

Provisional Quarterly Patient Reported Outcome Measures (PROMs) in England – Data Quality Note

April 2015 to March 2016, February 2017 release

Published 9 February 2017

This data quality note accompanies the latest publication by NHS Digital of provisional data from the Patient Reported Outcome Measures (PROMs) programme April 2015 to March 2016. Updates to the 2015-16 publication are intended to be released quarterly until the dataset is finalised and a final annual report published, expected in August 2017

Key Findings

- **Estimated missing episodes:** our estimates suggest that there are currently 630 missing PROMs-eligible episodes.
- **Episode counts:** across all procedures, counts of episodes have increased as expected since the first issue in November 2015 publication. Counts of post-operative questionnaires returned continue to increase, but the delay in timescales in issuing post-operative questionnaires (three months for groin hernia and varicose vein surgery; six months for hip and knee replacements) would explain this. We expect the numbers to increase further over the coming 6 months, but at a diminishing rate.
- **Average health gains:** across all procedures average health gains show fluctuations over the 18 month period to date, but these are becoming more stable and are not expected to change much more prior to issuing the finalised report.
- **Other quality factors:** the datasets used in quarterly provisional data are incomplete. Numbers of questionnaires and hospital inpatient episodes reported in previous provisional editions may have changed, not only because of the receipt of additional data, but also as a result of updated clinical coding or delayed submission of questionnaires.

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These statistics are used by health care providers and commissioners to improve the quality of health care offered to patients. Academic researchers use these data to inform research on PROMs-eligible procedures. Patients, carers, and other organisations that support patients (including GP practices and charities) may also find these statistics helpful in making informed decisions about elective procedures and providers.

About PROMs

This data quality note accompanies the latest publication by NHS Digital of provisional data from the Patient Reported Outcome Measures (PROMs) programme April 2015 to March 2016. Updates to the 2015-16 publication are intended to be released quarterly¹ until the dataset is finalised and a final annual report published, expected in August 2017.

The PROMs programme covers NHS England-funded elective inpatient surgery for four common groups of procedures: total hip replacement, total knee replacement, groin hernia repair and varicose vein surgery. Data releases and analyses in this publication are based on:

- Pre-operative questionnaires completed by patients within the reporting period, together with any associated inpatient hospital episodes and post-operative questionnaires (for reporting on key facts, participation and linkage), and headline findings;
- Episodes of inpatient hospital care within the reporting period, which included one of the four surgical procedures eligible for PROMs and associated pre- and post-operative questionnaires (for counts of episodes and casemix adjusted reporting).

Full details of the surgeries eligible for inclusion in PROMs are contained in the PROMs Guide (available from NHS Digital's PROMs homepage²), which also describes some general data quality and processing issues.

Relevance

Health providers and commissioners use PROMs publications and statistics to improve the quality of health care offered to patients. A case study³ on PROMs found several examples of healthcare providers using PROMs data to inform changes in service delivery, some of which are noted below:

- Northumberland NHS Healthcare Foundation Trust standardised implants and moved away from replacing kneecap surfaces during surgery
- CircleBath used PROMs data to shape their Enhanced Recovery Programme, “revising care pathways, standardising implant and anaesthetic protocols and providing patients with an extra physiotherapy appointment.”
- Derby Hospitals NHS Foundation Trust adapted their post-operative pain relief protocol for knee replacements
- Barnsley Hospital NHS Foundation Trust used PROMs data to provide evidence for the appointment of an additional physiotherapist.

¹ Publications are planned for quarterly release, in August, November, February and May

² <http://www.digital.nhs.uk/proms>

³ Benefits case study: Patient Reported Outcome Measures (PROMs) outputs, 2015
<http://www.digital.nhs.uk/benefitscasestudies/proms>

Patients (and others involved in managing patient care such as GPs and carers) can use PROMs data to help decide where to receive treatment in the following ways:

- NHS Choices publishes provider-level outlier data for PROMs-eligible procedures based on the following measures (see 'Measure completeness' section of this document for further information):
 - Groin hernia: EQ-5D™ Index;
 - Hip replacement (primary):- Oxford Hip Score;
 - Knee replacement (primary): Oxford Knee Score;
 - Varicose vein: Aberdeen Varicose Vein Questionnaire.

These data are published as part of a 'score card', together with other provider-level data for the procedure.

- NHS Digital publishes a Google Map service for all PROMs procedures and measures: users can click on providers to see whether or not they were also outliers in earlier years.

Academic researchers use these data to inform research on PROMs-eligible procedures. Patients, carers and other organisations that support patients (including GP practices and charities) may also find these statistics helpful in making informed choices about elective procedures and providers.

NHS Digital is keen to gain a better understanding of the users of this publication and of their needs; feedback is welcome and may be sent to enquiries@nhsdigital.nhs.uk (please include 'PROMs' in the subject line). We publish summary information about feedback received and how this has influenced product development in the annual report.

Accuracy and Reliability

Demographic information

Pre-operative questionnaires collect personal information about the patient's postcode, date of birth and sex. This information is used to support patient-level linkage with HES (other administrative information such as NHS number is also used for data linkage). Table 1 shows that item completeness exceeds 99 per cent for these data items across all procedures.

Measure completeness

Responses to the pre- and post-operative questionnaires are used to report on up to three measures.

General measures

- The EQ-5DTM Index combines five questions about health and quality of life domains (usual activities, self-care, anxiety/depression, pain/discomfort, and mobility) into an overarching measure of general self-reported health. This measure can only be calculated if valid responses are received for all five questions. Table 1 shows that measure completeness is at least 90 per cent for all procedures.
- EQ-VAS; a single-item 'thermometer'-style measure which asks patients to rate their general health at the time of completion. Measure completeness on EQ-VAS is lower for hip and knee replacements than for groin hernia and varicose vein procedures (see Table 1).

Condition-specific measures

- The Oxford Hip Score and the Oxford Knee Score are closely related twelve-item questionnaires which combine questions about the patient's specific condition and its impact on their quality of life into a single overarching measure. An overall score on these measures can be calculated if valid responses are present for ten out of the twelve individual items: this represents completeness for analysis purposes⁴.
- The Aberdeen Varicose Vein Questionnaire is constructed from a thirteen-item questionnaire that asks questions about specific elements of the patient's varicose veins. The final score is calculated by dividing the actual score by the maximum possible score for the questions answered so long as no more than two questions have been left unanswered.
- Measure completeness on condition-specific scores is high across all procedures where they are used (see Table 1).

⁴ For more information about each of the measures collected in PROMs questionnaires, and the individual questions that make up the measures, please see the 'Scoring Methodology' section and Annexes 2 and 3 of "Monthly Patient Reported Outcome Measures (PROMs) in England: a guide to PROMs methodology", 2015, http://www.digital.nhs.uk/media/1537/A-Guide-to-PROMs-Methodology/pdf/PROMs_Guide_V8.pdf

Table 1: Measure and item completeness for selected pre- and post-operative questionnaire items and measures, 2015-16 (provisional data)

England		Number and per cent			
		Groin hernia	Hip replacement	Knee replacement	Varicose vein
Pre-operative questionnaires					
Pre-operative questionnaires returned		39,493	66,498	80,898	10,827
Postcode populated		39,443	66,442	80,835	10,804
	<i>as % of pre-operative questionnaires</i>	99.9	99.9	99.9	99.8
Completed date populated		38,460	65,244	79,253	10,372
	<i>as % of pre-operative questionnaires</i>	97.4	98.1	98.0	95.8
Date of birth populated		39,297	66,325	80,664	10,765
	<i>as % of pre-operative questionnaires</i>	99.5	99.7	99.7	99.4
Gender		39,419	66,349	80,737	10,797
	<i>as % of pre-operative questionnaires</i>	99.8	99.8	99.8	99.7
EQ-5D Index Completeness		38,325	62,478	75,869	10,286
	<i>as % of pre-operative questionnaires</i>	97.0	94.0	93.8	95.0
EQ-VAS Completeness		37,878	59,862	72,207	9,966
	<i>as % of pre-operative questionnaires</i>	95.9	90.0	89.3	92.0
Condition-specific Completeness		N/A	65,663	79,826	10,472
	<i>as % of pre-operative questionnaires</i>	N/A	98.7	98.7	96.7
Pre- and post-operative questionnaires					
Pre- and post-operative questionnaire pairs matched		24,531	46,912	55,026	5,688
EQ-5D Index Completeness		22,565	42,343	49,545	5,209
	<i>as % of questionnaire pairs</i>	92.0	90.3	90.0	91.6
EQ-VAS Completeness		23,255	40,635	47,347	5,159
	<i>as % of questionnaire pairs</i>	94.8	86.6	86.0	90.7
Condition-specific completeness		N/A	45,817	53,672	5,384
	<i>as % of questionnaire pairs</i>	N/A	97.7	97.5	94.7

Data linkage

NHS Digital links pre-operative PROMs questionnaires to administrative data about the related inpatient hospital procedure held in the Hospital Episodes Statistics: Admitted Patient Care dataset (HES: APC). This is because HES: APC contains a range of variables (such as the Indices of Multiple Deprivation 2010) that are used in the PROMs casemix adjustment methodology. Whilst PROMs records that cannot be linked with HES: APC episodes are used in much of our reporting, only records that link to HES: APC can be used to make comparisons between provider-level and England-level outcomes.

When linking to HES: APC, matching rules are used to identify and rank potential matches between pre-operative questionnaires and hospital episodes⁵. Three kinds of error may be introduced during linkage:

- A questionnaire may be linked to an unrelated episode. This is rare as it can only happen when a patient has two or more PROMs-eligible procedures within a very short space of time (for example, a primary procedure, followed shortly after by an elective revision procedure).
- A questionnaire may not link successfully to a related episode. This is more common and can have a number of different causes such as poorly written or incorrect identifiers on the PROMs questionnaire or poorly coded HES episodes
- Very rarely, a questionnaire may be linked to the wrong patient: this could potentially happen if two patients with the same sex, date of birth (where this is not 1 February) and postcode had the same PROMs-eligible procedure at the same hospital within a short period of time.

⁵ For more information about how pre-operative questionnaires are linked to HES episodes, please see the 'Matching methodology' section of "Monthly Patient Reported Outcome Measures (PROMs) in England: a guide to PROMs methodology", 2015, http://www.digital.nhs.uk/media/1537/A-Guide-to-PROMs-Methodology/pdf/PROMs_Guide_V8.pdf

Table 2: Participation, linkage and response rates, 2015-16 (full year provisional data)

England	Number and per cent			
	Groin hernia	Hip replacement	Knee replacement	Varicose vein
Number of PROMs procedures (April 2015 – March 2016) ⁶	69,223	77,156	84,300	33,439
Pre-operative questionnaires returned	39,493	66,498	80,898	10,827
Pre-operative questionnaires returned to which NHS number assigned	37,089	63,116	76,114	9,797
<i>as a per cent of pre-operative questionnaires returned</i>	<i>93.9</i>	<i>94.9</i>	<i>94.1</i>	<i>90.5</i>
Pre-operative questionnaires linked to episode	28,718	54,657	59,501	9,212
<i>as a per cent of pre-operative questionnaires returned</i>	<i>72.7</i>	<i>82.2</i>	<i>73.6</i>	<i>85.1</i>
Post-operative questionnaires issued	38,753	63,453	76,598	10,552
Post-operative questionnaires returned	24,531	46,912	55,026	5,688
<i>as a per cent of post-operative questionnaires issued</i>	<i>63.3</i>	<i>73.9</i>	<i>71.8</i>	<i>53.9</i>
<i>as a per cent of pre-operative questionnaires returned</i>	<i>62.1</i>	<i>70.5</i>	<i>68.0</i>	<i>52.5</i>
Pre- and post-operative questionnaire pair linked to episode	19,915	41,889	45,390	5,200
<i>as a per cent of pre-operative questionnaires returned</i>	<i>50.4</i>	<i>63.0</i>	<i>56.1</i>	<i>48.0</i>
<i>as a per cent of all pre-operative questionnaires linked to an episode</i>	<i>69.3</i>	<i>76.6</i>	<i>76.3</i>	<i>56.4</i>

⁶ The total numbers of PROMs procedures have been included for illustrative purposes only; the procedures carried out between April 2015 and March 2016 will not necessarily be the same procedures for which the questionnaires were returned during this period.

Non-respondent analysis

Non-respondent analysis is produced for finalised datasets only, with the latest non-respondent analysis made in August 2016.⁷ Non-respondent analysis is based on episode counts within the reporting period and their associated pre- and post-operative questionnaires (pre- and post-operative questionnaires that do not link to an episode are not included in this analysis).⁸

In 2014-15, more than half of all patients undergoing elective hip (58.2%) and knee (57.2%) replacement procedures completed both pre- and post-operative questionnaires, both of which are the same completion rates of both questionnaires in 2013-14. Markedly lower proportions of groin hernia (30.5%) and varicose vein (18.8%) patients undergoing elective treatment in 2013-14 completed both questionnaires. This is a decrease on response rates in 2013-14 (31.8% and 19.2% respectively) and in 2012-13 (32.4% and 20.2% respectively).

Table 3: Patient engagement levels by procedure, 2014-15 (finalised data)

England		Number and per cent					
	All episodes	No linked questionnaires		<i>of which</i> Pre-operative questionnaire only		Pre- and post-operative questionnaire	
	(n)	(n)	%	(n)	%	(n)	%
Groin hernia	72,709	41,235	56.7	9,285	12.8	22,189	30.5
Hip replacement	78,195	22,631	28.9	10,062	12.9	45,502	58.2
Knee replacement	83,450	24,964	29.9	10,776	12.9	47,710	57.2
Varicose vein	32,692	22,070	67.5	4,462	13.6	6,160	18.8

Statistics for groin hernia and varicose veins may, therefore, be more affected by systematic patterns of non-response than those for hip and knee replacements. Many of the factors which are associated with systematic variations in engagement levels (such as higher levels of deprivation, for example), however, are incorporated into the case-mix adjustment methodology. This means that comparisons between provider-level data with England-level results should not be substantially affected. For further information, please refer to the annual report⁹.

⁷ Non-respondent analysis cannot be produced until the count of PROMs-eligible procedures carried out in the reporting year has been finalised. In addition, post-operative questionnaires for hip and knee replacements are not sent out to patients until six to nine months after their procedures.

⁸ This means that participation and response rates will differ substantially from headline participation rates (the count of pre-operative questionnaires received within the reporting period divided by the count of episodes) published for provisional data, and from other provisional measures of participation and response.

⁹ <http://www.content.digital.nhs.uk/catalogue/PUB21189>

Patient-provided answers

Most data items are based on answers given by patients themselves. A few data items are system-generated, such as the organisation code for the hospital administering the pre-operative questionnaire.

Questionnaire completion dates

Patients are asked to record when they completed the pre-operative questionnaires, using the format 'dd-mm-yyyy', as seen in the excerpt from a sample questionnaire below.

Figure 1: Questionnaire completion date question from PROMs pre-operative questionnaire¹⁰

Q26. Today's date

				2	0		
D	D	M	M	Y	Y	Y	Y

Please ensure this is **today's date NOT** your date of birth

This date is used to assign pre-operative questionnaires to reporting periods. Data will only flow from data suppliers to NHS Digital for this item if the date given exists (i.e. '21-03-1066' would flow; '42-56-1066' would not). Once received, NHS Digital applies further validation to determine whether or not the date when the data supplier scanned the questionnaire should be used instead of the patient-supplied completion date. The pre-operative questionnaire scan date is used instead of the completion date when the latter is:

- blank (i.e. no date has been supplied, or the date is illegible to both machine and human readers);
- before the PROMs programme started (for example, if they have written in their birth date in error);
- after the date on which the data supplier scanned the questionnaire.

As pre-operative questionnaires are usually scanned within a few weeks of the patient completing the questionnaire, replacing the completion date with the scan date in these cases increases the likelihood of successful linkage to a HES episode. In some cases, the scan date for the pre-operative questionnaire will fall in the reporting period after the pre-operative questionnaire was completed – the impact of this on the statistics is likely to be similar across years.

Despite these cleansing rules, it is likely that some patient-supplied completion dates are written down incorrectly (for example, near the beginning of a year, or due to patients entering dates in mm-dd-yyyy format). As with scan dates above, this may result in the pre-operative questionnaire being assigned to the wrong reporting period: in some

¹⁰

http://webarchive.nationalarchives.gov.uk/20130107105354/http://www.dh.gov.uk/prod_consum_dh/groups/dh_digitalassets/documents/digitalasset/dh_131115.pdf

circumstances it may also result in the pre-operative questionnaire failing to link successfully to an episode.

Data quality monitoring

Summary volume and data-field completeness data are made available monthly to hospital provider organisations and the data processing suppliers to allow them to monitor their data submissions and alert them at an early stage to any issues, such as missing data or emerging data quality problems.

Estimates of missing PROMs episodes

The PROMs questionnaire database is routinely linked to the Hospital Episode Statistics ('HES') data warehouse inpatient database in order to provide a richer and broader set of data for analysis. Regularly published HES Inpatient Data Quality Notes¹¹ identify organisations with shortfalls, missing data or specific data quality issues with their HES inpatient data.

As PROMs-eligible procedures comprise only a small proportion of all HES inpatient episodes, provider-level estimates of missing PROMs episodes (for organisations identified by HES Inpatient Data Quality Notes as having missing HES inpatient episodes) have been introduced. Details of the estimation method used may be found in Appendix A.

Table 4 shows the estimated missing PROMs episodes for April 2015 to March 2016, using this estimation method.

Table 4: Missing PROMs episodes (estimated), April 2015 - March 2016

Organisation code	Organisation name	Estimated missing episodes

Our estimates suggest that there are currently no missing PROMs-eligible episodes.

Mid-Staffordshire NHS Foundation Trust (RJD) is no longer providing health care as of 1 November 2014. Records for this organisation with activity from this date are split between University Hospitals of North Midlands NHS Trust (RJE) and The Royal Wolverhampton NHS Trust (RL4).

It has been decided not to map RJD records to the successor organisations as the Mid Staffordshire NHS Foundation Trust will

¹¹ The HES Inpatient Data Quality Notes can be found at <http://content.digital.nhs.uk/article/1825/The-processing-cycle-and-HES-data-quality>

remain open until a suitable agreement has been made with its stakeholders.

Provisional data

The datasets used in monthly and quarterly provisional data are incomplete. Numbers of questionnaires and hospital inpatient episodes reported in previous provisional editions may have changed not only because of the receipt of additional data but also as a result of updated clinical coding or delayed submission of questionnaires.

In general, provisional counts of questionnaires and hospital records are likely to be lower than will be reported in the final annual publication. Tables 5a to 8b show, for each of the PROMs-eligible procedures, how cumulative data releases affect counts of episodes, pre- and post-operative questionnaire returns, and complete PROMs records (to which the case-mix adjustment model can be applied). The tables also show changes in linkage rates, and in the average scores for each measure. Average adjusted health gain is included only where the national count of modelled records is 200 or more, consistent with publication protocols.

Table 5a: Cumulative data releases for groin hernia, 2015-16: episodes and questionnaires

England		count, per cent							
Cumulative data releases		Episodes		Pre-operative questionnaires returned		Pre-operative questionnaires linked to an episode		Post-operative questionnaires returned	
		(n)	(Quarterly % change)	(n)	(Quarterly % change)	(n)	(Quarterly % change)	(n)	(Quarterly % change)
Part-year releases									
Apr 2015 - Jun 2015 (pub. Nov 2015)		17,582	-	9,965	-	7,199	-	2,418	-
Apr 2015 - Sep 2015 (pub. Feb 2016)		34,710	97.4	19,576	96.4	14,253	98.0	6,613	173.5
Apr 2015 - Dec 2015 (pub. May 2016)		52,297	50.7	29,575	51.1	21,335	49.7	14,503	119.3
Full-year provisional releases									
Apr 2015 - Mar 2016 (pub. Aug 2016)		68,971	31.9	39,076	6.7	28,161	15.6	19,734	36.0
Apr 2015 - Mar 2016 (pub. Nov 2016)		68,971	0.0	39,324	0.6	28,575	1.5	23,464	18.9
Apr 2015 - Mar 2016 (pub. Feb 2017)		69,223	0.4	39,493	0.4	28,718	0.5	24,531	4.5
Apr 2015 - Mar 2016 (pub. May 2017)		-	-	-	-	-	-	-	-
Final 2015-16 release									
Apr 2015 - Mar 2016 (pub. Aug 2017)		-	-	-	-	-	-	-	-

The number of recorded episodes and numbers of questionnaires have increased since the August publication, with the number of post-operative questionnaires returned increasing by 4.5 per cent.

Table 5b: Cumulative data releases for groin hernia, 2015-16: modelled records and scores

England			count, per cent, average			
Cumulative data releases	EQ-5D™ Index			EQ- VAS		
	Modelled records (Quarterly (n) % change)	Average Health Gain		Modelled records (Quarterly (n) % change)	Average Health Gain	
Part-year releases						
Apr 2015 - Jun 2015 (pub. Nov 2015)	3,141	-	0.085	3,179	-	-0.699
Apr 2015 - Sep 2015 (pub. Feb 2016)	6,736	114.5	0.088	6,879	116.4	-1.232
Apr 2015 - Dec 2015 (pub. May 2016)	12,813	90.2	0.087	13,071	90.0	-0.800
Full-year provisional releases						
Apr 2015 - Mar 2016 (pub. Aug 2016)	16,351	27.6	0.087	16,825	28.7	-0.855
Apr 2015 - Mar 2016 (pub. Nov 2016)	18,015	10.2	0.088	18,516	10.1	-0.800
Apr 2015 - Mar 2016 (pub. Feb 2017)	18,354	1.9	0.088	18,860	1.9	-0.805
Apr 2015 - Mar 2016 (pub. May 2017)	-	-	-	-	-	-
Final 2015-16 release						
Apr 2015 - Mar 2016 (pub. Aug 2017)	-	-	-	-	-	-

Table 5b shows that the cumulative count of modelled records have increased in the last quarter by almost two per cent. Average health gains on the EQ-5D™ Index have been relatively stable at a national level since the start of the quarterly releases. Average health gains on the EQ-VAS show wide variation between reporting periods since the first release, but are settling now.

Table 6a: Cumulative data releases for hip replacements (primary and revision), 2015-16: episodes and questionnaires

England		count, per cent							
Cumulative data releases		Episodes		Pre-operative questionnaires returned		Pre-operative questionnaires linked to an episode		Post-operative questionnaires returned	
		(n)	(Quarterly % change)	(n)	(Quarterly % change)	(n)	(Quarterly % change)	(n)	(Quarterly % change)
Part-year releases									
Apr 2015 - Jun 2015 (pub. Nov 2015)		19,317	-	15,990	-	12,906	-	16	-
Apr 2015 - Sep 2015 (pub. Feb 2016)		38,377	98.7	32,281	101.9	26,486	105.2	2,919	18143.8
Apr 2015 - Dec 2015 (pub. May 2016)		57,878	50.8	49,133	52.2	39,871	50.5	16,513	465.7
Full-year provisional releases									
Apr 2015 - Mar 2016 (pub. Aug 2016)		76,749	32.6	65,604	9.6	53,009	19.5	28,919	75.1
Apr 2015 - Mar 2016 (pub. Nov 2016)		76,759	0.0	66,018	0.6	54,034	1.9	39,997	38.3
Apr 2015 - Mar 2016 (pub. Feb 2017)		77,156	0.5	66,498	0.7	54,657	1.2	46,912	17.3
Apr 2015 - Mar 2016 (pub. May 2017)		-	-	-	-	-	-	-	-
Final 2015-16 release									
Apr 2015 - Mar 2016 (pub. Aug 2017)		-	-	-	-	-	-	-	-

The cumulative episode count has increased as expected. The counts of pre-operative questionnaires returned and linked have also increased at a similar rate to those for knee replacements. The count of post-operative questionnaires returned continues to increase as expected, but is expected to slow down in the coming quarters, now that we are reporting after the six months lapse following the procedure have passed for all patients.

Table 6b: Cumulative data releases for hip replacements (primary), 2015-16: modelled records and scores

England				count, per cent, average					
Cumulative data releases	EQ-5D™ Index			EQ- VAS			Oxford Hip Score		
	Modelled records		Average Health Gain	Modelled records		Average Health Gain	Modelled records		Average Health Gain
	(n)	(Quarterly % change)		(n)	(Quarterly % change)		(n)	(Quarterly % change)	
Part-year releases									
Apr 2015 - Jun 2015 (pub. Nov 2015)	7	-	*	7	-	*	8	-	*
Apr 2015 - Sep 2015 (pub. Feb 2016)	4,641	66200.0	0.454	4,413	62942.9	11.952	5,016	62600.0	22.088
Apr 2015 - Dec 2015 (pub. May 2016)	16,177	248.6	0.449	15,494	251.1	12.035	17,462	248.1	21.926
Full-year provisional releases									
Apr 2015 - Mar 2016 (pub. Aug 2016)	25,467	57.4	0.442	24,463	57.9	12.092	27,534	57.7	21.682
Apr 2015 - Mar 2016 (pub. Nov 2016)	33,610	32.0	0.439	32,271	31.9	12.358	36,336	32.0	21.637
Apr 2015 - Mar 2016 (pub. Feb 2017)	35,955	7.0	0.438	34,505	6.9	12,405	38,864	7.0	21.617
Apr 2015 - Mar 2016 (pub. May 2017)	-	-	-	-	-	-	-	-	-
Final 2015-16 release									
Apr 2015 - Mar 2016 (pub. Aug 2017)	-	-	-	-	-	-	-	-	-

The cumulative count of modelled records has increased for each measure, reflecting the time delay in issuing post-operative questionnaires. The average health gain for each measure has changed very little between publications, with EQ-5D™ Index and Oxford Hip Score showing slight drops in the average health gain.

Table 6c: Cumulative data releases for hip replacements (revisions), 2015-16: modelled records and scores

England			count, per cent, average						
Cumulative data releases	EQ-5D™ Index			EQ- VAS			Oxford Hip Score		
	Modelled records		Average Health Gain	Modelled records		Average Health Gain	Modelled records		Average Health Gain
	(n)	(Quarterly % change)		(n)	(Quarterly % change)		(n)	(Quarterly % change)	
Part-year releases									
Apr 2015 - Jun 2015 (pub. Nov 2015)	8	-	*	7	-	*	9	-	*
Apr 2015 - Sep 2015 (pub. Feb 2016)	307	3737.5	0.279	281	3914.3	4.544	328	3544.4	13.000
Apr 2015 - Dec 2015 (pub. May 2016)	981	219.5	0.286	931	231.3	5.359	1,054	221.3	13.199
Full-year provisional releases									
Apr 2015 - Mar 2016 (pub. Aug 2016)	1,477	50.6	0.282	1,424	53.0	5.565	1,605	52.3	13.017
Apr 2015 - Mar 2016 (pub. Nov 2016)	1,938	31.2	0.284	1,875	31.7	6.438	2,099	30.8	13.212
Apr 2015 - Mar 2016 (pub. Feb 2017)	2,070	6.8	0.285	2,000	6.7	6,418	2,235	6.5	13,206
Apr 2015 - Mar 2016 (pub. May 2017)	-	-	-	-	-	-	-	-	-
Final 2015-16 release									
Apr 2015 - Mar 2016 (pub. Aug 2017)	-	-	-	-	-	-	-	-	-

Hip replacement (revision) procedures comprise only a small proportion of all hip replacements carried out. The cumulative count of modelled records is still increasing, but as with hip replacement (primary) procedures, average health gain scores on the three measures have all seen small changes since the August 2016 data release.

Table 7a: Cumulative data releases for knee replacements (primary and revision), 2015-16: episodes and questionnaires

England		count, per cent							
Cumulative data releases	Episodes		Pre-operative questionnaires returned		Pre-operative questionnaires linked to an episode		Post-operative questionnaires returned		
	(n)	(Quarterly % change)	(n)	(Quarterly % change)	(n)	(Quarterly % change)	(n)	(Quarterly % change)	
Part-year releases									
Apr 2015 - Jun 2015 (pub. Nov 2015)	20,826	-	18,955	-	13,690	-	11	-	
Apr 2015 - Sep 2015 (pub. Feb 2016)	41,500	99.3	38,775	104.6	28,502	108.2	2,637	23872.7	
Apr 2015 - Dec 2015 (pub. May 2016)	62,974	51.7	59,726	54.0	43,385	52.2	17,753	573.2	
Full-year provisional releases									
Apr 2015 - Mar 2016 (pub. Aug 2016)	83,870	33.2	79,930	9.0	57,868	19.3	32,770	84.6	
Apr 2015 - Mar 2016 (pub. Nov 2016)	83,876	0.0	80,434	0.6	58,929	1.8	46,384	41.5	
Apr 2015 - Mar 2016 (pub. Feb 2017)	84,300	0.5	80,898	0.6	59,501	1.0	55,026	18.6	
Apr 2015 - Mar 2016 (pub. May 2017)	-	-	-	-	-	-	-	-	
Final 2015-16 release									
Apr 2015 - Mar 2016 (pub. Aug 2017)	-	-	-	-	-	-	-	-	

Similar to hip replacements, the cumulative episode count has increased by a very small number since the August 2016 publication. The counts of pre-operative questionnaires returned and linked have also increased at a similar rate to those for other procedures.

Table 7b: Cumulative data releases for knee replacements (primary), 2015-16: modelled records and scores

England			count, per cent, average						
Cumulative data releases	EQ-5D™ Index			EQ- VAS			Oxford Knee Score		
	Modelled records		Average Health Gain	Modelled records		Average Health Gain	Modelled records		Average Health Gain
	(n)	(Quarterly % change)		(n)	(Quarterly % change)		(n)	(Quarterly % change)	
Part-year releases									
Apr 2015 - Jun 2015 (pub. Nov 2015)	12	-	*	9	-	*	12	-	*
Apr 2015 - Sep 2015 (pub. Feb 2016)	4,333	36008.3	0.334	4,168	46211.1	4.623	4,656	38700.0	16.794
Apr 2015 - Dec 2015 (pub. May 2016)	16,789	287.5	0.331	16,041	284.9	5.506	18,205	291.0	16.654
Full-year provisional releases									
Apr 2015 - Mar 2016 (pub. Aug 2016)	27,736	65.2	0.322	26,508	65.3	5.830	29,994	64.8	16.367
Apr 2015 - Mar 2016 (pub. Nov 2016)	37,051	33.6	0.321	35,415	33.6	6.191	40,052	33.5	16.389
Apr 2015 - Mar 2016 (pub. Feb 2017)	39,531	6.7	0.320	37,764	6.6	6.226	42,732	6.7	16.368
Apr 2015 - Mar 2016 (pub. May 2017)	-	-	-	-	-	-	-	-	-
Final 2015-16 release									
Apr 2015 - Mar 2016 (pub. Aug 2017)	-	-	-	-	-	-	-	-	-

The cumulative count of modelled records has increased as expected for each measure. However, the average health gains for the three measures have not changed much between publications, showing a similar pattern to the primary hip replacements.

Table 7c: Cumulative data releases for knee replacements (revisions), 2015-16: modelled records and scores

England				count, per cent, average					
Cumulative data releases	EQ-5D™ Index			EQ- VAS			Oxford Knee Score		
	Modelled records		Average Health Gain	Modelled records		Average Health Gain	Modelled records		Average Health Gain
	(n)	(Quarterly % change)		(n)	(Quarterly % change)		(n)	(Quarterly % change)	
Part-year releases									
Apr 2015 - Jun 2015 (pub. Nov 2015)	2	-	*	2	-	*	2	-	*
Apr 2015 - Sep 2015 (pub. Feb 2016)	156	7700.0	0.235	155	7650.0	-1.213	173	8550.0	11.116
Apr 2015 - Dec 2015 (pub. May 2016)	657	321.2	0.268	650	319.4	0.229	717	314.5	12.172
Full-year provisional releases									
Apr 2015 - Mar 2016 (pub. Aug 2016)	1,088	65.6	0.261	1,056	62.5	1.154	1,183	65.0	11.881
Apr 2015 - Mar 2016 (pub. Nov 2016)	1,448	33.1	0.260	1,406	33.1	2.110	1,578	33.4	11.978
Apr 2015 - Mar 2016 (pub. Feb 2017)	1,546	6.8	0.258	1,497	6.5	2.031	1,680	6.5	11.935
Apr 2015 - Mar 2016 (pub. May 2017)	-	-	-	-	-	-	-	-	-
Final 2015-16 release									
Apr 2015 - Mar 2016 (pub. Aug 2017)	-	-	-	-	-	-	-	-	-

Knee replacement (revision) operations make up only a small proportion of all knee replacements, meaning that overall counts of modelled records are relatively low. Counts of modelled records are increasing with each cumulative release, mirroring increases in counts of post-operative questionnaires received. Scores on the EQ-VAS and Oxford Knee Score are quite varied over the early releases, however they are now starting to stabilise.

Table 8a: Cumulative data releases, varicose veins, 2015-16: episodes and questionnaires

England		count, per cent							
Cumulative data releases		Episodes		Pre-operative questionnaires returned		Pre-operative questionnaires linked to an episode		Post-operative questionnaires returned	
		(n)	(Quarterly % change)	(n)	(Quarterly % change)	(n)	(Quarterly % change)	(n)	(Quarterly % change)
Part-year releases									
Apr 2015 - Jun 2015 (pub. Nov 2015)		8,400	-	2,750	-	2,262	-	454	-
Apr 2015 - Sep 2015 (pub. Feb 2016)		16,536	96.9	5,230	90.2	4,399	94.5	1,280	181.9
Apr 2015 - Dec 2015 (pub. May 2016)		24,871	50.4	8,055	54.0	6,810	54.8	3,283	156.5
Full-year provisional releases									
Apr 2015 - Mar 2016 (pub. Aug 2016)		33,405	34.3	10,743	9.1	9,061	15.7	4,715	43.4
Apr 2015 - Mar 2016 (pub. Nov 2016)		33,406	0.0	10,799	0.5	9,178	1.3	5,455	15.7
Apr 2015 - Mar 2016 (pub. Feb 2017)		33,439	0.1	10,827	0.3	9,212	0.4	5,688	4.3
Apr 2015 - Mar 2016 (pub. May 2017)		-	-	-	-	-	-	-	-
Final 2015-16 release									
Apr 2015 - Mar 2016 (pub. Aug 2017)		-	-	-	-	-	-	-	-

The cumulative count of episodes has changed very little in the six months since the August 2016 publication. Pre-operative questionnaires returned, pre-operative questionnaires linked to an episode and post-operative questionnaires returned have increased by rates in line with those for groin hernia procedures, which also have a three month lapse between procedure and sending the post-operative questionnaire out.

Table 8b: Cumulative data releases, varicose veins, 2015-16: modelled records and scores

England				count, per cent, average					
Cumulative data releases	EQ-5D™ Index			EQ- VAS			Aberdeen Varicose Vein Questionnaire		
	Modelled records		Average Health Gain	Modelled records		Average Health Gain	Modelled records		Average Health Gain
	(n)	(Quarterly % change)		(n)	(Quarterly % change)		(n)	(Quarterly % change)	
Part-year releases									
Apr 2015 - Jun 2015 (pub. Nov 2015)	538	-	0.095	531	-	-0.823	551	-	-8.793
Apr 2015 - Sep 2015 (pub. Feb 2016)	1,339	148.9	0.104	1,319	148.4	-0.523	1,377	149.9	-8.989
Apr 2015 - Dec 2015 (pub. May 2016)	3,027	126.1	0.100	2,987	126.5	-0.073	3,111	125.9	-8.949
Full-year provisional releases									
Apr 2015 - Mar 2016 (pub. Aug 2016)	4,164	37.6	0.096	4,114	37.7	-0.380	4,302	38.3	-8.595
Apr 2015 - Mar 2016 (pub. Nov 2016)	4,607	10.6	0.094	4,552	10.6	-0.451	4,756	10.6	-8.543
Apr 2015 - Mar 2016 (pub. Feb 2017)	4,728	2.6	0.095	4,669	2.6	-0.452	4,879	2.6	-8.597
Apr 2015 - Mar 2016 (pub. May 2017)	-	-	-	-	-	-	-	-	-
Final 2015-16 release									
Apr 2015 - Mar 2016 (pub. Aug 2017)	-	-	-	-	-	-	-	-	-

Counts of modelled records for varicose vein procedures are still increasing, with all measures showing the same increase of 2.6 per cent. The EQ-5D™ Index score has been stable since the first release of provisional data in November 2015, with the EQ-VAS being more variable and the Aberdeen Varicose Vein Questionnaire showing small fluctuational change over the same period.

Timeliness and Punctuality

Timeliness

Analysis in this report is based on:

- Pre-operative patient questionnaires completed between 1 April 2015 and 31 March 2016 and any associated in-patient hospital episodes and post-operative questionnaires;
- Episodes of inpatient hospital care where the episode started between 1 April 2015 and 31 March 2016 and which included one of the four surgical procedures eligible for PROMs
- Episodes of inpatient hospital care where episode ended between 1 April 2015 and 31 March 2016 (which included one of the four PROMs-eligible procedures) and any associated pre- and post-operative questionnaires.

Annual datasets are typically finalised fifteen months after the end of the reporting period covered. This delay is needed:

- to allow sufficient recovery time after surgery before post-operative questionnaires are completed and;
- to maximise the number of post-operative questionnaires returned.

A further six weeks (approximately) is necessary for data processing, analysis and production and checking of the annual publication.

Punctuality

This publication was published on the pre-announced release date.

Accessibility and Clarity

The HES dataset used in the PROMs publication has been collected primarily for official administrative purposes. Information about the administrative source and its use for statistical purposes is included in NHS Digital's Statement of Administrative Sources at <http://content.digital.nhs.uk/article/1789/Statement-of-administrative-sources>.

Other extracts of the HES dataset are published by the NHS Digital. Details are available at <http://content.digital.nhs.uk/article/1823/What-HES-data-is-available>.

This publication is being made available on the world-wide-web as a combination of web pages and downloadable reports and data files. The publication may be requested in large print or other formats through the NHS Digital's contact centre: enquiries@nhsdigital.nhs.uk (please include 'PROMs' in the subject line).

Coherence and Comparability

Other official statistics published by the HSCIC that report on extracts of HES inpatient data allocate episodes to time periods based on episode end date. PROMs publications, however, use the episode start date to assign records to time periods, as this date more closely represents the date of the PROMs operation.

A small number of HES episodes record more than one eligible PROMs procedure (there were 69 episodes between 1 April 2015 and 31 March 2016). PROMs publications report on eligible procedures, whereas other publications from HES data report on episodes. In practice, this means that if a patient undergoes both a hip and knee replacement in a single hospital episode, their hospital records this as one episode for both procedures. However, the distinction between the two is made within the PROMs analysis of the linked PROMs questionnaires.

Trade-offs Between Output Quality Components

Due to time and resource constraints it is not possible to produce a publication with the full complement of outputs every month. To ensure that data are available to users as frequently as is feasible, a full publication including interactive maps, spreadsheets and a record-level data pack are produced quarterly, whilst the monthly publications include only a national summary.

The decision to finalise the dataset around fifteen months after the end of the financial year when the PROMs procedures have taken place is a balance between timeliness and completeness. Patients can complete and return their post-operative questionnaire many months after it has been sent to them and often they are only returned after a series of reminders or duplicate questionnaires are issued. The decision to take fifteen months was taken after an analysis of the time taken by patients to return questionnaires showed that the number being returned after this point was small.

See also the 'Timeliness and Punctuality' section.

Assessment of User Needs and Perceptions

There is a "Have your say" link on the PROMs publication home page for users of the data and this publication report to feedback their views and suggestions. We have a dedicated e-mail address; proms@nhs.net, for users to e-mail their queries or concerns and if anything is identified as being unclear, we address that as soon as we possibly can.

For the twelve weeks between 4 January 2016 and 28 March 2016 NHS England conducted a consultation exercise around the future of PROMs, most notably looking to see which of the four current PROMs procedures should continue and what, if any, new procedure measures could be introduced. This consultation has now closed and the outcome will be published on the NHS England website once the results have been analysed.

In addition to this, NHS Digital launched its own consultation exercise on all its publications and services, including PROMs, over the coming three financial years 2016-17 – 2018-19. This consultation closed 27 June 2016 and the results can be found [here](#)¹²:

Performance, Cost and Respondent Burden

The PROMs programme invites all NHS-funded patients going through a PROMs-eligible procedure to complete pre- and post-operative questionnaires, which are linked, where possible, to administrative data about their procedure-related health care.

Pre-operative questionnaires

Patients due to have a PROMs-eligible procedure are invited to complete a voluntary self-administered pre-operative PROMs questionnaire. Questionnaires may be administered on the day the patient is admitted for treatment or at a pre-assessment clinic beforehand. The content and layout of these questionnaires is standard across all providers. Paper-based questionnaires are predominantly used, but questionnaires can be delivered electronically, provided that the look and feel is consistent with the paper-based versions.¹³ Questionnaire length varies with procedure type, ranging from six pages for groin hernia procedures to ten pages for varicose vein procedures. Patients may be assisted to complete questionnaires if they are unable to do so independently; this is recorded within the questionnaire itself. Typically the questionnaire will take around 5 - 10 minutes to complete.

All variations of the pre-operative questionnaires

¹² <http://content.digital.nhs.uk/article/7041/Consultation-on-changes-to-HSCIC-Statistics-201617---201819-Now-Closed>

¹³ Some providers administer pre-operative questionnaires electronically: providers choosing this option must ensure that appearance of the electronic questionnaire (e.g. layout) matches that of the paper-based questionnaire. This is intended to minimise mode effects (systematic differences in responses that are due to differences in how the questionnaires are administered, rather than differences among respondents). The standards for electronic representation of PROMs questionnaires are included within the Department of Health, Patient Reported Outcome Measures (Standards), 2012: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/212849/proms-framework-standards-k-m-050712.pdf

- Address consent issues by stating that participation is voluntary, describing how patient information will be used and linked with other data, and asking patients' permission to share patient-provided information with healthcare professionals directly involved in providing their care;
- collect personal information needed to:
 - send post-operative questionnaires to the patient,
 - link the pre-operative questionnaire to administrative data about the related inpatient hospital procedure;
- ask questions about the specific condition for which the patient will be treated¹⁴; and
- ask general questions about the patient's health and quality of life.

The pre-operative questionnaires also collect information about other health conditions that may affect recovery and/or quality of life.

Pre-operative questionnaire collection and processing

All providers that offer treatment eligible for PROMs will hold a contract with a third party data supplier accredited to offer questionnaire services to the NHS under the Patient Questionnaire Framework (PQF). Pre-operative questionnaires are collected by providers after completion and sent to their data supplier. The data supplier carries out a number of processing tasks prior to submitting record-level data files to NHS Digital:

- Paper questionnaires are physically scanned and the information extracted using software;
- The NHS Number is obtained from the NHS Demographics Batch service from the personal information on the questionnaire;
- Data may be verified by hand in cases where the data are ambiguous or the software cannot determine what has been recorded due to poor handwriting;
- Data validation rules are applied, such as ensuring the data are in the correct format for submission.

NHS Digital validates the data submissions on arrival and links pre-operative questionnaires with administrative data about patients' hospital stays (for relevant procedures) held in the Hospital Episode Statistics (Admitted Patient Care) dataset.¹⁵ Pre-operative questionnaires then become available for NHS Digital to analyse, whether or not they are successfully linked to an inpatient episode.

¹⁴ Patients undergoing groin hernia procedures are not asked condition-specific measures.

¹⁵ Detailed information about the matching algorithm used to link pre-operative questionnaires with HES episodes can be found in "Matching methodology" section of "Monthly Patient Reported Outcome Measures (PROMs) in England: A guide to PROMs methodology" http://content.digital.nhs.uk/media/1537/A-Guide-to-PROMs-Methodology/pdf/PROMs_Guide_V8.pdf

Post-operative questionnaires

Patients who have completed pre-operative questionnaires are asked to complete a post-operative questionnaire. These are sent to patients at their homes for self-completion. The timeframe within which post-operative questionnaires must be sent depends upon the procedure and whether or not the pre-operative questionnaire has been successfully linked with an episode.

Where pre-operative questionnaires link to a HES episode, NHS Digital sends the data supplier a file containing the PROMs Serial Number, the procedure, and the operation date. This lets data suppliers calculate when to send post-operative questionnaires to patients. Post-operative questionnaires should be sent out according to the schedule outlined in Table 9.

Table 9: Schedule for post-operative questionnaire distribution¹⁶

	If pre-operative questionnaire links to a hospital episode	If pre-operative questionnaire does not link to a hospital episode
Groin hernia	Three months after the procedure date	Approximately six months after pre-operative questionnaire scan date ¹⁷
Hip replacement	Six months after the procedure date	Approximately nine months after pre-operative questionnaire scan date
Knee replacement	Six months after the procedure date	Approximately nine months after pre-operative questionnaire scan date
Varicose vein	Three months after the procedure date	Approximately six months after pre-operative questionnaire scan date

¹⁶Department of Health, "Patient Reported Outcome Measures (PROMs) Standards https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/212848/proms-framework-standards-a-j-050712.pdf

¹⁷ All pre-operative questionnaires are assigned a 'default' date, which is the length of time usually allowed for recovery from the PROMs procedure (three months or six months), plus twelve weeks from the pre-operative questionnaire scan date. Where pre-operative questionnaires do not link to procedures, they are mailed out to arrive near the default date.

Data suppliers can send out up to two follow-up mailings to patients that have not returned post-operative questionnaires, encouraging them to do so.

Post-operative questionnaires contain:

- A pre-printed serial number (often in the form of a bar-code which can be scanned) enabling the post-operative questionnaire to be linked with the pre-operative questionnaire;
- Questions about whether or not the patient required assistance to complete the questionnaire;
- Questions about procedure-related complications;
- Questions about the specific condition for which the patient received treatment (identical with those used in the pre-operative questionnaire);
- Questions about self-reported health and quality of life (identical with those used in the pre-operative questionnaire).¹⁸

Post-operative questionnaire collection and processing

Patients return completed post-operative questionnaires to the data supplier using a pre-paid envelope. The data supplier then performs similar processing tasks as for the pre-operative questionnaire prior to submitting post-operative data as record-level xml files to NHS Digital:

On receipt of post-operative data, NHS Digital performs a number of validation checks and the data becomes available for NHS Digital analyses and publications.

Confidentiality, Transparency and Security

The use of PROMs data are covered by consent which specifies what the data can be used for, what other datasets (such as HES) that can link to PROMs and how long the data can be kept. This includes retaining the patient identifiers (NHS number, date of birth and postcode) for no longer than 24 months after completion of the pre-operative questionnaire.

All NHS Digital publications, including PROMs, are required to complete an annual risk assessment in order to determine the risk of accidentally including information that could inadvertently lead to the identification of a patient.

¹⁸ Samples of pre- and post-operative questionnaires for all PROMs-eligible procedures are available at:
http://webarchive.nationalarchives.gov.uk/+/www.dh.gov.uk/en/publicationsandstatistics/publications/publicationspolicyandguidance/dh_091815

Data are subject to disclosure control before being released. Aggregate data at organisation level are suppressed (shown as *) where counts of HES eligible episodes or pre-operative questionnaires are less than or equal to five. Record level data are anonymised by removing the NHS number, date of birth and postcode and presenting the age in ten year groups (e.g. 50 to 59, 60 to 69). Organisations with fewer than five records for a given age and gender category are further controlled by suppressing age group and gender suppressed (shown as *) on those rows of data.

Any changes to the way the data are presented must first be assessed and passed by NHS Digital's internal Disclosure Control Panel.

Data are released under the [Open Government Licence](#), which encourages the re-use of our statistics as long as certain [conditions](#) are observed.

Appendix A: Method for Estimating Missing PROMs Episodes

The following approach is used to estimate missing PROMs episodes for providers known to have missing HES episodes. Within the equations below, the current reporting period (RP) is the portion of the current financial year covered within the publication (in this case the current reporting periods are April 2015 to March 2016).

- Where providers have submitted PROMs episodes for both part of the current reporting period (RP) and for the previous reporting period:

$$\begin{aligned}
 & \text{Estimated missing episodes for current RP} \\
 &= \sum \text{Episodes for corresponding months of previous year} \\
 &+ \left(\sum \text{Episodes for corresponding months of previous year} \times \text{Annual rate of change} \right) \\
 &- \sum \text{Episodes within current RP in months for which partial data submitted}
 \end{aligned}$$

The annual rate of change is the percentage difference (expressed as a decimal) between the number of episodes within the current reporting period (for which data submissions were complete) and the corresponding period of the previous financial year. The data submission for any given month is assumed to be incomplete if it has fewer than half as many episodes as the corresponding month of the previous reporting year. This method of estimation is used because it takes some account of seasonal variation in episode numbers.

- Where providers have submitted PROMs episodes for part of the current reporting period, and none of the previous year's reporting period (for example, new providers);

$$\begin{aligned}
 & \text{Estimated missing episodes for current RP} \\
 &= \left(\left(\frac{\sum \text{Episodes in current RP}}{n(\text{Months for which data submitted})} \right) \right. \\
 & \quad \left. \times n(\text{Months in current RP}) \right) \\
 &- \sum \text{Episodes in current RP}
 \end{aligned}$$

- Estimates of missing PROMs episodes are produced only for providers having at least one recorded PROMs episode in the current reporting period.
- Estimates are rounded to the nearest ten episodes (estimates between 1 and 4 inclusive are shown as '<5').

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