Impact of ICD-10 Implementation on the Continuity of the Cause-of-Death Statistics. The Case of France

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Understanding mortality trends requires a precise analysis of the evolution of causes of death. Unfortunately, this evolution is difficult to follow on the long term because of changes in classification and coding of causes. The International Classification of Diseases (ICD) has been revised ten times since its first adoption in 1893. Each time a new revision was implemented, more or less severe breaks occurred in the time series of deaths by cause. A link between two successive revisions of ICD could be made if a double classification according to both the old and the new revisions was systematically performed at the time of the change. Unfortunately, this type of work was made only in a few countries and usually at the level of rough groups of causes of death. In the absence of such double classification, a method of reconstruction of coherent series of deaths by cause has been developed at INED (Meslé and Vallin, 1996) and used to analyse long-term trends in causes of death in France (Vallin and Meslé, 1988), and in a number of other countries like Russia (Shkolnikov et al., 1996; Meslé et al., 2003), Ukraine (Meslé and Vallin, 2003), the Baltic countries (Hertrich and Meslé, 1997), Germany and the Czech Republic (Pechholdova, 2006). Requiring several years of deaths classified according to the most recent revision, these works did not cover the move to ICD-10 yet.

In France the new statistical gaps caused by the implementation of ICD-10 are all the more problematic since the sweep to ICD-10 was done at the same time as the adoption of the automatic coding. Statistical series were damaged not only by the change of contents of the ICD items, but also because of a different way to apply the WHO rules for selecting the initial cause of death. Even at the level of very large groups of causes used by many authors to get a rough view on cause-of-death trends, French data show important disruptions between 1999 (the last year covered by ICD-9) and 2000 (the first ICD-10 year). For example, if we compare the ICD-9 Chapters 1 “Infectious and parasitic diseases” and 7 “Diseases of the respiratory system” to ICD-10 Chapters 1 “Certain infectious and parasitic diseases” and 10 “Diseases of the respiratory system”, the theoretical medical contents of which are basically the same, rather large differences appear in the number of deaths for 1999 and 2000 (Table 1). Infectious diseases increase by 36% while respiratory diseases decrease by 19%. Such sudden changes cannot be caused by real increase or decrease in these groups of pathologies, while they cannot be completely explained by the change in the classification neither.

Table 1. Number of deaths classified in ICD-9 Chapters 1 and 7 in 1999 and in ICD-10 Chapters 1 and 10 in 2000, in France

Chapter	1999	2000	Change (%)
1 (ICD-9)/1 (ICD-10)	7833	10615	+ 35.5
7 (ICD-9)/10 (ICD-10)	43841	35668	– 18.6

On one hand, good piece news is that, for the first time in France, a double classification of deaths which was performed on a 1999 death sample, and it is possible to identify the major breaks, at least at the level used to performed the work. But, on the other hand, the results of

that double classification show a situation close to be hopeless. Results for Pneumonia are given in Table 2. Among the 1635 deaths which were classified in ICD-9 items 480-486 which gather all the different forms of pneumonia, only 1008 were classified in ICD-10 items J12-J18 which theoretically gather the same conditions. The rest (637 deaths) were shared out between many other items belonging to different chapters (Table 2).

Table 2. Share-out of deaths classified in Pneumonia (items 480-486 of ICD 9) among ICD-10 items and chapters (1999 French death sample)

ICD-10 items or chapters	Number of deaths	Percentage
Pneumonia (J12-J18)	1008	61.7
Diseases of the circulatory system	136	8.3
Mental and behavioural disorders	98	6.0
Diseases of the respiratory system (except pneumonia)	94	5.7
Neoplasms	79	4.8
Diseases of the nervous system	68	4.2
Endocrine, nutritional and metabolic diseases	55	3.4
Certain infectious and parasitic diseases	32	2.0
External causes	16	1.0
Diseases of the digestive system	13	0.8
Diseases of the blood and blood-forming organs	9	0.6
Diseases of the musculoskeletal system and connective tissue	8	0.5
Diseases of the skin and subcutaneous tissue	7	0.4
Diseases of the genitourinary system	7	0.4
Congenital malformations, deformations and chromosomal abnormalities	5	0.3
Total	1635	100.0
Source : Pavillon et al., 2004		

In that case, the break is clearly not related to the move of some pathologies from one chapter to another but is obviously due to changes in the coding practice. More explicit rules of codification were given in ICD 10 and the automatic coding strictly enforced them. Our paper will investigate if this type of breaks could be corrected by taking in account multiple causes of death, instead of considering the only initial cause. For France detailed data on multiple causes of death are available since 1979 (Désesquelles and Meslé, 2004).

Finally the paper will discuss the possibility to use the results as a benchmark for other countries. Previous studies have shown that each national case is specific (Meslé and Vallin, 1993; 2003). This assertion will be checked for the transition between ICD-9 and ICD-10.

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