Riksrevisjonen
Office of the Auditor General of Norway

The Office of the Auditor General's investigation of medical coding practice within the health enterprises

Riksrevisjonen

Background and objectives of the investigation.
Findings and recommendations.

The Office of the Auditor General's investigation of medical coding practice within the health enterprises

BACKGROUND AND OBJECTIVES OF THE INVESTIGATION

Medical coding entails converting textual descriptions of diagnoses and procedures in medical records into codes. An important purpose of medical coding is to obtain an overview of diseases amongst the population. The codes also provide a basis for planning, administration, financing, management and quality assurance of the specialist health services.

The objective of the investigation was to examine how the health enterprises, the regional health enterprises, the Directorate of Health and the Directorate of eHealth (NDE) fulfil their responsibility to promote good code quality. The investigation was based on two patient groups which are examined and treated at most hospitals: pneumonia patients and hip replacement patients.

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Riksrevisjonen

Findings and recommendations

The quality of medical coding is poor

The health enterprises are responsible for submitting to the Norwegian Patient Registry information which is correct and relevant to the treatment that the patient has received during their period of admission. Amongst the pneumonia patients, an incorrect principal diagnosis was reported for 41 percent of admissions. One in three errors in these admissions was due to the medical record describing a clinical condition other than pneumonia as the principal condition. The other errors were due to the code giving an inaccurate picture of the cause of the patient's pneumonia. This reduces the quality of the patient statistics.

Proportion of doctors who believe that the following aspects are important or very important causes if coding errors are discovered in their department. N=887.	
Those who assign codes have not received sufficient training in coding	79 %
Those who assign codes do not have sufficient time to find the right medical code	72 %
Those who assign codes do not take sufficient care to code correctly	55 %
Those who assign codes do not receive adequate feedback concerning their coding	54 %
Conditions that are coded are not adequately documented in medical records	48 %
DIPS or PAS is not sufficiently user-friendly	47 %
Those who assign codes do not have adequate access to guidance from resource persons relating to coding	41 %
The quality assurance of coding is inadequate	42 %
The electronic aids (such as FinnKode) are inadequate	30 %
Short-lists are not sufficiently updated frequently	25 %
Speech recognition tools do not work adequately	22 %
The code guidance from the Directorate of Health is inadequate	19 %

Source: Questionnaire for doctors

The same questions were asked of both managers and code controllers, with the latter highlighting the same causes as the doctors, particularly a lack of training.

The health enterprises are not adequately following up code quality to ensure good patient statistics

Although the health enterprises have implemented numerous initiatives to improve code quality in recent years, management of the work relating to codes is still inadequate in many enterprises. An important cause behind this is a lack of knowledge of coding amongst the doctors. It is important that the doctors undergo training and receive feedback on their own coding. Clear management which supports the code work is also vital.

Poor code quality has adverse consequences for the management and financing of the specialist health service

Stakeholders at all levels use data from the medical codes for statistics, health monitoring, research and planning. Poor code quality will cause decisions that are taken on the basis of the codes to be based on erroneous premises.

The Office of the Auditor General recommends that

- The health enterprises promote better medical coding through giving employees the necessary updated knowledge concerning coding and requirements for medical record documentation, and through giving clear signals that correct coding is important to ensure good patient statistics

- The regional health enterprises play a greater role as a driving force to ensure good and consistent medical coding

- The Directorate of eHealth facilitates good coding through the provision of guidance and the development of support tools

- The Ministry of Health and Care Services follows up to verify that the Directorate of eHealth and the regional health enterprises ensure that the health enterprises' coding is of good and uniform quality, so that assessments and decisions within the specialist health service are made on the right basis

The Office of the Auditor General's investigation of medical coding practice within the health enterprises

To the Storting (the Norwegian Parliament)

The Office of the Auditor General hereby submits Document 3:5 (2016–2017) *The Office of the Auditor General's investigation of medical coding practice within the health enterprises.*

The Office of the Auditor General, 23 March 2017

For the Board of Auditors General

Per-Kristian Foss
Auditor General

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The aim of the investigation was to examine how the health enterprises ensure that medical codes can be used for governing and financing specialist health services. A further objective of the investigation was to examine how the regional health enterprises, the Directorate of Health and the Directorate of eHealth fulfil their responsibility to contribute to good code quality.

An important purpose of medical coding is to obtain an overview of diseases amongst the population and how incidences of diseases vary temporally and spatially. The codes also provide a basis for the administration, financing, governance and quality assurance of specialist health services throughout the decision-making chain, from the Ministry of Health and Care Services to the clinical departments at the hospitals. In a number of previous investigations, the Office of the Auditor General identified major weaknesses in the quality of the medical coding.

The investigation was based on a letter and electronic questionnaires which were sent to all the health enterprises. In addition, an audit was carried out covering the codes for a sample of 600 admissions of pneumonia patients and hip replacement patients at two departments in ten health enterprises.

A detailed study was also carried out on six departments. These departments were chosen because the code audit, the responses to the letter and questionnaires give reason to believe that their code practice is good. The investigation covers data from the period January 2015 to November 2016.

The investigation was based on the following decisions and intentions of the Storting:
- *Regulation on the collection and treatment of medical information in the Norwegian Patient Registry of 7 December 2007* (the Norwegian Patient Registry Regulation)
- *Medical Record Regulation* of 21 December 2000
- *Act on health enterprises, etc.* of 15 June 2001 (the Health Enterprise Act)
- Recommendation to the Storting no. 198 (2005–2006) *Recommendation to the Storting from the Standing Committee on Scrutiny and Constitutional Affairs concerning the Office of the Auditor General's investigation of code quality at the health enterprises*

The investigation was also based on *Regulations and guidance concerning the use of clinical codes in the specialist health service 2015.*

The report was presented to the Ministry of Health and Care Services in a letter dated 7 December 2016. The Ministry commented on the report in a letter of 10 January 2017.The remarks have largely been incorporated into the report and this document.

The report, the Board of Auditors General's covering letter to the Ministry dated 2 February 2017 and the Minister's reply of 16 February 2017 are enclosed as appendices.

1 Key findings

- The quality of medical coding is poor
- Poor code quality has adverse consequences for the governance and financing of the specialist health service
- The health enterprises are not adequately monitoring code quality to ensure good patient statistics
- The Directorate of eHealth's guidance and tools do not adequately support the code work of the health enterprises

2 The Office of the Auditor General's remarks

2.1 The quality of medical coding is poor

The health enterprises are responsible for submitting information which is correct and relevant to the treatment that patients received during their admission to the Norwegian Patient Registry (NPR) in the Directorate of Health. The investigation identified unacceptably large discrepancies between the medical codes for conditions which were reported to the NPR and the information in the medical records that were audited. This reduces the quality of the patient statistics.

The health enterprises must code and report the *main condition* and *any other conditions* to the NPR following a hospital admission. The building blocks of the codes are individual codes consisting of three characters each, which are used internationally to compare incidences of diseases, among other things. Most codes are also subdivided using a fourth character. In most cases, errors at first and second character level will result in changes to the DRG grouping that is used to finance the health enterprises. Errors at third character level will often also lead to such changes. Such errors will also result in an "inaccurate picture" in national statistics as regards which condition the medical assistance was primarily aimed at during the admission. Errors at fourth character level are less serious as regards patient statistics and rarely impact on the DRG group.

The main condition is the medical problem at which the medical assistance is primarily aimed during a particular admission. The investigation revealed the following errors in the choice of coding of main condition:
- 16 percent of patients coded with pneumonia were assigned a new main condition after the code audit. This means that the medical record documentation describes a clinical condition other than pneumonia as the main condition
- Similarly, five percent of hip replacement patients were given a completely new main condition after the code audit
- 25 percent of pneumonia patients had their main condition altered at third character level. The medical record documentation shows that the main condition is pneumonia, but the code that has been used gives an inaccurate picture of the cause of the patient's pneumonia, e.g. whether it was caused by bacteria or a virus
- For 14 percent of the hip replacement patients, the main condition was coded incorrectly at fourth character level. This means that these cases have not been reported in accordance with the applicable regulations, resulting in a less precise description of the main condition in the patient statistics than the medical record documentation makes provision for.

The doctors also make a discretionary assessment as to whether there were *other conditions* besides the *main condition* which were of real significance to the provision of medical assistance during the admission. The discretionary assessment of conditions that are reported to the NPR must be documented in the medical record. Conditions

relating to previous or chronic diseases which had no real impact on the medical assistance that was provided should not be reported to the NPR. All the health enterprises covered by the investigation report *other conditions* to the NPR for which there is no basis in the medical records. These include:

- Fifty eight percent of reported other conditions amongst hip replacement patients
- Thirty seven percent of reported other conditions amongst pneumonia patients.

Some of these conditions may have been of importance for the medical assistance that was given during the admission, but the doctor's discretionary assessment is not sufficiently well-documented in the medical records to provide a basis for reporting them. These admissions therefore appear to be more complicated in the national statistics than was documented in the medical records.

However, the situation is the reverse for some admissions, i.e. there are cases where there is a basis in the medical records for reporting more *other conditions*. Consequently, these cases appear to be less complicated in the national statistics than has been documented in the medical records. Both under- and over-reporting of *other conditions* to the NPR have consequences for the patient statistics and therefore also for the governance and financing of the specialist health service. However, in the sample, it is more common to over-report than under-report.

Code quality varies between the departments. For the admissions with pneumonia that were audited, three in ten departments reported an erroneous main condition for more than half of the admissions. However, the Department of Medicine at Stavanger University Hospital reported 80 percent of their admissions with the correct main condition. This shows that some departments are more successful than others at ensuring good code practice.

In the case of some departments, there is no basis in the medical records for 70 percent of *other conditions* which have been reported to the NPR, while in the case of other departments, there is no basis for less than 20 percent. There is a tendency for the departments which report many *other conditions* to the NPR to be the same as those which have a high proportion of *other conditions* for which there is no basis to report in the medical records.

The Office of the Auditor General's investigations have also previously indicated poor code quality amongst the health enterprises. The sample covered by the code audit is limited and, when viewed in isolation, does not provide a basis for drawing general conclusions concerning code quality amongst the health enterprises. However, the investigation was based on patient groups which are examined and treated at most hospitals. Given that the investigation also indicates that internal controls are poor (see section 2.3), the Office of the Auditor General believes there is reason to assume that code quality at other hospitals and for other patient groups is also poor.

2.2 Poor code quality has adverse consequences for the governance and financing of the specialist health service
Stakeholders at national, regional and local level are increasingly making extensive use of data from the medical codes. It is therefore important that assessments and decisions which are made on the basis of established codes are founded on correct premises.

The Ministry of Health and Care Services uses DRG scores as an indicator of performance and to finance the health enterprises through the performance-based financing (PBF) scheme.

The primary purpose of this scheme is to underpin the executive responsibility of the regional health enterprises and promote cost-effective patient treatment. The payments made through the PBF system must reflect actual treatment provision, and this presupposes good quality of medical coding.

Approximately one in four of the admissions audited were assigned to a new DRG when they were re-grouped following the code audit. This is of importance for the PBF reimbursement.

The DRG score awarded to most audited departments was reduced overall following the code audit. This is because the majority of the admissions were re-grouped from a complicated DRG to an uncomplicated DRG. An admission in a complicated DRG triggers a higher reimbursement from the state than one in an uncomplicated DRG. A few departments ended up with higher DRG scores overall. This is just as serious as regards the basis for payments from the PBF scheme as a reduction. Both indicate that the main code does not correspond with the medical record documentation, which in many cases also means that the reimbursement does not correspond with the medical assistance that was provided.

The investigation shows that the health enterprises use DRG scores as an indicator of the performance of the clinical units. Most health enterprises also forward the PBF reimbursement to the clinical units. As a result, most clinics and many departments are partly financed according to the DRG scores they generate, even though the Directorate of Health does not believe that the DRG system is sufficiently robust to be used for this purpose. In the opinion of the Office of the Auditor General, the investigation indicates that variable and poor code quality could impact on the basis for correct and fair distribution at local level.

Poor code quality will result in governance information which makes it difficult to assess what proportion of a change in performance is real, and what proportion is due to changes in coding practice. Better code quality will therefore provide management at all levels within the health enterprises with a better basis for assessing performance levels as regards the provision of patient treatment within the enterprise's clinical units. Many decisions which impact on the running of the health enterprises are made on the basis of information from the DRG system. If the health enterprises establish systems which ensure good code quality and thereby provide a better decision-making basis, they can improve their cost control and resource utilisation.

Good and consistent data is essential if the regional health enterprises are to be able to assess the extent to which they are fulfilling their executive responsibility. The regional health enterprises use statistics based on coding to analyse consumption patterns, availability, variations in service delivery and practice and quality within their own health region. Data is also used by the regional health enterprises to plan and monitor the allocation of functions between health enterprises, to prepare projects/ strategies and regional plans, and to determine demand for medical personnel. The Office of the Auditor General therefore believes that the regional health enterprises must play a larger role as a driving force to ensure consistent and good medical coding amongst the health enterprises within their region.

The Ministry of Health and Care Services uses information from medical codes to plan the specialist health service and assess whether the health service is achieving its objectives. This is partly done through 73 national quality indicators which are based on information derived from the medical codes. These will be used as a tool for management and quality improvement purposes within the specialist health service.

Other pivotal knowledge providers for the health sector, such as the National Institute of Public Health, Statistics Norway and research communities, also use data from the NPR based on medical codes.

Poor code quality can reduce the level of confidence in patient statistics as a basis for the planning, governance, follow-up and evaluation of health services locally, regionally and nationally. It also limits the scope to use patient statistics for medical research purposes. The Office of the Auditor General therefore believes that it is important that all stakeholders with responsibility for medical coding contribute to ensuring that the statistics are of good quality.

2.3 The health enterprises are not adequately monitoring code quality to ensure good patient statistics
The board and management of the health enterprises have a responsibility to establish systems which contribute to good code quality. Although the health enterprises have implemented numerous initiatives to improve code quality in recent years, governance of the work relating to codes is still inadequate in many enterprises.

The investigation has identified the following factors as having a major impact on code quality:
• Whether or not the doctor is familiar with medical coding
• Whether or not the health enterprises have established good quality assurance procedures for the codes that their doctors assign
• Whether clear messages from the management teams facilitate good coding in practice as well as good attitudes towards coding amongst the staff

The health enterprises' management teams have a responsibility to ensure that their staff possess sufficient knowledge and expertise to perform the task of medical coding. Many doctors have an inadequate understanding of the fundamental principles for coding and the requirements that are imposed regarding documentation in medical records in order to report a condition to the NPR.

A combination of different tools means that some health enterprises and departments appear to have been more successful than others in training their doctors concerning coding and in maintaining the level of knowledge. It is particularly important that doctors receive training, individual follow-up and explanatory feedback on their own coding. This is not common in most health enterprises.

In many health enterprises, the training is targeted at interns and sometimes also recently appointed doctors, whilst experienced doctors are given little refresher training during their career. At the same time, more experienced doctors often guide younger colleagues regarding correct coding. The Office of the Auditor General believes that the most important initiative for improving code quality is for the health enterprises to endeavour to raise the level of knowledge of coding amongst all doctors who assign codes, including both new doctors and the more experienced.

The results of the code audit show that many errors are not identified and amended through the quality assurance procedures. During the code audit, many codes for *other conditions* were found for which there was no basis in the medical records. This may be due to the quality assurance procedures of many departments being aimed more at ensuring that the health enterprise receives a fair income than ensuring correct patient statistics. Another possible cause is uncertainty concerning the requirements that are imposed relating to documentation in the medical records in order to code a diagnosis and report it to the NPR. The Office of the Auditor General believes that this indicates

that quality assurance of coding amongst the health enterprises is not being targeted sufficiently at ensuring good code quality.

All the health enterprises aim to code correctly. However, these enterprises have not developed specific and realistic targets concerning code quality. With few exceptions, the health enterprises do not measure trends in code quality over time, and many enterprises have also not assessed in any systematic way, where in the coding process the greatest risk of errors lies. This makes it difficult to implement targeted initiatives to ensure good code quality.

Most health enterprises have developed common overarching procedures for coding. However, many of these procedures vary in terms of quality and content and give managers at lower levels considerable freedom in the management of the code work. The freedom of a department's management team to manage and organise the code work can lead to a risk that code quality is largely dependent on the management's competence and interest in coding.

The investigation shows that written routines are not sufficient on their own to ensure good code quality. Clear and competent management teams with a commitment to medical coding are just as important and can create attitudes amongst the staff which promote good code quality. This includes stressing to doctors the broad range of uses of the codes, over and above the financing of health enterprises.

The Office of the Auditor General believes that overall the health enterprises' management and follow-up of code quality is inadequate. To ensure good internal controls and risk management of code quality, it is important that the management team identifies weaknesses in control procedures, implements relevant measures and shows commitment and engagement towards the coding work.

2.4 The Directorate of eHealth's guidance and tools do not adequately support the code work of the health enterprises

The Directorate of eHealth is responsible for administering the medical codes. This responsibility includes auditing codes and ensuring that the sector receives guidance concerning how the regulations for medical coding should be practised.

The Directorate has a number of instruments and tools at its disposal for guiding the sector in practising the code rules, including the search tool FinnKode and an elearning course in coding. The investigation revealed weaknesses relating to both FinnKode and the e-learning course in coding, tools which are extensively used within the sector. The Office of the Auditor General believes it is important that the Directorate of eHealth develops and maintains good tools. This will help to raise the level of knowledge and motivation amongst doctors relating to coding.

The Directorate of eHealth is responsible for informing the sector about regulatory changes in good time, something which is not always done. The Directorate must ensure that the information is released at the right time, and that this takes place through a documented, clear and transparent process with fixed dates for the provision of information. This will create predictability for the health enterprises when they plan how the changes should be implemented within the organisation.

The investigation shows that attitudes and practices vary within the departments as regards when *other conditions* should be reported to the NPR. This indicates that the Directorate should work with the relevant specialist groups to clarify where the thresholds for the coding of *other conditions* lie. This would contribute to more

uniform reporting of *other conditions* and thereby improve the quality of patient statistics. Attitudes within the sector also vary as regards when a reported condition is considered to be adequately documented. The Directorate of eHealth should clarify what the documentation requirement actually entails, and the sector must be given good information in this regard.

The Directorate is currently working on a number of projects and initiatives under the umbrella "Programme for coding and terminology", with one expected outcome of the programme being better code quality. Many of the initiatives are aimed at overcoming the challenges that the audit has identified. The Office of the Auditor General believes it is important that many of the initiatives, particularly the updating and improvement of the training material, be implemented to enable the sector to improve code quality.

3 The Office of the Auditor General's recommendations

The Office of the Auditor General recommends that:
- The health enterprises promote better medical coding through giving their employees the necessary updated knowledge concerning coding and the requirements for medical record documentation, and ensuring that management teams give clear signals that correct coding is important in order to ensure good patient statistics
- The regional health enterprises play a larger role as a driving force to ensure good and consistent medical coding
- The Directorate of eHealth facilitates good coding through the provision of guidance and the development of support tools
- The Ministry of Health and Care Services follows up to verify that the Directorate of eHealth and the regional health enterprises ensure that the health enterprises' coding is of good and uniform quality, so that assessments and decisions within the specialist health service are based on the right premises

4 The Ministry's follow-up

In his letter of reply of 16 February 2017, the Minister states that the Office of the Auditor General's investigation of medical coding practice within the health enterprises covers an important area. In the letter, he notes that code quality has an important impact on how precisely such information can be used in the development of the service, and in financing at local level. The Minister notes that it is important that all stakeholders with responsibility for medical coding help to ensure that the statistics are of good quality.

The Minister notes that the sample of 600 admissions from two patient groups is of limited size, which reduces the potential to draw general conclusions concerning medical coding and code quality. At the same time, the Minister notes that the investigation's findings underline the importance of focusing on medical coding practice. The Minister welcomes the report as it provides a basis for learning and the transfer of experience.

The Minister will follow up the Office of the Auditor General's investigation in the governance dialogue with the relevant stakeholders in an appropriate manner.

5 The Office of the Auditor General's final remarks

The Office of the Auditor General has no further remarks.

The case will be submitted to the Storting.

Adopted by the Board of Auditors General on 7 March 2017

Per-Kristian Foss   **Karl Eirik Schjøtt-Pedersen**

Beate Heieren Hundhammer   **Gunn Karin Gjul**   **Arve Lønnum**

Jens Gunvaldsen

Appendix 1

The Office of the Auditor General's letter to the Minister

R

Riksrevisjonen

MINISTRY OF HEALTH AND CARE SERVICES

0030 Oslo

Att.: Minister Bent Høie

Forwarding of Document 3:x on the Office of the Auditor General's investigation of medical coding practice within the health enterprises

Please find enclosed a draft version of Document 3:X (2016-2017) *The Office of the Auditor General's investigation of* medical coding practice within the health enterprises.

The document is based on a report submitted to the *Ministry of Health and Care Services* in connection with our letter dated *7 December 2016*, and on the Ministry's reply dated *10 January 2017*.

The Minister is asked to give an account of how the Ministry will follow up the Office of the Auditor General's remarks and recommendations, and whether the Ministry disagrees with the Office of the Auditor General.

The Ministry's follow-up will be summarised in the final document, which will be submitted to the Storting. The Minister's reply will be enclosed with the document in its entirety.

Deadline for reply: *16 February 2017*.

For the Board of Auditors General

Per-Kristian Foss
Auditor General

Appendices:
Draft version of Document 3:X (2016-2017) *The Office of the Auditor General's investigation of medical coding practice within the health enterprises*

By authority

The letter has been sent digitally and therefore has no handwritten signature.

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The original letter in Norwegian has been translated into English

Appendix 2

The Minister's reply

Office of the Auditor General
Postboks 8130 Dep
0032 OSLO

Your ref.	Our ref.	Date
2015/01596	16/6753-	16 February 2017

Regarding the Office of the Auditor General's investigation of medical coding practice within the health enterprises

I refer to the Office of the Auditor General's letter dated 2 February 2017.

I am in agreement with the Office of the Auditor General that the quality of medical coding is of importance as regards how precisely such information can be used in the work to develop the service and the financing locally. The Office of the Auditor General's investigation of medical coding practice within the health enterprises therefore covers an important area.

The investigation covered 600 patient admissions from just two patient groups, i.e. pneumonia and hip replacement patients. The Ministry has previously noted that such a limited sample reduces the scope to draw general conclusions concerning medical coding and code quality. At the same time, some of the investigation's finding emphasise the importance of focusing on medical coding practice. It is positive that the report which forms the basis for the Office of the Auditor General's remarks and recommendations is laid out in such a manner that it can be used as a basis for learning and the transfer of experience.

I agree that it is important that all stakeholders with responsibility for medical coding contribute to ensuring that the statistics are of good quality. The health enterprises are responsible for submitting to the Norwegian Patient Registry information which is correct and relevant to the treatment that the patient has received during their period of admission. Among other things, the Office of the Auditor General notes that an important initiative to improve the quality of codes within the health enterprises is to increase the level of knowledge concerning coding amongst health personnel who assign codes. The Office of the Auditor General furthermore notes that the Directorate of eHealth is working on a number of projects and initiatives aimed at improving code quality in line with and within its area of responsibility.

I will follow up the Office of the Auditor General's investigation in the management dialogue with the relevant stakeholders in an appropriate manner.

Yours sincerely

Bent Høie

Appendix 3

Report: The Office of the Auditor General's investigation of medical coding practice within the health enterprises

The audit has been conducted in accordance with the Act and Instructions relating to the Office of the Auditor General, and in accordance with the guidelines for performance audits which are consistent with and based on ISSAI 300, INTOSAI's international standards for performance audits.

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1 Introduction

1.1 Background

Medical coding entails converting textual descriptions of diagnoses and procedures in medical records into codes. By using codes instead of ordinary diagnoses, it is possible to use the information for statistical, health monitoring and research purposes – see Figure 1.

Figure 1 Medical coding in brief
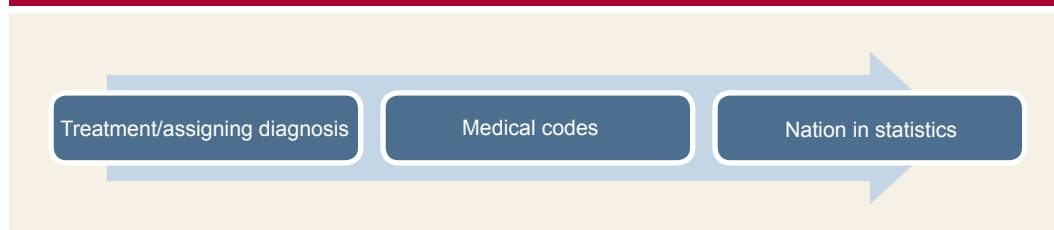
Treatment/assigning diagnosis → Medical codes → Nation in statistics

An important purpose of medical coding is to obtain an overview of diseases amongst the population and how incidences of diseases vary temporally and spatially. Medical codes also provide a basis for administration, financing, governance and quality assurance of specialist health services throughout the decision-making chain, from the Ministry of Health and Care Services down to the clinical departments at the hospitals.

In a number of previous audits, the Office of the Auditor General has identified major weaknesses in the quality of medical coding.[1] In addition, the units of internal audits of the regional health enterprises concluded in 2011 that insufficient internal governance and control had been established to afford a reasonable level of confidence that the coding was correct.[2] The internal audits units also concluded that there is a low risk of widespread conscious erroneous coding with the aim of achieving financial gain. A lack of knowledge of which codes should be used, insufficient time for coding, dissatisfaction with IT systems used for coding and lack of motivation amongst doctors were identified as the principal causes of erroneous coding. The internal audits recommended initiatives aimed at both the health enterprises and the regional health enterprises in order to strengthen internal governance and control within this area, and they also suggested that it may be appropriate to consider initiatives at national level.

A number of stakeholders have a responsibility to ensure that coding is correct. The Directorate of eHealth (eHealth) is responsible for developing and managing codes and promoting good code quality. The Directorate of Health administers the Norwegian Patient Registry (NPR) and is responsible for ensuring that the medical information that is collected and processed in the Registry is correct, including medical codes. In addition, the Directorate of Health has a responsibility to calculate performance-based financing (PBF) in line with the provisions in the regulations, and ensure that the payments made through the PBF scheme reflect actual performance. Among other things, the regional health enterprises must ensure that medical coding is medically correct and not used to increase funding income in breach of good professional practice and appropriate organisation. The health enterprises report the medical codes to the Directorate of Health, and each individual health enterprise has a responsibility

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1) Document 3:2 (2004–2005), Document 3:7 (2005–2006) and Document 3:2 (2009–2010).
2) The internal audits conducted by the regional health enterprises (2011) *National internal audit of medical coding practice. Main report.*

both to establish internal control procedures which ensure correct coding, and to send correct data to NPR.

The Norwegian Patient Registry (NPR) is one of Norway's pivotal health registries. Medical codes are key variables in the NPR. According to the Ministry of Health and Care Services, the NPR is the most important source for quality management at all levels.[3] In addition to the statistics that the Directorate of Health itself publishes, other pivotal knowledge providers to the health sector such as the National Institute of Public Health and Statistics Norway (SSB) also use data from the NPR. Data from the NPR is also used as a basis for research purposes, both at national level and by the hospitals.

Seventy-three of the national quality indicators are based on information from medical codes. These will be used as a tool for management and quality improvement purposes within the specialist health service. The Ministry of Health and Care Services also uses the indicators to draw conclusions concerning the quality of health services provided in Norway compared with those in other OECD countries.[4]

The Ministry of Health and Care Services uses statistics based on coding in its governance. Medical codes are used for analysis purposes when the Ministry plans developments within the specialist health service, e.g. the future emergency preparedness of hospitals.[5] In addition, codes are used as a source of data when the Ministry assesses whether the targets set for the specialist health service are being achieved. One example is the targets that the Ministry sets for cancer pathways for the regional health enterprises. Data concerning variables such as performance and waiting times is essential if the regional health enterprises are to be able to assess the extent to which they are fulfilling their executive responsibility. Both the health enterprises and the regional health enterprises use data from medical codes at a relatively detailed level in order to plan and manage their health services.

Medical codes are also vital input data in the DRG system which is used to finance the health enterprises through PBF. In 2016, the regional health enterprises received around NOK 30 billion through the PBF grant, which was then redistributed between the health enterprises.[6] The grant is intended to cover around 50 percent of the health enterprises' expenditure for somatic patient treatment. The payments made through the PBF system must reflect actual treatment provision,[7] and this presupposes good quality medical coding. Poor internal controls can lead to a risk that obtaining increased funding is given more emphasis than ensuring correct codes.

The health enterprises also use information from the medical codes and the DRG system for planning purposes and to compare their own performance with that of others. All the health enterprises use DRG scores as key performance indicators, and most health enterprises distribute the PBF refund down through the organisation.

The codes are used by many stakeholders for a wide variety of purposes. Good code quality is vital in order for decisions made on the basis of data derived from codes to be taken on the right premises. If the medical codes provide an accurate description of the medical assistance that has been given during each individual hospital admission, the codes will collectively be able to provide a statistical picture of patient activity at

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3) Report to the Storting no. 11 (2015–2016) *National health and hospital plan*, p. 89.
4) Report to the Storting no. 12 (2015–2016) *Quality and patient safety 2014*, p. 11–12.
5) Report to the Storting no. 11 (2015–2016) *National health and hospital plan (2016-2019)*, p. 99-103.
6) In addition, the regional health enterprises received NOK 521.5 million in 2016 through the quality-based financing scheme (QBF). QBF is a financing scheme for the specialist health service where a proportion of the regional health enterprises' funding is made dependent on the achievement of set performance targets using 32 of the quality indicators. Of these 32 indicators, six are based on medical codes.
7) Proposition 1 S (2014–2015), p. 113.

Norwegian hospitals, and what the medical condition of the Norwegian population is like and how it is developing.

1.2 Objective and audit questions

The objective of the investigation was to examine how the health enterprises ensure that medical codes can be used for governance and financing. A further objective of the investigation was to examine how the regional health enterprises, the Directorate of Health and the Directorate of eHealth fulfil their responsibility to contribute to good code quality.

Issues

1. To what extent do the medical codes reported to the Norwegian Patient Registry (NPR) and the information in patient medical records correspond?
2. What consequences could a lack of correspondence between medical codes which are reported to the Norwegian Patient Registry (NPR) and the information in patient medical records have for the governance and financing of the health enterprises?
3. How do the health enterprises ensure that codes are of good quality
   a. What impact does code quality have within the health enterprises?
   b. What practices have the health enterprises established to ensure good code quality?
4. How do the regional health enterprises contribute to good code quality?
5. How do the Directorate of Health and the Directorate of eHealth promote good code quality?

An important purpose of medical coding is to obtain an overview of diseases amongst the population and how incidences of diseases vary temporally and spatially. Photo: ScanStock photo

2 Methodical approach and execution

The audit questions in this investigation have been answered through a combination of methods: A code audit, a document review, interviews, analysis of available statistics and secondary sources. Data collection took place during the period December 2015 to November 2016.[8]

Figure 2 Model for the performance of the investigation

Letter and questionnaire

Documents concerning internal control within all the health enterprises

+ Results of *questionnaire* for all health enterprises

+ NPR data
= Sample of 20 departments for code audit

Code audit and further analysis

External code audit of medical records

Case study

Three health enterprises, Six departments
• Interviews
• Document review
• Questionnaire
• NPR data

2.1 Document review of answers to letter

A letter was sent to the health enterprises in December 2015 requesting information concerning the written targets, routines, procedures and risk descriptions that they have established to ensure good code quality. In addition, the health enterprises were also asked how the management and the board have followed the recommendations from the internal audits' joint investigation of medical coding in 2011.[9]

A letter was sent to the Directorate of eHealth, the Directorate of Health and the regional health enterprises requesting information on the status of the initiatives they are working on within the field of medical coding, and how they are working to fulfil their responsibilities within the field. They were also asked how they are working to follow up the recommendations from the corporate audit from 2011 which was aimed at them, as this responsibility is shared between the Directorates.

2.2 Questionnaires

Three questionnaires were undertaken in February 2016 in order to examine how the health enterprises are ensuring, and how the Directorates are contributing to, good

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8) Sequential method use ensured good utilisation of the various data sources in the study during the process of data acquisition and at different phases of the analysis. In addition, method use contributed to systematic triangulation both during the process and the analysis phase of the investigation. Systematic triangulation at every phase of the investigation also contributed to the belief that the data collectively has a high level of validity and reliability.

9) *The internal audits of the regional health enterprises 2011: National internal audit of medical coding practice. Main report.*

code quality (issues 3 and 5). One questionnaire was aimed at managers at different levels, one at doctors10[10] and one at staff whose main task is to quality-assure main codes. This could include both medical personnel and finance staff ('code controllers'). All three questionnaires include staff who either work in or provide support functions to the departments which treated the two patient groups covered by the code audit.

The questionnaires mapped internal controls concerning medical coding within all the health enterprises. A total of 1989 doctors, 164 managers and 151 code controllers received the questionnaires. The response rate was 55 percent for doctors, 84 for managers and 88 for code controllers.[11]

2.3 Code audit

The purpose of the code audit concerning coding amongst the health enterprises was to investigate whether the medical record documentation and the conditions and procedures that the health enterprises have reported to the Norwegian Patient Registry (NPR) correspond. In addition, the code audit provides information on the possible consequences of erroneous coding as regards financing and governance.

The results of a code audit give an indication of how well the health enterprise has succeeded in converting the conditions and procedures which are described in the patient's medical records into patient statistics in the form of a set of diagnosis and procedure codes in line with the regulations for coding.

Medical coding consists of three main elements which the health enterprises must report to the NPR following a hospital admission:
- *The main condition* is the condition for which the medical assistance was primarily given during the admission
- *Other conditions* are conditions which exist at the same time as the main condition, or which develop during the treatment period. These are conditions which are subject to examination and treatment, which must be taken into account or which have consequences for the treatment of the patient
- *Procedures* are examinations and treatments which are carried out.

The code audit covered a sample of 600 admissions of pneumonia patients and hip replacement patients. These two patient groups were chosen as they are both common conditions which are dealt with at most hospitals. Pneumonia patients are normally treated by a medical department, while hip replacement operations are carried out by an orthopaedic department.

Certain patient groups were chosen in the code audit in order to examine whether code practices between hospitals for the same patient group are consistent and to more readily find explanations as to why certain departments are more successful than others at ensuring good code quality.

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10) The respondents to the *questionnaire* aimed at the doctors included four people who were not doctors (nurses, physiotherapists, etc.). Everyone who responded to this *questionnaire* is referred to here as a 'doctor'.

11) Two of the questions in the questionnaire were revised after the questionnaire had been sent out. Firstly, it was no longer possible to choose *several* alternative answers to the question "What consideration would you place emphasis on if several diagnoses appeared to be of equal value when you were selecting a main condition?". One alternative answer was also changed from "the condition which is perceived to be the most important from a medical perspective" to "most serious". In addition, the question "How would you justify whether 'other conditions' should be coded?' was changed to "How do you justify your choice of *other conditions?*" These changes were implemented on 3 February. In the analyses of these questions, only those who responded to the new versions of the questions were included, i.e. 744 instead of 1062 respondents. Analyses show that these respondents do not differ from those who responded to the original version. A further two questions were also added during the questionnaire. These were the claims "It is most appropriate for the doctor to do the coding" and "Coding takes too much time away from treating patients". These were answered by 786 respondents. Respondents who replied that they assign codes less often than once a month were omitted from the questionnaire.

The code audit was limited to admissions within two DRG pairs (see fact box 1):

- DRG 89 Simple pneumonia and Pleurisy, age greater than 17 with *other conditions*
- DRG 90 Simple pneumonia and Pleurisy, age greater than 17 without *other conditions*
- 209 D Major joint and reattachment procedures of lower extremity with *other conditions*
- 209 E Major joint and reattachment procedures of lower extremity without *other conditions*

For the sake of clarity, these admissions are referred to in the report as "pneumonia patients" and "hip replacement patients".

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Fact box 1 DRG pair

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A DRG pair consists of two DRGs – one complicated DRG for admissions with other conditions and one uncomplicated DRG without other conditions. The health enterprises receive a higher reimbursement for patients who are grouped under a complicated DRG than under an uncomplicated DRG pair. The determining factor as to whether an admission is grouped under a complicated DRG in a given DRG pair is whether one or more other diagnoses have been reported which are coded with an ICD-10 code which is assigned complicating characteristics for the DRG pair concerned. Examples of diagnoses with complicating characteristics for both DRG pairs are dehydration, COPD and type 2 diabetes.

Source: Directorate of Health

Medical record documentation was acquired for a total of 600 hospital admissions.[12] The code audit covered 30 admissions in each of the two DRG pairs at 20 departments in 10 health enterprises during the first and second four-month periods of 2015[13] There are two departments at the same hospital in each of the health enterprises.[14] The departments were selected on the basis of evidence which suggested good or poor governance of medical coding. This assessment is based on information from data that had already been collected, i.e. statistics, documents and the questionnaire. The following health enterprises and hospitals were covered by the code audit:

Health enterprise	Hospital
University Hospital of North Norway	Tromsø
Nordland Health Enterprise	Bodø
Nord-Trøndelag Health Enterprise	Levanger
Møre and Romsdal Health Enterprise	Ålesund
Førde Health Enterprise	Førde
Stavanger Health Enterprise	Stavanger
Innlandet Health Enterprise	Gjøvik
Vestre Viken Health Enterprise	Bærum
Akershus University Hospital Health Enterprise	Ahus
Østfold Hospital Health Enterprise	Østfold

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12) See Appendix 1 for the documentation that was requested.
13) In the case of some departments, there were 28 or 29 admissions.
14) The health enterprise has notified the Office of the Auditor General of the two units at the lowest organisational level at each hospital which have the highest number of pneumonia patients (DRG 89/90) and hip replacement patients (DRG 209D/209E) respectively.

In each of the departments, the number of admissions which were extracted from complicated and uncomplicated DRGs corresponds to the ratio between these two DRGs which were reported to the NPR during the first and second four-month periods of 2015; see Table 1.

	DRG 89	DRG 90	Proportion in compli-cated group	DRG 209D	DRG 209E	Proportion in complicated group
	Pneumonia patients			**Hip replacement patients**		
Østfold	27	3	90 %	16	14	53 %
Bodø	22	8	73 %	7	23	23 %
Tromsø	24	6	80 %	12	18	40 %
Gjøvik	29	1	97 %	14	16	47 %
Førde	16	14	53 %	7	23	23 %
Stavanger	27	3	90 %	14	16	47 %
Levanger	26	4	87 %	16	14	53 %
Ålesund	25	5	83 %	16	14	53 %
Ahus	26	4	87 %	13	17	43 %
Bærum	28	2	93 %	19	11	63 %

Table 1 Number of admissions in complicated and uncomplicated DRGs, and propotion of admissions in complicated groups broken down per DRG pair

Source: Norwegian Patient Registry

All information which could be used to identify patients and hospitals was anonymised before the code audit. Two audit teams from Analysesenteret and Nirvaco have each assessed all the 600 admissions. The following principal questions were considered:

1. Is there a basis in the medical record documentation that was obtained for the condition and procedure codes which were reported to the NPR in accordance with the national coding regulations?
2. Were the conditionss and procedures which were reported to the NPR correctly coded?
3. Are there conditions and procedures which, based on the medical record documentation in accordance with the regulations, should have been reported to the NPR, but were not?

By way of conclusion, the audit teams jointly compared their respective audit results for the 600 admissions. The result of this review was a complete consensus between the two audit teams. Following the code audit, the admissions were grouped again under the DRG system to examine what consequences the erroneous coding of these admissions could have as regards financing and governance.

2.4 Case study

A case study of medical coding practice was carried out on two departments from three selected health enterprises (Stavanger from Stavanger Health Enterprise, Gjøvik from Innlandet Health Enterprise, and Levanger from Nord-Trøndelag Health Enterprise) to investigate how the health enterprises work to promote good code quality. The purpose of these case studies was to identify characteristics and examples of *good* medical coding practice which other departments within the same health enterprise

and other health enterprises could learn from. Departments were selected which were believed to have good coding practice based on the code audit, document review and questionnaire.

Staff involved in medical coding were interviewed concerning practice. These staff included doctors, managers, code controllers and other employees within analysis departments, in addition to other key staff. The topics covered by the interviews conducted with the health enterprises included the organisation of coding work, training and quality assurance of coding.

2.5 Interviews

Staff at the Directorate of eHealth were interviewed. The purpose of these interviews was to further examine the role and tasks of the Directorate, and these acted as a supplement to the responses that the Directorate gave in the letter.

3 Audit criteria

3.1 Requirements for correct medical coding

Medical codes must be determined based on the documented information in the patient's medical record.[15] The medical record must contain information on the preliminary diagnosis, observations, findings, examinations, treatment, care, diagnosis and other follow-up which is initiated, and the results thereof.[16] *The Regulation on patient medical records* (the Medical Records Regulation) stresses the legal importance of the medical record, e.g. in connection with issues concerning incorrect treatment.[17] The natural consequence of this is that both what was done during an admission and the background to it must be documented.[18]

The requirement for good documentation in medical records is also laid down in Section 40 of the *Act on medical personnel, etc.* (the Medical Personnel Act), which amongst other things states that medical records must contain relevant and necessary information concerning the patient and the medical assistance, and that they must be easy to understand for other qualified medical personnel.

The health enterprises must ensure that data, i.e. information which is relevant to the treatment provided during the admission concerned, is sent to the Norwegian Patient Registry.[19] This entails a responsibility to ensure that the data that is submitted is correct.

Every year, the Directorate of eHealth publishes a set of regulations and guidance concerning the use of the ICD-10, NCSP and NCMP medical codes (the code guidance/code guide).[20] This provides information on the applicable rules and guidelines for coding, registration and reporting. The hospitals are expected to follow the guidelines for the coding of diagnoses and procedures closely.[21]

The code guidance operationalises the documentation requirement as follows: It must be apparent from the written medical record documentation that all conditions which have been included were of real importance during the admission. The general principle is that the coding must provide information which is as precise as possible and as much information as is necessary for the purpose, but no more. The definition for the selection of other *conditions* is a consequence of this. In the guidance, the Directorate of eHealth stresses that it is essentially an impossible task to be absolutely certain what *conditions* will be of importance for other conditions during an admission. This has to be a discretionary assessment, which must be documented in the medical record[22]

This means that not everything that is wrong with the patient and not every routine procedure should be reported to the Norwegian Patient Registry. In order to accept the reporting of a condition or a procedure, the audit has, in line with the above, assumed:
- That the condition/procedure must be formulated in free text in the patient's medical record
- That assessments are presented which explain why the condition was of real importance during the admission

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15) *Regulations IS-233. Performance-based financing 2015, p. 22, Directorate of Health 2015. Regulation on the collection and treatment of medical information in the Norwegian Patient Registry* (the Norwegian Patient Registry Regulation), Section 2-1
16) *Regulation on patient medical records (the Medical Record Regulation),* Section 8(f).
17) *The Medical Record Regulation,* Section 8 and associated remarks.
18) *Regulations and guidance concerning the use of clinical codes within the specialist health service 2016,* p. 16. Directorate of eHealth (2016)
19) *Regulation on the Norwegian Patient Registry (the Norwegian Patient Registry Regulation),* Section 2-1 and remarks to Section 1-6.
20) *Regulations and guidance concerning the use of clinical codes within the specialist health service.*
21) Storting proposition no. 1 (2003–2004).
22) *Regulations and guidance concerning the use of clinical codes within the specialist health service 2015, p. 12. Directorate of Health, 2015.*

The following regulations were used as a basis in the code audit:
- The Directorate of Health's IS-2300 *Regulations and guidance concerning the use of clinical codes within the specialist health service 2015*
- Norwegian version of ICD-10 International Statistical Classification of Diseases and Related Health Problems 10th revision 2015 (FinnKode: ICD10 version 1 2015)
- NCMP (Norwegian Classification of Medical Procedures) and NCSP (Norwegian Classification of Surgical Procedures) 2015 (FinnKode: NCMP/NCSP version 1 2015)
- WHO ICD-10 International Statistical Classification of Diseases and Related Health Problems, 10th revision, 2015
- WHO ICD-10 International Statistical Classification of Diseases and Related Health Problems 10th Revision, volume 2 *Instruction manual*, 5th revision
- Report A679 *Manual for medical record review*, NPR/Sintef 2006

3.2 Requirements concerning internal controls within the health enterprises

In its recommendations concerning the Office of the Auditor General's audit of code quality within the health enterprises in 2006, the Standing Committee on Scrutiny and Constitutional Affairs[23] stressed that better code quality is vital for patient safety, research and governance of the health enterprises. The Committee also believed that the board and management of the health enterprises have a responsibility to establish systems which contribute to good code quality.

The board must ensure that internal control systems are established which guarantee adequate control concerning the enterprise's target attainment, finances and resource use[24] and that the management teams within the health enterprises have overall responsibility for the follow-up and control of their own activities. It is also a requirement that the organisation must ensure that employees possess the requisite knowledge and skills within the relevant discipline and as regards the organisation's internal controls.[25] Good governance means that the health enterprises have established internal controls which helps to ensure that the set targets and performance requirements are met.

The internal controls must ensure that:
- Resource use is efficient
- The anticipated income is received
- The organisation complies with applicable laws and regulations
- The organisation possesses sufficient management information and an appropriate decision-making basis[26]

The health enterprises are responsible for submitting the information that is listed in the Patient Registry Regulation, including procedure and diagnosis codes, to the Norwegian Patient Registry.[27] The sender must ensure that the data that is reported is complete and subject to quality assurance in accordance with the applicable requirements for reporting. This must form part of the organisation's internal controls.[28]

COSO's framework will be used as a basis in assessments to determine whether or not the internal controls are satisfactory. The health enterprise must establish internal controls which provide a reasonable guarantee that the medical coding is satisfactory.

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23) Recommendation to the Storting no. 198 (2005–2006) *Recommendation to the Storting from the Control and Constitution Committee.*
24) Odelsting proposition no. 66 (2000–2001) *Regarding the Act on health enterprises, etc.* (the Health Enterprise Act), Section 28
25) *Regulation on internal control within the health and care service,* Section 4.
26) *Regulations for financial governance within the state* Section 5 and Section 14 (the requirements here do not apply to the health enterprises, but an organisation should still be expected to comply with them).
27) *The Norwegian Patient Registry Regulation,* Section 1.6.
28) Remarks to the *Norwegian Patient Registry Regulation*, Section 2-3.

Such controls include general risk assessments and attitudes at top level, such as integrity and ethical values, and the requirement for management to be concerned about developing competent employees, including employees who have a good knowledge of medical coding. In addition, control activities are required at all levels and within various parts of the coding process, and must contribute to attainment of the objective concerning good code quality. Internal controls also include the way in which management within the health enterprises communicates internally, its follow-up activities to establish whether or not internal controls are functioning, and initiatives to correct any non-conformities.

3.3 Requirements concerning the regional health enterprises

The regional health enterprises have executive responsibility for the specialist health services which are provided to the population.[29] This means that the regional health enterprises must acquire equivalent and the best possible health services using the allocated resources based on needs within the health region.[30] Good quality medical coding is vital if the regional health enterprises are to base their decisions concerning their executive responsibility on the right premises.

The regional health enterprises must use their funding efficiently and in a way which ensures that they benefit the patients.[31] They also have a responsibility to coordinate activity within the health enterprises that they own, with the aim of ensuring that resources are collectively utilised in an appropriate and rational manner.[32] The regional health enterprises must also ensure that medical coding is correct and is not used to increase income contrary to good professional practice and appropriate organisation.[33]

The regional health enterprises have a responsibility to ensure that their own health enterprises report activity in accordance with the relevant intentions. Among other things, this encompasses a responsibility to ensure that medical coding is carried out in line with the national code guidance and provisions laid down in the regulations, to carry out quality controls on data and to ensure that reporting deadlines are met.[34]

3.4 Requirements on the Directorate of eHealth

The Directorate of eHealth is responsible for the governance, implementation and administration of national solutions within the field of e-health. The Directorate is responsible for the administration and development of codes, terminology and ICT standards.[35]

This responsibility also encompasses the provision of advice and answers to questions from the sector concerning codes.[36]

In connection with the development of new services, the Directorate of eHealth must also facilitate the use of external suppliers. Dialogue and the involvement of the

29) *Act on the specialist health service,* Section 2.1a first and sixth paragraphs.
30) Recommendation to the Odelsting no. 118 (2000–2001) 1.2.10, see Odelsting proposition no. 66 (2000–2001) on the Act on health enterprises, etc., point 8.12.
31) *Assignment Document 2015 (Oppdragsdokument 2015) from the Ministry of Health and Care Services to the regional health enterprises.* Ministry of Health and Care Services, 2015
32) *Articles of association for the regional health enterprises,* Section 6.
33) Proposition 1 S (2014–2015) *Ministry of Health and Care Services.*
34) *Performance-based financing 2015:* Regulations. Directorate of Health, 2015
35) Proposition 1 S (2015–2016) *Ministry of Health and Care Services*, p., 28.
36) *Governing documentation for improvements to the administration of codes,* p.4. Directorate of eHealth, 2016

health and social care service must be a guiding principle for the Directorate in all development of national ICT solutions.[37]

3.5 Requirements on the Directorate of Health

The Directorate of Health's administrative duties include authority to apply and interpret laws and regulations within the health sector,[38] including the regulations for PBF.[39] [40]

The Directorate administers the Norwegian Patient Registry, which is the pivotal source of key performance data concerning the specialist health service.

The Directorate of Health must also ensure that medical information that is collected and processed in the Norwegian Patient Registry is correct, relevant and necessary for the administration, governance and quality assurance of the specialist health services, including financing.[41] The objective of the NPR is to provide high-quality management information to the Ministry of Health and Care Services, the regional health enterprises and the municipal authorities[42]

The Directorate of Health is responsible for calculating PBF in line with the provisions of the relevant regulations and must ensure that the necessary control mechanisms are established to ensure that payments made through the PBF scheme reflect actual performance levels and are in line with the Storting's intentions generally.[43]

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37) Proposition 1 S (2015–2016) *Ministry of Health and Care Services*, p. 28.
38) Proposition 1 S (2015-2016), *Chapter 720 Directorate of Health*.
39) In 2015, the Directorate of Health was responsible for developing and administering the medical coding regulations.
40) *Performance-based financing – regulations,* Directorate of Health 2015.
41) *Norwegian Patient Registry Regulation,* Sections 1-2 and 2-4.
42) *Letter of commitment from the Ministry of Health and Care Services to the Directorate of Health for 2015.* Ministry of Health and Care Services, 2015
43) *Performance-based financing – regulations.* Directorate of Health, 2015.

4 To what extent do the medical codes reported to the Norwegian Patient Registry (NPR) and the information in patient medical records correspond?

4.1 The patient groups covered by the investigation

The two patient groups covered by the code audit are grouped into DRG pairs (Fact box 1). The health enterprises receive a higher reimbursement for patients who are grouped under a complicated DRG compared with an uncomplicated DRG pair.

As regards pneumonia patients (DRG pair 89/90), national figures obtained from the NPR for the first and second four-month periods of 2015 show that 81 percent of admissions were grouped in the complicated group. Similarly, 39 percent of admissions for hip replacement patients (DRG pair 209 D/E) were grouped in the complicated group.[44]

Figure 3 Pneumonia patients. Proportion of admissions in complicated group DRG 89. First and second four-month periods 2015
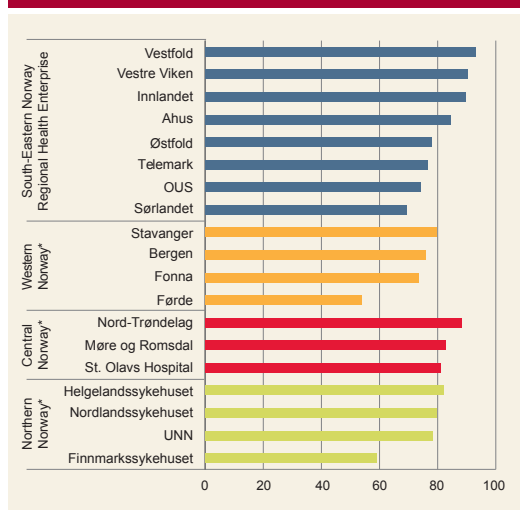
Figure 4 Hip replacement patients. Proportion of admissions in complicated group DRG 209D. First and second four-month periods 2015
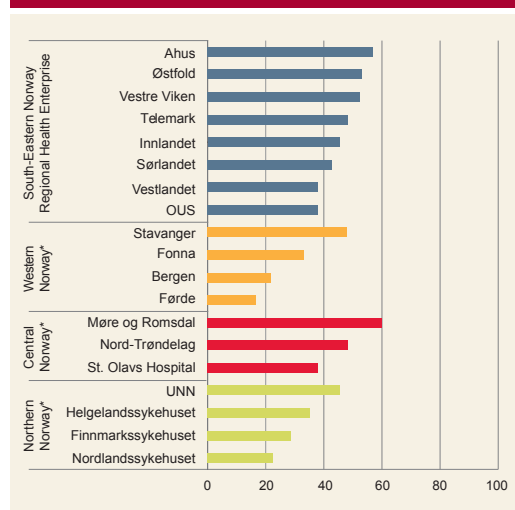
Source: Norwegian Patient Registry
* Regional Health Enterprise

The proportion of admissions in the complicated group varies between the health enterprises – from 54 percent to 93 percent for pneumonia patients and from 17 percent to 60 percent for hip replacement patients; see Figures 3 and 4.

Between the four regional health enterprises, the proportion of admissions in the complicated group varies from 74 percent under the Western Norway Regional Health Enterprise to 83 percent under the Central Norway Regional Health Enterprise for the pneumonia patients. Similarly, the proportion of admissions in the complicated group varies from 30 percent under the Western Norway Regional Health Enterprise to 48 percent under Central Norway Regional Health Enterprise for the hip replacement patients.

44) The calculations include Diakonhjemmet Hospital, Lovisenberg Diakonale Hospital, Martina Hansens Hospital and Haraldsplass Diakonale Hospital.

Figure 5 Pneumonia patients. Proportion in complicated DRG in the DRG pair 89/90, broken down between regional health enterprise and hospital. First and second four-month periods 2015.[45]
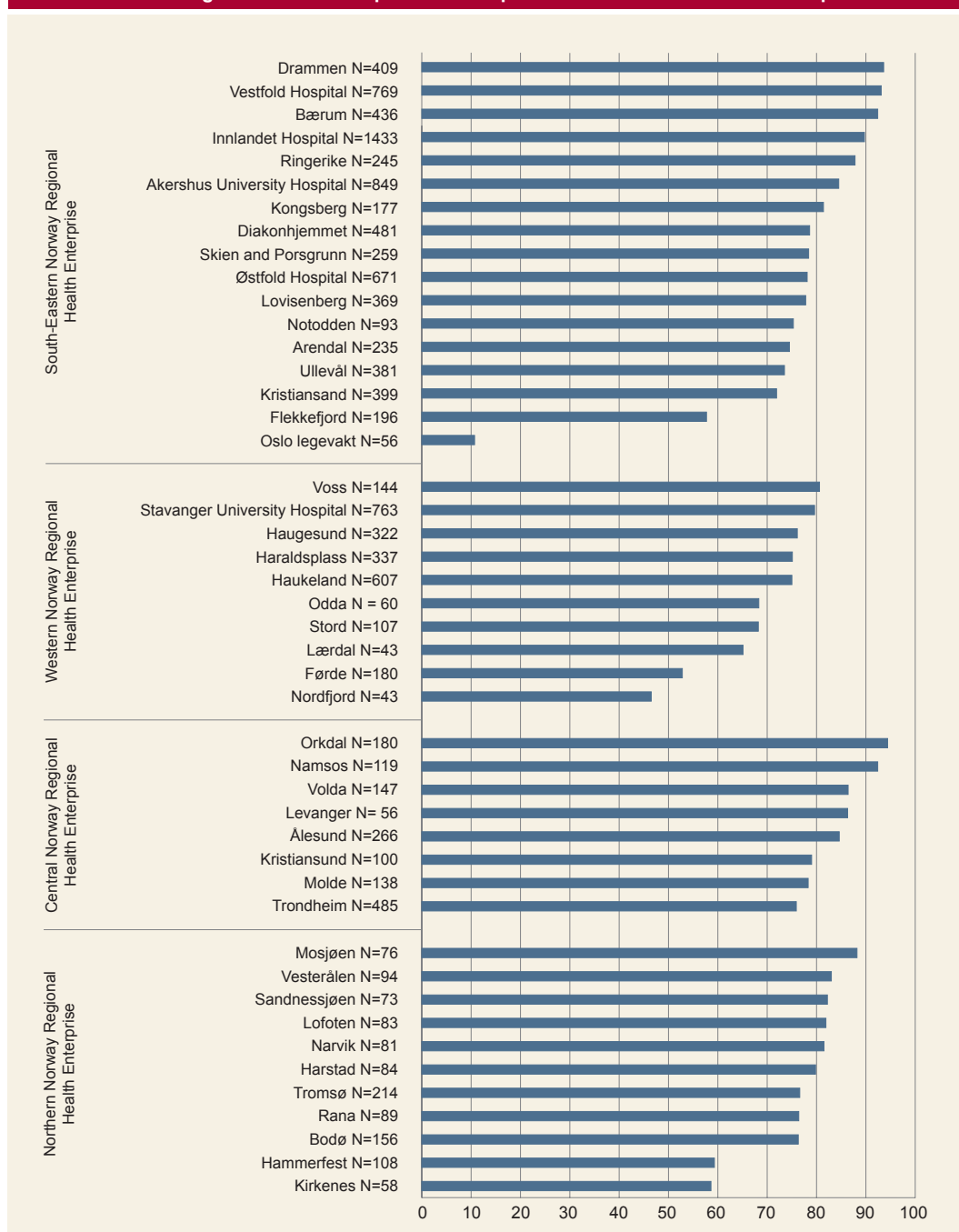
Source: Norwegian Patient Registry

There are variations within the same health region in the proportion of admissions in the complicated group between the hospitals for the pneumonia patients; see Figure 5. The proportion of admissions in the complicated group varies between the 46 hospitals from 11 percent to 94 percent. There are also substantial variations between the hospitals in the proportion of admissions in the complicated group for hip replacement patients (see Appendix 2).

A high proportion of admissions in the complicated group in a given DRG pair apparently indicates that a health enterprise or hospital has many patients with a

number of diseases and disorders at the same time. A high proportion of admissions in the complicated group may have several explanations. If the patient groups treated within a given DRG pair include a higher proportion of elderly patients at one hospital than at another, the proportion of admissions in the complicated group would be expected to be higher at the hospital with the older patients. Functional distribution between hospitals within a health enterprise or a regional health enterprise where the most seriously ill/complicated patients are treated at a number of selected hospitals could be another explanation. The threshold for admission also impacts on the proportion of admissions in the complicated group in the DRG pair. In the same way, if one hospital has a higher threshold/stricter requirement for admitting pneumonia patients (for example) than another hospital, this will tend to result in a higher proportion of admissions in the complicated group in a given DRG pair than at the other hospital.

However, different proportions of admissions in the complicated group in a DRG pair may also be due to differing code practices between the hospitals. Statistics from the NPR indicate that the hospitals have different practices for reporting *other conditions* to the NPR, which in turn will inevitably impact on the proportion of complicated admissions.

Figure 6 Pneumonia patients. Proportion of admissions in DRG 89/90 where COPD, atrial fibrillation and dehydration are reported as other conditions. First and second four-month periods 2015. Hospitals with over 100 admissions in DRG 89/90
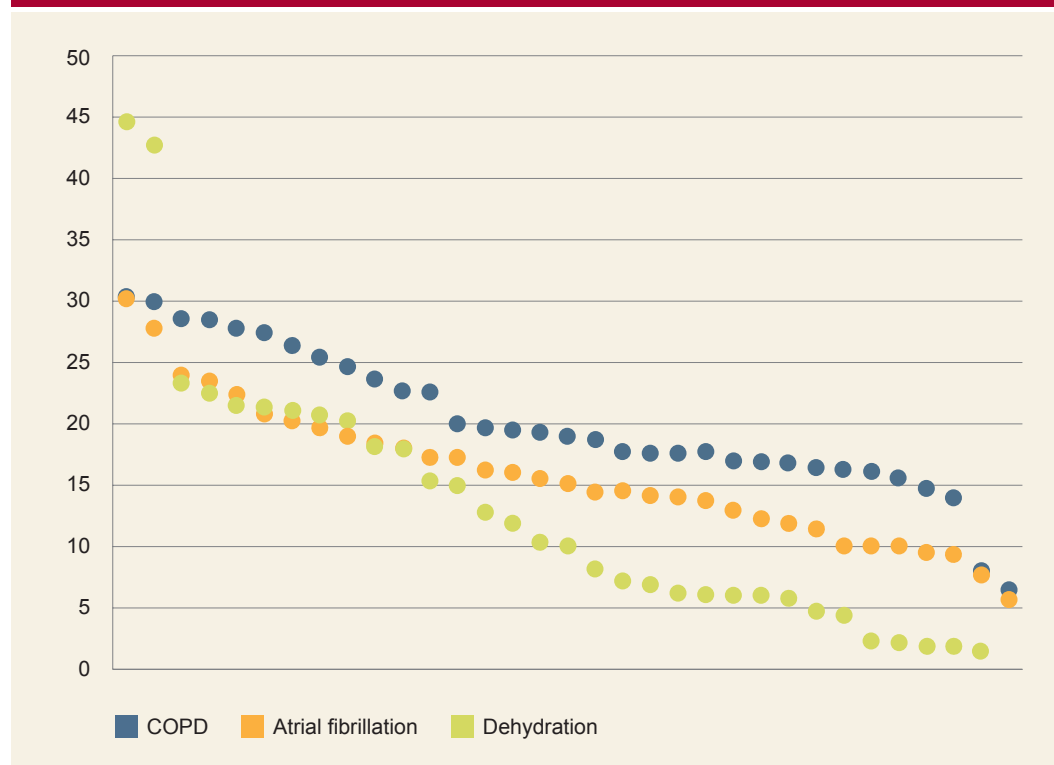
Source: Norwegian Patient Registry

Data from the NPR shows that there is some variation between hospitals as regards the proportion of admissions with pneumonia as the main condition which also reported COPD[46], atrial fibrillation [47] or dehydration[48] as *other conditions*; see Figure 6. For example, dehydration is reported as *other conditions* when pneumonia is the main condition for almost no admissions at certain hospitals, but almost half of admissions at other hospitals.

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46)   J 44 Chronic obstructive pulmonary disease, unspecified.
47)   I 48 Atrial fibrillation and flutter.
48)   E 86 Dehydration.

Similarly, there is also variation amongst hip replacement patients as regards how often different *other conditions* are reported to the NPR.

According to the specialist auditors, the code audit indicates that there is considerable variation between the departments as regards the criteria that are used as a basis for *diagnosing* certain frequently occurring *other conditions* such as dehydration. The specialist auditors also found that there is considerable variation between departments as regards when they perceive these *other conditions* to be of importance to the medical assistance provided during the admission and therefore to be reported to the NPR.

The Ministry of Health and Care Services notes that patients in DRG 89 and 90 only account for 59 percent of all pneumonia patients. Patients who were grouped in DRGs other than 89/90 may also be of relevance when the proportion of admissions in the complicated group in the DRG pair is assessed.[49]

4.2 Coding of main condition

A main condition must be reported for all admissions. The main condition is the condition for which the medical assistance is primarily given during the admission or consultation. If more than one condition could be relevant as a main condition, the condition which required the most treatment resources from a medical perspective should be selected.[50] Not all changes to main condition have the same consequences for the patient statistics. The errors which were discovered during the code audit can be split into two main groups:
• Incorrect main condition reported to the NPR
• Incorrect coding of correctly reported main condition

Incorrect main condition reported to the NPR
In the group 'incorrect main condition reported to the NPR', a distinction is made between admissions which are assigned a completely new main condition, and admissions which are assigned a different classification of main condition at third character level – see Fact box 2. An incorrect code at third character level means that the main condition after the code audit describes a fairly different clinical condition compared with the originally reported condition, although the condition usually occurs within the same organ system as originally reported. Both types of error can affect the grouping of the admission in the DRG system, and therefore also the financing of hospitals. This leads an "inaccurate picture" in the national statistics (NPR) as regards the condition that the medical assistance was primarily aimed at during the admission.

The proportion of admissions reported to the NPR with an incorrect main condition in the code audit is considerably higher for pneumonia patients than for hip replacement patients.

Amongst the pneumonia patients, many of the errors which concern the main condition have serious consequences for the patient statistics. The code audit shows that an incorrect main condition was reported to the NPR for 41 percent of these admissions. Amongst these admissions, a distinction is made between those which were assigned a completely new main condition (16 percent) and those which were altered at third character level (25 percent).

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49) Letter from the Ministry of Health and Care Services to the Office of the Auditor General dated 10 January 2017.
50) *Regulations and guidance concerning the use of clinical codes within the specialist health service 2015,* Directorate of Health 2015.

Sixteen percent of pneumonia patients were assigned a new main condition following the code audit. This is because the medical record documentation describes a clinical condition other than pneumonia as the main condition. There is a basis for reporting some of the incorrectly reported main conditions as *other conditions* during the admission.

However, in most cases, the specialist auditors did not find any basis whatsoever in the medical record documentation for reporting the originally selected main condition which was treated during the admission as either a main condition or under other conditions.

In addition, 25 percent of pneumonia admissions were assigned a different main condition at third character level. Amongst the pneumonia patients, an error at third character level will primarily be an indication that there is no correspondence between the originally reported code and the cause of the patient's pneumonia as indicated in the medical record. For these admissions, the code audit contributed to a more precise indication of the type of pneumonia which was the main problem during the admission. Revised coding in line with the medical record documentation would, for example, alter the description of the admission from an admission with pneumonia where the doctor was unable to find clinical evidence for determining the type of microbiological agent (virus, bacteria, amoebae, etc.) to a description of an admission with bacterial pneumonia.

Sixteen percent of pneumonia patients were assigned a new main condition following the code audit. Photo: Pixabay

The code audit shows that, amongst the hip replacement patients, a lower proportion of admissions (5 percent) was reported to the NPR with an incorrect main condition.[51] According to the specialist auditors, this is not unexpected, as the challenges associated with selecting a main condition are normally greater for pneumonia patients than they are for patients who are to undergo hip replacement surgery. Many of the admissions where the patients underwent hip replacement surgery were planned operations on otherwise healthy and somewhat younger patients. This is less often

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51) However, all of these admissions were assigned a completely new main condition. This means that the admission was originally reported under a code which describes a completely different clinical condition than that which the medical records provide a basis for.

the case with the pneumonia patients. Where the hip replacement patients had a number of disorders at the same time, these conditions were generally stabilised and brought under control before the operation was performed, regardless of whether the patient was admitted electively or as an emergency operation. Conditions which result in hip replacement surgery are clinically well-defined and relatively straightforward to diagnose, and there are no alternative codes at third character level.

Fact box 2 Structure of a code

In some cases, a condition (diagnosis) may require one or more ICD-10 codes in order to be correctly classified. Conversely, some codes in ICD-10 can be common to a number of conditions (diagnoses). The coding of a condition will often entail some loss of precision compared with the doctor's freely formulated description of the condition (diagnosis). Each ICD-10 code is linked to a code text which describes the conditions that are covered by this code. This is a help text for use by statisticians, which often makes little sense in a clinical context. The statistician's code text should not be used in discharge summaries[52], but replaced by the treating practitioner's precise clinical formulation,of the conditions (diagnoses) which were treated during the admission.

The cornerstones of ICD are three-character codes – first a letter from A to Z and then two digits from 0 to 9. When codes are compared for statistical purposes at international level, only the three-character codes are used. However, most codes are also subdivided using a fourth character after a decimal point. Where ICD-10 enables a condition to be specified using a fourth character, it is obligatory to use four-character codes. Examples of codes are:
- J15.1 Pneumonia due to pseudomonas
- M16.0 Primary coxarthrosis, bilateral

Source: Regulations and guidance for the use of clinical codes within the specialist health service 2016

Incorrect coding of correctly reported main condition to the NPR

The incorrect coding of a correctly reported main condition to the NPR means that the wrong code has been reported at fourth character level. This indicates that the originally reported code for the main condition is less specific for the condition concerned than the medical record documentation provides a basis for. A change in main condition at fourth character level will generally not result in any significant change in the "picture" of the clinical condition which the medical assistance was primarily aimed at during the admission, but it does provide a more specific description of the clinical condition.

The specialist auditors believe that the incorrect coding of main condition at fourth character level is less serious as regards the consequences for national patient statistics than incorrectly reported main conditions. In addition, the incorrect coding of main condition at fourth character level will not normally affect the DRG group and will therefore not affect hospital financing either.

The code audit indicates that the main condition for just one admission was altered at fourth character level amongst the pneumonia patients. However, amongst the hip replacement patients, most changes to main condition concerned the fourth character level. In total, 14 percent of the admissions were assigned a different code for main condition at fourth character level.

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52) According to Section 9 of the *Medical Record Regulation* and Section 45 of the Medical Personnel Act, a discharge summary is a summary of medical record information which is sent to medical personnel who require the information in order to provide the patient with appropriate follow-up as necessary.

Types of errors per hospital

As regards pneumonia patients, Table 2 indicates that the types of errors vary between hospitals. At Tromsø Hospital, only one admission was assigned a completely new main condition in the code audit, but the main condition was altered at third character level for a relatively high number of admissions to this hospital. Three hospitals report incorrect main conditions for at least half of the admissions. Stavanger Hospital stood out in a positive direction in that few incorrect main conditions were reported to the NPR.

Table 2 Main condition – types of errors at individual hospitals amongst pneumonia patients. Number. N = 30 per hospital.[53]

Hospital	Incorrect main condition reported to the NPR			Incorrect coding of correctly reported main condition to the NPR
	Completely new main condition	Main condition altered at third character level	Total	Main condition
Ålesund	5	13	18	0
Østfold	6	12	18	0
Stavanger	3	2	5	0
Bærum	5	4	9	0
Ahus	6	3	9	0
Gjøvik	4	4	8	0
Førde	6	5	11	0
Levanger	4	10	14	1
Bodø	7	8	15	0
Tromsø	1	13	14	0
Sum	**47**	**74**	**121**	**1**

Source: The code audit

Table 3 Main condition – types of errors at individual hospitals amongst hip replacement patients. N = 30 per hospital

Hospital	Incorrect main condition reported to the NPR			Incorrect coding of correctly reported main condition to the NPR
	Completely new main condition	Main condition altered at third character level	Total	Main condition
Ålesund	1	0	1	4
Østfold	1	0	1	7
Stavanger	0	0	0	1
Bærum	1	0	1	5
Ahus	6	0	6	2
Gjøvik	0	0	0	2
Førde	0	0	0	8
Levanger	0	0	0	0
Bodø	2	0	2	4
Tromsø	3	0	3	10
Sum	**14**	**0**	**14**	**43**

Source: The code audit

53) Ålesund (N = 29), Østfold (N = 29), Bærum (N = 29), Stavanger (N = 28).

Four hospitals reported all 30 admissions to the NPR with the correct main condition for the hip replacement patients; see Table 3. At nine of the hospitals, 90 percent or above of admissions were reported to the NPR with the correct main condition. Levanger Hospital stood out in a positive direction in that all admissions were reported to the NPR with both the correct main condition and the correct coding of the main condition. This also applies to 90 percent of admissions at the hospitals in Stavanger and Gjøvik.[54]

4.3 Coding of other conditions

Other conditions are conditions which exist alongside the main condition or which develop during the treatment period, and which become subject to examination and treatment. These conditions must be taken into account or they will have consequences for the treatment of the patient. Doctors who assign codes must also assess whether it would be relevant to report *other conditions* other than the main condition to the NPR. All conditions which are reported must be of real importance during the admission, and this must be apparent from the written medical record documentation. This is a discretionary assessment, which must be documented in the medical record.[55]

The documentation of findings and measures alone does not provide a basis for classification. It is the treating practitioner's documented assessment of findings and the consequences of the findings for the medical assistance given during the admission which determine whether or not a condition should be reported – see the example in Fact box 3.

Fact box 3 Dehydration – operationalisation of the documentation requirement

Dehydration is a condition which arises when the body loses more fluid than it takes in, as a result of low fluid intake, high fluid loss or a combination of the two. Disease, whether acute or chronic, increases the risk of dehydration. Fluid treatment during an admission is primarily initiated due to two circumstances:
- The patient is dehydrated
- The treating practitioner wishes to prevent the patient from becoming dehydrated

The code guidance states the following:
"E86 Dehydration

When this code is used, it must be documented that the patient is clinically dehydrated. It is not sufficient for basic intravenous fluid therapy to be added to the list of medications. The specialist auditors used the following documentation requirements as a basis for reporting the condition 'dehydration' treated during the admission:
- The condition must at least be formulated in the patient's medical record during the admission as an indication of a clinical assessment
- It is apparent from the medical record during the admission that the condition had consequences for the provision of medical assistance during the admission, e.g. further investigations, fluid therapy, extended admission, etc."

Source: The code audit and Regulations and guidance concerning the use of clinical codes within the specialist health service 2016

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54) Incorrect coding at fourth category level largely concerns incorrect reporting in connection with unilateral or bilateral coxarthrosis and/or whether or not the coxarthrosis is based on dysplasia.
55) *Regulations and guidance concerning the use of clinical codes within the specialist health service 2015.* Directorate of Health, 2015.

For all the hospitals viewed as a whole, the specialist auditors found grounds in the medical record documentation to conclude that 51 percent of the codes for *other conditions* were correctly reported for pneumonia patients, while the corresponding figure for hip replacement patients was 36 percent.

Figure 7 Proportion of correctly reported other conditions. Pneumonia patients
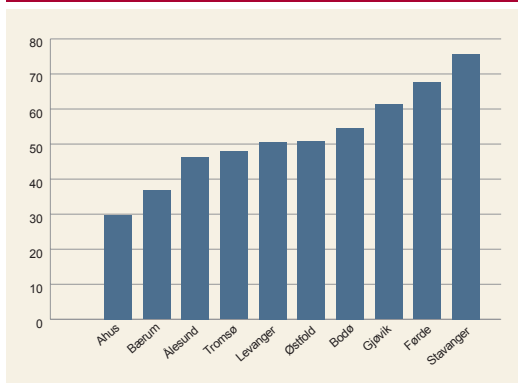
Figure 8 Propotion of correctly reported other conditions. Hip replacement patients
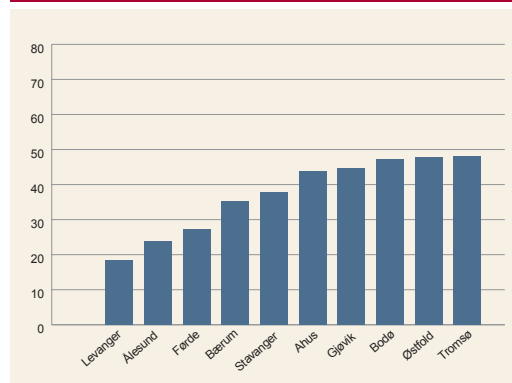
Source: The code audit

Amongst the pneumonia patients, the proportion of correctly reported codes for *other conditions* varies from 30 percent to 76 percent; see Figure 7. Stavanger Hospital stands out in a positive direction in that three in four codes for *other conditions* were correctly reported to the NPR. This means that the conditions are both adequately documented in the medical record and correctly coded. Similarly, the proportion of correctly reported codes for *other conditions* varies amongst the hip replacement patients (see Figure 8), but for this patient group, no hospital correctly coded more than half of the codes for *other conditions*.

Too many *other conditions* reported to the NPR contribute to a statistical picture of admissions where more conditions were treated than there is documentation for in the patients' medical records. Amongst the pneumonia patients, 37 percent of the *other conditions* reported to the NPR were deleted in the code audit. For hip replacement patients, more than half of the *other conditions* were deleted (58 percent). According to the specialist auditors, this does not necessarily indicate that the diagnoses did not impact on the medical assistance which was given during the admission. Many of the deleted codes could probably have remained in the patient records had the doctor's assessment of the diagnoses been better documented in the medical records.

The specialist auditors also believe that the large number of deleted diagnoses indicates non-existent or inadequate knowledge and practising of the medical coding guidelines within the health enterprises.

The impression gained by the specialist auditors is that the documentation for *other conditions* treated during the admission is consistently sparser for the hip replacement patients than it is for the pneumonia patients. The clinical formulation of relevant *other conditions* was more often lacking for hip replacement patients than it was for pneumonia patients.

Amongst the pneumonia patients, the proportion of *other conditions* which were deleted varied between the hospitals from 18 percent to 53 percent. At the hospitals in Førde, Stavanger and Gjøvik, one in four or fewer diagnoses were deleted during the code audit, while for four hospitals, over 40 percent of *other conditions* were deleted.

Amongst the hip replacement patients, the proportion of *other conditions* which were deleted during the code audit varied from 24 percent to over 70 percent.

In the medical record documentation, the specialist auditors found grounds to add 172 cases of *other conditions* which had not been reported to the NPR for the pneumonia patients. This represents 26 percent of the total number of *other conditions* following the code audit. For the hip replacement patients, even more conditions were added in relative terms (32 percent). Inadequate reporting of *other conditions* contributes to a picture of less complicated admissions than the documentation in the patients' medical records provides a basis for.

Figure 9 Number of other conditions added, and number of conditions deleted, per hospital for pneumonia patients
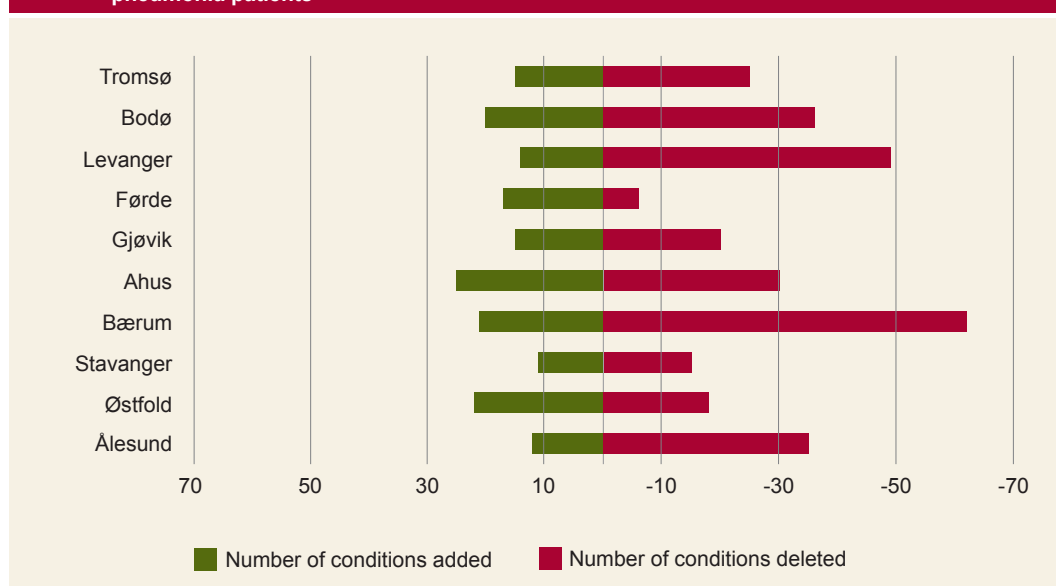
Source: The code audit

Figure 10 Number of other conditions added, and number of conditions deleted, per hospital for hip replacement patients
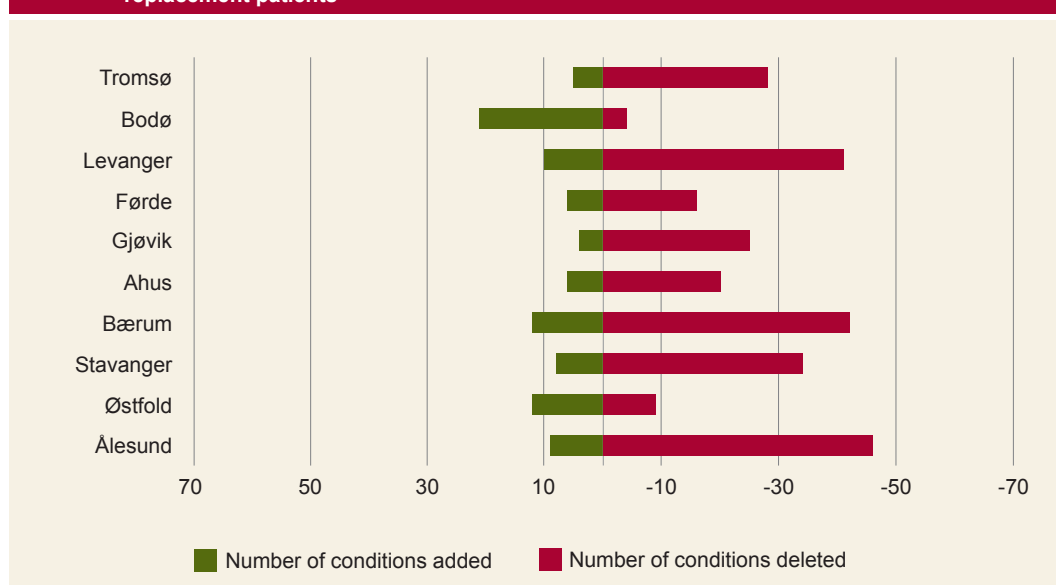
Source: The code audit

With the exception of the hospitals in Førde and Østfold for pneumonia patients and the hospitals in Bodø and Østfold for the hip replacement patients, more *other conditions* were deleted than added during the code audit; see Figures 9 and 10. This results in reductions in the average number of *other conditions* per admission from 2.7 to 2.3 per admission after the code audit for pneumonia patients and from 1.5 to 1.0 per admission for the hip replacement patients. Table 4 shows changes in the number of *other conditions* per admission before and after the code audit per hospital for the two patient groups.

Table 4 Average number of other conditions per admission before and after the code audit. Per hospital. N = 595 – 30 admissions per hospital.[56]				
	Pneumonia patients		Hip replacement patients	
	Before audit	After audit	Before audit	After audit
Bodø	3,3	2,8	0,6	1,1
Stavanger	2,6	2,4	2,0	1,2
Gjøvik	2,7	2,4	1,6	0,9
Levanger	3,6	2,5	1,8	0,8
Førde	1,1	1,6	0,7	0,4
Østfold	2,2	2,2	0,8	0,9
Ålesund	2,8	2,0	2,2	1,0
Bærum	4,0	2,6	2,4	1,4
Ahus	2,1	1,9	1,4	1,0
Tromsø	2,4	2,1	1,9	1,1
Samlet	2,7	2,3	1,5	1,0

Source: The code audit

Before the code audit, the number of *other conditions* per admission reported to the NPR varied from 1.1 to 4.0 between the hospitals for pneumonia patients. Amongst the hip replacement patients, the corresponding variation was from 0.6 to 2.4; see Table 4. For both patient groups, this means that, amongst the admissions which were audited, one hospital reported almost four times as many *other conditions* per admission as the hospital which reported the fewest conditions per admission. This gives the impression that some hospitals have admissions where far more conditions are apparently dealt with than other hospitals.

Following the code audit, the spread between the hospitals as regards the number of *other conditions* per admission decreased. The numbers of other conditions per admission now vary between the hospitals from 1.6 to 2.8 codes per admission amongst the pneumonia patients, and from 0.4 to 1.4 conditions per admission amongst the hip replacement patients. The differences between hospitals as regards the number of conditions which were documented as being dealt with in the medical record during the admissions are therefore fewer than is indicated by the national statistics in the NPR.

There is a trend, particularly as regards pneumonia patients, for the hospitals which originally reported the largest number of *other conditions* per admission to the NPR to have the most *other conditions* in relative terms deleted during the code audit. This also has consequences when the admissions are re-grouped under the DRG system following the code audit; see section 4.5.

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56) Ålesund (N = 29), Østfold (N = 29), Bærum (N = 29), Stavanger (N = 28).

4.4 Coding of procedures

Procedures which are performed can be reported using procedure codes from the medical (NCMP), surgical (NCSP) or radiological (NCRP) procedures.
Each set of regulations of procedures includes guidelines for when and how procedures which are performed during an admission must be reported. A fundamental prerequisite for reporting a procedure as having been performed during an admission is that there is documentation in the medical record to verify that the procedure has been carried out. When interpreting the results for procedures, it is important to take account of the fact that some procedure codes were excluded from the analysis.[57] Relatively few surgical procedures were deleted or added during the code audit. According to the specialist auditors, this would be expected because surgical procedures are clearly defined – either they are performed or they are not. A procedure memo is also created for surgical procedures. Consequently, it is very rare for the medical record documentation not to provide a basis for reporting the procedure. Amongst both patient groups, the specialist auditors found grounds in the medical records for reporting a relatively large number of medical procedures which had not been included in the reports submitted to the NPR.

Fact box 4 Results of the code audit of procedure codes

Pneumonia
Medical procedures (NCMP):
In summary, there is no basis in the medical record documentation for seven of the 118 codes for medical procedures which were reported (6 percent). Conversely, the auditors found grounds in the medical records to report 55 medical procedures which had not been reported to the NPR.

Surgical procedures (NCSP):
According to the specialist auditors, few surgical procedures would be expected to be reported for these patients. Only 26 codes for surgical procedures were reported to the NPR, and of these, there is no basis for reporting six of them. Conversely, there are grounds in the medical records to report 12 codes which had not been reported to the NPR.

Hip replacement procedure
Medical procedures (NCMP):
Nine of the original 172 codes for medical procedures were deleted after the audit. Conversely, there is no basis for reporting 78 medical procedures to the NPR.

Surgical procedures (NCSP):
Six of the total of 520 (1 percent) codes for surgical procedures were deleted across all enterprises collectively. Conversely, 17 out of a total of 528 (3 percent) codes which the specialist auditors found to have a basis for reporting to the NPR are missing.

Source: The code audit

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57) This concerns the following procedure codes: OAALOO Structured mapping of diet and nutritional condition, OBAB00 Guided and instructed physical training, OBAF00 Lung therapy, TKC20 Bladder catheterisation, KXFC00 24-hour measurement of urine volume and KCDE41 External ultrasound examination of bladder.

Procedures which are performed are reported using procedure codes from the medical (NCMP), surgical (NCSP) or radiological (NCRP) procedures.Photo: Pixabay

4.5 Consequences for statistics and financing after the admissions are regrouped in the DRG system following the code audit

4.5.1 Pneumonia patients

As regards pneumonia patients, 81 admissions were grouped under a different DRG following the code audit, i.e. one in four admissions (28 percent). This means that correct coding would have triggered a different reimbursement in the PBF scheme for more than one in four admissions which were audited.

Figure 11 Pneumonia patients. Proportion of admissions who change DRG. DRG 89/90
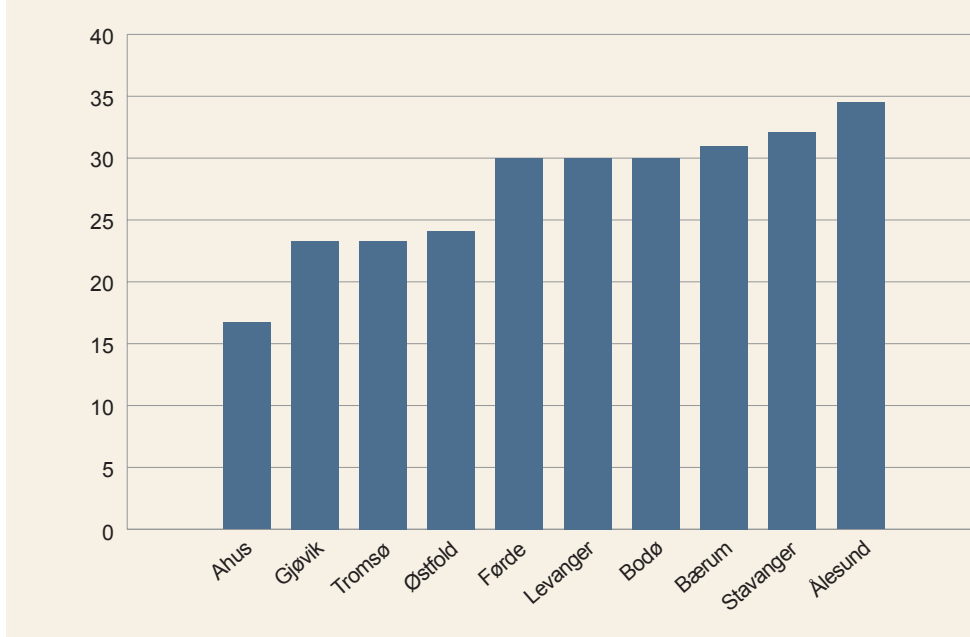
Source: The code audit

Figure 11 shows that the proportion of admissions which were assigned to a different DRG varies from 17 to 35 percent between the hospitals.

The 81 admissions which were assigned to a different DRG break down as follows after the code audit:
• Fifty two percent of admissions were regrouped from the complicated to the uncomplicated DRG or vice versa in the DRG pair

- Thirty three percent of the admissions were regrouped under a different DRG in main diagnosis group 4, "Diseases of the respiratory system"
- Fifteen percent of admissions were regrouped under a different main diagnosis group[58]

Following the audit, the admissions which were regrouped under a different main diagnosis group ended up in the national statistics indicating that the main condition which was treated during the admission occurred in a completely different organ system than that indicated by the original report to the NPR.

Around half of the admissions which were assigned to a different DRG were switched from the complicated to the uncomplicated DRG in the DRG pair, or vice versa. More were switched from the complicated to the uncomplicated DRG than the other way around. The admissions which were re-assigned from the complicated to the uncomplicated DRG did not change as regards the main condition that was treated during the admission, but they do appear less complicated after the audit than the original coding for the NPR indicated. In addition, admission under an uncomplicated DRG triggers a lower PBF reimbursement from the state than admission under a complicated DRG. Figure 12 shows the proportion of admissions in the complicated group before and after regrouping of the admissions under the DRG system following the code audit.

The proportion of admissions in the complicated group varied from 53 to 97 percent between the hospitals before the code audit. This indicates that some hospitals have admissions where more conditions are apparently dealt with than other hospitals.

Figure 12 Proportion of patients in the complicated DRG before and after the code audit. Pneumonia patients. N = 295 – 30 per hospital.[59]
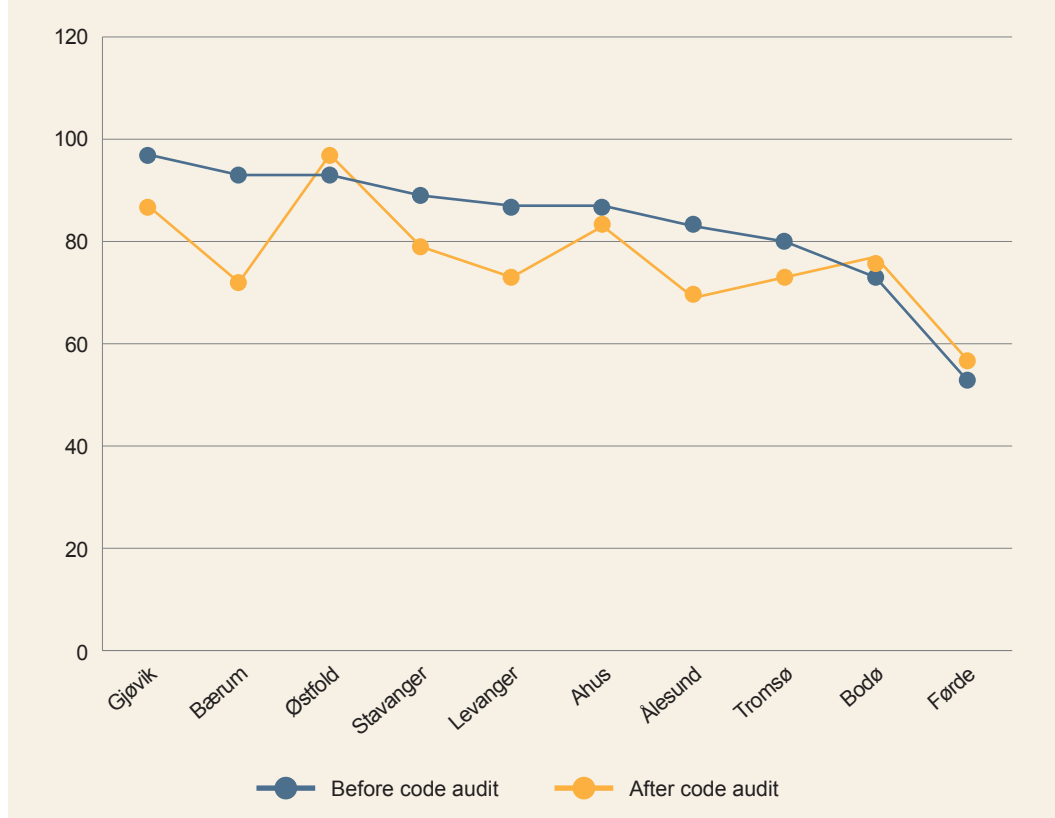
Source: The code audit

58)   The over 800 DRGs in the DRG system were grouped into approximately 25 main condition groups. The pneumonia patients (DRG 89/90) were grouped under main condition group 4, "Diseases of the respiratory system".

Figure 12 shows that seven hospitals have a lower proportion of admissions in the complicated DRG after the admissions were regrouped under the DRG system following the code audit, while three hospital have a higher proportion. A change from uncomplicated to complicated DRG is a consequence of the audit finding a basis in the medical record documentation for adding *other conditions* which were not originally reported to the NPR. For these admissions, the correct medical coding would have resulted in a higher refund under the PBF scheme.

Amongst the audited admissions, there is somewhat less variation in the proportion of admissions in the complicated DRG in the DRG pair after the code audit than the national statistics in the NPR would indicate.

4.5.2 Hip replacement patients

As regards hip replacement patients, 73 admissions were grouped under a different DRG following the code audit, i.e. approximately one in every four admissions (24 percent). This means that correct coding would have triggered a different reimbursement in the PBF scheme for almost one in four admissions which were audited.

Figure 13 Proportion assigned a new DRG after the code audit for hip replacement patients
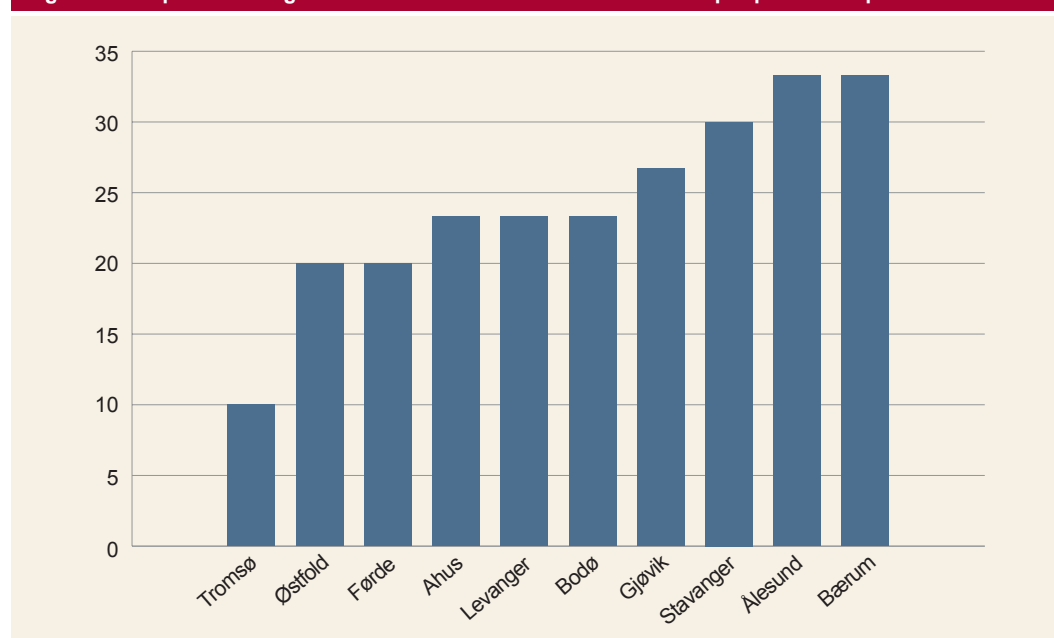
Source: The code audit

Figure 13 shows that the proportion of admissions which were assigned a different DRG varies from 10 percent to over 30 percent between the hospitals.

Sixty nine of the 73 admissions which were assigned a different DRG were switched from the complicated DRG to the uncomplicated DRG in the DRG pair, or vice versa. Most of these changes concern admissions which were altered from the complicated to the uncomplicated DRG following the code audit. Figure 14 shows the proportion of admissions in complicated and uncomplicated DRGs before and after the admissions were regrouped under the DRG system following the code audit.

The proportion of admissions in a complicated DRG varied between 23 and 63 percent between the hospitals before the code audit. This indicates that some hospitals have

59) Ålesund (N = 29), Østfold (N = 29), Bærum (N = 29) and Stavanger (N = 28).

admissions where more diagnoses are apparently dealt with than other hospitals.

Figure 14 Proportion of patients in the complicated DRG before and after the code audit. Hip replacement patients. N = 300 – 30 per hospital
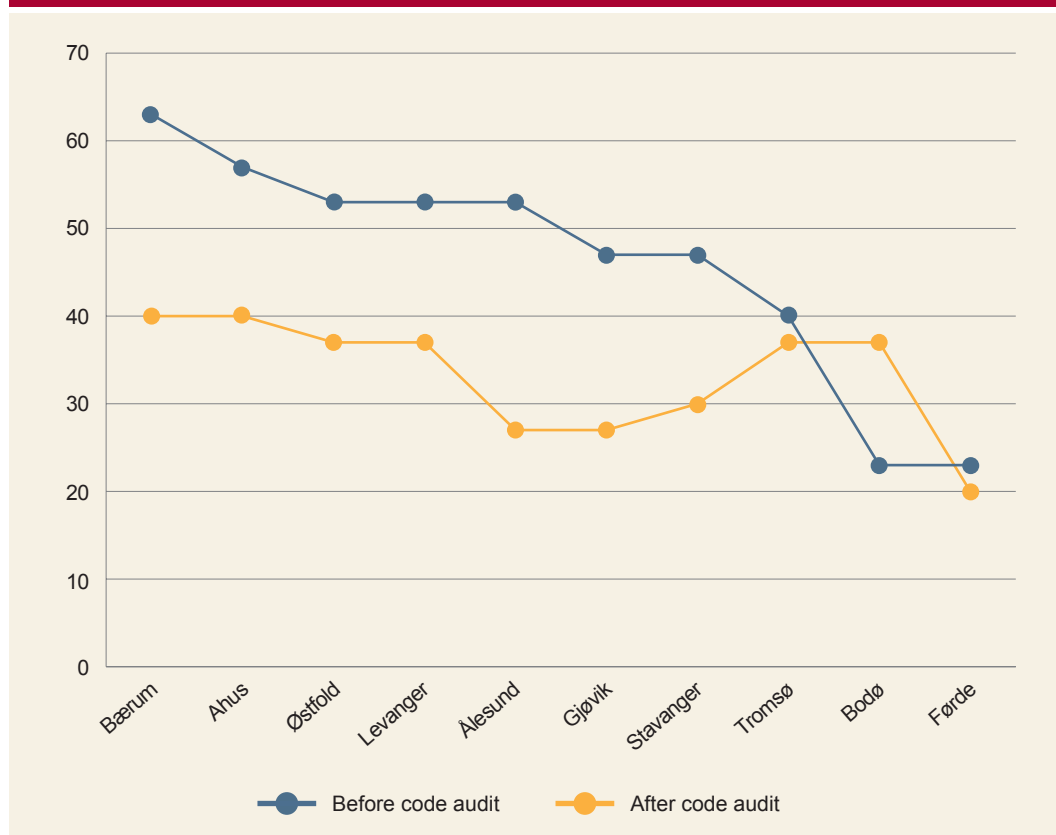
Source: The code audit

Figure 14 shows that nine hospitals have a lower proportion of admissions in the complicated DRG after the admissions were regrouped under the DRG system following the code audit, while one hospital has a higher proportion. Amongst the audited admissions, there is somewhat less variation in the proportion of admissions in the complicated DRG in the DRG pair after the code audit than the national statistics in the NPR would indicate.

4.5.3 Change in DRG score after the code audit

It is the regional health enterprises that receive the reimbursement from the state under the PBF scheme. One DRG point was worth NOK 42,081 in 2016.[60] The regional health enterprises receive half of this amount as reimbursement through the PBF scheme and the other half through the framework appropriation. They therefore receive NOK 21,040 via the PBF scheme for every DRG point that the health enterprises report to the NPR. The regional health enterprises are free to decide whether they wish to forward the PBF reimbursement to the health enterprises and, if so, how. All four regional health enterprises forward the reimbursement.

This investigation shows that the health enterprises use DRG scores as an indicator of the performance of the clinical departments. Most health enterprises also forward the PBF reimbursement to the clinical departments. This reimbursement is distributed in different ways by the health enterprises, but common to them all is that the clinics and many departments are partly financed according to the DRG score that they generate. For both patient groups, the code audit resulted in a net reduction in the DRG score after the admissions were regrouped under the DRG system following the code

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60)   In 2015, one DRG point was worth NOK 41,462.

audit. After the audit, the DRG score was reduced by 2 percent amongst the audited admissions. For these admissions, the correct medical coding would have resulted in a smaller reimbursement under the PBF scheme. Seven out of ten hospitals saw a reduction in their DRG score after the admissions with pneumonia were regrouped under the DRG system following the code audit. In the case of hip replacement patients, this applies to eight out of ten hospitals. One reason why the DRG score is reduced for so many hospitals is that most hospitals have a relatively high proportion of admissions in the complicated group in the DRG pair in the sample.

However, an increase in DRG score is just as serious for the basis for PBF payments as a reduction in DRG score. Both indicate that the main codes are incorrect based on the medical record documentation. A small change in the DRG score before and after the code audit must therefore not be interpreted as an error, but could equally be due to the fact that many errors "are cancelling out one another". This applies to many of the hospitals for the audited admissions; see Figures 15 and 16.

Figure 15 Pneumonia patients. Reduction and increase in DRG score per hospital

Source: The code audit

Figure 16 Hip replacement patients. Reduction and increase in DRG score per hospital
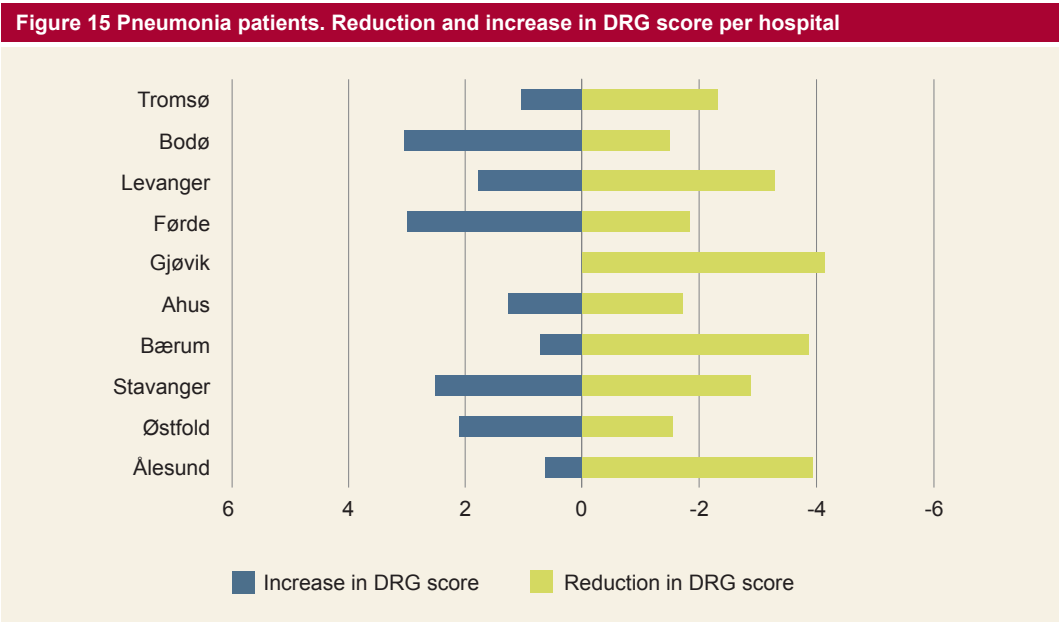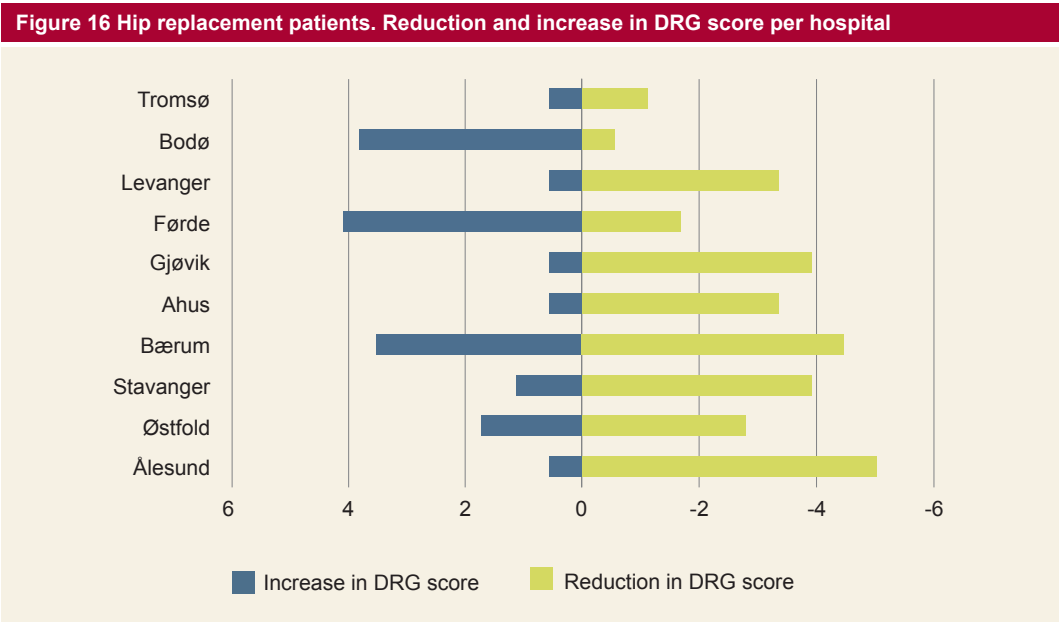
Source: The code audit

5 How do the health enterprises ensure that codes are of good quality?

To investigate what can ensure good code quality, the code practice followed by six of the audited departments was studied in more detail through a case study. The departments in the case study organise their work relating to medical coding in different ways, but they all achieved relatively good results in the code audit with regard to certain dimensions. All six departments have a relatively high proportion of correctly reported and coded main conditions. Not all these departments were as successful in documenting the *other conditions* that they have reported, or in selecting the appropriate code for them.

The case study shows that three factors in particular impact on code quality:
- The first factor is whether the doctors are familiar with medical coding
- The second factor is whether the health enterprises have established good **quality assurance** regarding the codes that the doctors assign
- The third is whether the department and the health enterprise have clear leadership which contributes to the attitudes of employees regarding the importance of coding

In addition, the questionnaires provide an answer to the distribution of relevant phenomena/factors.

5.1 Familiarity with coding

Eighty five percent of doctors responded to the questionnaire at all hospitals across the country, saying that they had received basic training in the principles of coding. At the same time, the code audit and questionnaire indicated that many doctors need to learn more about medical coding. In the questionnaire, the doctors were asked two questions concerning the main principles for coding: one concerning the coding of main condition (Figure 17) and one concerning the coding of *other conditions* (Figure 18).

Figure 17 Distribution of responses to the question "What consideration would you place emphasis on if several conditions appeared to be of equal value when you had to select a main condition?" Only one alternative answer may be chosen. The alternative marked in green is correct. N = 635[61]

The condition for which the patient was primarily admitted: 16%

The condition which gives the highest DRG score: 2%

Correct answer: The condition which required the most resources during the admission from a medical perspective: 56%

The condition which is considered to be the most serious from a medical perspective: 26%
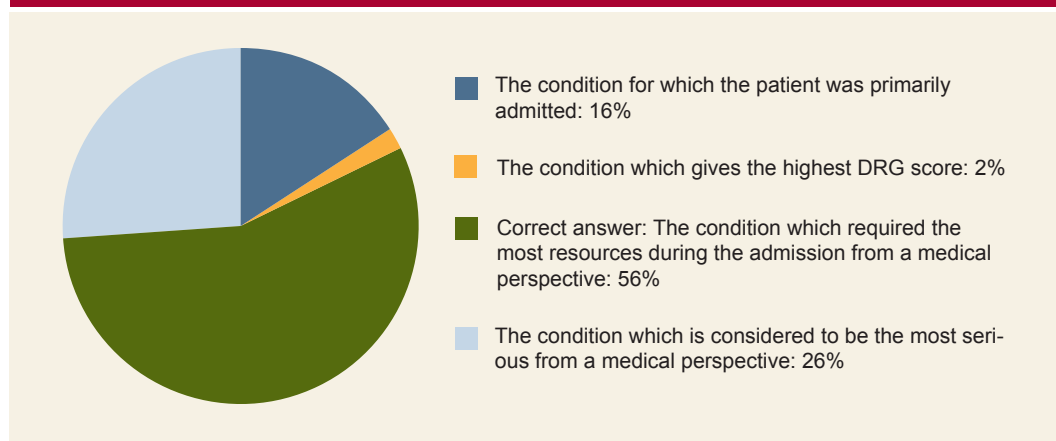
Source: Questionnaire for doctors

61) This question was reviewed during the questionnaire; see footnote 11. Only those who responded to the most recent version were included in the distribution of responses.

When asked the question concerning main condition, 56 percent chose the correct answer (Figure 17). This means that half chose the condition which required the most resources during the admission from a medical perspective. However, 26 percent chose the condition which is perceived to be the most serious and 16 percent chose the condition for which the patient was primarily admitted.

Figure 18 Distribution of responses to the question "How would you justify your choice of other conditions? In other words, which conditions should be coded as 'other conditions' and therefore be reported to the Norwegian Patient Registry?" Several alternative answers could be selected. N = 632. In percent
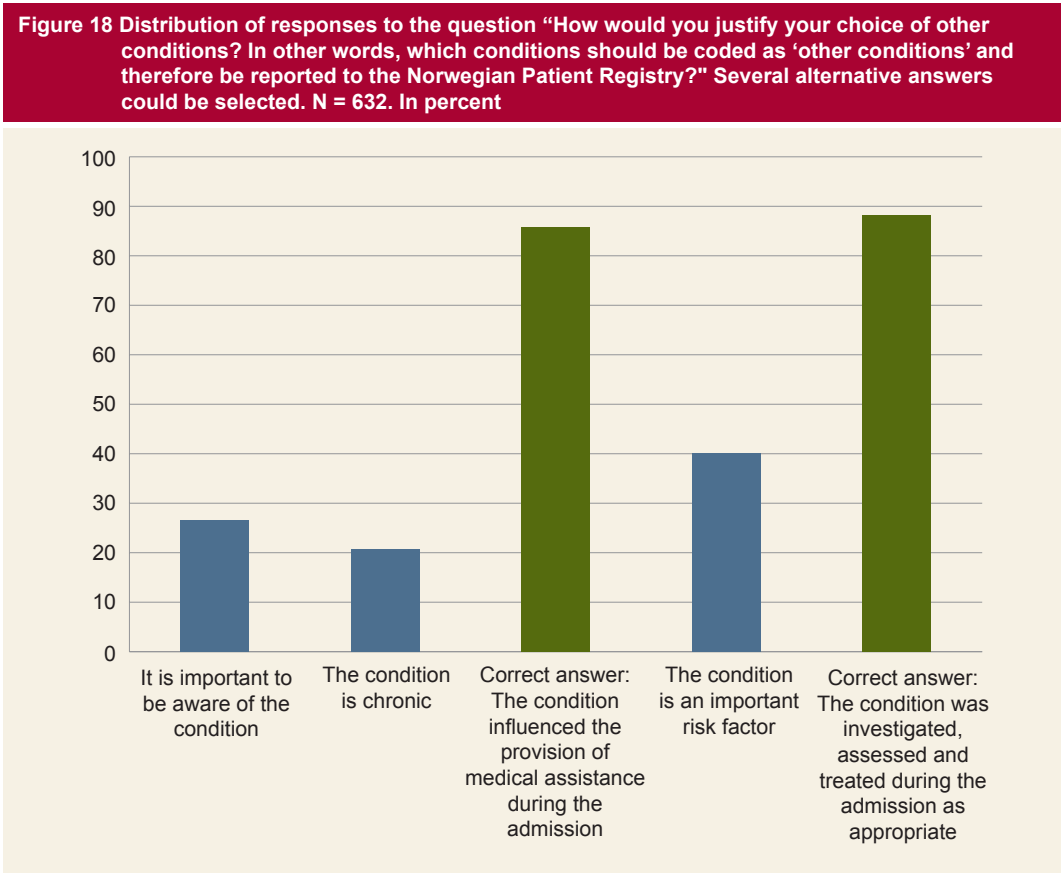
Source: Questionnaire to doctors

When asked the question concerning the coding of *other conditions*, half again chose the correct alternative. The correct answer is where the doctor selects at least two of the alternatives indicated in green in Figure 18, but none of the other alternatives.[62] Conditions relating to previous or chronic diseases which do not influence the treatment concerned should not be included in reports to the NPR.

In the questionnaire, eight out of ten doctors referred to inadequate training as an important cause of incorrect coding (Table 5). In addition, most doctors highlighted a lack of time as being an important cause of incorrect coding.

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62)   That around half gave the correct answer stems from the fact that many doctors inserted a cross for one of the green alternatives as well as one of the blue ones, which is wrong.

Table 5	Proportion of doctors who believe that the following aspects are important or very important causes if coding errors are discovered in their department. N = 887	
Those who assign codes have not received sufficient training in coding		79 %
Those who assign codes do not have sufficient time to find the right medical code		72 %
Those who assign codes do not take sufficient care to code correctly		55 %
Those who assign codes do not receive adequate feedback concerning their coding		54 %
Conditions that are coded are not adequately documented in medical records		48 %
DIPS or PAS is not sufficiently user-friendly		47 %
Those who assign codes do not have adequate access to guidance from resource persons relating to coding		41 %
The quality assurance of coding is inadequate		42 %
The electronic aids (such as FinnKode) are inadequate		30 %
Short-lists are not sufficiently updated frequently		25 %
Speech recognition tools do not work adequately		22 %
The code guidance from the Directorate of Health is inadequate		19 %

Source: Questionnaire to doctors

Many doctors also believe that inadequate feedback concerning coding and the fact that those who assign codes are not sufficiently concerned about coding correctly are important reasons behind incorrect coding. The same questions were asked of both managers and code controllers, and both groups highlighted the same causes as the doctors, particularly a lack of training.

Many of the errors in the code audit were caused by *other conditions* being deleted because of inadequate documentation in the medical record for reporting them to the NPR. Although the condition influenced the medical assistance provided during the admission, it is not adequately documented in the medical record. This may indicate that many doctors are not sufficiently familiar with the documentation requirements; see Table 5.

The case study showed that three factors in particular are important in order to give doctors a knowledge of coding:
* Firstly, *courses* are important in order to give doctors and code controllers a knowledge of basic principles and an overall picture of the codes
* Secondly, ongoing *individual follow-up* and training through discussions, guidance and feedback on the doctor's own coding from resource people within coding are essential
* Thirdly, it is important that the doctors understand that coding is *relevant* to them

Figure 19 How have you learned about coding while you have been working at this hospital? N = 926

None of these:
10%

At least one of four
types of courses

18 %

10 %

17 %

22 %

Individual
guidance from
resource people
within coding

5 %

9 %

10 %

Feedback on
own coding
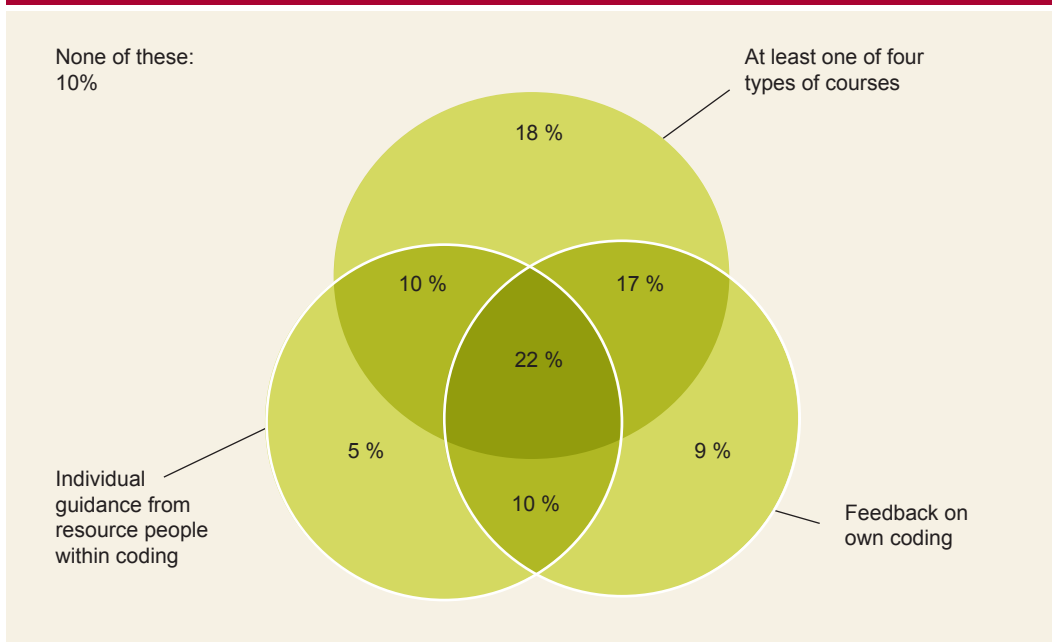
Source: Questionnaire to doctors

Twenty two percent of the doctors responded that they had learned about coding through training, individual guidance from resource people *and* feedback on their own coding; see Figure 19. Ten percent of doctors have not learned about coding in any of these ways.

Some departments in the case study were more successful than others in giving doctors knowledge of coding. These departments are characterised by the fact that they provide a *combination* of the various tools.

5.1.1 Training on coding

Figure 20 How have you learned about coding while you have been working at this hospital? In percent. N = 926
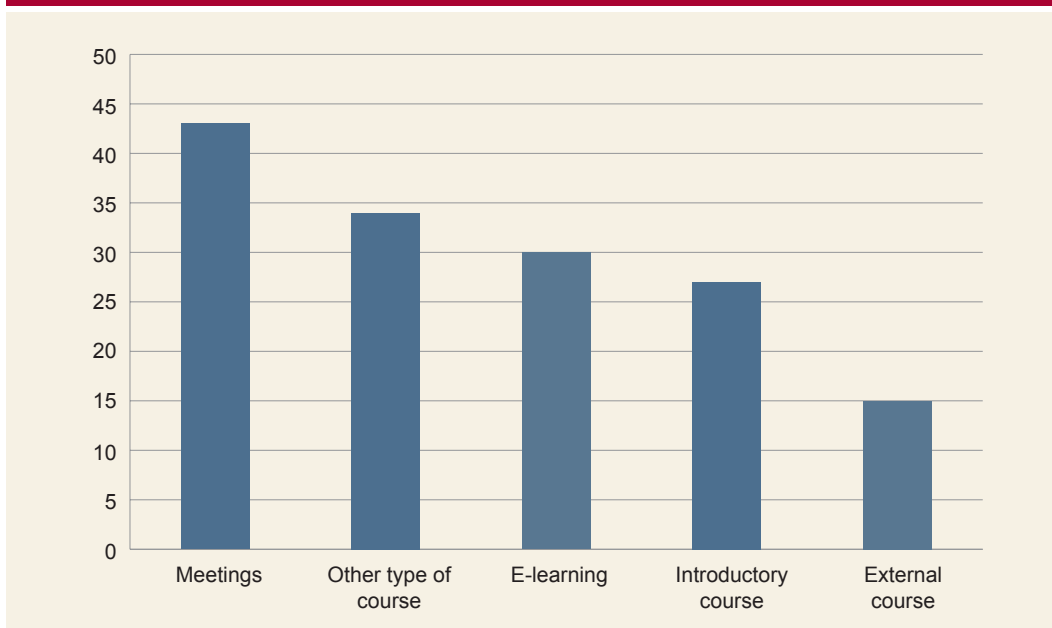
Source: Questionnaire to doctors

The questionnaire indicates that the doctors learned about coding through various types of courses (see Figure 20). Sixty seven percent of the doctors said that they had acquired their knowledge through at least one of four types of course, either an e-learning course, an introductory course, external course or some other type of course. The proportion rises to 80 percent if you add those who responded that they had acquired their knowledge through meetings. The boundaries between the various categories may be somewhat fluid. For example, departmental meetings which are used to provide information concerning coding could be seen as both a course and a meeting.

Of those who did *not* acquire their knowledge through courses, 74 percent responded that they have also not been *offered* any of these types of courses. Overall, 25 percent of the doctors have acquired their knowledge through a course or an offer of a course. This indicates that a lack of training is largely due to inadequate provision by the departments or health enterprises, or that the doctors have not been made aware of the courses that are actually available. Irrespective of what the health enterprises offer in terms of in-house-produced courses, an e-learning course on coding is available for everyone via the Directorate of eHealth's website.

The document review indicates that most health enterprises require doctors to undergo a course on medical coding.[63] A typical "training package" provided by the health enterprises, which is representative of half of the health enterprises, is for intern candidates to be given an introduction to medical coding during their introductory week, in addition to the health enterprises stating that an e-learning course is anything from "being offered" to mandatory.

Nine out of ten intern candidates responded in the questionnaire that they had learned about coding through some form of course. The case study indicates the importance of doctors being given an introduction to the fundamental principles of coding and the entire system, so that they have a good foundation for practising coding in actual work. However, many of the doctors noted that the coding courses during the introductory week "passed them by" during a week in which they had to familiarise themselves with many different aspects of their new working environment. The study shows that it is important to provide follow-up training as *well* as a course during the introductory week.

However, only a handful of health enterprises offer *both* an introduction to coding during the introductory week as well as a classroom-based training/refresher course afterwards (see the examples in Fact box 5). Most health enterprises do not offer this type of training, other than the introductory week and e-learning courses. At the same time, all health enterprises have code controllers with specialist expertise within coding and most have doctors with coding responsibility. During the questionnaire, four out of ten controllers responded that they offer training within the departments. This indicates that the competence of the code controllers could have been better utilised on the internal training of doctors.

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63) The question which the health enterprises were asked was: *Does the health enterprise require doctors and finance staff to undergo obligatory basic training in coding, and if so, which groups are covered by this requirement?*

Example 1:
Following the introduction to coding during the introductory week, all interns within the medical department at Stavanger Health Enterprise must complete an e-learning course[64] in coding. Around 3-4 weeks after they start, they are then required to complete a three-hour course given by a doctor with coding responsibility at Stavanger Health Enterprise. The course, known as a "code workshop", is mandatory for intern candidates, but more experienced doctors are also welcome to attend. This course reviews pivotal topics in medical coding with patient examples, and considerable emphasis is placed on requirements concerning documentation and medical classification. Recently appointed doctors are also required to complete the same courses (e-learning course and code workshop), which are then given by the code controller in the medical department. Variations on these arrangements are also used by Finnmark Health Enterprise and Sørlandet Health Enterprise

Example 2:
In 2014, the orthopaedic department at Stavanger Health Enterprise organised a half-day course on medical coding for all doctors, regardless of their position.

Example 3:
At St. Olav's, the departments are offered a six-hour course on medical coding every month. This is particularly aimed at newly appointed doctors, but other doctors are also welcome to attend, and it is obligatory for all doctors to complete the course. In addition to training, the departments also offer local courses tailored to the departments' respective disciplines. The courses are given by doctors with specialist expertise in coding.

Kilder: Stavanger University Hospital and St. Olav's Hospital

When responding to questions concerning coding principles during the questionnaire (Figures 17 and 18), consultants made as many errors as less experienced interns. This indicates that consultants do not have a better understanding of the principles of coding than less experienced doctors. At the same time, consultants normally have greater responsibility for their department's coding than specialist doctors *(LIS-leger)* and interns, through their role as mentor and through being responsible for the quality assurance of less experienced doctors' discharge summaries and associated codes. Many of the health enterprises target courses at recently appointed doctors and interns. This could indicate that the health enterprises do not organise their training so as to ensure that more experienced doctors also have adequate and up-to-date knowledge of coding.

5.1.2 Individual and collective follow-up of coding
In the questionnaire, 47 percent of doctors responded that they had learned about coding through guidance, while 57 percent acquired their knowledge through feedback on their own coding. Seventy two percent had acquired their knowledge through *either* guidance or individual feedback, and 32 percent through both (Figure 19). These forms of learning overlap to some extent, i.e. what some people would call individual feedback, others would call guidance, e.g. where a doctor with coding responsibility and a specialist doctor discuss the latter's coding. Twenty eight percent of doctors therefore do not believe that they learn about coding through these types of informal training.[65]

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64) This e-learning course is Analysesenteret's course and not the Directorate of Health's e-learning course.
65) This result comes from 10 percent who responded that they have not acquired any form of knowledge and 18 percent who responded that they have only acquired knowledge through courses.

The questionnaire shows that it is not common for doctors to be given feedback on their medical coding on an ongoing basis. Doctors who normally receive explanatory feedback find to a far greater extent that they learn something from the feedback, rather than if they are rarely told the reason why a particular code should be changed. Photo: iStock

The questionnaire shows that the extent to which consultants take note of the coding when they counter-sign varies, and four in ten doctors amongst those who were subject to checks receive feedback on coding once a year or less often through these checks. At the same time, the questionnaire indicates that most doctors believe that they learn from the feedback which is actually given by the person who counter-signs.

Around half of those who counter-sign chose the wrong alternative answers to the questions concerning the key principles for coding during the questionnaire. This could imply that many doctors who counter-sign do not possess sufficient knowledge of the fundamental principles for coding to guide other doctors within the field. Overall, both the case study and the questionnaire show that counter-signing is a key check which contributes little to ensuring that doctors are sufficiently familiar with coding.

The next step in the quality assurance process is the checks that are carried out by code controllers in the departments, sometimes in collaboration with a doctor with coding responsibility. The questionnaire shows that half of the doctors receive annual or less frequent feedback indicating that the codes they have assigned contain errors or omissions. It is therefore uncommon for doctors to receive *ongoing* feedback concerning medical coding. Within many health enterprises, doctors therefore do not learn about coding when code *controllers* quality-assure their coding.

Of those who do receive feedback, three in ten believe that the feedback they receive makes a strong or very strong contribution to their learning. The questionnaire also shows that doctors who normally receive *explanatory* feedback find to a far greater extent that they learn something from the feedback than those who rarely find out the reason why their codes should be changed.

However, 34 percent of doctors rarely or never learn the reason why a particular code must be changed.[66]

Overall, half of the doctors either do not receive any feedback at all, or rarely receive explanatory feedback concerning their own coding in connection with quality assurance. This means that many health enterprises could improve their learning loops, so that doctors can learn from their own mistakes. A prerequisite for learning from feedback is, in any case, that the doctors actually read the feedback they are given and take an active stance on what it says. During their interview, many doctors stated that they only write "OK" regarding the code controller's questions concerning their coding, without looking at the feedback in more detail. An opportunity to learn has thus been lost.

The medical departments at Stavanger and Levanger hospitals are examples of departments where the questionnaire shows that a relatively high proportion of doctors find that they learn about coding through individual feedback on their own coding given by the code controllers. Responses to interviews indicated that code controllers review discharge summaries thoroughly and give the doctors individual feedback if they have any questions concerning coding. Doctors within both departments, including both experienced and less experienced doctors, receive such feedback relatively frequently, and code controllers state *why* they are suggesting changes to the codes (see Fact box 6).

Fact box 6 Examples of feedback

Example 1:
Hello
The discharge summary refers to the growth of e-coli in expectorate. Would it be an alternative to use J15.5? Suggested change, please give feedback if you disagree.

Example 2:
When pneumonia is demonstrated in a COPD patient, pneumonia must be coded as the main condition. You should therefore swap over the main and other conditions, and have pneumonia as the main condition. See the 2016 code rules, section 14.3.1, correct coding of COPD with acute deterioration (p. 105 of the code regulations).

Sources: Medical departments in Stavanger and Levanger

In the medical department in Stavanger, where doctors receive frequent explanatory feedback from the code controller, this is apparent from the results of the code audit and the doctors' responses to the questionnaire (see Figures 17 and 18). During the code audit, the specialist auditors found few errors in coding at third character level relating to pneumonia patients.[67] This may be because the code controller consistently gives feedback to the doctors if she finds this type of error, and the interviews indicate that the doctors now understand how this should be coded.

As regards *individual guidance*, the Department of Surgery in Stavanger is a good example. This department highlights how important a doctor with coding responsibility is for the provision of guidance and training of the department's doctors relating to medical coding. This doctor has been allocated time for this work as part of their normal working hours and is identified as an important resource by both managers and doctors.

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66) The question read: "Think about the situations where you receive feedback that the code you have assigned must be changed: How often do you also receive feedback about the reason why the code has to be changed? Disregard any feedback you get in connection with counter-signing." Here, 35 percent answered 1-3 on a scale from 1 (Never) to 7 (Every time).
67) In this audit, changes at third character level largely stem from the auditor finding grounds in the medical record documentation to code the patient's pneumonia more precisely with regard to the type of micro-organism which caused the pneumonia.

Collective guidance concerning coding can be given during departmental meetings. Meetings can be a suitable arena to learn about coding. Four in ten intern candidates responded in the questionnaire that they had learned about coding through meetings. Half of the doctors replied that medical coding is a topic which is considered annually (27 percent) or less often (24 percent). The questionnaire thus indicates that many departments could make greater use of meetings as an arena for learning. These meetings could for example be used to reiterate the key code rules. The meetings could also be used to enable doctors with assigned responsibility for coding or code controllers to give feedback on the *department's* coding, e.g. by highlighting recurring code errors or reviewing admissions which are particularly complicated to code.

An example of a department where doctors learn about coding during meetings is the Department of Medicine at Gjøvik Hospital. In the questionnaire, more than seven in ten doctors responded that they learned about coding through meetings, compared with four in ten on a national basis. In its coding procedure, the department states that coding must be an item on the agenda for at least two departmental meetings a year, and in interviews, the doctors highlighted these meetings as a good arena for learning.

The questionnaire shows that it is not sufficient to solely offer doctors courses to ensure that they have an up-to-date knowledge of coding at all times. Ongoing follow-up and learning through discussions, guidance and feedback on the doctors' individual coding is also essential. Guidance and feedback can for example come from doctors with specific responsibility for coding, or from code controllers.

This would enable doctors to maintain the knowledge that they build up through courses they attend, and to relate theoretical knowledge to their own coding and patients. When the person who gives feedback or guidance to doctors themselves has a good understanding of coding as well as professional legitimacy amongst the doctors, such informal training can compensate for a lack of formal training to some extent.

5.1.3 Practice for providing information on changes to the code rules
The code rules are revised every year. To ensure correct code practice, doctors must therefore be informed about the changes. During the questionnaire, 43 percent of doctors responded that they had not received any information concerning the changes to the regulations when the question was asked in February 2016. In 2016, major changes were made to the codes, particularly as regards the procedure codes. In addition, 26 percent entirely or partly agreed that the department had good routines for updating doctors regarding changes to the code rules.

The document review shows that many health enterprises lack routines for implementing changes to the coding rules. The questionnaire furthermore shows that seven in ten managers do not have, or do not know whether they have, such routines. Overall, this indicates that many health enterprises do not have adequate formal routines or practice for disseminating knowledge concerning changes to the regulations.

An example of a department which has established good routines for disseminating information concerning changes to regulations is the Department of Surgery at Stavanger Health Enterprise. Here, almost all doctors who responded to the questionnaire received information concerning changes, and three in four entirely or partly agreed that the department had good routines for updating. The central doctor with assigned responsibility for coding within the health enterprise distributes

information concerning changes to the regulations to the clinic managers and to the code controllers within each department. The clinic managers then forward the information to their departments. Changes to regulations of relevance to the various clinics are highlighted. Information concerning changes to rules is also given during meetings within the clinic.

5.1.4 The doctors' understanding of coding
Eight out of ten doctors in the questionnaire reply that they assign codes at least weekly. Assigning codes is part of a doctor's normal duties in connection with the discharge of patients.

During both the case study and the questionnaire, it was very unusual for doctors to refer to coding in positive terms. This also applies to doctors who have specific responsibility for coding. There may be a number of reasons for this. The case study shows that doctors understand that the management wants coding to be carried out correctly. At the same time, most doctors who were interviewed understood that the most important aim of coding is to ensure that the health enterprise receives its fair share of the funding that is available. Fewer doctors understood that the management places emphasis on the other purposes of coding, e.g. as a basis for statistics and governance.

However, doctors in the Department of Medicine and the Department of Surgery stated in interviews that considerable emphasis is placed within their enterprise/department on the importance of coding in ensuring good statistics and research. Through the ongoing provision of training and guidance, the message of correct coding to ensure good statistics is being passed on to the doctors. A doctor from Stavanger Health Enterprise said the following regarding why it is important to code correctly: *"To ensure that the statistics are accurate, to ensure that research is correct, (…) … there is a lot of talk about it, there's a lot in it."* The management and other key personnel play an important role in ensuring that doctors believe that coding is relevant to them; this is discussed in section 5.3.2.

During both the interviews in the case study and in the questionnaire, many doctors stated that they do not believe that the codes describe the medical assistance that they give accurately and that this makes spending time on them less meaningful. One possible reason for this might be that the most important codes (ICD10) are administered by the World Health Organisation (WHO) and have not been formulated specifically for Norwegian conditions (see Chapter 7). When doctors find that the codes do not reflect their everyday clinical work, spending time on learning about coding and actually coding can be less motivating.

Another reason why some doctors do not believe that the codes reflect their everyday clinical work is that they mix the terms "coding" and "condition". They believe that they have made a diagnosis once they have assigned a code and associated code text. However, there are many more diagnoses than codes, and information and accuracy will be lost if the code text replaces a precisely formulated diagnosis. The code text from the codes has been formulated to describe the content of the statistical category concerned, rather than to describe the medical problems of a particular patient.[68] Doctors who do not realise that the purpose of the code text is not to give a precise description of a condition will be more likely to consider the codes less meaningful and coding to be of little relevance.

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68) Directorate of Health (2012): *Functional and technical requirements for IT support in medical coding - report from national coding module feasibility project (Funksjonelle og tekniske krav til IT-støtte i medisinsk koding - rapport fra forprosjekt nasjonal kodingsmodul).*

The code audit indicates that there is often no free text description or explanation for the conditions that were of real importance for the medical assistance provided during admission. The ongoing medical records from the doctors may be relatively comprehensive, particularly in the case of admissions which extend over a number of days. In addition, there will be other documentation such as test results. This makes it time-consuming to find out what should be reported as the main condition and what should be reported as *other conditions*. This particularly applies in cases where doctors write a discharge summary and assign codes for patients who they have not been involved in treating.

The questionnaire shows that half of the doctors responded that they were involved in less than 75 percent of the admissions for which they assign codes.

Overall, the questionnaire shows that there are still challenges as regards time pressure and motivation amongst doctors, as indicated by the internal audit in 2011.[69]

5.2 Quality assurance of medical coding

The quality assurance of coding consists of a number of steps during the coding process.

Figure 21 The coding process

Treatment/diagnosis → Documentation → Medical codes assigned → Counter-signing → Quality assurance within department and amongst staff → Quality assurance at end of four-month period → Reporting to the NPR → **National statistics**
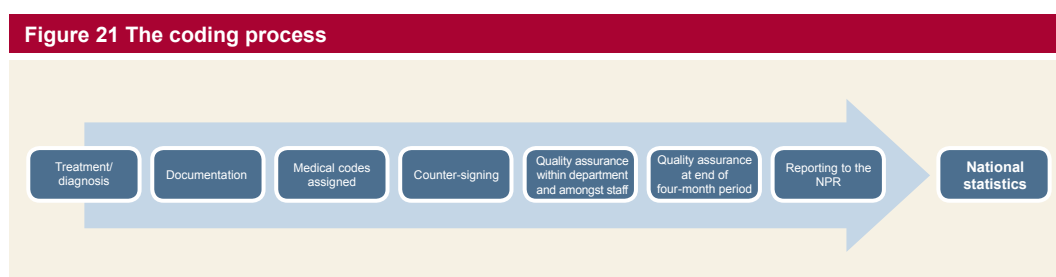
The quality assurance of medical coding primarily involves three key checks:
- *Counter-signing,* which is a check where an experienced doctor reads a discharge summary and associated codes assigned by the doctor responsible for the summary
- *Ongoing quality assurance,* where code controllers follow a quality assurance procedure to ensure that the coding is complete, correct and adequately documented in the medical record, where appropriate in collaboration with a doctor within the departments with coding responsibility
- *Central code check,* which involves checks by an employee outside the department/clinic before the health enterprises report activity data to the NPR. Analysis tools are used to identify admissions with logical errors or possible errors.

The case study shows that three factors are of particular importance in ensuring good quality assurance.
- Firstly, it is important that code controllers and any doctors with coding responsibility have sufficient competence and time to carry out quality assurance of coding
- Secondly, it is important *that doctor with asssigned responsibility for coding* are actively involved in quality assurance. This creates legitimacy and helps to ensure that the management group gains ownership of the coding. In connection with this, it is important that the tasks of the doctor with asssigned responsibility for coding and code controllers are coordinated and focused
- Thirdly, quality assurance should be carried out to ensure that reported conditions are *adequately documented* in the medical records

69)   The internal audits of the regional health enterprises (2011): *National internal audit of medical coding practice. Main report.*

Registration of codes. Photo: Pixabay

The results of the code audit show that many errors are not identified and amended through the quality assurance procedures. This indicates that the quality assurance is not appropriately organised. The departments which appear to be more successful than others use a combination of the various quality assurance measures referred to above.

5.2.1 Counter-signing by an experienced doctor

Counter-signing is the first step in the quality assurance process for coding. Any weaknesses during this check can be picked up by the code controllers' quality assurance. At the same time, 41 percent of code controllers in the questionnaire responded that not all day admissions are subject to quality assurance. In these departments, the quality assurance in connection with counter-signing will be particularly important.

The questionnaire reveals a number of circumstances linked to this check which could help to explain why the code audit found that too many *other conditions* were being reported to the NPR by certain enterprises:

- Discharge summaries prepared by experienced doctors were not being counter-signed; the codes concerned will therefore also not be subject to quality assurance at this level
- Those who counter-sign pay less attention to quality assuring the codes for *other conditions* than the code for the main condition
- Some of the doctors who counter-sign are not familiar with the fundamental principles for coding (see section 5.1)

The document review of information obtained from the health enterprises indicates that only five health enterprises refer to the *counter-signing* check in their common overarching procedures. Many of the procedures which have been developed also do not specify which groups of doctors must be counter-signed, whether the coding should be subject to quality assurance through counter-signing and what, if anything, should be subject to quality assurance in connection with this. In many health enterprises, it appears to be up to the individual clinic manager and/or head of the department to formulate routines to ensure good quality assurance of coding in connection with the counter-signing. This leads to a risk of substantial differences in the quality of the checks that are performed on the coding in connection with counter-signing.

5.2.2 Quality assurance within departments

Quality assurance within departments is the most important check for ensuring good code quality. The health enterprises have delegated the responsibility to ensure good code quality to the managers of the clinical units.

The document review shows that many of the overarching procedures do not define the assigned authority, responsibilities and duties for the personnel groups who are involved in the quality assurance of medical coding, in a clear and precise manner. This concerns key roles such as managers, doctors with coding responsibility and code controllers. Within many health enterprises, it is therefore up to each manager within the clinical departments/units to develop routines for this division of labour. These managers appear to have a decisive influence over the way in which the code work is organised, and how the coding within the department should be subject to quality assurance. The way in which the quality assurance is carried out will therefore be influenced by the managers' competence, interest and motivation relating to coding. This may explain why there are differing practices between departments within each health enterprise with regard to the way in which they allocate tasks between doctor with assigned responsibility for coding and code controllers.

However, the case study shows examples which indicate that differing practices do not necessarily represent a problem in themselves: two departments at one hospital in the case study both achieved relatively good results in the code audit, even though their quality assurance is organised differently.

At the same time, the questionnaire shows that many departments within the health enterprises have not developed written routines for key quality assurance processes. Thirty seven percent of the code controllers responded that they either do not have or are not aware of written routines for the quality assurance of coding. In addition, half responded that they do not have or are not aware of written routines for enterprises and responsibilities in connection with changes to the coding as a result of the quality assurance. A lack of written routines which define tasks, responsibilities and authorities amongst doctor with assigned responsibility for coding and code controllers could result in a risk of inappropriate quality assurance of coding.

Sufficient competence and time for quality assurance is important in order to achieve good code quality

The questionnaire shows that almost all code controllers within the health enterprises have received training concerning medical coding. Many of the code controllers affiliated to departments/sections work part-time. Four in ten have a full-time equivalent percentage of less than 60. In addition, half of the code controllers affiliated to a department/section spend less than half of their working hours on the quality assurance of coding. They spend the rest of their time on other administrative tasks. There is therefore evidence which suggests that the competence of code controllers is not being fully utilised, as many code controllers spend relatively few hours per week on the task of medical coding.

For most of the code controllers who were interviewed during the case study, the quality assurance of coding accounts for a high proportion of their working hours. In addition, they both possess competence and spend a lot of time on the quality assurance of coding. The code controllers have received basic training in medical coding and been given opportunities to raise their level of competence and maintain their existing competence. In the case of some departments, the competence of the code controllers is also utilised to provide training for doctors. This takes place through the provision of training via courses or general meetings, and through giving doctors explanatory feedback in connection with quality assurance. In this way, the health

enterprises covered by the case study derive considerable benefit from the resources they have utilised in establishing and maintaining the competence of their code controllers.

The questionnaire shows that it is common for clinics and/or departments within the health enterprises to have a doctor with code responsibility who is assigned specific responsibility for tasks relating to medical coding. During the questionnaire, around four in five managers responded that they have a doctor who has code responsibility.

The case study shows that the tasks of doctor with assigned responsibility for coding vary between departments. Many doctor with assigned responsibility for coding are involved in the process when medical codes are altered and/or during the actual quality assurance of main codes. Some doctor with assigned responsibility for coding are also responsible for training employees and for updating them as regards changes to the regulations. The questionnaires show that a minority (three in ten) of the doctor with assigned responsibility for coding within all health enterprises have been allocated time to work on medical coding during their normal working hours. Many doctor with assigned responsibility for coding do not have time specifically set aside for this task during their working hours. This indicates that many doctor with assigned responsibility for coding within the health enterprises may face challenges finding sufficient time for the task.

In four of the six departments covered by the case study, there are one or more doctor with assigned responsibility for coding within the departments, while two of the departments have no doctor with code responsibility. A common characteristic of the doctor with assigned responsibility for coding who were interviewed was that they said they had allotted time specifically set aside for quality assuring coding.

Creating legitimacy and involving the doctors can be important in order to ensure good quality

The case study shows that an important criterion for success in achieving good quality coding is that doctor with assigned responsibility for coding are involved in the quality assurance of the codes. This creates legitimacy amongst the doctors as regards coding. Both doctors and code controllers believe that feedback from a doctor regarding coding could have a different emphasis compared with that from a code controller, because doctors with assigned responsibility for coding are aware of the clinical aspects, unlike financial controllers. In the two departments covered by the case study which do not have a doctor with code responsibility, the code controllers stated that they do not have any clinicians to discuss issues with.

The case study furthermore shows that it is important that the tasks of doctor with assigned responsibility for coding and code controllers are coordinated and focused. An example of this is the Department of Medicine at Stavanger University Hospital. In this department, there is systematic division of labour between the code controller and the doctor with code responsibility, which contributes to the complementary quality control of coding. The code controller reviews all day admissions, partly to ensure that all the conditions which are to be reported to the NPR are adequately documented in the medical records. In addition, the doctor with code responsibility within the department reviews all documentation for many of the admissions which are grouped under the uncomplicated DRG in a DRG pair.[70] An important purpose of this check is to ensure that all conditions documented in the medical record which are relevant to the admission are reported to the NPR.

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70) In addition, a sample of admissions from areas where errors are often made was audited. These admissions were selected through standard reports from an analysis tool.

Checks to ensure that conditions are adequately documented in the medical records are important to ensure good code quality

During the code audit, many codes were deleted because the conditions were not adequately documented in the medical record concerned. During the questionnaire, the code controllers within the health enterprises were asked what they believed were the most important grounds for correcting codes following the quality assurance. In their view, the two most common reasons for this are that those who assign codes forget to include *other conditions* or that they forget to include *procedures* which are relevant to the admission. It is therefore more common to correct the coding for those who have forgotten to include *other conditions* which are relevant to the admission than it is to correct *other conditions* for which there is no basis in the patient's medical record. This indicates that the controllers pay too little attention to checking that there is sufficient documentation for the conditions in the medical records. The results of the code audit can therefore partly be explained by the number of hospitals that have opted to formulate routines for quality assurance.

Figure 22 How often do you quality-assure the various factors when coding is subject to quality assurance? Average carrying out of quality assurance never (0) every time (6) (N = 104)
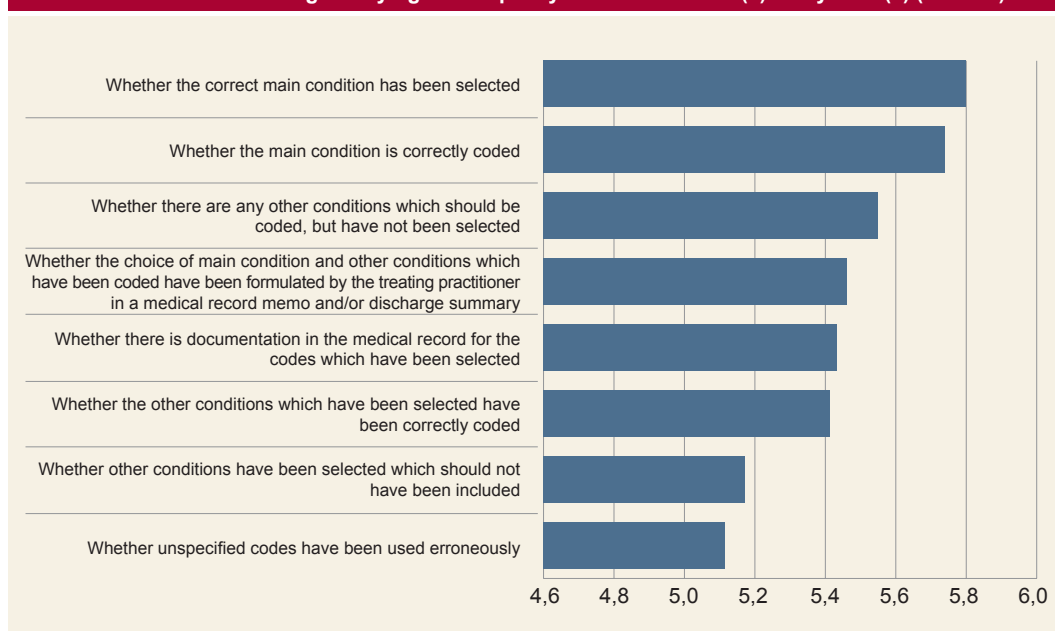
Source: Questionnaire for code controllers.

The questionnaire shows that the code controllers within the health enterprises almost always carry out quality assurance to ensure that the correct main condition has been reported to the NPR and that the main condition has been correctly coded (see Figure 22). In addition, the code controllers focus more during the quality assurance process on ensuring the "complete" coding of conditions which have been documented in the medical record, than on checking whether codes for *other conditions* have been reported which should not have been reported. Many of the code controllers in the case study specifically noted that admissions with a long admission period and low DRG weighting are checked more thoroughly. For these admissions, there is a risk that the reporting of *other conditions* to the NPR will be incomplete. This may explain why the controllers in the questionnaire responded that more *other conditions* are added as a result of the quality assurance process, than are deleted.

In two of the six departments in the case study, not all day admissions were subject to quality assurance by the code controllers. Although the target is to subject all

admissions to quality assurance, it is not possible to check them all. In these departments, special programs are used as an aid to identifying admissions which should be checked. The program identifies factors such as admissions with seven or more *other conditions* per admission, to enable the code controllers to check whether too many *other conditions* have been reported for these admissions. However, seven *other conditions* per admission is far more than the average number of *other conditions* reported for the patient groups in the code audit.[71] Thus, there is a risk that admissions which have been coded with a relatively high number of *other conditions* which were of no significance to the medical assistance given during the admission, or which are not adequately documented in the medical record, will not be picked up during this check. Both of these departments report a relatively high number of other conditions per admission to the NPR for the selected patient groups, and a relatively high proportion of the reported *other conditions* were deleted during the code audit because the conditions were not adequately documented in the medical record.

In the four other departments covered by the case study, all day admissions were checked. The aim is to carry out quality assurance to ensure that all codes reported to the NPR are documented in the medical records.

In these departments, a special program is therefore used as a tool to identify admissions which require particularly thorough checks to ensure that all codes have been included. Such thorough checks will, for example, involve the controller checking admissions where the patient has been admitted to the hospital for a long time without many *other conditions* being coded. During the code audit, relatively fewer *other conditions* were deleted in these departments than was the case in the two departments which do not subject all admissions to quality assurance.

The case study shows that the code controllers have two different approaches to reviewing medical records during the quality assurance process, even within the same hospital:
• Using the medical record upon admission as a starting point: the controller uses the medical record upon admission as a starting point to obtain a complete overview of a patient's illness, and ends with the discharge summary
• Discharge summary as a starting point: the controller uses the discharge summary as a starting point to investigate whether there is sufficient documentation for the reported codes

The first approach leads to a stronger focus on ensuring the "complete" coding of conditions which are documented in the medical record than on whether *other conditions* have been selected which should not have been reported. However, this approach is time-consuming because the code controller has to read through a lot of information in a number of different types of document. The case study shows examples which suggest that this approach leads to the code controller not having sufficient capacity to subject all admissions to quality assurance.

With the other approach, the code controller uses the discharge summary as a starting point, but looks for documentation in other medical record documentation as necessary. This approach is less time-consuming. In one department covered by the case study, few *other conditions* were deleted because the code controller has sufficient capacity to investigate whether there is sufficient documentation for all *other conditions* which have been suggested for coding.

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71)　Amongst the patient groups covered by the code audit, the average numbers of other conditions reported per
　　admission were 2.7 and 1.5 respectively.

Two departments at Gjøvik Hospital are included in the case study. In these two departments, many of those who were interviewed believed that they discussed during meetings what constitutes sufficient documentation in order to report conditions to the NPR. In addition, the departments have routines for identifying *other conditions* which have been documented as having been treated/specified during the admission, but which were not initially coded. This practice may be one of the reasons why relatively few *other conditions* were deleted, and why few *other conditions* were added during the code audit in the case of one of these departments.

The case study shows that the departments have established different routines as regards whether errors should be approved by a doctor with discharge summary responsibility, and where appropriate which types of error should be approved. Within some of the departments, the code controller and/or doctor with code responsibility can correct codes themselves, whilst in other departments, all changes must be approved by the doctor responsible for the discharge summary. In one of the departments, many of the codes which were deleted during the code audit were added by a doctor with code responsibility, without the doctor responsible for the discharge summary approving the change.

In one of the departments covered by the case study, the doctors must approve all corrections to codes. In order for the health enterprise not to receive undue funding as a result of an admission, corrections are only made for *other conditions* which the code controller knows will affect the grouping of a complicated or uncomplicated DRG. Other *other conditions* are not always corrected, even if documentation is missing. This is justified by the statement that it would take the doctors too long to do it, because they would have to approve all changes.

One consequence of such a practice is that even if the quality assurance system at a hospital identifies *other conditions* which are not relevant to the admission and/or which have not been adequately documented in the medical record, the condition will still be reported to the NPR and result in errors in the statistics. This department had many *other conditions* deleted during the code audit.

Many code controllers in the case study noted that quality-assuring doctors' codes is a demanding task because it is not clear from the final memo or the discharge summary what the main condition was or which *other conditions*, if any, were treated during the admission and/or had a real impact on the medical assistance provided during the admission. This results in the code controllers spending a lot of time on searching for documentation elsewhere in the medical record. The specialist auditors believe that it would improve code quality and reduce the amount of time required by doctors and code controllers if it were mandatory for the doctor to enter the following in the discharge summary:
• The main condition (main diagnosis) during the admission was: (the doctor's freely formulated diagnosis/condition description)
• *Other conditions* which were treated and/or which had a real impact on the medical assistance provided during the admission are: (the doctor's freely formulated diagnosis[diagnoses]/condition description[s])
• Procedures which were carried out during the admission: (the doctor's freely formulated statement of the procedure[s] performed)

5.2.3 Quality assurance within the staff unit
The document review indicates that all the health enterprises have code controllers amongst their staff who perform computer-aided checks on medical codes. These checks are intended to ensure that reports to the NPR undergo quality assurance.

Computer-aided or automated checks are used to identify admissions where there may be a risk that the coding is not in accordance with the applicable regulations. Checks are, for example, made for missing or incomplete coding and illogical relationships. In addition, admissions where there is a risk that the health enterprise will not receive due funding are also identified. For example, the checks identify admissions where the patient has been admitted to the hospital for a long time without any *other conditions* being coded. The investigation shows that, in many health enterprises, code controllers also use this type of tool in the quality assurance of the departments.

However, the computer-aided checks will not identify many of the admissions where errors were found during the code audit. One reason for this is that most of the errors identified during the code audit were due to circumstances other than incomplete coding and illogical relationships. To identify many of the errors which were found during the code audit, the code controllers must investigate whether there is correspondence between the codes which have been assigned and the documentation in the patient's medical record. In order to identify these errors, the health enterprises are dependent on the competence of those who assign codes and those who quality-assure them within the departments. The computer-aided checks can therefore only compensate for poor quality assurance within the departments to a limited degree.

The document review shows that it is common for the finance department within a staff unit to carry out the computer-aided checks. In the three health enterprises covered by the case study, these employees were affiliated to other entities within the staff unit, such as the medical director. During the interviews, it became apparent that key stakeholders believe this organisation to be appropriate, because it helps to keep medical coding separate from financial issues.

5.3 Governance and management of medical coding within the health enterprises

The health enterprises have a responsibility to govern and manage the work relating to medical coding. The investigation indicates that some enterprises have not established effective routines and systems for ensuring good medical coding. However, some of the health enterprises which have established good *written* routines, governance and management systems still face challenges achieving good code quality. The case study shows that clear management which supports the code work and a widespread attitude that coding is important can compensate for weaker formal management with few written routines and procedures.

5.3.1 Governance
The document review shows that almost all health enterprises have a written aim of ensuring correct coding. In their overarching common procedures, most health enterprises also describe the purpose of coding. In their procedures, most health enterprises state that an important purpose of coding is to secure the health enterprise full funding, while fewer procedures refer to the non-financial purposes of coding. These purposes could for example include health monitoring, planning and quality assurance of health services, as well as research.

Previous investigations indicate that completely correct coding is an unrealistic aim.[72] It is therefore an unrealistic aim to attempt to achieve coding which is entirely correct (i.e. 100 percent correct). The document review shows that no health enterprise has developed operationalised targets concerning what constitutes satisfactory code

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72) Code audits conducted within the health enterprises always lead to changes to the codes which were originally registered. See for example Document 3:2 (2004–2005), Document 3:7 (2005–2006) and Document 3:2 (2009–2010).

quality.[73] Managers who are responsible for code quality within their unit therefore have no specific quality requirements to aim for when organising the work relating to coding.

Although the health enterprises have not set specific performance targets for coding, indicators can be used to monitor quality trends over time. The document review shows that, with few exceptions, such indicators are not used.[74] The indicators used by the Department of Surgery at Sørlandet Hospital are one of the exceptions. The head of the clinic and the department managers receive a report on the scope of reviewed and amended admissions, the associated financial consequences and the reason for recoding (see Table 6).

SØRLANDET SYKEHUS

Status First four-month period 2015
detailed

	First four-month period 2015					
	Number of altered admissions	N umber up-coded	Number down-coded	Result up-coding	Result down-coding	Net result
Other						
Change of main and other conditions of main and other conditions						
Change of or new procedure						
Complicating other conditions missing						
Procedures missing						
New main condition						
Administrative error						
Total						
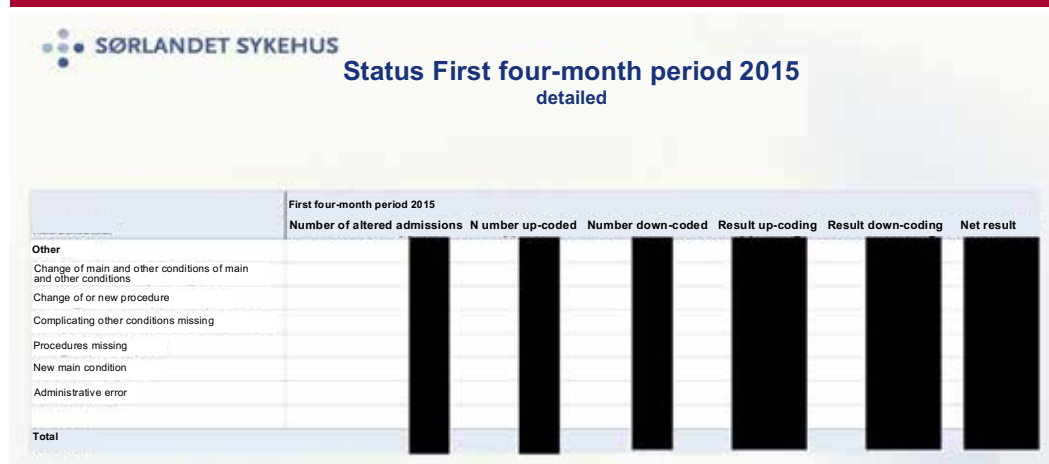
Source: Sørlandet Hospital (Department of Surgery)

The aim is to reduce the number of amended admissions following quality assurance over time. This enables the training initiatives and quality assurance to be targeted and corrected using the indicators.

The DRG index is an indicator of patient weighting which is calculated by dividing the total DRG score by the number of hospital admissions. Many health enterprises noted that the DRG index is an indicator of code quality. These enterprises use the DRG index to compare the level of this indicator over time, either within their own organisation and/or with other health enterprises.

An analysis of DRG indices between three health enterprises shows that differences within the patient population as regards age, for example, explains many of the differences in DRG indices between the enterprises[75] This shows that the health enterprises must be careful when interpreting differences in DRG indices as indicating differences in code quality. A low DRG compared with another health enterprise does not necessarily mean poorer code quality, as it could be an indication of a different age, gender or function distribution, for example.

One in four code controllers stated in the questionnaire that statistics or figures are prepared for errors or deficient medical coding for the units on which they carry out quality assurance. The fact that they actually do this indicates that there is scope to use statistics to a greater degree to systematically assess code quality, both by

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73) With the possible exception of the Department of Surgery at Sørlandet Hospital Health Enterprise, which aims to reduce the number of amended admissions following quality assurance.
74) During the investigation, the key performance parameter 'DRG index' was not considered to be an indicator of code quality.
75) Analysesenteret (2015): *Compared performance analyses (Sammenlignede aktivitetsanalyser). Stavanger Health Enterprise, Sørlandet Health Enterprise, Vestfold Health Enterprise.*

using the statistics that the code controllers already prepare and through more code controllers preparing such statistics.

Around half of the health enterprises stated that they have carried out some form of risk assessment. However, the document review shows that far fewer enterprises have conducted a systematic evaluation of the organisation of their code work which identifies the risk factors relating to erroneous coding during the coding process. At all hospitals covered by the code audit, code quality is poorer amongst the pneumonia patient admissions which were audited than amongst hip replacement patients. The specialist auditors believe that this is to be expected, because it is more demanding to code an admission for pneumonia than for a hip replacement. The different results of the code audit between the two patient groups indicate that the health enterprises have not adapted the organisation of their code work to the differing risks of erroneous coding between the two patient groups.

The document review furthermore shows that some health enterprises test code quality by auditing a random sample of medical records from certain departments. Such audits can provide the health enterprises with information on the extent to which the objective of correct coding is being achieved. The challenges highlighted by certain disciplines during the audits are often general and fundamental in nature, and could have provided some useful lessons for other departments had they been utilised. The case study shows that the health enterprises do not make sufficient use of code audits for learning purposes, except in the departments in which the audit is carried out. This results in a lost opportunity to improve the code work.

Common overarching procedures can help to ensure consistent and appropriate practice between departments within each health enterprise. The document review shows that 14 out of 19 health enterprises have developed common overarching procedures. However, many of these procedures vary in terms of their quality and content. Some procedures do not define roles, responsibilities and tasks within the work relating to medical coding clearly and precisely. For example, many procedures do not describe the responsibilities relating to the way in which the health enterprises should implement changes in the coding regulations. The document review also indicates that few of the common overarching procedures impose requirements concerning local procedures, e.g. as regards their content. This could explain why there can be considerable variation between departments within the same hospital as regards how medical coding practice is managed. Many of the health enterprises told the Office of the Auditor General that no written routines had been prepared within the departments covered by the audit.

In the majority of health enterprises, the responsibility for training is described in common procedures, but many of the health enterprises make no mention of what the managers' responsibilities as regards training entail in specific terms. In addition, few health enterprises have established procedures which explain what feedback doctors should receive from those who carry out checks, how they should be given guidance concerning coding, how often coding should be an item on the agenda during meetings, etc. In practice, it is therefore up to each clinic and head of department to define and fulfil training needs.

This could be one reason why practices vary between departments within individual health enterprises as regards the formal and informal training that doctors receive.

Within a few health enterprises, the management is able to document that it has an

overview of, and monitors, which doctors have completed courses. This is confirmed by the managers in the questionnaire: just three in ten managers who responded that e-learning courses are mandatory have an overview of the number of employees within their department who have taken such a course. The questionnaire shows that a minority of doctors have completed an e-learning course within most health enterprises where it is claimed to be mandatory. In their replies, many of the health enterprises stated that it can be difficult to get doctors to take the courses they are offered or required to take. Overall, this indicates that, although health enterprises have introduced a requirement for the doctors to take a coding course, they face challenges in ensuring that the doctors actually take the course in practice. This also shows that senior management faces challenges in following up to ensure that managers at lower levels fulfil their responsibility to provide employees with the requisite knowledge concerning coding.

5.3.2 The role of management as regards medical coding within the health enterprises

The investigation shows the importance of the role of management in medical coding, in the work relating to code quality. In the questionnaires, doctors, code controllers and managers of lower coding were asked to what extent they agreed with various statements concerning its management.

Figure 23 Proportion that says they entirely or partly agree with various claims concerning the management of the respondent's unit (N = 797)
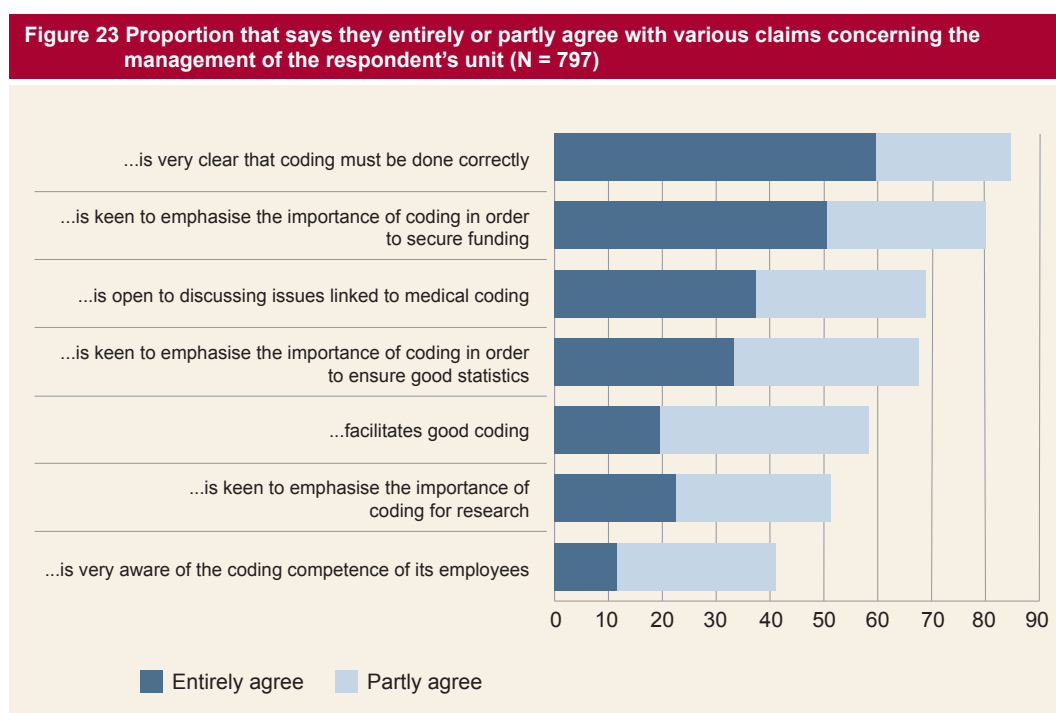
Source: Questionnaire to doctors

Most doctors agreed with the statement that the managers are clear about the importance of coding correctly (see Figure 23). Roughly as many doctors agreed that the management are keen to emphasise the importance of coding for securing funding. Fewer doctors agreed that the management are keen to emphasise the importance of coding as regards patient statistics and research.

Within most enterprises, it is up to the departments to manage the code work in practice. Most health enterprises pass the PBF reimbursement down to the departments, and DRG scores are therefore used for both performance and funding targets in many departments. Within the departments, the financial results are followed up, something which in many departments is influenced by the PBF reimbursement.

The case study shows that, although the managers say they try to protect their doctors from financial issues linked to coding, the doctors in most departments say that the management is keen to secure funding when coding is a topic for discussion.

The case study also shows the importance of a clear management structure which highlights the importance of coding work for reasons other than just securing funding, and which supports the work. This creates the attitude that coding is an important part of the work and promotes good code quality. An example of unambiguous management is that of Stavanger University Hospital, where there are clear signals from the CEO down through the organisation that coding must be done correctly, even if it does not pay financially. Many employees stated during the interviews that the CEO has repeatedly made it crystal clear that coding must be done correctly.

When asked whether the CEO makes this clear, the person being interviewed said the following:
"The CEO says it at management meetings, at expanded management meetings down to level 4, which includes section consultants and senior charge nurses, and at Friday meetings for everyone at regular intervals when coding is a topic for discussion."

It has been difficult to bring about this change in attitudes that coding is important. This shows the importance of a clear and supportive management structure at a number of levels in order to bring about such changes in attitude and behaviour in practice:

> "When a doctor with code responsibility has looked at the coding, they have
> seen that the practice that has been adopted is not correct and asked the
> doctors to change their practice. This can sometimes result in a significant drop
> in funding and the doctor responsible for coding has had to fight a few battles
> […] We definitely have a CEO who supports us then."

The case study also shows that where the management gives clear signals concerning the importance of correct coding, they also have pivotal stakeholders with dedicated responsibility for coding. Dedicating resources to coding is therefore a better way for the management to show in practice that coding is important. Stavanger University Hospital is a good example of this. Within the Department of Surgery and the Department of Medicine, these pivotal stakeholders work to promote a positive attitude towards medical coding and ensure good quality, and the management provides the right conditions for the doctors to perform the task of medical coding. This work is organised in slightly different ways within the two departments. One department has a doctor with overall code responsibility and another has a group of doctor with assigned responsibility for coding who are responsible for checking the coding against what is documented in the medical records.

In addition, there is an example in the case study where coding is discussed at meetings at different levels. During these meetings, the management emphasises the importance of coding and continually reiterates this message, e.g. at the doctors' morning meetings. Such messages help to ensure that doctors also realise the importance of coding for other, non-financial purposes. There is therefore clear management and a widespread attitude amongst the staff that coding is important: "They say it is much easier to go back and see how many breaks we have treated, why we have done it, whether it has led to any complications […] You then understand the value of coding much more".

The management uses statistics based on coding for planning purposes. However, it is not common within the departments covered by the case study for doctors to see

patient statistics based on the department's coding, even though they are aware that the coding forms the basis for such statistics. Many people said that they thought it would be interesting to see such statistics. This would probably have increased the doctors' focus on the way in which the data is used for other purposes besides securing funding, e.g. quality improvements, management and research. In addition, it would probably also help to increase the doctors' personal interest in ensuring correct coding.

6 How do the regional health enterprises contribute to good code quality?

The regional health enterprises have overall responsibility for ensuring that medical coding is carried out in line with the national coding guidance and the provisions laid down in the regulations, for the quality control of data and for ensuring that reporting deadlines are met.[76]

In order to assess whether their executive responsibilities are being fulfilled, the regional health enterprises also have a strong interest in good statistical descriptions of the performance of the hospitals within their region, e.g. which conditions are being treated and where. Among other things, the regional health enterprises use data from medical coding to:
- Assess and follow-up functional distribution between health enterprises
- Report to their own board and the Ministry of Health and Care Services regarding whether they have achieved the various objectives and requirements that were set
- Monitor the health enterprises' activities and service quality
- Monitor projects/strategies and regional plans
- Analyse consumption patterns, availability, variations in services and practices
- Determine the need for future health personnel in the region

Coding is used to plan and ensure uniform health services, among other things.
Photo: Fredrik Nauman

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76) *Performance-based financing – regulations.* Directorate of Health, 2015.

6.1 Follow-up of the 2011 internal audit

It was particularly in connection with the joint audit of medical coding practice that the regional health enterprises followed up the work of the health enterprises relating to medical coding [77] The audit was conducted in 2011 by the regional health enterprises' internal auditors on the initiative of the Directorate of Health. The purpose of the joint audit was to investigate the health enterprises' quality assurance of medical coding.[78] The report proposes a raft of measures aimed at all health enterprises and regional health enterprises, as well as at national level organisations.[79]

Among other things, it was recommended that all health enterprises carry out risk assessments concerning the coding process, ensure that a learning loop is established by giving regular feedback on coding practice to everyone who assigns codes, and develop common routines for medical coding within the health enterprise. In addition, specific recommendations were aimed at nine health enterprises which were audited in more detail.

All regional health enterprises noted that their board considered the audit and received feedback from the nine enterprises in total which were audited in more detail. In addition, the South-Eastern Norway Regional Health Enterprise noted that they have specific meetings with Ahus[80] and Telemark[81] concerning medical coding, during which they obtain detailed information concerning organisation, execution and established routines and procedures for coding.

The regional health enterprises followed up the nine health enterprises which were the subject of *specific* recommendations far more closely than the other health enterprises, even though the aim of the audit was to strengthen internal management and control relating to code quality amongst *all* health enterprises.

In addition, the regional health enterprises imposed a requirement for all their health enterprises to promote correct coding in their governing documents in 2012.[82] The requirement from three of the regional health enterprises was worded as follows:

> "All documentation of medical activity within the enterprises must be prepared on the basis of medical rather than financial considerations. Routines, processes, training and ICT systems must contribute to correct medical coding."

In addition, the Northern Norway Regional Health Enterprise imposed a requirement in the assignment document for 2016[83] to "use the feedback from the NPR to actively reduce coding errors".

The board of the South-Eastern Norway Regional Health Enterprise has been more active in following up the health enterprises in its region than other regional health enterprises, as the 2016 corporate audit unit conducted an internal audit into how the

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77) The internal audits conducted by the regional health enterprises (2011) *National internal audit of medical coding practice.* Main report.
78) *National internal audit.*
79) *National internal audit.*
80) 12 September 2012.
81) 29 April 2014.
82) The Western Norway, Northern Norway and South-East Regional Health Enterprises all imposed this requirement. In the same year, the Central Norway Regional Health Enterprise formulated this objective in its governing documents: "The necessary competence and routines have been secured through the use of patient administration systems, so that the health enterprise ensures correct and complete registration."
83) Ministry of Health and Care Services (2016) *Assignment Document 2016 Northern Norway Regional Health Enterprise.*

national audit was followed up. In addition, the regional health enterprise noted that, as a result of the board's consideration of the 2013 internal audit, a study had been initiated concerning the coding work in Norway and certain selected countries to assess initiatives to help ensure that medical coding is carried out by suitably qualified coders.[84]

Following the internal audit in 2011, the regional health enterprises' corporate audits recommended considering the imposition of requirements on the health enterprises concerning obligatory training in medical coding for all new doctors – a requirement which had previously been recommended as a measure by the Directorate of Health and the regional health enterprises themselves in 2008.[85] Nevertheless, none of the regional health enterprises have imposed such an explicit requirement on the health enterprises. However, as the Northern Norway Regional Health Enterprise states, with reference to the requirement imposed in 2012 concerning correct coding: "In order to fulfil this requirement, it follows that the health enterprises have a responsibility to ensure that medical personnel responsible for medical coding possess the requisite knowledge."

6.2 Other work relating to medical coding

When asked how the regional health enterprises work to ensure that medical coding within the health enterprises is in line with applicable regulations, the Central Norway and Northern Norway Regional Health Enterprises stated that regional networks have been established for coding, within which the health enterprises are represented.

The South-East Regional Health Enterprise noted that the work to ensure good quality medical coding consists of a number of elements. The regional health enterprise has developed the e-learning course which is now administered by the Directorate of eHealth, discussed in section 7.5, and has informed the health enterprises of this on a number of occasions. The South-East Regional Health Enterprise also worked with the Directorate of Health regarding a national coding module.[86] In addition, the South-East Regional Health Enterprise sent a letter to the Directorate of Health concerning changes to the template for discharge summaries (see section 8.3) and the need for clarifications in the regulations and requirements for IT solutions.

The Western Norway Regional Health Enterprise pointed out that their work to ensure correct coding practice must be viewed as part of the general improvement work within the health enterprises. The regional health enterprise referred to its involvement in the work relating to the development of a national coding module in 2012 through its representation in the project's reference group which provided input to the project. The other regional health enterprises were also represented in this group.[87]

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84) South-East Regional Health Enterprise (2013) *Medical coding. Measures to ensure that medical coding is performed by suitably qualified coders.*
85) *Better quality medical coding within the specialist health service. Report from a collaborative project between the regional health enterprises and the Directorate of Health.* Report no. IS-1598. Directorate of Health, 2008.
86) The coding module was intended to provide doctors with ICT support when they registered codes, e.g. through immediate checks on the validity of the codes which were selected against coding rules. The person who did the coding could receive advice, reminders and warnings during the coding process. The module was also intended to improve access to updated codes, code guidance and coding rules. The overall aim was for ICT support to contribute to more correct coding during the coding process, as well as more uniform coding. The project did not progress beyond the feasibility project stage and was discontinued in 2012 due to capacity problems.
87) *Functional and technical requirements for IT support in medical coding - report from the national coding module feasibility project.* Directorate of Health, 2012.

Section 4.1 contains a description of the differences between the hospitals within the various regions as regards the proportion of admissions which come under a complicated DRG for the patient groups audited. Some of these differences may be due to differences in code practices. None of the regional health enterprises stated that they analyse NPR data with the aim of analysing code practice within the region.

However, the South-East Regional Health Enterprise noted that they have a separate department which works on issues linked to reducing variations in waiting times. Here, variations and medical coding are discussed on an ongoing basis during follow-up meetings with the health enterprises.

7 How does the Directorate of eHealth promote good code quality?

The Directorate of eHealth's responsibilities relating to the administration of national medical codes include the revision and publication of the codes and associated regulations and guidance, and receiving and responding to enquiries concerning medical codes.[88] These responsibilities were transferred from the Directorate of Health to the Directorate of eHealth on 1 January 2016, when the Directorate was established. The Directorate of Health still administers the Norwegian Patient Registry (NPR), for which the medical codes are key variables.

Through the establishment of the new Directorate, two specialist groups, both of which performed tasks relating to medical coding, were split between two Directorates. However, both Directorates noted that they have a close and productive collaboration relating to the work concerning codes following the reorganisation. This collaboration has been formalised through a specific agreement[89] and, in practice, involves regular meetings between the Directorate of Health's DRG team and the code team of the Directorate of eHealth (E-health), at which issues concerning correct coding and observations concerning coding practice are discussed.

7.1 The coding regulations

The Directorate of eHealth is responsible for issuing rules and providing guidance to the sector as regards the interpretation and application of the codes. ICD-10, which classifies diseases, is an international set of codes administered by the WHO. The Directorate of eHealth therefore has limited scope to make changes.[90] However, e-Health is able to determine the content of the procedure codes itself.

Figure 24 Proportion which entirely or partly agrees with the claim "The regulations for medical coding are simple and clear to relate to", broken down between different types of respondents
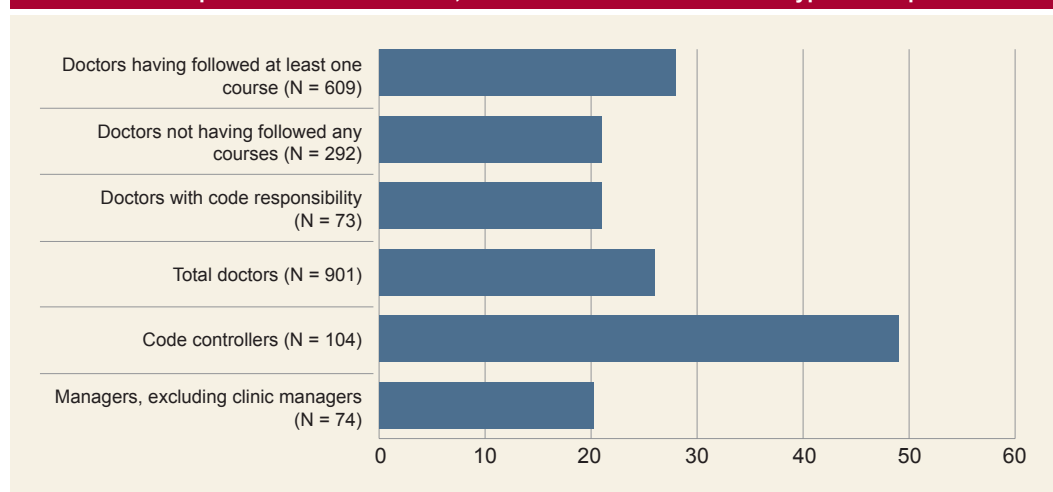
Source: Questionnaire for doctors, code controllers and managers

88) *Collaboration agreement between the Directorate of Health and the Directorate of eHealth.* Directorate of Health and Directorate of eHealth, 2016
89) *Collaboration agreement between the Directorate of Health and the Directorate of eHealth.*
90) Norwegian adaptations must be made at fifth character level (see Fact box 2 for an explanation). These could be adaptations which are made for funding or statistical purposes. An example of such a "special national code" at fifth character level is the code which specifies that palliative treatment has been given at a palliative centre. Palliative treatment is treatment which is given to patients to relieve symptoms where it is not possible to eliminate or stop the disease.

A minority of managers and doctors consider the coding regulations to be simple and clear to relate to. This applies to doctors who have or have not followed a course, including doctors with specific code responsibility (see Figure 24). A somewhat higher number of code controllers found the regulations easy to relate to, but half of them still considered the regulations to be difficult.

During the case study and through remarks made in the questionnaire, it became apparent that there is some frustration over the codes. It was for example noted that the codes in some areas are "illogical" and do not reflect the doctors' "everyday clinical work" or "daily work". Some noted that this leads to a lack of motivation regarding coding.

The Directorate pointed out that the lack of involvement of the clinical reference groups could lead to a risk of the codes being not relevant or user-friendly.[91] To date, specialist clinical groups have been involved in major audits, and a fixed reference group has met annually in connection with the code audits.[92] Participation from the sector during these meetings has been voluntary, and according to the Directorate, it has been challenging to get clinicians to attend.

7.2 FinnKode and ICT support

To make it easier for those who assign codes to relate to the codes, navigate them and find the right codes for the diagnoses they have assigned, the Directorate has developed the search tool FinnKode.

FinnKode is widely used by doctors and the vast majority of them believe that FinnKode makes it both quick and easy to find the right code. However, during both the questionnaire and the case study, many people stated that they considered the synonym function to be poor, which causes them problems when they assign codes. A quote from the questionnaire illustrates this:

"Too often, I don't find anything that fits the condition/procedure I want to code. I often have to know exactly what wording the program will respond to and have to try many different combinations of words before I find what I am looking for. This is time-consuming and imprecise and it takes too long, and sometimes you're not sure whether you are coding correctly."

FinnKode makes it possible to submit suggestions for synonyms. The development of the tool's search function is therefore partly dependent on input from the sector. According to the Directorate of eHealth, "a handful" of suggestions are submitted every year. In addition, the Directorate updates FinnKode itself when it becomes aware that a synonym is missing. In total, the Directorate has added around 10,000 synonyms since FinnKode was created in 2006.

Through the questionnaire, many people stated that they do not use FinnKode because they do not have good access to the internet and/or computers. Many also commented that better provision should be made for using FinnKode via a mobile phone/tablet, e.g. in the form of an app. FinnKode is not currently available via an app, and the search tool is also not suitable for use on small screens. The Directorate of eHealth believes that FinnKode does not meet current functional or technical

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91) *Risk analysis in relation to existing administration of medical codes,* Directorate of eHealth, 2016.
92) According to the Directorate of eHealth, they have always had a reference group.

needs[93] that it lacks sufficient content[94], and that the platform is very unlikely to be developed further.[95] The Directorate of eHealth also stated during an interview that it is aware that clinicians face challenges relating to synonyms.

The Directorate of eHealth itself noted that the ICT systems must support the coding process in order to achieve satisfactory code quality. During interviews and the questionnaire, it became apparent that there are frustrations regarding a lack of functionality for medical coding in the patient administration systems. There are, for example, no automatic quality controls in the ICT systems when registering codes. For example, there is no check for illogical codes.

It is the health enterprises which have client responsibility with respect to the data providers, but these have a requirement to provide systems which comply with standards which are based around applicable regulations. The Directorate of eHealth is responsible for specifying obligatory ICT standards, i.e. based on regulations, or recommended standards within the health and healthcare sector, through the reference directory for ICT standards. According to the Directorate of eHealth, this reference directory makes no reference to standards for supporting correct medical coding. For example, the Directorate of eHealth could have added a requirement for it not to be possible to register invalid codes. According to the Directorate, this would require a legislative amendment. In other words, the reference directory is not used as a tool for supporting correct coding as much as it could be.

Electronic tools are important for coding. Photo: Pixabay

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93) *Programme for codes and terminology/information structure. Phase 1: Plan,* p. 65. Directorate of Health, 2015.
94) *Programme for terminology and codes. Phase summary Phase 2: Planning,* p. 26. Directorate of Health, 2015.
95) *Programme for terminology and codes. Phase summary Phase 1 Plan,* p. 65. Directorate of eHealth, 2015.

7.3 Information on changes to codes

The Directorate of eHealth updates the codes and associated guidance annually. For example, new codes are added and existing codes are deleted or specified in more detail. To enable the sector to implement the new rules and code correctly, the information that the Directorate of eHealth provides concerning the changes must be made available in time and be of sufficient quality.

2016 was a year of major changes to the codes. During this year, the Directorate of eHealth conducted a major audit of the three procedure codes for the specialist health service, a change which covered a total of around 1850 codes. In addition to code changes, the audit noted that these should be viewed as a collective set of procedure codes with effect from 1 January 2016.

Some of the changes required adaptations in the patient administration systems.[96] It is the health enterprises that are responsible for ordering changes to their IT systems from the system suppliers. The IT suppliers must receive orders for major changes at least nine months before the changes are to take effect. The information that the enterprises had from the Directorate concerning the changes which were to apply from 1 January 2016 was received too late for the enterprises to order changes from their suppliers in time.[97]

The Directorate of eHealth admits that the information given to the sector during the process of coordinating the procedure codes was not as good they would have wished in 2015. The routines relating to the updating of the codes do not form part of a predictable process with a fixed annual cycle. According to the Directorate of eHealth, a number of stakeholders have reported a need for a more transparent process, including a predictable annual cycle with fixed deadlines, payment points or publication dates.[98] The dates for the provision of information concerning changes have varied from year to year, and the information has been released from June right through to December.

The Directorate of eHealth notes that there is a very high risk of stakeholders not receiving sufficient notice concerning the changes to the codes. The lack of an annual cycle and a documented process was identified as one of a number of possible reasons for this. The Directorate considers the consequences to be serious, partly because it could lead to a loss of reputation due to the sector having to use obsolete codes, and partly because there will be insufficient time to implement the changes.[99] In addition, the Directorate notes that errors in the codes which are published could result in inefficiency because quality assurance would take a long time and there would be consequences for the quality of the registers in general, and national statistics.

The questionnaire shows that six in ten code controllers believe that information concerning changes to the regulations is not received in time. At the same time, more than six in ten agree that the information concerning changes to the regulations is satisfactory. The Directorate of eHealth has carried out a risk assessment during which they assessed the process relating to the implementation of changes, and have acknowledged the need to improve the process with the sector.

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96) The patient administration systems had to be altered to make it possible to register a procedure performed by a radiological unit using a code from amongst the radiology codes.

97) The sector received official information concerning the changes in a letter from the Directorate of Health, sent in early November 2015, and in information on the Directorate's website in December 2015.

98) *Phase summary: Programme for codes and terminology/information structure. Governing document phase 2: planning, p.* 26. Directorate of Health, 2015.

99) *Risk analysis in relation to existing administration of medical codes.* Directorate of eHealth, 2016.

7.4 The code guide

The code guide provides basic information concerning medical coding. The guide provides an introduction to what medical coding is, the purpose of coding and the key principles behind the selection of main condition and other conditions, as well as more detailed information concerning structure and principles for using each of the relevant codes. According to the Directorate, the guide contains information which everyone who is involved with coding must be familiar with. A sound knowledge of the basic information at the beginning of the guide is absolutely essential for everyone who carries out medical coding.[100] This basic information covers five pages.

Before the first code guide was published in 2010, the sector was referred to the regulations for PBF, which contained some information on coding, and there was some diffuse information on the Directorate of Health's website. The code guide collated this information and made it obsolete.

Table 7 Distribution of responses to the claim "The Directorate of Health´s code guidance provides adequate guidelines regarding medical coding". In percent					
	Entirely/ partly agree	Neither agree nor disagree	Entirely/ partly disagree	No opinion	N
Managers (excluding clinic managers)	41	22	31	7	74
Code controllers	56	13	29	3	104
Doctors (total)	22	25	23	30	901
Doctors who entirely/partly agree that they are familiar with the guide	35	24	21	21	487
Doctor with assigned responsibility for coding	29	25	36	11	73

Source: Questionnaires for doctors, code controllers and managers.

The degree of familiarity with the guide varies, and the guide is rarely used when the doctors are uncertain as to how they should code. However, it is used relatively frequently by code controllers.

Opinions are divided as regards whether the code guide provides sufficient guidance concerning medical coding (see Table 7). The fact that between 21 and 36 percent in the various groups in Table 7 disagree with the statement that the guide provides good guidance indicates that there is room for improvement. During the questionnaire, those who believe that the guide does not provide sufficient guidance were given the opportunity to explain how they believed the code guide could be improved. In summary, the contributions concerned the following:
• The guide is revised too often and what is allowed one year is not allowed the next
• It is too comprehensive, complicated and unclear
• It is not specific enough; it should contain better and more specific examples
• There is a lot of room for interpretation and misunderstanding
• It is cumbersome to look things up in and search

In 2015, the Directorate of eHealth (the Directorate of Health at the time) itself concluded that there is a risk of the code rules not being followed, partly because they

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100) *Regulations and guidance for the use of clinical codes within the specialist health service 2016.* Directorate of eHealth, 2016.

are too complicated. It was noted that this could lead to differing interpretations of the rules and varying practices - "creativity in the wriggle room" - for the reporting units (the health enterprises) and inconsistent data.[101]

During the 2011 internal audit, the complexity of the regulations was again brought up as a problem, and one recommendation aimed at national authorities was to "look at the complexity of the current regulations".[102] According to the Directorate of eHealth, it has been an aim to ensure that there are no discrepancies between the code guide and the code rules, which are contained in a separate chapter in the PBF regulations. These regulations refer to special code rules in areas which are of particular importance for calculating PBF. One example is the coding of dialysis treatment. In the code guide, the Directorate of eHealth is unable to simplify exceptions and code rules which are set out in the PBF regulations, and according to the Directorate, this is a contributory factor behind the complexity of the code guide.

The Directorate of Health's regulations for performance-based financing (on the left) and the Directorate of eHealth's regulations and rules for clinical codes

The Directorate of eHealth does not itself carry out analyses of NPR data which could shed light on variations and identify where there is a particular need for more guidance with respect to the sector in order to ensure more consistent coding. All quality control and statistical analyses of NPR data are carried out by the Directorate of Health. The Directorate of eHealth noted that the fact that they do not have easy access to data represents a problem for them, as they have to apply to the NPR to receive data through Altinn (the Norwegian web portal for electronic dialogue between the business/industry sector, citizens and government agencies). Remarks made during the questionnaire indicate that some people would like to see *specific information and examples* in the code guide. The Settlement Committee, whose tasks include advising the Directorate of Health on issues linked to medical coding practice, would also like to see criteria for the use of codes, e.g. in the 2014 annual report: "The Committee recommends that the Directorate of Health clarifies the guidelines for the coding of post-operative anaemia".[103]

The code guide gives few clinical examples of when it is appropriate to report medical assistance linked to a diagnosis. The Directorate does not consider it appropriate to add more such examples to the code guide, as it is already a long document, but notes that the new e-learning modules will include examples of when *other conditions* can be reported.

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101) *Project description for the Directorate of Health's courses on medical coding. Assessment of needs and new measures.* Phase 1, p. 17. Directorate of Health, 2015.
102) The internal audits conducted by the regional health enterprises (2011) *National internal audit of medical coding practice. Main report.*
103) Settlement Committee (2014) The Settlement Committee's annual report 2014. *Work on Performance-based financing for 2013*, p. 21.

When asked what the Directorate of eHealth itself is doing to ensure consistent thresholds for the reporting of other conditions, the Directorate noted that rules regarding what must be registered as other conditions are determined by the WHO.[104] There is some scope for interpretation here, which is an area that the Directorate is responsible for clarifying. According to the Directorate of eHealth, the requirement is for there to be documentation in medical records in order to report other conditions for legal assessment internally within the Directorate of Health, which is responsible for administering the Medical Record Regulation.

7.5 E-learning courses and the 'code help'

In 2015, the Directorate of Health referred to "a lack of competence regarding the correct registration of coded information in specialist systems" as a key risk with respect to the "overarching objective that registered information must be of adequate quality".[105]

The Directorate of eHealth administers an e-learning course on coding, which was last updated in 2012. E-Health also administers a "self-test" on coding, which was last updated in 2013.[106] The document review shows that many health enterprises base the training of doctors on this e-learning course, often combined with an introduction to coding during the intern candidates' introductory week. According to eHealth, parts of the course are now outdated.

The Directorate of eHealth also provides guidance for the sector regarding medical coding by answering questions on the issue through the so-called 'code help'. The questionnaire shows that the code help is well-known amongst code controllers and doctor with assigned responsibility for coding, but less so amongst doctors who do not have code responsibility, and managers. In 2015, the Directorate of Health referred to "a lack of competence regarding the correct registration of coded information in specialist systems" as a key risk with respect to the "overarching objective that registered information must be of adequate quality".[107]

Table 8 Overview of enquiries to code help in 2014 and 2015, Directorate of eHealth		
	2014	**2015**
Number of actual enquiries[108]	683	738
Median response time (days)	5,0	5,3
Proportion with response time of 0-30 days	69 %	77 %
Proportion with response time of 31-90 days	16 %	12 %
Proportion with response time of 91-180 days	11 %	7 %
Proportion with response time of more than 180 days	3 %	4 %

Source: Directorate of eHealth

104) WHO (2015) *WHO ICD-10 International Statistical Classification of Diseases and Related Health Problems 10th revision, Volume 2 Instruction manual, fifth edition.*
105) *Programme for terminology and codes/information structure. Phase summary Phase 2: Planning.* Directorate of eHealth, 2016.
106) *Project description for the Directorate of Health's courses on medical coding.* Assessment of demand and new initiatives. Phase 1, p. 15-16. Directorate of Health, 2015
107) Programme for terminology and codes/information structure. Phase summary Phase 2: Planning. Directorate of eHealth
108) The term 'actual enquiries' is used here. This is because not all enquiries which are opened have to be answered or forwarded. Examples of such enquiries include spam, copies of messages from the finance department and DRG within the Directorate of Health, e-mails with thanks for a previous reply and cases which are re-opened by Outlook's automatic out of office reply assistant. These cases will simply be closed without any further processing. Differences in the number of opened and closed enquiries per calendar year are due to overlying enquiries from one year to the next.

Table 8 shows that the Directorate of eHealth (the Directorate of Health at the time) responded to enquiries that they received in 2014 somewhat quicker than they did in 2015, and that the number of enquiries rose. One in four enquiries had a response time of more than 30 days in 2015. One possible consequence of questions being answered late is that a particular code practice at a hospital which is not following the regulations will continue over an extended period of time without being corrected. This could lead to errors in the patient statistics. In April 2016, the Directorate of eHealth itself wrote that long response times for answers result in a low level of predictability for the sector.[109]

In interviews, code controllers stated that they have had to reach agreement with colleagues at their hospital if it has taken a long time to receive an answer from the Directorate. There have also been cases where the practice that they have agreed upon does not correspond with the answer that is eventually received from the Directorate.

The answers to questions submitted to the code help are not disseminated to other stakeholders in the sector, nor are they made available on the Directorate's website. It is also not possible to subscribe to a newsletter or automatically receive notification if new information is published on the Directorate's website. In the questionnaire, nine out of ten code controllers responded that they would like there to be a question-and-answer service on the Directorate of eHealth's website.

7.6 Programme for codes and terminology

The programme for codes and terminology is a collection of projects and initiatives which, among other things, are intended to ensure that codes and terminology are standardised. One expected benefit is better quality medical coding.[110] Some of the projects are at the planning stage, while others have been completed. The programme includes the following initiatives and projects:
- Merging of procedure codes
- Updating and further development of the e-learning course
- Improvements to FinnKode
- Development of a subscription scheme for new developments concerning coding from eHealth
- New specialist reference groups for codes, which are anchored in the sector to a greater extent than the reference groups are at present, because the regional health enterprises are themselves responsible for designating participants. These groups are responsible for providing specialist advice in connection with the annual code audit and for contributing to clarifications and advice concerning terminology and terms. According to the Directorate of eHealth, greater involvement by the specialist groups will ensure that the codes are both relevant and user-friendly[111]

Common to these initiatives is that they have not yet been fully implemented.

109) *Governing documentation (BP3 and BP4) for improvement of code administration,* p. 4. Directorate of eHealth, 2016.
110) Directorate of eHealth (2016): *Programme for codes and terminology.* https://ehelse.no/nasjonale-prosjekter/program-for-kodeverk-og-terminologi, lesedato: 10 October 2016.
111) *Consultation – Mandate specialist reference groups for national medical codes.* Directorate of eHealth, 2016.

8 How does the Directorate of Health promote good code quality?

The Directorate of Health administers the regulations for PBF and the Norwegian Patient Registry (NPR), which is the pivotal source of governance and key performance data concerning the specialist health service. The Directorate of Health is responsible for ensuring that medical information which is collected and processed in the Norwegian Patient Registry is correct, relevant and necessary for the purpose for which it is collected, which is to provide a basis for the administration, governance, management and quality assurance of the specialist health services. However, the data is also used for national and international statistics, research, quality indicators, etc.

8.1 Data control by the Directorate of Health

The health enterprises report performance data, including diagnosis and procedure codes, to the NPR every four months. The NPR checks the reported data by carrying out 153 checks, which identify hospital admissions for which there may be errors in the reports, e.g.:
- Admissions with more than 20 registered condition codes or procedure codes
- Admissions with invalid or expired diagnosis or procedure codes

The health enterprises receive the results of the checks by return and must then correct any errors before the final data is published. However, the checks do not ensure that performance data reported by the health enterprises gives a precise and accurate history of the patients that the hospital has treated. Some incorrect codes, e.g. in the choice of main condition or whether *other conditions* are adequately documented, are difficult to detect automatically and will require a review of the relevant medical records. Automatic checks would also not identify some of the 600 admissions which were reviewed during the code audit based on the query that identifies admissions with more than 20 diagnosis or procedure codes.[112] At the same time, the specialist auditors deleted 37 percent of *other conditions* which were reported for the pneumonia patients, as well as 58 percent for the hip replacement patients.

When the checks identify issues linked to medical coding, the case is normally sent to the Settlement Committee *(Avregningsutvalget)*. The Settlement Committee then carries out further analyses of the patient data to examine the specific cases concerned and contacts the health enterprises to obtain explanations as to why the figures are as they are. In all cases where it is concluded that incorrect coding has had a significant impact on the basis for PBF calculations, a correction will be made in the final PBF settlement. If any uncertainties or omissions are identified in the PBF regulations which are of material importance, the Directorate of Health will write to the regional health enterprises in order to limit the extent of incorrect coding during the current year. Such letters with clarifications concerning the regulations are also published on the Directorate of Health's website.[113]

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112) The respective maximum numbers of codes amongst the 600 admissions covered by the code audit were 16 for diagnosis codes, 18 for medical procedure codes and 16 for surgical procedure codes. Very few admissions had that many codes.

113) 113) The Directorate of Health sent out nine such letters with clarifications in 2016 and four in 2015. These letters are available here: https://helsedirektoratet. no/finansieringsordninger/innsatsstyrt-finansiering-isf-og-drg-systemet/innsatsstyrt-finansiering-isf#helsedirektoratets-uttalelser-om- regelverket-m.m.

All issues identified during checks which the Directorate of Health prioritises for follow-up, are followed up through analyses in subsequent years in order to assess whether measures such as settlement or changes to the regulations have had an effect.

In other words, the work of the Settlement Committee is a tool that the Directorate of Health can use to promote better coding, both through the Committee's contact with the health enterprises which receive enquiries concerning possible erroneous practising of the regulations, and through the Committee providing input concerning the codes.

In addition to the checks that are performed to ensure correct payments to the regional health enterprises, specific checks are, according to the Directorate of Health, also carried out when data from the NPR is used for analyses, to calculate quality indicators and to administer the PBF scheme.

The NPR also carries out what are known as 'document checks'. They then compare the submitted information with the sender's documentation, e.g. patient medical records and reports from nurses, in the same way as was done during this audit. Such checks were carried out on seven occasions during the period 2008–2015.

8.2 Use of statistics by clinics

By making performance data available online, the Directorate of Health enables the health enterprises to compare their own performance with that of other health enterprises. However, through the project entitled "Clinically relevant feedback", a need has been identified for a more detailed and precise level for the use of performance data in clinics right down to department level.[114] The aim of this project is to make it easier to use NPR data in order to monitor a unit's development over time, to compare in-house practice with that of others and to quality-assure and further develop services. By making data more readily available, the Directorate of Health expects to uncover variable practices and resource usage, and to promote better code quality by identifying errors.[115]

In the publication solution, users can obtain reports broken down according to four themes: patient, treatment, results and pathway. The solution is adapted to the various disciplines, offers options for diagnosis groups and procedures, and enables different regions and units to be compared.[116]

When the need for clinically relevant feedback was investigated, a wish was expressed for greater transparency concerning what is happening with the NPR's data, including an overview of the data that is missing after the completion of error checks.[117] The Directorate is planning to meet this wish by providing the health enterprises with more information concerning omissions and errors which are identified during the quality assurance process through to the production of the national figures.

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114) *Clinically relevant feedback from the Norwegian Patient Registry. Feasibility project.* Directorate of Health, 2014.
115) *Clinically relevant feedback from the Norwegian Patient Registry summarised June 2015.* Directorate of Health, 2015
116) *Clinically relevant feedback from the Norwegian Patient Registry summarised June 2015.* Directorate of Health, 2015.
117) *Clinically relevant feedback from the Norwegian Patient Registry.* Feasibility project, p. 7. Directorate of Health, 2014.

As part of the project, the Directorate of Health has developed 20 quality indicators for medical coding118[118]. Examples of these indicators are:

- Average number of ICD-10 codes reported per admission for a treatment centre
- Number of diagnoses and procedures which contain invalid codes
- Proportion of admissions with a non-specific code as the code for main condition

The Directorate of Health prepares statistics based on these indicators, but no statistics have so far been officially published or made available to the health enterprises.

The Directorate itself notes that the indicators for code quality do not reveal whether the correct condition has been selected as the main condition, or whether too few or too many conditions have been included as *other conditions.*[119] In order to determine this, a code audit must be carried out, as was the case in this audit.

8.3 Follow-up of the recommendation to separate discharge summaries from codes

Medical codes used by the specialist health service do not constitute relevant information for the further treatment of patients elsewhere within the health service or by general practitioners. Nevertheless, the Template for Discharge Summaries published in 2002 states that such summaries *must* include diagnosis and procedure codes.[120] At present, a doctor therefore has to add medical codes to the current discharge summary in order to complete the summary. It is an aim for discharge summaries to accompany the patient when leaving the hospital.[121] This means that the summary must be ready by the time the patient is discharged, or alternatively that it is dispatched within a week.

Whether or not the coding should be separated from the discharge summary has been a matter for discussion within various specialist arenas and forums both regionally and nationally.[122] The 2011 internal audit recommended that the national authorities consider removing codes from discharge summaries because this would alleviate the time pressure relating to the coding and thereby reduce the risk of errors.

The South-East Regional Health Enterprise believes that introducing clear separation between clinical diagnosis and coding for statistical purposes would be an important quality-enhancing measure.[123]
The regional health enterprise notes that there have numerous initiatives to separate codes from discharge summaries, including a proposal that they sent to the Directorate of Health concerning a new discharge summary template without medical codes in 2012. The South-East Regional Health Enterprise has never received any feedback on this proposal.

No national authorities have acted on the recommendation to split discharge summaries and coding. According to the Directorate of eHealth, the responsibility

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118) *Quality indicators for medical coding in NPR data.* Version 13. Memorandum sent by the Directorate of eHealth to the Directorate of Health on 11 July 2016. Directorate of eHealth, 2016.
119) *Clinically relevant feedback from the Norwegian Patient Registry.* Feasibility project, p. 17. Directorate of Health, 2014.
120) *Medical content of discharge summaries – "The good discharge summary".* Directorate of Health, 2002.
121) Helsenorge.no, https://helsenorge.no/Kvalitetsindikatorer/kvalitetsindikator-sykehusopphold/tilbakemelding-(epikrise)-sendt-innen- syv-dager
122) Letter to the Office of the Auditor General from the South-East Regional Health Enterprise, p. 3.
123) South-East Regional Health Enterprise (2011) Governance case no. 081/2011: *National internal audit of medical coding practice within the health enterprises – results and follow-up.*

should rest with the division for specialist health services within the Directorate of Health. The Directorate of eHealth has stated that the question of responsibility will be addressed during one of the collaboration meetings to be held. For its part, the Directorate of Health has noted that the Ministry of Health and Care Services has not tasked the Directorate with drawing up a new discharge summary guide, but they will resume the dialogue with the Ministry concerning such a guide.

9 Assessments

9.1 The quality of medical coding is poor

The health enterprises are responsible for submitting to the Norwegian Patient Registry (NPR), information which is accurate and relevant to the treatment that the patient received during the admission concerned. All conditions which are reported must have been of real significance to the medical assistance that was given during the admission and be documented in the medical record.
The investigation shows that, for the 600 admissions which were audited, there are substantial discrepancies between the medical codes for diagnoses which were reported to the NPR and the information in the patients' medical records. This reduces the quality of the patient statistics.

An important purpose of medical coding is to obtain an overview of diseases amongst the population and how incidences of diseases vary temporally and spatially. Furthermore, the codes provide a basis for the administration, funding, management and quality assurance of the specialist health services throughout the decision-making chain, from the Ministry of Health and Care Services right down to the individual departments at the hospitals.

The health enterprises must code and report the *main condition* and any other conditions to the NPR following a hospital admission. The building blocks of the codes are individual codes consisting of three characters each, which are used internationally to compare incidences of diseases, among other things. Most codes are also subdivided using a fourth character. In most cases, errors at first and second character level will result in changes in the DRG grouping which is used to fund the health enterprises (see section 9.2). Errors at third character level will often also lead to such changes. Such errors will also result in an "inaccurate picture" in national statistics as regards the condition that the medical assistance was primarily aimed at during the admission. Errors at fourth character level are less serious for the patient statistics and rarely impact on the DRG grouping.

The investigation shows that 16 percent of pneumonia patients were assigned a completely new main condition after the code audit. This means that the medical record documentation describes a completely different clinical condition than pneumonia as the main condition. Similarly, five percent of hip replacement patients were assigned a completely new main condition after the code audit.

Furthermore, 25 percent of pneumonia patients were assigned a different main condition at third character level. The medical record documentation shows that pneumonia is the main condition, but the code gives an inaccurate picture of the cause of the patient's pneumonia, e.g. bacteria or virus. The code audit did not reveal any errors at third character level amongst the hip replacement patients.

In addition, the investigation shows that for 14 percent of hip replacement patients, the main condition was coded incorrectly at fourth character level. This means that reporting is not being carried out in accordance with the applicable regulations and this is resulting in a less precise description of the main condition in the patient statistics than the medical record documentation provides a basis for.

The doctor who codes also carries out a discretionary assessment of whether there are *other conditions* other than the main condition, which have been treated or which were otherwise of significance to the admission. The discretionary assessment of conditions which are reported to the NPR must be documented in the medical record. Conditions relating to previous or chronic diseases which had no effect on the treatment provided must not be included in reports submitted to the NPR. All the health enterprises covered by the audit reported *other conditions* to the NPR for which there is no basis in the medical records.

This covers 58 percent of *other conditions* amongst the hip replacement patients and 37 percent amongst the pneumonia patients. Some of these conditions may have been of importance for the medical assistance that was given during the admission, but the doctor's assessment was not sufficiently well-documented in the medical records to provide a basis for reporting them. These admissions therefore appear to be more complicated in the national statistics than was documented in the medical records.

However, the situation is the reverse for some admissions, in that there is a basis in the medical record to report more *other conditions*. Consequently, these cases appear to be less complicated in the national statistics than has been documented in the medical records. Both under- and over-reporting of *other conditions* to the NPR have consequences for the patient statistics and therefore also for the governance and financing of the specialist health service. However, it is much less common to under-report in the sample than it is to over-report.

Code quality varies between the departments. For the admissions with pneumonia that were audited, three in ten departments reported an erroneous main condition for more than half of the admissions. However, the Department of Medicine at Stavanger University Hospital reported 80 percent of their admissions with the correct main condition. This shows that some departments have been more successful than others in establishing good code practice.

In the case of some departments, there is no basis in the medical records for 70 percent of *other conditions* which have been reported to the NPR, while in the case of other departments, there is no basis for less than 20 percent. The investigation shows that there is a tendency for the departments which report many *other conditions* to the NPR to be those which have a high proportion of *other conditions* for which there is no basis in the medical records for reporting. This means that the national statistics in the NPR give the impression that there are greater differences between the *other conditions* that the departments have reported than is apparent from the information in the medical records.

For many of the 600 admissions which were audited, there is no correspondence between the codes reported to the NPR by the health enterprises and the information in the patients' medical records. The auditors believe that the quality of the medical codes which the health enterprises are responsible for reporting to the NPR is inadequate. Previous investigations conducted by the Office of the Auditor General also indicated that the code quality of the health enterprises was inadequate.
The sample covered by the code audit is limited and, when viewed in isolation, does not provide a basis for drawing general conclusions concerning code quality amongst the health enterprises. However, the investigation was based on patient groups which are examined and treated at most hospitals. Given that the investigation also shows that internal control is weak (see section 9.3), there is reason to believe that code quality is poor at other hospitals and amongst other patient groups.

9.2 Poor code quality has adverse consequences for the governance and financing of the specialist health service

Stakeholders at national, regional and local level make extensive use of data from the medical codes, regardless of whether the information is obtained directly from the codes or indirectly through information from the DRG system. It is therefore important that assessments and decisions which are made on the basis of established codes are based on correct premises.

The Ministry of Health and Care Services uses DRG scores as an indicator of performance and to finance the health enterprises through the performance-based financing (PBF) scheme. The PBF grant amounts to around NOK 30 billion, and the key aims of the scheme are to support the executive responsibility of the regional health enterprises and to promote cost-effective patient treatment. The payments made through the PBF system must reflect actual treatment provision, and this presupposes good quality medical coding.

Approximately one in four admissions which were audited were assigned a new DRG when the admissions were re-grouped in the DRG system after the code audit. This is of importance for the PBF reimbursement. The DRG scores awarded to most audited departments were reduced overall following the code audit. This is because the majority of the admissions were re-grouped from a complicated DRG to an uncomplicated DRG. An admission in a complicated DRG triggers a higher reimbursement from the state than one in an uncomplicated DRG. A few departments ended up with higher DRG scores overall. This is just as serious as regards the basis for payments from the PBF scheme as a reduction. Both indicate that the main code does not correspond with the medical record documentation, which in many cases also means that the reimbursement does not correspond with the medical assistance that was provided during the admission.

The investigation shows that the health enterprises use DRG scores as an indicator of the performance of the clinical units. Most health enterprises also forward the PBF reimbursement to the clinical units. As a result, most clinics and many departments are partly financed according to the DRG scores they generate, even though the Directorate of Health does not believe that the DRG system is sufficiently robust to be used for this purpose. The investigation shows that variable and poor code quality could impact on the basis for accurate and fair distribution at local level. However, the investigation does not provide a basis for assessing whether the total payment made through the PBF scheme is correct.

Poor code quality will result in management information which makes it difficult to assess what proportion of a change in performance is real, and what proportion is due to changes in coding practice. Better code quality will therefore provide management at all levels within the health enterprises with a better basis for assessing performance levels as regards the provision of patient treatment within the enterprise's clinical units. Many decisions which impact on the running of the health enterprises are made on the basis of information from the DRG system. If the health enterprises establish systems which ensure good code quality and thereby provide a better decision-making basis, they can improve their cost control and resource utilisation.

Good and consistent data concerning activities and waiting times is essential if the regional health enterprises are to be able to assess the extent to which they are fulfilling their executive responsibility. The regional health enterprises use statistics

based on coding to analyse consumption patterns, availability, variations in service and practice and quality within their own health region. The regional health enterprises also use data to plan and monitor the allocation of functions between the health enterprises, to prepare projects/strategies and regional plans, and to calculate the need for medical personnel. The investigation revealed that coding practices vary, indicating a need for the regional health enterprises to act as a stronger driving force in ensuring consistent and good medical coding for the health enterprises in their region.

This would give provide regional health enterprises with a better basis for calculating demand and for planning services and the distribution of functions within their region.

The Ministry of Health and Care Services uses information from medical codes to plan the specialist health service and to assess whether the health service is achieving its objectives. This is partly done through 73 national quality indicators which are based on information derived from the medical codes. These will be used as a tool for management and quality improvement purposes within the specialist health service. Other pivotal knowledge providers for the health sector, such as the National Institute of Public Health, Statistics Norway and research communities, also use data from the NPR based on medical codes.

Poor code quality can reduce the level of confidence in patient statistics as a basis for the planning, management, follow-up and evaluation of health services locally, regionally and nationally. The scope to use patient statistics for medical research is also limited. The investigation shows that it is therefore important that all stakeholders with responsibility for medical coding contribute to ensuring that the statistics are of good quality.

9.3 The health enterprises are not adequately monitoring code quality to ensure good patient statistics

The board and management have a responsibility to establish systems which promote good code quality. Although the health enterprises have implemented numerous initiatives to improve code quality in recent years, management of the work relating to codes is still inadequate in many enterprises.

The investigation has identified the following three factors as having a major impact on code quality:
- Whether or not the doctor is familiar with medical coding
- Whether or not the health enterprises have established good quality assurance procedures for the codes that their doctors assign
- Whether the department and the health enterprise have clear leadership which promotes good attitudes regarding coding amongst the employees and facilitates good coding in practice

9.3.1 Inadequate knowledge of coding is an important factor behind poor code quality

The health enterprises' management teams have a responsibility to ensure that their staff possess sufficient knowledge and skills to perform the task of medical coding. The investigation shows that many doctors, including both recently qualified and more experienced doctors, are not sufficiently familiar with the basic principles of medical coding. In addition, many doctors do not have an adequate knowledge of the requirements that apply regarding documentation in medical records in order to report a condition to the NPR.

A combination of different tools means that some health enterprises and departments appear to have been more successful than others in training their doctors concerning coding and in maintaining the level of knowledge. It is particularly important that doctors receive training, individual follow-up *and* explanatory feedback on their own coding and that they see coding as being relevant to them. However, this is not common at most hospitals. In the questionnaire, just 22 percent of the doctors claimed to have acquired their knowledge of coding through training, individual guidance and feedback on their own coding.

Most health enterprises stated that they either offer or require doctors to complete training in coding. Nevertheless, the *questionnaire* shows that one in three doctors have not completed such a course.

Most of these doctors have also not been offered such a course. Overall, the investigation shows that the health enterprises are not offering an adequate range of courses in medical coding. One reason for this is that the training in many health enterprises is often aimed at interns and recently appointed doctors.

In addition, many doctors do not receive sufficient refresher training concerning coding once they have completed the course at the start of their career. The questionnaire shows that half of the doctors receive either no individual feedback concerning their coding, or explanatory feedback which provides little basis for learning. Most doctors also state that coding is rarely an item on the agenda at meetings. Training in the form of courses which are not followed up afterwards means that doctors can forget what they have learned about coding, or that their knowledge can become outdated.

The investigation also shows that many doctors make no distinction between making a diagnosis and assigning a code. The code texts from the codes have been prepared to describe the content of the statistical category concerned, rather than to describe the medical problems of the patient. Doctors who have not understood that the purpose of the code text is not to give a precise description of a condition will be more likely to find the codes less meaningful, and coding to be less relevant. It is therefore important that the health enterprises make it clear that doctors must make a distinction between describing a condition in their own precise words and translating the diagnosis into a code and associated code text.

Overall, the investigation shows that the courses and ongoing training are inadequate and insufficiently focused on the code knowledge that doctors need. A key initiative to improve code quality within the health enterprises is to increase the level of knowledge concerning coding amongst the stakeholders involved. The investigation indicates that the doctors, code controllers and managers all agree that this is the most important initiative. The investigation shows in addition that experienced doctors must also receive good and updated training or information concerning coding, so that they can both code correctly and guide less experienced colleagues in correct coding.

9.3.2 Quality assurance is not adequately focused on ensuring good patient statistics

The quality assurance of codes involves someone checking that there is a basis in the medical records for the codes which the doctor has entered in the discharge summary, and that all relevant conditions have been reported. The results of the code audit indicate that many errors are not identified or altered through the quality assurance process, indicating that the quality assurance is not focused on ensuring that it fulfils its intended purpose.

All the health enterprises have code controllers amongst their staff who carry out computer-aided checks on medical coding. The purpose of these checks is to quality-assure reports submitted to the NPR. Computer-aided or automated checks are used to identify admissions where there may be a risk that the coding is not in accordance with the applicable regulations. Checks are, for example, made for missing or incomplete coding and illogical relationships. The checks also identify admissions where there is a risk that the health enterprise may not receive the funding it is due. However, the focus of the computer-aided checks is such that they do not identify many of the errors that were found during the code audit. To identify many of these errors, the code controllers must investigate whether there is correspondence between the codes which have been assigned and the documentation in the medical record. To identify such errors, the health enterprises are dependent on the competence of those who quality-assure the coding in the departments.

During the code audit, many codes for *other conditions* were found for which there was no basis in the medical record. This may be because the quality assurance in many departments is aimed more at securing fair funding for the health enterprises rather than ensuring accurate patient statistics. Other possible reasons include the fact that not all admissions undergo quality assurance, and the uncertainty that seems to prevail concerning the requirements that apply regarding documentation in the medical record in order to assign a code.

The code controls carried out within the departments are performed by code controllers, sometimes in collaboration with doctor with assigned responsibility for coding. Both doctors and code controllers believe it is important that a doctor with code responsibility is involved in providing feedback concerning coding to doctors. This is because doctor with assigned responsibility for coding have a professional gravitas through their knowledge of the clinical aspects that financial controllers do not. The Department of Surgery and the Department of Medicine at Stavanger University Hospital are examples of departments where both doctor with assigned responsibility for coding and code controllers contribute to the transfer of knowledge to other doctors, and these departments achieved good results in the code audit.

Patient statistics based on codes are extensively used for the governance and funding of the specialist health service. Overall, the quality assurance of coding amongst the health enterprises is not adequately focused on ensuring good code quality. This view is further reinforced by the fact that the Directorate of Health's computer-aided coding checks are also unable to identify many of the types of errors that were found during the code audit.

9.3.3 The health enterprises' control and follow-up of code quality is inadequate

All the health enterprises aim to code correctly, but the investigation indicated that they have not developed specific and realistic targets concerning code quality to give managers something to strive for, e.g. the objective of a positive trend in the percentage of correct codes. Managers who are responsible for code quality within their unit therefore have no specific quality requirements to aim for when they organise the work relating to coding. This can make it difficult for managers to prioritise the work on code quality. The general impression gained from the audit is that the health enterprises have also not systematically assessed where in the coding process the greatest risk of errors lies. Moreover, this makes it difficult to implement targeted initiatives aimed at ensuring good code quality.

The management has overall responsibility for monitoring to determine whether code quality is adequate. With few exceptions, the health enterprises do not monitor trends in code quality over time. However, there are examples of managers receiving monthly feedback on the scope of and reasons for changes made as a result of the quality assurance. In this way, the clinical units are able to target checks on medical coding more precisely at the errors that are identified.

Most health enterprises have developed common overarching procedures for coding. This can help to ensure consistent and appropriate practice between the departments within each individual health enterprise. However, many of these procedures vary in terms of their quality and content.
Few procedures impose requirements regarding how departments and clinics must fulfil their responsibilities concerning coding, something which gives considerable freedom at lower levels regarding the governance of the code work. There are also few written procedures in place at department level. The scope of the department management to manage and organise the code work themselves can lead to a risk that code quality is largely dependent on the department management's competence, interest, motivation and attitudes as regards coding.

Governance and leadership without written procedures results in a risk of varying code practices and vulnerability in the event of changes in management and the resource situation. Written medical coding routines can help to ensure that stakeholders understand their responsibilities and roles linked to coding more clearly.

Clear management can compensate for weak written routines and governance systems. The investigation shows that clear management which is concerned about ensuring correct coding is at least as important as written routines and management systems. It is important for code quality that the management possesses sufficient competence, interest and motivation as regards medical coding. Management which gives clear signals that correct coding is important, particularly as regards purposes other than simply securing funding for the enterprise, can make a strong contribution to good code quality. It is also important that the management enables doctors to acquire a sound knowledge of coding and establishes good quality assurance procedures. In turn, this leads to attitudes amongst the staff which can promote good code quality.

The Department of Surgery and the Department of Medicine at Stavanger University Hospital are examples of engaged and clear management of the code work. Within these departments, the management has set aside resources for training and quality assurance of coding, and key stakeholders work to promote a positive attitude towards coding.

The investigation shows that managers use patient statistics based on medical codes to plan and manage clinical activity. Managers therefore primarily make extensive use of medical coding data for purposes other than to secure funding for their departments. Few managers present these statistics to the doctors. This may be one reason why many doctors believe that the management is more concerned about securing the hospital's funding than it is about the importance of the codes as regards patient statistics, governance and research. The investigation therefore shows the potential that exists for doctors to gain greater ownership of the medical coding if they are given a greater insight into the many uses of the codes in addition to funding of the health enterprises.

Overall, the investigation indicates that the governance and follow-up of code quality by the health enterprises is inadequate. To ensure good internal control and risk management, it is important to identify weaknesses in the control environment and implement relevant initiatives.

9.4 The Directorate of eHealth's guidance and tools do not adequately support the code work of the health enterprises

The Directorate of eHealth is responsible for administering the medical codes. This encompasses the auditing of codes and ensuring that the sector receives guidance concerning how the medical coding regulations should be practised.

The Directorate has a number of instruments and tools at its disposal to guide the sector in practising the code rules, including the search tool FinnKode, an e-learning course in coding and the code help question-and-answer service. FinnKode is the most frequently used of the tools amongst both doctors and code controllers. A large majority of them believe that FinnKode makes it both quick and easy to find the right code. The code guide is frequently used by code controllers, but rarely by doctors when they are unsure as to how they should code. The level of awareness amongst doctors concerning the code guide is also variable.

The investigation revealed weaknesses associated with both FinnKode and the elearning course in coding. FinnKode does not meet current functional and technical needs, partly because the search tool does not have an adequate synonym function and partly because it is not suitable for use on small screens or available via an app. The elearning course has not been adapted since 2012 and is out-of-date to some extent. As the sector is in need of both a search tool and learning material, the auditors believe it is important that the Directorate of eHealth develops and maintains appropriate tools. This could help to raise the level of knowledge and motivation amongst doctors relating to coding.

The Directorate of eHealth is responsible for informing the sector about regulatory changes in good time. In 2015, the information concerning the major changes to the regulations for 2016 was received too late to enable some changes to be incorporated into the health enterprises' IT systems. The Directorate must ensure that the information is released in time, and that it is linked to a documented, clear and transparent process with fixed dates for the release of information. This will create predictability for the health enterprises when they plan how the changes should be implemented within the organisation.

The investigation shows that there are differing perceptions and practice within the departments concerning when *other conditions* should be reported to the NPR and when they should not. This indicates that the Directorate of eHealth should clarify where the thresholds for the coding of *other conditions* lie. It is also important that the Directorate of eHealth involves the specialist groups in the work to clarify when it is appropriate to report *other conditions* to the NPR, to a greater extent than at present. Better anchoring amongst the specialist groups can promote more consistent reporting of *other conditions*, and thereby improve the quality of the patient statistics.

Attitudes within the sector also vary as regards when a reported condition is considered to be adequately documented. The Directorate of eHealth should clarify

what the documentation requirement means, and the sector should be given adequate information concerning this requirement.

The Directorate is currently working on a number of projects and initiatives under the umbrella "Programme for coding and terminology", with one expected outcome of the programme being better code quality. Many of the initiatives are aimed at overcoming the challenges that the audit has identified, e.g. that there is a need to update and improve both the e-learning course and FinnKode, and to involve and anchor clinical specialist groups more in the administration of the codes. It will be important to implement these initiatives in order to enable the sector to improve code quality.

10 List of references

Interviews

Interviews were conducted with representatives of the following stakeholders:
- Directorate of eHealth
- Innlandet Health Enterprise, Gjøvik
- Nord-Trøndelag Health Enterprise, Levanger
- Stavanger Health Enterprise, Stavanger

Letters, assignment documents and memoranda
- Ministry of Health and Care Services (2015) A*ssignment Document 2015 Northern Norway Regional Health Enterprise, Assignment Document 2015 Central Norway Regional Health Enterprise, Assignment Document 2015 South East Regional Health Authority, Assignment Document 2015 Western Norway Regional Health Authority*
- Ministry of Health and Care Services (2016) *Assignment Document 2016 Northern Norway Regional Health Enterprise*
- South East Regional Health Enterprise (2011) *Governance case no. 081 - 2011; National internal audit of medical coding practice within the health enterprises - results and follow-up*
- Ministry of Health and Care Services (2015) *Letter of commitment from the Ministry of Health and Care Services for 2015*

Websites
- Directorate of eHealth (2016): Programme for codes and terminology <https://ehelse. no/nasjonale-prosjekter/program-for-kodeverk-og-terminologi> [obtained 15 March 2016]
- Directorate of Health (undated): Performance-based financing <https:// helsedirektoratet. no/finansieringsordninger/innsatsstyrt-finansiering-isf-og-drg-systemet/innsatsstyrt- finansiering-isf#helsedirektoratets-uttalelser-om-regelverket-m.m.> [obtained 10 February 2016]
- Helsenorge.no (2017): Distribution of discharge summaries within the somatic health service. <https:// helsenorge.no/Kvalitetsindikatorer/kvalitetsindikator-sykehusopphold/tilbakemelding- (epikrise)-sendt-innen-syv-dager> [obtained 23 January 2017]

Guidelines and guides
- *Regulations and guidance concerning the use of clinical codes within the specialist health service 2015, Directorate of Health 2015*
- *NCMP (Norwegian Classification of Medical Procedures) and NCSP (Norwegian Classification of Surgical Procedures) 2015 (FinnKode NCMP/NCSP version 1 2015), Directorate of Health 2015*
- *ICD-10 International Statistical Classification of Diseases and Related Health Problems, 10th revision, version 2015, WHO 2015*
- *ICD-10 International Statistical Classification of Diseases and Related Health Problems, 10th revision, Volume 2 Instruction manual, 5th edition, WHO 201*
- *Nomesco Classification of Surgical Procedures: Norwegian interpretation of the Nordic procedure codes, Directorate of Health 2015*
- *NCMP (Norwegian Classification of Medical Procedures) and NCSP (Norwegian Classification of Surgical Procedures), Directorate of Health 2015*
- *Report A679 Handbook for medical record reviews, NPR/Sintef 2006*

Reports

- Document 3:2 (2004-2005) *The Office of the Auditor General's audit of the Minister's (the Ministry's) management of the state's interests in companies, banks, etc. for 2003*
- Document 3:7 (2005-2006) *The Office of the Auditor General's investigation of code quality within the health enterprises*
- Document 3:2 (2009-2010) *The Office of the Auditor General's audit of the management of state companies for 2008*
- *National internal audit of medical coding practice. Main report,* The internal audits of the regional health enterprises 2011
- *Compared performance analyses. Stavanger Health Enterprise, Sørlandet Health Enterprise, Vestfold Health Enterprise,* Analysesenteret 2015
- *Medical coding in the specialist health service. Code audit 10 enterprises. Report to the Office of the Auditor General,* Analysesenteret 2016
- *Functional and technical requirements for IT support in medical coding - report from the national coding module feasibility project,* Directorate of Health 2012
- *Medical coding. Measures to ensure that medical coding is performed by suitably qualified coders,* South East Health Enterprise 2013
- *"Better quality medical coding within the specialist health service". Report from a collaborative project between the regional health enterprises and the Directorate of Health. Report no. IS-1598,* Directorate of Health 2008
- *The Settlement Committee's annual report 2014. Work on Performance-based financing for 2013,* Settlement Committee 2014

Regulations (laws and regulations)

- *Act on health enterprises of 15 June 2001* (the Health Enterprises Act)
- *Act on the specialist health service of 2 July 1999 (the Specialist Health Service Act)*
- *Act on health personnel etc. of 7 February 1999 (the Health Personnel Act)*
- *Regulation on internal control within the health and care service of 20 December 2002* (Internal Control Regulation within the Health Service)
- *Regulation on patient medical records of 21 December 2000 (Regulation on patient medical records)*
- *Regulation on the collection and treatment of medical information in the Norwegian Patient Registry of 7 December 2007* (the Norwegian Patient Registry Regulation)
- *Regulations IS-233. Performance-based financing 2015.* Directorate of Health 2015
- *Regulations and guidance for the use of clinical codes within the specialist health service 2016.* Directorate of eHealth (2016)

Storting documents

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- Proposition 1S (2015-2016) (2014-2015) *Ministry of Health and Care Services*
- Storting proposition no. 1 (2003–2004)
- Odelsting proposition no. 66 (2000–2001) On the Act on health enterprises

Storting reports
- Report to the Storting no. 11 (2015-2016) National health and hospital plan 2016-2019
- Report to the Storting no. 12 (2015-2016) Quality and patient safety 2014

Recommendations
- Recommendation to the Odelsting no. 118 (2000–2001) *Recommendation to the Storting from the Social Committee on the Act on health enterprises, etc.*
- Recommendation to the Storting no. 198 (2005 - 06) *Recommendation to the Storting from the Control and Constitution Committee*
- Recommendation to the Odelsting no. 65 (1998–99), see Odelsting proposition no. 10 (1998–99) *on the Act on the specialist health service*
- Recommendation to the Storting no. 198 (2005-06) *Recommendation to the Storting from the Control and Constitution Committee concerning the Office of the Auditor General's investigation of code quality within the health enterprises*

Other references
- Collaboration agreement between the Directorate of Health and the Directorate of eHealth. Directorate of Health and Directorate of eHealth, 2016
- Risk analysis in relation to existing administration of medical codes. Directorate of eHealth, 2016
- Project description for the Directorate of Health's training course on medical coding. Assessment of demand and new initiatives. Phase 1. Directorate of Health, 2015
- Programme for codes and terminology/information structure. Phase 1. Directorate of Health, 2015
- Programme for terminology and codes/information structure. Phase summary Phase 2: Planning. Directorate of eHealth, 2016
- Governing documentation (BP3 and BP4) for improvement of code administration. Directorate of eHealth, 2016
- Consultation – Mandate specialist reference groups for national medical codes. Directorate of eHealth, 2016
- Clinically relevant feedback from the Norwegian Patient Registry. Feasibility project. Directorate of Health, 2014
- Clinically relevant feedback from the Norwegian Patient Registry summarised June 2015. Directorate of Health, 2015
- Medical content of discharge summaries – "The good discharge summary". Directorate of Health, 2002

11 Appendices

Appendix 1

All health enterprises selected for the code audit received the following description of how medical record documentation should be submitted:

Description of submission of medical record documentation to the code audit

To enable the specialist auditors to conduct a code audit, all relevant medical record documentation for a particular admission must be available. In addition, medical record documentation submitted for an admission must be anonymised to ensure personal privacy and objective assessment. More detailed guidance is presented below concerning anonymisation, the medical record information that must be provided, and the sequence and format of the submission.

The starting point for the submission is the list provided by the Office of the Auditor General of department admissions extracted for auditing. For each department admission, the following applies as regards the provision of medical record information:

Anonymisation

All medical record information (all sheets) which are submitted must be anonymised. Patient numbers must be replaced with the reference number assigned by the Office of the Auditor General to the admission concerned.

Anonymisation means that the following must be deleted/censored from ALL sheets and texts:
• Name, date of birth, national ID number and home address of the patient
• Name, address and telephone number of the enterprise/hospital
• Name of the treating practitioner/medical personnel (these need not be removed/censored where only initials are used)
• Name, address and telephone number of referring body/doctor and other collaborating personnel within the primary health service or the patient's home municipality

Medical record documentation which must be submitted

The following medical record documentation must be provided for each department admission:
1. Discharge summary
2. Continuous doctor's medical record from admission to discharge (i.e. medical record upon arrival*, ongoing medical record notes, including intensive care notes, supervisory notes, notes from internal polyclinic during the department admission, discharge memo/transfer memo, etc.)
3. Ongoing nurses' records from admission to discharge (i.e. admission note*, daily notes, treatment plan, concluding summary from the nurse, e.g. discharge memo, nurse's discharge summary, transfer note, treatment form, etc.)
4. Graphs and other data record sheets
5. Ongoing records from other medical professionals involved (e.g. physiotherapists, occupational therapists, nutritional physiologists, social workers, etc.) from admission to discharge and any internal discharge summaries and other summaries, treatment plans from these professional groups
6. Test results: Clinical-chemical**
7. Test results: Microbiology**

8. Test results: Cytology **
9. Test results: Histology**
10. Description of all radiological investigations (including any scintigraphy and bone density measurement/osteometry) and interventions carried out during the admission
11. Description(s) of all diagnostic and treatment procedures, e.g. "oscopies", interventions, all types of organ function investigations (such as ultrasound, ECG, spirometry etc.) carried out during the admission
12. Preoperative assessments*
13. Description(s) of surgical procedure(s) carried out during the admission
14. Surgical procedure memo/form from operating room nurse
15. Anaesthetic forms
16. Intensive care form (for both short-duration postoperative admissions and for extended intensive care admissions)

* If any interviews/clinical examinations, preoperative assessments and other pre-surgical procedure measures are carried out in connection with polyclinic consultations prior to admission for elective surgery, all notes and forms from these consultations must also be provided.
** All results concerning *samples taken during the admission*, even if the results were not available until after discharge.
Points 12-15 will only be relevant when a surgical procedure was performed during the admission.
Point 16 will only be relevant when intensive care was provided during the admission. In addition, for admissions to intensive care wards, this also includes admission to specialist monitoring departments, e.g. postoperative, heart monitoring, etc.

Appendix 2

Hip replacement patients. Proportion in complicated DRG in the DRG pair 209D/209E, broken down between regional health enterprise and hospital. First and second four-month periods 2015.[124]
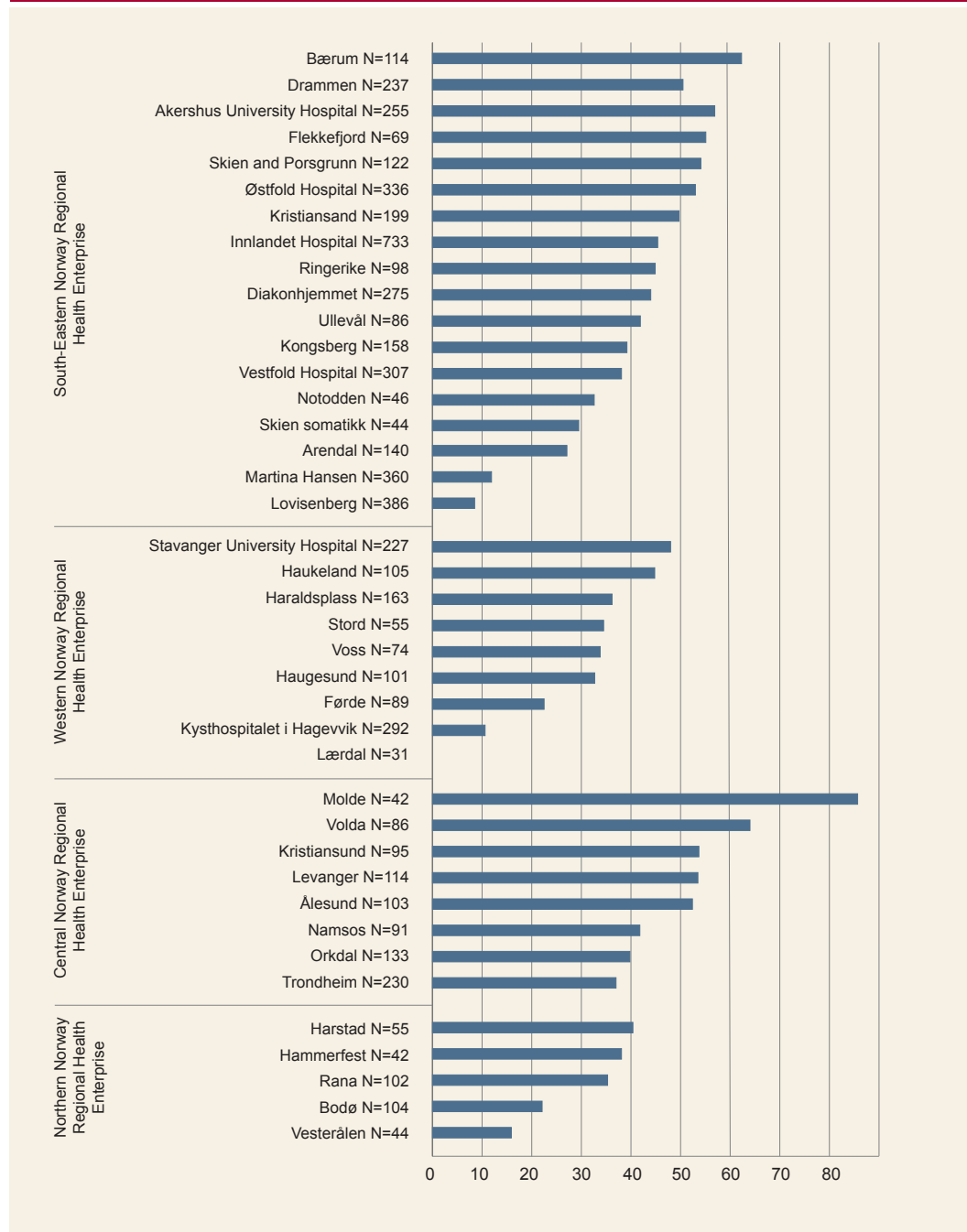
124) Hospitals with fewer than 30 admissions in DRG 89/90 during the first and second four-month periods of 2015 have been omitted from the figure. Some health enterprises do not report per treatment centre/hospital.

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