

National COPD Audit Programme



COPD: Who cares when it matters most?

National Chronic Obstructive Pulmonary Disease (COPD) Audit Programme:
Outcomes from the clinical audit of COPD exacerbations admitted to acute units in England 2014

**National supplementary report
February 2017**

Prepared by:



**Royal College
of Physicians**



**British
Thoracic
Society**

In partnership with:



Royal College of
General Practitioners



Commissioned by:



Working in wider partnership with:



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Document purpose	To disseminate results of the outcomes of the cohort of patients included in the clinical audit of COPD exacerbations admitted to acute units between 1 February and 30 April 2014 in England.
Title	<i>COPD: Who cares when it matters most? National Chronic Obstructive Pulmonary Disease (COPD) Programme: Outcomes from the clinical audit of COPD exacerbations admitted to acute units in England 2014</i>
Author	Stone RA, Holzhauser-Barrie J, Lowe D, McMillan V, Saleem Khan M, Searle L, Skipper E, Welham S, Roberts CM (on behalf of the National COPD Audit Programme: secondary care workstream)
Publication date	February 2017
Audience	Healthcare professionals, NHS managers, chief executives and board members, service commissioners, policymakers, COPD patients, their families/carers, and the public.
Description	<p>This is the third of the 2014 COPD secondary care audit reports, published as part of the National COPD Audit Programme.</p> <p>This report details national outcome data relating to the cohort of patients included in the clinical audit of COPD exacerbations admitted to acute NHS units in England. It complements the national clinical report published previously by the audit programme.</p> <p>The report is relevant to anyone with an interest in COPD and will enable lay people, as well as experts, to understand the outcomes of people admitted to acute NHS units in England with acute exacerbations of COPD, and where change needs to occur.</p> <p>The information, key findings and recommendations outlined in the report are designed to provide readers with a basis for identifying areas in need of change and to facilitate development of improvement programmes that are relevant not only to units, but also to commissioners and policymakers.</p>
Supersedes	This report is a supplement to the secondary care clinical report published in February 2015. It is not designed to be read in isolation, but rather to complement the recommendations and key findings from this report.
Related publications	<ul style="list-style-type: none"> Stone RA, Holzhauser-Barrie J, Lowe D, Searle L, Skipper E, Welham S, Roberts CM. <i>COPD: Who cares? National Chronic Obstructive Pulmonary Disease (COPD) Audit Programme: Resources and organisation of care in acute NHS units in England and Wales 2014</i>. National organisational audit report. London: RCP, November 2014. www.rcplondon.ac.uk/projects/outputs/copd-who-cares-organisational-audit-2014 Stone RA, Holzhauser-Barrie J, Lowe D, Searle L, Skipper E, Welham S, Roberts CM. <i>COPD: Who cares matters. National Chronic Obstructive Pulmonary Disease (COPD) Audit Programme: Clinical audit of COPD exacerbations admitted to acute units in England and Wales 2014</i>. National clinical audit report. London: RCP, February 2015. www.rcplondon.ac.uk/projects/outputs/copd-who-cares-matters-clinical-audit-2014
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This report was written by the following, on behalf of the national COPD secondary care audit 2014–15 workstream group (the full list of workstream group members is included in [Appendix C](#)).

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How to use this report

This supplementary report contains the main messages and key recommendations derived from an extensive analysis of data. The full data analyses are available online (via www.rcplondon.ac.uk/copd-outcomesreport2014) for in-depth perusal. These can be accessed either in full (*COPD: Who cares when it matters most? Results and data analysis*) or in the following component sections:

- Inpatient mortality
- Mortality at 30/90 days after the index admission
- Length of stay
- Readmissions 30/90 days after index discharge
- Previous/recent admissions.

The data are presented largely in tabular form, with explanatory notes throughout. A summary of the key messages and suggested areas for improvement is presented at the beginning of each section. Although these data are available to the interested reader, it is not necessary to review them to appreciate the key messages, which are outlined below. We strongly advise primary and secondary care teams to discuss these findings between themselves and with their commissioners.

Executive summary

This report, which is the last in the series from the secondary care workstream of the 2014 National Chronic Obstructive Pulmonary Disease (COPD) Audit, presents outcome data extracted automatically from Hospital Episode Statistics (HES) and the Office for National Statistics (ONS). The data relate to patients whose index admission with COPD exacerbation occurred during the audit period (February–April 2014) in England. It is supplementary to the previous reports, *COPD: who cares matters*¹ and *COPD: who cares?*,² which detailed respectively the organisation of services and the clinical care for COPD in England and Wales in 2013/2014. It also builds upon learning from the 2003³ and 2008⁴ audits.

The earlier reports highlighted improvements in care (more efficient management at the front end of admission, improved resourcing), but there were still significant areas where change was necessary (notably reducing variation in care, providing better access to specialist care, improving access to care at weekends and referral into evidence-based COPD services). To quote the clinical report:¹

[T]he picture painted by the data is very much one of high front-end efficiency, with short hospital stays organised around a 5-day working week. There appears to be less emphasis on whole-case management and the important application of evidence-based care during the hospital episode, factors that have ramifications for patient experience and long-term outcomes.

The outcome data that are presented here do nothing to dispel this sense and, if anything, imply expediency and fragmentation of care have inadvertently led to a shift from holistic management that is proving to be counterproductive. While inpatient mortality and deaths within 90 days have fallen historically, 43% of the audit patients were readmitted at least once within 90 days. Although COPD was the most common reason for readmission, it accounted for fewer than half of the recorded readmissions, many of which were in older people with multiple comorbidities. Patients in sheltered accommodation were at particular risk of readmission, and the period between 30 and 90 days post-discharge was a crucial time for these people. Length of stay has reduced, but patients discharged to community beds, rehabilitation facilities or residential care remained longer in hospital than those discharged to their own homes. Many of the audited patients had also been admitted in previous months, and appeared to be on a continuous cycle of hospital admission, suggesting that the needs of this challenging group have received insufficient attention.

The reasons for the high admission and readmission rates are unclear. Potential causes would be ineffective discharge processes, poor coordination between primary and secondary care services, inadequate community service provision, lack of social care, reduced threshold for admission, or the mere fact that the patient cohort has become increasingly hard to support out of hospital. However, whatever the reasons, the overriding impression provided by the data is of a *system* that is not only stressed, but is ultimately failing COPD patients.

It is encouraging that inpatient mortality, and deaths within 90 days, have fallen historically. There was, however, high inpatient and post-discharge mortality for those who received non-invasive ventilation (NIV). Treatment with NIV beyond 24 hours from admission was associated with particularly high mortality and patients who received NIV were also at greater risk of early readmission. We noted, as have others,^{1,5} that patients admitted on a Saturday and Sunday (days that also corresponded to the shortest lengths of stay), or over an extended Easter weekend, had higher mortality within 90 days of discharge than those admitted on weekdays.

The recommendations that we make are therefore not complex. We emphasise the need for early identification of patients who are at risk of inpatient deterioration, both acutely and as their admission progresses. We stress the importance of careful inpatient assessment of comorbidity and good discharge

planning to reduce the risk of readmission. We recommend that teams pay close attention to the recent admission history of their patients. We advise the identification and targeted support within primary care of patients who are at particular risk of hospital admission. We emphasise the importance of high-value interventions such as pulmonary rehabilitation and smoking cessation. We underline the pressing need for commissioners and the primary, secondary and social care sectors to develop integrated care systems that better manage the needs of this complex and fragile patient group.

The National COPD Audit moves to continuous collection of exacerbation data in February 2017 and will report in real time; reporting will include the time that it takes for patients to be treated with NIV and the readmission rate. We hope that the audit will continue to drive some of the desired improvements in outcome that are highlighted within this report.

Important note

Many readers will note the significant time that it has taken to obtain the outcome data for the 2014 audit, a delay caused predominantly by information governance issues arising within health systems. These issues have affected multiple national audits and are not confined to the National COPD Audit Programme. Although frustrating for all concerned, it has not been possible to bring the outcome data to the public realm any sooner.

Key findings

Key findings from previous COPD audits have centred primarily on ‘front-end’ care processes relating to the early management of the patient with exacerbating COPD. Although it is clear that an issue remains around the timely delivery of NIV and a need to consider the risk of clinical decline beyond the first 24 hours, the outcome data presented here suggest there have been significant improvements in front-end care. Attention should now be focused on the management of multimorbidity, on the appropriate introduction of end-of-life and palliative care, on the care of older people with COPD and on care processes around discharge and beyond. Particular thought should be given to how patients can be effectively supported in the period between 30 and 90 days after discharge.



Mortality

To see the data analysis in full, please access the ‘Inpatient mortality’ and ‘Mortality at 30/90 days’ sections at www.rcplondon.ac.uk/copd-outcomesreport2014

- Inpatient mortality has **reduced historically** (7.9% 2003, 7.8% 2008, 4.3% 2014).
- Inpatient mortality was **four times higher** for patients who received NIV (17%).
- Mortality for patients receiving NIV began to rise between 1 and 3 hours after admission.
- Mortality was particularly high (33%) in those patients who received NIV 24 hours or more after admission.
- For those patients discharged alive, mortality was **2.8% within 30 days** of admission and **8.0% within 90 days** of admission (ie 35% of the deaths occurred within 30 days, and the remaining 65% between 30 and 90 days).
- Patients **having received NIV** were **at particular risk of death** within both 30 and 90 days of admission (20.2% mortality within 30 days, 27.7% within 90 days).
- Mortality within 90 days of admission was higher for patients who were admitted **on a Saturday/Sunday**, and over the extended Easter weekend (which fell during the audit period), than for those admitted on weekdays.
- For patients discharged alive, **longer lengths of stay** were related to increased mortality within both 30 days (9.9%) and 90 days (22.6%) of admission.



Length of stay (LOS)

To see the data analysis in full, please access the 'LOS' section at www.rcplondon.ac.uk/copd-outcomesreport2014

- There has been a **historical reduction** in the median LOS (6 days 2003, 5 days 2008, 4 days 2014).
- 46% of patients were discharged **within 3 days**, but 25% stayed **longer than 7 days**.
- LOS was **noticeably longer** than average in those patients discharged to residential care (median 6 days), community hospitals or rehabilitation facilities (median 9 days).



Readmissions

To see the data analysis in full, please access the 'Readmissions' section at www.rcplondon.ac.uk/copd-outcomesreport2014

- **One-quarter (24%)** of the patients were readmitted at least once (for any reason) **within 30 days** of discharge.
- **Nearly half (43%)** of the patients were readmitted at least once (for any reason) **within 90 days** of discharge.
- **Twelve percent** of the patients were readmitted at least once owing to COPD **within 30 days** of discharge.
- **Twenty three percent** of the patients were readmitted at least once owing to COPD **within 90 days** of discharge.
- Although COPD was the **commonest reason** for readmission, it accounted for fewer than half of all the readmissions within 30 (44%) and 90 (43%) days of discharge.
- While 5% of patients had two or more admissions within 30 days following discharge, **one-fifth (18%) had two or more** admissions within 90 days of discharge.
- All-cause readmission rates within 30 and 90 days were **much higher** (27% and 47%, respectively) for patients discharged to community hospitals / rehabilitation facilities or equivalent, and particularly so for those discharged to sheltered accommodation (33% and 57%, within 30 and 90 days respectively). Respiratory and COPD-related readmissions **were also higher** for those discharged to sheltered accommodation.
- Readmission rates, particularly all-cause, were **increased in patients with longer index admission LOSs**.



Previous/recent admissions

To see the data analysis in full, please access the 'Previous/recent admission' section at www.rcplondon.ac.uk/copd-outcomesreport2014

- **36% of patients** had at least one admission **within the 90 days (3 months)** prior to their index admission.
- **51% of patients** had at least one admission **within the 180 days (6 months)** prior to their index admission.
- **65% of patients** had at least one admission **within the 365 days (12 months)** prior to their index admission.
- Previous/recent admission was associated with increased **LOS**, increased **inpatient mortality**, increased **mortality at 30/90** days after discharge and increased **readmission**.
- The greater the number of previous/recent admissions, the greater was the **chance of subsequent readmission** within 30 and 90 days after discharge from the index admission.

Recommendations

For commissioners



Reducing readmissions and frequent admissions

- We suggest commissioners ensure that **integrated COPD pathways and services** for COPD are widely available, and are incorporated into **Sustainability and Transformation Plans (STPs)** to encourage the development of whole-system, seamless integrated care. The evidence base for developing integrated primary/secondary approaches to COPD care is strong,^{6,7} with many areas now providing early/supported discharge and admission avoidance services. Such services are not only **associated with shorter LOS**, but **may also reduce readmission rates**. Fred Nicholls' story, on [page 17](#), gives an example of the benefits of this way of working.
- The outcome data highlight a need to develop not only **supported discharge and admission avoidance services** for COPD, but also better links into mechanisms of support for vulnerable, frail patients. **Coordinated multidisciplinary working** across health and social sectors, and between primary and secondary care, is necessary, achievable^{8,9,10,11} and should be a fundamental tenet within STPs.
- While investment will be necessary to deliver these recommendations, we suggest that contractual empowerment of primary, secondary and social care teams to develop such integrated working patterns and relationships (which may challenge traditional methods of working and responsibility) is likely to be highly beneficial to patients, health professionals and the health economy.¹²
- We suggest that commissioners also review their local provision of high-value interventions¹³ such as pulmonary rehabilitation, management of tobacco dependence and community palliative care, all of which are highly relevant to hospital admissions and readmissions.

For providers



Inpatient mortality

- Inpatient mortality remains very high for patients who receive NIV, particularly if it is received beyond 24 hours from the time of admission. **Early respiratory specialist review and timely provision of NIV** according to British Thoracic Society (BTS) guidance **is essential**, therefore.¹⁴ Patients receiving NIV should be cared for by respiratory physicians in a respiratory ward.^{1,2}
- Every effort should be made to **initiate treatment escalation plans (TEPs) within 24 hours of admission**. Use local guidance documents or the updated 2016 guidelines provided by the British Medical Association, the Resuscitation Council (UK) and the Royal College of Nursing;¹⁵ escalation plans should include information around progression or non-progression to NIV.
- To facilitate better identification of patients at risk of imminent or later deterioration, we suggest that hospitals **incorporate space within their admission documentation** to record **a range of information** that includes the initial pH, DECAF score,¹⁶ recent MRC breathlessness score,¹⁷ GOLD stage¹⁸ or % predicted FEV₁, and the chest X-ray appearance.^{1,19}



Readmissions – hospital teams

- Hospital teams should think carefully **before discharge** about the **total needs of COPD patients**, including risk of readmission, using where appropriate not only respiratory tools such as the DECAF score, but also established multimorbidity and frailty scores (such as the Mayo early screen for discharge planning,²⁰ UK Frailty Index,²¹ Charlson Index,²² PRISMA-7 questionnaire,²³ eFI (electronic frailty index),²⁴ PEONY (predicting emergency admissions over the next year),²⁵ the Groningen Frailty Indicator questionnaire,²⁶ and other suggestions as per NICE guidelines²⁷) to guide their thinking. Thus, while the COPD exacerbation may have stabilised somewhat by the time of discharge, it is imperative to consider the whole patient and their other requirements.
 - Can the risk of readmission be mitigated by identifying frailty and managing comorbidities before patients are discharged?
 - Has the team addressed **wider social care issues** prior to discharge?
 - Does the patient require a comprehensive **geriatric assessment**?
 - Has the team provided comprehensive **discharge information** to colleagues in **primary care**, highlighting patients at risk of readmission?
 - Has a BTS, or equivalent, **COPD discharge bundle**²⁸ been completed that addresses tobacco dependence, referral to pulmonary rehabilitation, inhaler use and rescue medication?



Readmissions – primary care teams

- The high number of readmissions makes a compelling case for recommending **early review** (within 7 days, because the median time to first readmission is 12 days) of every discharged case by a suitable community clinician. The purpose of this review would be to consider the recent COPD exacerbation, to identify any ongoing medical or social care issues that might place the patient at increased risk of readmission, and to ensure that **high-value interventions** such as pulmonary rehabilitation and tobacco dependence have been addressed.
- **Case finding** and **enhanced case management** (for example GRASP-COPD, a direct enhanced service [DES]) are increasingly employed to manage at-risk patients in the community.^{29,30} The readmission data support the use of such strategies, and we recommend that primary care teams devote resource to identifying, reviewing and enhancing the management of those COPD patients on their lists who are deemed at particular risk of hospital admission, or whose management should include consideration of end-of-life planning and referral to the community palliative care service.



Previous/recent admissions

- Admitting teams should pay greater attention to the **recent admission history** of their patients, and try to understand specifically what has caused the readmission. The principles outlined in the readmissions advice likewise apply.
 - Is the COPD optimally managed?
 - Are any associated conditions and frailty being addressed?
 - How can the multidisciplinary team help?
 - Was the previous discharge planning adequate?
 - Is there an escalation plan and is it appropriate?
 - Should the patient be referred to palliative care services and do they have an end-of-life plan?
 - Has there been adequate discharge communication with community COPD or primary care services?

Fred's story

Fred Nicholls, 94 years of age

'I was diagnosed with COPD 12 years ago after feeling rather poorly for a little while. I visited my GP, who referred me onto a hospital department who specialise in pulmonary conditions, where they examined me thoroughly and diagnosed me.

About a month ago, I was admitted to hospital for a week, to a ward for patients with pulmonary conditions. The staff were very good and were very focused on me and my condition. I was very happy with the level of care I received. There were other patients on the ward who were much younger than me, which made me feel quite lucky as I am 94 and this was my first admission for COPD! We were monitored at night, but I was allowed to move around and be quite independent during the day. I found the whole experience very uplifting.

I found the integration of care with my GP surgery to also be very good. I am part of a well-organised surgery, and they gave me helpful feedback when I visited them in the week after my discharge. The practice nurse was very well organised, and understood my condition very well.

Every week I go to the community centre for hour-long pulmonary rehabilitation classes. The classes are about 50 or 60 people, with a mix of ages and genders. The physiotherapists are very helpful, and they focus the classes well. The sessions are very sociable, and we're all on Christian names with each other. It is quite a happy reunion every week. I think, given my age, that I am the oldest person there.

I consider myself lucky to be my age, and I have come through the whole experience quite well. I accept the condition I have got, and I understand that I have to take care of myself.'

Friday 6 January 2017

Appendices

Appendix A

Introduction to the National COPD Audit Programme

Appendix B

Methodology

Appendix C

Members of the secondary care workstream group

Appendix D

References

For the following information, please refer to the previous National COPD Audit Programme's secondary care organisational² and clinical¹ national reports and appendices:

- methodology of the secondary care national audit 2014
- participating trusts and hospitals in the secondary care national audit 2014
- governance of the National COPD Audit Programme
- glossary of terminology.

Appendix A: Introduction to the National COPD Audit Programme

The National COPD Audit Programme is a programme of work that aims to drive improvements in the quality of care and services provided for COPD patients in England and Wales. The programme looks at COPD care across the patient pathway, both in and out of hospital, bringing together key elements from the primary, secondary and community care sectors.

There are three programme workstreams.

- 1 Primary care: collection of audit data from general practice patient record systems in Wales. Delivered by the Royal College of Physicians (RCP) and NHS Digital, working with the Primary Care Respiratory Society UK, the Royal College of General Practitioners and the NHS Wales Informatics Service.
- 2 Secondary care: in 2014, there were snapshot audits of patients admitted to hospital with COPD exacerbation, plus organisational audits of the resourcing of COPD services in acute units. The 2014 audits were delivered by the BTS, working with the RCP. A continuous audit of admission to hospital with COPD exacerbation will commence in 2017.
- 3 Pulmonary rehabilitation: audits of COPD patients attending pulmonary rehabilitation (including outcomes at 180 days), plus organisational audits of the resourcing of pulmonary rehabilitation services for COPD patients. The 2015 round of this audit was delivered by the BTS, working with the RCP. Another round of snapshot clinical and organisational audits will commence in 2017.

The audit also delivered a 1-year development work exploring the potential/feasibility of future incorporation of a patient-reported experience measure (PREM) into the audit programme. This was delivered by the British Lung Foundation, working with the Picker Institute Europe.³¹

The programme is commissioned by the Healthcare Quality Improvement Partnership (HQIP) as part of the National Clinical Audit (NCA) Programme. It is included in the list of national audits for inclusion in NHS trusts' quality accounts and also the NHS Wales Clinical Audit and Outcome Review Plan.

Appendix B: Methodology

The secondary care snapshot audit of acute exacerbations of COPD was conducted between February and April 2014. One national clinical report was produced using the data collected.¹ To enable the collection of patient identifiable data items without obtaining explicit individual patient consent, Section 251 approval was gained via the Confidentiality Advisory Group. This approval also allowed 30- and 90-day outcome data to be requested, extracted and linked by NHS Digital (formally known as the Health and Social Care Information Centre), without the need for units to carry out any subsequent notes audit.

Consequently, in late 2015, the audit programme applied to NHS Digital to obtain outcome data for the patients who were included in the audit period (application reference: DARS-NIC-349273-T3L4K-v1.4).

Once approved, a file containing a study ID and necessary identifiable information (NHS number, date of birth and postcode) was sent to the Data Access Request Service (DARS) at NHS Digital. DARS NHS Digital then supplied a dataset consisting of all HES records for people in the requested cohort, which was defined in two ways:

- anybody in the supplied cohort list
- anybody with any of the following ICD-10 diagnosis codes in any position during the years 2013/14 and 2014/15:
 - J44.0 or J44.1 or J44.8 or J44.9.

DARS NHS Digital also provided linked ONS mortality data for all people within the provided cohort.

A pseudonymised, linked dataset was supplied to the RCP to carry out the analyses in the summer of 2016. The supply of the data was covered by the NHS Digital Framework Contract and a data-sharing agreement between HQIP, NHS Digital and the RCP.

The data were analysed and cleaned using the following methodology.

1 Case ascertainment

The HES data files from the years 2013/14 and 2014/15 (to capture patients in the audit period 1 February – 30 April 2014) were cleaned in accordance with the following.

- Records were deleted in both the HES files if:
 - the admission date was out of scope of the audit period (1 February – 30 April 2014)
 - the primary diagnosis code listed for the admission was not COPD (ie not J44.0, J44.1, J44.8 or J44.9).
 - they were duplicates (based on the same HES ID and same admission date)
 - duplicates between the two files were also removed (using HES ID and admission date).
- Aggregate count was run to identify number of readmission/s of the patients in the period – any readmissions were removed (ie the patient was counted only once). This was done to accord with the audit methodology (readmissions were not included).
- The file that was analysed was a cleaned list of all patients who were recorded as having at least one COPD admission during the audit period (regardless of whether the audit captured them), plus the total number of admissions during the audit period.

2 Mortality

- ONS data and HES data were combined to calculate mortality within 30 and 90 days of the index admission date.
 - The cut-offs taken were the 30th day and the 90th day (meaning day 30 and day 90 NOT inclusive).
 - Thus, anything before the 30th or 90th day constitutes a definite death within the period.
- The cause of death was broken down by the following conditions and codes:
 - COPD = J44.0, J44.1, J44.8, J44.9, J44.0-, J44.1-, J44.8-, J44.9-
 - Pneumonia = J18.9, J18.0, J18.1
 - other respiratory = all with J codes, minus the COPD and pneumonia codes listed above
 - cardiovascular = all codes between I00 and I99
 - other = all other codes.
- The ONS file received included 3,721 patients. Duplicates based on patient ID (n=64) were removed.
- Patients were counted as having died as inpatients if one of the following two codes were recorded in the HES record:
 - **DISDEST1** (destination on discharge)
 - code 79 = not applicable (patient died or stillbirth)
 - **DISMETH** (method of discharge)
 - code 4 = died.

3 General HES data cleaning

(For LOS, readmissions and preadmissions)

- Cleaned by:
 - removing the duplicates (based on same patient ID and same admission date)
 - choosing the episode with highest episode number (this represents the most recent and complete episode within the admission).
- All three HES files were then merged; n=89,483.

4 LOS

- The LOS index date of admission variable was created by identifying the admission date that matched the COPD audit admission date.
 - There was an **exact match** for **10,431** IDs (ie there was an HES admission date that exactly matched the audit admission date).
 - For the **unmatched IDs**, the nearest HES admission date to the audit admission date was selected as a possible matched index date of admission. Where the nearest HES admission date was out of the scope of audit, then the nearest available date whether within, before or after the audit period was computed.

5 Readmissions and preadmissions

The number of COPD admissions and non-COPD admissions during the 365, 180 and 90 days **prior** to the date of the index admission was computed.

For each readmission within 30 and 90 days of the discharge date of index admission, the number of days to the readmission, as well as the reason for the readmission was calculated.

The data were cleaned as follows.

- In situations where there was a match for the index admission between the audit data and HES data (on encrypted ID and admission date) (n=10,431):
 - any additional HES records for these patients were counted as readmissions/preadmissions (if within appropriate timelines).
- In situations where there were no HES data available at all (ie no readmission or preadmission, plus the index admission itself had not been captured by HES) (n=1,001):
 - no readmissions or preadmissions were recorded.
- In situations where the HES data did not match our audit data (for the index admission), but there was an HES record within ± 2 days (n=1,982):
 - if there was **only one record** for the patient that fell into this category, it was assumed that it was the audit admission itself (**not** a readmission or preadmission)
 - if there were **two records** for the patient that fell into this category, one was counted as being a readmission/preadmission. Rules determining how we selected the admission that was the readmission/preadmission vs the original attendance are as follows:
 - the admission with the closest date to our audit data was considered to be the index admission (ie if one HES admission was +1 day and the other was -2 days, the former was considered to be the index admission)
 - if the two admissions were equally close to the audit admission (ie one was -2 days and one was +2 days) and one was coded as COPD admission and the other was not, we chose the COPD admission
 - if the difference from the audit date between two admissions was the same and diagnosis was the same (both COPD or both non-COPD), then we chose the episode that had a longer stay.
 - If the HES data did not match our audit data and there was no record within ± 2 days, we made the assumption that our audit admission had been missed by HES.
 - Any other HES records for these patients were counted as readmissions/preadmissions (if within appropriate timelines).

Appendix C: Current members of the secondary care workstream group

- Dr Noel Baxter, Primary Care Workstream Clinical Lead, National COPD Audit Programme (from October 2015); and GP Clinical Lead, NHS Southwark CCG
- Dr Tom Burden, SpR representative, Somerset (group member from February 2016)
- Dr Chris Dyer, Consultant Geriatrician at the Royal United Hospitals in Bath and Chair of British Geriatrics Society Respiratory Special Interest Group (group member from June 2016)
- Dr Colin Gelder, Consultant Respiratory Physician, University Hospital, Coventry
- Ms Juliana Holzhauer-Barrie, National COPD Audit Programme project manager, Clinical Effectiveness and Evaluation Unit, Care Quality Improvement Department, RCP, London
- Dr John Hurst, Consultant and Senior Clinical Lecturer, UCL Medical School
- Professor Derek Lowe, Medical Statistician, Clinical Effectiveness and Evaluation Unit, Care Quality Improvement Department, RCP, London
- Dr Gill Lowrey, Consultant Respiratory Physician, Royal Derby Hospital
- Mr Mike McKeivitt, Head of Patient Services, British Lung Foundation
- Ms Viktoria McMillan, National COPD Audit Programme programme manager (from April 2016), Clinical Effectiveness and Evaluation Unit, Care Quality Improvement Department, RCP, London
- Professor Steve Morris, Professor of Health Economics, University College London, London (group member from February 2016)
- Ms Sandra Olive, Respiratory Nurse Specialist and Association of Respiratory Nurses representative (group member from August 2016)
- Ms Sam Prigmore, Respiratory Nurse Consultant, St George's Hospital, London
- Dr Louise Restrick, Consultant Respiratory Physician, Whittington Hospital
- Professor C Michael Roberts, National COPD Audit Programme – Programme Clinical Lead; and Consultant Respiratory Physician, Whipps Cross University Hospital NHS Trust, Barts Health, Barts and The London School of Medicine and Dentistry, Queen Mary University of London
- Dr Georgina Russell, Clinical Fellow, RCP, London (group member until April 2014)
- Mr Muhammad Saleem Khan, National COPD Audit Programme data manager (from June 2016), RCP, London
- Dr Nick Scriven, president of the Society for Acute Medicine (group member from June 2016)
- Ms Laura Searle, project manager, BTS, London
- Mrs Emma Skipper (until April 2016), National COPD Audit Programme programme manager, Clinical Effectiveness and Evaluation Unit, Care Quality Improvement Department, RCP, London
- Professor Michael Steiner, National COPD Audit Programme Clinical Lead – Pulmonary Rehabilitation Workstream; Honorary Clinical Professor at Loughborough University; and Consultant Respiratory Physician, Glenfield Hospital, Leicester
- Dr Robert A Stone, National COPD Audit Programme Clinical Lead – Secondary Care Workstream; and Consultant Respiratory Physician, Taunton and Somerset NHS Foundation Trust, Musgrove Park Hospital, Taunton
- Miss Sally Welham, Deputy Chief Executive, BTS, London
- Dr Penny Woods, Chief Executive, British Lung Foundation

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For further information on the overall audit programme or any of the workstreams, please see our website or contact the National COPD Audit Programme team directly:

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