Breast Screening Programme

England, 2015-16

Published 23 February 2017

This publication presents information about the NHS Breast Screening Programme in England in 2015-16 as well as key statistics from previous years. It includes statistics on women aged 50-70 who are invited for regular breast screening including coverage, invitation uptake and screening outcomes.

Key findings

- 2015-16 saw the first increase in the national coverage rate for five years. The 75.5% reported in 2016 was the first increase in coverage since 2011. Coverage is measured for women aged 53-70 (see Figure 1).

- Uptake of routine invitations amongst women aged 50-70 has also risen for the first time since 2011. In 2015-16, 72.1% of women attended their screening appointment compared with 71.3% the previous year.

Figure 1: Breast screening coverage among women aged 53-70

England at 31 March, 2006 to 2016

Source: KC63, NHS Digital – see also Table 1 in the Data Tables.
# Contents

This is a National Statistics publication 3

## Executive Summary 4

Breast Screening Programme, England 2015-16 4
Main Findings 4
Coverage 4
Overall Screening Activity 4
Invitations and Uptake 5
Cancers Detected 5

## Introduction 6

1.1 Background 6
1.2 Quality Statement 7
1.3 Report Structure 7
1.4 Changes to the Report 8
1.5 User Feedback 9

## Analysis and Commentary 10

2.1 Coverage 10
2.2 Overall Programme Activity 15
2.3 Invitations for Screening 19
2.4 Uptake of Invitations 20
2.5 Outcome of Screening 27
2.6 Cancers Detected 30
2.7 High Risk Women 38

## Appendices 40

Appendix A – Glossary 40
Appendix B – Background 44
Appendix C – Definitions 49
Appendix D – Type of Invitation/Referral 54
Appendix E – High-risk categories 57
Appendix F – How are the Statistics used? 58
Appendix G – Feedback from Users 62
Appendix H – Data Validation and Data Quality 64
Appendix I – Related Publications and Useful Web Links 65
This is a National Statistics publication

National Statistics status means that official statistics meet the highest standards of trustworthiness, quality and public value.

All official statistics should comply with all aspects of the Code of Practice for Official Statistics. They are awarded National Statistics status following an assessment by the Authority’s regulatory arm. The Authority considers whether the statistics meet the highest standards of Code compliance, including the value they add to public decisions and debate.

It is NHS Digital’s responsibility to maintain compliance with the standards expected of National Statistics. If we become concerned about whether these statistics are still meeting the appropriate standards, we will discuss any concerns with the Authority promptly. National Statistics status can be removed at any point when the highest standards are not maintained, and reinstated when standards are restored.


This report may be of interest to members of the public, policy officials and other stakeholders to make local and national comparisons and to monitor the quality and effectiveness of services.
Executive Summary
Breast Screening Programme, England 2015-16

Women between the ages of 50 and 70 are invited for regular breast screening (every three years) under a national programme. Some women outside this age group are also screened as part of the NHS Breast Screening Programme, either through self or General Practitioner (GP) referral where appropriate, or as part of a research trial. Screening is intended to detect breast cancer at an early stage when there is a better chance of successful treatment.

This report presents information about the NHS Breast Screening Programme in England in 2015-16 and includes data on women invited for breast screening, coverage, uptake of invitations, outcomes of screening and cancers detected.

Main Findings

Coverage

Coverage is defined as the percentage of women in the population who are eligible for screening at a particular point in time, who have had a test with a recorded result within the last three years.

Coverage of women aged 53-70 was 75.5% at 31 March 2016, compared with 75.4% at the same point in 2015, and a peak of 77.2% in 2011. This represents the first increase in coverage in 5 years and remains above the NHS Cancer Screening Programmes’ minimum standard of 70%.

Coverage for women aged 53-70 was 70% or above (the national minimum standard) in all but one region; London reported the lowest coverage of 69.3%. East Midlands reported the highest coverage at 79.8%.

Overall Screening Activity

In total, 2.16 million women aged 45 and over were screened within the programme in 2015-16. This compares with 2.11 million in 2014-15 and represents an increase of 2.7%.
Invitations and Uptake

The number of women aged 45 and over invited for screening increased by 1.8% to 2.85 million in 2015-16, from 2.80 million in 2014-15. There was a notable increase in women aged 71-74 invited (12.8%), which covers part of the age extension trial.

Uptake of routine invitations amongst women aged 50-70 has risen for the first time since 2011. In 2015-16, 72.1% took up their invitation to be screened and were screened adequately within six months of invitation, this compares with 71.3% in 2014-15.

Cancers Detected

The aim of breast screening is to reduce mortality by finding breast cancer at an early stage when any changes in the breast are often too small to detect by self-examination. Of all women with cancers detected in 2015-16, 41.2% (7,543 women) had invasive but small cancers which are less than 15mm in diameter and are usually too small to detect by hand. This compares with 40.5% (7,301 women) in 2014-15.

The age profile of women with cancer detected by the screening programme shows the incidence of breast cancer increasing with age. Detection rates were lowest for women aged 45-49 (6.2 women with cancer detected per 1,000 women screened). The detection rate was highest amongst women over 70 years (14.6 women per 1,000 women screened).
Introduction

This report presents information about the NHS Breast Screening Programme (NHSBSP) in England in 2015-16 and includes data on women invited for breast screening, coverage, uptake of invitations, outcomes of screening and cancers detected. Although it is also possible for men to develop breast cancer, their risk is much lower\(^1\) and because of this they are not invited as part of the programme.

The statistics in this report are used to inform policy and to monitor the quality and effectiveness of screening services.

This publication has been in existence for a number of years and publications are available on the NHS Digital and Department of Health websites dating back to 1997-98\(^2\). The report was originally published by the Department of Health Statistics Division. With the establishment of the NHS Digital, responsibility for the publication transferred in 2005.

The statistics are presented at a national, regional and local level. Local level statistics are presented by Upper Tier Local Authority (LA), region and breast screening unit (BSU). The eligible populations in two LAs are relatively small and in these instances their data have been combined and reported under other LAs. Data for Isles of Scilly are reported under Cornwall and City of London are reported under Hackney. Statistics in this report are therefore presented by 150 Upper Tier Local Authorities, two of which include another small LA.

1.1 Background

Under the NHS Breast Screening Programme, all eligible\(^3\) women aged 50-70 are invited for screening every three years. Screening is intended to detect breast cancer at an early stage when there is a better chance of successful treatment. Because the programme is a rolling one which invites women in a three year cycle, not every woman will receive an invitation as soon as she is 50. Every woman registered with a GP in England should however, receive her first invitation before her 53\(^{rd}\) birthday.

More information on the background to the Breast Screening Programme, including links to policy, age extension trials and the process itself can be found in Appendix B.

\(^1\) For more information on breast cancer including male breast cancer see [http://www.cancerresearchuk.org/cancer-info/cancerstats/keyfacts/breast-cancer/?script=true](http://www.cancerresearchuk.org/cancer-info/cancerstats/keyfacts/breast-cancer/?script=true)


\(^3\) See Appendix C for more information on the eligible population for Coverage.
1.2 Quality Statement

The Quality Statement presents information to aid understanding and presentation of the data. This is now published as a separate document on the publication webpage which can be accessed via the following link:

http://content.digital.nhs.uk/pubs/brstscreen1516

1.3 Report Structure

1.3.1 Statistics from the NHS Breast Screening Programme are presented in the Analysis and Commentary section of this report and primarily focuses on women in the core age range for invitations, 50-70 (53-70 for coverage). Women aged 45 and over are referred to where statistics are presented for the whole screening programme, to include all those invited through the screening programme as well as GP and self-referrals.

In reporting invitations to screening, the 45 and over age group is sometimes used, as under the current age extension trial, some women aged 47-49 and 71-73 are invited for screening. Even where the age extension has not yet been implemented, some women are invited for screening whilst they are still 49 but in the calendar year of their 50th birthday.

1.3.2 More detailed statistics and data for other age groups are presented in the Data Tables.

1.3.3 There are a number of Appendices towards the end of the report:

- Glossary (Appendix A),
- Background (Appendix B)
- Definitions (Appendix C),
- Information on the Types of Invitation/Referral to the screening programme (Appendix D),
- High-risk categories (Appendix E),
- How the Statistics are Used (Appendix F),
- Feedback from Users (Appendix G),
- Information on Data Validation and Data Quality (Appendix H),
- Related Publications and Useful Web links (Appendix I).
1.4 Changes to the Report

In line with the re-branding of the Health and Social Care Information Centre to NHS Digital, this publication has a different look and feel to previous publications. The re-design of publication materials aims to make the information within it more user-friendly and accessible with key findings immediately presented to the reader.

Following user feedback, we have moved the Background section within the main body of the report into a new Appendix (Appendix B), as a means of making the report more succinct.

The 2015-16 publication will, for the first time, present an interactive dashboard available as part of the accompanying data resources. This dashboard can be accessed via the following link:

https://app.powerbi.com/view?r=eyJrIjoiMjJmMjk2YTYtZDY1Yy00NTAyLTYiYjIiLCI6IjgwN2YyZjMwLWNhOGMtNDE5Zi1hMTc5LTViNGZjN2E0YmY2YiIsImMiOjN9

Please note that this single interactive dashboard has been developed in software called Microsoft Power BI, an analysis and visualisation tool in the suite of BI products offered by Microsoft. The purpose of offering this resource is to:

- Enhance our publication by providing additional dynamic visualisations
- Enable us to publish reports and visualisations as refreshable web reports

Some of the end user benefits of Power BI over a macro-driven spreadsheet are that:

- It is more interactive: users can amend their selections with the report updating immediately
- It is viewable on any internet browser, meaning there is no requirement to download the file and enable macros
- Once a report has been created, it is simple and efficient to update when the data is updated in the future.

We would be particularly grateful if users accessing the data via Power BI would be able to provide feedback on their interactions with it on the following link:

http://content.digital.nhs.uk/haveyoursay
1.5 User Feedback

1.5.1 NHS Digital welcomes feedback on all publications. If you wish to comment on this report a feedback form (Have Your Say) is available on the NHS Digital website at:
http://content.digital.nhs.uk/haveyoursay

We would be particularly interested in how you use the statistics in this report.

Feedback received from users via the publication web page is summarised in Appendix G alongside any action that has been taken as a result of this feedback.
Analysis and Commentary

2.1 Coverage

Coverage is defined as the percentage of women in the population who are eligible\(^4\) for screening at a particular point in time (31 March 2016 in this instance), who have had a test with a recorded result within the last three years (for more information see Appendix C on coverage). Currently, coverage is best assessed using the 53-70 age group as all women aged 50-70 are invited for screening every three years and may be first called at any time between their 50th and 53rd birthdays. The minimum standard for coverage, as identified by the NHS Cancer Screening Programmes, is 70\(^5\).

2.1.1 National Coverage

At 31 March 2016, 5.83 million women aged 53-70 were eligible for screening and 4.40 million had been screened within the last three years.

Coverage of women aged 53-70 was 75.5% at 31 March 2016, compared with 75.4% at the same point in 2015, and a peak of 77.2% in 2011. This marks the first increase in coverage amongst women aged 53-70 since 2011 and remains above the minimum standard of 70% (see Figure 2).

Breast screening units may identify achieving coverage as a challenge for a variety of factors, in particular their ability to maintain a three-year screening round which directly affects coverage.

\(^4\) Women are eligible for screening if they are in the screening age range and are not ineligible due to bilateral mastectomy.

Figure 2: Breast screening coverage among women aged 53-70
England at 31 March, 2006 to 2016

<table>
<thead>
<tr>
<th>Year</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>2006</td>
<td>71.3</td>
</tr>
<tr>
<td>2007</td>
<td>75.4</td>
</tr>
<tr>
<td>2008</td>
<td>75.4</td>
</tr>
<tr>
<td>2009</td>
<td>75.4</td>
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<td>2010</td>
<td>75.4</td>
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<td>2011</td>
<td>75.4</td>
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<tr>
<td>2012</td>
<td>75.4</td>
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<tr>
<td>2013</td>
<td>75.4</td>
</tr>
<tr>
<td>2014</td>
<td>75.4</td>
</tr>
<tr>
<td>2015</td>
<td>75.5</td>
</tr>
<tr>
<td>2016</td>
<td>75.5</td>
</tr>
</tbody>
</table>

NB: The definition of coverage changed in 2013 to include short term recalls. See Appendix C for more information. Source: KC63, NHS Digital – see also Table 1 in the Data Tables.

2.1.2 Coverage by age

Coverage at 31 March 2016 rose across the 53-70 range. Within this age group, the greatest rise in coverage was seen amongst women aged 65-69 (0.3%) (see Table A). However, there were small decreases in the age-groups 53-54 and 70 year olds (-0.1%).

Coverage was highest amongst women in the 60-64 and 65-69 year age groups (76.2% and 76.7% respectively).
### Table A: Breast screening coverage by age group

<table>
<thead>
<tr>
<th>Age group*</th>
<th>31 March 2015</th>
<th>31 March 2016</th>
<th>% point change from 2015 to 2016</th>
</tr>
</thead>
<tbody>
<tr>
<td>53-70</td>
<td>75.4</td>
<td>75.5</td>
<td>0.1</td>
</tr>
<tr>
<td>53-54</td>
<td>73.7</td>
<td>73.6</td>
<td>-0.1</td>
</tr>
<tr>
<td>55-59</td>
<td>74.7</td>
<td>74.8</td>
<td>0.0</td>
</tr>
<tr>
<td>60-64</td>
<td>76.1</td>
<td>76.2</td>
<td>0.1</td>
</tr>
<tr>
<td>65-69</td>
<td>76.5</td>
<td>76.7</td>
<td>0.3</td>
</tr>
<tr>
<td>70</td>
<td>74.2</td>
<td>74.1</td>
<td>-0.1</td>
</tr>
</tbody>
</table>

NB: The definition of coverage changed in 2013 to include short term recalls. See Appendix C for more information.

% point change has been calculated using unrounded figures.

* The age groups shown in Table A are as submitted on the KC63 central return data set.

Source: KC63, NHS Digital – see also Table 2 in the Data Tables.

### 2.1.3 Regional Coverage

Coverage for women aged 53-70 was 70% or above (the national minimum standard) in all but one region; London reported the lowest level of coverage at 69.3%. East Midlands reported the highest coverage at 79.8% (see Figure 3).
Figure 3: Breast screening coverage among women aged 53-70, by region

England, 31 March 2016

Source: KC63, NHS Digital – see also Table 2a in the Data Tables.

2.1.4 Local Coverage

Across Upper Tier Local Authorities (LAs), 120 out of 150 reported coverage of 70% or more for women aged 53-70 and of these, 74 LAs reported coverage of 75% or more. Coverage of below 70% was reported by 30 LAs (see Figure 4).
2.1.5 Coverage in Other UK Countries

Breast screening coverage figures are also available for Wales for women aged 53-70 years through the following link:
http://www.breasttestwales.wales.nhs.uk/reports-1

Coverage figures are not currently available for Scotland and Northern Ireland.
2.2 Overall Programme Activity

2.2.1 Total Screening (Invitations and Referrals)

Women may be invited to attend screening by the NHS Breast Screening Programme or may attend as a result of self or GP referral (see Appendix B). In total, (including both those invited and self/GP referrals), 2.16 million women aged 45 and over were screened within the programme in 2015-16. This compares with 2.11 million in 2014-15 and 1.63 million ten years ago in 2005-06 (see Table B1). This growth can be partly explained by the expansion of the NHS Breast Screening Programme to a broader age group (first to women aged 65-70 and the current trial involving women aged 47-49 and 71-73 years – see Appendix B). Population growth amongst women in the NHS Breast Screening Programme’s target age range over the last ten years will also have affected numbers invited and screened.

Table B1: Total women screened by age group

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>45 and over</td>
<td>1.63</td>
<td>1.64</td>
<td>1.71</td>
<td>1.77</td>
<td>1.79</td>
<td>1.88</td>
<td>1.94</td>
<td>1.97</td>
<td>2.08</td>
<td>2.11</td>
<td>2.16</td>
</tr>
<tr>
<td>50 - 70</td>
<td>1.55</td>
<td>1.56</td>
<td>1.63</td>
<td>1.67</td>
<td>1.68</td>
<td>1.73</td>
<td>1.72</td>
<td>1.71</td>
<td>1.77</td>
<td>1.80</td>
<td>1.83</td>
</tr>
</tbody>
</table>

Percentage change has been calculated using unrounded figures. Source: KC62 (Part 1, Tables A to F2) NHS Digital – see also Table 1 in the Data Tables.

The age breakdown in Table B2 shows the numbers of women screened in the last five years. Though most of those screened are aged 50-70 (84.9% in 2015-16), it highlights increases in the 45-49 and 71-74 age groups since 2011-12, which will have been affected by the age extension trial. The extension of the programme started at selected pilot sites in 2009 and by the end of March 2016, 67 out of 80 breast screening units (83.8%) had started implementing it.

2.16 million women were screened in 2015-16 – an increase of 33% in ten years.
Women invited as part of the NHS Breast Screening Programme accounted for the majority of those screened; 94.4% in 2015-16, with self or GP referrals accounting for 5.6% (see Table B3).

### Table B3: Total women screened (age 45 and over) by invitation and referral

<table>
<thead>
<tr>
<th>Age Group</th>
<th>2011-12 Number</th>
<th>2012-13 Number</th>
<th>2013-14 Number</th>
<th>2014-15 Number</th>
<th>2015-16 Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total women screened (50+)</td>
<td>1,940,603 100.0</td>
<td>1,970,955 100.0</td>
<td>2,079,271 100.0</td>
<td>2,105,454 100.0</td>
<td>2,161,268 100.0</td>
</tr>
<tr>
<td>Programme invitations</td>
<td>1,843,025 95.0</td>
<td>1,879,233 95.3</td>
<td>1,964,267 94.5</td>
<td>1,984,540 94.3</td>
<td>2,040,709 94.4</td>
</tr>
<tr>
<td>Self/GP referral</td>
<td>97,578 5.0</td>
<td>91,722 4.7</td>
<td>115,004 5.5</td>
<td>120,914 5.7</td>
<td>120,559 5.6</td>
</tr>
</tbody>
</table>

Source: KC62 (Part 1, Tables A to F2) NHS Digital – see also Table 5 in the Data Tables.

### 2.2.2 Self / GP Referrals

Self/GP referrals (aged 45 and over) accounted for 120,599 women screened in 2015-16, this compares to 120,914 in 2014-15 (see Table B3). The majority of GP/Self referrals are from women aged over 70 (60.9% in 2015-16) (see Table C).

Self/GP referrals are most common in the 75 and over age group as all these women are outside the target age group for invitations. No women over the age of 73 will be invited for screening, but the programme does accept self/GP referrals from women over 70 at three-yearly intervals. More information on self/GP referrals can be found in Appendix B.

The large increase in the number of women aged over 70 being screened when compared to 2012-13, may be due to the national Public Health England Be Clear on Cancer awareness campaign on breast cancer in women aged over 70, which ran from 3 February to 16 March.
2014. No campaign was run during the 2014-15 period and this may explain why the increase between 2013-14 and 2014-15 is not as pronounced.

With the roll out of the current age extension trial, women aged 47-49 who have not been invited for screening but who live in an area that has started the age extension can ask to be screened. This might explain the increase in self/GP referrals amongst women aged 45-49 in the last five years (See Table C below and Figure 5 below).

Table C also shows that the number of self-referrals for the 71-74 and 75 and over age groups has decreased slightly in 2015-16 compared with 2014-15.

Table C: Women screened through self/GP referrals, by age group

<table>
<thead>
<tr>
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<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Total self/GP</td>
<td>86,143</td>
<td>84,433</td>
<td>85,722</td>
<td>96,134</td>
<td>94,488</td>
<td>101,592</td>
<td>97,578</td>
<td>91,722</td>
<td>115,004</td>
<td>120,914</td>
<td>120,559</td>
</tr>
<tr>
<td>referrals (45+)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>45 - 49</td>
<td>124</td>
<td>108</td>
<td>143</td>
<td>141</td>
<td>264</td>
<td>1,476</td>
<td>2,242</td>
<td>3,298</td>
<td>3,756</td>
<td>4,021</td>
<td></td>
</tr>
<tr>
<td>50 - 70</td>
<td>44,376</td>
<td>37,394</td>
<td>34,243</td>
<td>37,395</td>
<td>37,463</td>
<td>38,811</td>
<td>36,846</td>
<td>35,394</td>
<td>39,472</td>
<td>42,550</td>
<td>43,122</td>
</tr>
<tr>
<td>71 - 74</td>
<td>26,503</td>
<td>29,167</td>
<td>31,073</td>
<td>35,435</td>
<td>33,195</td>
<td>34,862</td>
<td>29,868</td>
<td>24,729</td>
<td>30,758</td>
<td>31,056</td>
<td>31,024</td>
</tr>
<tr>
<td>75 and over</td>
<td>15,140</td>
<td>17,764</td>
<td>20,263</td>
<td>23,163</td>
<td>33,195</td>
<td>34,862</td>
<td>29,868</td>
<td>24,729</td>
<td>30,758</td>
<td>31,056</td>
<td>31,024</td>
</tr>
</tbody>
</table>

Source: KC62 (Part 1, Tables E to F2) NHS Digital – see also Table 5 in the Data Tables.

For more information on the Be Clear on Cancer campaign see: [http://www.nhs.uk/be-clear-on-cancer/breast-cancer/home](http://www.nhs.uk/be-clear-on-cancer/breast-cancer/home)
Figure 5: Women screened through self/GP referrals, by age group

England, 2005-06 to 2015-16

Source: KC62 (Part 1, Tables E to F2) NHS Digital – see also Table 5 in the Data Tables
2.3 Invitations for Screening

The number of women aged 45 and over invited for screening increased by 1.8% to 2.85 million in 2015-16, from 2.80 million in 2014-15. There was a notable increase in women aged 71-74 invited (12.8%), which covers part of the age extension trial. There was also an increase of 4.6% in the number of women aged 45-49 invited, which includes the ages at the lower end of the age extension trial (see Table D).

<table>
<thead>
<tr>
<th>Age group</th>
<th>2014-15</th>
<th>2015-16</th>
<th>Change from 2014-15 to 2015-16</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total women invited (45-74)</td>
<td>2,803,834</td>
<td>2,853,297</td>
<td>49,463</td>
</tr>
<tr>
<td>45 - 49</td>
<td>259,609</td>
<td>271,560</td>
<td>11,951</td>
</tr>
<tr>
<td>50 - 70</td>
<td>2,458,418</td>
<td>2,484,909</td>
<td>26,491</td>
</tr>
<tr>
<td>71 - 74</td>
<td>85,807</td>
<td>96,828</td>
<td>11,021</td>
</tr>
</tbody>
</table>

Source: KC62 (Part 1, Tables A to D) NHS Digital - see also Table 4 in the Data Tables.

The screening programme categorises screening invitations into types as shown in Table E. Detailed explanation of the different types of invitation in Table E are given in Appendix D.

The majority of invites to women aged 50-70 were routine invitations to previous attenders, where the last screen was within 5 years (66.6%). Outside of this, the only type of routine invitation to fall between 2014-15 and 2015-16 are first invitations to women aged 50-70. This is likely to be because as the age extension trial continues, more women will have already been invited and screened by the time they turn 50.
## Table E: Breast Screening Programme invitations to women aged 50-70 by invitation type

<table>
<thead>
<tr>
<th>Type of Invitation</th>
<th>2014-15 Number</th>
<th>2014-15 %</th>
<th>2015-16 Number</th>
<th>2015-16 %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total women invited</td>
<td>2,458,418</td>
<td>100.0</td>
<td>2,484,909</td>
<td>100.0</td>
</tr>
<tr>
<td>First invitation for routine screening</td>
<td>286,755</td>
<td>11.7</td>
<td>252,745</td>
<td>10.2</td>
</tr>
<tr>
<td>Routine invitation to previous non-attenders</td>
<td>297,196</td>
<td>12.1</td>
<td>310,761</td>
<td>12.5</td>
</tr>
<tr>
<td>Routine invitation to previous attenders (Last screen within 5 years)</td>
<td>1,624,377</td>
<td>66.1</td>
<td>1,655,822</td>
<td>66.6</td>
</tr>
<tr>
<td>Routine invitation to previous attenders (Last screen more than 5 years)</td>
<td>249,304</td>
<td>10.1</td>
<td>264,888</td>
<td>10.7</td>
</tr>
<tr>
<td>Short term recall</td>
<td>786</td>
<td>0.0</td>
<td>693</td>
<td>0.0</td>
</tr>
</tbody>
</table>

NB: The sum of components may not equal totals due to rounding.
Source: KC62 (Part 1, Tables A to D) NHS Digital – see also Table 4 in the Data Tables.

## 2.4 Uptake of Invitations

Uptake is the percentage of women invited for screening in the year, who were screened adequately within six months of invitation (see uptake definition in Appendix C for more information).

One of the objectives of the NHS Breast Screening Programme, as set out in the service specification for commissioning breast screening attached to the Section 7a agreement\(^7\) (see Appendix B), is to maximise the number of eligible women who attend for screening. A national minimum standard for uptake of routine invitations has been set at 70%, with an achievable standard which all BSUs should aim for of 80%. Measurement of the national standard excludes short term recall\(^8\) invitations.

### 2.4.1 National Uptake

In 2015-16, 1.79 million women aged 50-70 who received a routine invitation were screened by the programme.

Uptake of routine invitations amongst women aged 50-70 has risen for the first time in five years, to 72.1% in 2015-16 from 71.3% in 2014-15. Uptake ten years ago in 2005-06 was 74.8% (see Figure 6), although at

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\(^7\) See: [Public health functions to be exercised by NHS England, Service Specification 24, Breast Screening Programme](#)

\(^8\) Short term recall is a non-routine invitation at less than a standard screening interval following assessment.
this time very few women aged 65 to 70 were invited for screening (see ‘Age extension’ in Appendix B).

**Figure 6: Uptake* by women aged 50-70 of invitations to screen**

England, 2005-06 to 2015-16

<table>
<thead>
<tr>
<th>Year</th>
<th>Minimum Standard</th>
</tr>
</thead>
<tbody>
<tr>
<td>2005-06</td>
<td>74.8</td>
</tr>
<tr>
<td>2006-07</td>
<td>75</td>
</tr>
<tr>
<td>2007-08</td>
<td>75</td>
</tr>
<tr>
<td>2008-09</td>
<td>75</td>
</tr>
<tr>
<td>2009-10</td>
<td>75</td>
</tr>
<tr>
<td>2010-11</td>
<td>75</td>
</tr>
<tr>
<td>2011-12</td>
<td>75</td>
</tr>
<tr>
<td>2012-13</td>
<td>75</td>
</tr>
<tr>
<td>2013-14</td>
<td>75</td>
</tr>
<tr>
<td>2014-15</td>
<td>75</td>
</tr>
<tr>
<td>2015-16</td>
<td>75</td>
</tr>
</tbody>
</table>

* Data excludes short term recalls and self/GP referrals.
Source: KC62 (Part 1, Tables A to C2) NHS Digital – see also Table 3 in the Data Tables.

### 2.4.2 Uptake by invitation type

Uptake rates in 2015-16 varied considerably according to the type of invitation (see Figure 7)

- 62.2% of women receiving their first invitation were screened, which compares to 63.3% in 2014-15 and 70.1% in 2005-06 (see Figure 8). However, part of the age-extension trial includes invitations to women aged 47-49 - who are outside of the mandatory age range of the programme. This age group is forming an increasingly large proportion of all first invitations.
- 87.1% of women who had already been screened (within the last five years) and received a routine invitation were screened.
- Uptake was lowest (at 21.6%) amongst women who received a routine invitation, having failed to respond to a previous invitation(s).
- 46.9% of women who had already been screened (but more than five years previously) and received a routine invitation were screened.
- Uptake was highest (99.0%) amongst those receiving short term recall invitations.
Figure 7: Uptake by women aged 50-70 of invitations to screen by invitation type

England, 2015-16

<table>
<thead>
<tr>
<th>Invitation type grouping</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>First invitation for routine screening</td>
<td>62.2</td>
</tr>
<tr>
<td>Routine invitation (previous non-attender)</td>
<td>21.6</td>
</tr>
<tr>
<td>Routine invitation (last screen within 5 yrs)</td>
<td>87.1</td>
</tr>
<tr>
<td>Routine invitation (last screen more than 5 yrs)</td>
<td>46.9</td>
</tr>
<tr>
<td>Short-term recall invitations</td>
<td>99.0</td>
</tr>
<tr>
<td>First &amp; routine invitation (within 5 yrs)</td>
<td>83.8</td>
</tr>
<tr>
<td>First &amp; all routine invitations</td>
<td>72.1</td>
</tr>
</tbody>
</table>

Source: KC62 (Part 1, Tables A to D) NHS Digital – see also Table 13 in the Data Tables.
2.4.3 Uptake by Age

Uptake was highest amongst women in the 65-70 year age group (73.9%) and lowest (66.9%) among women aged 45-49, which covers part of the programme’s age extension trial to women aged 47-49 and 71-73 years. Full roll out of the age extension trial is not expected to be complete until after 2016. Uptake for the 45-49 and 71-74 year age groups is based on 271,560 and 96,828 women invited respectively in 2015-169 (see Figure 9).

The 45-49 years age group will include some women who were not invited as part of the age extension trial but were invited in the calendar year of their 50th birthday while they were still 49 (see Appendix B).

9 Uptake data are collected in an aggregate form and it is therefore not possible to produce uptake figures for the 47-49 and 71-73 year age groups.
2.4.4 Regional Uptake

Uptake by women aged 50-70 rose in seven out of eight reporting regions in 2015-16 when compared with the previous year. Uptake was highest in the East Midlands at 75.9%, the same level as in 2014-15.

Uptake was below the minimum standard in London where it rose to 64.9% in 2015-16 from 62.6% in 2014-15. Uptake in the North West was 70.1%, an increase from below the minimum standard in 2014-15 at 69.9% (see Figure 10).
Figure 10: Uptake* by women aged 50-70 of invitations to screen by reporting region**


* Data excludes short term recalls and self/GP referrals.
** The North East, Yorkshire & the Humber (NEYH) reporting region is further broken down into the Yorkshire & the Humber and the North East sub regions. The South reporting region is further broken down into the South East and South West sub regions.

Source: KC62 (Part 1, Tables A to C2) NHS Digital – see also Table 12 in Data Tables.

Of the 80 breast screening units, 64 recorded uptake rates of at least 70% amongst women aged 50-70 years and of those, 30 recorded uptake rates of 75% or more (see Figure 11), an increase from 21 in 2014-15. Uptake rates below the minimum standard of 70% were recorded by 16 units (one more than in 2014-15).
Figure 11: Uptake* by women aged 50-70 of invitations to screen by Breast Screening Unit

England, 2015-16

* Data excludes short term recalls and self/GP referrals.

Due to rounding, aggregating the figures represented in the bar chart above may not exactly match those derived from the relevant column in Table 12 in the Data Tables

Source: KC62 (Part 1, Tables A to C2) NHS Digital – see also Table 12 in Data Tables.

2.4.5 Uptake in Other UK Countries

Breast screening uptake figures are also available for other UK countries through the following links:

Northern Ireland:
http://www.cancerscreening.hscni.net/Breast_Uptake_Rates.htm

Figures for Northern Ireland are published for the 50-70 age groups.

Scotland:
http://www.isdscotland.org/Health-Topics/Cancer/Publications/

Click on view 'View Data Tables' and then on 'Uptake by type of invitation'.
Wales:

http://www.breasttestwales.wales.nhs.uk/reports-1

Figures for Wales are published for the 50-70 age groups.

2.5 Outcome of Screening

2.5.1 Referrals for Assessment

Women are asked to attend an assessment clinic for further tests if a potential abnormality is detected at initial screening (for further information see Appendix B). The NHS Breast Screening Programme aims to minimise the adverse effects of screening (e.g. anxiety and unnecessary investigations) and therefore the number of women screened who are then referred for assessment.

Referrals for assessment are commonly reported by two distinct screening types (prevalent screening and incident screening) as the percentage of women referred for assessment is expected to vary according to screening type. Prevalent screening refers to first invitations for routine screening and routine invitations to previous non-attendees. Incident screening, in this report, refers only to routine invitations to previous attendees last screened within five years. The percentage of women who are referred for assessment is expected to be lower in incident screening than prevalent screening, as only recently developed disease will be detected in women who have been screened previously within the last five years.

Of women aged 45 and over attending for the first time (i.e. prevalent screening), 7.6% were referred for assessment. This compares to 7.8% in 2014-15. Amongst women who received a routine invitation in 2015-16 and had been previously screened in the last five years (i.e. incident screening), 3.0% were referred for assessment, the same as in 2014-15 (see Table F).
### Table F: Women screened and referred for assessment aged 45 and over, by invitation type


<table>
<thead>
<tr>
<th>Type of Invitation/referral</th>
<th>2014-15</th>
<th></th>
<th></th>
<th></th>
<th>2015-16</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number Screened</td>
<td>Number</td>
<td>%</td>
<td>Number Screened</td>
<td>Number</td>
<td>%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>2,105,454</td>
<td>87,737</td>
<td>4.2</td>
<td>2,161,268</td>
<td>88,654</td>
<td>4.1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prevalent Screens (b)</td>
<td>398,738</td>
<td>31,089</td>
<td>7.8</td>
<td>390,417</td>
<td>29,607</td>
<td>7.6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1st invitation for routine screening</td>
<td>340,545</td>
<td>26,401</td>
<td>7.8</td>
<td>320,057</td>
<td>24,307</td>
<td>7.6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Routine invitation to previous non attenders</td>
<td>59,193</td>
<td>4,688</td>
<td>7.9</td>
<td>70,360</td>
<td>5,300</td>
<td>7.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Incident Screens (c)</td>
<td>1,467,583</td>
<td>44,144</td>
<td>3.0</td>
<td>1,517,707</td>
<td>46,213</td>
<td>3.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Routine invitation to previous attenders (Last screen within 5 years)</td>
<td>116,238</td>
<td>5,560</td>
<td>4.8</td>
<td>131,720</td>
<td>6,107</td>
<td>4.6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Routine invitation to previous attenders (Last screen &gt;5 years)</td>
<td>981</td>
<td>959</td>
<td>97.8</td>
<td>865</td>
<td>854</td>
<td>98.7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Self/GP referral (no previous screen)</td>
<td>20,324</td>
<td>1,710</td>
<td>8.4</td>
<td>20,851</td>
<td>1,612</td>
<td>7.7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Self/GP referral (within 5 years)</td>
<td>79,795</td>
<td>3,005</td>
<td>3.8</td>
<td>80,726</td>
<td>3,049</td>
<td>3.8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Self/GP referral (&gt;5 years)</td>
<td>20,795</td>
<td>1,270</td>
<td>6.1</td>
<td>18,982</td>
<td>1,212</td>
<td>6.4</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(a) Including women referred for cytology, core biopsy or open biopsy. See Appendix B for more information.
(b) Prevalent relates to first invitations for routine screening and routine invitations to previous non-attendants.
(c) Incident refers only to routine invitations to previous attendees last screened within five years.

Source: KC62 (Part 1, Tables A to F2) NHS Digital – see also Table 6 in Data Tables.

### 2.5.2 Assessment

Of all women referred for assessment (aged 45 and over), 46.0% underwent fine-needle aspiration cytology and/or core biopsy (see Table G). 1.8% of women referred for assessment were referred for open biopsy. See Appendix B for more information about these procedures.
Table G: Selected assessment procedures by type of invitation, women aged 45 and over

England, 2015-16

<table>
<thead>
<tr>
<th>Type of invitation/referral</th>
<th>Total referred for assessment (b)</th>
<th>Referred for cytology and/or core biopsy (a)</th>
<th>Referred for open biopsy</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number</td>
<td>% (c)</td>
<td>Number</td>
</tr>
<tr>
<td>Total</td>
<td>88,654</td>
<td>46.0</td>
<td>1,616</td>
</tr>
<tr>
<td>Prevalent Screens (e)</td>
<td>29,607</td>
<td>46.3</td>
<td>642</td>
</tr>
<tr>
<td>1st invitation for routine screening</td>
<td>24,307</td>
<td>46.1</td>
<td>526</td>
</tr>
<tr>
<td>Routine invitation to previous non-attenders</td>
<td>5,300</td>
<td>47.2</td>
<td>116</td>
</tr>
<tr>
<td>Incident Screens (f)</td>
<td>46,213</td>
<td>45.3</td>
<td>766</td>
</tr>
<tr>
<td>Routine invitation to previous attenders (Last screen within 5 years)</td>
<td>6,107</td>
<td>48.8</td>
<td>107</td>
</tr>
<tr>
<td>Routine invitation to previous attenders (Last screen more than 5 years)</td>
<td>854</td>
<td>13.3</td>
<td>11</td>
</tr>
<tr>
<td>Short term recall</td>
<td>1,612</td>
<td>45.5</td>
<td>29</td>
</tr>
<tr>
<td>Self/GP referral (within 5 years)</td>
<td>3,049</td>
<td>51.1</td>
<td>43</td>
</tr>
<tr>
<td>Self/GP referral (&gt;5 years)</td>
<td>1,212</td>
<td>57.5</td>
<td>18</td>
</tr>
</tbody>
</table>

(a) Including women referred for open biopsy.
(b) Including women referred for cytology, core biopsy or open biopsy. See Appendix B for more information.
(c) The percentage of ‘Referred for cytology and/or core biopsy’ is calculated using the total number of women referred for assessment as the denominator.
(d) The percentage of ‘Referred for open biopsy’ is calculated using the total number of women referred for assessment as the denominator.
(e) Prevalent relates to first invitations for routine screening and routine invitations to previous non-attendees.
(f) Incident refers only to routine invitations to previous attendees last screened within five years.

Source: KC62 (Parts 1 and 2, Tables A to F2) NHS Digital – see also Table 6 in Data Tables.

2.5.3 Short Term Recall Outcomes

Amongst women who are referred for assessment following breast screening, in a small minority of cases a definitive diagnosis cannot be made. Where this occurs, women are recalled early for a further assessment. Of all women referred for assessment (aged 45 and over), 0.9% were recommended for short term recall (see Table H).
### Table H: Short term recall outcomes, women aged 45 and over

<table>
<thead>
<tr>
<th>Type of invitation/referral</th>
<th>Total referred for assessment (a)</th>
<th>Assessment Outcome - Short term recall</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>88,654</td>
<td>837 (0.9)</td>
</tr>
<tr>
<td>Prevalent Screens (c)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1st invitation for routine screening</td>
<td>29,607</td>
<td>293 (1.0)</td>
</tr>
<tr>
<td>Routine invitation to previous non attenders</td>
<td>24,307</td>
<td>240 (1.0)</td>
</tr>
<tr>
<td>Routine invitation to previous non attenders</td>
<td>5,300</td>
<td>53 (1.0)</td>
</tr>
<tr>
<td>Incident Screens (d)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Routine invitation to previous attenders (Last screen within 5 years)</td>
<td>46,213</td>
<td>355 (0.8)</td>
</tr>
<tr>
<td>Routine invitation to previous attenders (Last screen more than 5 years)</td>
<td>6,107</td>
<td>87 (1.4)</td>
</tr>
<tr>
<td>Short term recall</td>
<td>854</td>
<td>50 (5.9)</td>
</tr>
<tr>
<td>Self/GP referral (no previous screen)</td>
<td>1,612</td>
<td>14 (0.9)</td>
</tr>
<tr>
<td>Self/GP referral (within 5 years)</td>
<td>3,049</td>
<td>29 (1.0)</td>
</tr>
<tr>
<td>Self/GP referral (&gt;5 years)</td>
<td>1,212</td>
<td>9 (0.7)</td>
</tr>
</tbody>
</table>

(a) Including women referred for cytology, core biopsy or open biopsy.
(b) Note that the percentage of assessment outcomes that were ‘short term recalls’ is calculated using the total number of women referred for assessment as the denominator. This differs from tables 6, 7 and 7a in the Data Tables where the denominator is the number of women screened.
(c) Prevalent relates to first invitations for routine screening and routine invitations to previous non-attendees.
(d) Incident refers only to routine invitations to previous attendees last screened within five years.

Source: KC62 (Part 1, Tables A to F2) NHS Digital – see also Table 6 in Data Tables.

### 2.6 Cancers Detected

#### 2.6.1 Cancer Detection Rates

A total of 18,320 women aged 45 and over had cancers detected by the screening programme in 2015-16, a rate of 8.5 cases per 1,000 women screened. This compares with 18,015 women with cancers detected in 2014-15 (a rate of 8.6 cases per 1,000 women screened) and 13,523 women with cancers detected in 2005-06 (a rate of 8.3 cases per 1,000 women screened) (see Table I1 and Figure 12).

Amongst women aged 50-70 years the detection rate was 8.2 per 1,000 women screened. This compares with 8.3 per 1,000 women screened in 2014-15.
The number of women with cancer detected each year can be affected by a number of factors, including changes to the numbers of women eligible for screening due to population change. Population growth amongst the screening programmes target age group in the last ten years will have affected the numbers of cancers detected. The cancer detection rate, while not influenced by increases or decreases in the total population, can be affected by other factors. The age distribution of the women screened in any one year will, for example, affect the detection rate as the incidence of breast cancer increases with age. The expansion of the screening programme to broader, largely older, age groups in the last ten years as well as the Be Clear on Cancer awareness campaigns run in recent years may have impacted on the rate of cancer detected as well as the numbers. The introduction of two-view mammography in 2001-02 and digital mammography in 2008 is also thought to have led to an increase in cancer detection rates.

Figure 12 shows rates of cancer detected amongst women screened over the last ten years. It shows the total number of women aged 45 and over with cancers detected (per 1,000 women screened) as well as the rate for non-invasive or micro-invasive cancers, small invasive cancers and invasive cancers which are 15mm or greater in diameter. Figures from the time series in Figure 12 are shown in Table I2.

### Table I1: Women with cancers detected by age group

<table>
<thead>
<tr>
<th>Age group</th>
<th>2005-06</th>
<th>2014-15</th>
<th>2015-16</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cancers detected</td>
<td>Women with cancer</td>
<td>Rate per 1000 women screened</td>
<td>Cancers detected</td>
</tr>
<tr>
<td>45 and over</td>
<td>1,626,597</td>
<td>13,523</td>
<td>8.3</td>
</tr>
<tr>
<td>45 - 49</td>
<td>31,142</td>
<td>208</td>
<td>6.7</td>
</tr>
<tr>
<td>50 - 70</td>
<td>1,552,813</td>
<td>12,592</td>
<td>8.1</td>
</tr>
<tr>
<td>71 - 74</td>
<td>27,393</td>
<td>433</td>
<td>15.8</td>
</tr>
<tr>
<td>75 and over</td>
<td>15,249</td>
<td>290</td>
<td>19.0</td>
</tr>
</tbody>
</table>

South West London includes one outcome of cancer which is not a breast cancer (in the 71-74 age group, 2015-16) which was only made known after the submission deadline.

Source: KC62 (Part 1 and 3, Table T) NHS Digital - see also Table 9a in Data Tables.

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10 NHS Cancer Screening Programmes, [http://www.nhs.uk/conditions/breast-cancer-screening/Pages/Introduction.aspx](http://www.nhs.uk/conditions/breast-cancer-screening/Pages/Introduction.aspx)

11 For more information on the Be Clear on Cancer campaign see: [http://www.nhs.uk/be-clear-on-cancer/breast-cancer/home](http://www.nhs.uk/be-clear-on-cancer/breast-cancer/home)
Figure 12: Women aged 45 and over with cancer detected (rate per 1,000 women screened) by type/size

England, 2005-06 to 2015-16

Table I2: Women aged 45 and over with cancer detected (rate per 1,000 women screened) by type/size

South West London includes one outcome of cancer which is not a breast cancer (in the 71-74 age group, 2015-16 only) which was only made known after the submission deadline.

The age profile of women with cancer detected by the screening programme shows the incidence of breast cancer increasing with age. In
2015-16, detection rates were lowest for women aged 45-49 (6.2 women with cancer detected per 1,000 women screened). The detection rate fell slightly to 8.8 per 1,000 women screened for those aged 60-64 and rose slightly to 11.1 for women aged 65-70. The detection rate was highest amongst women over 70 years (14.6 per 1,000 women screened) - see Figure 13 and Tables J1 and J2.

**Figure 13: Women with cancer detected (rate per 1,000 women screened) by age group**

England, 2005-06 to 2015-16

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>50-54</td>
<td>6.3</td>
<td>6.4</td>
<td>6.3</td>
<td>6.3</td>
<td>6.3</td>
<td>6.2</td>
<td>6.6</td>
<td>6.7</td>
<td>7.0</td>
<td>6.7</td>
<td>6.3</td>
</tr>
<tr>
<td>55-59</td>
<td>6.8</td>
<td>6.7</td>
<td>6.7</td>
<td>6.5</td>
<td>6.2</td>
<td>6.0</td>
<td>6.3</td>
<td>6.6</td>
<td>6.5</td>
<td>6.7</td>
<td>6.8</td>
</tr>
<tr>
<td>60-64</td>
<td>8.8</td>
<td>8.5</td>
<td>8.5</td>
<td>8.6</td>
<td>8.6</td>
<td>8.4</td>
<td>8.6</td>
<td>8.9</td>
<td>9.0</td>
<td>8.9</td>
<td>8.8</td>
</tr>
<tr>
<td>65-70</td>
<td>11.6</td>
<td>11.3</td>
<td>11.2</td>
<td>10.2</td>
<td>10.1</td>
<td>10.1</td>
<td>10.1</td>
<td>10.4</td>
<td>10.3</td>
<td>11.1</td>
<td>11.0</td>
</tr>
<tr>
<td>Over 70*</td>
<td>17.0</td>
<td>16.4</td>
<td>15.5</td>
<td>14.5</td>
<td>14.5</td>
<td>14.7</td>
<td>13.9</td>
<td>14.6</td>
<td>15.6</td>
<td>14.8</td>
<td>14.6</td>
</tr>
</tbody>
</table>

Source: KC62 (Parts 1 and 3, Table T) NHS Digital - see also Table 9a in Data Tables.

**Table J2: Women with cancer detected (rate per 1,000 women screened) by age group**

England, 2005-06 to 2015-16

South West London includes one outcome of cancer which is not a breast cancer (in the 71-74 age group, 2015-16 only) which was only made known after the submission deadline.

*Over half of the women screened for the 70 years and over age group came from self/GP referrals, and are not invited as part of the programme.

Source: KC62 (Parts 1 and 3, Table T) NHS Digital - see also Table 9a in Data Tables.
In prevalent screens, the number of women aged 45 and over with cancer detected by the screening programme was 7.7 per 1,000 women screened. Amongst women who received a routine invitation and had been previously screened in the last five years (i.e. incident screening\(^{12}\)) the number with cancer detected was 8.0 per 1,000 women screened (see Table J2).

The cancer detection rate was highest in the short term recalls. The detection rate is expected to be comparatively high in the short term recalls as in these cases women have been referred for assessment following an abnormal mammogram, but following further tests a normal or benign diagnosis could not be made. The screening programme aims to minimise the number of women who are recalled early. Note that the detection rate for short term recalls is based on a relatively small number of women screened. In 2015-16, there were 865 short term recalls and of these 33\(^{13}\) were found to have cancer (a rate of 38.2 cancers detected per 1,000 women screened aged 45 and over).

### Table J2: Women with cancer detected (rate per 1,000 women screened) by age group and type of invitation

<table>
<thead>
<tr>
<th>Type of invitation/referral</th>
<th>Rate per 1,000 women screened</th>
<th>England, 2015-16</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>45 and over</td>
<td>50-70</td>
</tr>
<tr>
<td>Prevalent Screens (^{(a)})</td>
<td>8.5</td>
<td>8.2</td>
</tr>
<tr>
<td>1st invitation for routine screening</td>
<td>7.7</td>
<td>8.7</td>
</tr>
<tr>
<td>Routine invitation to previous non attenders</td>
<td>7.2</td>
<td>8.2</td>
</tr>
<tr>
<td>Prevalent Screens (^{(a)})</td>
<td>8.0</td>
<td>7.8</td>
</tr>
<tr>
<td>Routine invitation to previous attenders (Last screen w ithin 5 years)</td>
<td>9.9</td>
<td>9.9</td>
</tr>
<tr>
<td>Incident Screens (^{(b)})</td>
<td>8.2</td>
<td>7.8</td>
</tr>
<tr>
<td>Routine invitation to previous attenders (Last screen &gt;5 years)</td>
<td>11.4</td>
<td>11.1</td>
</tr>
<tr>
<td>Short term recall</td>
<td>38.2</td>
<td>(35.0)</td>
</tr>
<tr>
<td>Self/GP referral (no previous screen)</td>
<td>11.2</td>
<td>10.8</td>
</tr>
<tr>
<td>Self/GP referral (within 5 years)</td>
<td>12.6</td>
<td>9.7</td>
</tr>
<tr>
<td>Self/GP referral (&gt;5 years)</td>
<td>23.2</td>
<td>15.9</td>
</tr>
</tbody>
</table>

\(^{(a)}\) Prevalent relates to first invitations for routine screening and routine invitations to previous non-attendees.

\(^{(b)}\) Incident refers only to routine invitations to previous attendees last screened within five years.

Rates shown in brackets are based on fewer than 2000 women screened.

\(^{-}\) = Zero.

South West London includes one outcome of cancer which is not a breast cancer (in the 71-74 age group) which was only made known after the submission deadline.

Source: KC62, Parts 1 & 3, Table T

\(^{12}\) Incident screening in this report refers only to routine invitations to previous attendees last screened within five years.

\(^{13}\) See table 8 in the data tables
2.6.2 Type and Size of Cancers Detected

Among women aged 45 and over with cancer detected in 2015-16, 20.9% had non-invasive or micro-invasive cancers. This compares with 21.7% in 2014-15 (see Table K1). A non-invasive or micro-invasive cancer is one which demonstrates no or only very slight invasion into adjacent tissues.

79.1% of all women with cancer detected in 2015-16 had invasive cancers, compared with 78.2% in 2014-15. An invasive cancer is one which has spread beyond the layer of tissue in which it developed and is growing into surrounding, healthy tissues.

The aim of breast screening is to reduce mortality by finding breast cancer at an early stage when any changes in the breast are often too small to feel. Of all women with cancers detected in 2015-16, 41.2% (7,543 women) had invasive but small cancers which are less than 15mm in diameter and are usually too small to detect by hand. This compares with 40.5% (7,301 women) in 2014-15.

### Table K1: Women with cancer detected by size, aged 45 and over

<table>
<thead>
<tr>
<th>Type/size of cancer</th>
<th>Total with cancer</th>
<th>Total with cancer</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2014-15</td>
<td>2015-16</td>
</tr>
<tr>
<td></td>
<td>%</td>
<td>%</td>
</tr>
<tr>
<td>Total</td>
<td>18,015</td>
<td>18,320</td>
</tr>
<tr>
<td>Invasive status not known</td>
<td>19</td>
<td>6</td>
</tr>
<tr>
<td>Non-invasive or micro-invasive</td>
<td>3,907</td>
<td>3,830</td>
</tr>
<tr>
<td>Total invasive</td>
<td>14,089</td>
<td>14,484</td>
</tr>
<tr>
<td>Invasive – small (&lt;15mm)</td>
<td>7,301</td>
<td>7,543</td>
</tr>
<tr>
<td>Invasive (15mm+)</td>
<td>6,304</td>
<td>6,478</td>
</tr>
<tr>
<td>Size not known</td>
<td>484</td>
<td>463</td>
</tr>
</tbody>
</table>

NB: The sum of components may not equal totals due to rounding.

South West London includes one outcome of cancer which is not a breast cancer (in the 71-74 age group, 2015-16 only) which was only made known after the submission deadline.

Source: KC62 (Part 3, Table T) NHS Digital - see also Table 10 in Data Tables.

Amongst women aged 50-70, those with non-invasive or micro-invasive cancer made up 25.5% of those with cancer in prevalent screens. This compares with 20.2% amongst women who received a routine invitation and had been previously screened in the last five years (i.e. incident screening) (see Table K2).

Women with invasive but small cancers accounted for 35.5% of all women aged 50-70 with cancers found in prevalent screens and for 43.4% amongst women who received a routine invitation and had been previously screened in the last five years (i.e. incident screens).
Table K2: Women aged 50-70 with cancer detected by type of invitation and type of cancer

England, 2015-16

<table>
<thead>
<tr>
<th>Type of invitation/referral</th>
<th>Non-invasive or Micro-invasive</th>
<th>Total Invasive (≤15mm)</th>
<th>Invasive (&gt;15mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total with cancer Number %</td>
<td>(of total with cancer) Number %</td>
<td>(of total with cancer) Number %</td>
</tr>
<tr>
<td>Total</td>
<td>15,112</td>
<td>3,129 20.7</td>
<td>11,979 79.3</td>
</tr>
<tr>
<td>Prevalent Screens (b)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1st invitation for routine screening</td>
<td>1,954 (25.5)</td>
<td>498 25.5</td>
<td>1,454 74.4</td>
</tr>
<tr>
<td>Routine invitation to previous non attenders</td>
<td>1,290 (27.9)</td>
<td>360 27.9</td>
<td>929 72.0</td>
</tr>
<tr>
<td>Incident Screens (c)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Routine invitation to previous attenders (Last screen within 5 years)</td>
<td>11,294 (20.2)</td>
<td>2,283 20.2</td>
<td>9,009 79.8</td>
</tr>
<tr>
<td>Routine invitation to previous attenders (Last screen within 5 years)</td>
<td>1,379 (17.8)</td>
<td>246 17.8</td>
<td>1,133 82.2</td>
</tr>
<tr>
<td>Short term recall</td>
<td>24 (41.7)</td>
<td>14 58.3</td>
<td>12 50.0</td>
</tr>
<tr>
<td>Self/GP referral (no previous screen)</td>
<td>165 (17.6)</td>
<td>29 17.6</td>
<td>136 82.4</td>
</tr>
<tr>
<td>Self/GP referral (within 5 years)</td>
<td>229 (21.4)</td>
<td>49 21.4</td>
<td>180 78.6</td>
</tr>
<tr>
<td>Self/GP referral (&gt;5 years)</td>
<td>67 (20.9)</td>
<td>14 79.1</td>
<td>19 28.4</td>
</tr>
</tbody>
</table>

(a) Includes some invasive cancers of unknown size.
(b) Prevalent relates to first invitations for routine screening and routine invitations to previous non-attendees.
(c) Incident refers only to routine invitations to previous attendees last screened within five years.

South West London includes one outcome of cancer which is not a breast cancer (in the 71-74 age group) which was only made known after the submission deadline.

Source: KC62 (Part 3, Tables A to F2, T) NHS Digital - see also Tables 8, 10 and 10a in Data Tables.

2.6.3 Invasive Cancers

An invasive cancer is one which has spread beyond the layer of tissue in which it developed and is growing into surrounding, healthy tissues.

Among all women aged 50-70 with invasive cancers detected, small cancers (less than 15mm in diameter) accounted for 52.7% (see Table L).

In women aged 50-70, small cancers accounted for 47.7% of all invasive cancers in prevalent screening and 54.4% amongst women who received routine invitations and had previously been screened within five years (i.e. incident screens).
Table L: Women aged 50-70 with invasive cancers detected by type of invitation and size

England, 2015-16

<table>
<thead>
<tr>
<th>Type of invitation/referral</th>
<th>Total invasive</th>
<th>Invasive – Small (&lt;15mm)</th>
<th>Invasive – Size unknown</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number (%)</td>
<td>Number (%)</td>
<td>Number (%)</td>
</tr>
<tr>
<td>Total</td>
<td>11,979</td>
<td>6,307 (52.7)</td>
<td>5,303 (44.3)</td>
</tr>
<tr>
<td>Prevalent Screens (a)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1st invitation for routine screening</td>
<td>1,454</td>
<td>693 (47.7)</td>
<td>706 (48.6)</td>
</tr>
<tr>
<td>Routine invitation to previous non attenders</td>
<td>929</td>
<td>459 (49.4)</td>
<td>446 (48.0)</td>
</tr>
<tr>
<td>Incident Screens (b)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Routine invitation to previous attenders (Last screen within 5 years)</td>
<td>9,009</td>
<td>4,900 (54.4)</td>
<td>3,862 (42.9)</td>
</tr>
<tr>
<td>Routine invitation to previous attenders (Last screen &gt;5 years)</td>
<td>1,133</td>
<td>535 (47.2)</td>
<td>547 (48.3)</td>
</tr>
<tr>
<td>Short term recall</td>
<td>14</td>
<td>12 (85.7)</td>
<td>1 (7.1)</td>
</tr>
<tr>
<td>Self/GP referral (no previous screen)</td>
<td>136</td>
<td>58 (42.6)</td>
<td>72 (52.9)</td>
</tr>
<tr>
<td>Self/GP referral (within 5 years)</td>
<td>180</td>
<td>90 (50.0)</td>
<td>85 (47.2)</td>
</tr>
<tr>
<td>Self/GP referral (&gt;5 years)</td>
<td>53</td>
<td>19 (35.8)</td>
<td>30 (56.6)</td>
</tr>
</tbody>
</table>

(a) Prevalent relates to first invitations for routine screening and routine invitations to previous non-attendees.
(b) Incident refers only to routine invitations to previous attendees last screened within five years.

South West London includes one outcome of cancer which is not a breast cancer (in the 71-74 age group) which was only made known after the submission deadline.

Source: KC62 (Part 3, Tables A to F2, T) NHS Digital - see also Tables 8, 10 and 10a in Data Tables.

2.6.4 Cancer Detection Rates in Other UK Countries
Breast cancer detection rates are also available for Scotland, Wales and Northern Ireland through the links below. Reporting by different age groups mean that the figures are not always directly comparable to England:

Scotland:
http://www.isdscotland.org/Health-Topics/Cancer/Publications/

See Data Tables link under 'Scottish Breast Screening Programme Statistics'

Wales:
http://www.breasttestwales.wales.nhs.uk/reports-1

Figures for Wales are only published for the 50-70 age group.

Northern Ireland:
http://www.cancerscreening.hscni.net/2051.htm

Please note, most recent data relates to 2012-13.
2.7 High Risk Women

2.7.1 Numbers screened

A total of 4,667 high-risk\textsuperscript{14} women were screened in 2015-16 compared to 2,908 in 2014-15.

Figures 14 and 15 show high-risk women screened by risk category and reporting region respectively. This is the third year the data are published, they are not considered to be of the same quality as the statistics in the rest of the KC62 collection. Accordingly, data on high risk women has therefore been labelled as Experimental Statistics and is additional analysis beyond the National Statistics badge.

Figure 14: Total high-risk women screened by risk category

\begin{figure}
\centering
\includegraphics[width=\textwidth]{figure14.png}
\caption{Total high-risk women screened by risk category}
\end{figure}

Source: KC62 (Table U) NHS Digital - see also Table 16 in Data Tables.

\textsuperscript{14} More information on high-risk women can be found in Appendix B.
Figure 15: Total high-risk women screened by reporting region*

England, 2015-16

* The North East, Yorkshire & the Humber (NEYH) reporting region is further broken down into the Yorkshire & the Humber and the North East sub regions. The South reporting region is further broken down into the South East and South West sub regions.

Source: KC62 (Table U) NHS Digital - see also Table 17 in Data Tables.
## Appendices

### Appendix A – Glossary

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Assessment</strong></td>
<td>This is defined as ‘further diagnostic tests’ and does not include ‘repeat examinations’ (see below)(^\text{15}).</td>
</tr>
<tr>
<td><strong>Benign</strong></td>
<td>Not cancer. Not malignant. A benign tumour does not invade surrounding tissue or spread to other parts of the body(^\text{16}).</td>
</tr>
<tr>
<td><strong>Bilateral Mastectomy</strong></td>
<td>Surgical removal of both breasts.</td>
</tr>
<tr>
<td><strong>Biopsy</strong></td>
<td>A biopsy is a medical procedure that involves taking a small sample of tissue so that it can be examined under a microscope(^\text{17}).</td>
</tr>
<tr>
<td><strong>Breast Screening Unit (BSU)</strong></td>
<td>There are 80 breast screening units (BSU) in England. These deliver local screening programmes.</td>
</tr>
<tr>
<td><strong>Carcinoma</strong></td>
<td>This refers to a malignant tumor arising from cells which line body organs.</td>
</tr>
<tr>
<td><strong>Carcinoma in situ (CIS)</strong></td>
<td>This is an early form of carcinoma. There are cancerous cells but they have not started to grow beyond the small area where they started(^\text{18}).</td>
</tr>
<tr>
<td><strong>Core Biopsy</strong></td>
<td>Involves the use of a needle to take a sample of tissue from the breast lump. Also called a needle biopsy(^\text{19}).</td>
</tr>
<tr>
<td><strong>Coverage</strong></td>
<td>The percentage of women in the population who are eligible for screening at a particular point in time (31 March 2016 in this instance), who have had a test with a recorded result at least once.</td>
</tr>
</tbody>
</table>


\(^{16}\) MedicineNet.com: [http://www.medterms.com](http://www.medterms.com)

\(^{17}\) NHS Choices: [http://www.nhs.uk/Pages/HomePage.aspx](http://www.nhs.uk/Pages/HomePage.aspx)


within the screening round, i.e. in the previous three years. Currently coverage is best assessed using the 53-70 age group.

NB: Women are eligible for screening if they are in the screening age range and are not ineligible due to bilateral mastectomy.

<table>
<thead>
<tr>
<th>Cytology</th>
<th>The medical and scientific study of cells. Cytology refers to a branch of pathology, the medical specialty that deals with making diagnoses of diseases and conditions through the examination of tissue samples from the body.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fine-needle aspiration cytology</td>
<td>Fine-needle aspiration cytology is where samples of breast cells or fluid are drawn off through a very fine needle.</td>
</tr>
<tr>
<td>Histology</td>
<td>The examination of tissues under the microscope to assist diagnosis.</td>
</tr>
<tr>
<td>Incident Screening</td>
<td>Screening of women who have been previously screened within the NHS Breast Screening Programme. In this statistical bulletin, incident screening figures relate only to routine invitations to previous attenders last screened within five years.</td>
</tr>
<tr>
<td>Invasive Cancer</td>
<td>Cancer which has spread beyond the layer of tissue in which it developed and is growing into surrounding, healthy tissues.</td>
</tr>
<tr>
<td>Magnetic Resonance Imaging (MRI)</td>
<td>A type of scan that uses strong magnetic fields and radio waves to produce detailed images of the inside of the body.</td>
</tr>
<tr>
<td>Mammogram</td>
<td>X-rays of each breast. Mammography can detect small changes in breast tissue which may indicate cancers which are too small to be felt either by the woman herself or by a doctor.</td>
</tr>
<tr>
<td>Mastectomy</td>
<td>Surgical removal of the whole breast.</td>
</tr>
</tbody>
</table>

---

21 NHS Choices - [http://www.nhs.uk/Conditions/MRI-scan/Pages/Introduction.aspx](http://www.nhs.uk/Conditions/MRI-scan/Pages/Introduction.aspx)
22 NHS Breast Screening Programme: [http://www.nhs.uk/conditions/breast-cancer-screening/Pages/Introduction.aspx](http://www.nhs.uk/conditions/breast-cancer-screening/Pages/Introduction.aspx)
<table>
<thead>
<tr>
<th><strong>Non- or micro-invasive cancer</strong></th>
<th>A cancer which demonstrates no or only very slight invasion into adjacent tissues by malignant cells of a carcinoma in situ.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Open Biopsy</strong></td>
<td>A minor operation to take one or more samples of tissue under general anaesthetic. Also known as excision or surgical biopsy.</td>
</tr>
<tr>
<td><strong>Prevalent Screening</strong></td>
<td>Screening of women never previously screened within the NHS Breast Screening Programme. In this statistical bulletin, prevalent screening figures relate to first invitations for routine screening and routine invitations to previous non-attendees.</td>
</tr>
<tr>
<td><strong>Repeat examinations</strong></td>
<td>Repeat examinations include both those images repeated with the same view while the woman is still present in the unit, and those occasions when a woman is required to attend a second time to have a film repeated (same view) because of a technical inadequacy²³.</td>
</tr>
<tr>
<td><strong>Reporting region</strong></td>
<td>The NHS Breast Screening Programme has eight reporting regions. These are similar to the SHAs which operated prior to April 2013 with a few exceptions. The North East and Yorkshire &amp; the Humber SHAs together form one reporting region (North East, Yorkshire &amp; the Humber). The South East and South West reporting region together form reporting for The South.</td>
</tr>
<tr>
<td><strong>Short Term Recall</strong></td>
<td>A second invitation to attend an assessment clinic at less than the routine (three year) screening interval²³.</td>
</tr>
<tr>
<td><strong>Ultrasound</strong></td>
<td>A procedure that uses high frequency sound waves to create an image of part of the body²⁴.</td>
</tr>
<tr>
<td><strong>Uptake</strong></td>
<td>The percentage of women invited for screening in the year, who were screened adequately within six months of invitation.</td>
</tr>
</tbody>
</table>


For definitions of further medical terminology please visit the NHS Cancer Screening Programmes website at https://www.gov.uk/topic/population-screening-programmes.
Appendix B – Background

Breast Screening Policy

Under the NHS Breast Screening Programme, all eligible women aged 50-70 are invited for screening every three years. Screening is intended to detect breast cancer at an early stage when there is a better chance of successful treatment. Because the programme is a rolling one which invites women in a three year cycle, not every woman will receive an invitation as soon as she is 50. Every woman registered with a GP in England should however, receive her first invitation before her 53rd birthday.

Age extension

Screening policy changed in 2001. Prior to this only women aged 50-64 were invited for screening as part of the NHS Breast Screening Programme. In April 2001 the age range was extended to include women aged 65-70, and the last screening unit began inviting older women in April 2006.

Some women outside the 50-70 core age group are also screened as part of the NHS Breast Screening Programme, either through self or GP referral where appropriate, or as part of a research trial. Women who are over the upper age limit for routine invitations for breast screening are encouraged to make their own appointments at three yearly intervals. The NHSBSP is currently undertaking a randomised controlled trial on extending the programme to women aged 47-49 and 71-73. The trial started at selected pilot sites in 2009 and by the end of the 2015-16 collection year, 67 out of 80 breast screening units (83.8%) were taking part in the trial.

The randomisation trial means that initially it only affects around half of the women in the 47-49 and 71-73 age groups. Nine BSUs which are unsuitable for randomisation (mostly due to IT systems) are inviting the 47-49 year-olds only, as women aged over 70 can already self-refer every three years. The trial will allow the programme to assess the net benefit of extending the age range for breast screening to these age groups. Results showing the impact of breast screening on mortality are expected in the early 2020s.

In order to get a significant result from the trial the programme will need to invite women in the extended age ranges for at least two more (three-year) screening rounds. If women aged 71-73 are in the control group they will be able to self-refer into the programme. Women aged 47-49 in

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25 See Appendix C for more information on the eligible population for Coverage.
26 More information on the trial can be found at http://www.agex.uk/
the trial control group can also request to be screened. The Screening Process section in this appendix has more information on self-referrals.

Further information on the randomised controlled trial can be found at:

http://www.isrctn.com/ISRCTN33292440
http://clinicaltrials.gov/ct2/show/NCT01081288

Screening higher risk women

There are also some women who are identified and assessed by a specialist in genetics or oncology as being at more risk of developing breast cancer than women in the general population. These women are also screened as part of the NHSBSP.

In January 2012 the Advisory Committee on Breast Cancer Screening (ACBCS) agreed practical guidance for the NHS on the surveillance\(^{27}\) of women of all ages assessed to be at a higher risk of breast cancer. The NHS Breast Cancer Screening Programme has started managing the surveillance of these higher risk women according to specified protocols\(^{28}\). Higher risk became part of the specification for commissioning breast cancer screening through NHS England as part of the Section 7a agreement (Public health functions to be exercised by NHS England) with the Department of Health in 2013-14. The agreement was updated for 2015-16 – see link below:

**NHS public health functions agreement 2015-16: Service Specification no.24: Breast Screening Programme**

More information is given on the screening process for high-risk women in the Breast Screening process section below.

**Data Sources**

The statistics are derived from information that is routinely collected by NHS Cancer Screening Programmes for the operation of the screening programme, including for quality assurance and performance management purposes.

Information on the NHS Breast Screening Programme is supplied from the following NHS Digital central return data sets:

- KC62 – Information on invitations, uptake and outcomes from all 80 breast screening units across England.

\(^{27}\) Surveillance screening: women at higher risk of developing breast cancer are offered breast screening at an earlier age than women from the general population.

\(^{28}\) For more information on the protocols see: [https://www.gov.uk/guidance/breast-screening-programme-overview](https://www.gov.uk/guidance/breast-screening-programme-overview)
• KC63 – Information on the population coverage of the programme from all 152 Upper Tier Local Authorities.

Further information on the underlying sources of information can be found in NHS Digital’s List of Administrative Sources, available through the following link:

http://content.digital.nhs.uk/pubs/listadminsources

Breast Screening Process

Introduction

Breast screening is a method of detecting breast cancer at a very early stage. Women may be invited to attend screening by the NHS Breast Screening Programme or may attend as a result of self or GP referral if they have not been screened within the last three years. Although no women over the age of 73 will be invited for screening, the programme encourages self/GP referrals from women over 70 at three-yearly intervals.

Invitations for breast screening are sent out by breast screening units to eligible women. Some women are first invited for screening whilst they are still 49 but in the calendar year of their 50th birthday. Where the randomised controlled trial is inviting women aged 47-49, women may receive their first invitation at 46 but in the calendar year of their 47th birthday.

A self-referral is where a woman contacts the screening programme, either without an invitation or more than six months after her last invitation, requesting to be screened. A GP referral is the same as a self-referral except that the initial contact with the screening programme is made by the GP on behalf of the woman.

Symptomatic referrals (i.e. where a woman is referred to a specialist breast clinic with recognised symptoms of breast cancer) are not part of the screening programme and so are not included in this publication.

At the screening unit

A visit to a screening unit for breast screening takes about half an hour. Breast screening uses mammograms (low dose x-rays) which can detect small changes in breast tissue which may indicate cancers. Mammograms are now all digital. Digital mammography uses computer imaging.

29 Details from the NHS Breast Screening Programme: https://www.gov.uk/topic/population-screening-programmes/breast
There are currently 80 breast screening units in England. Breast screening units can offer screening which is hospital based, mobile or in other convenient community locations (e.g. shopping centres).

**The results**

The mammograms are examined and the results sent to the woman and her GP within two weeks. A woman may be asked to go to an assessment clinic for further tests if a potential abnormality is detected at initial screening. Women may also be asked to go to an assessment clinic if their mammograms need repeating (e.g. if the x-ray was not clear enough).

**Further investigation**

At the assessment clinic more tests are carried out, following the triple assessment process. These may include clinical examination and patient history, additional imaging and pathology (fine-needle aspiration cytology or core biopsy). Core biopsy may be carried out where some of the breast tissue is removed using a wide-bore needle for analysis. Fine-needle aspiration cytology is where samples of breast cells or fluid are drawn off through a very fine needle for laboratory analysis. Where assessment clinic examinations do not give a definitive result, some women may need to go on for an open biopsy performed by a surgeon. An open biopsy is a minor operation to take one or more samples of tissue under general anaesthetic.

In a small minority of cases a definitive diagnosis cannot be made following the assessment process. Where this occurs, women may be recalled for a further assessment at an interval shorter than the normal screening interval of three years, these are known as short term recalls.

**High-risk women**

A woman can be referred by a GP or another relevant professional group for genetic or oncology assessment where her medical history or family history indicates a higher risk of developing breast cancer. At assessment, a full personal and family history is taken and for some families a blood sample may be taken for testing for specific known genetic abnormalities. Women identified as being at high risk of developing breast cancer may then be referred to the local breast screening unit for inclusion in high-risk screening, where she will have the opportunity to discuss the process and benefits with a healthcare professional.

Referrals into the NHSBSP should only be via:
• a genetics service
• a local family history service, situated in an oncology department
• an oncologist (in the case of women treated with supradiaphragmatic radiotherapy30)

Whilst some high-risk screening is performed using mammograms, others are performed using a Magnetic Resonance Imaging (MRI) scanner; a large tube surrounded by a strong magnetic field. A small injection of liquid contrast is given to help different areas of the breast tissue become visible on the scans. A visit for this type of screening usually takes between half an hour and an hour.

High-risk women are offered screening more regularly (usually annually) than those in the routine programme up until their 50th birthday. After this, some women will remain in high risk screening and some women will enter routine breast screening (i.e. every three years). Protocols for each risk category determine screening frequency31.

30 Radiotherapy administered in the area of the chest.
31 For screening frequency protocols see: https://www.gov.uk/guidance/breast-screening-programme-overview
Appendix C – Definitions

The definitions below include formulae for the calculation of statistics from the KC62 central data return.

Coverage

Coverage is defined as the percentage of women in the population who are eligible for screening at a particular point in time (31 March 2016 in this instance), who have had a test with a recorded result at least once within the screening round, i.e. in the previous three years. Women are eligible for screening if they are in the screening age range and are not ineligible due to bilateral mastectomy.

Coverage is routinely reported only for the age range invited for screening. Currently coverage is best assessed using the 53-70 age group as women may be first called at any time between their 50th and 53rd birthdays\(^{32}\).

National coverage is calculated from the KC63 central return dataset as follows:

\[
\frac{\text{Number of women screened in the last three years}}{\text{Number of women eligible for screening}} \times 100
\]

Coverage statistics in this report are calculated using data from the NHAIS (Exeter) system and include all women currently registered with an NHS GP practice and others who are not registered with a GP practice but who are otherwise known to the NHS. The total number of women who are not registered with a GP or otherwise known to the NHS is unknown and it is therefore not possible to estimate how overall coverage rates might be affected by this group.

NHAIS data supports many primary care services including the NHS Breast Screening Programme’s call and recall system for inviting women for screening. It is the only data source that can identify both the eligible population and those women who have been tested in the last three or five years.

\(^{32}\) With the extension of the Breast Screening Programme, some women will now be invited before the age of 50. It is expected that coverage will continue to be calculated for the 53-70 age range until full rollout of the age expansion is completed.
Coverage is reported by LA in this publication, and is based on the postcode of residence for each woman in the eligible registered population. Some women who cannot be allocated to an LA are known to the NHS and are recorded on the NHAIS (Exeter) system. These women account for such a small proportion of the total resident population (less than 0.5%) aged 53-70 at 31 March 2016 that they do not have a significant impact on the national coverage figures.

The changes to the KC63 described in section 1.1 of the separate Quality Statement included a change to the definition of coverage to include short term recalls. In years previous to 2012-13, the number of women screened excluded women who had been invited under a short term recall invitation. Coverage figures and the numbers of women screened in Tables 1, 2, 2a, and 11 of the Data Tables are impacted by this change as is coverage in Figures 1, 2 and 3 of the Analysis and Commentary Section. The number of women invited under a short term recall is relatively small and these women will, by definition, already have been screened within the last three years, so this change is expected to have little or no impact on national coverage.

**Uptake**

Uptake is the percentage of women invited for screening in the year, who were screened adequately within 6 months of invitation. The uptake rate is calculated from the KC62 central return data set as follows:

\[
\frac{\text{Number of women screened adequately}}{\text{Number of women invited for screening}} \times 100
\]

NB: Uptake is based only on women invited for screening and excludes self/GP referrals.

**Cancer Detection Rate**

This is the number of women with cancer detected per 1,000 women screened and is calculated from the KC62 central return data set as follows:

\[
\text{Cancer Detection Rate} = \frac{\text{Number of women with cancer detected}}{\text{Number of women screened}} \times 1000
\]

---

33 A woman who is not registered with a GP may still be known to the NHS (e.g. through presentation at a breast screening unit or other hospital attendance).

34 A technically adequate screen is defined as one which gives sufficient detail to allow a decision to be made to refer for assessment or to return to a routine recall status.
Total number of women with cancer \( \times 1000 \)

Total number of women screened adequately

**Benign biopsy rate**

The number of benign biopsies per 1,000 women screened. This measures the number of women per 1,000 women screened who had surgery which resulted in a diagnosis of benign breast disease (i.e. not cancer) or no breast disease. The NHS Breast Screening Programme aims to minimise the number of unnecessary operative procedures and so benign biopsy rates should be low. The rate is calculated as:

\[
\frac{\text{Number of women with a benign or normal result following an open biopsy}}{\text{Number of women with a technically adequate screen}} \times 1000
\]

**Non-operative diagnosis rate (overall)**

This is the number of women diagnosed without the need for surgery as a percentage of all women with cancer. The NHS Breast Screening Programme aims to ensure that the majority of cancers are diagnosed without the need for surgery. The rate is calculated as follows:

\[
\frac{\text{Women who attended for cytology and/or core biopsy (but not referred for open biopsy) who were diagnosed with breast cancer}}{\text{All women diagnosed with breast cancer}} \times 100
\]

The non-operative diagnosis rate (invasive) is the number of women diagnosed with invasive cancer without the need for surgery as a percentage of all women diagnosed with invasive cancer.

The non-operative diagnosis rate (non-invasive) is the number of women diagnosed with non-invasive cancer (including definitely micro-invasive and possibly micro-invasive) without the need for surgery as a percentage of all women diagnosed with non-invasive cancer.

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35 A technically adequate screen is defined as one which gives sufficient detail to allow a decision to be made to refer for assessment or to return to a routine recall status.
Assessment rate

This is the percentage of women screened who were referred for assessment following their initial screen. Women are referred to an assessment clinic for further tests if a potential abnormality is detected at initial screening. The rate is calculated as follows:

\[
\text{Assessment rate} = \frac{\text{Number of women referred for assessment}}{\text{Number of women with a technically adequate screen}} \times 100
\]

Small cancer detection rate

This is the number of women with invasive cancers smaller than 15mm in diameter detected per 1,000 women screened. The rate is calculated as follows:

\[
\text{Small cancer detection rate} = \frac{\text{Number of women with invasive breast cancer less than 15mm in diameter}}{\text{Number of women with a technically adequate screen}} \times 1000
\]

Standardised Detection Ratio (SDR)

This is the ratio of the observed number of invasive cancers to the expected number based on applying criteria from the Swedish Two County randomised controlled trial, which is used as a yardstick of performance. A Standardised Detection Ratio (SDR) of 1 equates to approximate parity with this trial. The SDR is calculated as:

\[
\text{SDR} = \frac{\text{Number of invasive cancers observed (i.e. the number of women with invasive cancers)}}{\text{Number of invasive cancers expected}}
\]

The number of invasive cancers expected is a count of the number of women in each age group in whom invasive cancers would be expected to be detected if the screening service were operating to the criteria of the Swedish Two County Study. The number should be given to 2 decimal places.

The expected number of cancers for each age group is calculated by applying the following rates (taken from the Swedish Two County study) to the number of women screened in each age band:
Expected rates of invasive cancers to be detected per 1,000 women screened

<table>
<thead>
<tr>
<th>Age band</th>
<th>Prevalent Screens</th>
<th>Incident screens</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;44</td>
<td>1.77</td>
<td>1.68</td>
</tr>
<tr>
<td>45 – 49</td>
<td>2.97</td>
<td>1.94</td>
</tr>
<tr>
<td>50 – 52</td>
<td>3.64</td>
<td>3.20</td>
</tr>
<tr>
<td>53 – 54</td>
<td>4.44</td>
<td>3.46</td>
</tr>
<tr>
<td>55 – 59</td>
<td>5.86</td>
<td>3.79</td>
</tr>
<tr>
<td>60 - 64</td>
<td>8.72</td>
<td>4.42</td>
</tr>
<tr>
<td>65 – 69</td>
<td>10.76</td>
<td>4.54</td>
</tr>
<tr>
<td>70</td>
<td>12.30</td>
<td>4.71</td>
</tr>
<tr>
<td>71 – 74</td>
<td>13.89</td>
<td>4.93</td>
</tr>
<tr>
<td>&gt;=75</td>
<td>15.74</td>
<td>5.21</td>
</tr>
</tbody>
</table>

Note that the rates differ according to whether women were part of prevalent or incident screening. Standardised Detection Ratios (SDRs) can be calculated only for prevalent invited episodes and routine incident invited episodes. The calculation for the expected number of cancers detected is as follows:

Number of women screened in the specific age group × expected detection rate for that specific age group

\[ \frac{\text{Number of women screened in the specific age group} \times \text{expected detection rate for that specific age group}}{1000} \]

The expected number of cancers detected in each age band is summed to give a total for the expected number of cancers in all ages.

---

36 Prevalent screening refers to women being screened for the first time within the NHS Breast Screening Programme. In this statistical bulletin, prevalent screening figures relate to first invitations for routine screening and routine invitations to previous non-attendees. Incident screening refers to women previously screened within the NHS Breast Screening Programme. In this statistical bulletin, incident screening figures relate only to routine invitations to previous attendees last screened within five years.
Appendix D – Type of Invitation/Referral

Invitation Types

First Invitation for Routine Screening
This includes those women who were invited to attend for routine breast screening with:

i) no previous invitation for NHS breast screening; and

ii) no previous technically adequate screen within the NHS Breast Screening Programme as a self or GP referral.

NB: A technically adequate screen is defined as one which gives sufficient detail to allow a decision to be made to refer for assessment or to return to a routine recall status.

Routine Invitation to Previous Non-Attenders
This includes those women who were invited to attend for routine breast screening with:

i) one or more previous invitations for NHS breast screening; and

ii) no previous technically adequate screen within the NHS Breast Screening Programme.

Routine Invitation to Previous Attenders (Last screen within five years)
This includes those women who were invited to attend for routine breast screening with:

i) any number of previous invitations for NHS breast screening; and

ii) at least one previous technically adequate screen within the NHS Breast Screening Programme as a result of an invitation or a self/GP referral within the last five years (60 months).

Routine Invitation to Previous Attenders (Last screen more than five years previously)
This includes those women who were invited to attend for routine breast screening with:

i) any number of previous invitations for NHS breast screening; and

ii) at least one previous technically adequate screen within the NHS Breast Screening Programme as a result of an invitation or a self/GP referral, the most recent of which was more than five years (60 months) ago.

**Short term recalls**

This includes those women who were invited to attend for non-routine breast screening with:

i) any number of previous invitations for NHS breast screening; and

ii) a previous technically adequate screen within the NHS Breast Screening Programme as a result of an invitation or a self/GP referred episode within the last three years (36 months); and

iii) the previous episode resulted in a recommendation for non-routine recall.

A non-routine recall is an intentional recall after less than the normal recall interval of three years (or other recall period followed by the programme).

**Referral Types**

**Self or GP Referrals of Women Not Previously Screened**

This includes those women who attended for routine breast screening as a result of a self or GP referral with:

i) any number of previous invitations for NHS breast screening; and

ii) no previous technically adequate screen within the NHS Breast Screening Programme.
Self or GP Referrals of Women Previously Screened (Last screen within five years)

This includes those women who attended for routine breast screening as a result of a self or GP referral with:

i) any number of previous invitations for NHS breast screening;

and

ii) at least one previous technically adequate screen within the NHS Breast Screening Programme as a result of an invitation or a self/GP referral within the last five years (60 months).

Self or GP Referrals of Women Previously Screened (Last screen more than five years previously)

This includes those women who attended for routine breast screening as a result of a self or GP referral with:

i) any number of previous invitations for NHS breast screening;

and

ii) at least one previous technically adequate screen within the NHS Breast Screening Programme as a result of an invitation or a self/GP referral, the most recent of which was more than five years (60 months) ago.
Appendix E – High-risk categories

Genetic/familial risk

Women with a strong family history of breast cancer are likely to have inherited a faulty gene or genes that predispose to breast cancer from one or other of their parents. Screening is undertaken for high risk women who have or are likely to have inherited a high risk fault in one of these uncommon genes.

BRCA1 – a gene that helps suppress cell growth

BRCA2 – a gene that helps suppress cell growth

Not tested, equivalent high risk (a strong family history that makes inheriting one of the known high risk genes likely but for one of a variety of reasons genetic testing has not been undertaken) – defined by a geneticist.

TP53 (Li-Fraumeni) – a protein which acts as a tumour suppressor

A-T homozygotes (ataxia-telangiectasia homozygotes) – rare severe disorder associated with DNA repair. Homozygotes are known to show increased incidence of cancers.

A-T heterozygotes (ataxia-telangiectasia heterozygotes) – rare severe disorder associated with DNA repair. Heterozygotes are known to show increased incidence of cancers.

Supradiaphragmatic radiotherapy – irradiated below age 30

Radiotherapy administered in the area of the chest to women under the age of 30 for the treatment of Hodgkin's lymphoma\textsuperscript{37}, a cancer of the lymphatic system.

\textsuperscript{37} NHS Choices: [http://www.nhs.uk/conditions/Hodgkins-lymphoma/Pages/Definition.aspx](http://www.nhs.uk/conditions/Hodgkins-lymphoma/Pages/Definition.aspx)
Appendix F – How are the Statistics used?

Users and Uses of the Report

Uses of Statistics by Known Users

This section details known users of the report and the purposes for which they use the statistics. All these users have found the information in the report useful for the purposes set out.

Department of Health (DH)
The Department of Health (DH) use the statistics from this publication to inform policy and to monitor the quality of screening services. The statistics in the report are also used by DH to respond to public and Parliamentary business.

NHS Cancer Screening Programmes (NHSCSP) – Public Health England
The NHS Cancer Screening Programmes (NHSCSP) uses the bulletin as a reference document to monitor the quality and effectiveness of the NHS Cancer Screening Programmes and progress against their key targets for screening the eligible population in England.

NHS England
NHS England use the statistics from this publication to monitor the quality of screening services commissioned against key performance indicators set out in the Section 7a agreement with the Department of Health.

Breast Screening Units (BSUs)
Breast screening units use the statistics for planning and performance monitoring purposes.

The Cancer Epidemiology Unit
The Cancer Epidemiology Unit, University of Oxford use the raw data supplied by NHS Digital and supplement it with additional data to provide a more evaluative analysis to improve the performance of the national screening programmes through peer reviewed research papers and the dissemination of such information through appropriate channels e.g. QA Directors.
Policy Research Unit in Cancer Awareness, Screening and Early Diagnosis

The Policy Research Unit carries out research on changes to the screening programme and the effects of such changes on markers of screening quality, such as detection rates and recall rates.

Screening Quality Assurance Services (SQASs) NHSCSP

The Regional Senior (QA) Advisors use the report as part of their role in ensuring the screening process is achieving its primary targets across England.

Organisation for Economic Co-operation and Development (OECD)

The screening statistics are supplied to the OECD by NHS Digital and are used in the OECD Health Database and also for the Health Care Quality Indicator project.

Compendium of Population Health Indicators

Indicators from the publication are included in the Compendium of Population Health Indicators which is widely used within the NHS as well as outside it. See: http://content.digital.nhs.uk/article/1885/Compendium-of-Population-Health-Indicators

Annual Report of the Chief Medical Officer

Coverage from the publication, together with supplementary information provided by NHS Digital, was used to inform the Annual Report of the Chief Medical Officer.

The report draws attention to major health challenges requiring immediate action and details progress made in key areas identified in previous annual reports. Data from the KC63 on coverage by PCT for women aged 53-70 is used in Chapter 5 of this report. See: https://www.gov.uk/government/publications/cmo-annual-report-2011-volume-one-on-the-state-of-the-public-s-health

National Audit Office (NAO)

Outcome statistics for prevalent and incident screens were used to inform the NAO report, 'Healthcare across the UK'.

This report highlights key trends and variations in the delivery of healthcare across the four countries of the UK. See:

Media
The data are used to underpin articles in newspapers, journals, etc. on matters of public interest.

Local Authorities
Local Authorities and NHS Clinical Commissioning Groups (CCGs) are required to prepare Joint Strategic Needs Assessments of Health and Wellbeing (JSNAs), which inform local commissioning of health and wellbeing services. Indicators from the publication form part of the Local Government Association’s Joint Strategic Needs Assessment: Data Inventory (via the Compendium of Population Health Indicators).
**Unknown Users**

The breast screening publication is free to access via the NHS Digital website and therefore the majority of users will access the report without being known to NHS Digital. It is important to put mechanisms in place to try to understand how these additional users are using the statistics and also to gain feedback on how we can make the data more useful to them.

On the web page where the report is published there is a link to a feedback web form which NHS Digital uses for all its reports.

The specific questions asked on the form are:

- How useful did you find the content in this publication?
- How did you find out about this publication?
- What type of organisation do you work for?
- What did you use the report for?
- What information was the most useful?
- Were you happy with the data quality?
- To help us improve our publications, what changes would you like to see (for instance content or timing)?
- Would you like to take part in future consultations on our publications?

Any responses via this web form are passed to the team responsible for the report to consider.
Appendix G – Feedback from Users

NHS Digital publishes around 90 series of Official Statistics and National Statistics each year. Use of health and care statistics helps those involved to manage the system more effectively, commission better services, understand public health trends in more detail, develop new treatments and monitor the safety and effectiveness of care providers.

Our Strategy for 2015-2020 sets out that over the next few years we are committed to analysing and making openly available data, statistical information and insights about the health and social care sector in ways which better meet our users’ needs. However, these changes come at a time when spending on central services is being squeezed, and we must better prioritise our current services.

In our recent consultation on changes to our statistics produced by NHS Digital, we proposed a series of changes over the next three years which will help us to better prioritise resources from our stretched budget while developing our statistical products to better meet the needs of our users. We are making the changes necessary to enable us to produce high quality statistics suited to support a modern health and care system and help Britain make better decisions. The consultation closed on 27 June 2016, and full results are available on the NHS Digital web site here.

In terms of the NHS Breast Screening Programme, England publication we proposed to reduce commentary and increase use of infographic type presentation.

The responses received showed very good support for the proposal. In particular, the majority of respondents were in favour of moving towards an increased use of infographic type presentation as long as the underlying methodologies that are used in the data analysis are made available as a technical annex. The responses also highlighted the need to retain the annual data tables as these are regarded as crucial for performance monitoring, benchmarking and trend analysis, as well as contributing to JSNA updates. Some responses also highlighted the need to publish timely data at a more granular level, i.e. CCG/GP Practice level, in addition to LA level, as this will support the needs of commissioners.

As a result of the consultation we will explore ways of reducing the commentary and increasing the use of infographic type presentation and making data available interactively to users via dashboards. This is likely to be achieved via a phased approach and will require close partnership working with colleagues within the Breast Screening Programme at PHE and other key stakeholders. We will also continue to work with colleagues from the Breast Screening Programme to explore ways of making more frequent, timely and contemporaneous screening data at
CCG/GP Practice level available in the public domain. In doing so, regular timely data releases will provide users with a more immediate source for local oversight and commissioning of screening services, and will also help those involved in managing the Breast Screening Programme make better informed and considered decisions.
Appendix H – Data Validation and Data Quality

Information on the NHS Breast Screening Programme is collected on the following central return data sets:

- **KC63** – information on the population coverage of the programme is collected on all 152 Upper Tier Local Authorities (LAs).
- **KC62** – information on invitations, uptake and outcomes from all 80 breast screening units across England.
- Data are submitted to a bespoke NHS Digital data collection system which performs a number of at-source validations. Once the data have passed through validation they are extracted as a single CSV file and further validations and quality assurance checks are carried out. These include:
  - population comparisons between the KC63 LA resident data with ONS LA resident data
  - comparisons with previous years’ data to ensure that any unusual trends are identified and explained
  - consistency checks between different parts of the returns
  - checks that totals equal the sums of parts
  - checks on the calculation of statistics
  - checking for outliers (figures that are particularly low or high compared to other areas)

Part of NHS Digital’s quality assurance procedure includes returning some data tables to the four Screening Quality Assurance Services (SQASs) for verification prior to publication. SQASs cover four regional areas; North, South, London and Midlands & East.

For 2015-16 returns were received on all 152 LAs and from all 80 breast screening units.
Appendix I – Related Publications and Useful Web Links

This bulletin can be found on the NHS Digital website at:

http://content.digital.nhs.uk/pubs/brstscreen1516

Since 2004-05 this bulletin has been published by NHS Digital (formerly known as the Health and Social Care Information Centre) Previous editions, published by the Department of Health, can be found at:


Further information about breast screening is available from the NHS Cancer Screening Programmes website:

https://www.gov.uk/topic/population-screening-programmes
Information and technology for better health and care

www.digital.nhs.uk
0300 303 5678
enquiries@nhsdigital.nhs.uk

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