**Aburto et al., cause of death classification**

*September 1, 2017*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Cause of Death** | **ICD-7** | **ICD-8** | **ICD-9 (Sweden, Norway)** | **ICD-10** |
| Infectious, non-respiratory | A001-A043 | A001-A044 | B01-B07, B184-B185 | A00-B89, B99 |
| Cancer, amenable to smoking | A044-A050, A052, 157, 180-181 | A045-A051, A055, 157, 188-189 | B08, B090-B094, B096, B100-B101, 180, 188-189 | C00-C21, C25, C30-C34, C53, C64-C68 |
| Cancer, not amenable to smoking | A051, A053-A056, A058-A059, 155-156, 158-160, 164-165, 175-176, 178-179, 192-195, 198-199 | A052-A054, A056-A057, A059-A60, 155-156, 158-160, 163, 171, 183-184, 186-187, 190-199 | B095, B099, B109, B11, B13-B14, 179, 181-187 | C22-C24, C26, C37-C39, C40-C41, C43-C52, C54-C58, C60-C63, C69-C97 |
| Diabetes mellitus | A063 | A064 | B181 | E10-E14 |
| Cardiovascular | A070, A079-A086 | A080-A088 | B25-B30 | I00-I99 |
| Respiratory, infectious | A087-A092, A095 | A089-A092, A095 | B310-B312, B320-B322 | J00-J06, J09-J18, J20-J22, J34.0, J36, J39.0, J39.1, J85, J86 |
| Respiratory, non-infectious | A093, A094, A096, A097 | A093, A094, A096 | B313-B315, B319, B323-B327, B329 | J30-J33, J34.1-J34.3, J34.8, J35, J37, J38, J39.2, J39.3, J39.8, J39.9, J40-J47, J60-J70, J80-J82, J840-J841, J848-J849, J90-J99 |
| External | A138-A150 | A138-A150 | B47-B56 | S00-T89, V01-Y84 |
| Other | A060-A062, A064-A069, A071-A078, A098-A137 | A061-A063, A065-A079, A097-A137 | B15-B17, B180, B182-B183, B189, B19-B23, B33-B46 | D00-D48, D50-D89, E00-E07, E15-E16, E20-E35, E40-E46, E50-E68, E70-E90, F00-F99, G00-G99, H00-H59, H60-H95, K00-K93, L00-L99, M00-M99, N00-N99, O00-O99, P00-P96, Q00-Q99, R00-R99 |

**Notes**.

1. Classification across ICD-7, -8 and -10 was cross checked with Janssen and Kunst 2004.
2. In any cause of death where micro-organisms are involved, death is the result of the micro-organism in the context of the immune function and other relevant functions of the host. Some virulent micro-organisms tend to kill even a healthy host, and diseases are simply contagious. For instance, *Mycobacterium tuberculosis* is not a bacteria that is normally present in healthy subjects, which may not be reasonable expected to remain healthy under an infection with this bacteria. In some cases, the micro-organism contributes to the disease process, but only in the context of other clear anomalies. For instance, the bacteria that are normally present in the appendix (commensals) cause appendicitis only in the context of a blockage of the appendix. Similarly, fairly innocent, commensal bacteria can cause death in AIDS patients (which itself is an infectious disease). For as much as this can be decided in a general fashion, our category “Infectious” includes those infections of virulent micro-organisms that are capable of causing disease in healthy hosts. Other diseases where a micro-organism plays a role, such as appendicitis, are classified according to their organ system. Hence, death due to (a perforated) appendicitis is listed under ‘other’ rather than ‘infectious’. Such a classification is bound to be imperfect. For instance, in an immunocompromised host, less virulent bacteria can cause diseases like erysipelas, but in the meantime it cannot be stated categorically that no healthy subject could attract erysipelas, depending on the virulence of the bacteria. This classification is in accordance with the way the ICD classification is set up.
3. The classification across ICD versions is based on the smallest common denominator. For instance, myeloid leukemia has been associated with smoking, but ICD-7 and -8 contain only a category ‘leukemia’, without subclassification. Hence, for reasons of consistency across classifications, myeloid leukemia, listed separately in ICD-10, is considered as not amenable to smoking throughout. Those cancers that were listed as amenable to smoking were separately identifiable across ICD versions.
4. A partition of cause of death is always tentative. For instance, rheumatic fever can be induced by an otherwise harmless infection that a patient may not even remember, making it partially an infectious disease. Yet we have strived to achieve a workable partition suitable for our analysis.
5. Benign neoplasms and neoplasms of unspecified nature were classified as ‘other’.
6. Because of the rise of diabetes in Western societies, we analyzed this cause of death separately.
7. Newborns are vulnerable. Therefore we analyzed all cause mortality for the first year of life.
8. ICD-7 and ICD-8 have an overall rest group from malignant neoplasms, while ICD-9 and ICD-10 have also a rest group for each tract, if known. Because ICD-7 and ICD-8 do not have these detailed rest groups, rest groups were classified as not amenable to smoking for all ICDs.
9. In ICD-7, ICD-8 and ICD-10, lung empyema and lung abscess are separate categories, while in ICD-9 the detailed number codes for these causes, respectively 510 and 513, where included in a rest group B329. Hence, the respiratory categories show some discontinuity between ICD-8 and ICD-9, and ICD-9 and ICD-10. The overall trend over time, from ICD-7 to ICD-10, is not affected by this discontinuity.