



EDITORIAL ARTICLE

Beneficial impact of forensic sources to cause-of-deaths statistics[☆]



Impacto beneficioso de la incorporación de las fuentes forenses a las estadísticas de mortalidad

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Mortality is one of the most important health indicators and one of the parameters used in the design and evaluation of health policies. The death statistics according to cause of death kept by the Spanish National Institute of Statistics (INE) aim to establish the mortality trends associated with gender, age and geographical area, as well as how these evolve over time.¹ The death statistics according to cause of death in Spain are collated from information on two main types of death: those in which a medical certificate of death (MCD) is issued (since 2009 a single document accompanied by the statistical bulletin of death [SBD]²) and those others where the judicial authority intervenes. A third type would be those deaths which occur in the first 24 h of life (statistical bulletin of birth).¹ In deaths with judicial intervention (DJI), the MCD cannot be issued as these are violent or suspicious deaths or deaths from unknown causes in which, according to the Criminal Procedure Law,

the judicial authority intervenes, ordering an autopsy which is carried out by forensic doctors in the forensic pathology departments of the Instituts de Medicina Legal y Ciències Forenses [Legal Medicine and Forensic Sciences Institutes] (IMLCF). The statistical declaration of these DJIs is made by the courts of instruction based on the information obtained from the autopsy, which is issued telematically to the registry offices and the statistics administration (INE) through the SBD with judicial intervention (SBDJI). This information is subsequently sent by the INE to the mortality registries of the autonomous communities, who validate the demographic information and codify the basic cause of death according to the World Health Organisation's International Classification of Diseases (ICD).

This introduction is necessary in order to understand the role of the forensic sources (IMLCF) on the statistical declaration circuit of DJIs and for a detailed analysis of the interesting article that Puigdefàbregas et al.³ have published in the current issue of the *Revista Española de Medicina Legal* [Spanish Journal of Legal Medicine], which describes the beneficial effects the incorporation of forensic information has on the mortality statistics for certain causes. Firstly, the collaboration between the Registro de Mortalidad de Cataluña [Catalonia Mortality Registry] (RMC)

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and the Catalonia IMLCF (IMLCFC) is worthy of note. This collaboration has been ongoing since 2012 through an agreement between the Departments of Health and Justice of the Government of Catalonia, which allows access to data from deaths submitted to judicial autopsy in the IMLCFC in order to improve the quality of the statistics.⁴ It came about after the detection of an underdeclaration of DJI in the city of Barcelona in 2010 in excess of 30%,⁵ probably as a consequence of the 2009 changes in the documents and the statistical circuit of declaring deaths. This article is a further step in this collaboration, like those taken previously when the statistics for suicide mortality in the province of Tarragona were studied⁶ or when the number of judicial autopsies and clinical autopsies in Catalonia were compared.⁷ We assume that this type of collaboration also exists in other autonomous communities and that the statistical information received is completed with the forensic information, as is the case in Navarre.⁸ However, we are unaware of any publications in this area, and it would be highly desirable to know to what extent and in what conditions (through agreements or other instruments) this collaboration exists in the rest of the country.

For the years studied, the DJI in Catalonia were around 6% of total mortality, a percentage similar to those previously estimated for Catalonia.⁹ According to data from the Forensic Medical Council for 2013 and 2014, the average percentage of judicial autopsies in Spain compared to overall mortality was 5.6% (from 3.5% in the autonomous community of Castilla y León to 10.3% in the Canary Islands).¹⁰ This percentage is similar to Scotland,¹¹ higher than Germany (just 2%)¹² and lower than Finland (21% judicial autopsies).¹³ It is also lower than Anglo-Saxon countries, where deaths reported to the *coroner* or *medical examiner* are 15.5% in Canada,¹⁴ 45% in England and Wales¹⁵ and approximately 40% in USA,¹⁶ although post mortems are not carried out in all cases.

Something which stands out is the "loss" of 108 cases of DJI which do not appear in the autopsy records in the IMLCFC. Although this has negligible impact given the small number of cases, it would be interesting, at least for internal purposes, to know the distribution and characteristics of these cases in order to identify areas for improvement. In this sense, the forensic terminology and the statistics may differ and explain (in part) this small discrepancy: the IMLCF data are territorial compared to the populational (residents) nature of the statistical data, and there may also be small differences between territories when studying deaths by natural causes which end up being DJI as there is no MCD. This small group of deaths which trigger the judicial machinery by not having a MCD¹⁷ but about which enough information is known to ascertain their natural origin and deduce their cause, have a whole chapter dedicated to them in the IMLCFC protocol, which states that this is an area with enormous variability.^{18,19}

Certainly, what stands out most from the Puigdefàbregas et al. study is the improvement in the basic cause of death in almost 4 out of 5 of the DJIs analysed, with a 157% decrease in poorly defined causes and an 18.45% increase in external causes in the mortality statistics. Although DJIs were chosen whose cause of death according to ICD-10 criteria could be improved (those with poorly defined or non-specified causes of death, which was just under half), these results are much

higher than those from other studies which also used forensic sources in Spain, but with different methodologies. From a sample (15.6%) of DJIs in Catalonia in 1996 and using the definitive autopsy reports and the results of additional tests, De Arán et al.²⁰ found a 72.3% correlation between the forensic information and the SBD, which fell to 69.2% for deaths from external causes. The same percentage was obtained in Galicia (72.9%) in 1998 when a similar percentage of judicial autopsies to the Puigdefàbregas et al. study was analysed (45.5%).²¹ In Galicia, differences could be seen between provinces, a factor that Puigdefàbregas et al. did not analyse. In the case of the city of Barcelona, Gotsens et al.²² analysed the changes produced after including the forensic information over a period of 3 years, finding that poorly defined causes fell from 23.7% to 7.4% while external causes increased from 25.6% to 41.7%. The Puigdefàbregas et al. article is further evidence of the need to incorporate the IMLCF information with the mortality statistics, something which the Forensic Medical Council is now working on with the INE¹⁰ and which we will follow closely.

Another methodological aspect is the source of forensic information used: while the other studies described incorporate definitive information from the autopsies, Puigdefàbregas et al. use the information from the autopsy record, without being clear whether this record includes preliminary information after the autopsy or the definitive information. This is not a small methodological factor because several months can pass between an autopsy being carried out and the forensic information from the Mortality Registry becoming available, so the information used by Puigdefàbregas et al. could be provisional and, therefore, more complete if it came from the definitive autopsy reports. This, however, comes up against one of the weak points of the IMLCF: recording, storing and using information. To date, there has been little progress in internal record-keeping in the IMLCF forensic pathology departments, which forces other institutions or researchers to access information directly.^{23,24}

As you would expect and as highlighted by the authors, the improvement in the quality of the cause of death has a direct effect on certain causes of death which are not considered very reliable in mortality statistics. The external causes in particular increase, specifically accidental poisonings, accidental falls, suicides and traffic accidents. For all these causes of death, except for accidental falls, the use of forensic data for monitoring purposes has been developed, an aspect which is also of great interest for public health. Another well-established example in Spain since the 1980s is the use of forensic sources to monitor mortality due to acute reactions to psychoactive substances (RASUPSI).^{25,26}

In the case of traffic accidents, forensic information is also used to ascertain the evolution of mortality due to traffic accidents.²⁷ However, transport statistics are based on police records, which usually contain exhaustive information on the characteristics of the collision but under-record cases and do not include valid and reliable information on the seriousness of injuries.²⁸ In Catalonia, the IMLCFC has reported all deaths since 2003 (immediate or delayed) due to traffic injuries which undergo judicial autopsies. This information feeds telematically, monthly and territorially into the database managed by the Servei Català de Trànsit [Catalan Traffic Department], allows the deaths to be monitored

directly without correction factors being applied, and provides highly relevant information about the different profile of fatalities on the day of the accident compared to those who die in the following 30 days.²⁹

In terms of suicides, this cause of death has and continues to be the focus of attention with regard to the financial crisis. The under-reporting or poor categorisation of deaths by suicide, both as a whole and by particular methods (poisonings or falling under a train) has been highlighted by several studies.^{30–32} We have already defended the importance of forensic sources in suicide mortality statistics,³³ and studies have been carried out showing the discrepancies in the number of suicides between the INE and the IMLCF.^{34,35} As the pertinent authors themselves point out, the under-declaration of mortality by suicide has been estimated specifically for Tarragona.⁶ On the subject of deaths by suicide, concerning the methodology of death statistics according to the cause of death in 2013, the INE stresses the methodological improvement that has resulted from access to the Instituto Anatómico Forense de Madrid [Madrid Anatomical Forensic Institute], allowing the cause of death of DJS to be more precisely determined.^{1,36} This study is a further example of the need to incorporate information from the IMLCF to monitor mortality by suicide.

One of the results which stands out most for us is the impact of forensic data on ischaemic heart disease mortality statistics (increase of 5.2%) and its possible contribution to assessing health policies given the prevalence of the condition. Ischaemic heart disease is the main cause of sudden death in our setting, and sudden deaths are frequently studied by the IMLCF as they tend to be treated as natural deaths of initial unknown cause. We should not forget that half of forensic autopsies in Spain are deaths by natural causes,¹⁰ and that ischaemic heart disease which clinically manifests as sudden death represents the most common type of death submitted to autopsy in the IMLCF. It has traditionally been considered that forensic sources allowed the clinical and pathological characteristics of sudden death to be categorised, and recent studies in young adults in our setting indicate that forensic sources should also be used to ascertain the incidence of sudden death,³⁷ an aspect which is also suggested by Puigdefàbregas et al. Due to the health implications of these diseases, the inclusion of forensic sources in the records of sudden cardiac deaths or ischaemic heart disease is essential if these are to be quality records.³⁸

This article also allows us to identify opportunities for improvement in the IMLCF. As well as the aforementioned self-criticism with regard to the current lack of IMLCF standardised information systems, it is also necessary, as Puigdefàbregas et al. point out, to raise awareness amongst professionals of the importance of their work beyond just their main auxiliary function to administering justice. One solution may be to expressly assign functions in the area of public health, as has happened internationally,³⁹ and to make this explicit in a future amendment of the IMLCF Regulations.⁴⁰ In all these questions, the recently-created Forensic Medical Council could have a relevant role to play.⁴¹

Despite some limitations of the study (only DJS codified as poorly defined causes over the course of one year), we must congratulate the authors for their efforts in conducting the study and attributing importance to the IMLCF information, in collaboration with the Mortality Registry, to improve

mortality statistics. We would particularly like to thank the authors for publishing in a forensic journal, as this type of work is usually published in public health journals. Its publication in the *Revista Española de Medicina Legal* is a first step towards raising the awareness of the forensic profession of the importance of its role, a role which transcends its main auxiliary function to the administration of justice.

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