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Using ICD-10 for Case Groups

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Abstract. The definition of German case groups now uses an adaptation of the ICD-10: ICD-10-SGBV. For the transformation of the existing ICD-9-based definition into the ICD-10-SGBV an ICD-9/ICD-10 conversion table was used. The derived raw definitions were manually refined in detail. Due to the transformation of the classification system, the number of definitions increased immensely, as the ICD-10 SGBV is by far more detailed than the formerly used ICD-9. In our opinion, ICD-10 SGBV is not ideal for the definition of case groups, because this classification system is designed to support statistics on morbidity and mortality, but definitions of case groups are oriented to cost factors. Therefore the definition of case groups should be based on a specially designed classification system or one should reassess the necessity of a parallel definition by codes of classifications as well as by text. In both alternatives the introduction of a detailed and systematic medical documentation with expressive terminology systems will offer the advantage of classifying patients into medical oriented classifications as well as case groups.

1 Introduction

The German DRG-like groups, called "Fallpauschalen" and "Sonderentgelte", are defined in two ways. The first way is a textual description of procedures and diagnoses to define a "Fallpauschale" and a textual description of procedures to define a "Sonderentgelt". The second way is a definition given by the legislative obliged classifications for diagnoses and procedures. Up to two codes for diagnoses and three codes for procedures are combined for one definition. The second way is available for both types of case groups. The classification of diagnoses is noted for all "Fallpauschalen" but only for a small number of "Sonderentgelte". There are groups, which cannot solely be defined by classifications. In that case further criteria are listed in the textual section, for example age or medication. If there is any doubt, the textual definition is more important than the other.

Until 31/12/1999 the "Operationenschlüssel nach § 301 SGB V (OPS-301)", a German adaptation of the ICPM, was used as procedure classification and the ICD-9 as diagnosis classification. Starting with the 01/01/2000 the German Federal Ministry of Health introduced a special version of the ICD-10 called ICD-10-SGBV for the inpatient as well as the outpatient sector [1]. The changes of the ICD-10-SGBV are as follows (cf. [2] for details).

- Most of the classes from the chapters XX "External causes of morbidity and mortality" and XXI "Factors influencing health status and contact with health services" were dropped, because they were not seen as useful for purposes of reimbursement and cost control.
- Some special classes like septicemic plague (A20.7) were transmitted into an addendum, which isn't mandatory for classification, because the diseases are very rare in Germany.

- A special set of codes has been defined as minimum standard for the use of practitioners.
- In addition to the dagger-asterisk-system an exclamation mark is used for classes, which are only permitted in combination with other normal classes, for example "care involving dialysis" (Z49.-!).
- Two new qualifiers of diagnoses were introduced, one for the identification of the side location (right, left, on both sides) and the other for the quality of a diagnosis (suspicion, exclusion, condition after). These characteristics could be added to an ICD-10-SGBV-class if appropriate.

The definitions of "Fallpauschalen" and "Sonderentgelte" had to be transformed from the ICD-9 to the ICD-10-SGBV. We will report on the transformation process, the results and the problems occurred. In the end some conclusions will be drawn concerning the appropriateness of medical classifications for the definition of groups for reimbursement.

2 Methods

In the transformation process a conversion table between ICD-9 and ICD-10 was used. This conversion table is provided by the "Deutsches Institut für Medizinische Dokumentation und Information" (DIMDI) [3]. The conversion table consists of four columns: ICD-10-code, ICD-9-code, first three digits of the ICD-9-code, and a sign for suggestions for an automatic mapping from ICD-10 to ICD-9. The first two columns were used for the creation of a first version of "Fallpauschalen" and "Sonderentgelte" with ICD-10. From this raw version codes were deleted which are not part of the ICD-10-SGBV or senseless in a specific case group. Finally, the special features of the ICD-10-SGBV as exclusion of a class or cross-references were taken into account. A working group with representatives of the health insurance companies, the "Deutsche Krankenhausgesellschaft", union of the hospitals funding organizations, the Association of the Scientific Medical Societies in Germany, the German Medical Association and the DIMDI, was established. The work of this group was bound to two conditions: The case mix should remain unchanged and the definitions should not be further complicated. The working group prepared a draft version using ICD-10-SGBV-codes, which was officially adopted on the 16/12/1999 and will be used in parallel to the definitions with ICD-9-codes in the first half of 2000. An example taken from the published table is shown in table 1.

Table 1: Example from the new catalogue of the German case groups with the ICD-10-SGBV.

ID	definition of "Fallpauschale"		ICD-10-SGBV	ICD-9	OPS-301
14.03	varicocele	excision of varicocele, open-surgical	I86.1	456.4	5-630.0 to .4

As mentioned in the beginning, case groups may be defined by single codes or by combinations of two different codes for diagnoses. The analysis presented in this paper concentrates on complete definitions instead of codes. The number of single codes is much smaller than the number of definitions because in some case groups sets of codes are combined by their cross product to build up definitions. Furthermore a definition only makes sense in its case group, because the same definition might be acceptable in one and senseless in another case group.

The German terms of the ICD-10-SGBV were translated back into English using the UMLS Knowledge Source Server.

3 Results

Table 2 shows the number of definitions during different stages of the transformation process. The total number of definitions increased by factor 2.6. This is about 100 % more than the increase in codes from ICD-9 (5839 codes) to ICD-10-SGBV (8834 codes), which is around factor 1.5. About 11 % new definitions were used. Nearly one third of the codes gained from the conversion table were rejected. The rejected codes derived from 931 definitions with ICD-9. More than 50 % of the definitions with the ICD-9 concerning heart surgery and orthopedic/traumatic surgery lead to definitions with the ICD-10-SGBV in the raw version which had to be rejected later on. An analysis of the "Fallpauschalen" reveals, that the number of codes increased excessively concerning heart surgery (2415 definitions instead of 572), kidney transplantation (3 definitions instead of 1) and orthopedic/trauma surgery (471 definitions instead of 168). Thus, the number of definitions increased especially in complex case groups. Many ICD-10-SGBV-based definitions were rejected because of an inappropriate code within a combination. Only two ICD-9-codes explain more than 50 % of the rejected definitions:

- Codes of the V-classes of the ICD-9 like "other postsurgical states" (V45.8) are refined through their localization in the ICD-10. These codes indicate a case group concerning follow-up-treatment.
- The former code for "multiple delivery" (651.9) has been exchanged by several ICD-10 codes to indicate the procedure.

Table 2: Number of definitions including the case group ID, four digits ICD-10 only.

		number of definitions		
		"Fallpauschalen"	"Sonderentgelte"	total
ICD-9		2682	58	2740
translation with conversion table		8994	199	9193
	rejected	2797	75	2872
	accepted	6197	124	6321
new		750	11	761
ICD-10-SGBV		6947	135	7082

The fifth digit of the ICD-10 was only used for the differentiation between open and closed fractures, which is necessary for some case groups in trauma surgery. The fourth digit of the ICD-9 could cover this differentiation. The codes for "not otherwise specified" were further included in order to be compatible to the previous definitions. The new qualifiers of the ICD-10-SGBV were not used for the definition, neither the side location nor the diagnosis quality. Other new features of the ICD-10 were controversially discussed for their use concerning the definition of case groups.

One problem was the feature "side location". The ICD-10 provides in some cases a differentiation between both sides and one side only, for example concerning herniae viscerales. But it is not self-explanatory whether the side left and right could be used in case of unpaired organs as well as in case of paired organs, which could have a connection (left and right lobe of the thyroids) or could be located in the middle of the body (kidney). Consequently, a side location "middle" would be needed.

The ICD-10-SGBV provides no definition of what is called "condition after". Does it mean an improvement of symptoms, a total recovery or a condition after an operation?

Thus it was not possible to use it for the condition after a specific operation, which is needed in the definition of some case groups for follow-up-treatment.

There are a couple of ICD-10-classes combining more than one manifestation of a disease, for example multiple valve disease (I08.-), bilateral inguinal hernia with gangrene (K40.1) and multiple delivery (O84.-). With the exception of hernias the codes for multiple manifestations provide less information than the codes for a single manifestation. For this reason the combination of multiple delivery with single delivery by cesarean section is explicitly allowed in the ICD-10 but concerning valve disease there is no comment. To prevent loss of information the codes for multiple manifestations should not be used solely.

The asterisk-codes provide in most cases more relevant information for surgery than the etiologic-oriented dagger-codes. Furthermore other countries using DRG-systems make no difference between asterisk- and dagger-codes and use both types of codes to determine the appropriate case groups for reimbursement. Therefore the asterisk-codes were added to enable a clinical-oriented documentation.

4 Discussion

The number of definitions of codes for diagnoses increased enormously through the transformation into the ICD-10-SGBV. The multiplication by procedures will further increase the total number of accepted definitions for case groups. Using the "International Classification of Procedures - German Edition", a refinement of the OPS-301, there are about 580.000 accepted definitions for "Fallpauschalen" and 28.000 accepted definitions for "Sonderentgelte" to reflect only 93 "Fallpauschalen" and 145 "Sonderentgelte". This disproportion as well as the experiences gained from the transformation process demonstrate that the current definition of case groups is problematic.

The authors argue that a cost oriented grouping will result in classes, which are not compatible with a classification used for statistics on mortality and morbidity. On the one hand the legislative obliged classifications provide details, which are not necessary for the categorization of patients into case groups. On the other hand there are specific cost-relevant factors coped with in the definitions which are not provided by the classifications, for example gestation age or medication. Additionally, the ICD-10 introduced or strengthened characteristics of diagnoses like number and side location which are not really necessary for a classification of diagnoses but very problematic to deal with in case groups.

For the near future two possibilities should be discussed in Germany. Firstly the definition of case groups in textual form as well as by classifications should be reassessed. A further increase in factors that are not covered by the classifications will complicate the automatic inference of case groups from the documentation of diagnoses and procedures. Secondly a classification system, which is developed or adapted regarding the requirements of the case groups, will be more appropriate for their definition. This classification could be changed according to new or refined case groups on demand. In both possibilities a detailed systematic medical documentation with expressive terminology systems will enable an automatic classifying of patients into medical classifications like ICD-10 as well as cost oriented case groups. The establishment of electronic patient records is therefore advisable.

The ICD-10-SGBV as well as the ICD-10 include some unsystematic and problematic aspects, which need a further detailed definition for their use in the definition of case groups. In conclusion statistics for mortality, statistics for morbidity and cost oriented classes are not in the same quality supported by the ICD-10.

References

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[3] Schulz S, Zaiß A, Brunner R, Spinner D, Klar R. Conversion problems concerning automated mapping from ICD-10 to ICD-9. Methods Inf Med 1998; 37: 254-9.

Sources on the WWW

Material concerning the German ICD-10 and the ICD-10-SGBV: http://www.dimdi.de/
New definition of the "Fallpauschalen" and "Sonderentgelte": http://www.dkgev.de/fin_07.htm
Database including the diagnoses part of "Fallpauschalen" and "Sonderentgelte" after transformation: http://www.uni-essen.de/~tmi030/ak_chirurgie/entgelte.htm
UMLS Knowledge Source Server: http://umlsks.nlm.nih.gov/