Primary Care Contracting

Reading and Understanding the Dataset and Business Rules of the Quality and Outcomes Framework: A Guide

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Introduction

Achievement in the Quality and Outcomes Framework (QOF) of the GMS contract is recorded on a national system known as QMAS (Quality Management and Analysis System). Results are entered into the system either through an extraction from the patient's electronic health record or through the practice entering a value against an indicator. Achievement levels for the majority of the clinical indicators are generated through an extraction of the clinical record. The acceptable recording terms and the sequence in which these data are extracted are detailed in a set of documents known as the Dataset and Business Rules.

At first glance these documents can appear intimidating and confusing. However, an understanding of both the documents and their application is a key competence for those with responsibility for QOF assessment and the adjustment of achievement prior to payment. The aim of this guide is to inform potential users of the structure of the rule sets, consider their practical application and to enhance understanding and confidence. This will be accomplished through an assessment of the key features of the rule sets and the examination of some examples of rule sets of varying complexity. All examples and excerpts from the rule sets are taken from Version 11.

All the rule sets are publically available and can be downloaded from www.primarycarecontracting.nhs.uk. These documents are updated twice a year. When managing queries it is important to ensure that you are referring to the version of the relevant dataset in use during the QOF year the query relates to.

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Key Points

- Each Dataset and Business Rule contains all the information required to identify patients to be included in the disease register, indicator denominators and the indicator numerators.
- Each rule set is a series of logical statements which should be applied sequentially.
- Each rule set conforms to the logical principles outlined here no matter how complex they look.
- To limit the potential for confusion when managing a query it is useful to know the clinical terminology system used in the practice and to ensure that you are referring to the relevant version of the Dataset and Business Rules.
- For ‘in year’ queries this will be the current version.
- For historical queries this will be the version in use at the time of the data extraction e.g. for queries relating to the 06/07 QOF year you should refer to version 9.
- Confidence in the use of the rule sets comes with practice.

Purpose of the rule sets

The primary purpose of the rule sets is to support the accurate, consistent and timely payment of practice achievement in the Quality and Outcomes Framework of the GMS contract.

To do this they describe the following information:

- Patient selection criteria – to identify, from the clinical record, those patients who should be on the register for a specified condition.

- Clinical data extraction criteria – to identify, from the clinical record, those patients in whom the activities described in the indicators have been recorded.

- Indicator rule sets – to identify, from the clinical record, those patients who should be included in the numerator and denominator for each indicator.

These information sets are used to identify the following groups of patients in a logical and consistent manner. Firstly, using the patient selection criteria:

1. the practice population

2. those on the disease register from within the practice population

And secondly, using the clinical data extraction criteria and the indicator rule sets:

3. the indicator denominator from those on the disease register

4. the indicator numerator from those included in the indicator denominator.

All the rule sets follow the same structure and layout. This means that once you can navigate one you can navigate them all. The following sections consider in more detail the key components and how to interpret them.

Reading and Understanding the Patient Selection Criteria

The patient selection criteria aim to identify those patients who, according to their clinical record, should form the practice disease register. There are two elements to the patient selection criteria:

- registration status and
- diagnostic code status.

Registration status

Registration status identifies those patients who are registered at the practice for GMS care at the point at which the data extraction is made. Within the Dataset and Business Rules this is modelled as midnight on 31st March each year (the end of the QOF year). This determines the current patient population at the practice.

Looking at an example of these elements, further detail is given with regard to the qualifying criteria to determine registration status.

a) Registration status

Current registration status	*Qualifying criteria*
Currently registered for GMS	Most recent registration date < (REF_DAT)
Previously registered for GMS	Any sequential pairing of registration date and deregistration date where both of the following conditions are met: registration date < (REF_DAT); and deregistration date >= (REF_DAT)

To be included in the patient population of a practice a person needs to be registered for GMS care and therefore their most recent registration date needs to be before midnight on 31st March (the reference date). This is to ensure that patients are only considered for QOF payment purposes at a single practice at any one time. This is on the basis that it is not possible for a patient to be registered at more than one practice at the same time.

A patient is deemed as 'currently registered' at a given practice if there is only a date of registration before the reference date. In other words the patient is still registered at the practice.

A patient is deemed as 'previously registered' at a given practice when there is a pairing of both a registration date and a de-registration date *and* where the registration date is before the reference date but the de-registration date is after the reference date. In other words, the patient was registered at the practice at the reference date but has since registered elsewhere.

This allows for the identification of one practice population from another.

Diagnostic code status

The diagnostic code status determines the current patient population for a specified clinical condition i.e. it identifies the register size.

This consists of three criteria;

- code criteria,
- the qualifying diagnostic codes and
- the time criteria.

An example is given below.

b) Diagnostic code status

Code criteria	*Qualifying diagnostic codes*			*Time criteria*
Included	*Read codes v2*	*SNOMED-CT*	*CTV3*	*Latest < (REF_DAT)*
	G2... G20..% G24.. - G2z.. (Excluding G24z1)	38341003% (excluding 69909000, 72022006%, 198941007%, 367390009%, 62275004, 64715009%, 38481006%, 206596003, 169465000 194791005%, 199008003)	XE0Ub XE0Uc% G24..% (excluding 61462) G2...% Xa0Cs XSDSbG202. Xa3fQ	
	(Hypertension diagnosis codes)			
Excluded	*Read codes v2*	*SNOMED-CT*	*CTV3*	*Latest < (REF_DAT) AND > Date of diagnostic code above*
	21261 212K.	162659009	21261	
	(Codes for hypertension resolved)			

Underneath the code criteria there are normally two rows; one for those patients to be included and one for those patients to be excluded. These should be applied to the practice population in the order in which they are listed in order to select patients onto the disease register.

Reading across the 'included' row the second column identifies the qualifying diagnostic codes. This column is divided into sub-columns. Each sub-column contains the qualifying diagnostic codes for a specified version of the clinical terms. Those specified here relate to either Read codes version 2, clinical terms version 3 (CTV3) or SNOMED-CT. These clinical terminologies use different combinations of letters and numbers to record the same clinical concept. Occasionally one combination of letters and numbers is used by the different clinical terminology systems to refer to different diagnoses. Therefore to limit the potential for confusion when attempting to respond to practice queries it is important to know which version of Read codes they are using.

The final column specifies the time criteria. This usually identifies the recording of the qualifying diagnostic code of interest i.e. first, earliest, latest or new in relation to the reference date. In the example shown here (hypertension) we are instructed to identify the latest recording of one of the eligible diagnosis codes before the reference date.

The records of those patients in whom a qualifying diagnostic code is identified should then be checked against the criteria specified in the ‘excluded’ rows. In the example shown here this is to check that the diagnosis has not been resolved. The time criterion here has an additional check to ensure that the qualifying diagnosis code for ‘hypertension resolved’ is not only the *latest* recording of this code but that it appears *after* the qualifying diagnostic code for inclusion on the register.

In some rule sets additional criteria are also applied e.g. the diabetes rule set excludes patients with diabetes who are less than 17 years old. Others require multiple patient populations to be identified e.g. depression, but the basic principles outlined here of qualifying diagnostic codes and the application of each line of the inclusion and exclusion criteria in the order that they are written still apply.

Reading and Understanding the Clinical Data Extraction Criteria

The clinical data extraction criteria are used to identify those patients in whom certain activities have been recorded as occurring, or to identify those in whom the activity need not be completed. This information is then applied to the patient record using the indicator rule sets to calculate achievement against a given indicator.

The clinical data extraction criteria tables are made up of four primary columns: field number, field name, data item and qualifying criteria. See the example below, which shows the first four rows of the hypertension clinical data extraction criteria table.

2) Clinical data extraction criteria

Field Number	*Field name*	*Data item*			*Qualifying criteria*
1	PAT_ID	Patient ID number			Unconditional
2	REG_DAT	Date of patient registration			Latest < REF_DAT
3	HYPEXC_COD	*Read codes v2*	*SNOMED-CT*	*CTV3*	Latest < REF_DAT
		9h3..%	898310000000107%	XaJ4P%	
		(*Hypertension exception reporting codes*)			
4	HYPEXC_DAT	Date of HYPEXC_COD			Chosen record

A unique **field number** is allocated to each data item.

The **field name** is also unique to each data item. This is used in the indicator rule sets to identify the data item of interest.

The **data item** provides an English description of the field name e.g. date of patient registration describes the field name REG_DAT. It also provides a list or cluster of the accepted clinical codes for the item where required.

The **qualifying criteria** column guides you to the specified instance of the data item which is used for calculating achievement. This may be the earliest, latest, first or new recording of the data item or it may be unconditional.

As an example let us look at field 11 in the hypertension rule set.

11	BPEX_COD	*Read codes v2*	*SNOMED-CT*	*CTV3*	Latest < REF_DAT
		8I3Y.	413123006	XaJkR	
		(*BP recording exception codes*)			
12	BPEX_DAT	Date of BPEX_COD			Chosen record

Here the field name is BPEX_COD and there is one acceptable clinical term for each clinical recording system e.g. for CTV3 it is XaJKR. The qualifying criteria column then instructs us to examine the patient record for the latest recording of this code before the reference date. Field 12, BPEX_DAT, is used to identify the date of the identified clinical term. For example a patient could have a number of

entries of exception codes over the years but when we look in a given year it is the *latest* recording which we are interested in and is picked up on the extraction.

Equally, if we wished to identify the accepted codes for a data item we could examine the data item column until we found the English descriptor of interest. The acceptable codes are listed in the row above the descriptor. An example is given below of the accepted codes for blood pressure recording in the hypertension rule set identified in this way.

7	BP_COD	*Read codes v2*	*SNOMED-CT*	*CTV3*	Latest < REF_DAT
		246..% (excluding 2460., 246H., 246I., 246K., 246L., 246M.)	163020007% (excluding 163021006, 310357009, 310356000, 274283008%) 75367002% (excluding 37087001%, 315612005, 315613000, 386533006%, 6797001%, 251079001, 252076005%)	X773t% (excluding XaI9f, XaI9g) 246..% (excluding 2460., XaCFN, XaCFO)	
		(*BP recording codes*)			

From this example we can see that there are a number of ways of presenting the codes of interest. We may wish to include as acceptable a single code, a parent code and all its children, all codes in a range or alternatively all codes in a range but exclude one or more of these. These are expressed in the datasets in the following ways:

- a single code – G2…
- a parent code and all its children – G20..%
- all codes in a range – G24.. – G2z..
- all codes in a range but exclude one or more – G24.. – G2z.. (excluding G24z1)

The number of fields contained in the clinical data extraction criteria is determined by the number of data items required to support the calculation of achievement against the indicator set. The hypertension rule set requires 14 data items to support three indicators. As a rule clinical areas with a greater number of indicators require a greater number of data items.

Reading and Understanding the Indicator Rule Set

Each clinical indicator, with the exception of register indicators, is supported by a rule set to enable the identification of both the numerator and the denominator. These are expressed as a series of logical statements to which the answer is either true or false. Depending upon the answer to each statement we are instructed to *either* select or reject the record *or* apply the next rule.

The rule set tables are made up of four columns:

- the rule number
- the rule
- action to be taken if the rule is true
- action to be taken if the rule is false.

Identifying the denominator

Below is an illustration of a denominator rule set for hypertension indicator 4.

2 Indicator BP 4: The percentage of patients with hypertension in whom there is a record of the blood pressure in the previous 9 months.

a) Denominator ruleset

Rule number	*Rule*	*Action if true*	*Action if false*
1	If BP_DAT >= (REF_DAT – 9 months)	Select	Next rule
2	If BPEX_DAT>= (REF_DAT – 15 months)	Reject	Next rule
3	If REG_DAT >= (REF_DAT – 3 months)	Reject	Next rule
4	If HYPEXC_DAT >= (REF_DAT – 15 months)	Reject	Next rule
5	If HYP_DAT >= (REF_DAT – 3 months)	Reject	Select

Each rule should be applied to the clinical record in numerical order in order to identify whether a patient should be included in the denominator and/or the numerator for the indicator.

We will now work through these in more detail.

Rule 1

Rule number	*Rule*	*Action if true*	*Action if false*
1	If BP_DAT >= (REF_DAT – 9 months)	Select	Next rule

This rule is applied to those patients who have been identified as belonging on the disease register. To interpret and apply this rule we need further information as to:

- the data item with the field name BP_DAT
- the meaning of the symbols > and =.

Symbols are used within the rule sets in accordance with accepted mathematical definitions. A refresher of these is given in the notes section at the beginning of each rule set document. The symbols here are '>' greater than and '=' equal to.

To find further information on the data item of interest we need to refer back to the clinical data extraction criteria to identify the relevant field name. If we are working with an electronic version of the rule set, all field names are hyperlinks to the clinical data extraction criteria. For ease the relevant section is reproduced below.

7	BP_COD	*Read codes v2*	*SNOMED-CT*	*CTV3*	Latest < REF_DAT
		246..% (excluding 2460., 246H., 246I., 246K., 246L., 246M.)	163020007% (excluding 163021006, 310357009, 310356000, 274283008%) 75367002% (excluding 37087001%, 315612005, 315613000, 386533006%, 6797001%, 251079001, 252076005%)	X773t% (excluding XaI9f, XaI9g) 246..% (excluding 2460., XaCFN, XaCFO)	
		(*BP recording codes*)			
8	BP_DAT	Date of BP_COD			Chosen record

From this we can see that BP_DAT is field 8 of the clinical data extraction criteria and is used to refer to the date of the BP_COD. BP_COD is detailed in field 7 and refers to the instance of a blood pressure recording code we should look for. In this case the latest recording of this code, in the patient record, before the reference date.

When interpreting the indicator rule sets we must consider both any time criteria dictated by the rule set itself and the qualifying criteria stated in the clinical extraction table.

Thus, rule one makes the following statement:

'The date of the latest recording of an accepted blood pressure recording code is greater than or equal to the reference date minus nine months i.e. the date of the blood pressure recording code is in the last nine months of the QOF year.'

If the answer to this is true then the patient record is selected into the denominator. If it is false then we need to apply the next rule.

Rule 2

This is illustrated below.

a) Denominator ruleset

Rule number	*Rule*	*Action if true*	*Action if false*
1	If BP_DAT >= (REF_DAT – 9 months)	Select	Next rule
2	If BPEX_DAT>= (REF_DAT – 15 months)	Reject	Next rule

To interpret rule 2 we require additional information regarding the field name BPEX_DAT. Again we find this in the clinical data extraction criteria, shown below.

11	BPEX_COD	*Read codes v2*	*SNOMED-CT*	*CTV3*	Latest < REF_DAT
		8I3Y.	413123006	XaJkR	
		(*BP recording exception codes*)			
12	BPEX_DAT	Date of BPEX_COD			Chosen record

BPEX_DAT is field 12 of the clinical data extraction criteria and refers to the date of field 11, the blood pressure exception reporting code. The final column instructs us to look for the latest recording of one of these codes before the reference date.

Thus rule two makes the following statement:

'The date of the latest recording of an accepted blood pressure exception reporting code is greater than or equal to the reference date minus 15 months.'

If this is true, then the patient record should be rejected from the denominator as the patient has been exception reported. If it is false then we are instructed to apply the next rule.

For further information on exception reporting and the criteria for doing so please refer to Annex 1 of 'Revisions to the GMS Contract 2006/07' (www.nhsemployers.org).

Rule 3

This is illustrated below.

a) Denominator ruleset

Rule number	*Rule*	*Action if true*	*Action if false*
1	If BP_DAT >= (REF_DAT – 9 months)	Select	Next rule
2	If BPEX_DAT>= (REF_DAT – 15 months)	Reject	Next rule
3	If REG_DAT >= (REF_DAT – 3 months)	Reject	Next rule

Again we need to refer back to the clinical data extraction criteria to interpret and apply the field name REG_DAT, reproduced below.

2	REG_DAT	Date of patient registration	Latest < REF_DAT

So rule three makes the following statement:

'The date of the latest patient registration is greater than or equal to the reference date minus three months.'

If this is true, then the patient is rejected from the dominator for this indicator. This is because patients who have registered with a practice within three months of the end of the QOF year can be exception reported.

If this is false then we need to apply the next rule.

Rule 4

This is reproduced below.

a) Denominator ruleset

Rule number	*Rule*	*Action if true*	*Action if false*
1	If BP_DAT >= (REF_DAT – 9 months)	Select	Next rule
2	If BPEX_DAT>= (REF_DAT – 15 months)	Reject	Next rule
3	If REG_DAT >= (REF_DAT – 3 months)	Reject	Next rule
4	If HYPEXC_DAT >= (REF_DAT – 15 months)	Reject	Next rule

Referring back to the clinical data extraction criteria, we can identify the field name HYPEXC_DAT, shown below.

3	HYPEXC_COD	*Read codes v2*	*SNOMED-CT*	*CTV3*	Latest < REF_DAT
		9h3..%	89831000000107%	XaJ4P%	
		(*Hypertension exception reporting codes*)			
4	HYPEXC_DAT	Date of HYPEXC_COD			Chosen record

Here we are instructed to look for the latest recording of an accepted hypertension exception reporting code before the reference date.

Thus rule four makes the following statement:

'The date of the latest recording of an accepted hypertension exception reporting code is greater than or equal to the reference date minus 15 months.'

If this statement is true, then the patient is rejected from the denominator. If it is false, then the next rule should be applied.

Rule 5

This is reproduced below and is the final rule in this set.

a) Denominator ruleset

Rule number	*Rule*	*Action if true*	*Action if false*
1	If BP_DAT >= (REF_DAT – 9 months)	Select	Next rule
2	If BPEX_DAT>= (REF_DAT – 15 months)	Reject	Next rule
3	If REG_DAT >= (REF_DAT – 3 months)	Reject	Next rule
4	If HYPEXC_DAT >= (REF_DAT – 15 months)	Reject	Next rule
5	If HYP_DAT >= (REF_DAT – 3 months)	Reject	Select

The field name HYP_DAT is identified by referring back to the clinical data extraction criteria, reproduced below.

5	HYP_COD	*Read codes v2*	*SNOMED-CT*	*CTV3*	Earliest < REF_DAT
		G2... G20..% G24.. - G2z.. (Excluding G24z1)	38341003% (excluding 69909000 72022006%, 198941007%, 367390009%, 62275004, 64715009%, 38481006%, 206596003, 169465000, 194791005%, 199008003)	XE0Ub XE0Uc% G24..% (excluding 61462) G2...% Xa0Cs XSDSb G202. Xa3fQ	
		(*Hypertension diagnosis codes*)			
6	HYP_DAT	Date of HYP_COD			Chosen record

Here we are instructed to look for the earliest recording of an accepted hypertension diagnosis code before the reference date. Note the different

qualifying criteria used here. This is to ensure that a patient is not incorrectly rejected from the denominator.

Thus rule five makes the following statement:

'The date of the earliest recording of an accepted hypertension diagnosis code is greater than or equal to the reference date minus three months.'

If this is true then, the patient is rejected from the denominator as recent diagnosis i.e. within the last three months is an accepted exception reporting criteria. If it is false, then the patient is selected into the denominator.

Once all the rules have been applied then we have identified those patients who make up the indicator denominator from those who have been exception reported or those who have been excluded. The phrase 'exclusion' is used to refer to patients who are unsuitable or ineligible for the care described in an indicator and therefore are different to exceptions. Exceptions are patients who, all things being equal would be eligible for the care described in the indicator but have been excluded from this care for one of the nine reasons defined in the QOF Guidance.

An example of an indicator which requires 'exclusions' to be identified and removed from the denominator at the outset i.e. before identification of those to be included in the denominator is Depression 2. In this instance the register is comprised of all patients with a current diagnosis of depression but the care specified in the indicator only relates to those with a new diagnosis within the QOF year. Therefore, the first rule of the denominator rule set identifies and rejects those with a diagnosis outside of this time period.

Identifying the numerator

Once the denominator is identified the numerator rule set is applied to this population to identify those patients in whom the activity of interest has been performed. This data is then used to calculate a percentage achievement that is converted into a point achievement and ultimately results in a payment to the practice.

Continuing with the example of hypertension indicator 4 the numerator rule set is shown below.

b) Numerator ruleset: To be applied to the above denominator population

Rule number	*Rule*	*Action if true*	*Action if false*
1	If BP_DAT >= (REF_DAT – 9 months)	Select	Reject

Numerators usually consist of a single rule. This is commonly the same as the first rule of the denominator (unless there is an exclusion to be applied).

As before, further detail on the meaning of field names can be found in the clinical data extraction criteria.
This rule is making the statement:

'The date of the latest recording of an accepted blood pressure recording code is greater than or equal to the reference date minus nine months.'

If this statement is true, then the patient is selected into the numerator. If it false then the record is rejected.

You have now completed a walk through of the rule set for this indicator. At this stage you may wish to apply the principles demonstrated here to the interpretation of the remaining indicator rule sets in the hypertension dataset to confirm your understanding.

Further Advice and Support with QOF Queries

For further information and support on the implementation and management of the Quality and Outcomes Framework please visit the QOF pages at www.primarycarecontracting.nhs.uk or discuss with your Primary Care Contracting Advisor.

Glossary

Denominator – this is the name for the bottom part of a fraction. In the QOF rule sets it is comprised of all patients eligible for the care described in the indicator minus those who have been exception reported.

Exception reporting – this is a feature of the Quality and Outcomes Framework which allows practices to remove patients, who would otherwise be eligible for the care described, from the denominator of an indicator. Currently there are nine exception reporting criteria. These are detailed in the QOF guidance produced by NHS Employers and the BMA and also in the Statement of Financial Entitlement.

Exclusions – these are patients who are removed from the denominator of an indicator because they are ineligible for the care described in the indicator. For example CHD 2 only applies to patients with a diagnosis of angina after the 1st April 2003. However the CHD register will include patients with angina diagnosed before this date. It is therefore necessary to remove those patients from the denominator. This is done automatically by the rule set. This is conceptually different from exception reporting – see above.

GMS Contract – the General Medical Services Contract is the agreement under which the majority of GP practices provide care to their registered patients.

Numerator – this is the name for the top part of a fraction. In the QOF rule sets it is comprised of those patients who have received the care described in an indicator.

QMAS – the Quality Management and Analysis System is a national IT system which gives GP practices and PCT's objective evidence and feedback on the quality of care delivered to patients. It supports the Quality and Outcomes Framework (QOF) element of the GMS contract. QMAS shows how well each practice is doing, measured against national QOF achievement targets. It also ensures that the payment rules which underpin the GMS contract are implemented consistently across all systems and practices in England.

QOF – the Quality and Outcomes Framework is an incentive payment scheme for GPs. It was introduced as part of the GMS Contract in April 2004. Practices are rewarded for the delivery of care described in the 134 indicators covering clinical care, organisational standards and the quality of the patient experience.

Read codes – these are officially known as the NHS Clinical Terms. They are a coded thesaurus of clinical terms which enable clinicians to record care effectively on computerised record systems. Each code is made up of a series of numbers and letters together with a description of the clinical concept (activity/ diagnosis/ symptom/ etc.) the code represents. This description is known as the 'rubric'.

Reference date – this is the date on which achievement against the indicators is calculated. In the Dataset and Business Rules it is modelled for the end of the QOF year and abbreviated to REF_DAT.