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Evaluating the comparability of different grouping schemes for mortality and morbidity

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Abstract

Comparison of mortality and morbidity is a commonly used method in health related studies. The International Classification of Disease (ICD) consists of thousands of codes for classifying cause of death and disease categories. A grouping scheme is needed to cluster related categories into a meaningful and manageable number for comparative purposes. Different kinds of grouping schemes have been used; nevertheless, little is known about the comparability among different grouping schemes. In this study, we compared seven grouping schemes; five for mortality and two for morbidity. We found poor comparability between different grouping schemes. Different schemes covered different ranges of codes. Some schemes used the same title, but included different ranges of codes. Features of newly developed grouping schemes were to group disease categories of similar characteristics across traditional ICD chapters and to group disease categories based on health care needs, instead of those based merely on etiology or organ system. Different grouping schemes were developed to reveal the unique mortality and morbidity pattern of different geographical areas. Different grouping logic was used by different grouping schemes. Therefore, it is difficult to make a good comparison between different schemes. An investigator tabulating the mortality or morbidity figures based on a given grouping scheme should explicitly define the exact ICD codes included. Any user of data derived from different grouping schemes, especially for comparisons between countries, should be cautious about the comparability problems.

Keywords: Disease classification; Comparability study; Cause of death; Vital statistics

1. Introduction

Comparison of mortality and morbidity is a commonly used method in health services research, outcome studies, needs assessment, health policy studies, and epidemiological studies. The International Classification of Disease (ICD) is the archetypal coding sys-

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tem that serves as the cornerstone for classifying causes of death [1,2]. For morbidity coding and billing purposes, a more detailed Clinical Modification of Ninth Revision of ICD (ICD-9-CM) was published, which consists of more than 13,000 diagnosis codes [3]. A scheme to group causes of death and diseases is needed to cluster the related categories into meaningful and more manageable numbers for comparison. Different kinds of grouping schemes have been used, but little is known about the comparability between different grouping schemes. The aim of this study was to evaluate the comparability of different grouping schemes for causes of death and diseases categories and to highlight the problems related to the grouping process.

2. Methods

2.1. How we found grouping schemes for mortality?

We collected various kinds of grouping schemes for cause of death statistics from the websites of official publications of the World Health Organization (WHO) and governments in different countries. Some senior members of the International Collaborative Effort on Automating Mortality were consulted with regard to the extent of usage and features of different grouping schemes [4]. Five grouping schemes were selected for evaluation: the Basic Tabulation List (BTL) used by World Health Statistics Annual [5]; the cause of death shortlist used by the Statistical Office of the European Communities (EUROSTAT) [6]; the grouping scheme used by the Global Burden of Disease Project (GBD) [7]; the shortlist for mortality tabulation used by the Pan-American Health Organization (PAHO) [8]; and the selected cause of death used by the National Center for Health Statistics of the United States [9].

2.2. How we found grouping schemes for morbidity?

With respect to grouping schemes for disease categories, we focused on healthcare services studies with special emphasis on those focused on the ranking of cost of illness. After extensive literature searches, and excluding those that did not have systemic comparison of more than 10 disease groups, we identified 11 relevant studies. The ICD chapter was the most commonly used grouping scheme [10–15]. The grouping schemes used by other studies included BTL, GBD, and Clinical Classification Software (CCS) [16–20].

Having compared the ICD chapter and GBD grouping schemes with other grouping schemes, we then compared only the detailed BTL grouping scheme, which consisted of 307 two- and three-digit categories [1], and the CCS grouping scheme, which composed 260 mutually exclusive diseases categories [21]. The CCS was developed by the Agency for Healthcare Research and Quality (AHRQ) for Healthcare Cost and Utilization Project (HCUP). The CCS categories are revised annually in response to ICD-9-CM changes and all can be downloaded freely from the Internet (http://www.hcup-us.ahrq.gov/toolssoftware/ccs/ccs.jsp) [22].

2.3. How we compared the different grouping schemes?

Next, we compared the number of groups included in each grouping scheme. We then compared the title and ICD codes defined by different grouping schemes for similar diseases. We chose only some diseases for illustration in this study. A complete list comparing all selected groups in different schemes is available from the authors upon request. Comparability relationships between BTL and CCS were further classified into one-to-one, many-to-one, one-to-many, and non-comparable.

3. Results

3.1. Comparability between grouping schemes for mortality

Large variations in number of groups, either broad or selected, among different grouping schemes were noted (Table 1). The EUROSTAT scheme had the fewest number of selected groups. In contrast, the USA ICD-10 scheme had the largest number of selected groups. The BTL, EUROSTAT, and GBD schemes kept an equal number of groups between ICD-9 and ICD-10 revisions. The USA scheme showed a large increase in number of selected groups from ICD-9 to ICD-10