

# Can screening programmes for abdominal aortic aneurysm safely be made more efficient by targeting them at people at the highest risk of disease?

<b>Submission date</b> 23/03/2022	<b>Recruitment status</b> Recruiting	<input type="checkbox"/> Prospectively registered <input checked="" type="checkbox"/> Protocol
<b>Registration date</b> 20/04/2022	<b>Overall study status</b> Ongoing	<input type="checkbox"/> Statistical analysis plan <input type="checkbox"/> Results
<b>Last Edited</b> 08/10/2025	<b>Condition category</b> Circulatory System	<input type="checkbox"/> Individual participant data <input checked="" type="checkbox"/> Record updated in last year

## Plain English summary of protocol

### Background and study aims

An abdominal aortic aneurysm (AAA) is a swelling of the main blood vessel in the body, the aorta. If an AAA gets too large, it can burst (rupture) and cause internal bleeding. This is usually fatal. If they are found before they burst, AAAs can be repaired by having an operation. To reduce the number of people dying from ruptured AAA, the NHS offers AAA screening to men at the age of 65 (women rarely get AAA). About 280,000 men are invited for screening each year, with one in five men attending for screening. One in every 100 men screened is found to have an AAA. This screening programme costs the NHS about £7.75 million per year. Much of this cost is spent on screening the 99% of men who do not have AAAs. Some men who don't have an AAA also suffer unnecessary worry from the screening invitation and testing process. Smoking is the main risk factor for AAA. As the number of people who smoke has decreased over time, AAAs are becoming less common. In 2010, 1.50% of men screened by the NHS had an AAA, and this fell to 0.97% in 2019. As AAAs become less frequent, AAA screening costs more per person found to have an AAA. Eventually, the NHS will not be able to justify spending money on AAA screening. An alternative, more cost-effective approach is to only invite men for AAA screening if they are at high risk of having an AAA. This is done in the United States, where only men who are current or ex-smokers are invited for AAA screening. This reduces the number of men who are screened. It is not known if this approach misses many men with AAAs in the group who are not offered screening.

### Who can participate?

Men invited for AAA screening by the NHS AAA Screening Programme (2013 to date)

### What does the study involve?

In this research, we will analyse results from the NHS AAA Screening Programme from 2013-2021. General practice records will be obtained for around one-fifth of the men invited for screening using a process that ensures all men remain anonymous to the research team. By combining the results of AAA screening with general practice records, we will work out what

would have happened if only men with known risk factors for AAA had been invited for AAA screening.

This work will be extended to see if there are other details in general practice records that can be used to identify men at high or low risk of AAA. This information will be used to see if AAA screening can be targeted at groups of men who are at a high risk of having an AAA and, if so, whether such a targeted screening programme will still identify the majority of men with AAAs. The ethics and acceptability of targeted screening will be explored with members of the public.

What are the possible benefits and risks of participating?

None

Where is the study run from?

University of Leicester (UK)

When is the study starting and how long is it expected to run for?

January 2017 to October 2026

Who is funding the study?

National Institute for Health Research (NIHR) (UK).

Who is the main contact?

Prof. Matthew Bown, mjb42@le.ac.uk

## Contact information

### Type(s)

Principal investigator

### Contact name

Prof Matthew Bown

### ORCID ID

<https://orcid.org/0000-0002-6180-3611>

### Contact details

University of Leicester BHF Cardiovascular Research Centre

Glenfield General Hospital

Leicester

United Kingdom

LE3 9QP

+44 116 252 3190

mjb42@le.ac.uk

## Additional identifiers

### Clinical Trials Information System (CTIS)

Nil known

### Integrated Research Application System (IRAS)

233765

**Protocol serial number**

NIHR130075, IRAS 233765

## Study information

**Scientific Title**

In-silico trials of targeted screening for abdominal aortic aneurysm using linked healthcare data: can the efficiency of the NHS Abdominal Aortic Aneurysm Screening Programme be improved whilst maintaining publicly acceptable levels of disease detection in an ethically acceptable manner

**Study objectives**

Targeted screening for abdominal aortic aneurysm (AAA) is more efficient than whole population screening.

**Ethics approval required**

Ethics approval required

**Ethics approval(s)**

1. approved 30/05/2018, West Midlands - South Birmingham Research Ethics Committee (The Old Chapel, Royal Standard Place, Nottingham, NG1 6FS, United Kingdom; +44 207 104 8143; southbirmingham.rec@hra.nhs.uk), ref: 18/WM/0140

2. approved 06/05/2021, West Midlands South Birmingham REC (The Old Chapel Royal Standard Place, Nottingham, NG1 6FS, United Kingdom; +44 (0)207104 8256; southbirmingham.rec@hra.nhs.uk), ref: 18/WM/0140

**Study design**

In-silico trial using linked data from AAA screening and primary care

**Primary study design**

Other

**Study type(s)**

Screening

**Health condition(s) or problem(s) studied**

Abdominal aortic aneurysm

**Interventions**

This is an in-silico trial that will make use of routine healthcare data gathered as part of the NHS AAA Screening Programme linked to primary care records for these men. Between 2013 and 2022 approximately 2 million men were invited for AAA screening in England. With approval from the Health Research Authority Confidentiality Advisory Group the screening records for these men have been linked to primary care data from the Clinical Practice Research Datalink. Men who have opted out of NHS data sharing for research will not be included in this research. Primary care data is available for approximately 15% of England and therefore the final dataset will contain data around 300,000 individual records.

By linking primary care data with screening outcomes it will be possible to undertake in-silico trials to determine the effectiveness of targeting screening using primary care data to define groups to be invited for screening.

The primary outcome will be the proportional detection of abdominal aortic aneurysm at screening (diagnostic accuracy). Secondary outcomes will be clinical and economic effectiveness of AAA screening. Effectiveness will be estimated using an established discrete event simulation model of AAA screening.

The control group will be whole population screening (the current approach)

The intervention will be targeted screening using primary care data.

The study dataset will be split at random into two parts. Risk factors to use in targeted screening strategies will be identified from one part of the study dataset before testing these in the second part of the study data.

### **Intervention Type**

Other

### **Primary outcome(s)**

Diagnostic accuracy of AAA screening – sensitivity of targeted screening for AAA detection in comparison to whole population screening. AAA detection will be determined from AAA screening records at a single time point

### **Key secondary outcome(s)**

1. Effectiveness of targeted screening – using the baseline of whole population screening the clinical and economic effectiveness of targeted screening will be estimated using a validated discrete event simulation model. Model parameters will be determined from the analysis of AAA screening outcome data at a single time point
2. Diagnostic accuracy will be determined from data provided by the NHS AAA Screening Programme. This consists of attendance for screening and binary screening outcome (attendance yes/no, aneurysm yes/no). The gold standard for diagnostic accuracy will be the observed results from whole population screening. The results of targeted screening will be compared to this with data for AAA screening outcomes for each individual compared across the two strategies at a single time point

### **Completion date**

01/10/2026

## **Eligibility**

### **Key inclusion criteria**

Men invited for AAA screening by the NHS AAA Screening Programme (2013 to date)

### **Participant type(s)**

Population

### **Healthy volunteers allowed**

No

**Age group**

Adult

**Sex**

Male

**Key exclusion criteria**

Men who have opted out of NHS data sharing or NHS AAA Screening Programme research.

**Date of first enrolment**

01/04/2013

**Date of final enrolment**

01/07/2026

**Locations****Countries of recruitment**

United Kingdom

England

**Study participating centre****University of Leicester**

University Road

Leicester

United Kingdom

LE1 7RH

**Sponsor information****Organisation**

University of Leicester

**ROR**

<https://ror.org/04h699437>

**Funder(s)****Funder type**

Government

## Funder Name

National Institute for Health Research

## Alternative Name(s)

National Institute for Health Research, NIHR Research, NIHRresearch, NIHR - National Institute for Health Research, NIHR (The National Institute for Health and Care Research), NIHR

## Funding Body Type

Government organisation

## Funding Body Subtype

National government

## Location

United Kingdom

# Results and Publications

## Individual participant data (IPD) sharing plan

The datasets generated during and/or analysed during the current study are not expected to be made available due to restrictions placed upon data sharing within the data sharing agreements and research governance arrangements in place for this research.

## IPD sharing plan summary

Not expected to be made available

## Study outputs

Output type	Details	Date created	Date added	Peer reviewed?	Patient-facing?
<a href="#">Protocol article</a>		16/07/2025	07/08/2025	Yes	No
<a href="#">HRA research summary</a>			28/06/2023	No	No
<a href="#">Study website</a>	Study website	11/11/2025	11/11/2025	No	Yes