# NHSCSP
# Audit of invasive cervical cancer

## National report 2007-2010

**July 2011**

NHS
Cancer Screening Programmes

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- hospital based programme coordinators
- call and recall system managers
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**Profesor Peter Sasieni**
**Dr Alejandra Castanon**
**Ms Karly S Louie**

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# FOREWORD

## CLOSING THE LOOP

A service is a set of activities with a common set of objectives and an annual report. In the development of systems of care the issue of measurement is of central importance. Without measurement there can be no meaning for a service delivered to a population: without measurement the service delivered is simply a collection of random encounters between members of the public and that service. In developing the Cervical Screening Programme for the NHS there were many, much greater, challenges than in developing the NHS Breast Cancer Screening Programme.

The principal challenge was that cervical screening – that is, the taking and reading of several million unconnected cervical smear tests – was already a large activity within the NHS, whereas in breast cancer screening there was virtually nothing happening before the start of NHS Breast Cancer Screening. In developing the NHS Cervical Screening Programme from those millions of unconnected events the key issue was to convert it from Brownian Motion into a system: that is, into a set of activities with a common set of objectives and an annual report charting progress towards the objectives and the level of performance against explicit standards. The magnitude of the task should not be underestimated. This is not, as might be supposed, because of computing problems but because of the two other factors that always exist in systems development: namely, managerial factors and cultural factors, the human beings. Hundreds of human beings were closely involved in managing local cervical screening services, while thousands of professionals were involved in delivering the service to the millions of women who received it each year.

All of these people were seen as likely to be interested in a report on the service and several hundred of them felt that the audit would be of vital importance in managing their work and use of resources.

Research has also played a part in designing this audit, with researchers having the necessary obsession with criteria; for example, the debate on what was really meant by 'an interval cancer' lasted a couple of hours. The end result was nevertheless the production of a report on cervical screening, a report that provided a key element in a system: namely the feedback loop. The development of a knowledge system can take as long as the development of a hospital and I congratulate all those who have been involved in the development of this impressive input.

**Professor Sir Muir Gray, CBE**

# PREFACE

This is the first report arising from the NHSCSP Audit of Cervical Cancers. It is intended that reports will hereafter be produced annually. The initial focus of the re-launched NHS Cervical Screening Programme (NHSCSP) was to improve coverage by introducing a call and recall system. In 1992 an ad hoc audit was established to monitor and evaluate the programme's effectiveness in reducing the incidence of and mortality from cervical cancer. It also aimed to identify areas of good practice and indicate where improvements could be made.

In 2001, the Minister for Public Health announced that all women diagnosed with cervical cancer would be entitled to know the results of an audit of their cervical screening. Data collected for the purposes of such disclosure, together with similar data on a random sample of women without cervical cancer, form the basis of the cervical cancer audit today. The audit was initially carried out in an ad hoc manner across the UK and was coordinated by the Imperial Cancer Research Fund. Since April 2007, however, the regional Quality Assurance Reference Centres (QARCs) in England have adopted a standardised protocol for the collection of screening histories for all cases of cervical cancer to support data collation in a national database. The primary purpose of the audit is to monitor and improve the programme locally. However, there is also much to be gained by pooling data nationally. This report presents a comprehensive overview of the data included in the national audit database from cases diagnosed between April 2007 and March 2010 and their controls. The audit continues to collect data, and cases diagnosed on or after April 2010 will be included in future reports, as will any updates received in relation to cases diagnosed before April 2010.

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# EXECUTIVE SUMMARY

The NHS Cervical Screening Programme (NHSCSP) in England continues to provide high-quality cervical screening to a target population of 14.6 million women. The NHSCSP is highly effective in preventing cervical cancer and still more effective in preventing death from cervical cancer. This audit provides further insights into the current programme; it indicates, for example, that cervical cancer rates in women aged 50–64 today would be more than three times higher were it not for the screening undertaken over the last decade.

- The NHSCSP audit comprises 6,231 women with cervical cancer diagnosed between April 2007 and March 2010 (an estimated 90% of all cervical cancers in England), together with 18,783 controls.
- There was a shift towards earlier stage cancers in 2009–10. The numbers of advanced cancers (FIGO stage 2+) in the audit decreased by a third from 444 in 2007 to 300 in 2009.
- Forty four per cent of cancers in women aged 25–64 were micro-invasive (FIGO stage 1A) and 71% of these were treated conservatively (by cone biopsy/loop excision) without the need for hysterectomy, radiotherapy or chemotherapy.
- Over 60% of cervical cancers in women over the age of 65 were advanced (FIGO stage 2 or worse).
- Twenty nine per cent of cervical cancers (both micro- and fully-invasive) occurred despite apparent adherence to screening guidelines. By comparison, 62% of population controls adhered to screening guidelines.
- Approximately 14% of screened women aged 25–49 were on short-term recall owing to a previous abnormal result.
- Although the 5-year coverage of cervical screening was 79%, only 65% of screened women without a previous abnormal result were re-screened at an interval of under 5.5 years.
- At all ages, women with fully invasive (stage 1B+) cervical cancer were less likely to have been screened regularly (at least every 3.5 years) for the last 8 years than were women in general.
- Among women aged 50–64, 56% of those with fully invasive (stage 1B+) cancer had not been screened for at least 7 years, compared with only 16% of women without cervical cancer. This difference also exists in younger age groups, although to a lesser degree.

# 1. CONTEXT

## 1.1 The burden of cervical cancer in England

Cervical cancer is a malignant neoplasm of the cervix uteri. In 2007, 2,276 cases of cervical cancer were registered in England with an age-standardised incidence rate (ASR) of 8.8 per 100,000 women.[1] The highest incidence was among women aged 30–34 (ASR=17.7 per 100,000 women) and 35–39 (ASR=16.1 per 100,000 women). It is estimated that in the absence of cervical screening the age standardized incidence rate would be between 25 and 40 cases per 100,000 women. Mortality is substantially lower than incidence of cervical cancer, with 830 cases reported in 2008.[2] Age-standardised relative survival for patients diagnosed 2001–2003 was 82.4% at 1 year and 63.7% at 5 years.[3]

## 1.2 Epidemiology of HPV and cervical cancer

Cervical cancer has been recognised as a rare outcome of a common sexually transmitted infection. The aetiological association is restricted to a limited number of viral types of the human papillomavirus (HPV). Under optimal testing systems, HPV DNA can be identified in all specimens of invasive cervical cancer. There is consistent evidence from across the world that HPV infection is a necessary cause of cervical cancer.[4] HPV is implicated in both squamous cell carcinoma (SCC) and adenocarcinoma (ADC), as well as over 95% of the precursor, cervical intraepithelial neoplasia grade 3 (CIN-3). Co-factors that appear to modify the risk among HPV-infected women include the use of oral contraceptives, smoking, high parity and previous exposure to other sexually transmitted diseases, such as *Chlamydia trachomatis,* herpes virus type 2 and unidentified genetic factors possibly related to immunity. Women exposed to human immunodeficiency virus (HIV) are at high risk of HPV infection, HPV persistence and cervical cancer.

Cervical screening and treatment of high-grade CIN have the potential to prevent the development of cervical cancer in HPV-infected women and mass screening has had a substantial impact on cervical cancer incidence in many countries.[5]

## 1.3 Cervical screening

Cervical screening is not a test for cancer but a means of preventing it. It uses a screening test (cervical cytology) to detect early abnormalities which, if left untreated, could lead to cancer in a woman's cervix. Early treatment can prevent the development of almost 100% of cancers.[5] Although cervical screening may not detect every abnormality before it leads to cancer, screening may lead to the diagnosis of asymptomatic cervical cancer at an early stage, at which point it can be more easily and successfully treated. Virtually all micro-invasive (stage 1A) cancers are diagnosed by screening and they can usually be cured (5 year survival >98%)[6] with fertility-sparing surgery.

Cervical cytology testing involves the collection, staining and microscopic examination of cells from the cervix. Between 1988 and 2003, conventional smears were used to screen women: samples of cells were taken from around the cervix, the material was smeared on to a glass slide and the slide was sent to the laboratory for examination by a cytologist. Between 2003 and 2008, however, liquid-based cytology (LBC) was introduced and this way of preparing cervical samples reduced the proportion that were inadequate for evaluation.[7] The sample is taken with a special device that is used to brush cells from the neck of the womb and place them directly into a small vial containing preservative fluid. This vial is then sent to the laboratory where a glass slide is prepared from the cells in the fluid. This method was designed to produce a more representative sample of the specimen and reduce the presence of distracting background material.

## 1.4 HPV DNA testing

There are over 100 types of Human Papillomavirus (HPV), most of which do not cause significant disease in humans. However, around 15 HPV types have been implicated in cervical cancer, notably types 16 and 18 which give rise to some 70% of all cervical cancers. Research has shown that women with no evidence of high-risk HPV infection are extremely unlikely to have concurrent precursor disease or to develop such disease or cervical cancer over the next 6 years. [8]

HPV testing has been evaluated in various settings

- to triage women whose cytology shows borderline changes or mild dyskaryosis
- as a 'test of cure' to reduce the duration of surveillance following treatment for CIN
- to replace cytology as the primary screening test.

Before the end of 2011, HPV testing will be introduced in England for triage and test of cure following successful piloting in six sites within the NHSCSP.

## 1.5 NHS Cervical Screening Programme

The NHSCSP aims to reduce the incidence of and mortality from invasive cervical cancer. It does this by regularly screening all women at risk so that conditions which might otherwise develop into invasive cancer can be identified and treated.

Cervical screening in Britain began in the mid-1960s. By the mid-1980s many women were having regular cytology tests but there was concern that those at greatest risk were not being tested, while those who had positive results were not being effectively followed up and treated. The NHSCSP was set-up in 1988, when the Department of Health instructed all health authorities to introduce computerised call and recall systems and to meet defined quality standards.

Between 1988 and 2003, women were invited at least every five years (and no more than every three years) from age 20 to 64. In October 2003 it was announced that the first invitation would be at age 25, and that the interval would be three years up to age 49 and five years thereafter to age 64 (Table A). This change of policy took effect only from the date of the next screening, however. Consequently, a woman screened at age 20 in 2003 with an interval of three years before her next screening would have been invited again in 2006, despite the fact that she was still not 25. Similarly, a 61-year old women screened in 2003 could be invited again three years later if this date had already been entered on the call and recall system. Moreover, in some parts of England this policy change was not implemented until April 2005. In such places, it was only from April 2010 that no women were invited below age 25.

Today, all women between the ages of 25 and 64 are eligible for free cervical screening. The frequency of screening invitations varies according to age: every three years at ages 25–49 and every five years at ages 50–64. Cervical screening is not offered to women who have had a total hysterectomy.

**Table A** Cervical screening intervals since October 2003

| Age group (years) | Frequency of screening |
|---|---|
| **25** | First invitation |
| **25–49** | Three yearly |
| **50–64** | Five yearly |
| **65+** | Screen only women who have not been screened since age 50 or who have had recent abnormal tests |

The NHS call and recall system invites women who are registered with a GP. It keeps a record of the result of the screening test, and, if all is well, recalls the woman for further screening after three or five years depending on her age. Women should receive their first invitation for routine screening shortly before their 25th birthday. Migrants between the ages of 25 and 64 should receive their first invitation soon after registering with an NHS GP.

The programme screens almost four million women in England each year. For clinical reasons some women have more than one test during the course of a year so, in total, almost four and a half million samples are examined by pathology laboratories every year.

While no cervical screening test can be 100 per cent effective, cervical screening programmes have been shown to dramatically reduce the incidence of cancer in a population of women. Since the introduction of the NHSCSP in the UK in 1988, the number of cases diagnosed has halved – from 16 per 100,000 women in 1988 to 8 per 100,000 women in 2005 – despite increased rates of underlying disease.[9]

**Table B** Percentage of cancers prevented by a single negative cytology test

| Screening interval | 20–39 years | 40–54 years | 55–69 years |
|---|---|---|---|
| **Three yearly** | 41% | 69% | 73% |
| **Five yearly** | 30% | 63% | 73% |

Adapted from Sasieni, Adams, Cuzick (2003)[10]

The effectiveness of the programme can be judged partly by its coverage. The NHSCSP defines coverage as the percentage of women in the target age group (25–64) who have been adequately screened in the last five years. In 2009/2010, screening coverage of eligible women was 78.9%.[11]

## 1.6 Cervical screening and HPV vaccination

Two prophylactic HPV vaccines have been shown to be highly efficacious at preventing persistent HPV infection and the high-grade disease (CIN3) caused by infection. In September 2008 a national HPV immunisation programme was introduced to vaccinate girls against HPV 16 and 18. This covers girls aged 12–13, with a catch-up programme for those born in 1990-95. The NHSCSP will continue to play an important part in screening women who have not been vaccinated, including all those born before 1990. The role of cervical screening for vaccinated women remains to be clarified but will depend on the age at which the woman was vaccinated, the cross-protection given by the vaccine for other HPV types, and the duration of protection provided. The impact of HPV vaccination will in due course need to be monitored alongside the cervical screening programme. In the interim, continued work is needed to determine the most effective means of monitoring the impact of both vaccination and cervical screening.

# 2. AUDIT OF INVASIVE CERVICAL CANCERS

## 2.1 Introduction

Despite the provision of an effective population-based screening programme in England, there are several reasons why even screened women may develop cervical cancer. These reasons were recognised before the NHSCSP was implemented in 1988,[12] and were taken into account in previous recommendations relating to the audit.[13] Five-year cervical screening coverage has been around 80% since 1993, so it is likely that the majority of cancers detected in the screening age group will occur in women who have been screened at some point in their lives. Monitoring incidence and mortality rates is an important element in establishing whether the programme is achieving its objectives. It does not give a complete picture, however, and it certainly does not indicate how effective screening would be if all its activities were optimised.

## 2.2 Purpose of the Audit

The purpose of the NHSCSP Audit of Invasive Cervical Cancer (hereafter the Audit) is to monitor the effectiveness of the cervical screening programme, identify areas of good practice and indicate where improvements might be made. It also aims to monitor cases where the programme fails to prevent cervical cancer, which can be particularly revealing at a time when changes are being made to the technology used and to the age and frequency with which women are called for screening. The Audit provides an early indicator of the pattern of disease incidence, using cases which have not necessarily been fully abstracted by the cancer registries. It offers an opportunity to explain why some cases occurred (eg in previously unscreened women, or where colposcopic treatment has failed) and what proportion of them were screen-detected. It is also able to indicate in a timely fashion whether alterations in screening ages and frequencies have affected the incidence of cervical cancer. It is intended that all cervical cancers be included in the Audit, irrespective of clinical stage or the age of the woman at the time of diagnosis.

Judgements about the effectiveness of the NHSCSP depend on accurate data on incidence and prognosis or mortality, linked to individual-level information on screening uptake and outcome. In order to obtain consistently reported data, all parties in the NHSCSP should have followed the national protocol for audit of cases of invasive cervical cancer.[12]

## 2.3 Roles within the Audit

Although there are minor differences in procedure between regions, the broad principles of the Audit are described in the NHS Cancer Screening Programmes document *Audit of Invasive Cervical Cancers* (NHS CSP Publication No 28).[12]

Certain individuals within the NHSCSP are identified in the document as having key roles. When a case is identified with histologically confirmed invasive cervical cancer, the clinician

treating the woman should ensure that the Hospital-Based Programme Coordinator (HBPC) and the regional Quality Assurance Reference Centre (QARC) are informed. This will initiate a cascade of audit activities. The QARC provides regional coordination for the cervical screening history review, which includes validating local cytology, histology, and colposcopy review processes according to the national audit protocol and liaising with cancer registries to ensure that the information stored by the registry includes a record of the diagnostic status of each cervical cancer case. (The extent of liaison with the cancer registry varies between regions.) The QARCs assemble all the regional data, which are then collated nationally.

The NHSCSP Audit Management Group is the steering committee for the Audit. Based on the data and findings, the Group approves updates and makes recommendations to the NHSCSP.

## 2.4 Audit protocol

The national protocol document, *Audit of Invasive Cervical Cancers*, was published in 2006 to provide guidance on reviewing the full cervical screening history of cases of cervical cancer.[12] It was launched by the NHSCSP in April 2007 at a national meeting arranged to provide training to the QARCs in the use of the protocol and the audit database. However, minor variations in the way data are collected suggest that not all regions are interpreting national guidance in the same way. To address this, the protocol document is currently being updated to enhance its clarity and ease of use.

### 2.4.1 Ethical approval

Information on cases of invasive cervical cancer and their controls in England take the form of a selection of anonymised routinely collected data. Regarded as part of the NHSCSP's service evaluation, this process is exempt from research ethics review by the National Research Ethics Service.[14]

### 2.4.2 Databases and other data sources

The Audit is designed to collect data on age, stage, call and recall status, cytology, histology, and colposcopy from a number of sources. Information on screening invitations and results and laboratory data on cytology are drawn from the National Health Authority Information System (NHAIS, or 'the Exeter system') via Open Exeter.*

The Exeter system is used to invite women for screening. It stores screening records dating back to 1988 for all women registered with the NHS and is used to derive screening histories for audit purposes. Coordination between the HBPC and the QARCs is needed to obtain all records, as the availability of data varies locally. Colposcopy clinics are contacted for records

* Open Exeter is a portal that allows bodies such as NHS trusts, GP practices, and laboratories to access the Exeter (NHAIS) system.

of all appointments (whether the patient attended or not and whether or not any procedures were carried out) including details of the examiner and colposcopic impression. Histology results are collated to produce a complete picture of the patient's history and facilitate slide review. GP notes are also obtained and recorded to permit a comprehensive review of the patient's screening history.

An audit database was created to aggregate all data collected from the QARCs. The use of this common national database facilitates the pooling of data from screening programmes across the country for epidemiological analysis.

### 2.4.3 Essential fields

To generate a minimum dataset, information must be entered in a number of essential fields. These are listed at Appendix A. Every field in this list is expected to be completed by all QARCs for each case of cervical cancer included in the Audit.

#### 2.4.3.1 Selection of controls

To permit rigorous evaluation of the programme, women who did not develop cancer were used as controls for the cases identified. These age-matched controls were selected from among women who were not known to have had a hysterectomy and who were registered with a GP in the same administrative district as the case. Controls were selected from four groups

(i) **GP controls** were selected from the same group practice
(ii) **district controls** were selected from the same area (with the same first half of the postcode) but from a different GP
(iii) **screened controls** were selected only for cases whose cancer may have been diagnosed as a direct result of the screening programme, and the control was required to have had cytological tests in roughly the same time period as the case
(iv) **abnormal controls** were selected only for cases with an abnormal cytology test history prior to diagnosis; the control was required to have had an abnormal cytology test.

Each case was assigned two population controls (one GP control and one district control). In addition, some cases (see 4.1) were assigned controls whose screening history was partially matched. This was designed to facilitate the audit of screen-detected cancers and cancers that developed despite the woman having been referred to colposcopy some considerable time before diagnosis following an abnormal screening result. Controls were selected by specially written software within the Exeter call and recall system.

#### 2.4.3.2 Cytology screening history

Before 2003 cytology samples took the form of conventional smears. Between 2004 and 2008 laboratories converted from conventional to liquid-based cytology (LBC). To reflect the use of both technologies in the audit period, cytology samples are referred to here as tests rather than smears.

Details of every cytology test taken and recorded for both cases and controls were downloaded from the Exeter system. Records included all samples taken within the NHSCSP, as well as information on a large number of private cytology samples taken in England or elsewhere in the UK.

The following information was obtained for both cases and controls

- date the test was taken
- result of the test
- action code resulting from the test.

The action code is the national code used to define the woman's recall type, the type of notifications required, and the period of time between recalls. It determines the management action for each woman in the light of her latest test result and records any additional clinical input, automatically generating a specific recall type.

The following additional information was collected for cases

- date of birth
- date of cancer diagnosis
- FIGO stage of the tumour
- histology of the tumour
- treatment received
- an Index of Multiple Deprivation.

For controls, information was collected only on date of birth and Index of Multiple Deprivation.

Although treatment and Index of Multiple Deprivation are not currently included in the list of essential fields it is anticipated that they will form part of it in the future.

#### 2.4.3.3 Colposcopy

Colposcopy data were obtained only for cases. The data obtained on colposcopy visits included

- date of appointment
- attendance at appointment
- whether the examination was satisfactory
- surgical procedure performed.

Non-essential fields included

- colposcopic impression
- pathological diagnosis
- whether the woman was pregnant
- time to next follow-up appointment.

#### 2.4.3.4 Cytology and histology reviews

Audit guidelines covering the period of this report suggest that all cytology samples and histology specimens obtained in the 10 years preceding diagnosis, including those that diagnosed or led to diagnosis, should be reviewed for all women with cervical cancer. Data obtained from reviews were

- date of the original sample or specimen
- date of the review
- type of reviewer (screener, checker, advanced practitioner, consultant)
- original sample or specimen result
- result of the review/consensus.

Results of the review of cytology and histology samples require extensive analysis and detailed commentary, and will be published separately later this year. The primary purpose of the slide review is educational and it is not best served by summarising results in Audit reports. In all 7,598 cytology slides were reviewed and a total of 23,073 review results were entered into the database. The guidelines call for all slides in the 10 years preceding diagnosis to be reviewed. There were 28,632 such slides. Revised guidelines will require fewer slides to be reviewed and fewer reviews per slide. Over three-quarters of histology reviews were of the diagnostic biopsy; diagnostic biopsies will not form part of the Audit in future.

#### 2.4.3.5 GP notes

If the screening history is unclear GP notes on a patient may be obtained and recorded in the Audit. The two types of information that might be obtained from GP notes are the woman's reasons for not attending and her symptoms. Reasons for not attending screening or colposcopy might include

- pregnancy
- travelling
- co-morbidity
- the patient was treated privately.

The history of symptoms is of interest for symptomatic cases. Data from GP notes are currently difficult to obtain and different approaches to collecting them have been piloted. Following a recent review by the West Midlands QARC, the Evaluation Committee has agreed that in most cases it is not yet possible systematically to collect useful information from GP notes. Consequently, information derived from them is not included in this report.

#### 2.4.3.6 HPV DNA tests

HPV DNA testing within the NHSCSP in England has, until now, been conducted exclusively in three pilot and six Sentinel Sites. The HPV DNA test has been used for triage and test of cure at these sites. Women with mild or borderline test results have been triaged with HPV

DNA testing, which can speed up referral to colposcopy if HPV is found or avoid the need for referral if it is not. Women testing positive are offered immediate colposcopy, while those testing negative are returned to routine (three- or five-yearly) recall. HPV testing is also performed on women who have been treated for cervical intraepithelial neoplasia (CIN). Women who are found to be both HPV and cytology negative at six months following treatment are returned to routine recall; other women are followed up annually for ten years. These HPV tests are beginning to be recorded on the Exeter System but are currently not included in the download of screening histories. These tests will in future be added to the list of essential fields to be downloaded.

#### 2.4.3.7 Index of Multiple Deprivation

The Office of the Deputy Prime Minister produces the English Indices of Deprivation from which this Index of Multiple Deprivation is derived.[*]

For the purpose of this Audit the index of deprivation has been divided into deciles, from the most deprived (0) to the least (9). This data field is currently not essential and has therefore not been reported consistently across QARCs. The data received to date, while quite revealing, are thus incomplete (see Appendix B, Table B-1a). It is hoped to make this field essential in future and detail the results in next year's report.

### 2.4.4 Data aggregation

Names, addresses and unique identifiers such as NHS numbers are deleted before data are transferred to the national audit database. The only personal identifier the Audit receives (both for cancer cases and their controls) is the date of birth. Between the ages of 20 and 65, there are over 750 women in England with a given date of birth. This personal identifier is therefore not sufficient to identify a given individual and the data are thus considered to be anonymous.

[*] For more information see http://www.communities.gov.uk/publications/communities/indiciesdeprivation07.

# 3. DATA COMPLETENESS AND LIMITATIONS

Data completeness is critical when interpreting audit results, and the findings presented in this report should thus be approached with a degree of caution. Appendix B highlights data completeness in the essential fields, in treatment and in the Index of Multiple Deprivation. Where data are reported as missing, this may not mean that they are unavailable but merely that they have not yet been recorded as part of the Audit. For this reason the term 'none recorded' has been used, although reference is also made to 'missing values'. For some fields the information simply may not exist: on a death certificate, for example, the cancer will not have been staged. Such instances are rare, however, and cannot be distinguished from incomplete records. Other cases may have been submitted to the Audit before all essential fields were complete. Missing fields are updated as and when data become available so revised data may not be received until some months after the case has been registered. In addition to these reporting delays, one of the Audit's principal challenges is coordination between the various aspects of the Audit process when a case of cervical cancer is diagnosed. The difficulties in ensuring data completeness for specific sections of the essential fields are described below.

## 3.1 Cancers and population controls

Cases are identified by NHS hospital staff (primarily via gynae-oncology) and confirmed by histology. A small proportion of cancers will be missed. Additionally a very small number of cases are excluded from the Audit because the women are not registered with an NHS GP. Table C (Section 4.1) compares the number of registrations for cervical cancer in a given calendar year with the number of cases in this Audit in each financial year.

Controls are selected randomly (subject to matching) from women registered with an NHS GP. All those selected are included in the Audit.

## 3.1 Dealing with missing values

In general, providing the proportion of missing values is not large, estimates are reported on the assumption that the data are missing at random. For example, if 40 women were reported with FIGO stage 1A, 60 with stage 1B+ and 25 with stage unknown, it would be estimated that 40% of the 25 unknown (ie 10 women) were, in fact, stage 1A. With the category 'IN' (stage 1B or worse cervical cancer not otherwise specified) these cases are reassigned only to the specific 1B+ stages (see Table 6 and 6a). Where this approach has been adopted the label 'Estimated proportion' is used.

## 3.2 Cytology

Since data on cytological tests are downloaded directly from the Exeter system, it is assumed that the data are complete for all cases and controls. This is because cytological

tests (as noted above) are recorded for all women who participate in the NHSCSP and for some of those who are tested privately. The Audit does not attempt to capture screening events that take place outside the UK.

## 3.3 Colposcopy

The quality and completeness of the colposcopic data are variable. This is principally because there is no central database for colposcopy data. Indeed, most colposcopy records were not computerised until 2001. It is thus difficult to determine where a woman attended for colposcopy, particularly if she attended more than one clinic. The best indicator of whether a woman is likely to have had colposcopy is whether there is a suspend code in her cytology record (see Table 19). Similarly, a record in the histology laboratory would suggest that a sample was taken at colposcopy. However, neither the cytology nor the histology record provides conclusive information regarding colposcopy.

## 3.4 Histology

The quality and completeness of the data on histology in this Audit is also variable as there is no national linkage between histology laboratories. The comprehensiveness of data cannot therefore be guaranteed. The proportion of histological samples reviewed in the Audit is based on the total number of samples recorded in the database, rather than the total number of histological samples taken within the NHSCSP.

## 3.5 GP notes

Not all regions have been able to collect data from GP notes, chiefly because this requires manual searching and extraction rather than extraction from electronic databases. To date, the quality and completeness of the data available are insufficient to allow meaningful conclusions to be drawn. Information from GP notes is therefore not presented in this report.

## 3.6 HPV DNA

Data on HPV testing are currently available from only one region, as HPV testing is at present restricted to the six Sentinel Sites in England. In view of this incompleteness, no further details on HPV DNA tests are provided in this year's report.

## 3.7 Treatment

Data on treatment are obtained by the HBPC from the patient notes or from the meeting notes of the multidisciplinary team (MDT). These fields tend to be entered as data become available, which may be a few months after cases are first entered in the Audit. Obtaining treatment data can be especially challenging if women are diagnosed in one centre and treated in another.

There has been some confusion over the use of the category ‘none’. Whereas its intended meaning is that the treating hospital has given only palliative care, at least one centre interpreted it as meaning that no treatment was reported. Additionally, some HBPCs used ‘none’ when the only treatment of a micro-invasive cancer was the diagnostic LLETZ/cone. While efforts have been made to correct this, some cases classified as ‘none’ may in fact have received treatment. Future audits will include the category ‘palliative care’, to distinguish this from ‘no treatment’.

# 4. ANALYSIS AND COMMENTARY

In this section, key findings are commented on and analysed. The detailed data tables are presented in Appendix C.

## 4.1 Invasive cervical cancer

In the period 2007–2010, 6,231 cases of invasive cervical cancer and 18,783 controls were included in the Audit of Invasive Cervical Cancer. Table C shows the number of cases of invasive cervical cancer included in each audit year compared with those reported nationally. The Office for National Statistics (ONS) reported 2,276 cases of invasive cervical cancer diagnosed during 2007 and 2334 during 2008.[1,15] Although some cases included in the Audit are not included in cancer registries data, and vice versa, the number of cancers reported to registries is only around 10% greater than the number included in this Audit. All QARCs are working to minimise these discrepancies and make both data sources more directly comparable.

**Table C** Number of cases of cervical cancer included in this report compared with those reported nationally

| Audit year | Calendar year | No. of cases in Audit | Cancer registrations[a] |
|---|---|---|---|
| 2007–2008 | 2007 | 2,089 | 2276 |
| 2008–2009 | 2008 | 2,164 | 2334 |
| 2009–2010 | 2009 | 1,978 | NP[b] |
| **Total** | **-** | **6,231** | **-** |

[a]Source: ONS MB1 37 and MB1 38

[b]NP: not yet published

Most cases submitted to the Audit have at least two age-matched population controls (GP and district). However, for a small number of cases (n=31) only one of these controls was identified (see Table D), while 48 cases were submitted with no population control. For a subset of eligible cases up to two further controls were selected: ie 2,877 screened and 3,571 abnormal controls (see section 2.4.3.1.)

## 4.2 Age of invasive cervical cancer cases

Figure 1 shows the percentage distribution of cases of cervical cancer by age in the 2007–2010 Audit with peak number of cases in the 35–39 age group (15%). Approximately 80% of all cases of invasive cervical cancer fell within the eligible cervical screening age group of 25–64 years (see Table 3, Appendix C). In 2007, women in this age group made up 75% of registrations in England. As a proportion of all cancers, invasive cervical cancer stage 1B or worse was more likely to be diagnosed in women over age 45 than in those under age 45.

Table D Number of cases of invasive cervical cancer and controls submitted to the 2007–2010 audit by QARC region[a]

| QARC REGION | Case | Two population controls (GP and district) | One population control (GP or district) | No population controls |
|---|---|---|---|---|
| East of England | 507 | 506 | 1 | 0 |
| East Midlands | 540 | 538 | 2 | 0 |
| London | 681 | 631 | 2 | 48 |
| North East | 430 | 427 | 3 | 0 |
| Yorkshire | 722 | 718 | 4 | 0 |
| North West | 829 | 823 | 6 | 0 |
| South Central | 466 | 463 | 3 | 0 |
| South East Coast | 436 | 434 | 2 | 0 |
| South West | 816 | 812 | 4 | 0 |
| West Midlands | 804 | 800 | 4 | 0 |
| **Total** | **6231** | **6152** | **31** | **48** |

[a]Cancers diagnosed 01/04/07 to 31/03/2010

## 4.3 FIGO stage of invasive cervical cancers

Table E shows the number of cervical cancer cases by FIGO stage for each QARC region. Percentages are given in Table 5a. A substantial proportion of cases are micro-invasive (1A): 38% of all cases with known FIGO stage. This is significant, as micro-invasive cancer is asymptomatic and can usually be cured.

It is not possible to estimate how many of the instances where stage is missing are due to the lack of clinical staging, but histological type is missing from only 4.9% of cases (see section 4.4). It may be that some regions complete the Audit before the FIGO stage is known and have difficulty updating the stage information in the database when it becomes available. Other regions may delay the audit process until the FIGO stage is available.

**Figure 1** FIGO stage of cervical cancer cases: estimated percentage distribution, by age

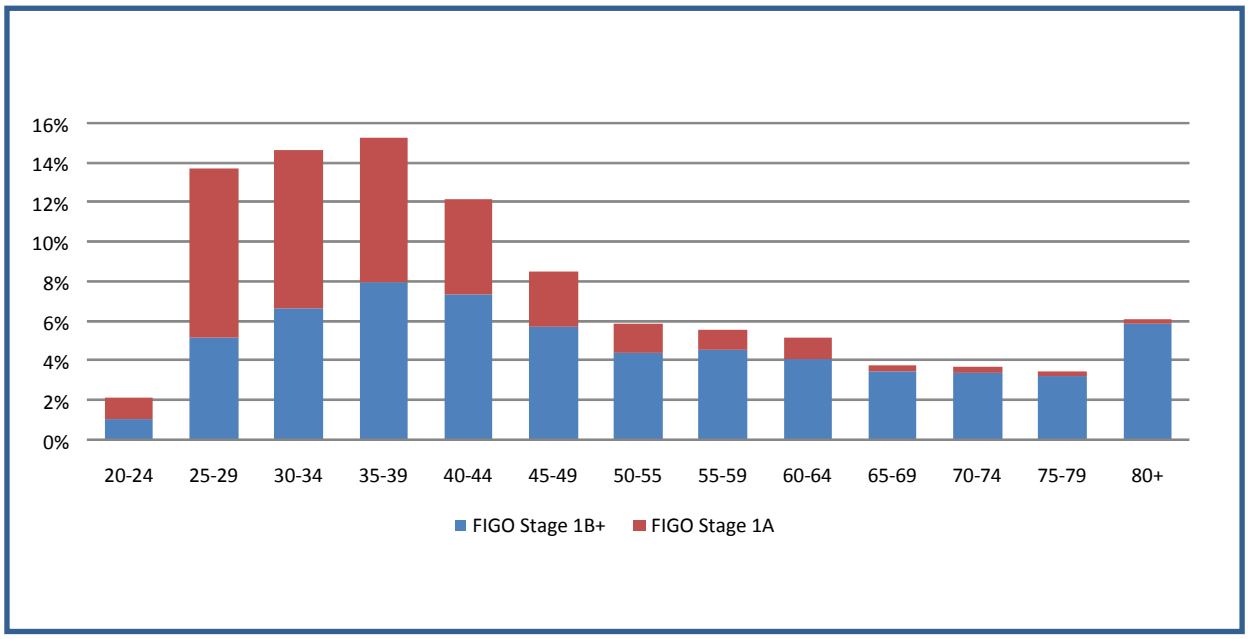



**Table E** Number of cervical cancer cases by FIGO stage in 2007–2010 Audit, by QARC region

| QARC Region | 1A | 1B | 2+ | 1B(NOS)[a] | None recorded | Total |
|---|---|---|---|---|---|---|
| East of England | 151 | 189 | 110 | 4 | 53 | 507 |
| East Midlands | 181 | 161 | 85 | 14 | 99 | 540 |
| London | 191 | 179 | 206 | 18 | 87 | 681 |
| North East | 146 | 130 | 58 | 68 | 28 | 430 |
| Yorkshire | 301 | 187 | 44 | 48 | 142 | 722 |
| North West | 224 | 251 | 105 | 98 | 151 | 829 |
| South Central | 144 | 130 | 33 | 1 | 158 | 466 |
| South East Coast | 164 | 123 | 100 | 3 | 46 | 436 |
| South West | 269 | 262 | 182 | 21 | 82 | 816 |
| West Midlands | 192 | 163 | 261 | 0 | 188 | 804 |
| **Total** | **1,963** | **1,775** | **1,184** | **275** | **1,034** | **6,231** |

[a] Cases reported as 1B(NOS) are known to be stage 1B or worse but detailed stage is not known

Figure 2 shows the estimated percentage distribution of FIGO stage in cervical cancer cases by year. This indicates a broad shift towards earlier stage cancers, particularly in 2009–10. This is encouraging because not only the proportion but also the number of FIGO stage 2+ cases has decreased (from 444 in 2007 to 300 in 2009), with no increase in the numbers of stage 1B+(NOS) (see Table 7). If this reflects a true decrease in advanced cancers it will result in fewer cervical cancer deaths. It is possible that this tendency towards earlier stage cancers in 2009–10 is related to the so-called Jade Goody effect. As noted, these results should be interpreted with caution, as it may be that late-stage cancers are included in the Audit more slowly than early-stage cancers. However, analysis of cases diagnosed in April–December of 2007, 2008 and 2009 shows the same pattern of stage distribution.

**Figure 2** FIGO stage of cervical cancers cases: estimated percentage distribution, by year

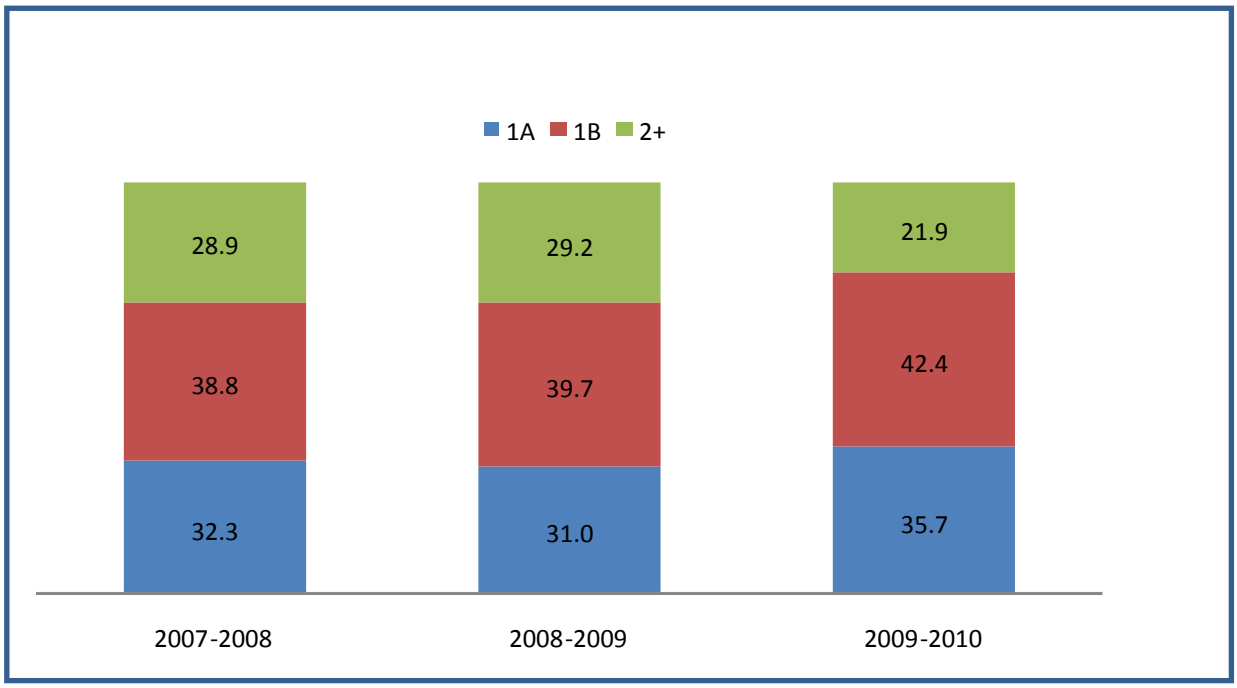



Figure 3 shows the estimated percentage distribution of FIGO stage in invasive cervical cancer cases by age-group. With increasing age, a decreasing proportion of cases with FIGO stage 1A are found and an increasing proportion with FIGO stage 2+. Even where it has failed to prevent cervical cancer from occurring, screening is clearly of benefit if it leads to the early diagnosis (at stage 1A or 1B) of cancer. Treatment of stage 1A cancer generally has fewer side effects and is more likely to be curative.

## 4.4 Histology of invasive cervical cancers

Figure 4 shows the distribution of invasive cervical cancer cases by histology. Almost three-quarters of cases of cervical cancer are of squamous histology, while almost one-fifth are adenocarcinoma and significantly fewer are adeno-squamous.

## 4.5 Treatment of invasive cervical cancers

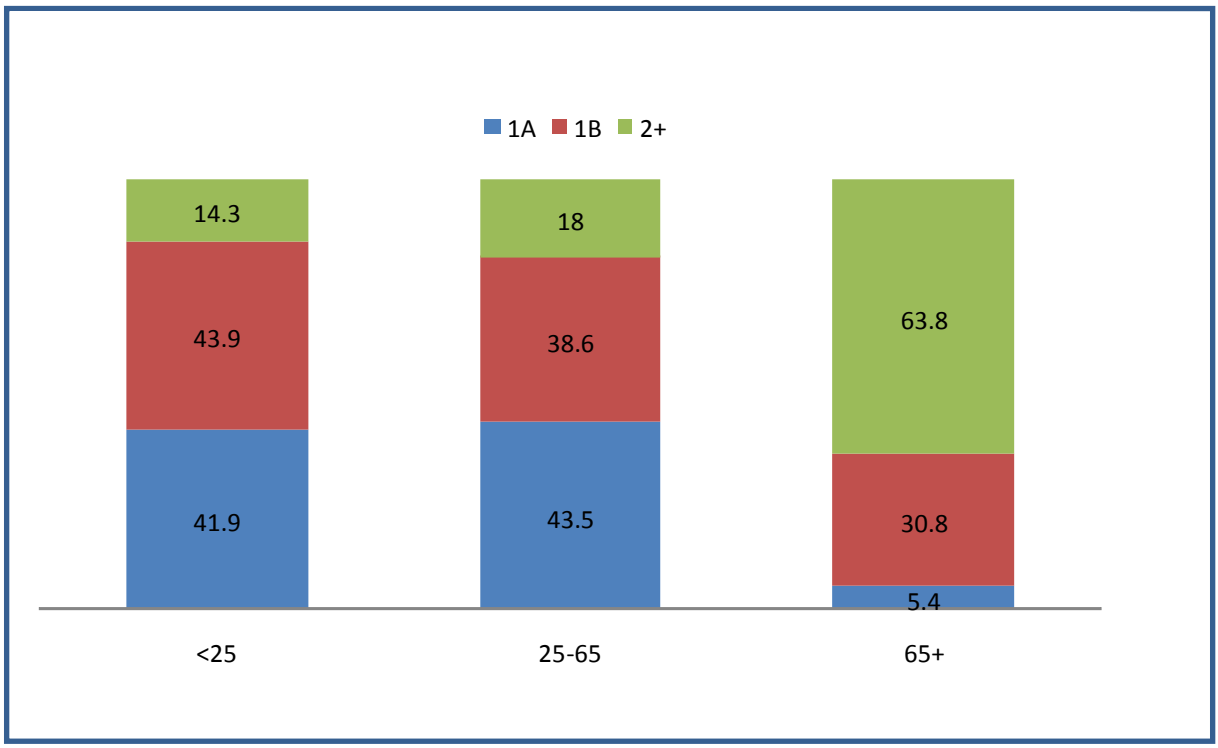
Figure 5 shows the distribution of (the most aggressive) treatment performed for cervical cancers, according to age (see Table 12). In almost half of cases treatment data are missing (46%). Where they were recorded, the most common types were cone biopsy/loop excision (32%), simple or radical hysterectomy (24%), and radiotherapy plus chemotherapy ± hysterectomy (21%).

Among women under the age of 65, the most common treatment was cone biopsy/loop excision (37%) followed by hysterectomy (28%). Of women under age 50, 46% had fertility-sparing treatment (cone biospy/loop excision or trachelectomy). For those aged 65+, radiotherapy ± hysterectomy (33%) was most common, followed by radiotherapy plus chemotherapy ± hysterectomy (27%). However, 22% of women in this age group reportedly received no treatment, other than perhaps palliative care. Given the substantially poorer

relative survival of elderly cervical cancer patients nationally,[16] this appears to warrant further investigation. It should be borne in mind, however, that some regions may have recorded 'no treatment' because they were unable to find a record of treatment, rather than because the patient was not treated (see section 3.7).

Figure 6 shows the distribution of treatment for invasive cervical cancer, by stage of disease (Table 13). The majority of women with FIGO stage 1A received cone biopsy/loop excision (70%), whereas those with stage 1B or worse (32%) received radiotherapy plus chemotherapy ± hysterectomy. Of women with no recorded stage, 26% received a cone biopsy/loop excision and 23% were given no treatment (other than perhaps palliative care).

**Figure 3** FIGO stage of cervical cancer cases: estimated percentage distribution, by age-group




## 4.6 Cervical screening history (cases compared with controls)

### 4.6.1 Classification of screening status

Table F summarises the screening status of women with cervical cancer and their controls six months before the cancer was diagnosed. All tests taken by women over the age of 66 have been excluded. Results in women aged 65 are included so as to allow for repeat tests in women with a low grade abnormality at age 64. The action code shown on the Exeter database has been used to determine whether the last cytology test led to a routine recall, early recall or suspension from the call and recall programme. After a routine recall interval, screening is considered to be up-to-date when the diagnosis occurred within 3.5 years of the routine cytology test (for women aged 25-49), or within 5.5 years (for women aged 50-

64). For women aged 65 or older (Table 15) up-to-date means that there was a cytology result at age 60-65. After an 'early repeat' action code, screening is considered to be up-to-date if diagnosis occurred within 1.25 years of the early repeat test (or .25 years if that test was inadequate).

**Figure 4** Percentage of cervical cancer cases, by histology

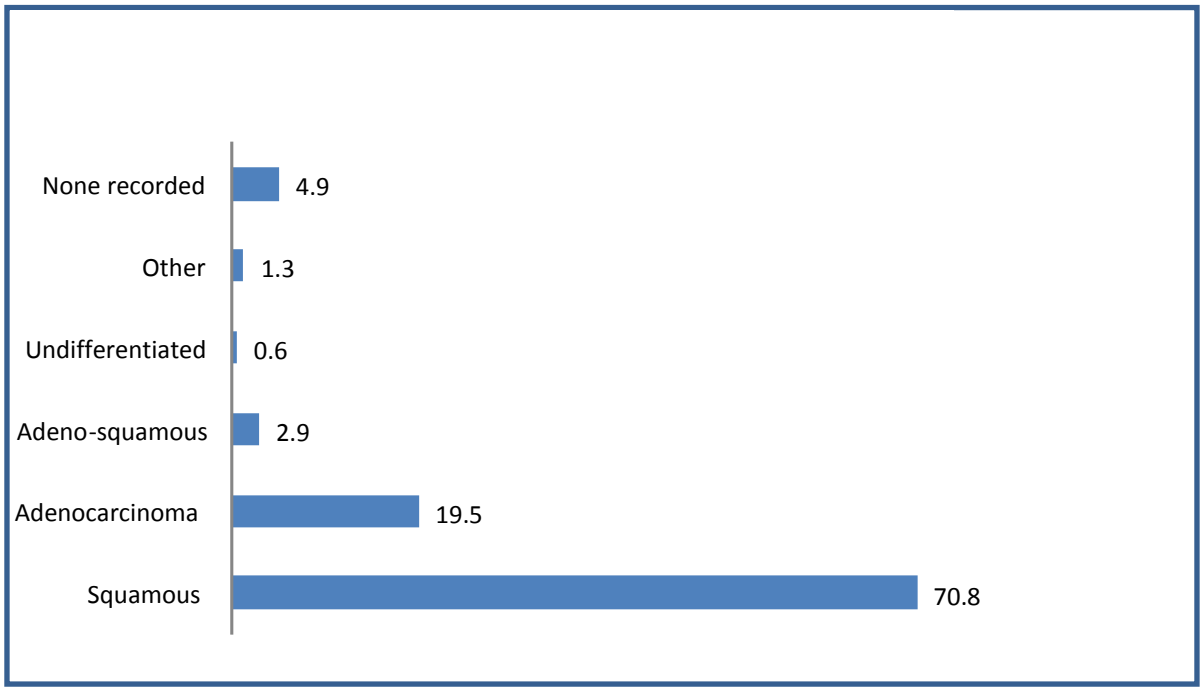



**Figure 5** Percentage treatment of cervical cancer cases, by age at diagnosis

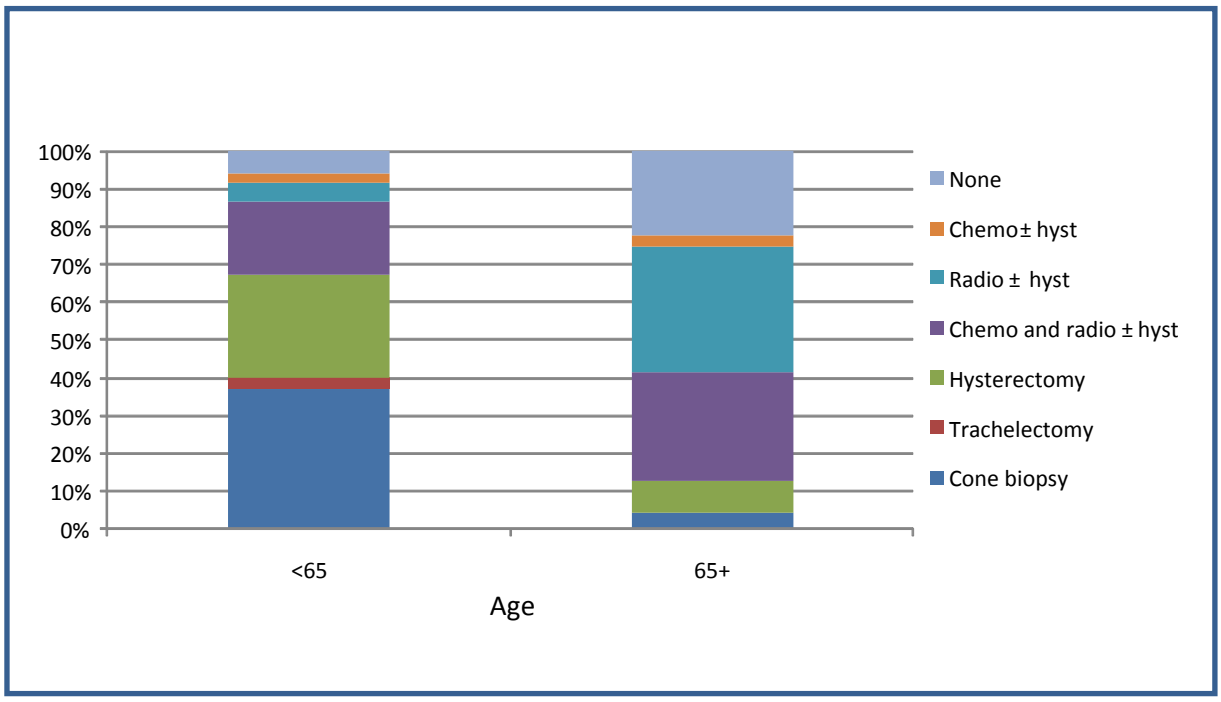


**Figure 6** Percentage treatment of cervical cancer cases by FIGO stage

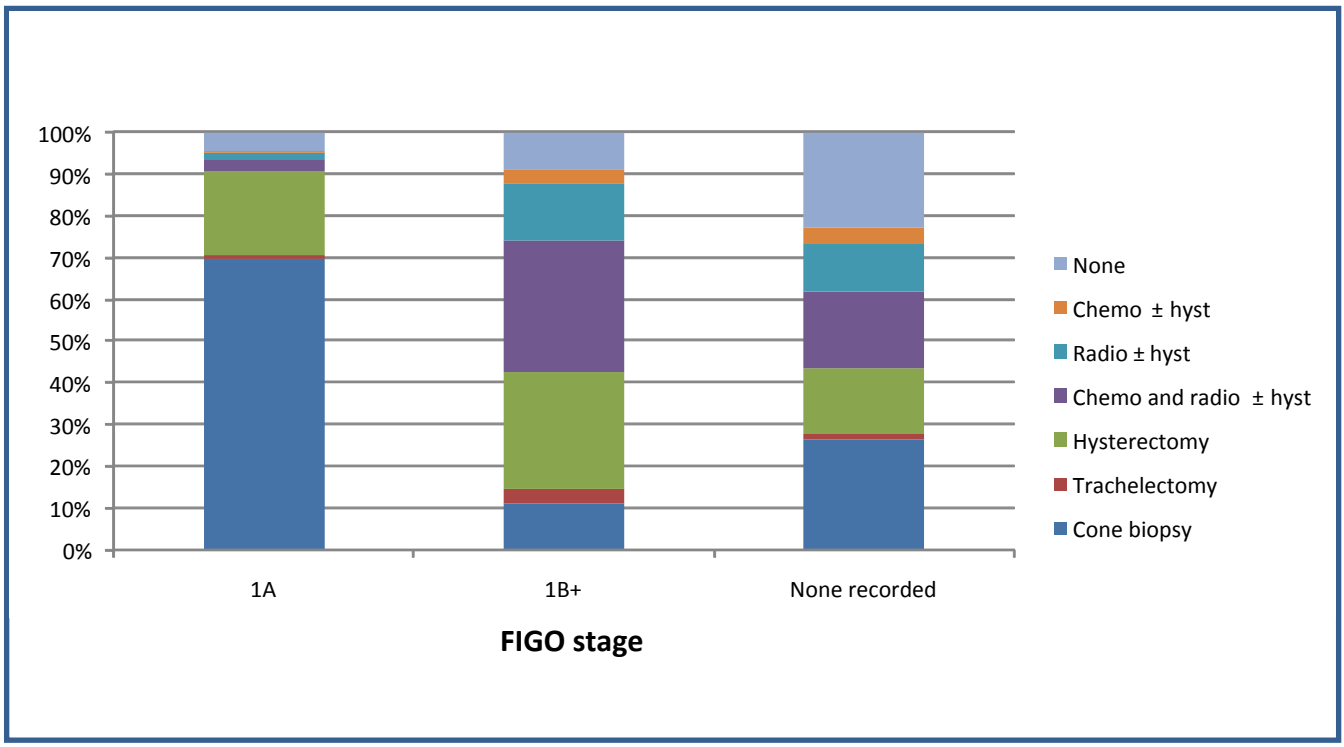



**Table F** Cervical screening status of cases of invasive cervical cancers and controls under age 65, up to six months prior to diagnosis (percentages)

| **Cervical screening history up to six months prior to diagnosis** | **Controls** | **Cases: stage 1A** | **Cases: stage 1B+** | **Cases: stage unknown** |
|---|---|---|---|---|
| *No cytology test (except within six months of diagnosis)* | 13.1 | 19.3 | 25.3 | 25.5 |
| *Last test routine and* | | | | |
| Up-to-date | 56.9 | 19.4 | 23.3 | 21.5 |
| Lapsed | 19.7 | 33.6 | 29.4 | 31.1 |
| *Last test early repeat and* | | | | |
| Up-to-date | 4.2 | 8.3 | 5.2 | 3.7 |
| Lapsed | 4.6 | 7.9 | 8.4 | 9.7 |
| *Last test suspend (not followed by a negative)* | 0.8 | 10.9 | 7.9 | 7.8 |
| *Last test suspend (followed by at least one negative)* | 0.8 | 0.6 | 0.5 | 0.8 |
| **Total** | **100** | **100** | **100** | **100** |

In 29% of cases aged under 65, cervical cancer occurred in women whose screening was apparently up-to-date and in line with national guidelines.* This percentage was the same for women with micro-invasive (stage 1A) cancers and those with more advanced forms. However, when compared with cases double the proportion of controls adhered to screening guidelines (62% vs 29%). For 11% of cancers at stage 1A and 8% of those at 1B or worse the diagnosis was made six months or more after the woman was suspended from the call and recall programme. A similar classification was published by Sasieni et al in 1996 when estimating the efficacy of screening (see Table G).[17] The proportion of women never screened has decreased both for the general population (16% in the 1996 paper, 13% in this Audit) and for cases with stage 1B+ cancer (31% in 1996, 25% in this Audit). However, this proportion remains almost unchanged for women with stage 1A cancers (18% in 1996, 19% in this Audit). More interesting is the halving of the proportion of micro-invasive cancers diagnosed more than six months after a 'suspend' code (22% in 1996, 11% in this Audit). Another substantial change is the proportion of controls scheduled for early repeat screening, which has increased from 3% in 1992-96 to 9% 2007-10. This can be explained only in part by the approximately 50% increase since the early 1990s in cytology classified as borderline or mild dyskaryosis. This is a major finding of the Audit that was not apparent from the routinely published national statistics. It means that, at any time, one in ten women aged 20-64 who have been screened are on early recall (or suspend) owing to an unresolved abnormal screening test. The proportion is higher in women aged 20-24 because they account for a small proportion of controls; nevertheless, excluding them does not substantially change this figure.

**Table G** Breakdown of screening histories of women under 65 years old up to six months before diagnosis[a]

| Cervical screening history up to six months prior to diagnosis | Controls | | Cases: stage 1A | | Cases: stage 1B+ | |
|---|---|---|---|---|---|---|
| | N | % | N | % | N | % |
| *No cytology test (except within six months of diagnosis)* | 80 | 15.8 | 15 | 18.1 | 54 | 30.7 |
| *All negative and most recent within* | | | | | | |
| 3 years | 241 | 47.6 | 9 | 10.8 | 39 | 22.2 |
| 4-5 years | 118 | 23.3 | 12 | 14.5 | 25 | 14.2 |
| over 5 years | 41 | 8.1 | 15 | 18.1 | 22 | 12.5 |
| *One borderline or mild* | | | | | | |
| Followed by two negatives | 10 | 2.0 | 3 | 3.6 | 3 | 1.7 |
| Diagnosis over six months later | 5 | 1.0 | 7 | 8.4 | 11 | 6.3 |
| *Cytology warranting colposcopy* | | | | | | |
| Followed by two negatives | 11 | 2.2 | 4 | 4.8 | 7 | 4.0 |
| Diagnosis over six months later | 2 | 0.4 | 18 | 21.7 | 15 | 8.5 |
| **Total** | **506** | **100** | **83** | **100** | **176** | **100** |

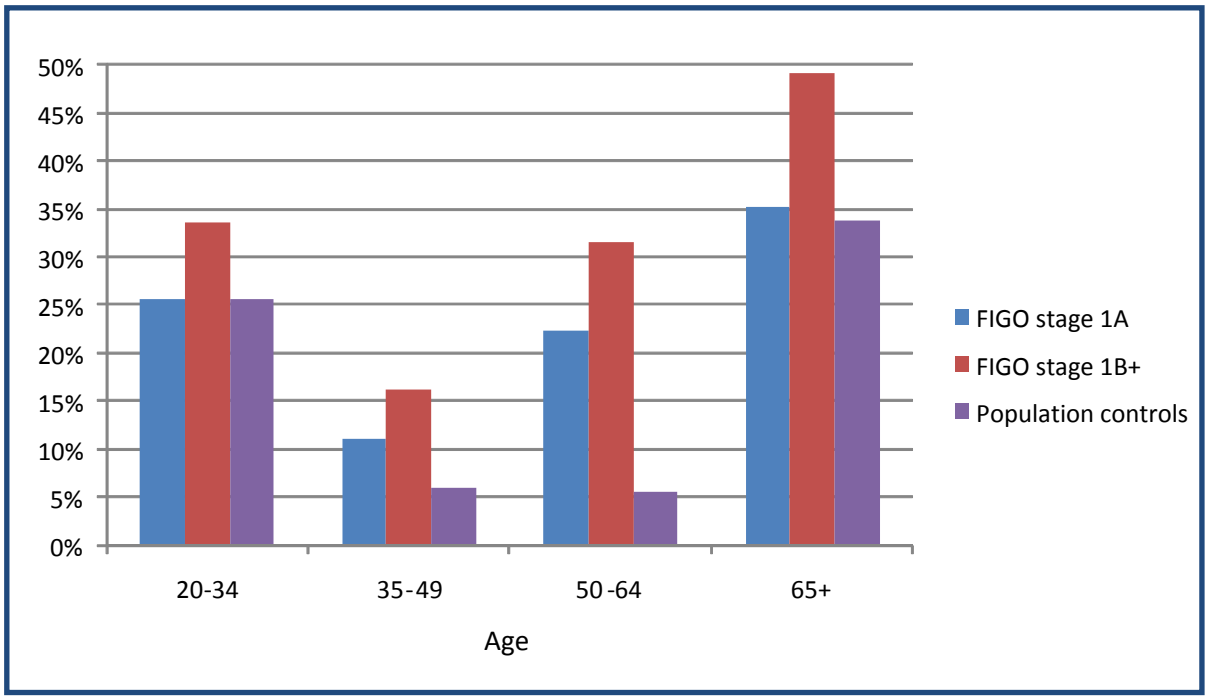
[a] Adapted from Sasieni, Cuzick, Lynch-Farmery, 1996[16]

* This comprises up-to-date routine screening plus up-to-date early recall screening and up-to-date last test suspended screening (1% not shown in Table F).

### 4.6.2 Proportion of women never screened

Figure 7 shows the proportion of cases and controls with no recorded screening history up to six months prior to diagnosis. Cases (n=1034) with no information on stage are excluded from this figure. Cases were generally more likely than controls to have no adequate tests up to six months prior to diagnosis. The exception to this was women aged 20–34 with invasive cervical cancer FIGO stage 1A, who were as likely as controls to have been screened (see section 4.6.4 for comparison with screened controls).

**Figure 7** Proportion of women with no screening test (other than those taken within six months of diagnosis), by FIGO stage and age




### 4.6.3 Coverage and number of cytology tests in the previous three (or five) years

Table H presents a snapshot of the coverage achieved by the cervical screening programme, by age group. NHSCSP statistics for 2009–10 show 3.5-year coverage in women aged 25–49 as 74%, and 5-year coverage for women aged 50–64 as 78.9%.* Results for 5-year age groups are presented in Table 16, which uses 3.0-year coverage for women aged 20–49 and includes comparable NHSCSP data.§ Coverage figures here are based on whether or not a sample of the population has been screened, whereas national coverage figures are based on the total number of women screened and the total population in the age group. The Audit's figures are thus subject to sampling error but are not compromised by a

* See The NHS Information Centre,[10] table 1.
§ See The NHS Information Centre,[10] table 3.

disconnection between the coverage denominator and numerator. Table H quantifies the number of women attending for screening more than once during the recommended interval and reveals that 14% – ie (395+326)/(4424+395+326) – of those screened aged 25–49 had had two or more cytology tests in the previous three years. This figure may be compared with the proportion of screened women on early repeat or suspended screening (Table 15): in women aged 20-49 this is 13%, and in those aged 25-49 (not shown) it is 12%.

**Table H** Proportion of population controls (GP and district) screened in the 3–5 year interval preceding the date of diagnosis of their matched case[a]

| Age | Coverage (>=1 test in interval) | Not screened in previous interval | | Screened once in previous interval | | Screened twice in previous interval | | Screened ≥3 times in previous interval | |
|---|---|---|---|---|---|---|---|---|---|
| | % | N | % | N | % | N | % | N | % |
| 25–49 | 65.6 | 2699 | 34.4 | 4424 | 56.4 | 395 | 5.0 | 326 | 4.2 |
| 50–64 | 78.0 | 453 | 22.0 | 1107 | 53.8 | 404 | 19.6 | 93 | 4.5 |
| 65–79 | 70.7 | 398 | 29.3 | 651 | 47.9 | 268 | 19.7 | 43 | 3.2 |
| 80+ | 31.4 | 514 | 68.6 | 193 | 25.8 | 37 | 4.9 | 5 | 0.7 |
| **Total** | | **4064** | **33.8** | **6375** | **53.1** | **1104** | **9.2** | **467** | **3.9** |

[a] For women under 50 the interval is 3 years; for those over 50 it is five years; for women aged 65+ it is the number of samples taken in the five years before their 65th birthday.

Table H indicates how many women aged 65+ had at least one test between age 60 and 64. It also reveals that a large proportion of women over the age of 50 were screened twice in the previous interval. This is most striking in women aged 50–54 (see Table 16) and is almost certainly because women aged 50 who were screened at age 46 and then again at age 49 were thus screened twice in the previous 5-year interval. For women aged 65–79, the figure of 20% screened twice in the period probably reflects screening policy before 2003, when women in many parts of the country were screened three-yearly up to age 65.
The number screened three or more times in the previous interval comprises women who underwent an early repeat test because of an abnormal result. (A similar figure is reported in the KC53: 3.7% for 2009/10). Women over the age of 80 have low coverage because they would have been over 60 when the screening programme began in 1988 and data prior to 1988 are unreliable.

### 4.6.4 Observed screening interval in women with routine recall

By definition, screen-detected cases are screened shortly before diagnosis. It then remains to be established whether such women were screened less often than screened women who do not have cervical cancer. Table I compares the interval between the previous screening test (if any) and the test that led to diagnosis in potentially screen-detected cases and their screened controls. (A potentially screen-detected case is one in which cytology results are consistent with screen detection; there is no national record of whether the cytology was in response to screening or to symptoms.) If a previous test result is recorded,

the interval starts after an action code of routine recall; if there is no previous adequate test, the time to previous screen is shown as 'none within 9.5 years'.*

Compliance with three yearly screening in women under the age of 50 was poor, reaching a high point of 47% among screened controls aged 35–49. The great majority (78%) of screened controls aged 50–64 had been screened in the previous 5-year period. Significantly, half of these had been screened in the previous 3-year period while only 19% were close to 5 years. Of the women with a routine screen in 2007–10, only 65% had had an earlier screen in the previous 5.5 years. This suggests that the 5-year coverage of 79% relies on excellent coverage among women with early recall and post-colposcopy. It would also appear that 16% of women aged 25–49 with a routine recall interval of 3.5 years were in fact screened between 3.5 and 4.75 years later.

In the 25–34 year age group there was a substantial proportion of women who had never been screened (classified as 'none within 9.5 years'). For women aged 35–49, however, the difference between cases who had not been screened in the last 9.5 years and controls was striking – 31% compared with 10% – and similarly for women aged 50–64. Fewer than 5% of women on routine recall were screened at an interval of under 2.75 years (see Table 17).

In women aged 25–34, those with screen-detected cancer were not screened at longer intervals than screened controls. By contrast, among women aged 35–64 screen-detected cases were much less likely than their screened controls to have been screened 3-yearly (see Table 17a). However, only 22% of cervical cancers in women aged 50–64 (224 of 1034 cases) were potentially screen-detected, compared with 47% (1896 of 3996 cases) in the 25–49 age group. These percentages are similar to those for cancers diagnosed as stage 1A: 49% at age 25-49, and 21% at age 50-64 (see Table 6a).

### 4.6.5 Regular screening interval

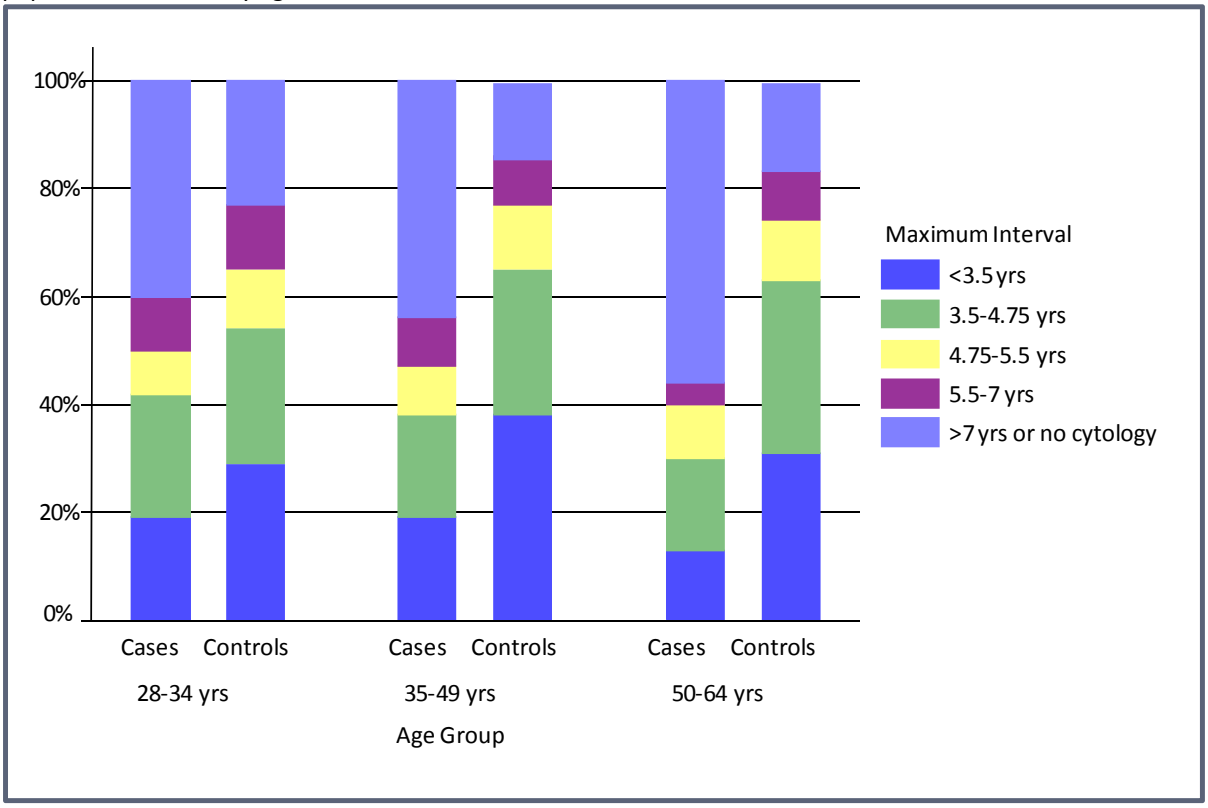
Figure 8 compares the maximum interval between cytology tests for cases with stage 1B or worse cervical cancer and for their population controls. The numbers are presented in Table 18. The analysis shows the longest period between tests in the eight years preceding the date of diagnosis. Women aged under 28 are not included in this analysis because (even allowing for screening from age 20) they would not have been eligible for screening for the whole of the previous 8 years.

In all age groups, women with stage 1B+ cervical cancer were less likely than controls to have been screened at least every 3.5 years during the period analysed. Unlike their older peers, women under age 35 with stage 1B+ cancer were nevertheless as likely as controls to have been screened every 3.5–4.75 years. The difference in the proportion of women with a maximum interval of more than 7 years between cytology tests, or with no cytology recorded, is greatest among women aged 50–64: 56% of those with stage 1B+ cancer were in this category compared with 16% of controls. This corresponds to a relative risk of 6.65 in women with a maximum interval of over 7 years. Since 16% of controls are in this category

* When discussing controls these times are informally referred to as the actual interval after routine recall although, in fact, the calculation looks back from a current test rather than forwards from one resulting in routine recall.

the risk of the population compared to that of those with a shorter interval is 0.16*6.65*0.84 = 1.9. In the absence of screening the (relative) risk of the population would be 6.65. Thus cervical cancer rates in women aged 50-64 today would be more than three times higher (6.65/1.9=3.5) were it not for the screening undertaken over the last decade.

**Figure 8** Maximum interval between cytology tests (in the last 8 years) among stage 1B+ cases and their population controls, by age




## 4.6.6 Colposcopy

Collecting colposcopy data for this Audit has been challenging and the variability of the data collected has made their interpretation still more challenging. Colposcopy history is of particular interest in women who had a cytology test indicating referral to colposcopy more than 4 months before diagnosis. This suggests either a delay (attributable to the woman or her service provider) in administering the diagnostic procedure or the recurrence of a previously-treated cervical abnormality. While 69% of all cervical cancers in the Audit had cytology with an action code of suspend, in only 21% (1314 cases) was the cytology taken more than 4 months before diagnosis (Table 19). Complete colposcopy data for this subset of cases is essential to evaluate colposcopy management as part of the Audit.

**Table I** Time to previous cytology test among potentially screen-detected cases and their screened controls (percentages)

| | Time to previous screen | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Age** | **<3.5 yrs** | | **3.5–4.75 yrs** | | **4.75–5.5 yrs** | | **5.5–9.5 yrs** | | **No previous cytology within 9.5 years** | | **Total** | | **<5.5 yrs** | |
| | **Cases** | **Controls** | **Cases** | **Controls** | **Cases** | **Controls** | **Cases** | **Controls** | **Cases** | **Controls** | **Cases** | **Controls** | **Cases** | **Controls** |
| 25–34 | 28.4 | 31.2 | 15.2 | 14.0 | 6.7 | 7.0 | 16.7 | 14.5 | 33.0 | 33.3 | 100 | 100 | 50.3 | 52.2 |
| 35–49 | 29.8 | 47.3 | 14.5 | 18.3 | 6.3 | 9.5 | 18.1 | 15.5 | 31.3 | 9.5 | 100 | 100 | 50.6 | 75.1 |
| 50–64 | 15.6 | 42.9 | 12.9 | 18.6 | 13.8 | 16.4 | 13.4 | 11.5 | 44.2 | 10.6 | 100 | 100 | 42.4 | 77.9 |
| **Total** | **27.6** | **39.5** | **14.7** | **16.4** | **7.3** | **9.1** | **17.0** | **14.6** | **33.4** | **20.4** | **100** | **100** | **49.6** | **65.0** |

Among those 1314 cases with referral indicated in their cervical screening history more than 4 months before diagnosis, 58% had a colposcopic appointment recorded. All colposcopy appointments attended by these women within 2 months of diagnosis were excluded on the grounds that they would presumably have resulted in the diagnosis of cancer, whereas the Audit's focus is on management prior to diagnosis. Excluding this group left only 437 cases in the Audit with a referral to colposcopy more than 4 months before diagnosis, and these are duly recorded in Table 19.

Table J summarises the colposcopy experience for all women with a cytology test indicating referral to colposcopy more than four months before diagnosis. For the reasons stated above, it excludes colposcopy appointments within two months of diagnosis. Interpretation of the table is difficult, as the results appear to reflect the poor quality of the data rather than the diagnostic pathway as such. It is unclear, for example, why 19% of women with a punch biopsy and a histological diagnosis of CIN2 or worse would return for a further biopsy rather than receive treatment. This may be compounded in the table by the fact that for many appointments a histological diagnosis was recorded but no procedure; these instances have been included with punch biopsies for summary purposes.

Table J Outcome of first colposcopy (recorded in the Audit) compared with the outcome of the subsequent colposcopy in women with an action code of 'suspend' at least six months before diagnosis.[a]

| First colposcopy | Subsequent colposcopy | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | Punch biopsy (or unknown procedure) with a diagnosis of | | | | |
| | No record | DNA | No biopsy/ treatment | <CIN2 | CIN2+ | Inadequate /missing | Treatment | Total |
| No record | 877 | 0 | 0 | 0 | 0 | 0 | 0 | 877 |
| DNA | 3 | 10 | 2 | 0 | 5 | 1 | 1 | 22 |
| No biopsy/treatment on first colposcopy | 6 | 6 | 29 | 2 | 7 | 2 | 24 | 76 |
| Punch biopsy (or unknown procedure) with a diagnosis of | | | | | | | | |
| <CIN2 | 5 | 3 | 10 | 7 | 19 | 0 | 18 | 62 |
| CIN2+ | 17 | 6 | 20 | 6 | 31 | 1 | 82 | 163 |
| Inadequate/missing | 1 | 1 | 1 | 1 | 3 | 0 | 6 | 13 |
| Treatment | 18 | 6 | 29 | 7 | 12 | 1 | 28 | 101 |
| **Total** | **927** | **32** | **91** | **23** | **77** | **5** | **159** | **1314** |

[a] Colposcopy within two months of diagnosis is ignored for the first colposcopy, but not the subsequent one.

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# GLOSSARY

| | |
|---|---|
| Action code | This field (downloaded as part of the screening history from the Exeter system) denotes the action to be taken in response to the result of each cytology test. The codes are:<br>A. Routine screening/call and recall<br>H. Result recorded but no change in current action code. (This code is usually used when privately taken cytology tests are entered into the system.)<br>R. Early recall at interval specified by laboratory<br>S. Suspend recall pending referral |
| Cases | Women diagnosed with invasive cervical cancer in England |
| Controls | Women registered with a GP in England matched by age and place of residence with a case |
| Cervical Screening Evaluation Group | Group charged with evaluating developments in the NHS Cervical Screening Programme. This group oversaw the NHSCSP national audit until February 2011, when an Audit Management Group was established. It consists of a sub-group of individuals from the Evaluation Group and is charged with coordinating the development of audit protocols and with gathering and disseminating recommendations for best practice |
| Exeter call and recall system | System used to invite women for screening. Stores screening records (since 1988) of all women registered with a GP |
| FIGO stage | The International Federation of Gynaecological Oncologists staging classification (I, IA, IA1, IA2, IB, IB1, IB2,III, IIIA, IIIA, IV, IVA, IVB) |
| Hospital Based Programme Coordinators (HBPC) | Named individual within each NHS trust responsible for collating cases of invasive cervical cancer and initiating the audit process. |
| Quality Assurance Reference Centres (QARC) | The nine Quality Assurance Reference Centres (QARCs) in England are responsible for the quality of the screening programme in their area. With the exception of the North East, Yorkshire and The Humber QARC (which covers two separate Strategic Health Authorities) each covers one region of the country. |

# Appendix A: Essential fields

| | | |
|---|---|---|
| **SECTION A & A1** | **Personal details** | NHS number (to be held locally)<br>Date of birth<br>For cases only:<br>Date of diagnosis<br>Stage of tumour (FIGO)<br>Histology |
| **SECTION B** | **Cytology** | No cytology found<br>Date test was taken<br>Result of test |
| **SECTION C** | **Colposcopy** | For cases only:<br>Number of colposcopic appointments<br>Date of colposcopy<br>Satisfactory examination or DNA<br>Surgical procedure |
| **SECTION D1** | **Histology cancer diagnosis** | For cases only:<br>Date of specimen<br>FIGO stage<br>Pathological diagnosis |
| **SECTION D2** | **Specimen history** | Date of specimen<br>Type of specimen<br>Pathological diagnosis<br>Clear margins |
| **SECTION E**<br>**Cytology Review of cases** | **E1. Original slide** | Slide ID<br>Date of original test<br>Cytology type<br>Original test result |
| | **E2. Review results** | Reviewed at<br>Review result |
| **SECTION F**<br>**Histology Review of cases** | **F1. Original specimen** | Specimen ID<br>Date of original specimen |
| | **F2. Review results** | Review pathological diagnosis |
| | **F3. Cancer original specimen** | Specimen ID<br>Date of original specimen |
| | **F4. Cancer review results** | Review pathological diagnosis |
| **SECTION G** | **GP notes** | Although Section G is not essential, if you attempt to collect data, all fields are required |
| **SECTION H** | **HPV DNA Testing** | Date of sample<br>Result |

# Appendix B: Completion of data for the essential fields

**NHS Number** is not received nationally

**B-1** Proportion of essential data collected for cases in **Section A. Personal and cancer details**

| | | Section A: Essential fields | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Date of Birth | | Date of Diagnosis | | Stage[a] | | Histology[a] | |
| QARC region | Case | n | % | n | % | n | % | n | % |
| East of England | 507 | 507 | 100 | 507 | 100 | 454 | 89.5 | 497 | 98.0 |
| East Midlands | 540 | 540 | 100 | 540 | 100 | 441 | 81.7 | 523 | 96.9 |
| London | 681 | 681 | 100 | 681 | 100 | 594 | 87.2 | 647 | 95.0 |
| North East | 430 | 430 | 100 | 430 | 100 | 402 | 93.5 | 409 | 95.1 |
| Yorkshire | 722 | 722 | 100 | 722 | 100 | 580 | 80.3 | 659 | 91.3 |
| North West | 829 | 829 | 100 | 829 | 100 | 678 | 81.8 | 823 | 99.3 |
| South Central | 466 | 466 | 100 | 466 | 100 | 308 | 66.1 | 433 | 92.9 |
| South East Coast | 436 | 436 | 100 | 436 | 100 | 390 | 89.4 | 402 | 92.2 |
| South West | 816 | 816 | 100 | 816 | 100 | 734 | 90.0 | 776 | 95.1 |
| West Midlands | 804 | 804 | 100 | 804 | 100 | 616 | 76.6 | 753 | 93.7 |
| **Total** | **6231** | **6231** | **100** | **6231** | **100** | **5197** | **83.4** | **5922** | **95.0** |

[a] See section 6 for details regarding missing data

**B-1a** Proportion of non-essential data collected for cases in **Section A. Personal and cancer details**

| | | Section A: Non-essential fields | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Treatment (in those with known tx, **excluding** palliative care[a]) | | Treatment (in those with tx recorded **including** palliative care) | | Index of Multiple Deprivation | | | Index of Multiple Deprivation | |
| **QARC region** | **Case** | n | % | n | % | n | % | **All controls** | n | % |
| East of England | 507 | 295 | 58.2 | 309 | 60.9 | 442 | 87.2 | 1822 | 8 | 0.4 |
| East Midlands | 540 | 335 | 62.0 | 358 | 66.3 | 0 | 0 | 1896 | 0 | 0 |
| London | 681 | 307 | 45.1 | 366 | 53.7 | 0 | 0 | 2192 | 0 | 0 |
| North East | 430 | 120 | 27.9 | 124 | 28.8 | 425 | 98.8 | 1572 | 0 | 0 |
| Yorkshire | 722 | 200 | 27.7 | 211 | 29.2 | 700 | 97.0 | 2619 | 0 | 0 |
| North West | 829 | 239 | 28.8 | 317 | 38.2 | 677 | 81.7 | 2819 | 4 | 0.1 |
| South Central | 466 | 259 | 55.6 | 271 | 58.2 | 459 | 98.5 | 1732 | 1712 | 98.8 |
| South East Coast | 436 | 284 | 65.1 | 302 | 69.3 | 428 | 98.2 | 1565 | 1520 | 97.1 |
| South West | 816 | 641 | 78.6 | 691 | 84.7 | 801 | 98.2 | 2754 | 2703 | 98.1 |
| West Midlands | 804 | 406 | 50.5 | 433 | 53.9 | 791 | 98.4 | 2691 | 0 | 0 |
| **Total** | **6231** | **3086** | **49.5** | **3382** | **54.3** | **4723** | **75.8** | **21662** | **5947** | **27.5** |

[a] Where treatment was recorded as 'None' this is interpreted as meaning 'none other than palliative care'. See section 6 for details.

**B-1b** Proportion of cases with FIGO stage reported as '1B+' (1B or worse) or stage not recorded, by QARC region, age and audit year

| QARC region | None recorded | 1B+ (NOS) | Total |
|---|---|---|---|
| East of England | 10.5 | 0.8 | 507 |
| East Midlands | 18.3 | 2.6 | 540 |
| London | 12.8 | 2.6 | 681 |
| North East | 6.5 | 15.8 | 430 |
| Yorkshire | 19.7 | 6.7 | 722 |
| North West | 18.2 | 11.8 | 829 |
| South Central | 33.9 | 0.2 | 466 |
| South East Coast | 10.6 | 0.7 | 436 |
| South West | 10.1 | 2.6 | 816 |
| West Midlands | 23.4 | 0.0 | 804 |
| **Age** | | | |
| <25 | 16.3 | 4.4 | 135 |
| 25–49 | 14.2 | 3.3 | 3,996 |
| 50–64 | 18.8 | 6.8 | 1,034 |
| 65+ | 23.4 | 6.5 | 1,066 |
| **Audit Year** | | | |
| 2007–2008 | 14.3 | 5.4 | 2,089 |
| 2008–2009 | 18.4 | 3.8 | 2,164 |
| 2009–2010 | 17.1 | 4.1 | 1,978 |
| **Total** | **16.6** | **4.4** | **6231** |

**B-2** Proportion of data collected for cases in **Section B. Cytology**

| QARC region | Case | Total no. of tests on cases[a] | Completeness of data among recorded cytology tests | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Date test was taken | | Result of test | | Action code | |
| | | | n | % | n | % | n | % |
| East of England | 507 | 2222 | 2222 | 100 | 2222 | 100 | 2221 | 100 |
| East Midlands | 540 | 2755 | 2755 | 100 | 2755 | 100 | 2750 | 99.8 |
| London | 681 | 1609 | 1609 | 100 | 1609 | 100 | 1609 | 100 |
| North East | 430 | 1769 | 1769 | 100 | 1769 | 100 | 1769 | 100 |
| Yorkshire | 722 | 3378 | 3378 | 100 | 3378 | 100 | 3377 | 100 |
| North West | 829 | 3573 | 3573 | 100 | 3573 | 100 | 3568 | 99.9 |
| South Central | 466 | 1865 | 1865 | 100 | 1865 | 100 | 1862 | 99.8 |
| South East Coast | 436 | 2064 | 2064 | 100 | 2064 | 100 | 2058 | 99.7 |
| South West | 816 | 3381 | 3381 | 100 | 3381 | 100 | 3381 | 100 |
| West Midlands | 804 | 3356 | 3356 | 100 | 3356 | 100 | 3356 | 100 |
| **Total** | **6231** | **25972** | **25972** | **100** | **25954** | **100** | **25951** | **99.9**[b] |

[a] Cytology tests known to the Audit

[b] Cytology data obtained directly from the Exeter system should have all three data fields completed. Missing data is likely to be a result of including in the Audit smears found in the laboratory. These tests will not have an action code as this field is generated by the Exeter system. The action code is missing for two cytology tests taken in the 1970s, before the screening programme was established.

**B-3** Proportion of data collected for cases in **Section C: Colposcopy**

| | Section C: Colposcopy | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | No. of cases with an action code of suspend | No. of cases with a suspend and colposcopy | | Additional cases with colpos-copy but no suspend | No. of colpos-copy appts | Date of colposcopy | | Satisfactory exam or DNA | | Colposcopic procedure | |
| QARC Region | n | n | % | n | n | n | % | n | % | n | % |
| East of England | 349 | 201 | 57.6 | 39 | 348 | 348 | 100 | 348 | 100 | 324 | 93.1 |
| East Midlands | 395 | 65 | 16.5 | 4 | 87 | 87 | 100 | 87 | 100 | 84 | 96.6 |
| London [a] | 473 | 468 | 98.9 | 190 | 899 | 899 | 100 | 0 | 0 | 411 | 45.7 |
| North East | 303 | 106 | 35.0 | 25 | 261 | 261 | 100 | 261 | 100 | 183 | 70.1 |
| Yorkshire | 548 | 145 | 26.5 | 19 | 379 | 379 | 100 | 379 | 100 | 306 | 80.7 |
| North West | 562 | 302 | 53.7 | 42 | 623 | 623 | 100 | 623 | 100 | 497 | 79.8 |
| South Central | 336 | 139 | 41.4 | 14 | 290 | 290 | 100 | 290 | 100 | 242 | 83.4 |
| South East Coast | 316 | 170 | 53.8 | 20 | 363 | 363 | 100 | 359 | 98.9 | 284 | 78.2 |
| South West | 526 | 365 | 69.4 | 42 | 728 | 728 | 100 | 728 | 100 | 619 | 85.0 |
| West Midlands | 500 | 201 | 40.2 | 49 | 370 | 370 | 100 | 370 | 100 | 299 | 80.8 |
| **Total** | **4308** | **2412** | **56.0** | **557** | **4348** | **4348** | **100** | **3445** | **79.2** | **3249** | **74.7** |

a London reports the diagnostic sample for every cancer; this has been taken as a colposcopy appointment making the results look complete. However cases very rarely have any other colposcopy recorded.

# Appendix C: Data tables

## C(i) List of tables

# Appendix C: Data tables

## C(ii) Tables

**Table 1** Number of invasive cervical cancer cases in 2007–2010 audit, by year and QARC region

| | Audit year | | | |
|---|---|---|---|---|
| **QARC region** | **2007-2008** | **2008-2009** | **2009-2010** | **Total** |
| East of England | 175 | 199 | 133 | 507 |
| East Midlands | 198 | 197 | 145 | 540 |
| London | 230 | 223 | 228 | 681 |
| North East | 128 | 149 | 153 | 430 |
| Yorkshire | 249 | 236 | 237 | 722 |
| North West | 298 | 279 | 252 | 829 |
| South Central | 168 | 151 | 147 | 466 |
| South East Coast | 138 | 137 | 161 | 436 |
| South West | 262 | 287 | 267 | 816 |
| West Midlands | 243 | 306 | 255 | 804 |
| **Total** | **2089** | **2164** | **1978** | **6231**[b] |

[a] Audit year runs from 1 April to 31 March.

[b] By April 2010 a total of 1701 cases of invasive cervical cancer diagnosed between April 2009-31st March 2010 had been received. By September 2010 a further 233 cases had been received for the same period, suggesting that next year's report is likely to include additional cancers for the audit years included in this report.

**Table 2** Number and percentage of invasive cervical cancer cases in five-year age groups, by year of diagnosis

| | Age group | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Audit year[a]** | **<20** | **20-24** | **25-29** | **30-34** | **35-39** | **40-44** | **45-49** | **50-55** | **55-59** | **60-64** | **65-69** | **70-74** | **75-79** | **80+** | **Total** |
| 2007-2008 | 0 | 55 | 233 | 295 | 309 | 244 | 183 | 133 | 123 | 110 | 89 | 92 | 83 | 140 | 2,089 |
| 2008-2009 | 1 | 35 | 292 | 316 | 342 | 276 | 170 | 125 | 124 | 113 | 86 | 68 | 71 | 145 | 2,164 |
| 2009-2010 | 0 | 44 | 328 | 299 | 298 | 236 | 175 | 107 | 98 | 101 | 63 | 72 | 61 | 96 | 1,978 |
| **Total** | **1[b]** | **134** | **853** | **910** | **949** | **756** | **528** | **365** | **345** | **324** | **238** | **232** | **215** | **381** | **6231** |
| **Percent** | | | | | | | | | | | | | | | |
| 2007-2008 | 0.0 | 2.6 | 11.2 | 14.1 | 14.8 | 11.7 | 8.8 | 6.4 | 5.9 | 5.3 | 4.3 | 4.4 | 4.0 | 6.7 | 100 |
| 2008-2009 | 0.1 | 1.6 | 13.5 | 14.6 | 15.8 | 12.8 | 7.9 | 5.8 | 5.7 | 5.2 | 4.0 | 3.1 | 3.3 | 6.7 | 100 |
| 2009-2010 | 0.0 | 2.2 | 16.6 | 15.1 | 15.1 | 11.9 | 8.9 | 5.4 | 5.0 | 5.1 | 3.2 | 3.6 | 3.1 | 4.9 | 100 |
| **Total** | **0.0** | **2.2** | **13.7** | **14.6** | **15.2** | **12.1** | **8.5** | **5.9** | **5.5** | **5.2** | **3.8** | **3.7** | **3.5** | **6.1** | **100** |

[a] Audit year runs from 1 April to 31 March.

[b] Case is 16 yrs old.

**Table 3** Number and percentage of invasive cervical cancer cases in 2007–2010 audit for each QARC region, by age

| | Age group | | | | |
|---|---|---|---|---|---|
| **QARC region** | **<25** | **25-49** | **50-64** | **65+** | **Total** |
| East of England | 6 | 342 | 70 | 89 | 507 |
| East Midlands | 12 | 349 | 86 | 93 | 540 |
| London | 19 | 428 | 128 | 106 | 681 |
| North East | 15 | 296 | 60 | 59 | 430 |
| Yorkshire | 15 | 504 | 111 | 92 | 722 |
| North West | 15 | 493 | 148 | 173 | 829 |
| South Central | 11 | 330 | 73 | 52 | 466 |
| South East Coast | 13 | 276 | 78 | 69 | 436 |
| South West | 15 | 497 | 132 | 172 | 816 |
| West Midlands | 14 | 481 | 148 | 161 | 804 |
| **Total** | **135** | **3996** | **1034** | **1066** | **6231** |
| **Percent** | | | | | |
| East of England | 1.2 | 67.5 | 13.8 | 17.6 | 100 |
| East Midlands | 2.2 | 64.6 | 15.9 | 17.2 | 100 |
| London | 2.8 | 62.9 | 18.8 | 15.6 | 100 |
| North East | 3.5 | 68.8 | 14.0 | 13.7 | 100 |
| Yorkshire | 2.1 | 69.8 | 15.4 | 12.7 | 100 |
| North West | 1.8 | 59.5 | 17.9 | 20.9 | 100 |
| South Central | 2.4 | 71.0 | 15.7 | 11.2 | 100 |
| South East Coast | 3.0 | 63.3 | 17.9 | 15.8 | 100 |
| South West | 1.8 | 60.9 | 16.2 | 21.1 | 100 |
| West Midlands | 1.7 | 59.8 | 18.4 | 20.0 | 100 |
| **Total** | **2.2** | **64.1** | **16.6** | **17.1** | **100** |

**Table 4** Number and percentage of invasive cervical cancer cases in 2007–2010 audit, by FIGO stage[a]

| FIGO stage | Number | Percentage |
|---|---|---|
| 1A | 1,963 | 31.5 |
| 1B+ NOS | 275 | 4.4 |
| 1B | 1,775 | 28.5 |
| 2 NOS | 56 | 0.9 |
| 2A | 97 | 1.6 |
| 2B | 485 | 7.8 |
| 3 NOS | 66 | 1.1 |
| 3A | 43 | 0.7 |
| 3B | 222 | 3.6 |
| 4 NOS | 86 | 1.4 |
| 4A | 82 | 1.3 |
| 4B | 47 | 0.8 |
| None recorded | 1,034 | 16.6 |
| **Total** | **6231** | **100** |

[a] NOS= not otherwise specified (or not further specified)

**Table 5** Number of invasive cervical cancer cases in 2007–2010 audit for each QARC region, by FIGO stage

| | FIGO stage | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| QARC region | 1A | 1B | 2 | 3 | 4 | 1B+ (NOS) | None recorded | Total |
| East of England | 151 | 189 | 62 | 26 | 22 | 4 | 53 | 507 |
| East Midlands | 181 | 161 | 53 | 17 | 15 | 14 | 99 | 540 |
| London | 191 | 179 | 103 | 71 | 32 | 18 | 87 | 681 |
| North East | 146 | 130 | 30 | 17 | 11 | 68 | 28 | 430 |
| Yorkshire | 301 | 187 | 24 | 13 | 7 | 48 | 142 | 722 |
| North West | 224 | 251 | 63 | 24 | 18 | 98 | 151 | 829 |
| South Central | 144 | 130 | 18 | 10 | 5 | 1 | 158 | 466 |
| South East Coast | 164 | 123 | 54 | 31 | 15 | 3 | 46 | 436 |
| South West | 269 | 262 | 97 | 51 | 34 | 21 | 82 | 816 |
| West Midlands | 192 | 163 | 134 | 71 | 56 | 0 | 188 | 804 |
| **Total** | **1963** | **1775** | **638** | **331** | **215** | **275** | **1034** | **6231** |

**Table 5a** FIGO stage of invasive cervical cancer cases in 2007–2010: estimated percentage distribution, by QARC region

| | FIGO stage | | | |
|---|---|---|---|---|
| **QARC region** | **1A** | **1B** | **2+** | **Total** |
| East of England | 33.3 | 42.2 | 24.6 | 100 |
| East Midlands | 41.0 | 38.6 | 20.4 | 100 |
| London | 32.2 | 31.5 | 36.3 | 100 |
| North East | 36.3 | 44.0 | 19.6 | 100 |
| Yorkshire | 51.9 | 38.9 | 9.2 | 100 |
| North West | 33.0 | 47.2 | 19.7 | 100 |
| South Central | 46.8 | 42.5 | 10.8 | 100 |
| South East Coast | 42.1 | 32.0 | 26.0 | 100 |
| South West | 36.6 | 37.4 | 26.0 | 100 |
| West Midlands | 31.2 | 26.5 | 42.4 | 100 |
| **England** | **37.8** | **37.3** | **24.9** | **100** |

**Table 6** Number of invasive cervical cancer cases in 2007–2010 audit, by age and FIGO stage

| | FIGO stage | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Age** | **1A** | **1B** | **2** | **3** | **4** | **1B+(NOS)** | **None recorded** | **Total** |
| <25 | 54 | 40 | 7 | 2 | 4 | 6 | 22 | 135 |
| 25-49 | 1,676 | 1,224 | 264 | 88 | 45 | 130 | 569 | 3,996 |
| 50-64 | 179 | 285 | 150 | 95 | 61 | 70 | 194 | 1,034 |
| 65+ | 54 | 226 | 217 | 146 | 105 | 69 | 249 | 1,066 |
| **Total** | **1963** | **1775** | **638** | **331** | **215** | **275** | **1034** | **6231** |

**Table 6a** FIGO stage of invasive cervical cancer cases in 2007–2010 audit: estimated percentage distribution, by age-group

| | FIGO stage | | | | | |
|---|---|---|---|---|---|---|
| **Age** | **1A** | **1B** | **2** | **3** | **4** | **Total** |
| <25 | 47.8 | 39.4 | 6.9 | 2.0 | 3.9 | 100 |
| 25-49 | 48.9 | 38.6 | 8.3 | 2.8 | 1.4 | 100 |
| 50-64 | 21.3 | 37.9 | 20.0 | 12.6 | 8.1 | 100 |
| 65+ | 6.6 | 30.4 | 29.2 | 19.6 | 14.1 | 100 |
| **Total** | **37.8** | **37.3** | **13.4** | **7.0** | **4.5** | **100** |

**Table 7** Number of invasive cervical cancer cases in 2007–2010 audit, by FIGO stage and year of diagnosis

| | FIGO stage | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Year** | **1A** | **1B** | **2** | **3** | **4** | **1B+(NOS)** | **None recorded** | **Total** |
| 2007-2008 | 639 | 596 | 233 | 135 | 76 | 112 | 298 | 2,089 |
| 2008-2009 | 646 | 598 | 239 | 120 | 81 | 82 | 398 | 2,164 |
| 2009-2010 | 678 | 581 | 166 | 76 | 58 | 81 | 338 | 1,978 |
| **Total** | **1963** | **1775** | **638** | **331** | **215** | **275** | **1034** | **6231** |

**Table 7a** Number of invasive cervical cancer cases in 2007–2010 audit, by FIGO stage and year of diagnosis

| | FIGO stage | | | | | |
|---|---|---|---|---|---|---|
| **Year** | **1A** | **1B** | **2** | **3** | **4** | **Total** |
| 2007-2008 | 35.7 | 36.9 | 14.4 | 8.3 | 4.7 | 100 |
| 2008-2009 | 36.6 | 36.5 | 14.6 | 7.3 | 4.9 | 100 |
| 2009-2010 | 41.3 | 38.7 | 11.1 | 5.1 | 3.9 | 100 |
| **Total** | **37.8** | **37.3** | **13.4** | **7.0** | **4.5** | **100** |

**Table 8** Number and percentage of invasive cervical cancer cases in 2007–2010 audit, by histology

| | Histology | | | | | | |
|---|---|---|---|---|---|---|---|
| **Year** | **Squamous** | **Adenocarcinoma** | **Adeno-squamous** | **Undifferentiated** | **Other** | **None recorded** | **Total** |
| 2007-2008 | 1,474 | 393 | 59 | 11 | 28 | 124 | 2,089 |
| 2008-2009 | 1,514 | 434 | 65 | 13 | 28 | 110 | 2,164 |
| 2009-2010 | 1,423 | 389 | 56 | 10 | 25 | 75 | 1,978 |
| **Total** | **4411** | **1216** | **180** | **34** | **81** | **309** | **6231** |
| **Percent** | | | | | | | |
| 2007-2008 | 70.6 | 18.8 | 2.8 | 0.5 | 1.3 | 5.9 | 100 |
| 2008-2009 | 70.0 | 20.1 | 3.0 | 0.6 | 1.3 | 5.1 | 100 |
| 2009-2010 | 71.9 | 19.7 | 2.8 | 0.5 | 1.3 | 3.8 | 100 |
| **Total** | **70.8** | **19.5** | **2.9** | **0.6** | **1.3** | **5.0** | **100** |

**Table 9** Number and percentage of invasive cervical cancer cases in 2007–2010 audit, by age at diagnosis and histology

| | Histology | | | | | |
|---|---|---|---|---|---|---|
| **Age** | **Squamous** | **Adenocarcinoma** | **Adeno-squamous** | **Other, including undifferentiated** | **None recorded** | **Total** |
| <25 | 101 | 16 | 7 | 6 | 5 | 135 |
| 25-49 | 2837 | 810 | 112 | 47 | 190 | 3,996 |
| 50-64 | 717 | 208 | 37 | 18 | 54 | 1,034 |
| 65+ | 756 | 182 | 24 | 44 | 60 | 1,066 |
| **Total** | **4411** | **1216** | **180** | **115** | **309** | **6231** |
| **Percent** | | | | | | |
| <25 | 74.8 | 11.9 | 5.2 | 4.4 | 3.7 | 100 |
| 25-49 | 71.0 | 20.3 | 2.8 | 1.2 | 4.8 | 100 |
| 50-64 | 69.3 | 20.1 | 3.6 | 1.7 | 5.2 | 100 |
| 65+ | 70.9 | 17.1 | 2.3 | 4.1 | 5.6 | 100 |
| **All ages** | **70.8** | **19.5** | **2.9** | **1.8** | **5.0** | **100** |

**Table 10** Percentage of invasive cervical cancer cases in 2007–2010 audit, by FIGO stage and histology

| | Histology | | | | | |
|---|---|---|---|---|---|---|
| **Stage** | **Squamous** | **Adenocarcinoma** | **Adeno-squamous** | **Other, including undifferentiated** | **None recorded** | **Total** |
| 1A | 35.9 | 21.8 | 8.9 | 11.3 | 28.2 | 31.5 |
| 1B+ | 49.4 | 61.5 | 72.2 | 52.2 | 37.2 | 51.9 |
| None recorded | 14.7 | 16.7 | 18.9 | 36.5 | 34.6 | 16.6 |
| **Total** | **100** | **100** | **100** | **100** | **100** | **100** |

**Table 11** Number of invasive cervical cancer cases in 2007–2010 audit for each QARC region, by treatment

| QARC Region | Treatment | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | None | Cone biopsy/ loop excision | Trachelectomy | Simple hysterectomy | Radical hysterectomy | Hysterectomy/ radiotherapy | Hysterectomy/ chemotherapy | Hysterectomy/ radio/chemo | Radiotherapy | Chemotherapy | Radiotherapy/ chemotherapy | Other | None recorded | Total |
| East of England | 14 | 108 | 12 | 14 | 63 | 7 | 1 | 18 | 25 | 2 | 45 | 0 | 198 | 507 |
| East Midlands | 23 | 110 | 4 | 23 | 68 | 9 | 1 | 2 | 26 | 7 | 85 | 0 | 182 | 540 |
| London | 59 | 70 | 19 | 20 | 56 | 6 | 0 | 7 | 42 | 24 | 52 | 11 | 315 | 681 |
| North East | 4 | 42 | 2 | 8 | 36 | 1 | 0 | 2 | 6 | 1 | 22 | 0 | 306 | 430 |
| Yorkshire | 11 | 80 | 4 | 17 | 41 | 0 | 1 | 5 | 14 | 5 | 33 | 0 | 511 | 722 |
| North West | 78 | 149 | 2 | 19 | 28 | 2 | 2 | 1 | 11 | 3 | 22 | 0 | 512 | 829 |
| South Central | 12 | 150 | 4 | 7 | 52 | 3 | 1 | 0 | 12 | 4 | 26 | 0 | 195 | 466 |
| South East Coast | 18 | 75 | 8 | 28 | 71 | 6 | 1 | 10 | 9 | 5 | 71 | 0 | 134 | 436 |
| South West | 50 | 192 | 20 | 43 | 138 | 12 | 3 | 20 | 59 | 15 | 139 | 0 | 125 | 816 |
| West Midlands | 27 | 91 | 2 | 52 | 38 | 8 | 3 | 13 | 63 | 8 | 128 | 0 | 371 | 804 |
| **Total** | **296** | **1067** | **77** | **231** | **591** | **54** | **13** | **78** | **267** | **74** | **623** | **11** | **2849** | **6231** |

**Table 11a** Percentage of invasive cervical cancer cases in 2007–2010 audit for each QARC region, by treatment

| | Treatment | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **QARC region** | **None** | **Cone biopsy/ loop excision** | **Trachelectomy** | **Simple hysterectomy** | **Radical hysterectomy** | **Hysterectomy/ radiotherapy** | **Hysterectomy/ chemotherapy** | **Hysterectomy/ radio/ chemo** | **Radiotherapy** | **Chemotherapy** | **Radiotherapy/ chemotherapy** | **Other** | **None recorded** | **Total** |
| East of England | 2.8 | 21.3 | 2.4 | 2.8 | 12.4 | 1.4 | 0.2 | 3.6 | 4.9 | 0.4 | 8.9 | 0.0 | 39.1 | 100 |
| East Midlands | 4.3 | 20.4 | 0.7 | 4.3 | 12.6 | 1.7 | 0.2 | 0.4 | 4.8 | 1.3 | 15.7 | 0.0 | 33.7 | 100 |
| London | 8.7 | 10.3 | 2.8 | 2.9 | 8.2 | 0.9 | 0.0 | 1.0 | 6.2 | 3.5 | 7.6 | 1.6 | 46.3 | 100 |
| North East | 0.9 | 9.8 | 0.5 | 1.9 | 8.4 | 0.2 | 0.0 | 0.5 | 1.4 | 0.2 | 5.1 | 0.0 | 71.2 | 100 |
| Yorkshire | 1.5 | 11.1 | 0.6 | 2.4 | 5.7 | 0.0 | 0.1 | 0.7 | 1.9 | 0.7 | 4.6 | 0.0 | 70.8 | 100 |
| North West | 9.4 | 18.0 | 0.2 | 2.3 | 3.4 | 0.2 | 0.2 | 0.1 | 1.3 | 0.4 | 2.7 | 0.0 | 61.8 | 100 |
| South Central | 2.6 | 32.2 | 0.9 | 1.5 | 11.2 | 0.6 | 0.2 | 0.0 | 2.6 | 0.9 | 5.6 | 0.0 | 41.8 | 100 |
| South East Coast | 4.1 | 17.2 | 1.8 | 6.4 | 16.3 | 1.4 | 0.2 | 2.3 | 2.1 | 1.1 | 16.3 | 0.0 | 30.7 | 100 |
| South West | 6.1 | 23.5 | 2.5 | 5.3 | 16.9 | 1.5 | 0.4 | 2.5 | 7.2 | 1.8 | 17.0 | 0.0 | 15.3 | 100 |
| West Midlands | 3.4 | 11.3 | 0.2 | 6.5 | 4.7 | 1.0 | 0.4 | 1.6 | 7.8 | 1.0 | 15.9 | 0.0 | 46.1 | 100 |
| **Total** | **4.8** | **17.1** | **1.2** | **3.7** | **9.5** | **0.9** | **0.2** | **1.3** | **4.3** | **1.2** | **10.0** | **0.2** | **45.7** | **100** |

**Table 12** Number and percentage of invasive cervical cancer cases in 2007–2010 audit, by age at diagnosis and treatment

| | Age group | | | | |
|---|---|---|---|---|---|
| **Treatment** | **<50** | **50-64** | **65-79** | **80+** | **Total** |
| None | 116 | 52 | 58 | 70 | 296 |
| Cone biopsy/loop excision | 958 | 85 | 18 | 6 | 1067 |
| Trachelectomy | 77 | 0 | 0 | 0 | 77 |
| Hysterectomy only (simple or radical) | 645 | 127 | 33 | 17 | 822 |
| Radiotherapy (+/- hysterectomy) | 75 | 59 | 95 | 92 | 321 |
| Chemotherapy (+/- hysterectomy) | 44 | 26 | 14 | 3 | 87 |
| Chemo-radiotherapy (+/- hysterectomy) | 340 | 197 | 142 | 22 | 701 |
| None recorded (other) | 1876 | 488 | 325 | 171 | 2860 |
| **Total** | **4131** | **1034** | **685** | **381** | **6231** |
| **Percent** | | | | | |
| None | 2.8 | 5.0 | 8.5 | 18.4 | 4.8 |
| Cone biopsy/ loop excision | 23.2 | 8.2 | 2.6 | 1.6 | 17.1 |
| Trachelectomy | 1.9 | 0.0 | 0.0 | 0.0 | 1.2 |
| Hysterectomy only (simple or radical) | 15.6 | 12.3 | 4.8 | 4.5 | 13.2 |
| Radiotherapy (+/- hysterectomy) | 1.8 | 5.7 | 13.9 | 24.1 | 5.2 |
| Chemotherapy (+/- hysterectomy) | 1.1 | 2.5 | 2.0 | 0.8 | 1.4 |
| Chemo-radiotherapy (+/- hysterectomy) | 8.2 | 19.1 | 20.7 | 5.8 | 11.3 |
| None recorded (other) | 45.4 | 47.2 | 47.4 | 44.9 | 45.9 |
| **Total** | **100** | **100** | **100** | **100** | **100** |

**Table 13** Number of invasive cervical cancer cases in 2007–2010 audit, by FIGO stage and treatment

| | FIGO stage | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Treatment** | **1A** | **1B** | **2** | **3** | **4** | **1B+(NOS)** | **None recorded** | **Total** |
| None | 50 | 57 | 36 | 25 | 29 | 20 | 79 | 296 |
| Cone biopsy/ loop excision | 762 | 192 | 3 | 2 | 2 | 16 | 90 | 1067 |
| Trachelectomy | 11 | 59 | 1 | 0 | 0 | 1 | 5 | 77 |
| Hysterectomy | 223 | 487 | 32 | 3 | 2 | 20 | 55 | 822 |
| Radiotherapy (+/- hyst) | 16 | 73 | 87 | 49 | 48 | 9 | 39 | 321 |
| Chemotherapy (+/- hyst) | 4 | 21 | 16 | 14 | 15 | 4 | 13 | 87 |
| Radiotherapy/chemotherapy (+/- hyst) | 29 | 170 | 246 | 110 | 52 | 31 | 63 | 701 |
| None recorded (other) | 868 | 716 | 217 | 128 | 67 | 174 | 690 | 2,860 |
| **Total** | **1963** | **1775** | **638** | **331** | **215** | **275** | **1034** | **6231** |

**Table 13a** FIGO stage of invasive cervical cancer cases: estimated percentage distribution in 2007–2010 audit, by treatment

| | FIGO stage | | | | | |
|---|---|---|---|---|---|---|
| **Treatment** | **1A** | **1B** | **2** | **3** | **4** | **Total** |
| None | 23.0 | 29.8 | 18.8 | 13.1 | 15.2 | 100 |
| Cone biopsy/ loop excision | 78.0 | 21.2 | 0.3 | 0.2 | 0.2 | 100 |
| Trachelectomy | 15.3 | 83.3 | 1.4 | 0.0 | 0.0 | 100 |
| Hysterectomy | 29.1 | 65.9 | 4.3 | 0.4 | 0.3 | 100 |
| Radiotherapy (+/- hyst) | 5.7 | 26.8 | 31.9 | 18.0 | 17.6 | 100 |
| Chemotherapy (+/- hyst) | 5.4 | 30.1 | 22.9 | 20.1 | 21.5 | 100 |
| Radiotherapy/chemotherapy (+/- hyst) | 4.5 | 28.1 | 40.6 | 18.2 | 8.6 | 100 |
| None recorded (other) | 40.0 | 38.1 | 11.5 | 6.8 | 3.6 | 100 |
| **Total** | **37.8** | **37.3** | **13.4** | **7.0** | **4.5** | **100** |

**Table 14** Cervical screening status of invasive cervical cancer cases and controls under age 65, up to six months prior to diagnosis (percentages)

| Cervical screening history up to six months prior to diagnosis | Population controls | | Cases: stage 1A | | Cases: stage 1B+ | | Cases: stage not recorded | |
|---|---|---|---|---|---|---|---|---|
| | N | % | N | % | N | % | N | % |
| ***No cytology test (except within six months of diag)*** | 1340 | 13.1 | 369 | 19.3 | 625 | 25.3 | 200 | 25.5 |
| ***Last smear routine and*** | | | | | | | | |
| Up-to-date | 5,815 | 56.5 | 371 | 19.4 | 575 | 23.3 | 169 | 21.5 |
| Lapsed | 2,012 | 19.7 | 641 | 33.6 | 726 | 29.4 | 244 | 31.1 |
| ***Last smear early repeat and*** | | | | | | | | |
| Up-to-date | 426 | 4.2 | 159 | 8.3 | 129 | 5.2 | 29 | 3.7 |
| Lapsed | 466 | 4.6 | 150 | 7.9 | 208 | 8.4 | 76 | 9.7 |
| ***Last smear suspend (not followed by any negative(s))*** | 83 | 0.8 | 208 | 10.9 | 196 | 7.9 | 61 | 7.8 |
| ***Last smear suspend (followed by at least one negative)*** | 84 | 0.8 | 11 | 0.6 | 12 | 0.5 | 6 | 0.8 |
| **Total** | **10,226** | **100** | **1909** | **100** | **2471** | **100** | **785** | **100** |

**Table 15** Cervical screening status of invasive cervical cancer cases and controls up to six months prior to diagnosis (numbers and percentages), by age

| | All cases | | | | Controls | | | |
|---|---|---|---|---|---|---|---|---|
| **Cervical screening history up to six months prior to diagnosis** | **20-49** | **50-64** | **65-79** | **80+** | **20-49** | **50-64** | **65-79** | **80+** |
| ***No cytology test (except within six months of diagnosis)*** | 885 | 308 | 252 | 269 | 1222 | 113 | 213 | 499 |
| ***Last smear routine and*** | | | | | | | | |
| Up-to-date | 822 | 293 | 267 | 96 | 4308 | 1507 | 945 | 237 |
| Lapsed | 1391 | 220 | 82 | 0 | 1707 | 305 | 155 | 1 |
| ***Last smear early repeat and*** | | | | | | | | |
| Up-to-date | 271 | 46 | 11 | 7 | 388 | 38 | 9 | 3 |
| Lapsed | 356 | 78 | 52 | 6 | 389 | 77 | 35 | 8 |
| ***Last smear suspend**** | 405 | 89 | 21 | 3 | 150 | 17 | 3 | 1 |
| **Total** | **4130** | **1034** | **685** | **381** | **8164** | **2057** | **1360** | **749** |
| **Percent** | | | | | | | | |
| ***No cytology test (except within six months of diagnosis)*** | 21.4 | 29.8 | 36.8 | 70.6 | 15.0 | 5.5 | 15.7 | 66.6 |
| ***Last smear routine and*** | | | | | | | | |
| Up-to-date | 19.9 | 28.3 | 39.0 | 25.2 | 52.8 | 73.3 | 69.5 | 31.6 |
| Lapsed | 33.7 | 21.3 | 12.0 | 0.0 | 20.9 | 14.8 | 11.4 | 0.1 |
| ***Last smear early repeat and*** | | | | | | | | |
| Up-to-date | 6.6 | 4.5 | 1.6 | 1.8 | 4.8 | 1.9 | 0.7 | 0.4 |
| Lapsed | 8.6 | 7.5 | 7.6 | 1.6 | 4.8 | 3.7 | 2.6 | 1.1 |
| ***Last smear suspend**** | | | | | | | | |
| | 9.8 | 8.6 | 3.1 | 0.8 | 1.8 | 0.8 | 0.2 | 0.1 |
| **Total** | **100** | **100** | **100** | **100** | **100** | **100** | **100** | **100** |

* The categories ‘last smear suspend (not followed by any negative)’ and ‘last smear suspend (followed by al least one negative)’ found in table 14 are combined as they are small numbers

**Table 16** Number and percentage of population controls (GP plus district controls) screened in the 3–5 year interval preceding the date of diagnosis of their matched case (aged 25–64), by QARC region

| Age | | Total | Not screened in previous interval | Screened once in previous interval | Screened twice in previous interval | Screened ≥3 times in previous interval |
|---|---|---|---|---|---|---|
| 20-24 | | 323 | 265 | 46 | 3 | 9 |
| 25-29 | | 1621 | 682 | 764 | 93 | 82 |
| 30-34 | | 1789 | 593 | 1004 | 111 | 81 |
| 35-39 | | 1911 | 646 | 1090 | 97 | 78 |
| 40-44 | | 1504 | 450 | 947 | 50 | 57 |
| 45-49 | | 1019 | 328 | 619 | 44 | 28 |
| 50-54 | | 747 | 140 | 343 | 212 | 52 |
| 55-59 | | 687 | 156 | 407 | 96 | 28 |
| 60-64 | | 623 | 157 | 357 | 96 | 13 |
| 65-69 | | 461 | 125 | 233 | 90 | 13 |
| 70-74 | | 469 | 141 | 220 | 91 | 17 |
| 75-79 | | 430 | 132 | 198 | 87 | 13 |
| 80+ | | 749 | 514 | 193 | 37 | 5 |
| **Total** | | 12333 | 4329 | 6421 | 1107 | 476 |
| **Percent** | **National coverage 2010[a]** | **Audit coverage (>=1 test in interval)** | % | % | % | % |
| 20-24[b] | 5.4 | 18.0† | 82.0 | 14.2 | 0.9 | 2.8 |
| 25-29 | 59.9 | 57.9 | 42.1 | 47.1 | 5.7 | 5.1 |
| 30-34 | 68.3 | 66.9 | 33.1 | 56.1 | 6.2 | 4.5 |
| 35-39 | 72.3 | 66.2 | 33.8 | 57.0 | 5.1 | 4.1 |
| 40-44 | 74.2 | 70.1 | 29.9 | 63.0 | 3.3 | 3.8 |
| 45-49 | 74.7 | 67.8 | 32.2 | 60.7 | 4.3 | 2.7 |
| 50-54 | 82.6 | 81.3 | 18.7 | 45.9 | 28.4 | 7.0 |
| 55-59 | 78.3 | 77.3 | 22.7 | 59.2 | 14.0 | 4.1 |
| 60-64 | 75.1 | 74.8 | 25.2 | 57.3 | 15.4 | 2.1 |
| 65-69 | - | 72.9 | 27.1 | 50.5 | 19.5 | 2.8 |
| 70-74 | - | 69.9 | 30.1 | 46.9 | 19.4 | 3.6 |
| 75-79 | - | 69.3 | 30.7 | 46.0 | 20.2 | 3.0 |
| 80+ | - | 31.4 | 68.6 | 25.8 | 4.9 | 0.7 |
| **Total** | | | **35.1** | **52.1** | **9.0** | **3.9** |

[a] Source: *Cervical Screening Programme, England: 2009-10*; 3-yearly coverage has been calculated using Table 2 for women aged 20-49.[9]

[b] While 55% of controls aged 20-24 are aged 24, only 9% are aged 20 or 21. This age group thus reflects the age at which their matched cases were diagnosed and not the distribution of women aged 20-24 nationally. This helps explains the difference in coverage nationally and in the Audit.

**Table 16a** Number and percentage of population controls (GP plus district controls) screened in the 3–5 year interval preceding the date of diagnosis of their matched case (aged 25–64), by QARC region

| QARC | Total | Not screened in previous interval | Screened once in previous interval | Screened twice in previous interval | Screened ≥3 times in previous interval |
|---|---|---|---|---|---|
| East of England | 819 | 253 | 490 | 50 | 26 |
| East Midlands | 857 | 231 | 517 | 72 | 37 |
| London | 1036 | 370 | 541 | 89 | 36 |
| North East | 699 | 214 | 383 | 66 | 36 |
| Yorkshire | 1211 | 401 | 679 | 87 | 44 |
| North West | 1272 | 411 | 677 | 115 | 69 |
| South Central | 804 | 258 | 458 | 63 | 25 |
| South East Coast | 708 | 230 | 393 | 51 | 34 |
| South West | 1250 | 389 | 706 | 92 | 63 |
| West Midlands | 1245 | 395 | 687 | 114 | 49 |
| **Total** | **9901** | **3152** | **5531** | **799** | **419** |
| **Percent** | **Coverage (>=1 test in interval)** | | | | |
| East of England | 69.1 | 30.9 | 59.8 | 6.1 | 3.2 |
| East Midlands | 73.0 | 27.0 | 60.3 | 8.4 | 4.3 |
| London | 64.3 | 35.7 | 52.2 | 8.6 | 3.5 |
| North East | 69.4 | 30.6 | 54.8 | 9.4 | 5.2 |
| Yorkshire | 66.9 | 33.1 | 56.1 | 7.2 | 3.6 |
| North West | 67.7 | 32.3 | 53.2 | 9.0 | 5.4 |
| South Central | 67.9 | 32.1 | 57.0 | 7.8 | 3.1 |
| South East Coast | 67.5 | 32.5 | 55.5 | 7.2 | 4.8 |
| South West | 68.9 | 31.1 | 56.5 | 7.4 | 5.0 |
| West Midlands | 68.3 | 31.7 | 55.2 | 9.2 | 3.9 |
| **Total** | | **31.8** | **55.9** | **8.1** | **4.2** |

**Table 17** Time to previous cytology test among screened controls

| | Time to previous cytology | | | | | | |
|---|---|---|---|---|---|---|---|
| **Age** | **<2.75 yrs** | **2.75-3.5 yrs** | **3.5-4.75 yrs** | **4.75-5.5 yrs** | **5.5-9.5 yrs** | **No previous cytology within 9.5 years** | **Total** |
| 25-29 | 14 | 105 | 55 | 23 | 58 | 225 | 480 |
| 30-34 | 20 | 162 | 80 | 44 | 82 | 96 | 484 |
| 35-39 | 25 | 173 | 83 | 34 | 82 | 54 | 451 |
| 40-44 | 13 | 131 | 58 | 33 | 43 | 24 | 302 |
| 45-49 | 7 | 91 | 29 | 21 | 19 | 10 | 177 |
| 50-54 | 5 | 53 | 16 | 5 | 6 | 8 | 93 |
| 55-59 | 5 | 22 | 13 | 17 | 9 | 8 | 74 |
| 60-64 | 0 | 12 | 13 | 15 | 11 | 8 | 59 |
| **Total** | **89** | **749** | **347** | **192** | **310** | **433** | **2120** |
| **Percent** | | | | | | | |
| 25-29 | 2.9 | 21.9 | 11.5 | 4.8 | 12.1 | 46.9 | 100 |
| 30-34 | 4.1 | 33.5 | 16.5 | 9.1 | 16.9 | 19.8 | 100 |
| 35-39 | 5.5 | 38.4 | 18.4 | 7.5 | 18.2 | 12.0 | 100 |
| 40-44 | 4.3 | 43.4 | 19.2 | 10.9 | 14.2 | 7.9 | 100 |
| 45-49 | 4.0 | 51.4 | 16.4 | 11.9 | 10.7 | 5.6 | 100 |
| 50-54 | 5.4 | 57.0 | 17.2 | 5.4 | 6.5 | 8.6 | 100 |
| 55-59 | 6.8 | 29.7 | 17.6 | 23.0 | 12.2 | 10.8 | 100 |
| 60-64 | 0.0 | 20.3 | 22.0 | 25.4 | 18.6 | 13.6 | 100 |
| **Total** | **4.2** | **35.3** | **16.4** | **9.1** | **14.6** | **20.4** | **100** |

**Table 17a** Time to previous cytology test among potentially screen-detected cases of cervical cancer and their screened controls

| | Time to previous cytology test | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Age** | **<3.5 yrs** | | **3.5-4.75 yrs** | | **4.75-5.5 yrs** | | **5.5-9.5 yrs** | | **No previous cytology within 9.5 yrs** | | **Total** | | **<5.5 yrs** | |
| | **Cases** | **Controls** | **Cases** | **Controls** | **Cases** | **Controls** | **Cases** | **Controls** | **Cases** | **Controls** | **Cases** | **Controls** | **Cases** | **Controls** |
| 25-34 | 277 | 301 | 148 | 135 | 65 | 67 | 163 | 140 | 322 | 321 | 975 | 964 | 490 | 503 |
| 35-49 | 274 | 440 | 134 | 170 | 58 | 88 | 167 | 144 | 288 | 88 | 921 | 930 | 466 | 698 |
| 50-64 | 35 | 97 | 29 | 42 | 31 | 37 | 30 | 26 | 99 | 24 | 224 | 226 | 95 | 176 |
| **Total** | **586** | **838** | **311** | **347** | **154** | **192** | **360** | **310** | **709** | **433** | **2120** | **2120** | **1051** | **1377** |
| **Percent** | | | | | | | | | | | | | | |
| | **Cases** | **Controls** | **Cases** | **Controls** | **Cases** | **Controls** | **Cases** | **Controls** | **Cases** | **Controls** | **Cases** | **Controls** | **Cases** | **Controls** |
| 25-34 | 28.4 | 31.2 | 15.2 | 14.0 | 6.7 | 7.0 | 16.7 | 14.5 | 33.0 | 33.3 | 100 | 100 | 50.3 | 52.2 |
| 35-49 | 29.8 | 47.3 | 14.5 | 18.3 | 6.3 | 9.5 | 18.1 | 15.5 | 31.3 | 9.5 | 100 | 100 | 50.6 | 75.1 |
| 50-64 | 15.6 | 42.9 | 12.9 | 18.6 | 13.8 | 16.4 | 13.4 | 11.5 | 44.2 | 10.6 | 100 | 100 | 42.4 | 77.9 |
| **Total** | **27.6** | **39.5** | **14.7** | **16.4** | **7.3** | **9.1** | **17.0** | **14.6** | **33.4** | **20.4** | **100** | **100** | **49.6** | **65.0** |

**Table 18** Maximum interval between cytology tests (over the previous 8 years) among cases with FIGO stage 1B+ and their population controls

| Age | Maximum interval between cytology tests | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | <3.5 yrs | | 3.5-4.75 yrs | | 4.75-5.5 yrs | | 5.5-7yrs | | >7 yrs or no cytology | | Total | |
| | Cases | Controls | Cases | Controls | Cases | Controls | Cases | Controls | Cases | Controls | Cases | Controls |
| 28-34 | 105 | 313 | 125 | 266 | 45 | 120 | 55 | 125 | 218 | 242 | 548 | 1066 |
| 35-49 | 211 | 839 | 206 | 588 | 100 | 261 | 104 | 195 | 490 | 329 | 1111 | 2212 |
| 50-64 | 89 | 411 | 109 | 419 | 63 | 143 | 29 | 122 | 370 | 210 | 660 | 1305 |
| **Total** | **405** | **1563** | **440** | **1273** | **208** | **524** | **188** | **442** | **1078** | **781** | **2319** | **4583** |
| **Percent** | | | | | | | | | | | | |
| 28-34 | 19.2 | 29.4 | 22.8 | 25.0 | 8.2 | 11.3 | 10.0 | 11.7 | 39.8 | 22.7 | 100 | 100 |
| 35-49 | 19.0 | 37.9 | 18.5 | 26.6 | 9.0 | 11.8 | 9.4 | 8.8 | 44.1 | 14.9 | 100 | 100 |
| 50-64 | 13.5 | 31.5 | 16.5 | 32.1 | 9.5 | 11.0 | 4.4 | 9.3 | 56.1 | 16.1 | 100 | 100 |
| **Total** | **17.5** | **34.1** | **19.0** | **27.8** | **9.0** | **11.4** | **8.1** | **9.6** | **46.5** | **17.0** | **100** | **100** |

**Table 19** Number and percentage of invasive cervical cancer cases in 2007–2010 audit with colposcopic appointment recorded, by QARC region

| QARC region | Number of cases | Cases with a recorded colposcopy | | Cases with an action code 'suspend' | | Cases with 'suspend' code >4 months before diagnosis | | Cases with 'suspend' code >4 months before diagnosis + colposcopy | | Cases with 'suspend' >4 months before diagnosis + colposcopy (excluding colposcopy within 2 months of diagnosis) | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | n | % | n | % | n | % | n | % | n | % |
| East of England | 507 | 240 | 47.3 | 349 | 68.8 | 76 | 15.0 | 44 | 57.9 | 30 | 39.5 |
| East Midlands | 540 | 69 | 12.8 | 395 | 73.1 | 124 | 23.0 | 32 | 25.8 | 19 | 15.3 |
| London | 681 | 658 | 96.6 | 473 | 69.5 | 141 | 20.7 | 139 | 98.6 | 70 | 49.6 |
| North East | 430 | 131 | 30.5 | 303 | 70.5 | 68 | 15.8 | 23 | 33.8 | 14 | 20.6 |
| Yorkshire | 722 | 164 | 22.7 | 548 | 75.9 | 190 | 26.3 | 69 | 36.3 | 45 | 23.7 |
| North West | 829 | 344 | 41.5 | 562 | 67.8 | 192 | 23.2 | 112 | 58.3 | 74 | 38.5 |
| South Central | 466 | 153 | 32.8 | 336 | 72.1 | 92 | 19.7 | 40 | 43.5 | 29 | 31.5 |
| South East Coast | 436 | 190 | 43.6 | 316 | 72.5 | 107 | 24.5 | 51 | 47.7 | 41 | 38.3 |
| South West | 816 | 407 | 49.9 | 526 | 64.5 | 174 | 21.3 | 117 | 67.2 | 85 | 48.9 |
| West Midlands | 804 | 370 | 46.0 | 500 | 62.2 | 150 | 18.7 | 92 | 61.3 | 30 | 20.0 |
| **Total** | **6231** | **2726** | **43.7** | **4308** | **69.1** | **1314** | **21.1** | **719** | **54.7** | **437** | **33.3** |

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