Ultrasound screening for AAA is cost effective and reduces AAA related mortality. Excess cardiovascular morbidity and mortality is well recognised in patients with AAA, however, AAA screening has no formal role yet in cardiovascular risk reduction which may be a missed opportunity.

Consent was gained to link data from the 2013/14 NHS AAA screening cohort with the UK Hospital Episode Statistics/Office for National Statistics datasets. Patients who did not attend screening were excluded. Aortic diameter, screening date, date of death and cause of death (ICD-10) were extracted from the linked datasets. Cardiovascular death included those ICD codes pre-specified by the Global Burden of Disease studies. Relative risks were calculated to compare groups and log-rank survival analysis was performed.

240,954 patients were included; mean aortic diameter was 18mm (SD 3mm). 3,235 patients (1.34%) had a sub-aneurysmal aorta (25-29mm) and 2,981 (1.24%) had an AAA (>30mm). Cardiovascular mortality was 0.30% (95% CI 0.28-0.32%) for individuals with an abdominal aortic diameter ≤2.5cm; 0.81% (0.51-1.11) for those between 2.5 and 2.9cm; and 1.30% (0.90-1.71) for those ≥3.0 cm. Death from a cardiovascular event was more likely for individuals with an AAA than for those with a normal aorta (risk ratio 4.33, 95% CI 3.15-5.97). Cardiovascular survival decreased with progressive aortic diameter (Figure 1, Long Rank P=0.0001).

The natural history of an enlarging aorta is progressive cardiovascular risk. Aortic screening is currently an opportunity missed to address this risk in those with and without AAA.
No evidence of a 'weekend effect' in the management of acute abdominal aortic aneurysm in the UK

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The 'weekend effect' is a phenomenon whereby patient outcomes appear worse at the weekend compared to during the week. Recent evidence has suggested that the effect may be due to a combination of inadequate correction for confounding factors and inaccurate coding. We investigated the effects of these factors in patients with acute abdominal aortic aneurysm (AAA).

All patients entered into the non-elective AAA repair section of the UK National Vascular Registry from January 2013 until December 2015 were eligible. Patients were divided into those treated during the week (8am Monday-5pm Friday) and those treated at the weekend (5pm Friday-8am Monday). Coding issues were investigated by looking separately at patients treated for ruptured, symptomatic or asymptomatic AAA. The primary outcome was in-hospital mortality. Secondary outcomes included length of stay and cardiac, respiratory and renal complications.

5439 patients were treated for acute AAA over the study period. Mortality appeared higher for patients treated at the weekend (odds ratio (OR) 1.65, 95% confidence interval (CI) (1.44-1.89), P<0.001), but this effect disappeared when confounding factors and coding issues were corrected for (corrected OR for ruptured AAA 1.09, 95% CI (0.92-1.29), P=0.33). Differences in outcomes were similar for prolonged length of stay (uncorrected OR 1.42, 95% CI (1.26-1.60), P<0.001; corrected OR for ruptured AAA 1.06, 95% CI (0.91-1.10), P=0.48) and morbidity outcomes.

After appropriate correction for confounding factors and coding effects, there is no evidence of a significant 'weekend effect' in the treatment of non-elective AAA in the UK.
Have we become risk averse in treating abdominal aortic aneurysms after introduction of surgeon specific mortality data reporting?
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Reporting surgeons’ outcomes may lead to risk aversion. We aimed to investigate whether reporting surgeon specific mortality data (SSMD) for Abdominal Aortic Aneurysm (AAA) repairs impacted on the number and risk-profile of those offered elective treatment.

Hospital Episode Statistics (HES) databases were used to assess the number of patients undergoing open or endovascular AAA-repair yearly from 2008/09 until 2014/15. National Vascular Registry (NVR) reports were used to compare number of AAA-repairs in the units that reported outcomes in 2013 (years 2008-2012), 2014 (2009-13), and 2015 (2010-14). Risk profiles of patients referred for elective AAA repair in one unit were analysed yearly between 2010 and 2015 based on cardiopulmonary-exercise test (CPET) results (available for all patients).

Admissions for elective AAA-repair in England increased yearly based on HES databases: 4,955 in 2008/09 to 5,601 in 2014/15. The median number of AAAs treated per unit yearly based on NVR reports increased from 192 (2008-2012 reporting-period) to 214 (2010-2014 reporting period) for the 85 centres that reported in all the 5-year periods (p=0.006). In the single-centre study, the % of patients offered elective AAA-repair increased yearly from 74% in 2009/10 to 81% in 2013/14. The age, AAA-size, and CPET anaerobic threshold levels of those offered AAA-repair did not differ significantly between 2010 and 2015.

There hasn't been a decrease in the number of AAAs treated based on HES and NVR databases after introducing SSMD-reporting; the risk profiles of patients in the single centre study did not differ before and after SSMD-reporting.
Comparative Analysis of the Outcomes of Elective Abdominal Aortic Aneurysm Repair in England and Sweden: Context for Contemporary Practice

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There is substantial international variation in mortality from abdominal aortic aneurysm (AAA) repair and many non-operative factors influence risk-adjusted outcomes. A contemporary international study provides perspective for evaluating current practice. This study compared 90-day and five-year mortality for patients undergoing elective AAA repair in England and Sweden.

Patients undergoing elective AAA repair were identified from English Hospital Episode Statistics and Swedish Vascular registry (Swedvasc) between 2003 and 2012. 90-day mortality and five-year survival were compared after age/gender adjustment. Separate within-country analyses were performed to examine the impact of co-morbidity, hospital teaching status and hospital annual caseload.

The study included 36,412 patients with AAA in England, of whom 87.24% were male with median (interquartile range, IQR) age 74 (69-79) years. There were 7806 AAA patients in Sweden, of whom 82.87% were male, with median (IQR) age 73 (68-78) years. 90-day mortality (5.35% vs 3.89%, p<0.001) and five-year survival (70.3% vs 72.8%, p<0.001) were poorer in England but equivalent after 2007. Utilisation of EVAR was initially lower in England, but surpassed that in Sweden after 2010. In both countries, poorer outcome was associated with a lower proportion of EVAR, increased age, operation at institutions with lower operative annual volume and/or without teaching status. EVAR was significantly better than open repair in younger patients in both countries in terms of 90-day mortality but significantly worse in young patients in terms of five-year survival.

Mortality for elective AAA repair was poorer in England than Sweden, but improved over time alongside greater uptake of EVAR. Mortality is now equivalent in both countries. High-caseload centres performing a greater proportion of cases with EVAR achieve better results in both countries.
Geographical and social inequality influence the prevalence of cardiovascular disease and have well known associations with smoking and ethnicity. The aim of this study was to analyse variation in ruptured AAA (rAAA) incidence in England and its relationship with healthcare, social and geographical factors.

Number of deaths from rAAA in England and population data were obtained from the Office of National Statistics (ONS) for each local authority (LA) area for the years 2013-14. Mortality was then calculated per 100,000 population to allow direct comparison. Data on ethnicity, smoking prevalence and index of multiple deprivation (IMD) were obtained from Public Health England. Year of introduction of AAA screening and distance from each LA to its vascular hub were then calculated and multivariate regression performed.

There is a 17-fold difference in rAAA mortality between the highest and lowest ranked LA in England (mean 5.7 deaths per 100,000 population). The longest distance between a LA and its vascular hub was 48 miles (mean 12.8 miles), with a mean smoking prevalence of 18.9%. Multivariate regression suggests that ethnicity, IMD and local smoking prevalence were significantly associated with rAAA mortality whilst distance from vascular hub and year of introduction of AAA screening were not (P=0.0001).

Variation in rAAA mortality in each local authority is associated with local rates of smoking, deprivation and differences in ethnicity. Local initiatives to identify patients at highest risk of rAAA may reduce this inequality in outcomes.
Personalised EVAR Surveillance Intervals Based on Stratification of Individual Patient Risk of Secondary Intervention from Readily Measurable Parameters

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Personalised EVAR surveillance based on individual patient risk of secondary intervention (SI) could improve service.

The aims of this project:
A) to develop a model that predicts an individual's risk of SI in the future based on the last surveillance imaging.
B) to develop personalised surveillance intervals without increasing the risk of a SI between surveillance visits compared to existing surveillance programme.

All 3,160 sets of reports of Duplex Ultrasound and Abdominal X-ray performed on 797 patients for EVAR surveillance in one institution (2008-15) were retrieved and 35 variables were noted from each. Data was split 70:30 for model creation and validation.

Weibull regression modelling was performed to the point of first SI, using the model creation dataset. Goodness of fit of the model was confirmed. Individual patient's cumulative risk of secondary intervention over time was calculated.

Mean risk of SI during a standard 1 year surveillance interval was 5.5% and considered the maximum allowable risk. The time to reach this risk was calculated for each individual in the validation group, using the risk model and was proposed the new surveillance interval. Median personalised surveillance interval was 1.9 years (IQR 0.8 - 3.6)

Computational risk modelling can be used to accurately estimate risk of SI after EVAR and this in turn to personalise surveillance intervals without exceeding overall risk associated with current surveillance regimens. Clinical adoption of this model will render surveillance programmes more efficient without compromising the overall safety.