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IMPLEMENTATION OF ICD-10 IN THE NORDIC COUNTRIES

Submitted by the WHO Collaborating Centre for the
Classification of Diseases in the Nordic Countries 1/

Introduction

1. The Nordic countries have a long-standing tradition of collaboration within the area of health statistics. Since 1966 this collaboration takes place mainly within the Nordic Medico-Statistical Committee (NOMESCO). The mandate of the committee includes to establish a basis for comparable health statistics in the Nordic countries, to take initiatives for Nordic projects of relevance for health statistics and to follow international developments in health statistics. NOMESCO publishes health statistics from the Nordic countries on a yearly basis since 1980 (see e.g., 1).

2. The WHO Collaborating Centre for the Classification of Diseases in the Nordic Countries was instituted in June 1987. The Centre is governed by a board which consists of representatives from the Nordic Medico-Statistical Committee (NOMESCO) and the head of the Centre. The terms of reference for the Nordic Centre include revision of the ICD and related classifications as well as inter-Nordic coordination.

3. The Nordic countries decided in 1975 to postpone the replacement of the ICD-8 and make a direct transition to ICD-10 (with the exception of Iceland where a switch from ICD-8 to ICD-9 was made in 1979). As work on ICD-10 did not proceed at an anticipated pace, Finland, Norway and Sweden subsequently deemed it necessary to introduce a new revision of ICD and implemented ICD-9 in 1987.

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Denmark however, kept a classification based on ICD-8. The national versions of ICD-9 in Norway and Sweden are basically four-character classifications with relatively small deviations from ICD-9. In Finland, however, the national version became a detailed five-character classification with greater deviations from the original ICD-9. Prior to this the Nordic countries had all used very similar versions of ICD. This increased discrepancy between the classifications of diseases in the Nordic countries was considered most unfortunate and the Nordic Centre has therefore regarded as one of its main tasks to try to reduce the discrepancies between the Nordic versions of ICD-10.

4. The Nordic Centre therefore took the initiative to create a structure for cooperation around the Nordic versions of ICD-10 at an early stage. In 1989 a Working Group for the Coordination of National ICD-10 Versions in the Nordic Countries was established as one of NOMESCO's ad hoc working groups. The head of the WHO Collaborating Centre for Classification of Diseases in the Nordic Countries was appointed chairman of the group and the Nordic Centre has administered the work of the group. The group consists of representatives from national health authorities in charge of developing and implementing ICD-10 as well as individuals involved in actual translation work. The majority of the work carried out so far on ICD-10 in the Nordic countries concerns the development of national versions of ICD-10. This means that the main part of this paper will deal with these aspects rather than implementation itself, as the title of the paper may imply.

5. The overall objective of the Nordic ICD-10 group is to achieve greatest possible agreement between the Nordic ICD-10 versions and to facilitate the development of national versions through inter-Nordic cooperation. The group has met 2-3 times a year and has held a series of seminars at which topics of special concern have been discussed with experts.

6. Initially the group agreed on some basic principles for the development of Nordic versions. One such principle was fidelity to ICD-10 as a basic classification, which can be used across all specialties. The detail of ICD-10 in comparison to earlier revisions should entail less need of specialist adaptations in the form of e.g., 5-digit codes. The group decided to strive for total adherence to the ICD-10 structure at the 3-character level including the alphanumeric code format. Another guiding principle agreed on was that a prerequisite for changes at the 4-character level should be Nordic agreement. The members of the groups also declared themselves committed to the goal of greatest possible inter-Nordic coordination and to adjust national work to accommodate this purpose. The group also agreed on cooperation around the alphabetic indexes and to aim at simultaneous publication of tabular list and alphabetic index. Other problems for the group to discuss in common were connected to the use of national languages vs Latin and to the need for development of computer readable versions and applications.

7. The Nordic Centre has adopted the role of clearinghouse for information relating to national ICD-10 work in the Nordic countries and is maintaining a data base containing current Nordic translations of ICD-10 as well as the original English-language version. The Nordic Centre publishes two newsletters per year which include information on the progress of ICD-10 activities, both at the international and Nordic level. Approximately 600 copies of the

newsletter are distributed to individuals and organizations within the health sectors of the Nordic countries. The Nordic Centre also maintains a database on literature on the ICD and other health-related classifications, including literature on ICD-10. The contents of the database have been published twice in the form of a bibliography (2) and a third edition is planned for 1994.

Present status and time schedule for implementation of ICD-10

8. As mentioned above Denmark never implemented ICD-9, which has meant that an ICD-8-based disease classification had been in use for over 20 years. A revision of ICD has therefore been considered long overdue and a decision to implement ICD-10 as soon as possible was made at an early stage. As one of the first countries in the world Denmark implemented ICD-10 both for mortality and morbidity as of January 1, 1994.

9. The Danish version of tabular list and alphabetic index to ICD-10 were published at the same time in October 1993. The tabular list of the Danish ICD-10 is quite thin in comparison to the original English-language version. Part of the explanation for this is the deferral of almost all inclusion terms to the alphabetic index. Also, as will be described below the Danish ICD-10 has replaced ICD-10's lengthy chapter on external causes with the Nordic Classification of Accident Monitoring (3). Later during the fall of 1993 the National Board of Health published a separate booklet with guidelines for diagnostic coding according to ICD-10 in hospitals. Articles describing ICD-10 have also been published in various professional journals during 1993. There are also plans for making ICD-10 available in CD-ROM-format.

10. As in the other Nordic countries ICD-10 is used extensively for diagnostic coding also in hospitals. Both volumes of the Danish ICD-10 as well as the coding booklet have been sent free of charge to all hospital clinics which report on discharges. Software for collecting information on hospital discharges based on ICD-10 into the National Hospital Discharge Data Base has been developed at the National Board of Health. Denmark has a special problem in that they have gone from ICD-8 straight to ICD-10. The National Board of Health are presently working at conversion of ICD-8 codes into ICD-10 codes.

11. Mortality coding is handled by a small number of coders at the National Board of Health who have received internal training. Coding of death certificates according to ICD-10 will start in March-April, when 1994 certificates will start being processed.

12. The main part of ICD-10 was translated into Danish by one physician working simultaneously with the tabular list and the alphabetic index. The translations were then reviewed by physicians with classification expertise at the National Board of Health. Cooperation with the specialist sections of the Danish Medical Society was established early and draft versions were circulated twice to these sections for comments, mainly on terminological aspects. Conferences were also held with these specialists. In general the reactions to ICD-10 have been overwhelmingly positive and specialists have expressed satisfaction with the detail of the new revision of ICD, partly due to the fact that the previous version of ICD was so out of date. A separate report on the experiences of implementing ICD-10 has been requested for the

October 1994 Meeting of Heads of Collaborating Centres for the Classification of Diseases in Venezuela.

13. The work on a national version of ICD-10 has thus by necessity progressed at a faster pace in Denmark than in the other Nordic countries, who are not in as great a hurry to implement ICD-10. This situation has somewhat hampered collaboration since the Danes have been forced to make certain decisions at a stage in time where the other Nordic countries were not ready to make the corresponding decisions. However, collaboration between Denmark and the other Nordic countries has been successful in many areas. Collaboration between the other Nordic countries is facilitated by the greater similarity in time schedules and these countries are striving at coordinated implementation of ICD-10 in order to avoid additional disruption of inter-Nordic comparisons of health statistics. In addition, a later implementation of ICD-10 will also enhance comparisons between Nordic and international health statistics.

14. In Finland, the currently planned date for implementation is January 1, 1996 for both mortality and morbidity. An ICD-10 project group has been established at the National Research and Development Centre for Welfare and Health. One physician with expertise in medical terminology has carried out the translation of the ICD-10 tabular list into Finnish, also working simultaneously with terms for the alphabetic index. A primary round of comments from specialists has been completed. The material will be sent out for comments from specialists a second time in the beginning of 1994 and this process is expected to be concluded at the beginning of the summer of 1994. The ICD-10 project group will start planning for implementation and training in the beginning of 1994.

15. In Iceland the planned date for implementation of ICD-10 for morbidity and mortality has been January 1, 1995. However, recent proposals to abandon the original plan to continue using the English-language version of ICD will influence the date of implementation. If Iceland decides to translate ICD-10 into Icelandic, more time for developing a national version will be needed and the implementation date will be postponed to January 1, 1996. Although starting translation at this point in time is fairly late the ICD-10 project group established at the National Health Directorate judges it possible to achieve due to well-developed work in Icelandic medical terminology with terminological databases etc. Extensive participation from medical specialists is not deemed necessary either.

16. In Norway, the planned date for implementation of ICD-10 is January 1, 1996. This date coincides with the beginning of the five-year reporting periods in use at the Norwegian Central Bureau of Statistics for e.g., mortality statistics. The National Health Directorate is responsible for development and implementation of ICD-10 and has established a special working group for the project.

17. Translation of ICD-10 into Norwegian has been assigned to professional translators at the Norwegian Term Bank. The first translation has been

developed in consultation with specialists at a local hospital. During the translation process the text has been coded which means that a basis for an alphabetic index and a terminological data base can be generated automatically. A conference with specialists was held in December 1993 and a draft of tabular list for ICD-10 is presently being circulated to specialists for comments. The Norwegian Term Bank has given alternative terms in the translation and specialists are asked among other things to indicate which is the preferred term that should be left in the tabular list, the others being included in the alphabetic index. Processing of specialist comments should be completed by the beginning of the summer 1994. Planning for implementation and training will start in earnest during 1994.

18. In Sweden as well January 1, 1996 is the date currently aimed at for implementation of ICD-10 for morbidity. Statistics Sweden, which handles mortality coding, has recently developed a system for automated coding of death certificates (4). One module of this system is the U.S. system for selection of underlying cause of death called ACME, which has been used since 1987. Sweden, therefore, will be dependent on the availability of an ICD-10-based ACME-version for actual implementation of ICD-10 for mortality. However, since the system is fully automated retrospective coding is possible and ICD-10-based mortality statistics from 1996 on can be produced relatively easily.

19. The National Board of Health and Welfare has set up several groups for the ICD-10 project, e.g., a steering group, a working group and a reference group, which consists of representatives from organizations which use health statistics. Two physicians have carried out the main part of the translation of the tabular list with internal consultants. ICD-10 has been introduced to representatives of the specialist sections of the Swedish Medical Society at conferences and ICD-10-chapters of specific relevance have been circulated to the appropriate specialist sections for comments. The process of collecting and reviewing specialists' comments is still underway. A second circulation of the entire tabular list is currently planned for the late spring of 1994. The typography of the WHO tabular list of ICD-10 closely follows the typography developed for the Swedish version of ICD-9. The typography of the Swedish version of ICD-10 will be similar but a larger format with two columns is currently being considered in order to reduce the thickness of the book. Planning for implementation and training has started and an educational project already in progress will be described below.

Specific chapters

20. Certain chapters of ICD-10 have been subject to Nordic adaptations and in an effort to achieve inter-Nordic agreement in such adaptations the Nordic ICD-10 group has directed attention to these chapters, e.g. in the form of seminars with Nordic experts. Such chapters include Chapter I on infectious diseases, Chapter V on mental disorders and Chapter XX on external causes. For chapter I the group has discussed the issue of removal of categories at the 4-character level, in particular for tropical diseases with little relevance for the Nordic health situation. Coordination of such removal is attempted and the group has pointed to the potential problem of partial removal of categories. The only acceptable change at 4-character level should be removal of all

decimals, since a partial removal of categories at the 4-character level can endanger comparability between the rest category at the level in question.

21. Another chapter subject to special attention has been chapter V, especially the issue of translation of the clinical descriptions included in the original chapter and use of ICD-10 in relation to use of DSM within psychiatry in the Nordic countries. At a seminar with Nordic psychiatrists in 1993 the Nordic ICD-10 group agreed to recommend that the clinical descriptions be translated and made available, either directly in the tabular list of ICD-10 or in a special publication.

22. In 1992 a special seminar was held on ICD-10 chapter XX on external causes of morbidity and mortality in relation to use of the Nordic Classification of Accident Monitoring developed by NOMESCO (3). Most participants agreed that the Nordic classification should be seen mainly as useful for special projects in the area of accident prevention and not for routine registration of hospital discharge data at the national level. However, as mentioned above Denmark has decided to remove chapter XX from the tabular list of ICD-10, mainly due to its complexity, and replaced it with the Nordic classification, which is judged easier to use. Norway has announced its intent to include only the 3-character level of this chapter in its version of ICD-10. The remaining countries have still not made a final decision with regard to possible abridgements of the chapter.

Drug coding in ICD-10

23. ICD-10 includes a classification of drugs involved in cases of intoxication and adverse effects. This fixed and rather crude classification is not sufficiently detailed and cannot be updated frequently enough to reflect particular substances involved in such occurrences. In the Swedish ICD-9 a possibility to use more specific drug codes from a Nordic drug classification instead of the ICD-9 drug codes was therefore offered. The Nordic classification in question is the Anatomical-Therapeutic-Chemical classification system (ATC), which is used extensively for pharmaceuticals in the Nordic countries and also for registering adverse effects at the WHO Collaborating Centre for International Drug Monitoring. A special study of the Swedish National Hospital Discharge Database revealed that for all cases of intoxication during 1989, about three quarters were coded with an ICD-9 code and one quarter with an ATC-code.

24. The Nordic ICD-10 group agreed in principle on the advantages of using a continuously revised and updated drug classification for statistics on intoxications and adverse effects. Denmark has adopted the system and physicians are instructed to use an ICD-code in combination with an ATC-code for all cases involving drugs (including drug dependence). ICD-10's drug codes have been reduced to two categories in many instances (type of substance known or unknown). Sweden will likely continue use of ATC in combination with ICD-10.

A decision has not yet been made on this issue in the other Nordic countries.

Language aspects

25. By tradition medical terminology in the Nordic countries has consisted of strictly Latin terms for diagnoses etc. During the past decades, however, a trend towards greater use of the national languages has been noted in all Nordic countries. Older physicians want to retain the old pure Latin terms whereas younger physicians, who are not as familiar with the Latin language, are more influenced by English terminology and to some extent the national language. Another development which has favoured use of national language in all Nordic countries is the increasingly recognized right of patients to be adequately informed by physicians, to have access to medical records and medical information which can be understood by lay persons.

26. In the Danish version of ICD-8, in use up until 1993, Latin was the predominant language. For example, on the first three levels the diagnostic expression is typically first given in Latin and then in Danish, on the 4-character level in Latin only. Sweden also has a relatively strong tradition of Latin medical terminology, but in the Swedish ICD-9 the first three level headings are first given in Swedish and then in Latin, the 4-character level was in either Latin or Swedish depending on clinical usage. In Finland the Latin tradition is strong as well. The Finnish ICD-9 version contains pure Latin terms, Finnish and Swedish down to the 3-character level and on the 4-character level mainly Latin terms only. The Norwegian version of ICD-9 does not contain pure Latin on any level except the 4-character level, which has many Latin terms or Norwegianized Latin terms. In Iceland WHO's English version of ICD-9 is mainly used, but a 3-character level translation into Icelandic is available.

27. Latin will remain in several of the Nordic ICD-10-versions. In the Danish ICD-10 headings are given in pure Latin on the 3-character level only and then after the national language. The Swedish version of ICD-10 will also give the Latin version after the national language but on all levels down to the 3-character level. Norway will have mainly Norwegian on the first three levels of ICD-10 but continue having Latin terms or Norwegianized Latin used in the clinical language at the 4-character level. In Finland the original plans were to have Finnish only in the tabular list and Latin terms in the alphabetic index, but Finnish physicians have demanded that Latin terms be included also in the tabular list. The 4-character level will have Finnish terms first then Latin or English when good Latin terms do not exist. For the Swedish-speaking minority in Finland, a Swedish-language version will also be published. Through the collaboration established within the Nordic ICD-10 group it has been agreed that the Finnish Swedish-language version will be based on the ICD-10 version developed in Sweden. As mentioned above Iceland originally planned to follow the same model for ICD-10 as for ICD-9, i.e., the English-language version for the main part but with provision of a 3-character level translation into Icelandic. However, quite recently health authorities in Iceland have started to discuss the possibility of translating the entire ICD-10 into Icelandic. No decision has been reached as yet, however.

28. The Nordic ICD-10 group has collaborated around the Latin terminology. Danish and Swedish 3-character level Latin versions have been compared and discussed. Interesting variations in Latin terminology have been discovered. Cultural as well as linguistic differences exist of which the group was

hitherto unaware. The principles applied while reviewing and translating the Swedish Latin were: use of ICD-9 Latin when possible, use of modern rather than classical Latin and a preference for terms which resemble the Latin which has survived in the English medical language. In Denmark Latin terminology developed in ICD-8 and in Danish clinical language has mainly been followed but the Swedish Latin version of ICD-10 has also been useful for the Danes, who did not have Latin terms from ICD-9 to rely on.

Collaboration with the Baltic countries

29. The Nordic Centre has been approached by representatives of the Baltic countries who were interested in starting collaboration between the Nordic and Baltic countries around ICD-10. In 1992 the Nordic Centre arranged a meeting in Uppsala with representatives from the Baltic countries, partly held together with the meeting of the Nordic ICD-10 group. The discussion focused on use of Latin in ICD, but the agenda also included Nordic adaptations of ICD and issues related to the implementation of and training for ICD-10.

30. During the meeting all countries described the current situation with regard to use of ICD-9, implementation of ICD-10, use of Latin etc. The Baltic countries are all currently using the Russian version of ICD-9, but are progressing with the translation of ICD-10. Physicians in the Baltic countries still use much Latin for diagnoses and ICD-10 will have Latin in combination with the national language on the 3-character level in all Baltic countries. At this point in time Lithuania was planning to translate also the 4-character level whereas only the 3-character level was going to be translated in Estonia. At this meeting the Baltic representatives were provided with hard copy and diskettes from the Centre's database containing the original English, Danish Latin and Swedish Latin versions of ICD-10 on the 3-character level.

31. The Chairman of the Estonian Committee of Medical Terminology, who is responsible for translating the Tenth Revision of the International Classification of Diseases (ICD-10) into Estonian and Latin, subsequently contacted the Nordic Centre for collaboration around the Latin terminology in ICD-10. The Latin 3-character level translations of Swedish version of ICD-10 has been circulated for comments to the Estonian and Finnish experts on Latin medical terminology. The Nordic Centre has also received Latin 3-character level versions from Latvia and Lithuania, which have been circulated in a similar manner. Meetings have been held during 1993 at the Nordic Centre between the Latin medical terminology experts engaged in development of national versions of ICD-10 in Estonia, Finland and Sweden.

32. In a great many instances it has proven possible to obtain consensus regarding Latin terminology. In some instances, however, for example regarding anatomical terms, the Swedish and Finnish traditions differed from Estonian tradition, which follows closely the terminology of the Nomina Anatomica. Also the traditional Latin terms used in ICD-9 in each country are strong precedents, which the countries do not want to change unnecessarily. Although the result of the collaboration will thus not be totally similar Latin terminology in the respective ICD-10-versions, greater correspondence between the Latin versions has most certainly been achieved. Although Finnish ICD-10 includes Latin on a different level (4-character) greater correspondence in the

Latin terminology has been achieved through the participation by the Finnish translator in the collaboration. Finnish-Estonian meetings and discussions around Latin and national language terminology have also taken place.

33. The Estonian translator planned to establish cooperation directly with Latin specialists from Latvia and Lithuania. The Swedish Latin version, developed in collaboration with Latin specialists from Estonia, Finland and Sweden, will be made available to Latvia and Lithuania by the Nordic Centre when finalized.

34. Other areas for collaboration between the Nordic and Baltic countries have also been discussed. The Baltic countries have expressed their interest in future collaboration in the related areas of epidemiology and health statistics, in particular comparability of health statistics between the Baltic and Nordic countries. The Nordic Centre has suggested for NOMESCO to take responsibility for cooperation in this area, and NOMESCO is currently planning a series of seminars to be held in the Baltic countries in collaboration with EUROSTAT.

The dagger-asterisk system

35. The dagger-asterisk system of simultaneous representation of both etiology and manifestation of diseases was introduced in ICD-9. In ICD-10 the system has been retained and extended, with the asterisk axis being contained in three-character level categories. A review of the current use of dagger-asterisk codes was made by the Nordic Centre to provide some background to the discussions regarding dagger-asterisk codes in ICD-10 in the Nordic groups (5).

36. The only Nordic countries which have used the dagger-asterisk system in ICD-9 are Norway and Sweden. Norway accepted the dagger-asterisk system as presented by the WHO, whereas Sweden accepted only about half of the original 103 asterisk codes. Those asterisk codes which were considered to add some information were kept. In the Swedish classification dagger and asterisk codes were linked together, so that use of asterisk codes entailed use of corresponding dagger codes as principal diagnoses. Explicit instructions to this effect were given right after the asterisk code itself in the tabular list. Data was provided by the Norwegian Institute of Public Health and the Swedish National Board of Health and Welfare on short-term hospital stays in 1988 and 1989.

37. In Norway the proportion of records with asterisk codes was the same in 1988 and 1989, 3 %. In the majority of asterisk records the asterisk code was also the main diagnosis. The corresponding dagger codes were used infrequently (12-14%), but when used they were most often recorded before the asterisk code. In Sweden the proportion of records with asterisk codes was also the same during both years and lower, 2 %. However, the effect of the explicit instructions was clearly evident in that asterisk codes occurred most frequently in second position and the great majority of asterisk codes were preceded by a dagger code.

38. Among other things, the review served to convince the Danes that the system is of little importance in practice. The dagger-asterisk system has not

been included in the Danish version of ICD-10. Both dagger and asterisk codes are left in the tabular list but the symbols have been removed and no instructions have been issued about their simultaneous use. The other Nordic countries have not yet made a final decision with regard to the dagger-asterisk system in ICD-10.

Special tabulation lists

39. ICD-10 contains several new special tabulation lists for presentation of mortality and morbidity statistics. The Nordic ICD-10 group has discussed this issue on several occasions. At present, the Nordic countries use different abbreviated lists for mortality and morbidity. At an early stage the group concluded that ICD-10 provided a good opportunity to achieve better coordination between the Nordic countries in this respect.

40. However, each country's tabulation lists also serve as instruments of continuity over time for presentations of national statistics. There is one tabulation list for mortality and two for morbidity in the Danish version of ICD-10. These are based on ICD-8 and have been converted into ICD-10. Sweden has a tabulation list of 99 groups for morbidity, which has been defined according to ICD-7, ICD-8 and ICD-9 and has an important function as "bridge" across the ICD revisions.

41. For inter-Nordic statistical comparisons NOMESCO has developed a Nordic abbreviated list of causes of death, consisting of 52 groups. The list is based on ICD-8 but has been converted into ICD-9. This tabulation list is used in publications from NOMESCO (e.g. 1), Nordic Statistical Secretariat (9) as well as in national publications on mortality statistics from Statistics Sweden and the Norwegian Central Bureau of Statistics. The Nordic ICD-10 group has concluded that a Nordic tabulation list for mortality will need to be developed, either converted to or based on ICD-10. The group is currently investigating the interest and need for development of a Nordic tabulation list for morbidity statistics.

Bridge coding studies

42. The implementation of a new revision of ICD entails some changes in health statistics which are entirely due to this shift. The Nordic Centre has reviewed what efforts have been made in the Nordic countries to illustrate and overcome the consequences of shifts between revisions of ICD for mortality statistics (6).

43. No special studies on this topic have been reported from Denmark, Iceland or Norway. Denmark has however indicated that double coding of a sample of death certificates according to ICD-9 and ICD-10 will be carried out to illustrate changes due to differences in disease classification. The work of Finland and Sweden in the area of bridge coding is briefly described below.

44. The effect of the switch from ICD-8 to ICD-9 on mortality statistics was studied extensively in Finland. An English-language report on this work has been published in Statistics Finland report series on health (7).

45. In Finland the underlying cause of death was coded both according to ICD-8 and the Finnish version of ICD-9 for all 1987 death certificates - nearly 50 000. 98.8 percent of all cases were coded into the same chapter in both classifications. Some significant changes in causes of death at chapter level were observed when looking at age-related mortality. Statistics Finland maintains a database with longitudinal data on causes of death since 1971. In order to convert mortality data from 1971-1986 into Finnish ICD-9 categories, a conversion key was created and tested on the ICD-8-coded death certificates of 1987. The results of the conversion are presented in a table together with a conversion error, which has been obtained by comparing the converted data to the 1987 data originally coded according to ICD-9. Statistics Finland intends to continue maintaining the longitudinal data base, which by now covers close to 25 years. Plans thus include conversion of the material in the data base into ICD-10. The method by which to achieve this conversion has not been decided upon at this point in time, however.

46. Sweden also switched from ICD-8 to ICD-9 in 1987 and in connection with this a bridge-coding study was undertaken by Statistics Sweden in order to illustrate the consequences of this shift on mortality statistics. The results have been presented in one of Statistics Sweden's publication series (8). Double coding was carried out samples representing slightly over 4 percent of all 1986 death certificates. Differences in distributions of underlying cause of death were presented according to ICD-chapters, Basic Tabulation List, a Nordic list of causes of death and some special diagnostic groups on the 4-character level. The reasons for discrepancies between underlying causes of death were described as follows: 1) the code has been moved from one part of the classification to another; 2) change of internal coding practices; 3) change of ICD rules for selection of underlying cause of death.

47. The differences between statistics based on ICD-8 and ICD-9 on the more aggregated levels of chapters and short-lists were surprisingly small, in some instances no greater than the estimated errors. It is however, important for the producers of mortality statistics to study and make users aware of the shifts in mortality statistics which occur as a result of new classifications (and coding practices). This is of course particularly true for the study of development of mortality patterns over time.

48. As mentioned above, Statistics Sweden has developed a system for automated coding of death certificates. Within this system the certificates are saved in their original format. It will thus be possible to code automati

cally by either ICD-9 or ICD-10, when this has been fully implemented, and to carry out bridge studies with relative ease.

Education, training, computer applications

49. The educational activities in connection with implementation of ICD-10 will to a great extent follow those carried out at the time of implementation of ICD-9. A detailed description of implementation of and training for ICD-9 in Finland, Norway and Sweden is available in an English-language document from 1988 (10). A common feature was use of the cascade model, in which some conferences and courses were arranged at central or regional levels with specially invited key persons, who in turn were expected to provide training and information at the local level. In some countries a teaching kit consisting of overheads etc was offered to the key persons for use at the local level. Another feature is the creation of a newsletter with information about the new classification including printing errors and answers to coding questions of general interest. Articles introducing the new revision of ICD are published in professional journals and booklets with guidelines for coding are developed. In Denmark national authorities will not organize educational activities in the form of conferences about ICD-10, however, but will leave this up to relevant organizations.

50. With ICD-10 there are some new developments however, especially regarding computer-based training. A computer-based training package for ICD-10 (TENDON) has been developed at the WHO Collaborating Centre for Classification of Diseases in London, England. Representatives from the Nordic Centre and from many other Nordic countries have participated in the courses offered by the London centre. The training package has been very favourably received by the Nordic participants, among Swedish participants to the degree that a decision has been made to translate parts of TENDON into Swedish. The Swedish version of TENDON will be offered for purchase to hospital clinics etc at cost price. Norway is currently considering translating TENDON into Norwegian but no decision has been made. Denmark has decided not to but will refer to the English version of TENDON, as will Iceland probably.

51. A closely related issue is the development of computer applications in general to facilitate learning and use of ICD-10. The Nordic Centre recently arranged an expert seminar to discuss these issues on a Nordic basis. Norway and Sweden are currently planning to develop terminological data bases in connection with development of a national version of ICD-10. A representative of Working Group 2 of the European CEN-project had also been invited to inform the working group about developments in the field of standardization of medical terminology at the European level. This representative also brought to the attention of the Nordic countries an initiative from CEN Working Group 2 aimed at standardization of the distribution format of national versions of ICD-10 (DIFO-ICD-10).

52. The ICD-10 group also recognizes that national authorities in their preparation for implementation of ICD-10 must also consider implementation in relation to existing computer systems. Currently a great variety of software exists for computerized medical record keeping etc including ICD-9 modules, the quality of which is unknown and which can often not communicate with each other. The Nordic ICD-10 group therefore recognized a need for national health authorities to take responsibility for the development of officially authorized software products in order to ensure that the contents of the classification is correct and that the classification is applied in a standardized manner.

53. Especially in Norway it is regarded as a necessity for the national health authorities to make software available to facilitate implementation and thereby entice hospitals to adopt ICD-10. The situation in Norway is somewhat different from the rest of the Nordic countries, in that the national health authorities can only recommend and not impose the adoption of a new revision of ICD. Hospitals are not required by law to report discharges to national authorities. The Nordic group agreed to strive for Nordic coordination between those countries which will develop official computer applications such as computer-assisted coding etc.

Related health classifications

54. International classification of medical procedures (WHO, 1978) is currently in use in Iceland, but the other Nordic countries have developed their own classifications of procedures, i. e., surgical procedures. NOMESCO has taken the initiative to develop a Nordic classification of surgical procedures. An ad hoc working group has worked for several years on this project and it is expected that the classification will be ready to take into use by January 1, 1995.

55. A related issue concerns the use of Diagnosis Related Groups (DRG) in the Nordic countries. In all Nordic countries except Denmark perhaps, the DRG-system has attracted great interest and has been used extensively albeit mainly on an experimental basis at local clinics or hospitals. The latest communications from USA regarding the development of and ICD-10-based DRG-system indicate that such a system will not be ready until late in this decade. This delay will create problems for the many users of the DRG-system in the Nordic countries when ICD-10 is implemented in 1996. NOMESCO has therefore taken the initiative to establish an ad hoc working group to investigate solutions to this problem on a Nordic basis. The Nordic Centre leads the group together with a renowned Finnish expert, who has developed a Finnish DRG-grouper. A first meeting will be held by the working group with invited experts in the beginning of February 1994. The group will consider alternative solutions, such as a Nordic adaptation of DRG or the development of a genuinely Nordic patient grouper system, based on the Nordic versions of ICD-10 and the Nordic classification of surgical procedures.

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