

Death certificate: filling by the medical staff of a university hospital

Luan Lucena ¹, Gustavo Henrique Bocalon Cagliari ², Julio Tanaka ³, Elcio Luiz Bonamigo ⁴

Abstract

This investigation analyzed the contents from death certificates filled in by a university hospital. The study aimed to evaluate in medical records the death certificates of the years 2009 and 2011, in the database, and the difficulties of the medical clinical staff to fill them in. A documental research was done as well as interviews with the doctors. In the 528 death certificates analyzed, it was found that 265 (50.18%) were incomplete. From the 34 clinical physicians who answered the questionnaire, 34.14% reported that deaths without medical assistance constitute the major difficulty in filling the document; 26.47% mentioned that they believe their learning during the undergraduate course was not good, and only half of them knew the guideline to fill in the certificate. In conclusion, it is inferred the need to improve the teaching during de undergraduate course and encourage the updating of doctors when it comes to this important aspect.

Key words: Death certificates. Epidemiology. Cause of death. Indicators of morbidity and mortality.

Resumo

Declaração de óbito: preenchimento pelo corpo clínico de um hospital universitário

Esta pesquisa analisou o preenchimento das declarações de óbito em um hospital universitário. O estudo objetivou avaliar, em prontuários médicos, as declarações de óbito dos anos 2009 e 2011 e as dificuldades dos médicos do corpo clínico em preenchê-las. Realizou-se pesquisa documental e aplicação de questionários aos médicos. Das 528 declarações de óbito analisadas, 265 (50,18%) estavam incompletamente preenchidas. Dos 34 médicos participantes, 34,14% referiram como principal dificuldade de preenchimento as mortes sem assistência médica; 26,47% consideraram ter tido um aprendizado ruim durante a graduação e somente 50% conheciam o documento que orienta o preenchimento da declaração. Como conclusão, infere-se a necessidade de aprimorar o ensino na graduação acerca da declaração de óbito, bem como incentivar a atualização médica sobre este importante aspecto.

Palavras-chave: Declaração de óbito. Epidemiologia. Causas de morte. Indicadores de morbimortalidade.

Resumen

Certificado de defunción: cumplimentación por el cuerpo médico en un hospital universitario

Esta investigación analizó la cumplimentación de los certificados de defunción en un hospital universitario. El objetivo fue evaluar, en registros médicos, los certificados de defunción de los años 2009 y 2011 y las dificultades para el personal médico en cumplimentarlos. Se realizó la investigación documental y encuestas a los médicos. De los 528 certificados de defunción analizados, 265 (50,18%) fueron incompletamente cumplimentados. De los 34 médicos participantes, el 34,14% apuntó que la principal dificultad en la cumplimentación fueron las muertes sin asistencia médica; el 26,47% consideró escasa su aprendizaje durante la graduación y; sólo el 50% conocía el documento guía que orienta la cumplimentación del certificado. En conclusión, se infiere la necesidad de perfeccionar la enseñanza en el pregrado acerca del certificado de defunción, así como promover la actualización médica sobre este importante aspecto.

Palabras-clave: Certificado de defunción. Epidemiología. Causas de muerte. Indicadores de morbimortalidad.

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1. **Graduando** luanlucena@icloud.com 2. **Graduando** gustavocagliari@yahoo.com.br 3. **Mestre** julioakeotanaka@yahoo.com.br 4. **Doutor** elcio.bonamigo@unoesc.edu.br – Universidade do Oeste de Santa Catarina (Unoesc) Campus de Joaçaba, Joaçaba/SC, Brasil.

Correspondence

Elcio Luiz Bonamigo – Rua Francisco Lindner, 310 CEP 89600-000. Joaçaba/SC, Brasil.

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The information derived from death certificates (DC) and the Mortality Information System (MIS) ¹ are essential for planning public actions, the development of health management and for epidemiological studies. The implementation of the MIS by the Ministry of Health (MOH) ² in 1975, which uses the data contained in DC, represented a considerable advance in the production of information on mortality in Brazil. It should be noted that the creation of this system was motivated by the need for complete information about the deaths in the country. These information enable further analysis and special studies to detect and correct both the underreporting of data as well as deficiencies of information quality ³.

The use of a standardized DC, for fetal and non-fetal deaths, nationally implemented by Law 6.015 of December 31st, 1973 ⁴, has allowed the national padronization of data and facilitated the provision of information relevant to the health sector. Considered the standardized instrument that feeds MIS, the DC enables obtaining better statistics on causes of death in Brazil. However, it assumes the correct filling of the form, so that the proportion of deaths from ill-defined causes, arising from incomplete or inadequate filling of the forms, may reduce. Thus, death certificates properly filled are essential to improve the quality of statistical data on the mortality of the population of a country.

The completion of death certificates represents ethical and legal responsibility ⁴ from the doctor who signs the document, as foreseen in Articles 82 and 83 of the Code of Medical Ethics from 2009 ⁵. However, it is possible that the filling his document may be interpreted as being merely legal and bureaucratic requirement, without receiving due attention from caregivers regarding the importance of data to be correctly recorded. Given this issue, the main objective of this research was to analyze the filling of death certificates in a university hospital and get information from physicians on the knowledge and difficulties of filling it, aiming on contributing for these barriers to be surpassed and, consequently, to improve mortality indicators.

Method

The quantitative, retrospective and cross-sectional study on death certificates of deceased pa-

tients at the University Hospital of Santa Terezinha, Joaçaba / SC, during the years 2009 and 2011. The choice of this period for the study was due to the existence of another study conducted in the same hospital ⁶, completed in 2010: a completion of course work that found high frequency of inadequacies in the filling of death certificates, particularly regarding the use of inappropriate terms, whose results were brought to the attention of the board of the institution. Thus, it was assumed that the death certificates of 011, after the cited study, would be more appropriately filled than the previous, from 2009. Data collection was conducted in the Health Department of the Municipality of Joaçaba / SC, where the DC are stored, being excluded from the study the forms from other hospitals and / or locations.

Data were collected from the original statements of death, directly sent from the hospital to the Health Department, prior to any changes that would subsequently be made by the responsible, for filing purposes and organization of data. The considered correct DC had all the items (from II to VII) adequately filled out. The procedure was approved and supervised by the responsible for the sector of the municipal health department and by the research ethics committee.

Aiming to identify and analyze problems reported by physicians in filling out death certificates, a questionnaire with 15 closed questions was applied within the participants of the hospital's medical staff. For data analysis, Excel spreadsheets and the BioEstat 4.0 system, with a significance level of $p < 0.05$, were used.

Results

Regarding the filling, from the 298 death certificates from 2009 that were analyzed, 205 (68.79%) presented a complete form and 93 (31.21%), incomplete. In 2011, from the 230 analyzed DC, 58 (25.21%) presented a complete form, and 172 (74.79%), incomplete ($p < 0.001$). In total numbers, 528 death certificates were analyzed, from which 263 (49.81%) were fully completed and 265 (50.18%) were incomplete (Table 1).

Table 1. Filling of DC in 2009 and 2011.

Filling	Years (%)		
	2009 n (%)	2011 n (%)	Total n (%)
Complete	205 (68,79)	58 (25,21)	263 (49,81)
Incomplete	93 (31,21)	172 (74,79)	265 (50,18)
Total (%)	298 (100)	230 (100)	528 (100)

(p<0,001)

By correlating the underwriters physicians of death certificates within the years 2009 and 2011, in a model that has divided them in the categories medical assistants, substitute, coroner (IML), others and not filled, it was found that 267 (89.60 %) DCs were signed in 2009 by medical assistants, 13 (4.30%) by substitutes, 3 (1%) by coroners, 12 by other physicians (4.10%) and 3 (1%) were not filled. In 2011, 155 (67.40%) were signed by medical as-

sistants, 24 (10.42%) by substitutes, 12 (5.22%) by coroners, 12 (5.22%) by other physicians and 27 (11.74%) were not filled. Variations showed statistical significance (p <0.001). In total numbers, 422 (79.92%) DCs were signed by medical assistants, 37 (7%) by substitutes, 15 (2.84%) by coroners, 24 (4.54%) by other physicians and 30 (5.68%) were not filled (Table 2).

Table 2. Medical categories of filled DCs in 2009 and 2011

Physician	Years (%)		
	2009 n (%)	2011 n (%)	Total n (%)
Assistant	267 (89,60)	155 (67,40)	422 (79,92)
Substitute	13 (4,30)	24 (10,42)	37 (7)
Coroner	3 (1,00)	12 (5,22)	15 (2,84)
Other	12 (4,10)	12 (5,22)	24 (4,54)
Not filled	3 (1,00)	27 (11,74)	30 (5,68)
Total (%)	298 (100)	230 (100)	528 (100)

(p<0,001)

The use of vague or inadequate terms was seen in 19 (6.37%) of the 298 DC in 2009, being the "cardiac arrest" (10 - 3.35%) and "multiple organ failure" (3 - 1%) the most widely used. In 2011, from the 230 DCs, 15 (6.52%) had inadequate or vague terms, being "cardiac arrest" (5 - 2.17%) the most frequent. In total, the 528 DCs examined, 34 (6.43%) had inadequate or vague terms, prevailing "cardiac arrest" in 15 (2.84%).

From the 54 doctors of the medical staff, 34 (62.9%) had participated in the survey. Regarding knowledge about the document of the Federal Council of Medicine (FCM) / Ministry of Health entitled the death certificate: necessary and important document, it was found that of 34 (100%) of participating physicians, 16 (47.0%) knew it, 14 (41.2%) did not know and 4 (11.8%) abstained from answering.

Regarding the use of not recommended terms - as "cardiac arrest", "cardiorespiratory arrest" or "multiple organ failure" - to fill the base cause on death certificates, it was found that 13 (38.2%) from the 34 participants used the terms, 17 (50%) did not use them and 4 (11.8%) did not answer.

When questioning the physicians about the greatest difficulties in completing the forms, in an question that allowed to choose more than one option, it was found that 14 (34.14%) had difficulty in filling DC without medical assistance; 10 (24.39%), in fulfillment of the basic, intermediate and immediate or terminal cause of death; 5 (12.19%), in the filling of violent deaths; 3 (7.31%), the filing about newborns (with less than 500 grams); 3 (7.31%) for amputations; 2 (9.75%) by other causes and 4 (9.75%) did not respond (Table 3).

Table 3. Main difficulties in filling DC

Difficulty by fillin DC	Nº (%)
Death among newborns	3 (7,31)
Violent death	5 (12,19)
Death with no assistance	14 (34,14)
Reporto on amputation	3 (7,31)
Basic, intermediate and immediate, and terminal cause	10 (24,39)
Other causes	2 (4,87)
Did not answer	4 (9,75)

Regarding the knowledge about filling the death certificate in relation to the time of medical training, the results showed that 13 (38.23%) physicians with training time up to 20 years considered their education good or very good; 11 (32.25%) as acceptable, and 3 (8.82%) as bad. With training time between 21 and 45 years, 3 (8.82%) of physicians considered their education good; 3 (8.82%) as acceptable, and only 1 (2.94%) as very bad ($p = 250$). In total numbers, 16 (47.02%) considered their education good or very good; 14 (41.18%) as acceptable, and 4 (11.76%) as poor or very poor (Table 4).

Table 4. Current knowledge and medical training time

Current knowledge	Training time		
	Up to 20 years n (%)	21-45 years n (%)	Total n (%)
Very good	1 (2,94)	0	1 (2,94)
Good	12 (35,29)	3 (8,82)	15 (44,12)
Acceptable	11 (32,35)	3 (8,82)	14 (41,18)
Bad	3 (8,82)	0	3 (8,82)
Very bad	0	1 (2,94)	1 (2,94)
Total (%)	27 (79,42)	7 (20,58)	34 (100)

($p=0.250$)

Discussion

Less than half of the death certificates examined in this study (49.81) has been completed in full (Table 1). A study conducted in Rio de Janeiro with 806 death certificates⁷ showed similar results: only 52.3% of the DCs examined were correctly filled. However, another study conducted in Belo Horizonte⁸ showed much higher number of incomplete forms. The death certificates of 282 institutions were examined: 141 (50%) came from the Cardiology Service of the Base Hospital (BH) and 141 (50%) from the Death Verification Services (DVS). Errors or failures in filling the forms occurred in 100% of the DC from the BH group and in 88.08% of the DVS group. Similar results were also found in studies conducted in Belém, in which 98.7% of the DC had at least one misconception in the form⁹. Elevated levels of ill-defined causes put into question the quality of information from death certificates and the consistency of using these data for certain geographical units¹⁰.

As occurred in the present study, the problems in filling usually appear clearly on all items of the

death certificate, from the identification data, pregnancy history of the mother, even in the causes of death, being reinforced when deaths occur with no medical assistance⁷.

In the institution in where this work was conducted, it became evident that, in 2010⁶, the internal disclosure of results of a work completion of medical school has pointed imperfections in the filling of DC and had the participation of one of the responsible by the ITU (Intensive Therapy Unity), although no desired effect for the improvement in the filling had emerged. When examining the results of 2009, it was found that among the 298 existing DCs, 205 (68.9%) were correctly filled. In 2011, contrary to what was expected, from the 230 death certificates, only 58 (25.21%) were correctly completed (Table 1).

To try to identify the causes of worsening seen above, the professional categories of doctors responsible for filling in the two periods were examined. It was noted that, in 2009 89.60% of the DC were filled out by medical assistants, a number that had decreased in 2011 to 67.40% ($p < 0.001$). Thus,

it was inferred that the filling of DC for a lower number of medical assistants may have contributed to the worsening of DC filled in 2011 (Table 2).

Several factors may contribute to the incorrect reporting of DC, such as the medical care provided at the time of death, the type of service used by the patient at the time of death (Emergency, ITU, obstetrics, medical clinic) and, yet, if the professional who gave the assistance was not the same person who filled out the death certificate¹¹. The not assistant physician obviously has less information and knowledge about the patient, disadvantaging a complete filling.

Regarding the knowledge of the Ministry of Health and the Federal Medical Council, it was found that 47.02% knew him. This result is close to what was seen by other authors¹² who interviewed 18 physicians and only 40% said they knew the document. Thus, although there is this elaborate instruction, there is a high level of professionals who do not know the form, hindering a proper filling.

Regarding the use of not recommended terms - as "cardiac arrest", "cardiorespiratory arrest" or "multiple organ failure" - to fill underlying cause on death certificates, part of the doctors (38.2%) claimed to use. In this study only 34 (6.43%) of DC with the use of vague or inadequate terms, being "cardiorespiratory arrest" in 15 (2.84%) documents the most frequent occurrence.

The document FCM/MH² has discouraged the use of these terms in the completion of the basic causes of death. Other studies showed higher rates of vague or inadequate terms. The cited study in Belo Horizonte showed that the terms "shock" (35%), "respiratory failure" (30%), "cardiorespiratory arrest" (10%) and "multiple organ failure" (5%) were used as underlying causes of death¹². In research conducted in Belém, the use of vague terms - "respiratory failure", "cardiorespiratory arrest" and "multiple organ failure" - was found in 55% of DCs⁹, much higher than what was observed in the present study. In South Africa, a study conducted with 304 DCs encountered the inappropriate diagnosis of "cardiorespiratory arrest" in an even higher number: 78.9% of cases¹³.

In data analysis, it became evident that the majority of physicians participating (58.53%) reported difficulties in completing the declaration in case of death without medical assistance and in items related to basic, intermediate and immediate, or terminal causes of death. A similar result was seen in the study developed in Belo Horizonte¹², in which 68% of physicians reported some difficulty in

filling out the form. In that study, the main difficulties identified were: lots of fields to be filled (31%), violent death (16%), unclear explanations on filling (11%), imposition of registries (5%) and filling in the condition substitute physician (5%).

Regarding the knowledge about the DC acquired during graduation, approximately half of the physicians considered the education good or very good (47%). Others classified it as acceptable, poor or very poor, highlighting the need to emphasize the knowledge of this study during medical undergraduate. There were no differences in the knowledge about the completion of death certificates when comparing the groups by length of training ($p = 0.250$). However, it should be taken into account the bias arising from the subjective component of a self-assessment, given that other studies have pointed to more frequent problems in filling the form by younger physicians^{14,15}.

A study conducted in Fortaleza¹⁶ showed significant reduction of poorly defined causes on death certificates from 2003 to 2008. In the premise of improving the filling of DC, and consequently the information on MIS, it was recommended a greater integration between service and medical education, providing better learning of student and understanding the importance of epidemiological data. Besides, the study proposes to integrate the different information systems available, to compose a technical group for analysis of MIS and to promote partnerships with the Regional Board of Medicine and Health Departments.

Internationally, a study made with 317 physicians from Qatar¹⁴ found that only 22.7% had received prior training on the death certificate and the main difficulties that were pointed on filling in difficult cases (47.3%) and the lack of training (43.55%). Another interesting study conducted in Australia¹⁷ suggests workshops for the training of physicians in filling out death certificates. The research showed that the hit rate increased from 33.3% before training to 69.2% after training. In Taiwan¹⁵, a survey inferred similar suggestion, but the authors emphasized the need to promote training directed to younger doctors and hospitals with little or no teaching activity, where the deficiency on filling the form was greater. In this wide study, 4,123 death certificates were analyzed of which only 61% were correctly completed.

A study made in Recife¹⁸ has suggested that the deficiency in the quality of filling records of DC relates to the undergraduate course in Medical School due to the little importance credited to the knowledge of the data as a source of information for

the health of population. This distortion affects negatively the comprehension of the records generated by this valuable tool for gathering information.

Thus, it is assumed as necessary for graduation, post-graduation and professional practice, to provide as much information for physicians about the importance of the death certificate, teaching them how to fill it correctly and completely, either in the detailing of the underlying cause of death or in the sequence of events and in the use of precise terms.

While filling the form by a physician is designated in the Law 6015/73 as a certificate, the designation of the document containing the complete information to be forwarded to the registry office and the municipal health department was consecrated as *death certificate* by Law 11.976/09^{4,19}. The need for a greater emphasis on the training about the death certificate, for its correct completion, became evident in this law⁴, which emphasizes both the medical origin of the document as its statistical purpose, whose medical-sanitary interest is highlighted by several authors^{19,20}. For a greater effect and effectiveness in completing the form, the Resolution 1779/05²¹ from the FCM specified that the death certificate must be completed by the medical assistant or his substitute, or also by a physician designated by the institution and, in the case of violent or suspicious death, by coroners.

The deficiencies identified in filling out the DC demonstrated the need for a greater encouragement in the study of death certificates during graduation^{14,15} and graduate programs, as well as promoting events related to medical activity, with effective results even when they represent single activities^{16,17}. The claim made by some physicians that the document is complicated to be filled out can be attributed to the limited information received. However, the filling of the DC form, in ever greater numbers, by physicians who are not medical assistants may be creating a subsequent difficulty that contributes to incomplete or inadequate completion of DC.

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The joint efforts of the FCM and MOH to draft a document aimed to guide and regulate², in simple language, for strengthening the commitment of the physician with the important and correct completion of death certificates. However, for this goal to be achieved, the disclosure of this guidance must occur with greater intensity, not only in undergraduate and graduate education, but also to all doctors in the profession.

Final Considerations

Half of the death certificates analyzed were incomplet and, contrary to expectations, there was a decrease in the number of full-fills during 2011 compared to 2009 ($p < 0.001$).

These results contrast with the epidemiological importance of filling these data for the country's public policies of health and point to the need of improving trainings on the death certificate. It is inferred that the approach to this issue during medical education should occur not only in forensic medicine, but along with the content of other disciplines, including Medical Ethics for the moral aspects involved. In this context, FCM / HOM orientation - called Death Certificates: necessary and important document² - is included as a source of study for undergraduate and as consultation for professionals. It is also proposed that Medicine Councils, the Ministry of Health (MOH) and other related institutions promote events in their workshops on filling out the death certificate - whose effectiveness in hit rate transpires in the results of those participate once.

In conclusion, the teaching on death certificate during medical undergraduate, graduate and professional practice must be encouraged and the existing guidelines to be disseminated more effectively. Further studies are necessary to identify gaps in medical training and the difficulties that occur during professional practice, so that more comprehensive solutions are identified.

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Participation of authors

Luan Lucena and Gustavo Henrique Bocalon Cagliari: desing of the study, data collection and interpretation, and writting. Julio Tanaka: co-orientation, data interpretation and writting. Elcio Luiz Bonamigo: coordination, study design, data interpretation and writtingo.

