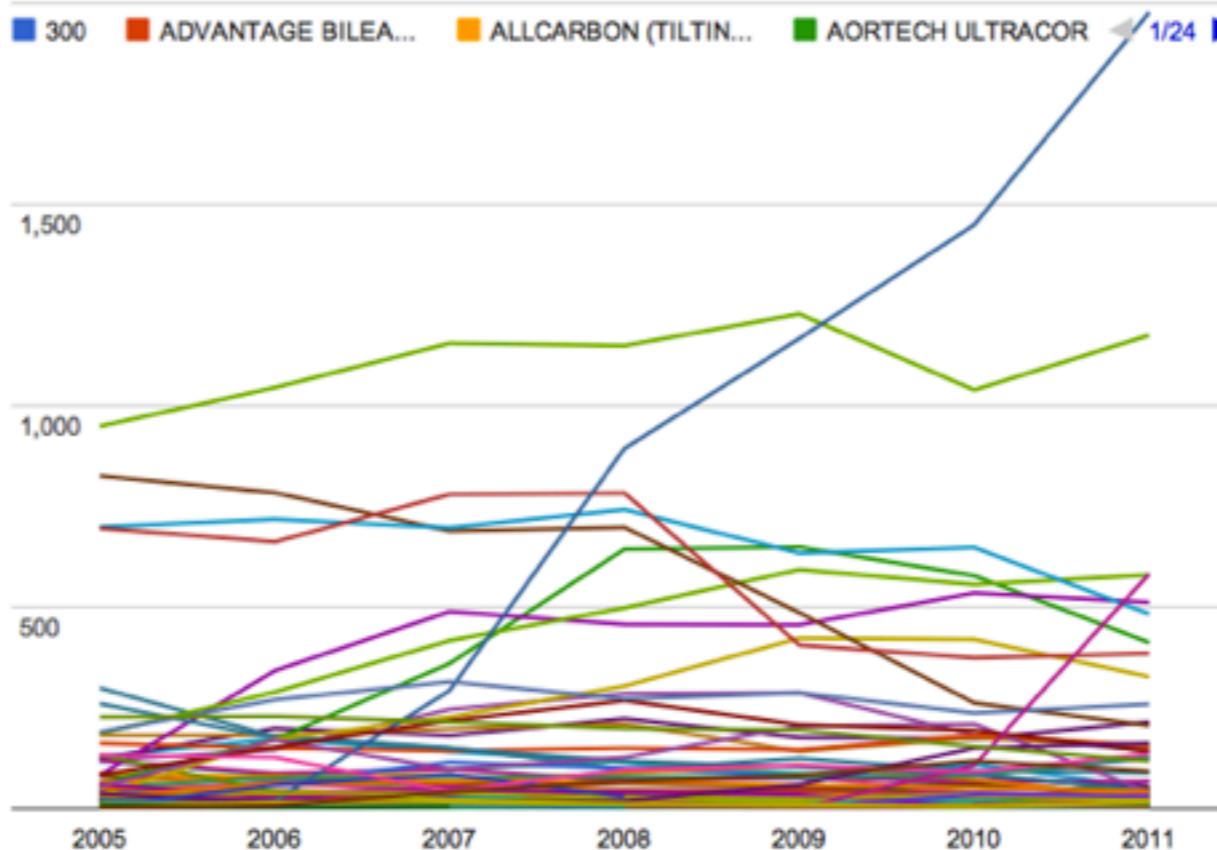


Logistic EuroSCORE (%)



About Market data Valve size Survival Patient data

Volume Market share Summary



SCTS UK Heart Valve Registry Tool v0.6.5



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[Volume](#) [Market share](#) [Summary](#)

Implant variables

Implant type

- All
- Biological
- Mechanical

Implantation date range (financial years beginning)



Brand

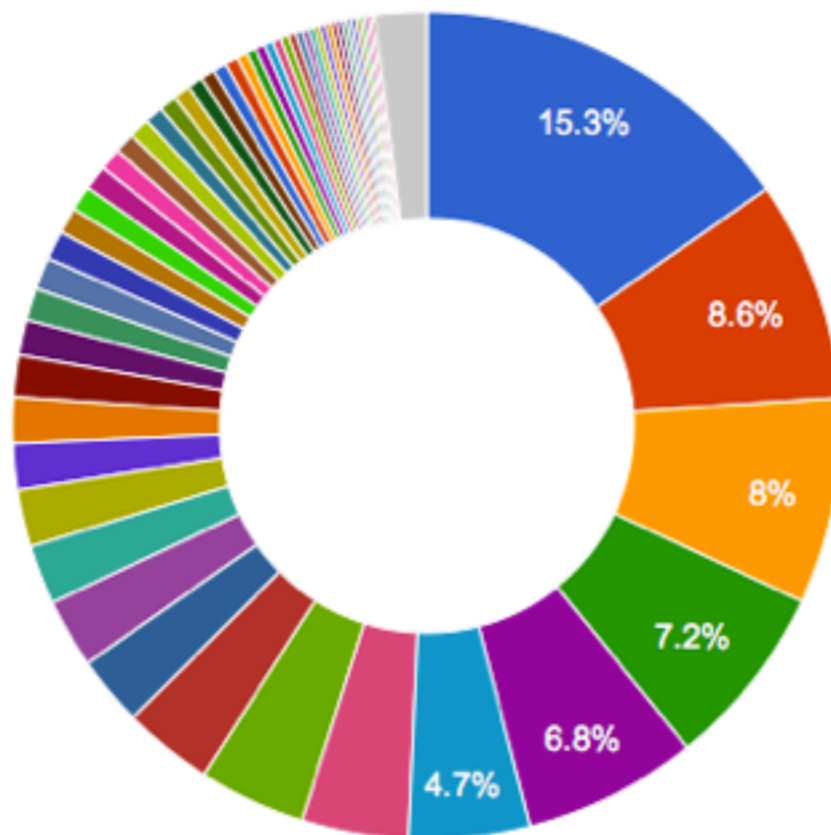
ALL

Show overall market share by:

- Brand
- Model

Clinical variables

Age at operation (years)





SCTS UK Heart Valve Registry Tool v0.6.5

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[Summary](#)
[Download summary table \(CSV\)](#)

Note that the first and last recorded implant dates are for the selected subset of data. They do not reflect the first and last **actual** implant dates in the UK.

Manufacturer	Model	Type	Number of implants	First recorded implant	Last recorded implant
BJORK SHILEY	MONOSTRUT VALVE GRAFT	Mechanical	9	2001	
EDWARDS LIFESCIENCES	DUROMEDICS DM-9120	Mechanical	4	2002	
EDWARDS LIFESCIENCES	MIRA 3600	Mechanical	133	2001	
EDWARDS LIFESCIENCES	STARR EDWARDS	Mechanical	59	2001	
EDWARDS LIFESCIENCES	UNKNOWN (EDWARDS)	Mechanical	21	2001	
MEDTRONIC	ADVANTAGE BILEAFLET A7760	Mechanical	60	2002	
MEDTRONIC	ATS (UNIDENTIFIED SUB-MODEL)	Mechanical	543	2001	
MEDTRONIC	ATS AORTIC CONDUIT 502AG	Mechanical	62	2001	
MEDTRONIC	ATS OPEN PIVOT 500FA	Mechanical	832	2001	
MEDTRONIC	ATS OPEN PIVOT 501DA AP	Mechanical	153	2001	
MEDTRONIC	ATS OPEN PIVOT 505DA AP360	Mechanical	28	2007	

Implant variables

Implant type

- All
 Biological
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Implantation date range (financial years beginning)



Brand

Clinical variables

Age at operation (years)



Logistic EuroSCORE (%)





Implant variables

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- All
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Brand

ALL

Clinical variables

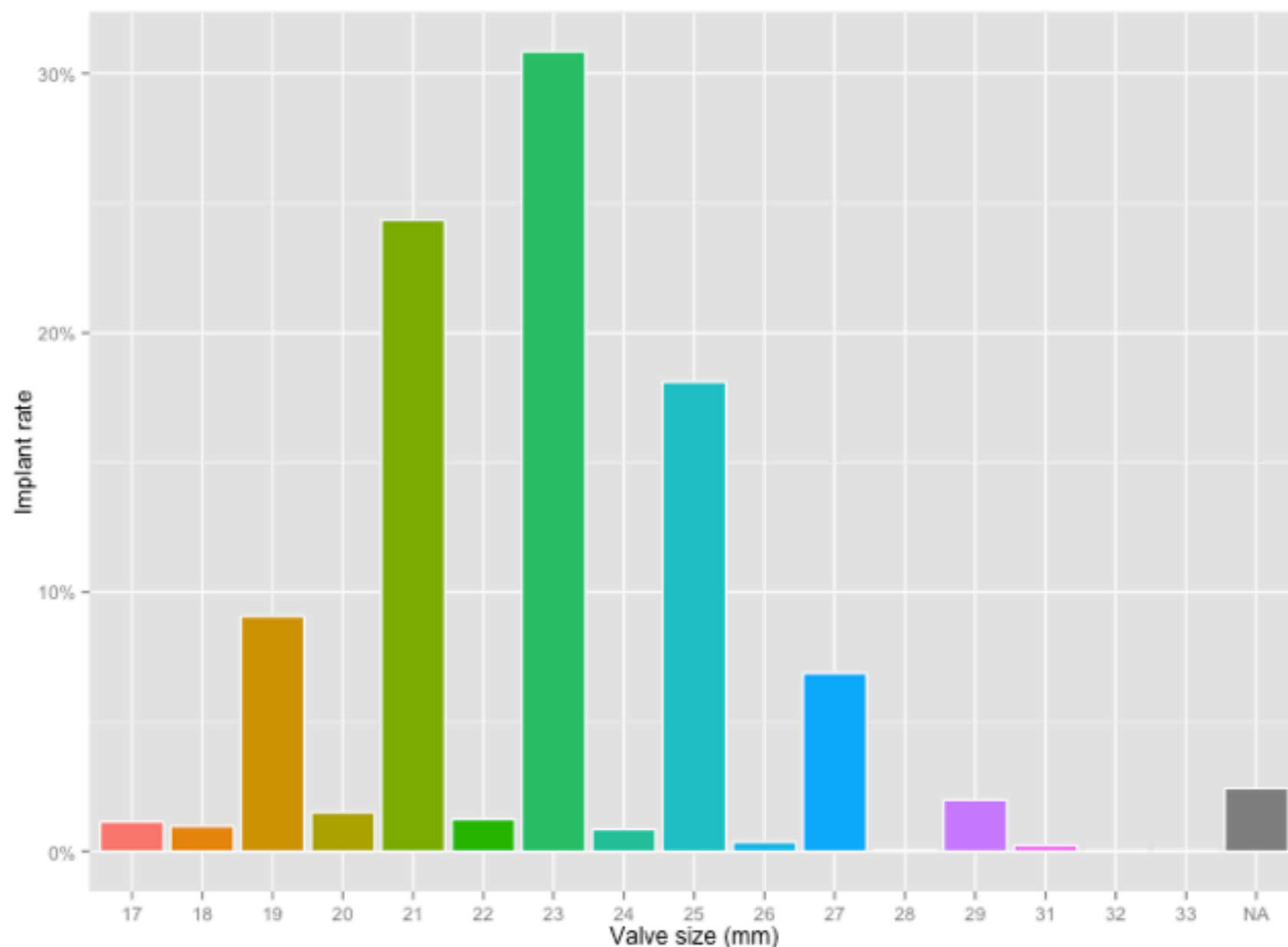
Age at operation (years)



Logistic EuroSCORE (%)

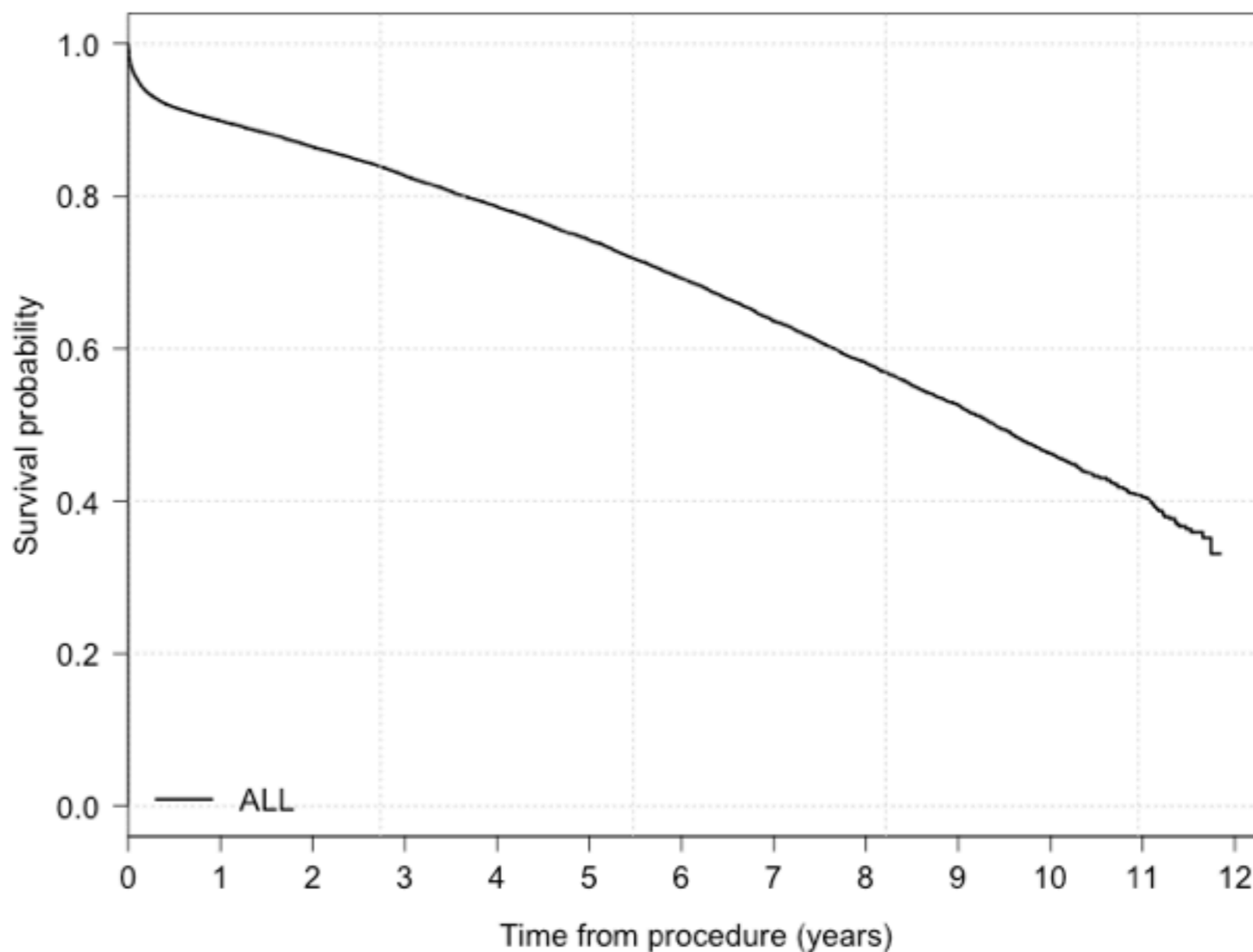


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[Patient data](#)



Like all data, valve sizes are subject to recording errors. However, transcriptional error rates are quite small. We have reported these valve sizes as they are recorded in the registry. If you represent a medical device company and believe this data to be erroneous, please contact the app author.

Download KM plot (PDF)



23 observations deleted due to missingness

time	n.risk	n.event	survival	std.err	lower 95% CI	upper 95% CI
1	26486	3124	0.899	0.00172	0.896	0.902
5	10709	3311	0.742	0.00292	0.737	0.748
10	894	2112	0.463	0.00630	0.451	0.475

Implant variables

Implant type

- All
- Biological
- Mechanical

Xenograft

- All
- Bovine
- Porcine
- Equine

Implantation date range (financial years beginning)



Brand

ALL

Stratify on model?

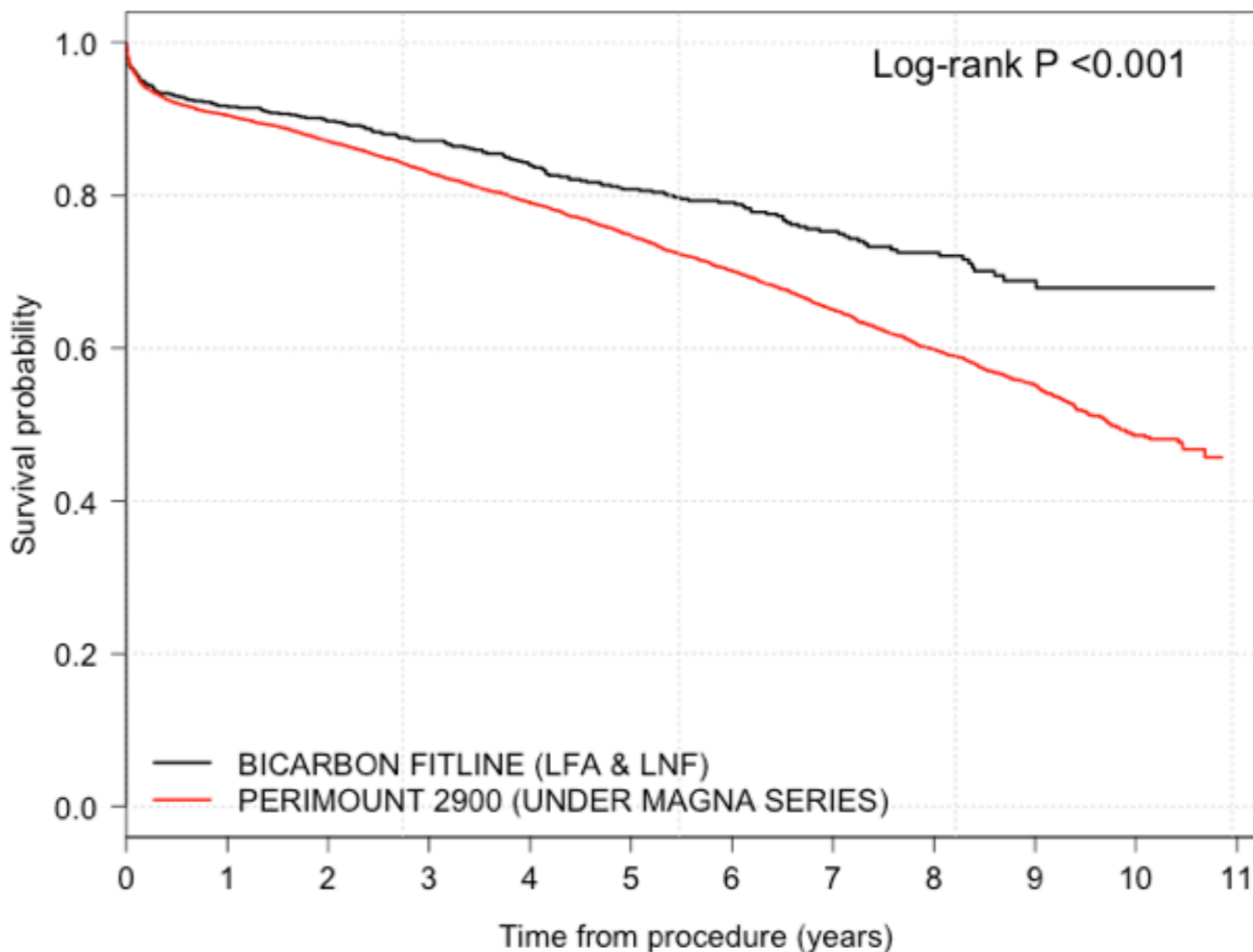
Clinical variables

Age at operation (years)



Logistic EuroSCORE (%)

Download KM plot (PDF)



7 observations deleted due to missingness

model=BICARBON FITLINE (LFA & LNF)

time	n.risk	n.event	survival	std.err	lower 95% CI	upper 95% CI
1	719	69	0.917	0.00959	0.898	0.936
5	409	71	0.808	0.01491	0.779	0.838

Implant variables

Implant type

- All
- Biological
- Mechanical

Implantation date range (financial years beginning)



Brand

ALL

Stratify on model?

Models(s)

- PERIMOUNT 2900 (UNDER MAGNA SERIES)
- PERIMOUNT MAGNA 3000
- PERIMOUNT MAGNA EASE WITH THE
- PERIMOUNT MAGNA WITH THE

Hint: To select more than one model hold down the CTRL button on your keyboard (command [cmd] button for Apple Mac) each time you click on a model.

Clinical variables

Age at operation (years)

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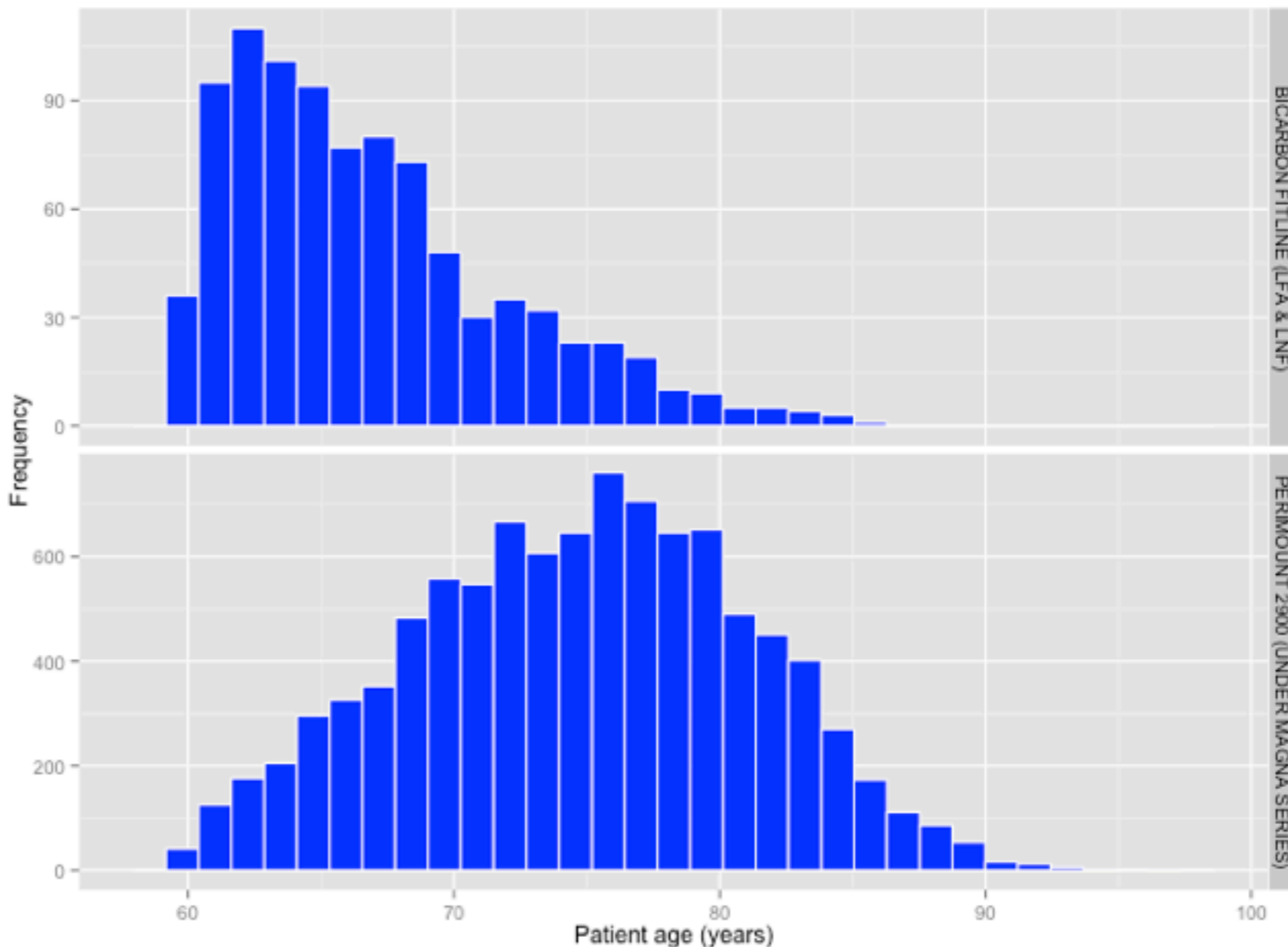
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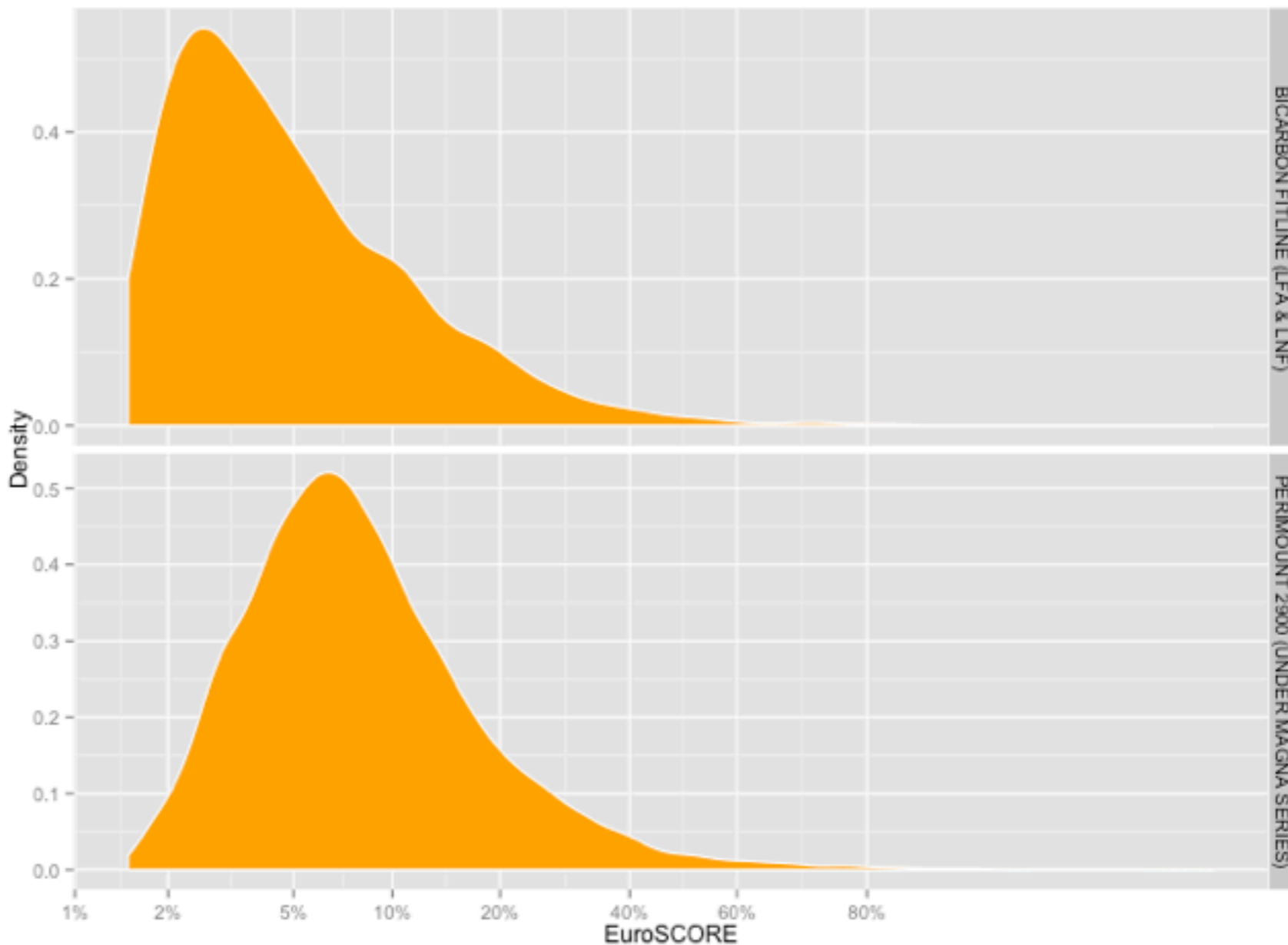
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