

Original article

Gaps and Opportunities in Death Certification and Mortality Reporting Systems in Libya: A Framework-Based Documentary Analysis

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ABSTRACT

Accurate death certification and mortality reporting are essential for reliable Civil Registration and Vital Statistics (CRVS) systems and evidence-based health planning. This study conducted a framework-based documentary analysis of Libya's death certification and mortality reporting systems using national legislation, institutional reports, technical guidance, and relevant scientific and international publications. The documents were analysed against World Health Organization (WHO) CRVS standards, focusing on death registration and certification, cause-of-death reporting and ICD coding, institutional coordination, data quality, and dissemination. We analysed 38 documents published between 1968 and 2026. The findings showed that Libya has important structural foundations, including a comprehensive legal framework, mandatory death registration, and expanding electronic registration. However, gaps were identified in the availability and dissemination of guidance, standardisation of cause-of-death certification, ICD coding capacity, institutional coordination, routine data quality assurance, and dissemination of mortality statistics. Strengthening operational guidance and training, improving institutional coordination and data quality mechanisms, and ensuring timely dissemination of mortality data could enhance the quality, completeness, and usefulness of mortality statistics in Libya.

Introduction

Accurate mortality data are fundamental for public health planning, efficiently tracking mortality trends in a population, policy development, and monitoring population health. Death certification, particularly the correct identification of the underlying cause of death, is a key component of functional Civil Registration and Vital Statistics (CRVS) systems. Standardised death certification ensures comparability of mortality data across regions and over time. The lack of information on causes of death limits the detection of emerging diseases and conditions and the identification of areas where medical research can have the greatest impact, thus deterring subsequent action by decision makers [1]. It can also hinder the allocation and distribution of health sector resources and the monitoring of programmes, including those relevant to Sustainable Development Goals (SDGs). The SDGs have 67 health indicators and 23 health-related targets, several of which are mortality indicators, while others depend on CRVS data to track progress toward achieving the SDGs [2]. The World Health Organization (WHO) has developed international guidelines for medical certification of cause of death and the International Classification of Diseases (ICD), which serve as global standards for mortality reporting and enable standardised comparison of data within and across countries [3]. Despite these frameworks, many low- and middle-income countries face persistent challenges in death registration completeness and accuracy of cause of death data. Weak institutional coordination, lack of standardised guidelines combined with limited technical capacity remain the most commonly cited barriers to data quality [1]. Libya's CRVS system is managed by the Civil Registration Authority (CRA) under the Ministry of Interior, which is responsible for registering births, deaths, marriages, and other civil events through 12 branches and 380 service offices across the country. Civil registration is governed by Law No. 36 of 1968, and all offices have been fully automated and connected to a central database using the national identification number as a unique identifier since 2013 [4]. Deaths occurring in health facilities are certified by attending physicians using a medical certificate of cause of death that corresponds to WHO principles [3]. Deaths suspected to be unnatural and unexplained undergo medico-legal investigation before registration. Information from all certification pathways is submitted to the CRA for issuance of burial permits and official death registration (Figure 1). Finally, the Bureau of Statistics and Census (BSC) publishes annual reports [5]. Recent reforms linking burial permit issuance to the deactivation of the national identification number of the deceased have reduced registration delays, with a national assessment estimating death registration coverage at over 95% [World Health Organization Regional Office for the Eastern Mediterranean [6]. Incomplete or incorrectly completed death certificates contribute to a high proportion of ill-defined causes of death, underscoring the need for improved physician training and strengthened mortality coding practices [7]. The availability of trained coders remains critical for accurate assignment of ICD codes and identification of the underlying cause of death. Recent collaboration between the CRA and the Ministry of Health (MoH) through the Health Information Centre (HIC) has supported the publication of a national cause of death and annual CRVS reports. Moreover, the HIC, with the support of WHO, has

started ongoing physician training and advocated the incorporation of death certification into formal medical education in order to strengthen the quality and usefulness of mortality statistics [8]. Nevertheless, despite these developments, significant challenges related to death certification quality and cause-of-death data accuracy persist. The system does not yet fully meet international standards in several areas [9]. In addition, there has been no comprehensive framework-based documentary analysis examining the legal, institutional, and operational dimensions of death certification and mortality reporting against internationally recognised standards. This study aims to conduct a framework-based documentary analysis of Libya's death certification and mortality reporting system, examining its legal, institutional, and operational components and its alignment with the WHO guidance to identify strengths, gaps, and opportunities for system strengthening and improvement.

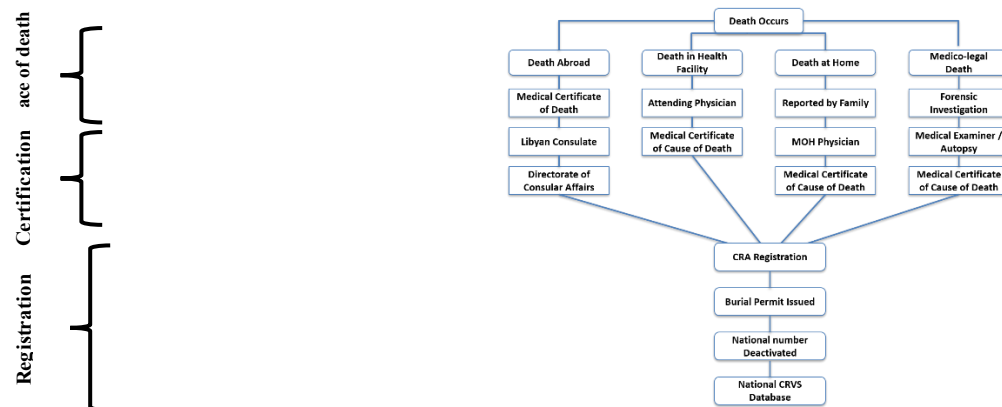


Fig. 1. Mortality Data Flow and Registration Process in Libya

BSC: Bureau of Statistics and Census, CRA: Civil Registration Authority, EMRO: Eastern Mediterranean Regional Office. HIC: Health information centre, MoH: Ministry of Health, WHO: World health Organization, UNFPA: United Nations Population Fund

Methods

This study employed a framework-based documentary analysis to examine the legal, institutional, and operational components of Libya's death certification and mortality reporting system. The analysis was based on national legislation, policy documents, institutional reports, technical guidance, and relevant scientific literature, and was guided by the WHO standards for CRVS systems. Data were collected from 1) a systematic search using PubMed and Google Scholar; 2) solicitation of documents from the WHO Regional Office for the Eastern Mediterranean; and 3) manual search for relevant national reports. The search was designed to be inclusive of all documents related to death certification, mortality data, death records and registration, and mortality statistics in Libya. The websites of the HIC, MoH, BSC and CRA were screened for publications and reports on the subject. In addition to national and academic database searches, the WHO website, the World Bank Documents and Reports repository, and other UN agencies were searched. Published and unpublished national reports and documents were also included in the search. For the literature search, the following keywords and terms ("Death Registration" AND Libya), ("Death Certificates" AND Libya), ("Death record" AND Libya), ("cause of death" AND Libya) and ("Death Certification" AND Libya) were used. To be included in the study, documents must relate to Libya's death certification or CRVS system, in both Arabic and English languages. The term "mortality" was also used in place of "Death". Documents that contained only demographic profiles or health indicators without substantive information on death certification or mortality reporting processes were excluded from the analytical dataset. Finally, retrieved documents were searched for any reference to "guidelines on death registration", "guidelines on death certification", "standard death certification" and "standard death reporting". The reference lists of identified articles were also searched for additional relevant literature. Relevant information was extracted from each document using a structured extraction framework that recorded the document type, year of publication, issuing organization, scope, and information relevant to predefined analytical domains. The extracted information was synthesised using a framework analysis approach: The analytical framework examined the availability of key system components, including the legal and regulatory framework, death registration procedures, medical certification of cause of death, ICD coding practices, institutional coordination, mortality data dissemination, workforce capacity, and quality assurance mechanisms. Evidence from multiple documentary sources was compared across these domains to identify areas of alignment with WHO recommendations, existing gaps, and opportunities for strengthening Libya's death certification and mortality reporting system.

Results

A total of 38 documents were identified and included in the analysis, spanning the period from 1968 to 2026 [4-6, 9-38]. These comprised peer-reviewed articles, national institutional reports, legislative documents, international guidelines, and

CRVS assessment reports. The documents included a series of annual statistical reports published by the BSC [5] and three unpublished CRVS reports commissioned by the HIC [38]. Four additional documents containing Libya country profiles and indicators were identified but excluded from the main document list [10-13]. The majority of documents were produced by national institutions including the CRA, MoH, HIC and BSC, with a smaller proportion sourced from WHO and other international agencies. Few documents specifically addressed guidelines for mortality registration and certification in the Libyan context. A summary of included documents by type, source and publication date is presented in (Table 1). Regarding policies and legal framework, the legislation governing civil registration is well defined and established. Registration of deaths is compulsory within one day and registration of births within ten days, with penalties applied for delayed or non-registration. Despite this legislative framework, the analysis identified limited documentary evidence of standard operating procedures (SOP) for civil registrars. With respect to death certification and cause of death data, the reviewed documents confirmed that cause of death reporting is incomplete. A death certification manual developed by the HIC was identified but is available primarily in paper form and is not widely distributed across health facilities. SOPs for physicians on death registration and cause of death completion were also identified but without evidence of broad dissemination. The most recent national cause of death report documented a high proportion of ill-defined and underspecified causes. No documentary evidence was identified indicating the availability of dedicated ICD mortality coders within the healthcare system or structured national programmes for continuing training in mortality coding. Concerning the use, dissemination and review of mortality data, the reviewed documents revealed limited evidence of systematic mortality data collection for decision-making and health planning. No comprehensive monitoring and evaluation plan was identified, and no institutionalised data quality assessments were found. Mechanisms for regular reporting, dissemination and feedback were found to be absent or underdeveloped. The functioning of the CRVS system was disrupted by the armed conflict that began in 2011, which resulted in the interruption of routine data collection and reporting. The first CRVS report to include data from 2013 onwards was not published until 2020, covering vital events from 2013 to 2019 retrospectively. Annual CRVS reports and cause-of-death publications have been produced inconsistently, and the 2019 ICD-coded cause-of-death report covering 2016–2017 represents the only such publication identified in the review period. Comparison of the findings against WHO standards for death certification and CRVS systems identified several areas where further strengthening is warranted (Table 2). These included: absence of clear SOPs for civil registrars; no dedicated ICD coders in the healthcare system; insufficient training on mortality coding for health staff; lack of widely available guidelines for physicians on completing the medical death certificate; absence of regular structured training of physicians on death certification and cause of death data completion; no direct electronic linkage between the CRA and MoH; and no institutionalised mechanism for data quality audit and feedback. Conversely, the analysis identified several strengths, such as a comprehensive legal framework for civil registration, high reported completeness of death registration, national implementation of electronic civil registration, and enhanced collaboration between key national institutions involved in mortality reporting.

Table 1. Summary of the document analyzed in the study.

No	Title	Source	Type	Year	No of documents
1	Civil Registration Act, No. 36 of 1968 ⁴	HIC-MoH	National legal document	1968	1
2	The vital registration and statistics systems In Libya and its improvement ¹⁴	International Institute for Vital Registration and Statistics	International guidelines	1991	1
3	Medical Records Manual: A Guide for Developing Countries ¹⁵	WHO	International guidelines	2006	1
4	Minister of Health Decree No. 152*	HIC-MoH	National legal document	2006	1
5	Guide for recording death certificate ¹⁶	HIC	National guideline	2007	1
6	Time series for vital statistics: 1977-2007 ¹⁷	The general authority for information	National report	2007	1
7	Improving the Quality and Use of Birth, Death & Cause-of-death Information ¹⁸	WHO	International guidelines	2010	1
8	Vital statistics report ¹⁹	Ministry of Planning- BSC	National report	2011	1
9	Series of Statistical books Libya- 2006-2012 ⁵	Ministry of Planning- BSC	National report	2012	7
10	Regional strategy for the improvement of civil registration	Regional Committee for the Eastern Mediterranean Resolution: Sixtieth	Strategy report	2013	1

	and vital statistics systems ²⁰	session- EM/RC60/10			
11	Rapid Civil Registration and Vital Statistics Assessment– Libya ²¹	WHO-EMRO	Assessment report	2013	1
12	Regional strategy for the improvement of civil registration and vital statistics systems (2014-2019) ²²	WHO-EMRO	Strategy report	2014	1
13	Progress report on the regional strategy for the improvement of civil registration and vital statistics systems 2014–2019 ²³	Regional Committee for the Eastern Mediterranean, Sixty-second session-EM/RC62/INF.DOC 8 Rev.2	Strategy report	2015	1
14	Comprehensive Civil Registration and Vital Statistics Assessment– Libya ⁶	WHO- EMRO	Assessment report	2017	1
15	National Statistical System Assessment of Libya ²⁴	UNFPA	Assessment report	2016	1
16	Health Information System Strengthening Strategy (2018-2022) ²⁵	HIC-MoH and WHO-EMRO	Strategy report	2017	1
17	Libyan Health Information System - Assessment and roadmap of priority actions ²⁶	WHO- EMRO	Assessment report	2017	1
18	Trends and projections of demographic indices of Libyan population using a fifty-year census data 1954-2016 ²⁷	African population studies Journal	Research article	2019	1
19	Libyan Cause of Death Report: Analysis of cause of death data for two years 2016-2017 ⁹	HIC-MoH and WHO-EMRO	National report	2019	1
20	Trends and patterns of deaths, injuries and intentional disabilities within the Libyan armed conflict: 2012–2017 ²⁸	BMC Public Health	Research article	2019	1
21	WHO methods and data sources for country-level causes of death (2000-2019) ²⁹	WHO	International guidelines	2020	1
22	SCORE for Health Data- Assessment Summary for Libya (data from 2013-2018) ³⁰	WHO-EMRO	Assessment report	2021	1
23	WHO civil registration and vital statistics strategic implementation plan (2021-2025) ³¹	WHO	Strategy report	2021	1
24	The impact of armed conflict on the epidemiological situation of COVID-19 in Libya, Syria and Yemen ³²	Frontiers in Public Health	Research article	2021	1
25	Advancing civil registration for vital statistics in the Arab countries ³³	UNFPA	International guidelines	2022	1
26	Vital statistics report 2020 And Summary of 2013 – 2019 Civil Registration Data ³⁴	HIC-MoH	National report	2022	1
27	Standard Operating Procedures for Physicians on Death Registration and Cause of Death Completion ³⁵	WHO	National guidelines	2023	1

28	Vital statistics report 2021 ³⁶	HIC	National report	2023	1
29	Vital statistics report 2012-2022 ³⁷	BSC	National report	2024	1
30	Vital statistics reports 2022-24 (unpublished) ³⁸	HIC	National report	2025	3

*Published internally within Ministry of Health facilities and directorates.

BSC: Bureau of Statistics and Census, EMRO: Eastern Mediterranean Regional Office. HIC: Health information centre, MoH: Ministry of Health, WHO: World Health Organization, UNFPA: United Nations Population Fund

Table. 2. Gaps in mortality reporting systems and their alignment with the WHO framework.

WHO analytical domain	Evidence identified	Main gap identified
Legal framework	Established	No documented SOPs for registrars
Death certification	National certificate and manual	Limited dissemination and training
ICD coding	Limited training in mortality coding	No documented dedicated coders
Data quality	National reports available	No documented routine quality audits
Institutional coordination	CRA-MoH collaboration	Limited electronic integration

SOP: Standard Operating Procedure, ICD: International Classification of Diseases, CRA: Civil Registration Authority, MoH: Ministry of Health.

Discussion

This study provides a structured assessment of death certification and mortality reporting systems in Libya through a framework-based documentary analysis of 38 national and international documents spanning nearly six decades. The findings indicate that Libya has established many of the structural elements required for a functional CRVS system, including a comprehensive legal framework, mandatory death registration, nationwide civil registration infrastructure, and the progressive adoption of electronic registration systems. However, the analysis also highlights significant gaps in the availability and implementation of national guidelines, as well as weaknesses in data collection, reporting, quality assurance, and dissemination of mortality information that may limit the production of complete, reliable, and internationally comparable mortality statistics. A key finding is the fragmentation of the CRVS system, with multiple institutions such as the CRA, MoH, HIC, and BSC, operating without fully integrated processes or formal data-sharing mechanisms. This fragmentation affects the completeness, timeliness, quality, and usability of mortality data and is consistent with findings from other low- and middle-income countries where weak institutional coordination has been identified as a primary barrier to reliable mortality statistics [39-40]. The disruption caused by the armed conflict beginning in 2011 compounded these challenges, interrupting routine data collection and contributing to the considerable delay between data collection and publication documented in this review. The considerable delay between data collection and publication demonstrated by the 2020 CRVS report, which retrospectively covered vital events from 2013 to 2019, reflects the broader challenge of sustaining routine reporting functions during and after periods of conflict and institutional disruption, a pattern documented in other fragile and conflict-affected settings where routine administrative systems are often among the first public functions to be disrupted and among the last to recover [32-41]. The challenges identified in this study are consistent with findings from other low- and middle-income countries in the region, where CRVS systems frequently face issues related to incomplete death registration, lacking or poor-quality cause-of-death data, along with limited use of standardised classification systems. The absence of standardised death certification practices and limited use of ICD coding have been shown to significantly reduce the reliability of mortality statistics in comparable settings [42-44]. The high proportion of ill-defined causes of death documented in Libya's national cause of death report reflects a pattern widely observed across the region, attributed primarily to insufficient physician training and the absence of dedicated mortality coders [42, 45]. The study identified several important opportunities that provide a potential foundation for system strengthening. Libya has achieved death registration completeness of over 95%, which compares favourably with many countries at a similar stage of CRVS development and provides a strong base upon which improvements in data quality can be built. The active collaboration between the CRA and MoH through the HIC represents an established institutional partnership that has already demonstrated its capacity to produce national outputs, including the first ICD-coded cause of death report covering the years 2016 and 2017 [9] and the retrospective CRVS reports covering 2013-2024 [34-36-38]. The formal establishment of an interagency coordinating committee between the CRA and HIC provides a functioning governance structure that can be leveraged to drive further reforms. The ongoing integration of death certification training into the Community Medicine curriculum at the University of Tripoli represents a long-term investment in future physician awareness that, combined with in-service training initiated since 2015, is beginning to address one of the most consistently cited barriers to data quality. The availability of internationally developed tools, including the WHO ICD coding guidelines and automated coding software, implies that Libya does not need to develop these resources from scratch, but can adapt and implement existing frameworks with appropriate technical support. These strengths suggest that the conditions for meaningful improvement are present and that, with stakeholders' commitment and targeted

investment in standardised capacity building and system integration could yield significant improvements in mortality data quality could be achieved within a relatively short timeframe. The findings should be interpreted in light of the study design; a documentary analysis's primary limitation is reliance on documentary evidence rather than directly evaluating practices within healthcare facilities or registration offices, which may not fully reflect actual practices at the facility level. Nevertheless, documentation itself constitutes an essential component of well-functioning CRVS systems because policies, procedures, governance arrangements, and quality assurance mechanisms should be clearly defined, accessible, and consistently implemented. The available documentary evidence therefore provides valuable insights into transparency and the institutional development of Libya's mortality reporting system. Despite these limitations, this study represents one of the first structured assessments of death certification and mortality reporting systems in Libya, using a comprehensive document analysis approach guided by international frameworks. Future research incorporating field assessments, stakeholder interviews, and facility-based evaluations would complement these findings by providing direct evidence on implementation and operational performance.

Conclusion

This study identifies several overarching challenges in Libya's mortality data and death registration system, including fragmentation of institutional responsibilities and absence of standardised procedures in addition to insufficient capacity for data analysis. At the same time, notable opportunities exist, including the active collaboration between the CRA and MoH through the HIC, the recent publication of ICD-coded cause-of-death reports and annual CRVS reports, and the ongoing integration of death certification training into medical education, all of which provide a viable foundation for reform. By assessing the system against internationally recognised CRVS standards, this study identifies key priorities for strengthening mortality reporting and improving the quality, completeness, and timeliness of mortality data. The findings provide a baseline for future evaluations and can inform national efforts to enhance mortality surveillance and evidence-based health policy.

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