Does the 'weekend effect' for post-operative mortality stand up to scrutiny? Association for Cardiothoracic Anaesthesia and Critical Care cohort study of 110,728 cardiac surgical patients.

Olympia Papachristofi[a] PhD, Andrew A Klein [b] FRCA, John Mackay[b] FRCA, Samer Nashef[c] FRCS, Nick S Fletcher[d] FRCS, Linda D Sharples[a] PhD, on behalf of the Association for Cardiothoracic Anaesthesia and Critical Care (ACTACC).

Contributors: G Lau (Glenfield Hospital, Leicester); D Woodward (Northern General Hospital, Sheffield); J Hillier (University Hospitals, Bristol); M Ware (University Hospital of Wales, Cardiff); S Agarwal (Liverpool Heart and Chest Hospital); M Bill (Royal Victoria Hospital, Belfast); R Gill (University Hospital, Southampton); D Duthie (Leeds General Infirmary, Leeds); H Skinner (City Hospital, Nottingham).

[a]Department of Medical Statistics, London School of Hygiene and Tropical Medicine, London, WC1E 7HT, UK

[b]Department of Anaesthesia and Intensive Care, Papworth Hospital, Cambridge, CB23 8RE, UK

[c] Department of Cardiothoracic Surgery, Papworth Hospital, Cambridge, CB23 8RE, UK

[d] Department of Anaesthesia and Intensive Care, St George's Hospital, London, SW17 0QT, UK

Corresponding author: Dr O Papachristofi, Department of Medical Statistics, London School of Hygiene and Tropical Medicine, London, WC1E 7HT, UK

Email: olympia.papachristofi@lshtm.ac.uk

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Objective: Ongoing debate focuses on whether patients admitted to hospital at weekends have higher mortality than those admitted on weekdays. Whether this apparent "weekend effect" reflects differing patient risk, care quality differences or inadequate adjustment for risk during analysis remains unclear. This study aimed to examine the existence of a "weekend effect" for risk-adjusted in-hospital mortality after cardiac surgery.

Design: Retrospective analysis of prospectively collected cardiac registry data.

Setting: Ten UK specialist cardiac centres.

Participants: A total of 110,728 cases, undertaken by 127 consultant surgeons and 190 consultant anesthetists between April 2002 and March 2012.

Interventions: Major risk-stratified cardiac surgical operations.

Measurements and Main Results: Crude in-hospital mortality rate was 3.1%. Multilevel multivariable models were employed to estimate the effect of operative day on in-hospital mortality, adjusting for centre, surgeon, anesthetist, patient risk and procedure priority. Weekend elective cases had significantly lower mortality risk compared to Monday elective cases (Odds Ratio [OR] 0.64, 95% CI 0.42, 0.96) following risk-adjustment by the logistic EuroSCORE and procedure priority; differences between weekend and Monday for urgent and emergency/salvage cases were not significant (OR 1.12, 95% CI 0.73, 1.72 and 1.07, 95% CI 0.79, 1.45 respectively). Considering only the logistic EuroSCORE but not procedure priority yielded 29% higher odds of death for weekend cases compared to Monday operations (OR 1.29, 95% CI 1.08, 1.54).

Conclusions: This study suggests that undergoing cardiac surgery during the weekend does not negatively affect patient survival, and highlights the importance of comprehensive risk-adjustment to avoid detecting spurious "weekend effects".

Keywords: weekend effect, day-of-the week, surgery, mortality, surgeon, EuroSCORE.

INTRODUCTION

Major reforms in the UK National Health Service (NHS) that aim to deliver improvements in healthcare are the subject of national debate [1, 2]. Published studies suggest that patients admitted to hospital at weekends have higher mortality than those admitted during the week. Reasons for the reported "weekend effect" may be patient-related (e.g. patients admitted at weekends are sicker), as well as hospital-related (e.g. quality of care is impaired due to reduced staffing levels and provision of services)[3-8]. The relative importance of these remains unclear due to difficulties in accounting for changing clinical risk factors throughout the week during analysis[3, 4, 10, 11]. Failure to adequately adjust for confounding factors may induce false positive associations between weekend surgery and worse outcomes, and thus unnecessary concerns for patients and medical staff [3, 4, 9, 11-13].

Availability of UK cardiac surgical mortality data offers an excellent opportunity to shed light on this ongoing national debate. Cardiac surgical risk of mortality is very well defined by the widely-used, validated risk stratification tool, logistic EuroSCORE, a weighted combination of 17 patient and operative factors known to affect patient outcomes. In addition, patients undergoing cardiac surgery consist of a mixture of emergency/salvage, urgent and elective cases with each classification being tightly defined[14, 15]. Although emergency/salvage operation is an element of EuroSCORE, its contribution to the score is compared to elective and urgent as a single category, which may not fully reflect its effect, especially when applied to weekend cases. As a result we analyse both EuroSCORE and priority status as markers of case severity. Moreover, this dataset includes (anonymised) information on hospital, surgeon and anesthetist, allowing adjustment for different healthcare providers, which has been shown to be important[16, 17].

This multi-centre study from ten UK centres uses disease registry data collected over one decade to assess whether a "weekend effect" exists for risk-adjusted in-hospital mortality in the emergency, urgent and elective cardiac surgical settings.

METHODS

Data source

The Association for Cardiothoracic Anesthesia and Critical Care secured consecutive case series from specialist cardiac centres in the UK. All 36 specialist cardiac centres in the UK were contacted, of which ten agreed to participate and acquired internal data provision permissions within a set timeframe of a month. All care data collection was mandated in line with NHS governance. Requirement for formal ethical approval was waived according to the National Research Ethics Service of the NHS Health Research Authority.

Study cohort

The study cohort included ten specialist cardiac centres and over 100,000 cardiac surgical patients, amounting to approximately a third of all UK cardiac operations in the study period. A detailed description of the study cohort has been previously published[17]; a flow diagram of how the final study cohort was obtained is given in Figure 1. In brief, the cohort comprised consecutive major cardiac operations prospectively collected between 2002 and 2012. Patients undergoing multiple cardiac procedures at distinct admissions were treated as independent episodes. Exclusions were operations for which the Logistic EuroSCORE is unsuitable (e.g. cardiac transplants, pulmonary endarterectomy procedures), patients aged <18 years and cases of elevated risk requiring operation by two or more consultant surgeons; cases with missing operative priority level information (n=41, 0.04%) were additionally excluded to allow for risk-adjustment using this variable. Finally after exclusion of low-volume providers, defined as those who have undertaken <0.1% of the cases in their centre, 91% (n=127 of 140) and 76% (n=190 of 250) of surgeons and anesthetists respectively remained in the dataset.

The final study cohort comprises 110,728 cases (96% of the cases originally supplied, n=115,254) treated by 127 surgeons and 190 anesthetists in ten centres.

Variables and outcome measures

The primary outcome measure was all-cause in-hospital mortality up to three months postoperatively; deaths beyond three months were considered unlikely to be due to the index surgery but instead a result of other comorbidities. The primary covariate of interest was the day of operation. Saturday and Sunday were merged into one category due to the limited number of operations undertaken in each of these days, and as there is no reason to assume Saturday would differ from Sunday in terms of their postulated effect on patient outcomes.

Patient case-mix adjustment was achieved using the logistic EuroSCORE, a widely-used, validated risk score for in-hospital death risk for cardiac surgery. The recently recalibrated version, EuroSCORE II, was not available at the study onset[19]. In common with published studies[5], we further adjusted for operative priority level (i.e. Elective [reference level], Urgent or Emergency/Salvage).

Statistical analysis

Patient and operative characteristics were compared using the chi-squared test for categorical, and analysis of variance for continuous variables; continuous variables are summarised as mean and standard deviation, and as median and quartiles where appropriate, and categorical variables are presented as percentages.

We used logistic random effects regression models to examine the association between in-hospital mortality (up to three months postoperatively) and the day of operation, with Monday as the reference day. We fitted a three-level cross-classified model that explicitly accommodates the clustered nature of the data (patients clustered within healthcare professionals (surgeons and anesthetists), clustered within centres). Detail on the statistical approach has been previously published[17, 20]. The logistic EuroSCORE was included as a fixed effects term in all models. We further included operative priority level as a fixed effect and as an interaction with operative day.

Supportive exploratory analyses examined a) the aggregated effect of weekday operation compared to the weekend (i.e. weekday vs. weekend), and b) the day of operation as an ordered continuous covariate (i.e. with Monday set to 1, Tuesday to 2 and so on) in order to examine incremental changes in the mortality risk as the week progresses.

Statistical model selection criteria used to compare models were the Akaike Information Criterion (AIC) and Bayesian Information Criterion (BIC). The amount of variation attributable to each of the clusters present (i.e. centre, surgeon and anesthetist) was quantified by the Intra-Class Correlation Coefficient (ICC). Data handling and analysis were performed with R (v3.3.2)[21].

RESULTS

Summary of the cohort

In the final dataset there were 110,728 cardiac surgery cases over the ten-year study period, with 3142 (3.1%) resulting in in-hospital death within three months of surgery (Figure 1). Almost three-quarters of our cohort were men (72.8%); mean age was 66.20 (SD: 11.31) years. Table 1 summarises patient and operative characteristics by operative day. Patient age and sex distributions did not substantially differ between weekday and weekend surgery. Although the average risk of patients treated during the weekend was not substantially higher compared to weekdays, the percentage of high-risk patients with logistic EuroSCORE over 30% (on the probability scale) more than doubled for weekend operations compared to weekdays.

Only 3.9% of cases were performed in the weekend (Table 1). All centres carried out fewer operations per day in the weekend compared to weekdays (Table S1, Supplementary material). Notably, centres 7, 9 and 10 undertook roughly twice as many weekend operations (≈6%) as other centres (≈3%). The proportion of cases per day of the week remained stable over time, apart from a small decrease for Friday and weekend operations (Table S2, Supplementary material).

Differences in operative characteristics between weekday and weekend operations were more pronounced (Table 1). The proportion of elective and urgent operations progressively decreased during the week whilst the proportion of emergency/salvage procedures undertaken in the weekend was five to seven times greater than that of other weekdays. This is in line with the proportion of “other major” operations almost doubling, and higher risk patients being treated in the weekend. Slightly more isolated CABGs were done over the weekend. The crude unadjusted mortality rate increased from 3% during the week, to 5% at the weekend.

Models adjusted for EuroSCORE only

The logistic EuroSCORE was significantly associated with in-hospital mortality in all models (Supplementary Tables S3, S4). Adjusting for logistic EuroSCORE only, the odds of death increased by 29% for operations in the weekend compared to Monday and by 16% for operations on Thursdays compared to Monday (Table 2). Figure 2 shows there is no clear linear upward trend in the odds of death over the week.

Models adjusted for EuroSCORE and operative priority

Including logistic EuroSCORE, operative priority and the interaction between operative priority and day of the week in the model reveals that the odds of death primarily increase due to operative urgency rather than due to day of the week (Table 3). Figure 3 shows that the odds of death remain fairly stable throughout the week within each priority level; rather unexpectedly, weekend elective operations fare better than Monday elective cases. The logistic EuroSCORE remained significant, albeit with a reduced effect (0.784, 95% CI 0.752 to 0.816) in this analysis. This is expected as operative priority is included in the logistic EuroSCORE ("emergency or not" component). Although logistic EuroSCORE and operative priority are correlated to some extent, they are both significant in the model (Table S4).

Additional exploratory analysis

Comparing aggregated weekday operations with weekend operations yielded similar findings. Weekend operations were associated with an increase of 18% in the odds of death (1.18, 95% CI 1.01 to 1.39) if operative priority is ignored, but including operative priority and its interaction with weekday/weekend operation led to a 39% reduction in odds of death for weekend elective operations (Table S5, Supplementary material); as in the main analysis, the principal driver of increased in-hospital mortality risk was the urgency of a procedure rather than the day of the week it was undertaken. The analysis examining operative day as a continuous variable [i.e. Monday (1) to Saturday/Sunday (6)] yielded similar results (Table S6).

Variation in outcomes due to patient, anaesthetist, surgeon and hospital

In line with previous analysis of this dataset, over 95% of the variation in in-hospital mortality was due to the logistic EuroSCORE and residual patient heterogeneity, whereas hospital and anesthetist variation were negligible. The intra-class correlation coefficient for surgeon was 4%, and did not change when the day of the week was adjusted for, suggesting that surgeon practice does not considerably vary throughout the week.

DISCUSSION

Our analysis of the large, high-quality UK cardiac surgical registry, using a validated risk score specifically designed for this patient population, adds considerable objectivity to the ongoing 'weekend effect' debate. We demonstrated that, after adjustment for patient heterogeneity and the procedure priority level, the risk of in-hospital mortality for weekend surgery is not significantly increased. However, in-hospital mortality was significantly lower for *elective* weekend operations.

There are several potential explanations for this important and rather unexpected finding.

1. <u>Surgeon selection of elective weekend cases</u>

Scheduling operations at weekends may reflect increased pressure faced by centres and professionals to meet waiting list targets, and/or a response to financial incentives for weekend surgery provision[22-25]. Such cases are generally chosen to be low-risk, routine procedures, to avoid putting strain on hospital systems that operate with reduced intensity in the weekend; this may explain the higher proportion of isolated CABG cases, which are typically low-risk and relatively standardised, in the weekend.

2. <u>Differences in theatre environment and working culture in the weekend</u>

The elective theatre working environment is considerably different at weekends, with fewer teaching cases scheduled (and fewer trainees in the hospital) and typically shorter operative durations. The proportion of isolated CABGs is higher in the weekend whereas the proportion of complex combined CABG and aortic valve replacement (AVR) procedures is lower (Table 1).

3. <u>Elective weekend cardiac surgical cases "protected" from the weekend ward effect</u>

Lower medical/nursing staffing levels at weekends extend beyond the operating theatre and ICU to the ward. Because the majority of weekend elective operations are scheduled on Saturdays when there may be less pressure on ICU beds, these patients may spend more time in ICU, relative to ward stay, than similar patients having operations on weekdays.

We stress that all the aforementioned issues require further investigation.

We previously demonstrated that the majority of variation in post-operative survival is due to patient heterogeneity [16-18]. Our current study suggests that, in the UK cardiac surgery setting, the "weekend effect" is primarily explained by operative priority and patient risk. Comprehensive risk-adjustment is crucial; a model adjusting only for operative day would lead to the unsafe conclusions of a "weekend effect" as well as "Thursday" and "Friday" effects (Supplementary Material, Figure S1). Adjusting only for patient risk (via the logistic EuroSCORE), but ignoring operative priority would remove "Friday" effects, but would be insufficient to fully account for differing risk at during the week. Further support for distinguishing between operative priority levels is that scheduling elective operations in the weekend is largely in the control of centres and professionals, and thus driven by mechanisms that could be fine-tuned if needed. In contrast, urgent/emergency operations are primarily unplanned, and driven by complex underlying mechanisms which are difficult to influence.

Our study is strengthened by the clinical, rather than administrative, nature of our cohort. Risk-adjustment using administrative data is often limited by the lack of relevant clinical detail which may have previously led to false-positive conclusions; multiple authors advocated studies using disease registry data to mitigate this issue [4, 6, 11, 30]. We used such a disease-specific registry including efficient means of risk- and provider-adjustment which enabled us to disentangle "weekend effects" due to reduced care quality, from differential risk treated at the weekend.

Our findings are consistent with published literature. Aylin *et al.* investigated 30-day mortality by operative day for all elective UK procedures from 2008 to 2011[26]. Even though they found an increase in the "weekend" odds of death across all surgical disciplines studied, this was not the case for the cardiac surgery subset (CABG only); the 95% CI for all odds ratios by operative day was not significant at the

5% threshold. Repeating our analysis on the subset of CABG cases only (primarily elective and of low risk), resulted in non-significant differences between weekend and week days (Table S8).

A Swedish study of 106,473 cardiac surgical cases over a 15-year period found significant "weekend effects" on 30-day mortality, even after risk-adjustment; this persisted in an analysis restricted to the last five years of the cohort[27]. It is not clear why there was so much missing data and it may be that the assumptions upon which their multiple imputation (MI) method relies were not satisfied. Sensitivity analysis based on the complete-cases only failed to establish a significant weekend effect, so that the conclusions in this study depended on how missing data problems were addressed, and the validity of the underlying assumptions made for different methods. In common with our study, analysis restricted to the elective cases suggested improved weekend outcomes; however, this did not reach statistical significance.

Although operative priority was included in the calculation of logistic EuroSCORE, the proportion of weekend cases included in the EuroSCORE development dataset was very small and the definition of operative priority did not include differentiation between urgent and elective cases. Therefore, adjustment for both EuroSCORE and operative priority, although correlated, is valid, and both were significantly independently associated with in-hospital mortality.

In common with previous studies, we chose to examine the day of operation as a categorical variable, aggregating only Saturday and Sunday [5, 7, 26]. An exploratory analysis grouping weekdays in one category yielded similar findings. Differences in findings compared to other studies may be due to variable definitions of mortality (e.g. in-hospital vs. long-term mortality, mortality seven days post-admission)[5, 6] or different outcomes examined. For instance, studies in acute stroke did not find an increase in 30-day mortality for weekend cases, but did detect a decline in other care quality indicators (e.g. stroke unit admission within 4 hours, stroke physician assessment)[13].

Weekly fluctuations in care quality may be more likely in acute settings and conditions resulting in emergency admission where the timely delivery of care is key (e.g. myocardial infarction, acute stroke), and are therefore particularly affected by treatment delays and reduced service at the weekend [4, 13].

Clinical and public health implications

Our study shows that cardiac surgery is delivered to a high-standard throughout the week, with "weekend effects" eliminated after adjustment for patient risk and the emergency/urgent nature of procedures, therefore suggesting that changes in how cardiac surgical care is currently delivered, including changes in staff contracts, are not warranted. Instead, resources should be devoted to minimising elective cardiac surgery waiting lists, to avoid the need for emergency surgery when patients deteriorate substantially whilst waiting.

Our findings are in line with previous authors concluding differences in hospital staffing are unlikely to fully explain potential "weekend effects" [3, 4, 7, 12]. Cardiac surgery and anesthesia are specialist consultant-delivered services seven-days-per-week, and thus service delivery is unlikely to vary substantially.

Policy makers must exercise caution in attributing differences between weekend and weekday outcomes to differences in staff. Efficient risk-adjustment is paramount to avoid unintentionally "penalising" treatment of high-risk cases; falsely attributing causal relationships will lead to extensive resource waste and unnecessary concerns for patients and medical staff [4, 9, 11-13].

Limitations

We were limited by the lack of other measures of care quality (e.g. waiting times to diagnostic testing, ICU stay) that may vary during the week, and of information on centre features (e.g. nurse-to-bed ratio, on-duty personnel seniority) that may explain time-based differences in these. We were further limited by the lack of information on other morbidities that may vary during the week (e.g. postoperative complications such as stroke). We underline the need for studies using similar, large morbidity databases, in order to obtain robust evidence on potential “weekend effects” for other important outcomes. Lastly, environmental factors potentially contributing to a “weekend effect” could not be adjusted for due to unavailability of relevant information.

All centres studied were high-volume and constitute a limited sample of all eligible centres in the UK (n=10 of 36); as such, these may be different from non-participating centres, in terms of patient risk, between-provider variability, weekend staffing and caseload organisation. Thus our results may not readily generalise to low-volume centres and may underestimate centre variation. Nevertheless, in the UK setting, we would expect the participating and non-participating centres to be considerably similar in nature, because cardiac surgery is exclusively undertaken in specialist cardiac centres with academic/teaching status, providing key aspects of cardiac surgical care, based on national guidance produced by the relevant specialist societies.

Conclusions

Weekly variation in mortality post-cardiac surgery is primarily driven by patient heterogeneity and operative urgency. Thus, efforts should focus on minimising the need for emergency surgery, potentially by reducing waiting times, rather than moving towards full surgical unit staffing at the weekends. Despite no “weekend effect” for in-hospital mortality being identified, future research should examine weekly patterns in more “sensitive” care quality measures, such as the occurrence of adverse events (readmissions, postoperative complications) and operational efficiency (timely delivery of care, prolonged ICU/hospital stay) [3, 11-13, 30].

Figure legends

Figure 1: Flow diagram showing how the final dataset was derived.

Figure 2: Odds (95% confidence intervals) of in-hospital death up to 3 months postoperatively by day of operation; risk-adjustment by the logistic EuroSCORE only.

Figure 3: Odds (95% confidence intervals) of in-hospital death up to 3 months postoperatively by day of operation; risk-adjustment by the logistic EuroSCORE and Operative Priority.

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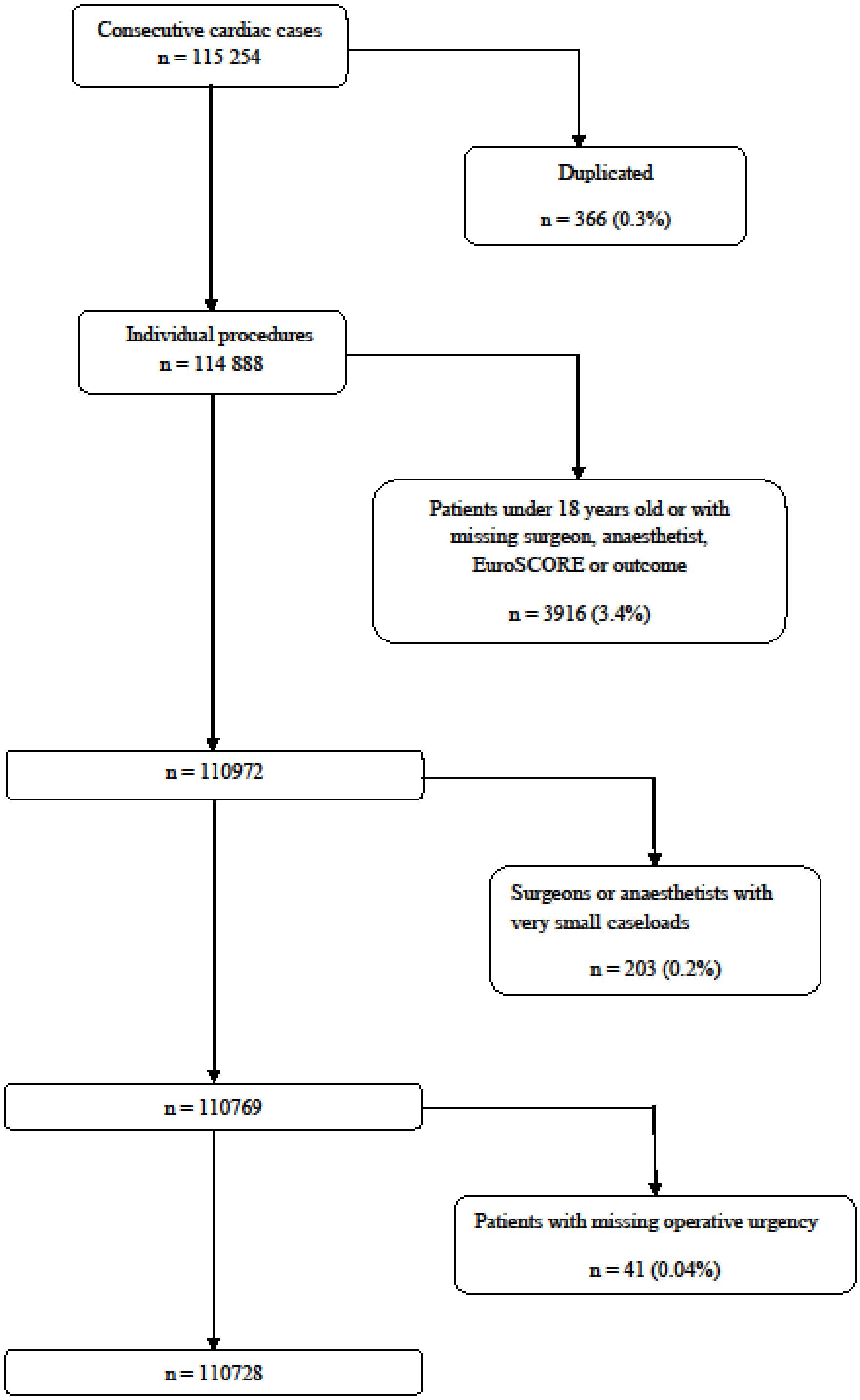
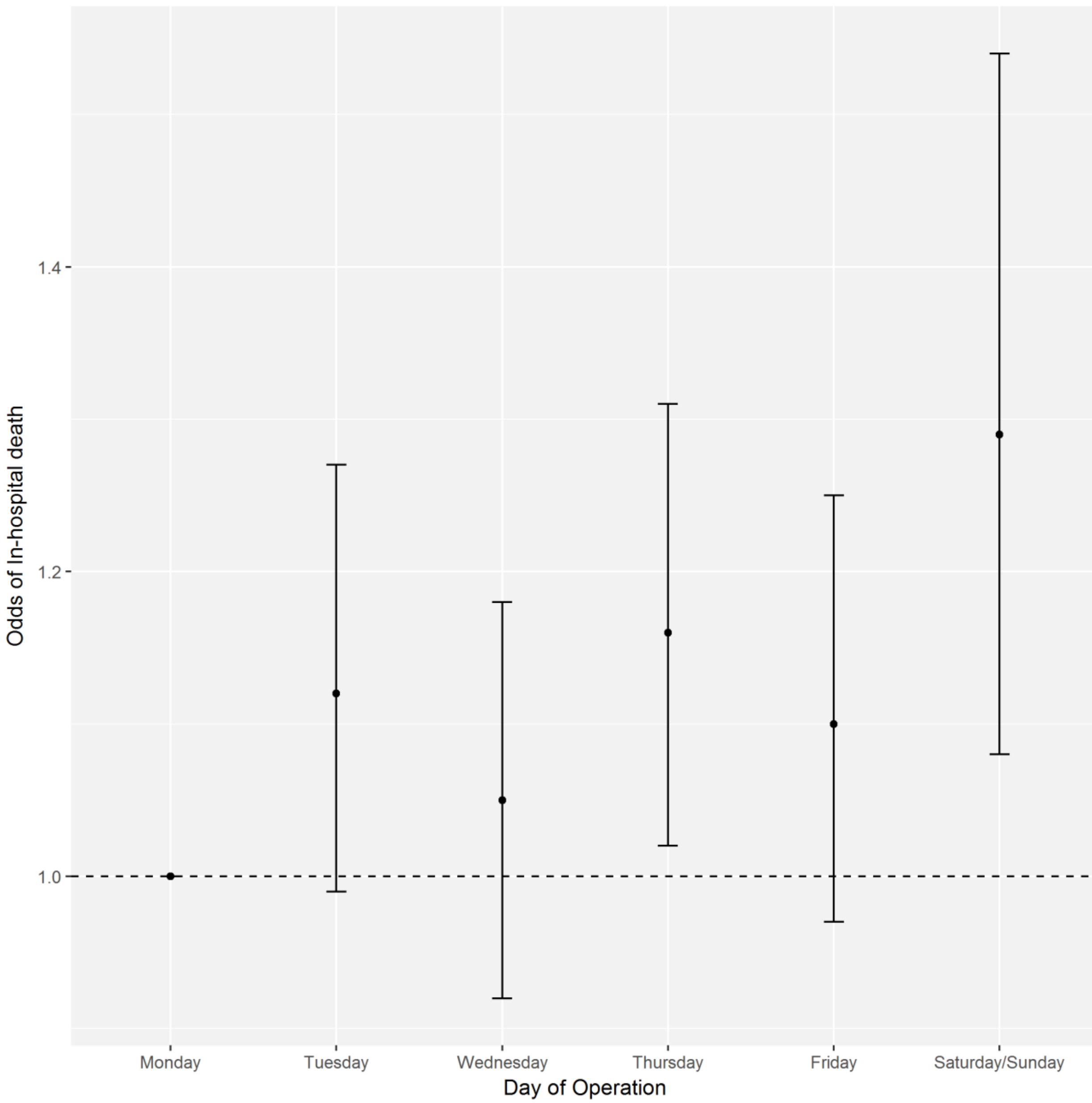
Figure 1: Flow diagram showing how the final dataset was derived.





Odds of In-hospital death
1.4
1.2
1.0
Monday
Tuesday
Wednesday
Thursday
Friday
Saturday/Sunday
Day of Operation

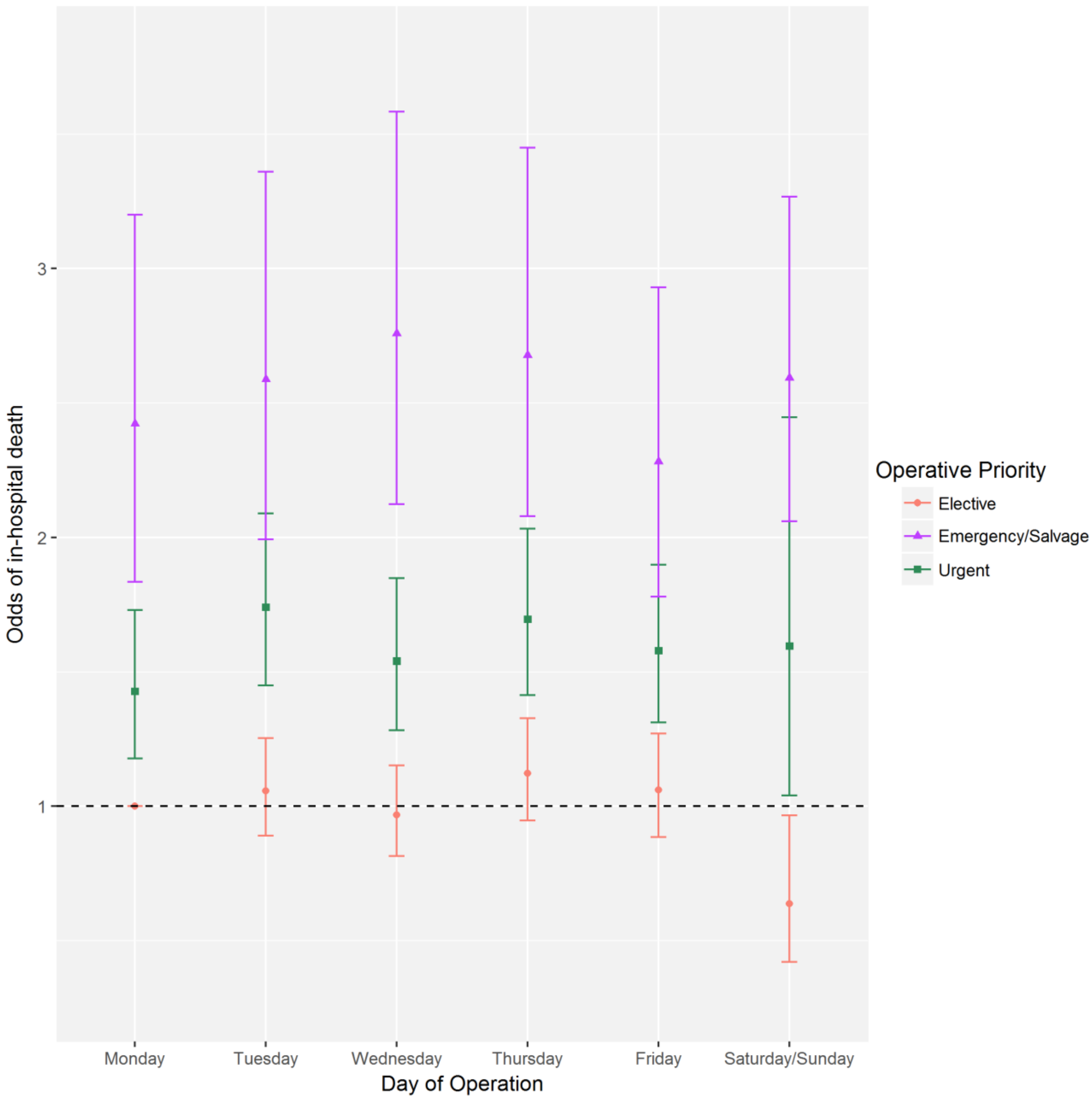

Odds of in-hospital death
3
2
1
Monday
Tuesday
Wednesday
Thursday
Friday
Saturday/Sunday
Day of Operation
Operative Priority
Elective
Emergency/Salvage
Urgent

Table 1: Patient and operative characteristics for analysis dataset by operative day (n=110,728). The figures given are percentage of cases unless otherwise specified.

Variables	***Monday*** ***(n=21402, 19.3%)***	***Tuesday*** ***(n=22166, 20.0%)***	***Wednesday*** ***(n=22080, 19.9%)***	***Thursday*** ***(n=21804, 19.7%)***	***Friday*** ***(n=18986, 17.2%)***	***Saturday/Sunday*** ***(n=4290, 3.9%)***
Patient Characteristics						
Age at admission*						
[18-36)	1.9	1.6	1.4	1.7	2.0	2.6
[36-46)	3.1	3.2	3.0	3.1	3.6	4.1
[46-56)	10.4	11.1	10.7	10.1	10.6	13.0
[56-66)	26.1	26.3	26.5	26.2	25.6	28.9
[66-76)	37.3	36.8	37.3	37.5	37.6	34.6
[76-86)	20.1	19.8	20.1	20.3	19.5	15.9
[86-96]	1.1	1.2	1.0	1.1	1.1	0.9

Mean(SD) Age at admission (years) *	66.45 (11.40)	66.35 (11.29)	66.56 (11.00)	66.55 (11.31)	66.15 (11.61)	64.54 (12.00)
Median (IQR) Age at admission (years)	68 (60, 74.88)	68 (60, 74.60)	68 (60, 74.82)	68 (60, 75.00)	68 (60, 74.39)	66 (58, 73.00)
Logistic Euroscore (probability) *						
[0,0.1)	81.6	80.2	81.6	80.0	79.9	74.7
[0.1,0.2)	11.8	12.6	11.5	12.4	12.1	11.9
[0.2,0.3)	3.5	3.7	3.6	3.9	4.0	4.5
≥0.3	3.1	3.5	3.3	3.7	4.0	8.9
Mean(SD) EuroSCORE (probability) *	0.07 (0.09)	0.07 (0.10)	0.07 (0.09)	0.07 (0.10)	0.08 (0.10)	0.10 (0.15)
Median (IQR) EuroSCORE (probability)	0.04 (0.02,0.08)	0.04 (0.02,0.08)	0.04 (0.02,0.08)	0.04 (0.02,0.08)	0.04 (0.02,0.08)	0.04 (0.02,0.10)
Male†	73.0	73.0	72.8	72.5	72.2	74.3
Operative Characteristics						
Operative Priority level*†						

Elective	72.5	70.7	68.9	69.2	65.1	62.6
Urgent	24.6	26.2	28.1	27.4	30.5	14.2
Emergency/Salvage	2.9	3.1	3.0	3.4	4.4	23.2
*Operation Type**┼┼						
CABG(isolated)	51.8	51.0	53.3	50.9	51.9	58.8
AVR(isolated)	9.1	8.3	9.0	9.8	8.7	9.4
MVR±other	5.0	8.0	5.7	4.3	6.3	5.4
CABG+AVR	8.5	7.8	8.3	9.1	7.7	4.7
CABG+other procedures	2.0	2.2	2.2	2.0	2.4	1.9
CABG+other valve	2.9	3.2	2.6	2.8	2.7	1.6
CABG+AVR+other	1.4	1.3	1.1	1.6	1.3	1.1
AVR+other procedures	2.3	2.5	1.9	2.7	2.6	2.8
Other major procedures	3.2	3.6	3.4	3.8	4.3	7.9
Valve alone	5.9	5.3	5.6	5.5	5.1	4.0

Valve + other	1.8	1.2	1.5	1.6	1.4	0.9
Unknown┼	6.1	5.6	5.4	5.9	5.6	1.5
Crude mortality rate						
In-hospital mortality*	2.7	3.0	2.9	3.3	3.2	5.0

*p<0.01
┼3 cases with Gender missing (<0.01%) and 6176 cases with Operation Type missing (5.6%).
┼┼CABG, coronary artery bypass grafting; AVR, aortic valve replacement or repair; MVR, mitral valve replacement or repair.
Square bracket denotes number inclusive in the interval.

Table 2: Odds ratios by operative day (as categorical variable) adjusted for the logistic EuroSCORE as fixed, and centre, surgeon and anaesthetist as random effects. P-values correspond to pairwise tests of significance compared to the reference day (i.e. Monday).

	Number of deaths/Total cases	*Odds Ratio (95% Confidence Interval)*	*p-value*
Monday	568/21402	1	-
Tuesday	668/22166	1.12 (0.99, 1.27)	0.074
Wednesday	648/22080	1.05 (0.92, 1.18)	0.478
Thursday	710/21804	1.16 (1.02, 1.31)	0.021
Friday	605/18986	1.10 (0.97, 1.25)	0.144
Saturday/Sunday	210/4290	1.29 (1.08, 1.54)	0.006

Table 3: Odds ratios and associated 95% confidence intervals for each operative priority level per day of the week. Monday elective operations are used as the reference level; the number of deaths by operative priority per day of the week is also listed.

	Monday	***Tuesday***	***Wednesday***	***Thursday***	***Friday***	***Saturday/Sunday***
Number of Deaths by Operative Priority						
Elective	282/568	304/668	283/648	325/710	240/605	25/213
Urgent	192/568	252/668	251/648	260/710	241/605	26/213
Emergency/Salvage	94/568	112/668	114/648	125/710	124/605	162/213
Odds ratio (95% Confidence interval)						
Elective	1	1.06 (0.89, 1.25)	0.97 (0.82, 1.15)	1.12 (0.95, 1.33)	1.06 (0.89, 1.27)	0.64 (0.42, 0.96)
Urgent	1.43 (1.18, 1.73)	1.74 (1.45, 2.09)	1.54 (1.28, 1.85)	1.70 (1.41, 2.03)	1.58 (1.31, 1.90)	1.60 (1.04, 2.44)
Emergency/Salvage	2.42 (1.84, 3.20)	2.59 (1.99, 3.36)	2.76 (2.12, 3.57)	2.68 (2.08, 3.45)	2.28 (1.78, 2.93)	2.59 (2.06, 3.27)