

## The development of cause-of-death registration in the Netherlands, 1865–1955

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As elsewhere in Europe in the middle of the nineteenth century, general dissatisfaction among Dutch doctors with their position in society and with overall levels of public health led to an active endeavour to raise their own status and to improve the level of public hygiene. For the most part these sanitary reformers or hygienists were inspired by the ‘Bodentheorie’ (literally ‘soil theory’) of the Munich hygienist Max von Pettenkofer, which postulated a specific relationship between chemical and biological processes in soil and air and in the human body, and by the Belgian statistician Adolphe Quetelet, according to whom statistics were an important means to social progress. The hygienists stressed the need for objective measures of health, including empirical research, standardization of data collection, and increased dissemination of data.<sup>1</sup>

Although a national system of death registration had been functioning in the Netherlands for more than thirty years,<sup>2</sup> there was no national registration of causes of death. Only local registration of causes existed and these were considered insufficient and inaccurate.

### I. THE TRANSITION TO A NATIONAL, COMPULSORY, MEDICAL CERTIFICATION OF CAUSE OF DEATH

Local systems of registration of deaths by cause emerged during the second half of the eighteenth century. Physicians and local councils came to realize that death was a social phenomenon and that prevention and control of diseases dictated the need for detailed data on the underlying

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causes of disease.<sup>3</sup> The first attempts to serve this interest in mortality data devolved from the municipal council of The Hague, which established a system of disease and death registration in 1755. The person reporting the death to the town clerk's office included a declaration of causes.<sup>4</sup> Other cities such as Alkmaar, Rotterdam, and Amsterdam followed this example and began to compile cause-of-death statistics in the 1770s.<sup>5</sup> Under French influence the Netherlands moved to a centralized system of government in 1795, adopting in 1798 a Constitution that envisioned a civil service responsible for the implementation of a standardized system of registration of vital events and for a central medical authority. The publication of an annual list of the total number of deaths for the country as a whole – classified according to age, sex, and, if possible, cause of death – was part of the planned reorganization.<sup>6</sup> This draft proposal for a national system of death registration was closely modelled on the report which J. van Heekeren, Jr, a member of the Medical Supervisory Committee in Amsterdam, had submitted earlier to improve the system of death registration in Amsterdam.<sup>7</sup>

Due to the implied costs to keepers of christening and burial records, the restrictiveness of the legislation, and subsequent change in the personnel of the committee, no national system of death registration was subsequently introduced.<sup>8</sup> However, when in 1810 the Dutch Republic was annexed by France and the *Code Napoléon* began to have force of law, the Imperial Decree of 19 April 1811 (*Bulletin des Lois*, no. 6872) made a uniform system of death registration mandatory. The French occupation ended in 1813, but the Napoleonic Code's broad guidelines remained in place until the Dutch Civil Code of 1838 (the *Burgerlijk Wetboek*, hereafter *BW*). Under both codes, each municipality was required to keep a register of deaths, reflecting death certificates issued by the registrar. The law stipulated only that notification of a death must be provided by someone with first-hand knowledge of it; no fixed period of notification was set.<sup>9</sup>

In practice family members had an interest in obtaining a death certificate, and typically undertakers provided the notification. Each deceased person was identified by name and surname, age, occupation, municipality of residence, and hour and day of death. The registrar was not allowed to create either a birth or a death certificate if a child's death was reported before the birth certificate had been issued. Rather a special certificate reflected only the day and hour of the delivery, name and surname, and the occupation and residence of the child's parents. By the 1820s, national mortality data were processed and published regularly, even though a specific office within the Ministry of the Interior to do this was not created until 1826.<sup>10</sup>

When in 1849 the *Nederlandsche Maatschappij tot bevordering der Geneeskunst* (Dutch Society for the Promotion of Medicine, hereafter *NMG*) was founded, the branch of the *NMG* in Amsterdam prompted physicians there to review the serious shortcomings of local cause-of-death registration. As the information was provided by people with no medical training, thus ‘based on the opinion of bystanders and servants of the deceased person’,<sup>11</sup> the accuracy of reported causes of death was considered highly dubious. Local medical committees or registrars then typically classified these causes according to an aetiological model of disease causation. Diseases were described as *species* and *genera morborum*, based on their outward aspects, and were considered to be entities that could flourish and die following environmental changes.<sup>12</sup> Instead Johannes Zeeman and Abraham Hartog Israels, both members of the Medical Statistical Committee of the Amsterdam branch of the *NMG*, wanted classification based upon the body organ affected. They argued that such anatomical classification would increase the reliability of the reported causes of death, as well as suggest the means by which deaths could be reduced. The registrars, however, were not prepared to cooperate.<sup>13</sup>

Curiously, a long-standing popular fear of being buried alive, in a state of ‘suspended animation’ or *schijndood*, persuaded doctors to assist the registration process without reforming the classification schemes. Article 53 of the Dutch Civil Code (the *BW*) had stipulated that no person could be buried without a registrar’s permission. The registrar, in turn, was required to establish that the person was indeed dead. This regulation proved difficult to enforce, because personal verification of a death was impossible for busy registrars, and the reporting person was not required to have medical expertise. Thus in 1852 a draft burial bill contained a provision prohibiting registrars from issuing a burial certificate without medical confirmation of the death. Aimed at preserving public order and safeguarding public hygiene, the bill did not at this point require a cause of death to be reported by a medical authority, but with persistent pressure from doctors<sup>14</sup> the 1858 revision of the proposed bill included such a provision.<sup>15</sup> The stated aim was not only to guarantee ‘that no person in a state of suspended animation would be buried, [and] that no person whose death had been violent would be committed to the earth without the knowledge of the authorities’, but also to provide a basis for ‘medical mortality statistics, the vital importance of which is self-evident’.<sup>16</sup>

Members of Parliament regarded this provision requiring certification of death by a qualified doctor as an improvement, but questioned its chances of being implemented, particularly in rural regions where

physicians and medical services were scarce. Moreover, legislators worried that where the deceased was unknown to the doctor, the correct cause of death would be difficult to state. Finally, they worried that divulging the cause of a death might conflict with the physician's oath of confidentiality.<sup>17</sup> The complex nature of the issue and the collapse of various government cabinets delayed passage of the Burial Act until 1869.<sup>18</sup> In the interim between the proposal and the passage of the Burial Act, important changes at the local level occurred. In July 1853, Amsterdam passed regulations prohibiting registrars from granting permission to bury without a medical certification that the individual was indeed dead.<sup>19</sup> Soon afterwards, the Medical Practitioners' Circle (*Geneeskundige Kring*) in Amsterdam agreed 'to personally monitor registration certificates, to ensure that local registrars had accurately and truthfully stated the nature of the disease'. They further concluded that a new disease classification system would have to be established at the Registry of Births, Deaths, and Marriages, which would enable each reported case to be added to the annual compilation of data.<sup>20</sup>

In a March 1854 meeting of the Medical Practitioners' Circle, Dr Jacobus Penn urged the membership to lend their support to new initiatives in Amsterdam in reporting causes of death. English mortality statistics provided a good model, with which the Circle could assist in 'obtaining similar, promising mortality statistics in this country...'.<sup>21</sup> The new 'Disease Classification System' was admittedly flawed. It retained some of the 'old, incorrect terminology' including 'vernacular terms for one disease or another, and one or another way of dying'. The tables did include some more scientific-sounding names, but the new terms often described 'the most sensational or startling final symptoms of the disease'. The society had grouped these 'semi-nosological, semi-aetiological, semi-illogical details' under 100 columns loosely based on William Farr's system, which provided a consistent nomenclature and classification of causes of death for England and Wales. They then established ten cause-of-death categories, based on criteria which critics deemed 'semi-topographic/nosological, semi-aetiological, and partly a combination of the two'.<sup>22</sup> By the late 1850s the Amsterdam model was nevertheless adopted by Middelburg, Utrecht, Leiden, Haarlem, The Hague and Schiedam.<sup>23</sup> The Royal Commissioner for the province of South Holland considered the regulations implemented in Leiden and The Hague to be so important that he sent a circular in 1856 to the mayors of municipalities in his province urging implementation of similar practices. The Commissioner stressed the inadequacy of cause-of-death assessments given by 'undertakers or other unqualified persons who are not sufficiently capable

of formulating a correct opinion as to the nature of the disease in question'.<sup>24</sup>

Partly as a result of such local initiatives, contributors to medical journals in the 1860s pressed for the establishment of reliable, well-organized, national cause-of-death statistics. Israels, for example, highlighted the enormous importance of the contemporary debate on classification systems at the Second International Statistical Conference, hoping that the work of Farr and d'Espine would contribute to local Dutch initiatives.<sup>25</sup> The parliamentarian and medical doctor Wintgens also underlined the importance of the Conferences in Brussels and Paris, stressing to Parliament that the pending burial bill might provide the initiative for change.<sup>26</sup> The State Statistical Committee (*Rijkscommissie voor Statistiek*), created in 1858 to promote the uniformity, completeness, and accuracy of Dutch statistics, looked instead to a model formulated by Van Capelle and Zeeman in 1860 for prison mortality statistics, because it offered a 'small-scale experiment to test the effectiveness of a general system of mortality statistics'.<sup>27</sup> The 1861 meeting of the *NMG* focused on 'the best means of obtaining more accurate medical statistics', and already at the 1862 general meeting Lucas Jacob Egeling and Johannes Adrianus Boogaard, on behalf of the society's Statistical Committee, presented a 'Statistical Disease Nomenclature'.<sup>28</sup>

These efforts in part led to the introduction, on 1 June 1865, of the Public Health Inspectorate Act (*Wet regelend het Geneeskundig Staatstoezicht*) and the Medical Practitioners Act (*Wet op de uitoefening der geneeskunst*).<sup>29</sup> Under Article 15 of the former, municipal councils were required to send monthly reports to the public health inspector, detailing the number of local deaths. This inventory was then to be processed by the Public Health Inspectorate, which expected 'more than simply the number of deaths'.<sup>30</sup> Under Article 5 of the Medical Practitioners Act, upon the death of one of their patients doctors were required to submit to the registrar a medical certificate, in which they were to state as accurately as possible what was the cause of death but 'with due regard to their oath of confidentiality'. Verification that the patient was indeed dead was still the principal requirement, but this article made explicit the aim of obtaining well-organized mortality statistics.<sup>31</sup> While some members of Parliament worried about monthly inventories adding to the burden of paperwork upon municipal councils, most members were convinced that better mortality statistics would point the way to public health improvements.<sup>32</sup>

Article 5 of the Medical Practitioners Act, which required doctors to provide a cause of death, met with much more resistance. One parliamentary committee summed up the objections, saying 'this Article

imposes an onerous obligation on doctors, which they will not in many cases be able to fulfil without repeatedly travelling great distances to satisfy themselves of the state of decomposition of the body or of the actual cause of death'. Similar worries about the arbitrary, uncompensated demand on physicians' time were expressed, as well as the need for easy pre-printed forms to minimize the burden.<sup>33</sup> One member of Parliament, Mr Westerhoff, a doctor himself, felt that the present inexpertise of most doctors insured statistics of

no scientific value whatsoever because they will never be truthfully compiled and consequently cannot be relied upon. We have frequently glanced through statistics of this kind and many a time could not help laughing aloud... The words 'cause of death unknown' will not feature in these statistics, because in the eyes of the public, doctors are always supposed to know what a patient died of, which is why they... give any name they like as a cause of death. Nor will 'Death due to incorrect treatment' ever be filled in on these lists... Moreover, many doctors will simply fill in the name of a disease, regardless of whether that is the correct name of the disease the patient died of, simply to get the job finished whilst at the same time complying with statutory requirements...<sup>34</sup>

More optimistic members of Parliament, such as Mr Idzerda, argued that even incomplete and flawed mortality statistics might be able to shed much light where currently there was still darkness.<sup>35</sup> Experience in other countries suggested that by collecting and revising the data each successive year, and by checking them against each other, an accurate insight into the state of public health could eventually be obtained. Where doctors had mere opinions about the direct cause of death,

Let them state their opinion; if it should be incorrect... it will be outweighed by the overall benefit. Remember, we are not dealing here with cause-of-death statements for just one year, one city or one district, but with thousands of statements, which can be compared with each other, year after year, and which will gradually begin to shed light where there is currently little or none, on the diseases and health history of the country.<sup>36</sup>

The introduction of these two acts represented the first move towards establishing cause-of-death registration and cause-of-death statistics. Until this point none of the forms which doctors were statutorily required to use to report a death included space for the cause of death. The municipal councils would normally provide doctors with supplementary forms stating that the undersigned declared that, following a personal examination, such and such a person, residing in such and such a municipality, had died on such and such a date at such and such an age and that the cause of death had been as follows.<sup>37</sup> Model forms specified under Article 15 of the Public Health Inspectorate Act now included the registration number of the death certificate, the date of death, the address at which death had occurred, plus the sex, marital status, age, and

occupation of the deceased, and the cause of death.<sup>38</sup> Public health inspectors in seven districts collected the inventories from municipal councils, then sorted and processed the data.

The first statistical compilation based on these revised inventories related to 1866 and focused on just six diseases: smallpox, scarlet fever, measles, typhus, angina diphtheria, and cholera. Other diseases, including unknown causes, were grouped together. During the period 1867–1874, a more sophisticated system of classification grouped causes into eleven main headings, which in turn included 55 causes of death.<sup>39</sup>

Not surprisingly, the reliability of data compiled in the early years left much to be desired. A high proportion of ‘unknown’ causes (for example, 13 per cent of the 1868 reports) reflected many patients’ lack of medical services. Moreover, doctors who had not been in attendance at a death often accepted the word of those who were, without inquiring further.<sup>40</sup> Additionally, public health inspectors did not resolve inconsistencies and duplications in records during the early years. The Ministry of the Interior consequently revised reporting procedures, requiring municipal councils to send their inventories monthly to the provincial statistical office. Councils submitted two separate compilations, one based on classification by sex, marital status, and age, the other based on deaths classified by age and cause. When these lists tallied, then the public health inspector would further process the data.<sup>41</sup>

New forms, beginning 1 October 1868, specified ‘cause of death’ (rather than simply ‘died of’) and differentiated underlying or ‘first disease’ from the immediate cause of death (the ‘last disease’). Former distinctions among children (‘dead before notification’) no longer appeared on the reporting forms. While the Ministry of the Interior hoped for more accurate and complete cause-of-death information, local physicians and mayors resisted the new demand for information on the underlying illnesses. Doctors justified their refusal on the grounds of their sworn oath of patient confidentiality.<sup>42</sup>

Regulations governing the reporting of causes of death were not entirely airtight. Although doctors were required to issue a medical certificate of cause of death to be given to the registrar, the registrar himself was not obliged to request one. Moreover in most municipalities, registrars could grant permission for burial even without this cause-of-death certificate. The Minister hoped that registrars would make every effort to obtain these medical certificates in the interests of reliable mortality and cause-of-death statistics ‘which the Netherlands desperately needs’, but his encouragement of them to do so did not meet with unqualified success. Not surprisingly, this gave rise to dubious practices during the years 1865–1869. In rural parts of the country in particular, situations arose

where next of kin, upon discovering that the patient's doctor was not readily available to issue a medical certificate, would report to the registrar, for convenience's sake, that the deceased had received no medical treatment. Practices such as these resulted in the number of unknown causes of death being high, whilst at the same time presenting an overly pessimistic view of the separate column headed 'death without medical treatment'.<sup>43</sup>

The Burial Act of 10 April 1869 finally made medical certification of cause of death a national, statutory requirement. Thereafter a local registrar could not legally issue a burial permit without a reported cause of death.<sup>44</sup> But the Burial Act, too, failed to stipulate the format of the medical certificate, partly out of fear of offending the sensibilities of doctors who resented the compulsion to provide every detail the statisticians required.<sup>45</sup> Generally speaking, the medical certificate of cause of death was issued by the doctor who had attended the deceased during his or her terminal illness. Where no doctor had attended, an expert appointed by the local mayor and aldermen was to conduct a post-mortem examination. Where there was reason to suspect a violent cause of death, a coroner's inquest was required.<sup>46</sup> In this way doctors were not allowed to issue a medical certificate of cause of death if they had not been in attendance prior to a death, nor were they allowed to issue certificates where a violent death had occurred, even if they had attended at the death. The introduction of the Burial Act resulted in a dramatic improvement in cause-of-death reporting. Between 1869 and 1899, 94–95 per cent of all deaths in the Netherlands were reported by doctors, and incidents of both 'cause of death unknown' and 'death without medical treatment' declined.<sup>47</sup>

## II. 1869–1901: CRITICISM AND PROPOSALS FOR CHANGE

For several decades, the national system of cause-of-death registration seemed to function without much discussion. However, in July 1897, at a meeting of the public health inspectors, it became clear that the quality of the national cause-of-death data had not gone unquestioned.<sup>48</sup> A committee consisting of two inspectors, J. Menno Huizinga and M. W. Pijnappel, was asked to make recommendations for a new system of compilation of data. Their report urged a more complete, accurate, and nationally standardized classification of cause of death than the system that had been in place for thirty years. In their view international standardization was desirable but not yet practicable. Inspectors could trust most of the data pertaining to age, sex, and marital status of the deceased; data pertaining to occupation and place of residence were less

reliable. But ‘the accuracy of the reported causes of death should be viewed with profound distrust’.<sup>49</sup> Huizinga and Pijnappel were concerned about several particular issues. Reporting of stillborn children was considered especially incomplete, because there were no statutory delimitations of the point at which a foetus became reportable as a child. They thus believed that premature infants were reported only arbitrarily to the local registrars. The inspectors found also that doctors continued to issue medical certificates of cause of death even for patients they had not attended, and that doctors not appointed to do post-mortem examinations were nevertheless performing such tasks. Finally they worried that virtually no attention was given to medical statistics in the course of medical education, and that there had been no attempt to update a system of classification that was now seriously outdated by advancements in medical science.<sup>50</sup> In particular, the inspectors considered the intermingling of aetiological, clinical, and pathological/anatomical categories to be a serious problem. In other words, discrete sources of error entered at every stage of the reporting process, compromising the validity and reliability of cause-of-death statistics. It was in particular the conversion of the diagnosed pathological process into a medical certificate of cause of death which was riddled with imperfections.

The complex issue of confidentiality in return emerged as the prime target of criticism from doctors. Many doctors felt that accurately specifying the cause of death of their patients to the registrar – bearing in mind that these details would also be seen by subordinates in each municipality – conflicted with their sworn duty to patient confidentiality. Doctors typically avoided this conflict by opting for a solution which resulted in unreliable cause-of-death statistics; ‘where the nature of the disease the patient died of gives no indication of the lifestyle of the deceased, that disease will be given as the cause of death; if, however, the doctor feels that disclosure thereof would compromise the memory of his patient or his patient’s next of kin, then it will be withheld or alternatively a concomitant cause of death will be given as being the true cause of death.’<sup>51</sup> The medical doctor Bruinsma even ventured that medical statistics from 1865 onwards could not consequently be relied upon in any way whatsoever. The fact that the category headed ‘cause of death unknown’ contained a ‘ludicrously small’ number of entries was used as a basis for arguments in favour of his opinion; there was no way that this column included all the people whose true cause of death the doctor had had to conceal. Another feature he found striking was that alcohol abuse and syphilis, which had such a visible impact on society, did not feature, or featured only to a limited extent, in the cause-of-death statistics. All the other categories were therefore ‘incorrect, because they included the

undoubtedly substantial number of people for whom a coincidental, concomitant disease was given as the cause of death, without taking either of these two very clear and predominantly true causes of death into consideration'. Moreover, failure to supply a cause of death would have untoward consequences for a doctor professionally or for the deceased's reputation, so causes were supplied even where doubt and uncertainty existed.<sup>52</sup>

In part, objections to the disclosure of cause-of-death information were also associated with the constraints imposed by burial funds and life insurance companies. If the cause of death could be attributed to a disease that existed when the policy was obtained, or if the insured had committed suicide, a fund or company could refuse to pay the death benefit.<sup>53</sup> Even if the doctor refused to supply the information, the company could request the information from the registrars, who often complied even though they were not legally obliged to do so. This situation led a number of doctors to 'state the cause of death in such imprecise and vague terms as to render them totally useless either for statistical purposes, or for the purposes of interested parties'. An *NMG* committee examined the conflict, but could find only two cases where a registrar provided a third party with a medical certificate of cause of death (one party a life insurance company, the other a police officer). Three cases involved doctors who found reporting the cause of death objectionable to himself or the deceased's family, because servants or neighbours might be able to infer a death from suicide, alcohol abuse, or venereal disease.<sup>54</sup>

Confidentiality also played a role in the reliability of cause-of-death statistics on other worrisome diseases. Deaths due to some contagious diseases, particularly typhoid and '*febris typhoidea*' posed problems because since the introduction of the Contagious Diseases Act of 1872 statutory requirements required notification and household quarantine.<sup>55</sup> Such measures could have serious financial implications for the family, so doctors who did not consider *febris typhoidea* to be contagious occasionally altered their diagnoses, reporting *febris acuta*, *febris remittens*, or *febris continua*.<sup>56</sup>

Of course the translation of a diagnosis into a specific cause of death was also prone to differences of medical opinion. For example, in Amsterdam in 1883, both croup and diphtheria were widespread, but the terms were treated independently in the cause-of-death statistics. Diphtheria was rarely reported in some districts that had extremely high mortality, while in other districts with lower mortality it was often reported. Moreover, as Korteweg concluded, an individual doctor could have 'a particular pet name which he usually employs, and which crops up relatively frequently in a particular district depending on how extensive

the area covered by the doctor is'. Korteweg therefore suggested limiting the options available to the doctors on the official forms.<sup>57</sup>

The coding stage of cause-of-death processing also posed problems.<sup>58</sup> The Ministry of the Interior had been responsible for the final processing since 1869, but after its Statistical Department was abolished in 1878 responsibility for cause-of-death statistics was transferred to the provincial statistical offices.<sup>59</sup> J. C. G. Evers, a professor of medicine in Leiden, attributed substantial regional variations in mortality due to diarrhoea and other digestive diseases to this decentralization of coding.<sup>60</sup> However, R. H. Saltet, then head of the Amsterdam Health Authority, took a less pessimistic view. Pointing to the guidelines that informed public health inspectors, he agreed that a simple diagnosis of pneumonia did not tell an inspector whether the patient had died of an acute or of a chronic respiratory disease. But 'anyone who has classified thousands of inventories and enumeration cards into categories will know that there are very few occasions on which one has to really stop and think how to classify a cause of death'.<sup>61</sup> Saltet was in a position to check the extent to which coding variation had occurred for various causes of death, because medical certificates of cause of death in Amsterdam were classified by two separate independent researchers, namely the public health inspector for the province of North Holland and the secretary of the Health Service Committee. Table 1 compares the deaths reported using both classification systems, for the periods 1880–1884 and 1885–1889. As is evident from the table, variations were of little significance, particularly in the earlier period.<sup>62</sup> Evers was concerned instead with changes and insufficiencies in nomenclature and in the overall classification system. The first statistics for 1866 only differentiated six categories, together accounting for 28.2 per cent of all deaths. By 1867 the column headed by 'other diseases' still included 34.5 per cent of all deaths. After the elimination of the 'other' category in 1875 dissimilar causes of death such as 'convulsions, trismus and epilepsy' were entered under one category. Evers bewailed the lack of a single, standard nomenclature, an initiative that he felt should come from a centralized Public Health Inspectorate.<sup>63</sup>

Attempts to create a new cause-of-death classification thus date from the 1880s, and reflected ongoing changes in the level of medical know-how.<sup>64</sup> Young doctors increasingly used more anatomically oriented terms learned at university, terms that were different from the symptom-oriented terms chosen by older colleagues. Dropsy is a case in point. During the period 1875–1889, deaths from dropsy declined, while deaths due to renal and heart diseases showed a marked increase.<sup>65</sup> The shift was most clearly seen in Amsterdam, where it occurred some ten years earlier than in the rest of the country.

TABLE 1  
*Mortality in Amsterdam by cause of death in the periods 1880–1884 and 1885–1889 according to two different classifications*

| Cause of death                                 | 1880–1884         |                | 1885–1889         |                |
|------------------------------------------------|-------------------|----------------|-------------------|----------------|
|                                                | Governmental data | Municipal data | Governmental data | Municipal data |
| Typhoid and <i>febris typhoidea</i>            | 501               | 491            | 258               | 259            |
| Smallpox                                       | 53                | 52             | 4                 | 4              |
| Scarlet fever                                  | 600               | 589            | 278               | 277            |
| Measles                                        | 926               | 911            | 1,132             | 1,158          |
| Throat and pulmonary tuberculosis, haemoptysis | 4,076             | 4,057          | 4,578             | 4,285          |
| Croup                                          | 1,513             | 1,499          | 606               | 735            |
| Whooping cough                                 | 758               | 748            | 739               | 743            |
| Acute respiratory diseases                     | 6,454             | 6,444          | 6,607             | 6,385          |
| Chronic respiratory diseases                   | 1,627             | 1,629          | 1,526             | 1,603          |
| Angina diphtheria                              | 584               | 588            | 704               | 603            |
| Maternal mortality                             | 295               | 291            | 293               | 324            |
| Suicide                                        | 25                | 117            | 66                | 127            |

Source: H. Saltet, 'Iets over de statistiek van de sterfte in het beroep en naar de doodsorzaken', *Archief voor de Verzekerings-wetenschap en aanverwante vakken* 5 (1895), p. 307.

The Public Health Inspectorate report of 1897 (written by Menno Huizinga and Pijnappel) as well as the earlier (1895) *NMG* committee report (written by Menno Huizinga, Saltet, and Stheeman) stressed the importance of clear communication of the goals of reporting to local physicians, and measures to make it easier for doctors to provide the necessary information. For that reason the *NMG* committee proposed that in instances where a person's death could be attributed to causes 'which did not reflect well on the deceased' (such as suicide, alcohol abuse, syphilis) only the way the person had died (for example, drowning) should be stated, if, indeed, any cause need be reported on the medical certificate. They regarded the last episode as only one out of several aetiological factors related to the death. An alternative proposal tried to ensure that only the medical official became acquainted with the cause-of-death details.<sup>66</sup> For that purpose, two forms were proposed, 'Form A' and 'Form B', which were first to be filled in by the registrar, based on the death certificate, then completed by the doctor and resubmitted to the

registrar. Form A was effectively the medical certificate of death required by law and given to the registrar. This stated that the doctor had examined the deceased in person and was satisfied that death had occurred. This form would also have to indicate whether the doctor had attended the deceased during his terminal illness and whether or not there were any circumstances requiring further statute-mandated notifications. Form B, in a sealed envelope, was directed to the medical officer through the registrar. The form contained four cause-of-death categories. Three of these were aetiological in nature; one contained a summary of the organs affected. Plans to expedite the sending, processing, and publication of data – weekly in larger cities, monthly in smaller municipalities – expressed the hope that regular publication would heighten doctors' interest in statistics and elicit greater cooperation on their part. Moreover, by bringing doctors into direct contact with the medical officer, a revised system could facilitate the acquisition of additional information directly from doctors.<sup>67</sup> The recommendations of the two committees had little practical impact but were to inspire later reforms.

### III. CONFIDENTIAL MEDICAL CERTIFICATES OF CAUSE OF DEATH

In 1892, in advance of these medical proposals, a Central Statistical Committee was established to provide the Dutch government with advice on statistical matters, and it led to the creation of the Netherlands Central Bureau of Statistics (NCBS) in 1899.<sup>68</sup> By May 1900 the Central Statistical Committee had adopted the recommendations of the Menno Huizinga–Pijnappel plan, allocating final processing and publication of mortality statistics by cause of death to the NCBS.<sup>69</sup> Almost immediately the nomenclature was adjusted to meet internationally developed standards, particularly those developed by Bertillon and approved during a meeting of the Institut International de Statistique of 1893.<sup>70</sup> R. H. Saltet designed a proposal for a slightly modified Bertillon nomenclature, gained the approval of the Public Health Inspectorate and the Minister of the Interior, who in turn sent three delegates to the international statistical meeting held in Paris in August 1900. By December 1900 the Minister had sent a circular to all Dutch doctors announcing that the processing of mortality statistics by the NCBS would, beginning on 1 January 1901, follow the classification system approved in Paris.<sup>71</sup> The Netherlands would from then on follow the international classification.

The introduction of the new nomenclature reopened the debate about the confidentiality of medical certificates of cause of death. The *NMG* re-introduced the idea of delivering the medical certificate in a closed envelope, so that neither the undertaker nor the next of kin could find out

what the cause of death had been. Registrars were to consider cause-of-death registration a ‘confidential matter’ and data should be used exclusively for administrative purposes. The Minister of the Interior concurred, even decreeing that town councils were no longer authorized to supply life insurance companies with copies of the medical certificate.<sup>72</sup> However, in 1903, the life insurance companies countered with a petition to the Minister in which they characterized the next of kin of the deceased as victims of this new decree. After all, without a certification of the cause of death they would not receive the payments to which they were entitled. They called for new measures to provide the next of kin with a certificate stating the cause of death. Without any prior consultation with medical professionals, the Dutch government drafted a bill in 1904 in which doctors were authorized to supply the insurance companies with information on the cause of death – a bill withdrawn in 1905 after strong objections from doctors.<sup>73</sup>

Beginning on 1 January 1903, individual enumeration cards giving the cause of death and a number of personal details for each deceased individual were introduced nationwide in the Netherlands. These cards, intended for statistical purposes only, were sent to health inspectors by the registrars, and were sent to the NCBS after numbers from the comprehensive and abridged lists of causes of death had been added by the inspectors. This system greatly improved the processing speed and accuracy of statistical data, as well as relieving provincial bureaus of their duty to compile municipal-level information.<sup>74</sup>

The first analysis of a sample of these enumeration cards showed that important differences existed in the classification of causes of death among the various health inspectors. In some cases discrepancies were even found in the work of one and the same inspector.<sup>75</sup> Problems were attributed to the lack of detailed ministerial instructions to aid inspectors in coding the data.<sup>76</sup> For that reason, in January 1905 a new ‘nomenclature’ was sent to inspectors, and they were encouraged to consult the *Dictionnaire des maladies*, the *Développement des rubriques de la nomenclature des maladies*, and each other in case of doubt.<sup>77</sup> In 1906, doctors were given six rules to follow in filling out cause-of-death certificates, rules intended to improve the consistency of the information that they provided to the health inspectors.<sup>78</sup>

Small changes to the medical certificates of cause of death continued during the first decades of the twentieth century. For example, in 1903 the certificate included information on whether the certifying doctor had been in attendance<sup>79</sup> and statistics on stillborn children also underwent changes. Until 1916, such statistics were based on data provided by the registrar, which merely made a distinction between ‘notified as living’ and ‘dead

before notification'. From 1917 medical certificates included questions on the probable age of the foetus, and doctors had to state whether or not the child had been born alive.<sup>80</sup>

In the mid-1920s the system of cause-of-death registration incorporated long-urged changes: centralized processing of registration; more detailed questions about cause on the medical certificates; the introduction of a confidential report; and the possibility for the NCBS to make further inquiries of the doctor in attendance. Transferral of the responsibility for compiling mortality statistics from the Public Health Inspectorate to the NCBS occurred in 1919, under the new *Gezondheidswet* (Public Health Act) of September 1920. Coding of the enumeration cards was transferred from regional health inspectors to the chief medical officer,<sup>81</sup> but in practice the NCBS gathered the cards from individual municipal councils.<sup>82</sup> These changes meant that the Public Health Inspectorate did not receive any mortality statistics until they had been processed by the NCBS, and was thus unable to use the information in the promotion of public health. As of 1 July 1932, all enumeration cards were sent directly by doctors to the NCBS, the beginning of a fully centralized system of processing.<sup>83</sup>

New forms, including information on the primary, the secondary and the concomitant disease, and on the doctor in attendance, had meanwhile been introduced on 1 January 1926, again without prior consultation with the medical profession. The director of the NCBS, Mr Methorst, found a single cause of death too vague and argued that the new system yielded far more accurate information.<sup>84</sup> The NCBS objectives were modelled on reporting in Switzerland, which elicited information about diseases other than that causing death.<sup>85</sup> The new forms provoked a cool welcome from doctors: the questions were too vague, the explanatory booklet was not sufficiently publicized, and the detail required was deemed unnecessary. Critics argued that a classification by three types of diseases would only confuse matters, and would lead to a deterioration in the quality of mortality statistics in the Netherlands.<sup>86</sup>

The Central Statistical Committee as well as the Minister realized that only a system that would guarantee doctors confidential handling of cause-of-death information could encourage them to cooperate with the NCBS. For that purpose, negotiations between the Central Statistical Committee, the Minister of the Interior, and the *NMG* resulted in a confidential medical certificate of cause of death (Form B) to be used for statistical purposes only, a change introduced on 1 January 1927.<sup>87</sup> Form B was to exist alongside the medical certificate used by the local registrar of deaths (Form A). Permission for burial was not to be granted until that registrar received both certificates. Form A included the name of the

doctor, his place of residence, the name of the deceased, the date of death, the municipality in which the death occurred, the age of the patient and the cause of death. Form B, addressed confidentially to the medical officer of the NCBS, included information on the 'main disease' causing death, the 'complication' which had caused the patient's death, and the 'concomitant' causes of death. Form A was the less accurate; doctors were not allowed to give false information to the registrar, but at the same time they were not required to state the absolute truth. Form B went to the NCBS via the registrar of deaths. A slip of paper stating the name of the deceased was attached to the envelope containing Form B. The registrar removed this slip from the envelope after he had drawn up a death certificate and had written the certificate's registration number on the envelope. The enumeration cards thus dispatched by the registrar gave personal details (not the name of the deceased), as well as the name of the doctor who had confirmed the death and the cause of death, collated with a registration number. With that number the medical statistical officer was able to transfer the cause of death given in the confidential report onto the appropriate enumeration card.<sup>88</sup>

The three changes in the system of registration introduced during the course of 1926 and 1927 – more detailed questions (three categories of causes of death), the confidential form, and the possibility of contacting the doctor in attendance for further details – significantly improved the validity and reliability of mortality statistics. This was clearly shown by Neurdenburg, who compared mortality statistics for the city of Amsterdam in 1926 and 1927 with the preceding period (1922–1925), as well as with national statistics over the period from 1922 to 1928. Some of his data has been included in Table 2.<sup>89</sup>

More detailed questions on the medical certificate enabled the medical statistical officer to determine the main cause of death in a more precise way. With confidential registration diseases such as syphilis (including *tabes dorsalis* and *dementia paralytica*) suddenly appeared to be more widespread than in previous years. Aneurism (in most cases, aortic aneurism associated with late-stage syphilis) also appeared to become more common. Statistics regarding neoplasms (cancers) improved after 1927, probably due to improved medical check-ups as well as to the greater detail demanded by the new forms. Similarly encephalitis, generally no more than a complication accompanying other diseases, became a less important cause of death. Meningitis, usually complicating otitis media (inflammation of the middle ear), was typically classified under diseases of the ear before 1926. The importance of complications such as embolism, thrombosis, phlebitis, and peritonitis as causes of death declined, as did the reported incidence of ileus and the deaths from sepsis.

CAUSE-OF-DEATH REGISTRATION IN THE NETHERLANDS

TABLE 2  
Mortality in Amsterdam by (selected) causes of death in 1922–1927

| Cause of death                                                                         | Year  |       |       |       |       |       |
|----------------------------------------------------------------------------------------|-------|-------|-------|-------|-------|-------|
|                                                                                        | 1922  | 1923  | 1924  | 1925  | 1926  | 1927  |
| Syphilis without congenital lues, <i>tabes dorsalis</i> and <i>dementia paralytica</i> | 82    | 53    | 60    | 40    | 61    | 93    |
| Aneurism                                                                               | 11    | 21    | 13    | 10    | 8     | 20    |
| Malignant neoplasms (cancers)                                                          | 901   | 926   | 862   | 944   | 914   | 1,025 |
| Benign neoplasms                                                                       | 49    | 43    | 33    | 26    | 27    | 13    |
| Diabetes                                                                               | 128   | 143   | 129   | 127   | 148   | 153   |
| Encephalitis                                                                           | 25    | 17    | 27    | 27    | 17    | 12    |
| Meningitis                                                                             | 71    | 48    | 60    | 48    | 33    | 33    |
| Diseases of the ear                                                                    | 10    | 8     | 9     | 7     | 15    | 14    |
| Embolism, thrombosis and phlebitis                                                     | 31    | 30    | 36    | 38    | 19    | 20    |
| Peritonitis                                                                            | 56    | 54    | 47    | 47    | 29    | 24    |
| Ileus                                                                                  | 20    | 23    | 34    | 25    | 27    | 14    |
| Diseases of the prostate                                                               | 19    | 26    | 23    | 24    | 34    | 52    |
| Diseases of the female reproductive system                                             | 5     | 8     | 5     | 12    | 21    | 16    |
| Complications of pregnancy and puerperum                                               | 39    | 31    | 36    | 49    | 56    | 57    |
| Gangrene, abscess and phlegmon <sup>a</sup>                                            | 19    | 24    | 16    | 14    | 15    | 28    |
| Sepsis                                                                                 | 55    | 57    | 66    | 54    | 40    | 27    |
| Suicide                                                                                | 40    | 50    | 43    | 52    | 58    | 72    |
| <i>Mors subita</i>                                                                     | 19    | 26    | 28    | 26    | 22    | 48    |
| Vaguely described and unknown                                                          | 250   | 212   | 206   | 240   | 189   | 177   |
| Total of above categories                                                              | 1,830 | 1,800 | 1,733 | 1,810 | 1,733 | 1,898 |
| As % of all deaths                                                                     | 25    | 28    | 27    | 28    | 27    | 28    |

<sup>a</sup> 'Plegmon' was a term for an extensive superficial inflammation of the skin with ulcers.

Source: M. G. Neurdenburg, 'Over de statistiek der doodsoorzaken. De nieuwe en geheime verklaringen van overlijden in de praktijk', *Tijdschrift voor sociale geneeskunde* 6 (1928), 110–11.

There was a strong increase, by contrast, in the reported incidence of diseases of the male and female genitalia. Reporting of diseases arising during pregnancy and delivery were probably affected by all three changes in the new system. An increase in the reported incidence of suicide and from medically and surgically induced causes highlighted the advantages of the new system. Needless to say, there was a rapid decline in the medical reports of 'cause of death unknown and unspecified'.<sup>90</sup>

During the 1930s and 1940s, only small changes in the cause-of-death certification took place, relating to medical assistance given by the doctor

and the circumstances in which violent deaths had taken place.<sup>91</sup> Thus it was not until the 1950s that Dutch cause-of-death certificates were adjusted to comply completely with international standards, where the ‘primary’ or underlying cause of death was seen as the main cause. Again the questions had to be reformulated. When the deceased had died of natural causes, the doctors were asked to state which disease had been the immediate cause and which diseases had led to the immediate cause. Doctors were also encouraged to provide details of other diseases from which the deceased suffered, but which had no causal relation to the causes of death given.

Most importantly, the enforcement of the *Wet op de lijkbezorging* (Undertakers Act) replacing the old Burial Act on 1 April 1956, led to statutory requirements to provide confidential details on causes of death.<sup>92</sup> The new legislation included a number of articles on the medical certificates that doctors submitted to the registrars (Form A). Burial or cremation required the registrar’s written permission, which in turn required the doctor or coroner to certify that he or she had personally examined the body and determined death by natural causes. Form A no longer stated the cause of death, doing justice to the medical profession’s long-standing objections to providing the local registrar with confidential information. Form B thus had to be redesigned in such a way that it would serve as a foundation for all cause-of-death statistics. It was for this reason that doctors had to come under a statutory obligation to fill out a medical certificate of cause of death.

The new procedures for completing Form B were specified in the *Gezondheidwet* (Public Health Act) of 18 January 1956. Under this new law, article 5 of the Medical Practitioners Act of 1 June 1865 was replaced by two new articles. The new Article 5 stated that the doctor had to certify the cause of death and other information related to statistical purposes, in addition to issuing the cause-of-death certificate required by the Undertakers Act. Article 6 stated that this information had to be reported in a closed envelope, attaching a slip stating the identity of the deceased. Both the envelope and the slip were delivered to the registrar as quickly as possible. The unopened envelope, bearing the registration number of the death certificate but no ‘identity slip’ was then forwarded to the chief medical officer.<sup>93</sup>

The Public Health Act of 1956 marked the end of a long evolutionary process culminating in a statutory obligation for doctors in attendance to issue a strictly confidential cause-of-death certificate. Prior to 1956, doctors in the Netherlands had only been specifically required to issue a medical certificate confirming a death to the registrar (Form A), which was required before the registrar could grant permission for burial.

Although the Public Health Act of 1919 required mayors and aldermen to report details of all deaths to the chief medical officer, doctors were not under any legal obligation to use Form B to give such information. The act of 1956 gave legal standing to the two-form system that had been instituted by the chief medical officer and the *NMG* beginning in 1927. For the first time, doctors were required by law to issue a medical certificate of cause of death for statistical purposes, the strict confidentiality of which was guaranteed.

## ENDNOTES

- 1 E. S. Houwaart, 'De hygiënisten. Artsen, staat en volksgezondheid in Nederland 1840–1890 (unpublished Ph. D. Dissertation, University of Maastricht, 1991), 343–6.
- 2 For the development of the national system of death registration see among others G. J. Heederik, *Van kasboekregister tot burgerlijke stand. Medisch-demografische aspecten van de registratie van huwelijken, geboorte en sterfte* (Meppel, 1973), 27, 127, 141; H. W. Methorst, *Geschiedenis van de statistiek in het Koninkrijk der Nederlanden, Bijdragen tot de Statistiek van Nederland* (The Hague, 1902), 83–98; L. van Nierop, 'De aanvang der Nederlandsche demographie', *Economisch-Historisch Jaarboek* 5 (1919), 192–208, 193–5; A. M. van der Woude, 'Demografische ontwikkeling van de Noordelijke Nederlanden 1500–1800', in *Algemene Geschiedenis der Nederlanden* 5 (Haarlem, 1980), 102–68, 103–6, 118–19.
- 3 A. M. van der Woude, 'Demografische ontwikkeling', 103–6.
- 4 *Verzameling van naauwkeurige lijsten opgemaakt uit oorspronkelijke registers betreffende de sterfte, geboortens, huwelijken, ouderdommen en ziektes in 's-Gravenhage, in het beloop van XIX jaaren, zedert het jaar 1775 tot 1773 inclus waargenomen* (The Hague, 1774), 33.
- 5 Heederik, *Kasboekregister*, 171; Van Nierop, 'De aanvang', 203–5; Van der Woude, 'Demografische ontwikkeling', 112–19.
- 6 Heederik, *Kasboekregister*, 59–60.
- 7 *Ibid.*, 185 and 195.
- 8 *Ibid.*, 332–46.
- 9 For a detailed overview of guidelines for registering deaths see C. E. Vaillant, *Handboek voor den ambtenaar van den burgerlijken stand* (The Hague, 1893, 3rd edn), 1–85 and 388–420.
- 10 Methorst, *Geschiedenis*, 2–4.
- 11 *Verzameling*, 32–4.
- 12 Houwaart, 'De hygiënisten', 35–59, 133, 346. See also *Departement van Binnenlandsche Zaken* (Department of Internal Affairs), *Statistische Bescheiden voor het Koninkrijk der Nederlanden, Vijfde Deel, Tweede stuk. Sterfte naar de oorzaken van den dood in 1869*, (The Hague, 1871), iv.
- 13 A. H. Israëls, 'Statistiek over 't jaar 1850', *Nederlandsch Weekblad voor Geneeskundigen* 1 (1851), 17–18.
- 14 Houwaart, 'De hygiënisten', 140–1.
- 15 'Ontwerp van Wet omtrent het begraven van lijken, de begraafplaatsen en de begrafenis-kosten', *Bijlagen van het verslag der Handelingen van de Tweede Kamer* (1858–1859), 134.

- 16 'Ontwerp van Wet omtrent het begraven van lijken, de begraafplaatsen en de begrafenis-kosten en Memorie van Toelichting', *Bijlagen van het Verslag der Handelingen van de Tweede Kamer der Staten-Generaal* (1858–1859), 133–9.
- 17 'Memorie van Beantwoording', *Bijlagen van het Verslag der Handelingen van de Tweede Kamer van de Staten-Generaal*, 1858–1859, 1335–8.
- 18 W. Cappers, 'Op zoek naar zekerheid omtrent de dood', *Groniek* **99** (1987), 98–109, 106.
- 19 See the announcement in the *Nederlandsch Weekblad voor Geneeskundigen* **3** (1853), 207 and 295.
- 20 *Nederlandsch Weekblad voor Geneeskundigen* **3** (1853), 336; **4** (1854), 345–6.
- 21 *Ibid.* **4** (1854), 193–4.
- 22 *Staten der in 1854, 1855 en 1856 te Amsterdam gestorvenen, opgemaakt voor de 5de Sectie (Historische en Staatgeneeskunde) van het Genootschap ter bevordering der genees- en heilkunde te Amsterdam* (Amsterdam, 1857), 6.
- 23 *Nederlandsch Weekblad voor Geneeskundigen* **4** (1854), 61, 70 and 228; **5** (1855), 50; **6** (1856), 236–7.
- 24 *Ibid.* **6** (1856), 236–7.
- 25 A. H. Israëls, 'Het 2de Internationale Congres voor Statistiek', *Nederlandsch Weekblad voor Geneeskundigen* **6** (1856), 301–3; 321–3, 301, 323.
- 26 *Verslag der Handelingen van de Tweede Kamer* (1855–1856), 785–6.
- 27 *Tweede verslag van de werkzaamheden der Rijkscommissie voor Statistiek. 1861*, (The Hague, 1862), 26–7.
- 28 'Handelingen van de dertiende algemeene vergadering der Nederlandsche Maatschappij tot bevordering der geneeskunst', *Nederlandsch Tijdschrift voor Geneeskunde* **5** (1861), 533; *Nederlandsche Maatschappij tot bevordering der Geneeskunst (NMG)*, 'Model en toelichting der tabel voor geneeskundige sterfte-statistiek, op de algemeene vergadering der maatschappij tot bevordering der geneeskunst voorgesteld door hare Commissie voor Statistiek', *Nederlandsch Tijdschrift voor Geneeskunde* **6** (1862), 502–5.
- 29 Published respectively in the *Staatsblad* (1865), nos. 58 and 60.
- 30 'Ontwerp van Wet tot regeling van het geneeskundig staatstoezicht, Memorie van Toelichting', *Bijlagen van het Verslag der Handelingen van de Tweede kamer der Staten-Generaal*, 1861–1862, 969.
- 31 'Ontwerp van Wet tot uitoefening der geneeskunst, Memorie van Toelichting', *Bijlagen van het Verslag der Handelingen van de Tweede kamer der Staten-Generaal*, 1861–1862, 974.
- 32 'Voorlopig Verslag der Commissie van rapporteurs voor het Ontwerp van Wet tot regeling van het geneeskundig staatstoezicht, Memorie van Toelichting', *Bijlagen van het Verslag der Handelingen van de Tweede kamer der Staten-Generaal*, 1862–1863, 1170.
- 33 *Ibid.*, 1182; translation for this and later translations in this article are by the authors.
- 34 *Handelingen van de Staten-Generaal*, 1864–1865, 700.
- 35 *Ibid.*, *Supplementblad*.
- 36 *Ibid.*, 702.
- 37 H. H. van Eijk, *Arts en wet. Handleiding voor praktizeerende artsen en medische studenten* (Haarlem, 1910), 46. A systematic inventory of surviving individual medical certificates has not yet been made. It is definite however that for several cities, including Tilburg (see C. G. W. P. van der Heijden, *Het heeft niet willen groeien. Zuigelingen- en kindersterfte in Tilburg, 1820–1930* (Tilburg, 1995) and Groningen (see P. Kooij, 'Gezondheidszorg in Groningen 1870–1914', *Tijdschrift voor sociale geschiedenis* **8** (1982), 112–55), and villages the original data are still available in the municipal archives.

- 38 *Bijvoegsel tot het Staatsblad van het Koninkrijk der Nederland*, 1865, no. 228.
- 39 *Verslag aan den Koning van de bevindingen en handelingen van het Geneeskundig Staatstoezicht in het jaar 1867* (The Hague, 1868), 33.
- 40 *Verslag van het Geneeskundig Staatstoezicht over 1869*, 391. See also the Instruction of the Ministry of the Interior, December 27 1869, no. 347, *9de Afdeling. Verslag der Handelingen van de Tweede Kamer der Staten-Generaal*, 1868–1869, 900–2, 910–12.
- 41 Missive of the Ministry of the Interior of August 14 1868, no. 209, *8ste Afdeling, stat., betrekkelijk de inzending van de lijst der overledenen, bedoeld in art. 15 der wet van 1 Junij 1865*, *Bijvoegsel tot het Staatsblad van het Koninkrijk der Nederlanden*, 1868, 417–18.
- 42 Circular of the Ministry of the Interior of September 15 1868, no. 277, *9de afd., med. pol., betreffende de invulling der lijsten bedoeld in art. 15 der wet van den 1sten Junij 1865* (Staatsblad no. 58), *Bijvoegsel tot het Staatsblad*, 1868, 514. Instruction of the Ministry of the Interior of October 26 1868, no. 275, *9de Afdeling, med. pol., betreffende de invulling door de geneeskundigen van de lijst voorgeschreven bij art. 15 der wet van den 1sten Junij 1865* (Staatsblad, no. 58), *Bijvoegsel tot het Staatsblad*, 1868, 674–7.
- 43 W. J. M. J. Rutten, ‘Mortaliteit en medicalisering’, *Holland* **17** (1985), 131–60, 132–38.
- 44 Article 1 stated that every deceased person and every stillborn child ought to be buried. During the discussion in Parliament the government had indicated that the provision on the permission for burial only referred to mature children and foetuses of seven months or more; if, however, someone notified the birth of a premature child and asked permission for burial the registrar had to accept the notification and was not allowed to refuse the permission for burial (S. Gratama Hz., *Wet tot vaststelling van bepalingen betrekkelijk het begraven van lijken, de begraafplaatsen en de begrafenisregten, van den 10den April 1869* (Staatsblad no. 65) zoals die gewijzigd is bij latere wetten door..., Part 1 (The Hague, 1888), 179).
- 45 *Verslag der Handelingen van de Tweede Kamer der Staten-Generaal*, 1868–1869, 900–2, 910–12.
- 46 Instruction of the Ministry of the Interior of November 11 1865, no. 236, *Bijvoegsel tot het Staatsblad*, 1865, no. 268.
- 47 Rutten, ‘Mortaliteit’, 132–3.
- 48 *Verslag aan de Koningin van de bevindingen en handelingen van het Geneeskundig Staatstoezicht in het jaar 1897* (The Hague, 1899), 15 and 48.
- 49 J. Menno Huizinga and M. W. Pijnappel, ‘Rapport omtrent de inrichting der sterftestatistiek’, in *Verslag aan de Koningin van de bevindingen en handelingen van het Geneeskundig Staatstoezicht in het jaar 1898* (The Hague, 1900), 33–48, 35.
- 50 A. de Knecht-Van Eekelen, ‘Opvattingen over geneeskundige statistiek in het “Nederlandsch Tijdschrift voor Geneeskunde” rond de eeuwwisseling’, *Gewina* **15** (1992), 163–81.
- 51 G. W. Bruinsma, ‘Sterfte-Statistiek naar de oorzaken van den dood en Art. III (Art. 5 oude wet) van het Wetsontwerp regelende de uitoefening der geneeskunst’, *Nederlands Tijdschrift voor Geneeskunde* **22** (1886), 385–97, 387.
- 52 Bruinsma, ‘Sterfte-Statistiek’, 388.
- 53 H. Saltet, ‘Iets over de statistiek van de sterfte in het beroep en naar de doods-oorzaken’, *Archief voor de Verzekerings-wetenschap en aanverwante vakken* **5** (1895), 300–24, 300–1.
- 54 J. Menno Huizinga, R. H. Saltet and H. A. Stheeman, ‘Rapport omtrent verklaring van overlijden’, *Nederlandsch Tijdschrift voor Geneeskunde* **39** (1895), 697–705.

- 55 Article 20 of the Contagious Diseases Act December 4 1872 (*Wet houdende voorzieningen tegen besmettelijke ziekten*), *Staatsblad* **134** (1872).
- 56 Saltet, 'Iets over de statistiek', 319; J. C. G. Evers, *Bijdrage tot de bevolkingsleer van Nederland* (The Hague, 1882), 67–74. See also J. A. Korteweg, 'Statistiek van croup en diphtheritis', *Nederlands Tijdschrift voor Geneeskunde* **21** (1885), 722–7.
- 57 Korteweg, 'Statistiek van croup', 726.
- 58 Even at the stage of the processing of the medical certificates at the registrars' offices serious shortcomings existed. Especially in busy town clerk's offices, young and inexperienced officials or volunteers had to fill in the monthly inventories for the inspectors on the basis of medical certificates which were often illegible. See letter from 'H. te S.' to *De Gemeente-Stem* **35** (13 April 1885), 3.
- 59 Instruction of the Ministry of the Interior of December 1 1877, no. 26, *8ste Afdeling, Statistiek, betreffende het opmaken der bevolkingsstatistiek, Bijvoegsel tot het Staatsblad*, 1877, no. 333.
- 60 Evers, *Bijdrage*, 105; C. M. Kleipool, *Een kritische beschouwing over beroepsziekte en beroepssterfte-statistiek* (Amsterdam, 1912), 17.
- 61 Saltet, 'Iets over de statistiek', 307–8.
- 62 Saltet ('Iets over de statistiek') explained the lower national figures for suicide by doctors' tendency to be cautious; one could only conclude that suicide was the cause of death when family circumstances and the place where the body was found were also taken into account and when it was certain that crime was not involved. This information was more often available at the local level.
- 63 Evers, *Bijdrage*, 57–9.
- 64 *Verslag aan de Koningin-weduwe van de bevindingen en handelingen van het Geneeskundig Staatstoezicht in het jaar 1890* (The Hague, 1892), 14.
- 65 Saltet, 'Iets over de statistiek', 312–14. See also H. van Vollenhoven, 'Drie vijfjarige tijdvakken, vergelijkend overzicht van de starfte in Nederland van 1875–1890', *Nederlands Tijdschrift voor Geneeskunde* **30** (1894), 1043–65, 1053.
- 66 Menno Huizinga, Saltet, and Stheeman, 'Rapport', 700–1.
- 67 Menno Huizinga and Pijnappel, 'Rapport', 44–5.
- 68 Methorst, *Geschiedenis*, 17–41.
- 69 *Jaarverslag over 1900 van de Centrale Commissie voor de Statistiek* (The Hague, 1901), 2–7, 40–2.
- 70 CBS, *Statistiek van de sterfte naar den leeftijd en naar de oorzaken van den dood over het jaar 1902* (The Hague, 1903), V–XVI.
- 71 Circular of the Ministry of the Interior of December 10, 1900.
- 72 G. W. Bruinsma, *Nieuw Geneeskundig Wetboek. Overzicht en aanwijzing van wetten, besluiten, reglementen enz., die van belang zijn voor Geneeskundigen, Apothekers enz. Supplement I–IV* (Haarlem, 1902), 15–17.
- 73 A. C. M. Beukers, *Het beroepsgeheim van den geneesheer* (The Hague, 1915), 15–17, 75–80.
- 74 F. Fonck, 'De bevolkingsstatistiek voor 25 jaar en thans', in *Gedenkboek 25 jarig bestaan Centrale Commissie voor de Statistiek 1892–1917* (The Hague, 1917), 27–48, 9.
- 75 *Jaarverslag van de Centrale Commissie voor de Statistiek over 1903, Bijvoegsel tot de Nederlandsche Staatscourant van Woensdag 6 juli 1904*, no. 156, no. 32, Supplement II.
- 76 *Jaarverslag over 1905 van de Centrale Commissie voor de Statistiek* (The Hague, 1906), 146–50.
- 77 *Verslag van de Centrale Commissie voor de Statistiek over 1904*, 38–46, 185 ff.
- 78 CBS, *Statistiek van de sterfte naar den leeftijd en de oorzaken van den dood* (The Hague, 1907), XXIX.

- 79 *Jaarverslag over 1902 van de Centrale Commissie voor de Statistiek* (The Hague, 1903), 3.
- 80 *Jaarverslag der Centrale Commissie voor de Statistiek over het jaar 1916* (The Hague, 1917), 30, 43–6; *Jaarverslag der Centrale Commissie voor de Statistiek over het jaar 1917* (The Hague, 1918), 31–2. Total conformity with the internationally accepted definitions of stillborn children was only reached in 1950, and with the definition of live-born children in 1964 (CBS, *Doodgeboorte in Nederland 1918–1965* (The Hague, 1968), 18–20; T. van den Brink, ‘Geboorteregistratie en geboortestatistiek’, *Tijdschrift voor sociale geneeskunde* **39** (1961), 285–7).
- 81 A medically trained official was appointed for this purpose at the NCBS. See *Jaarverslag der Centrale Commissie voor de Statistiek over het jaar 1918* (The Hague, 1919), 31–2.
- 82 Circular letter of the Minister of Labour of September 8 1920, *Bijvoegsel tot de Nederlandsche Staatscourant*, 8 September 1920, no. 174.
- 83 *Het Bureau van Statistiek der gemeente Amsterdam 1894–1944* (Amsterdam, 1944).
- 84 *Jaarverslag der Centrale Commissie voor de Statistiek over het jaar 1924* (The Hague, 1925), 21–4.
- 85 C. J. Brenkman, ‘Verklaring van Overlijden Model 1926’, *Tijdschrift voor Sociale Geneeskunde* **4** (1926), 47–50, 49.
- 86 H. Pinkhof, ‘De doodsoorzaak op de verklaring van overlijden’, *Nederlandsch Tijdschrift voor Geneeskunde* **70** (1926), 693–5.
- 87 *Jaarverslag der Centrale Commissie voor de Statistiek over het jaar 1925* (The Hague, 1926), 13–14.
- 88 M. G. Neurdenburg, *Doodsoorzaak en statistiek* (Amsterdam, 1929), 12–28.
- 89 M. G. Neurdenburg, ‘Over de statistiek der doodsoorzaken. De nieuwe en geheime verklaringen van overlijden in de practijk’, *Tijdschrift voor sociale geneeskunde* **6** (1928), 110–11.
- 90 *Ibid.* 111–14. See also Neurdenburg, *Doodsoorzaak*, 137–8.
- 91 Circular letter of the Minister of Social Affairs of June 16 1936, no. 1098H, Department of Public Health, *Nederlandsche Staatscourant*, 17 June 1936, no. 116; CBS, *Statistiek van de sterfte naar den leeftijd en de oorzaken van den dood over het jaar 1935* (The Hague, 1936), XXIII. Although this publication refers to the year 1935 the circular was only published by the Public Health Inspectorate in June 1936. No. 2193 H. Doss. 36, Department of Public Health, *Nederlandsche Staatscourant*, 29 November 1938, no. 231. See also the Ordinance of 29 November 1940, no. 2197 H/Doss. 36, Department of Public Health, *Nederlandsche Staatscourant*, 4 December 1940, no. 237, 4 and 6–7.
- 92 ‘Wijziging verklaring van overlijden’, *Nederlands Tijdschrift voor Geneeskunde* **100**, 1956, 957–8.
- 93 Ministry of Social Affairs and Public Health, Model form for entry of cause of death (*Model Doodsoorzaakverklaring*), 27 November 1956, no. 19439, *Afdeling Medische Beroepen en Ziektenbestrijding, Directie Volksgezondheid, Nederlandse Staatscourant* 13 December 1956, no. 244, 3–6. Shortly thereafter again a new, hardly revised, model was published: Ordinance of the Ministry of Social Affairs and Public Health of August 10 1957, no. 8603, *Afdeling Medische Beroepen en Ziektenbestrijding, Directie Volksgezondheid tot vaststelling van het Model Doodsoorzaakverklaring, Nederlandse Staatscourant*, 1957, no. 163. A recent overview of the cause-of-death registration is given in J. T. P. Bonte, L. M. Friden and J. W. H. van den Berg, ‘De statistiek van de doodsoorzaken’, *Nederlands Tijdschrift voor Geneeskunde* **129** (1985), 1421–8, and in D. Hoogendoorn, ‘Het formulier voor de verklaring van de doodsoorzaak’, *Nederlands Tijdschrift voor Geneeskunde* **129** (1985), 1429–32.